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Slovenia (SI, 2004, 2007)
Spain (ES, 1986, 1999)
Sweden (SE, 1995, no official target date yet)
United Kingdom (UK, 1973, opt-out)

ABBREVIATIONS

ABCP	Asset backed commercial paper
ABS	Asset backed security
AFME	Association for Financial Markets in Europe
AIFs, AIFMs	Alternative Investment Funds, Alternative Investment Fund Managers
AMR	Alert Mechanism Report
ATM	at-the-money (option)
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlements
CCPs	Central counterparties
CDO	Collateralized debt obligation
CDS	Credit default swap
CEE	Central and Eastern Europe
CLO	Collateralized loan obligation
CMO	Collateralized mortgage obligation
CNAV	Constant Net Asset Value
CRAs	Credit rating agencies
CVA	Credit valuation adjustment
DMOs	Debt management offices
DVA	Debit valuation adjustment
EA, EA18	Euro Area (18 Member States)
EBA	European Banking Authority
ECB, ESCB	European Central Bank, European System of Central Banks
EEA	European Economic Area
EFSF	European Financial Stability Facility
EFSIR	European Financial Stability and Integration Report
EIOPA	European Insurance and Occupational Pensions Authority
EM, EMEs	Emerging Market Economies
EONIA	Euro OverNight Index Average
ESAs	European Supervisory Authorities (EBA, EIOPA, ESMA)
ESFS	European System of Financial Supervision
ESM	European Stability Mechanism
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
ETFs	Exchange Traded Funds
EU, EU28	European Union (28 Member States)
FASB	Financial Accounting Standards Board
FDI	Foreign Direct Investment
FOMC	Federal Open Market Committee
FSAP	Financial Services Action Plan
FSB	Financial Stability Board
FVCs	Financial Vehicle Corporations
GAAP	generally accepted accounting practices
GDP	Gross Domestic Product
GSE	Government sponsored entities

G-SIBs	Global systemically important banks
IAS	International Accounting Standards
IASB	International Accounting Standards Board
ICMA	International Capital Market Association
IDRs	In-depth reviews in the context of the EU's Macro-Imbalances Procedure
IFRS	International Financial Reporting Standards
IIF	International Institute of Finance
IMF	International Monetary Fund
IOSCO	International Organisation of Securities Commissions
ISDA	International Swaps and Derivatives Association
ITM	in-the-money (option)
LEI	Legal identifier
LIBOR	London Interbank Offered Rate
LTROs	Longer term refinancing operations
MBS	Mortgage backed securities
MFI	Monetary financial institutions
MMFs	Money Market Funds
NACE	Nomenclature des Activités Économiques dans la Communauté Européenne
NAV	Net Asset Value
NFCs	Non-financial companies
NPLs	Non-performing loans
OTC	Over the counter
OTM	out-of-the-money (option)
PSI	Private sector involvement
QE	Quantitative easing
REITs	Real Estate Investment Trusts
RMBS	Residential mortgage-backed security
SEC	US Securities and Exchange Commission
SFTs	Securities financing transactions
SIFIs	Systemically Important Financial Institutions
SIVs	Structured investment vehicles
SMEs	Small- and medium-sized enterprises
SMFS	Single Market in financial services
SPV	Special purpose vehicle
TBTF	Too big to fail
TSCG	Treaty on Stability, Coordination and Governance
USD	U.S. Dollar
VNAV	Variable Net Asset Value
WTI	West Texas Intermediate (crude oil price benchmark)

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PREFACE

Since 2004, the European Commission has been publishing annual reports monitoring the evolution of the financial system as part of the Single Market.¹

The recent crisis has shown that financial risks need to be monitored more closely. As of 2011 this continuous monitoring was conferred to the European System of Financial Supervision (ESFS) and the European Systemic Risk Board (ESRB). EBA, ESMA, EIOPA and the ESRB have been monitoring different aspects of the financial system under their respective competencies and during 2013 all of them have been issuing regular reports and dashboards on risks and vulnerabilities, often on a quarterly basis. The ECB also monitors financial stability and integration in Europe on a continuous basis.

The present report does not provide a comprehensive overview or analysis of all developments across all the different financial market segments. It focuses on the main market and policy developments that are relevant from both a European financial stability and integration perspective.

The present report reflects market and policy developments in 2013 and, where possible, during the first quarter of 2014.

¹ http://ec.europa.eu/internal_market/economic_analysis/reports/index_en.htm

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EXECUTIVE SUMMARY

Chapter 1 discusses financial market developments in 2013 and early 2014 and the emerging financial landscape after the crisis. While financial stress has abated in 2013, the funding patterns have been altered and cross-border financial flows as well as the international diversification of balance sheets have changed across all sectors. It remains to be seen how permanent these changes will turn out to be, but there is a post-crisis consensus emerging that some markets (in particular sovereign bond markets and wholesale markets, but also interbank credit) had been haunted by a failure to correctly appreciate risks and market dynamics. After a short discussion of these broader trends in Section 1.1, Section 1.2 continues with a review of developments in sovereign bond markets where spreads have further declined in 2013. Section 1.3 reports on the various channels through which the financial system provided funding to the real economy but also within the financial sector itself. Section 1.4 focusses on banking sector developments and Section 1.5 discusses selected issues in insurance markets.

Chapter 2 reports on the recent evolution of financial support measures as well as on the progress with financial sector reform. A number of extraordinary financial support measures continued to be in place. In April 2013, financial assistance was granted to Cyprus. On the other hand, Ireland and Spain exited financial assistance programmes in 2013 and early 2014. 2013 was marked also by the early partial repayment of the two longer-term refinancing operations (LTROs) of the ECB of November 2011 and February 2012 and the normalisation of interbank markets. The intermediation position played by the ECB throughout the crisis diminished somewhat over the last 12-15 months, and direct support to the financial sector provided by governments declined for the EU as a whole. Finally, the chapter informs about the progress with legislative financial sector reform in 2013 and early 2014 with political agreements reached between co-legislators on a number of major building blocks of the emerging Banking Union such as the framework for the recovery and resolution of credit institutions and investment firms (BRRD) in December, as well as on the Single Resolution Mechanism (SRM) in March.

Chapter 3 focuses on the EU shadow banking sector and regulatory reform measures in this area. Shadow banking comprises a diverse system of entities and activities that perform bank-like activities without however being regulated and supervised like banks. After comparing the different approaches to measure the size and recent dynamics of shadow banking, the main economic drivers behind shadow banking growth are discussed to better assess the shadow banking's potential contribution to growth as well as to newly emerging systemic risks in the future. Certain shadow banking activities have given rise to systemic risk due to the sector's sheer size, its interconnectedness with the regulated banking sector, regulatory arbitrage, the excessive procyclicality in secured funding transactions, and the moral hazard or inadequate generated asset quality. However, the chapter also documents regulators' concern how to better unlock the sector's potential for fostering economic growth by taking away undue stigma attached to sound shadow banking intermediation, notably through reviving "high-quality" securitisation markets. The chapter ends by providing a comprehensive overview of all policy measures in the area of shadow banking, with a particular focus on the recent legislative initiatives with respect to hedge fund and other

alternative investment fund managers, money market funds, and the transparency in the area of securities financing transactions.

Chapter 4 provides a comprehensive overview and summary of the measures taken at EU level, notably included in MIFID/R to mitigate and control the risk and concerns associated with high frequency trading (HFT). Effective implementation of these measures across Europe shall ensure that HFT lives up to its promise of improving market quality without endangering or distorting the adequate functioning of securities markets either in normal times or in times of market stress. In the second part of the chapter the economic rationale and regulatory appeal of measures specifically targeted to curtail a possible zero-sum speed race which is largely driven by the existing market design is assessed.

Chapter 5 reviews the economic role of financial derivatives in commodity markets. The chapter documents how commodity markets have become progressively more integrated with other financial market segments, and it describes the role of commodity derivatives in managing or increasing risks across market segments. It analyses the growth of commodity financial transactions in terms of size, complexity and purposes in recent years. It also exposes how the financial crisis has had a large impact on commodity derivatives markets and how commodity markets' assets, participants and structures are interconnected with those of financial markets. The chapter analyses the main risks derived from these developments, including the lack of transparency and market concentration, leading to asymmetry of information for market participants and regulators and to counterparty risks. Finally, it examines how recent regulatory responses to these risks, such as those under the Dodd Frank Act in the US and EMIR, MiFID II, MAR/CSMAD among others in the EU are impacting this sector with a view to increasing market transparency and stability and reducing market concentration and the likelihood of market abuse.

Chapter 6 gives a general overview of derivatives accounting and disclosure in banks' financial statements and a number of related economic issues related to accounting practices. It addresses some elementary questions on the meaning of derivatives in bank reporting. What are the challenges derivatives pose to either accountants or analysts of banks? What do financial statements reveal about derivatives in the EU? Do derivatives accounted for on the balance sheet provide useful information to investors on the financial position of a given bank? Do aggregated figures on derivatives correctly inform investors about bank stability? How do changes in the fair value of derivatives play themselves out in terms of balance sheet stability?

Chapter 7 opens a debate on the current system of indicators used to monitor financial integration. Most of the indicators were established over a decade ago, reflecting the academic literature up to the early 2000s. The crisis has furthered our understanding of the pros and cons of some indicators. Data availability has improved tremendously, which allows the use of additional indicators compared to a decade ago. The chapter proposes a review of the set of indicators used by the Commission after the ECB reviewed its indicators in 2012 and is now working on a synthetic indicator of financial integration.

CHAPTER 1: MARKET DEVELOPMENTS

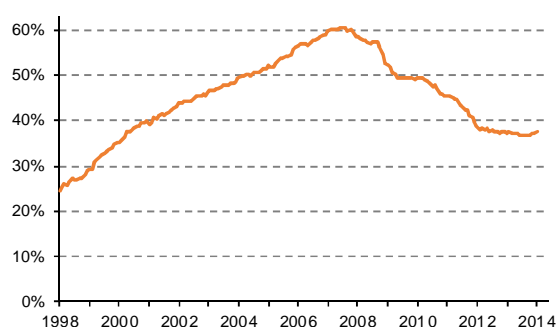
This chapter starts with an overview of the state of play of financial stability and integration after the financial and economic crisis (Section 1.1). Then, Section 1.2 describes the main developments in European sovereign debt markets in 2013 and early 2014. Section 1.3 presents the evolution of credit received by the economy either through banking intermediation or by issuing securities. Section 1.4 focuses on the EU banking sector, in particular, as regards the banks' funding conditions (liquidity) and their balance sheet repair (solvency). It also studies other structural features of the banking system such as size, concentration, or cross border ownership. Section 1.5 discusses selected recent developments in the EU insurance sector.²

1.1 ECONOMIC AND FINANCIAL LANDSCAPE AFTER THE CRISIS

In terms of *financial integration*, the European economic and financial area appears substantially more segmented along national borders after the crisis compared to 2007/08 (Chart 1.1.1), and balance sheets exhibit increased home bias, both on the asset and the liability sides. However, as can be seen from data and indicators presented throughout this report, not all market segments of the financial system and not all sectors in the economy were affected to the same extent or in the same manner.

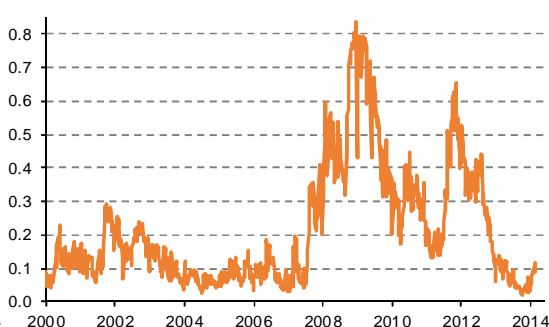
In terms of *financial stability*, aggregate measures of financial stress, including in the Euro Area, have come down in 2013 to levels not seen since 2007 (Charts 1.1.2 and 1.1.4). Many other indicators also points toward a normalisation of markets in terms of liquidity, risk aversion, volatility or perception of sovereign strength.³ On top of that, European business and consumer sentiment returned to its long-term average, albeit with strong variations across the EU, helped by continued accommodative monetary conditions (Chart 1.1.3). At the start of 2014, a modest economic recovery⁴ was underway supported by a changing mix of market-based and intermediated funding technologies.

Chart 1.1.1: Cross border debt securities held by Euro area banks, percentage of total debt securities



Source: ECB and own calculations.

Chart 1.1.2: Systemic Stress Composite Indicator (CISS), index



Source: ESRB: Risk Dashboard.

However, the prevailing *need to reduce leverage* across all sectors of the economy, in combination with *unacceptably high levels of unemployment* in many parts of the Single

² A number of additional graphs and tables are included in the Annex to this chapter.

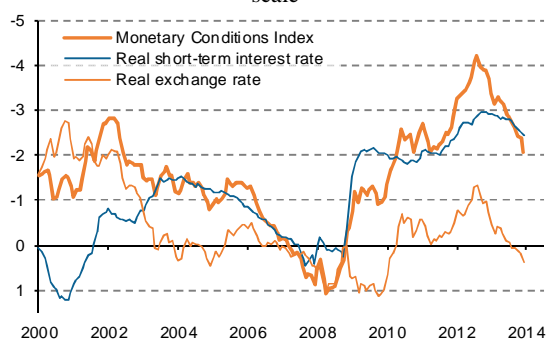
³ See Charts 1.A.4 to 1.A.7 in the Annex and Chart 1.2.2.

⁴ See Chart 1.A.1 in the Annex with the forecast of economic growth.

Market, *continued to hamper the speed of the recovery* over the last 12-18 months. Risks to financial stability remained as the future overall framework about how to deal with failing financial institutions still had to be finalized.⁵

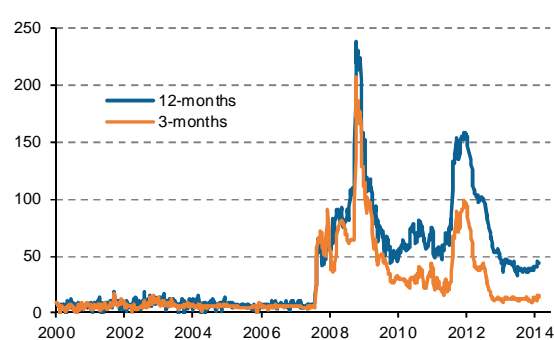
Overall, on both accounts – financial stability and integration – it therefore seems too early to tell if 2013 has been the year that witnessed a certain normalisation. Some market segments have returned to a situation which could be close to a new equilibrium. Other segments of the financial system took part in a process of rapid transformation with actors in the financial system trying to cater for the rapid evolution of technology and the multitude of regulatory innovations at the same time.

Chart 1.1.3: MCI and contributors, Euro area, inverted scale



Source: European Commission.

Chart 1.1.4: Euribor-OIS spread, basis points



Source: Bloomberg

Developments in 2013 and early 2014 trigger numerous questions as to what one should expect the new market and institutional equilibrium to look like. What will be the capital structure of financial institutions on the one hand and of non-financial companies on the other? How much will funding structures and financial leverage continue to differ from one country to another even within a more complete financial market? What is the emerging optimal benchmark portfolio that banks, insurers, other financial institutions should target in order to optimally diversify risks to their assets and liabilities? What effective hedging instruments will be available to financial institutions, NFCs, and private households? How much of these instruments is needed and how will they be accounted for?

What appears certain is that *technological progress* and *shifting cost functions* are rapidly transforming the supply of financial services in the Single Market with *increasing roles for shadow banking⁶ and market-based funding technologies*. On the other hand, banks are among the most important players themselves in the most dynamic segments of an evolving financial system. Reflecting this multitude of questions, this year's report contains a lot of information on various, often less known, aspects of the EU's financial system at this juncture. A central feature of European financial integration in 2013 is that several market segments are still at the beginning of a possible integration process.

The *analysis of financial integration up to the crisis had focussed on the most advanced market segments*, be it for the simple reason that these segments were the most transparent

⁵ See Section 2.3 on the state of play on the resolution mechanism as well as structural banking reform.

⁶ See Chapter 3 for an in-depth discussion on shadow banking.

ones where a statistical approach to monitoring integration and stability could be implemented in the first place. Several less transparent segments of the EU's financial market, where information on risk is local or lacks standardisation in order to be comparable, continue to be segmented (such as financial retail markets in areas such as housing mortgages or private household insurance).

Another feature of the post-crisis environment is the level-shift in debt across all sectors. In many parts of the Single Market, this observation applies to financial institutions, private households, non-financial companies, and governments alike. In 2013, the efforts across sectors to return to more acceptable degrees of leverage continued to weigh on spending and investment decisions and to hamper the economic recovery.

Equally, tackling the sovereign-bank feedback loop both at the level of sovereigns along several dimensions and at the level of financial institutions remained a priority in 2013 and early 2014. Fiscal consolidation continued to lower immediate financing needs. Optimal uses of debt management tools reduced the likelihood to experience short-term stress by avoiding peaks of debt redemption and refinancing. Structural reforms in labour and product markets in several Member States helped address bottlenecks to potential growth and enhance the capacity to "bounce back" after a shock, also referred to as increased resilience of the economic system. Member States that benefitted from financial assistance programmes⁷ progressed with labour and product market reforms. The evolution on the side of the banking sector is discussed in detail in Section 1.4.

A pertinent trend which has been further confirmed in 2013 is the changing pattern of risk sharing within the EU. Whereas cross-border investments, mainly in debt instruments and to a lesser extent in equity, until 2007 have led to a reduction in the home bias on balance sheets of economic agents at all levels (private savers, banks, insurers, institutional investors) as reflected in the national balance sheets, and this diversification of financial assets has allowed a higher degree of risk sharing, the development has gone sharply into reverse since 2008.

Developments in 2013 thus have confirmed at least ***two weaknesses of European financial integration***: (a) a dominant use of debt instruments for international diversification of portfolios, and (b) a poor geographical and sector diversification of these instruments. The first element has less favourable insurance properties compared to risk sharing via equity instruments.⁸ The second element introduces an additional degree of vulnerability in national balance sheets as well as on balance sheets of individual institutions or private households. In the worst case these institutions with poorly diversified international portfolios were financial institutions that could not absorb sufficient losses triggered by a (price) correction mainly in housing markets.

Even so, reflections on a possible need to rebalance integration of different segments in the single market for financial services continued to be in an early stage. In almost all EU Member States debt financing receives a more favourable tax treatment compared to equity

⁷ Section 2.2.2 provides an overview of financial assistance programmes in 2013 and at the start of 2014.

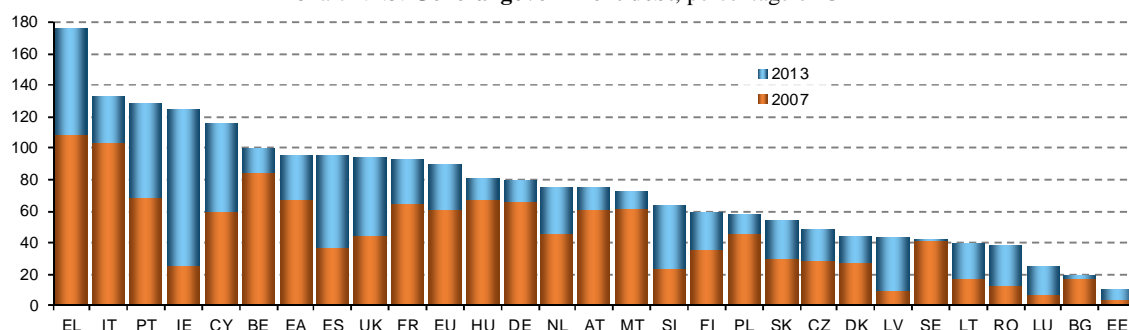
⁸ This aspect is developed in more detail in Chapter 7.

finance. Will this observation in conjunction with robust empirical evidence that strong credit growth precedes financial and banking crisis be sufficient to trigger shifts in taxation policies as suggested in the Commission’s Alert Mechanism Report (AMR)⁹ as well as several individual in-depth reviews (IDRs)¹⁰? Is there a need for coordinated action at the EU level? The link of the debt bias in corporate taxation with the issue of tax base shifting and transfer pricing has so far gained more attention with national ministers of finance, but if action in this area has positive side effects on financial stability it would not be a bad outcome at all.

Last but not least, the data and analysis contained in this report support the following observations:

First, the legacy of the crisis includes a massive increase in *debt* levels, including government debt (Chart 1.1.5), in many Member States and the threat of a lost generation in some of the most affected countries. Moreover, low potential growth rates driven by demographic trends leave no room for complacency to address unsustainably high *contingent liabilities* such as explicit or implicit state guarantees for financial institutions, underfinanced public infrastructure and subsidized state-owned companies, as well as pension and health care entitlements. The *Banking Union* shall address the first item in this list, innovative financial market solutions can do a lot to help addressing the other items as well. A mix of new financial instruments is needed to tackle *long-term funding needs*¹¹ including for a modern public infrastructure. New forms of (high quality) securitisation can help to improve cost-efficiency of public service providers, and still other financial instruments are needed to address the ever growing *individual financial risks* linked to longevity and health status.

Chart 1.1.5: General government debt, percentage of GDP



Note: General government includes Central government, State government, Local government and Social security funds; it does not include debt issued by public sector enterprises.

Source: European Commission: Eurostat (2007) and AMECO (2013).

Second, in the absence of a *more effective market-based risk-sharing*, financial solidarity through the official sector has proven effective in Europe. Out of eight financial assistance programmes, five have been completed and the one for Portugal is scheduled to be completed

⁹ The Alert Mechanism Report (AMR) is the starting point of the yearly cycle of the Macroeconomic Imbalance Procedure (MIP) and it identifies the Member States which may be affected by imbalances. For those countries, subsequent in-depth reviews (IDRs) are performed to verify the existence or persistence of imbalances and their nature.

¹⁰ See e.g. the in-depth review of Italy.

¹¹ See European Commission (2014d).

by mid-2014. Programmes for Greece and Cyprus continue. All the programmes have in common that, in their absence, a much steeper adjustment of domestic consumption possibilities or write-down of financial assets (from the domestic and international creditor point of view) would be necessary. Due to official financial support the rebalancing can be spread over several years.

Third, after the use of private sector involvement (PSI) in Greece, the restructuring of the financial sector in Cyprus required the *use of capital controls*. The absence of significant reactions by market participants to events in Cyprus allows the conclusion that they have understood that such measures can be justified in extraordinary circumstances and in certain situations.

Fourth, *financial intermediation is changing at a rapid pace*. Banks have continued issuing stock, at a faster pace in the second half of 2013, and have at the same time reduced risk-weighted assets. Lending to non-financial corporations is falling slightly on average, with more pronounced reductions in some Member States. At the same time, larger non-financial companies turn increasingly to markets for funding instead of using bank credit.

Fifth, banks and insurers have to adapt to *rapidly changing consumer tastes and demands* and adopt *new technologies* for example in the context of mobile banking. Big data holds a lot of promises for personalized financial retail products. At the same time it raises issues linked to personal data protection, IT security and cyber-crime.

Sixth, in terms of political developments, *the creation of a Banking Union* to complement Economic and Monetary Union *has made important progress*. Previous releases of this report (EFSIR 2011 and 2012) have discussed the rationale of the Banking Union at some length, and Chapter 2 of the present report contains an update on the state of play.

Seventh, *a protracted low interest rate environment may imply risks and future vulnerabilities*. Long term investors such as insurance companies are starting to encounter difficulties to remain profitable. Investors are increasingly engaged into a search for yields in some market segments. On the other hand, a shock can stem from a quick reverse of interest rates to higher levels. Such an episode was observed in emerging markets in 2013 with the first rumours that the Federal Reserve would start tapering the bonds purchased under the QE policy (see Section 1.2.1 and Box 1.1.).

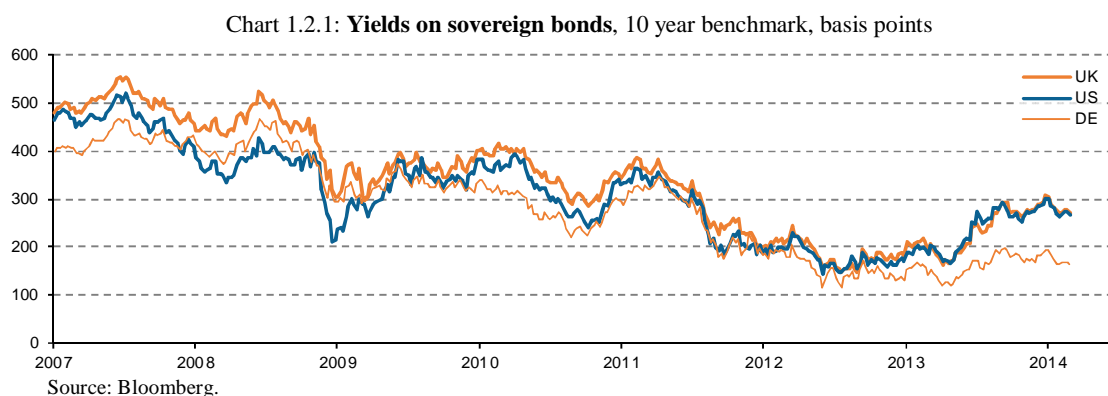
Finally, in its Communication on long-term finance,¹² the Commission has taken the lead in *a broad reflection how to foster long-term funding* in the EU, and how to promote alternatives to bank-intermediated funding especially for smaller SMEs.

¹² European Commission (2014d).

1.2 SOVEREIGN DEBT MARKETS IN 2013

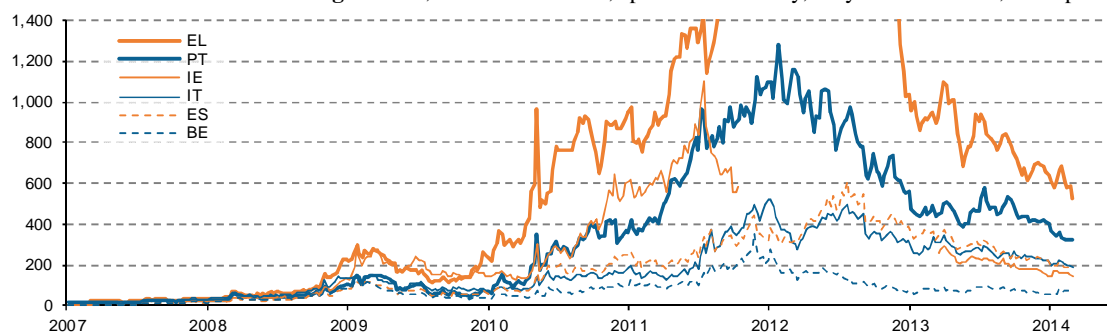
1.2.1 The trend is reversed, significant country-specific risk premiums remain

Trends in sovereign bond markets turned in 2013. This shift compared to the situation one year earlier is marked by an upward trend in sovereign bond yields for "safe" countries that has gradually established itself throughout the year. Investors had pushed the yields of the sovereigns they considered safest (including Germany, US, Japan and the UK, see Chart 1.2.1) to artificially low levels. Increasing yields for these bonds imply that confidence is returning to alternative investments. This has been driven by monetary policy announcement in the U.S. and better than expected news from the real economy in the U.S. and in Germany. These drivers were further consolidated by announcements in Ireland and Spain that their respective governments would not seek a prolongation of financial assistance programme after 2013. At the start of the year, sovereign bond yields for "safe" countries had already embarked on a rising trend, inter alia reflecting increasing demand for Euro Area securities (also from outside the Euro area). The upgrade of Greece to B- by Standard and Poor's in December 2012 (later followed by Fitch) acknowledged the strong political commitments made by EU leaders and the ECB during the summer (see Chart 1.A.7 in the Annex).



The end of the first quarter of 2013 was marked by the crisis in Cyprus. However, the impact on bond markets was short-lived (Charts 1.2.1 and 1.2.2). Spreads narrowed again after the parameters of the bailout were made public. Hence, although spreads rose strongly for Slovenia, and auction outcomes in Slovenia and Italy were negatively affected, the intensity of intra-European contagion remained much more limited compared to the most severe episodes of sovereign debt market contagion experiences in 2011 and the first half of 2012. By the end of 2013 Q1, another trend reversal started and consolidate itself thereafter: net bond issuance of MFIs and other financials had turned negative whereas net issuance by NFCs had more than doubled compared to levels seen in 2011 and 2012 signalling a change in the pattern of financial intermediation (see Section 1.3.3).

Chart 1.2.2: **Yields on sovereign bonds**, selected countries, spread to Germany, 10 year benchmark, basis points



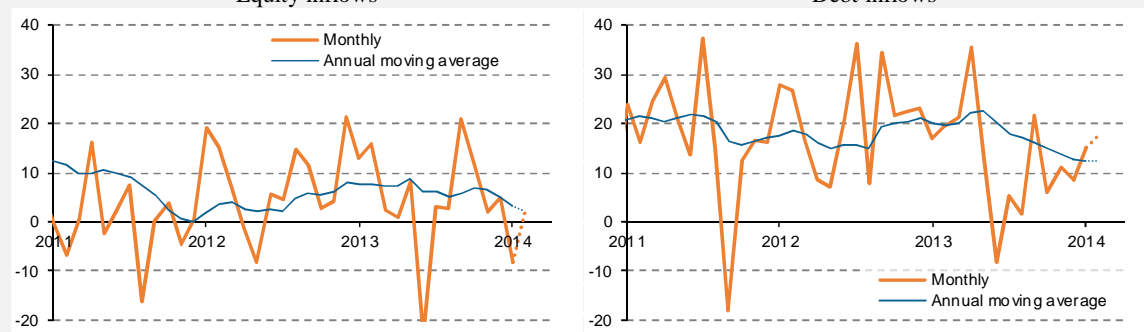
Source: Bloomberg and own calculations.

The third quarter of 2013 was marked by rather calm markets, stable issuance by sovereigns, continued negative net issuances by MFIs, and continued strong issuance by NFCs. Positive reviews of the financial assistance programmes supported the market sentiment of a stabilization of the Euro area periphery's sovereign debt markets. Thus, in November, the ECB lowered its main refinancing rate to 0.25 in an environment of falling yields and narrowing spreads. However, the U.S. market had been turning before (see Section 1.3.4), and stock market developments had signalled a renewed risk appetite also in European equity markets. At the same time, the ECB rate further approached the zero lower bound and no further impetus for sovereign bond demand was to be expected from this side.

Box 1.1: More volatile capital flows into and out of emerging markets?

At the end of the second quarter of 2013 and again at the start of 2014 there was renewed concern that international capital flows in and out of emerging market economies (EMEs) could impact financial stability, including in the EU. In general, an acceleration of foreign (portfolio) capital flows quickly raise financial stability concerns in EMEs for a number of reasons. First, portfolio capital tends to flow into asset classes that can quickly absorb the inflow with the risk of creating asset price bubbles. Second, lack of consensus in EM societies how to distribute the benefits from higher growth can quickly translate into political instability. Third, the larger the stock of foreign assets or liabilities becomes, the more the country becomes exposed to a sudden stop or even reversal of capital flows. European bond markets reacted immediately to the shift in market expectations. After the May tapering comments of Bernanke, German 10-year yields rose, euro-area government spreads declined and CDS spreads for the periphery also declined. In the meantime the Fed has further managed expectations of a gradual reduction of asset purchases.

Chart 1.B.1: **Portfolio inflows to Emerging Markets, \$ billion**
Equity inflows Debt inflows



Source: Institution of International Finance and own calculations.

Chart 1.2.3 left-hand panel displays the percentage of central government debt coming due within one year based on tradable government debt instruments (bills, notes, bonds)¹⁴. The amount varied from country to country, but can be a significant part of total outstanding debt, Cyprus, Hungary, Greece, Croatia, Portugal and Bulgaria all about 15 per cent or more of outstanding debt falling due within a year. In most of these countries, the higher percentage results from the predominant use of debt instruments with a maturity of less than one year. On the other end of the spectrum, Ireland, Luxembourg and Poland do not have redemptions within a year and the redemptions for Slovakia, Austria, Lithuania, Slovenia, Germany, the UK and Finland represent less than 4 per cent of outstanding debt.

1.3 CREDIT PROVIDED TO THE ECONOMY

Businesses, governments and households need to finance their activities. This section reviews how the financial sector in 2013 provided credit to different sectors in the economy. Section 1.3.1 presents an overview of the funding structure of the different economic sectors in the Euro area. Section 1.3.2 focuses on the provision of credit through bank loans, Section 1.3.3 analyses the bond markets and Section 1.3.4 equity markets. Section 1.3.5 focuses on the credit provided by banks through the purchase of securities. Finally, while all previous sections present an aggregated overview, Section 1.3.6 provides a country perspective for individual EU Member States.

1.3.1 How economic sectors are financed

The funding mix differed from one economic sector to the other (Chart 1.3.1¹⁵). The real economy finances its activity mainly through bank loans; almost exclusively in the case of households, complemented with a variety of other instruments in the case of non-financial corporations (NFCs). Indeed, unquoted shares and other equity were the main sources of financing of NFCs (including private contributions and retained earnings)¹⁶. For the government and financial corporations (MFIs, ICPF and OFIs), the use of bonds is a significant source of funding (between 20 and 70 per cent).

The relatively low use of quoted shares and equity in general by the financial sector should be highlighted. Quoted shares represent 14.3 per cent of NFCs financing but only a tiny 1.4 per cent for financial corporations. In addition, a significant portion of financial corporations' equity corresponds to cross-ownership within the financial sector. This implies not only a risk of contagion within the financial sector, but also that the consolidated loss absorption

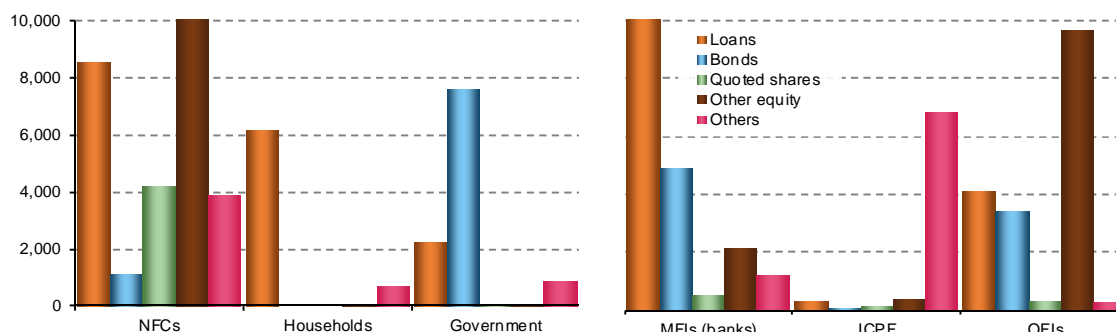
¹⁴ Although it does not give the full picture since government also use various forms of loans and non-traded securities, it provides a good indication.

¹⁵ For the data, see Table 1.A.1 in the Annex.

¹⁶ Note that equity other than quoted shares constitutes the larger funding source for NFCs but it is provided outside the regular financial channels (bank intermediation or market financing). The real sector uses a number of sources beyond the internal market for financial services. They include, for instance: trade credit, internal funding, factoring or loans from family and friends. An overview of the sources of financing used by NFCs in the Euro area is presented on Chart 1.A.8 in the Annex. The analysis of these other sources of finance falls beyond the scope of this report.

capacity of the equity is much lower than what is suggested by the headline figure on aggregate equity of the financial sector¹⁷.

Chart 1.3.1: Sources of financing by sector, Outstanding amounts, Euro area, 2013 Q3, € billion



Note: MFIs loans: €23,000 bn; they include interbank lending and the deposits received from other sectors. NFCs: non-financial corporations, MFIs: monetary and financial institutions, ICPF: insurance corporations and pension funds, OFIs: other financial institutions. "Other financing" for ICPF corresponds to insurance technical reserves. "Other equity" for OFIs corresponds to unquoted shares and mutual fund shares.

Source: ECB: Euro area accounts.

Besides channelling funds from savers to investment needs of the real economy¹⁸, the financial sector is also moving large amounts of funds within the financial system itself¹⁹. This is the case not only for the Euro area as a whole but also for many EU Member States (see Section 1.3.6 for a country by country approach). A number of authors²⁰ argue that, in the last 10 to 15 years, there has been an increased intra-financial system complexity via the lengthening of intermediation chains. This is reflected in a size of inter-financial credit of €57,000 bn (6.5 times Euro area GDP), almost twice the financing used by the real economy (€35,000 bn). If the external sector and the governments are also taken into consideration, the financial sector provided less than 30 per cent of its resources to the real economy and over 70 per cent circulated within such an "extended" financial sector²¹.

1.3.2 Credit provided through bank intermediations: loans

Loan volumes

Bank loans are one of the main sources of financing for the real economy, but they are also important within the financial sector. Indeed, about half of the loans provided by Euro area banks financed the real economy (€9,600 bn or 110 percent of Euro area GDP) and the other half went to the financial sector and governments (€9,700 bn), including loans to non-Euro area residents, which are, to a large extent, financial institutions based in London, New York and other global financial centres (see Table 1.A.2 in the Annex for details).

¹⁷ See Section 1.4.1 for further discussion about bank capital and interconnectedness within the banking sector.

¹⁸ For a discussion about the rational and role of the financial system, see Section 3.2.1.

¹⁹ In this context, the ESRB has commissioned to its Advisory Scientific Committee a report to analyse if Europe is "overbanked" (see Pagano, 2014)

²⁰ See, for instance, Adrian and Shin (2010), Shin (2010) or Turner (2014).

²¹ The external sector and governments have similar features to the financial sector and are an integral part of the long intermediation chains.

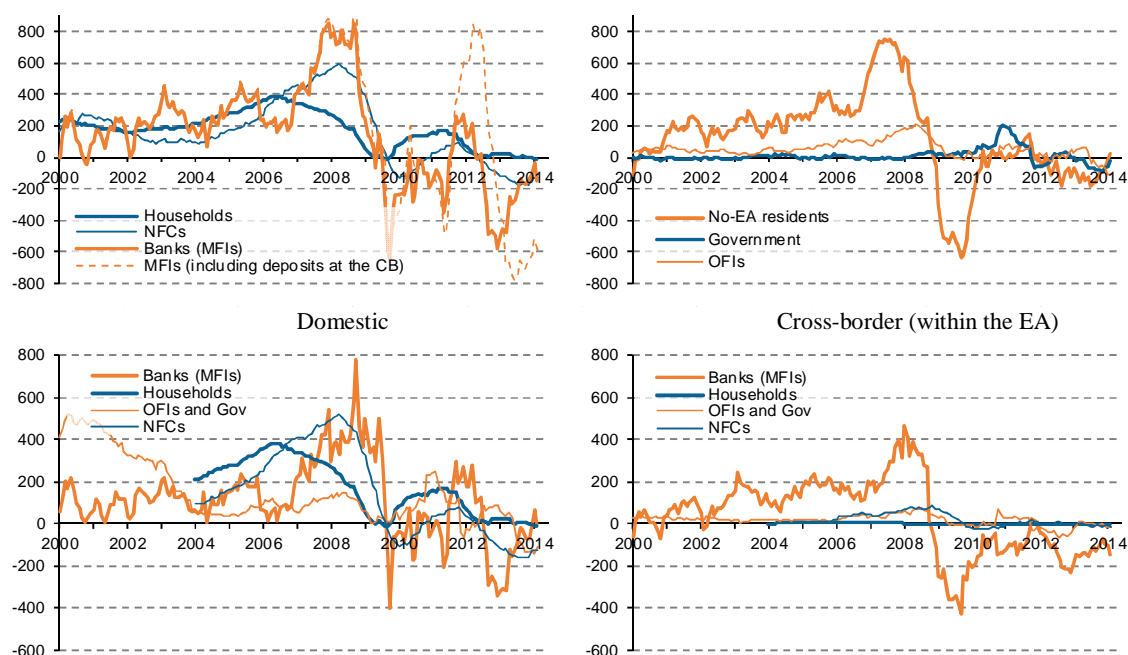
Net flows of loans

While loan volumes provide an order of magnitude of the sector composition, the analysis of flows provides a more dynamic picture of the impact of the crisis across economic sectors (Chart 1.3.2).

In 2013, net flows of loans have stagnated for households and slightly declined for other financial institutions. Net flows of loans to non-financial corporations, non-Euro area residents and interbank lending have been negative since early 2012. Some positive developments appear in all three series in the last months of 2013 pointing to a turning point (interbank lending series, while still negative, have significantly improved since the dropped observed in early 2013).

Net flows of loans to government used to be negligible because the main source of external financing for governments is the issuance of bonds; however, they gained importance in late 2010 and early 2011 when the crisis impacted sovereign markets. With increasing financing needs and increasing cost for market financing in some countries, public authorities resorted to bank loans as a complementary source of financing. These loans have been repaid thereafter, so that by December 2013, the total volume of loans to governments have come down to 2009 levels (€1,000 bn, see Table 1.A.2 in the Annex).

Chart 1.3.2: Loans by counterparts granted by Euro Area MFIs (excluding the Eurosystem), net annual flows, € bn
Totals by sector



Notes: Net annual flows are calculated as new businesses minus redemptions. MFIs: Monetary and financial institutions (banks); NFCs: Non-financial corporations. Deposits at the central bank include current account, deposit facility and fixed term deposits.
Source: ECB: monetary statistics and own calculations.

Net flows of loans to the financial sector (MFIs, non-Euro area residents and other financial institutions) show a much more volatile profile than loans to the real economy. A crucial factor driving interbank lending was the role played by the ECB as an intermediary between banks. The decline in the remuneration of the deposit facility since July 2012 and

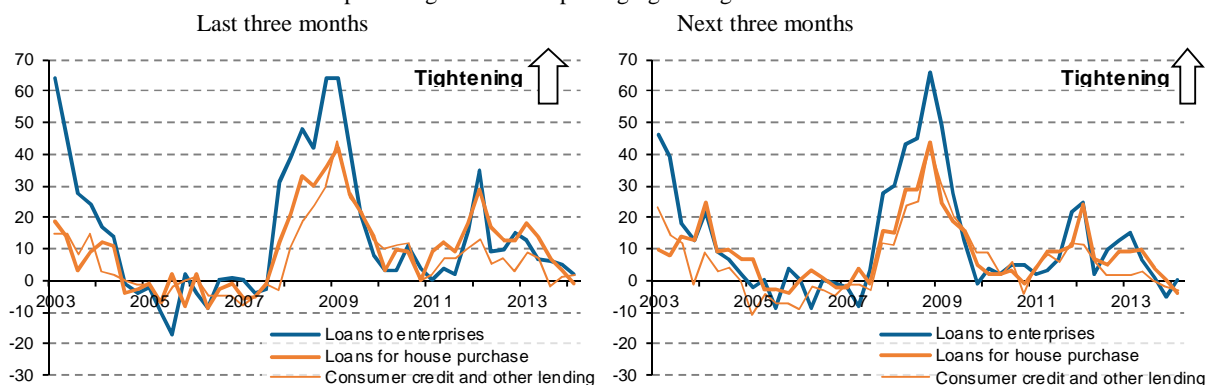
the early repayment of the LTROs have helped ease the intermediation role of the ECB and reactivated interbank markets²².

Cross-border loans and financial integration

Cross-border interbank lending continued to be affected by the crisis. With sustained negative flows since late 2008, cross-border interbank lending positions within the Euro area have halved from a peak of over €2,100 bn in 2008 to €1,250 by December 2013. Net flows of loans to non-Euro area residents have been faltering. These developments have contributed to **an increased home bias in interbank lending**.

Market integration in the retail segment takes usually the form of cross-border ownership of banking assets (see Section 1.4.5). The loans provided by subsidiaries and branches of foreign groups to local households and non-financial corporations are counted as domestic in monetary statistics. Therefore, the series of domestic / cross-border loans fail to capture all the cross-border implications of these loans. Analysing the implications of the crisis for cross-border provision of credit through branches and subsidiaries and mitigating its potential negative effects is the main goal of the Vienna Initiative²³.

Chart 1.3.3: **Changes in credit standards applied to the approval of loans and credit lines**, Euro area banks
Net percentage of banks reporting tightening of standards



Source: ECB: Bank Lending Survey.

Interaction of credit supply and demand factors

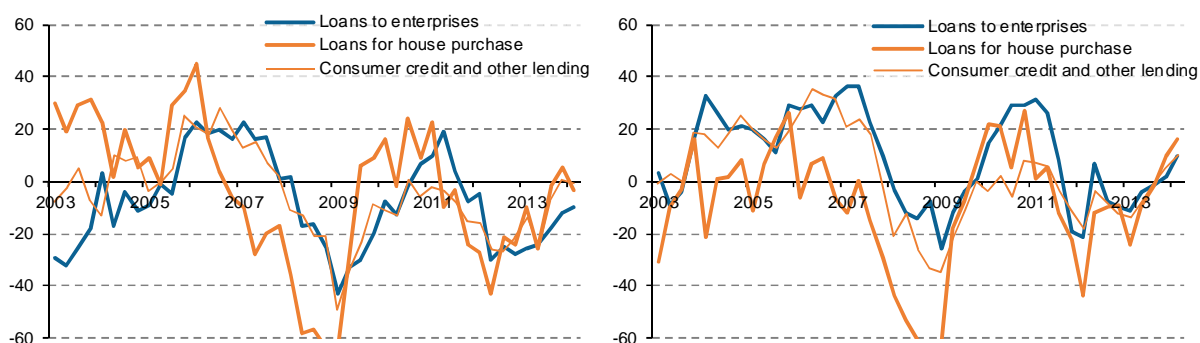
In 2013 and early 2014, tightening of lending conditions (interest rates, collateral and guarantees required, fees and commissions, etc.) has slowed down (Chart 1.3.3). On the other hand, the slowdown in economic activity led to a decline in the demand for loans (Chart 1.3.4) and lower profitability expectations deteriorated the quality of loan applications. These demand factors interact with credit standards and can explain to some extent the reduction in the flow of credit observed in Chart 1.3.2. Reflecting this mix of supply and demand factors many SMIs reported difficulties to access credit in 2013²⁴.

²² For further discussion about the ECB role throughout the crisis, see Section 2.2.2.

²³ For further details, see Section 2.2.1 and <http://vienna-initiative.com>.

²⁴ See ECB (2013a).

Chart 1.3.4: **Changes in the demand of loans and credit lines**, Euro area banks
 Net percentage of banks reporting an increase in demand
 Last three months Next three months



Source: ECB: Bank Lending Survey.

1.3.3 Credit obtained through the issuance of bonds

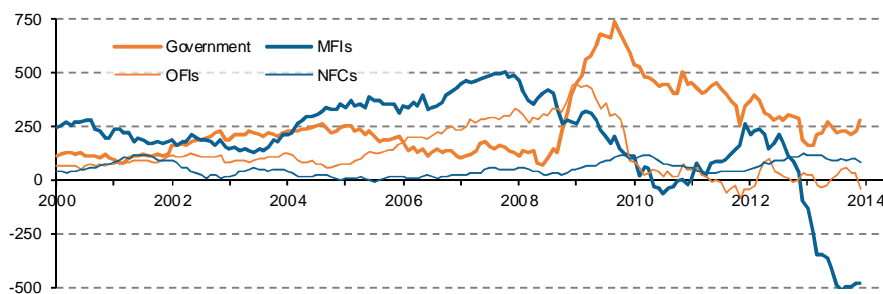
Bond volumes

Between 2006 and 2013, the Euro area bond markets expanded by 50 per cent compared to a 12 percent increase in bank loans during the same period. The financing provided through bond markets in the Euro area (€16,400 bn or 190 percent of Euro area GDP) has a similar size to the financing provided through bank loans, but the sector composition is different (see Table 1.A.3 in the Annex). Bonds issued by non-financial corporations represent just about 6.5 percent of the total and the rest is distributed almost evenly between the financial sector (MFIs and other financial institutions) and governments.

Net issuance of bonds

The issuance of bonds has compensated, at least partly, the financing gap springing from the collapse of the loan markets reported on the previous section. The use of bonds as funding by non-financial corporations is rather marginal (see Chart 1.3.1), and hence the migration from bank loans to market financing has mainly occurred within the financial system itself. Net annual issuance of bonds by governments soared from about €150 bn before the crisis to over €700 bn in late 2009 and recently seems to have stabilised at around €250 bn on annual basis (Chart 1.3.5).

Chart 1.3.5: **Bonds issued by Euro Area residents**, net flows, year to date, € bn



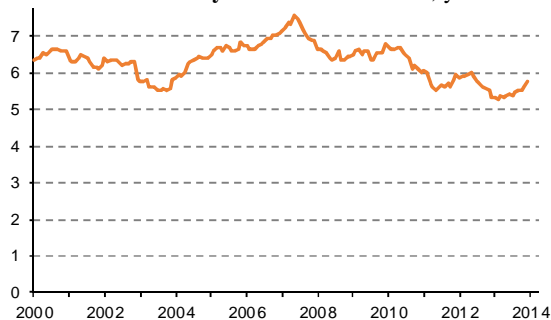
Source: ECB: Securities statistics and own calculations.

Except for a short revival around 2012, net issuance of bonds by banks has continuously declined since 2007 and accelerated its decline in 2013. This decline reflects the need for banks to reduce their levels of wholesale funding and to deleverage, particularly ahead of the ECB comprehensive assessment. According to the ECB²⁵, market turmoil constrained banks to reduce their issuance of bonds. Data suggest that this was mainly the case for medium-size and small banks but not for the bigger banks²⁶.

The issuance of bonds by NFCs is much lower than the one of the three other sectors. However, it has significantly increased with respect to the pre-crisis period and stands at levels last seen after the bursting of the dot.com bubble. A substitution effect in favour of direct bond issuances by NFCs is observed since the early 2009²⁷ and still continues. This is further confirmed by a broader use of debt securities across rating classes and sectors, notably for lower-rated investment-grade issuers and more cyclical sectors²⁸.

Maturities and redemptions

Chart 1.3.6: **Implied average maturity of long-term bonds issued by Euro area residents, years**



Notes: Long term bonds: with a maturity of more than one year. The implied average maturity is computed as the ratio between the outstanding amounts and annual redemptions.

Source: ECB: Securities statistics and own calculations.

Chart 1.3.7: **Proportion of short term bonds within bonds issued by Euro area residents, percentage**



Note: Short term bonds: with a maturity of up to one year

Source: ECB: Securities statistics and own calculations

The maturity profile of bonds determines the future financing needs and constitutes, therefore, an important risk indicator. While needed to avoid the collapse of financial markets, the drop in the ECB policy rate in the early stage of the crisis had the side effect of incentivising shorter maturities through a shift of the yield curve to a steeper profile²⁹. Indeed, the implied average maturity of long term bonds shortened from 7.6 years before the crisis to 5.3 years in late 2012 (Chart 1.3.6); on top of that, the proportion of short term bonds also increased (Chart 1.3.7). In this context, a recent report by ESMA indicates that a

²⁵ ECB (2013b), p. 18.

²⁶ The median share of debt securities in total assets have significantly decreased (from 14 percent to 7 percent) while the average share only marginally declined (from 17 percent to 15.5 percent), see ECB (2013b), p. 18, Chart 19.

²⁷ ECB (2009), p. 22.

²⁸ *Ib.*

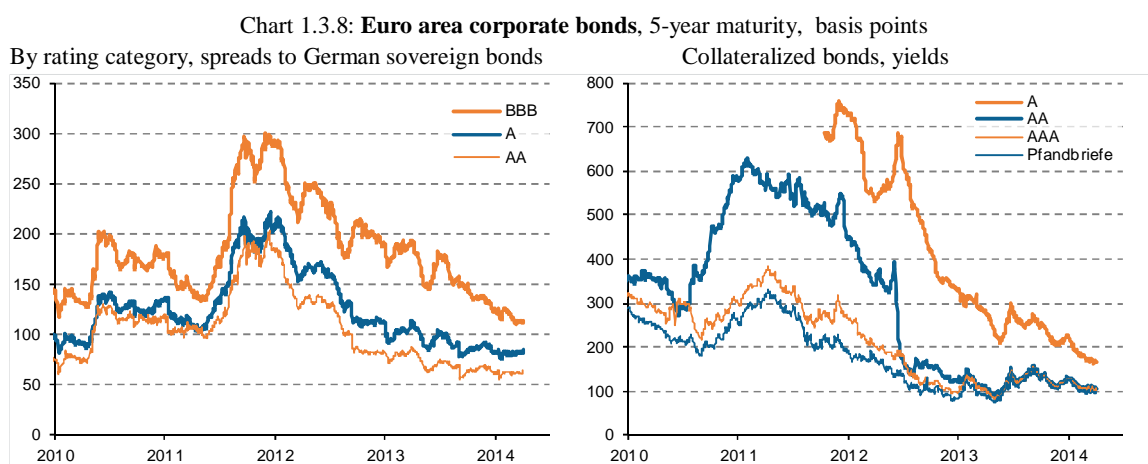
²⁹ For the evolution of ECB policy rate, see Chart 1.A.2 in the Annex; for the evolution of the yield curve, see Chart 1.A.3 in the Annex.

substantial fraction of debt outstanding has to be rolled over in coming quarters³⁰. On top of that, potential increases in interest rates can also put pressure on public finances.

Besides the yield curve, government guarantees also contributed to the decrease in average maturities of (bank) bonds. The State guarantees played a crucial role in ensuring a continuous access of banks to debt markets, but State aid has to be limited in time due to its potential distortive effects. Government guaranteed bonds could have a maximum maturity of five years, but most of them were issued with a maturity of about three years with redemptions concentrated in late 2011 and early 2012.

This negative trend has been reversing in 2013: average implied maturity of long term bonds rose to about 6 years by December and the use of short term bonds significantly declining (see also Chart 1.A.9 in the Annex). Towards the end of 2013, sovereigns and corporates were able to issue debt with longer maturities³¹ and gross issuance has abated (see Chart 1.A.9). All these factors point towards easing the pressure on liquidity in the coming months.

Market developments in bond markets



Source: Bloomberg.

Reflecting the continuous improvement in market confidence, *Euro area corporate bonds spreads continued to compress across rating categories since early 2012* (Chart 1.3.8, left-hand panel), at the same time, volatility also declined. These developments have supported the expansion in the issuance of bonds by NFCs.

Spreads also tightened for all types of bank bonds, but particularly for bonds issued under State guarantee. By late 2013, the spreads of secured (covered or guaranteed) and unsecured bank bonds have been converging.

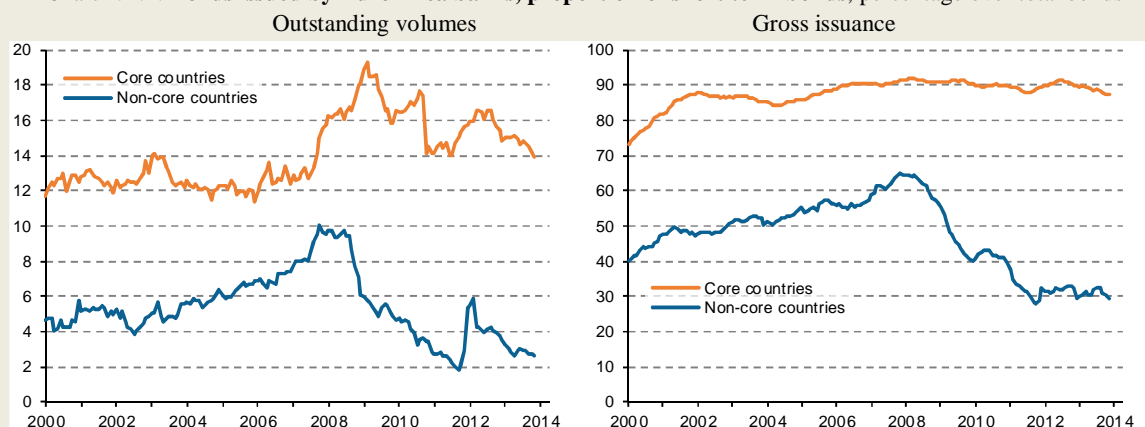
³⁰ See ESMA (2014), p. 8. See also Chart 1.2.3.

³¹ *Ib.*

Box 1.2: The implicit Government subsidy and bank bonds

The issuance of bonds and their maturity structure can be used to illustrate the implicit subsidy banks enjoy from their sovereign. Banks from core countries benefit from the strength of their sovereigns by being able to finance short term to a larger extent than banks from non-core countries. Data show how already before the outbreak of the crisis, over 12 per cent of bank bonds in core countries were short term while, in non-core countries, short term bonds represented less than 6 per cent of total bonds (Chart 1.B.2).

Chart 1.B.2: Bonds issued by Euro Area banks, proportion of short term bonds, percentage over total bonds

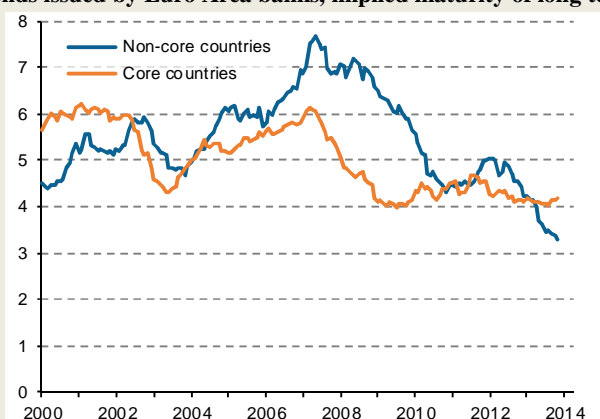


Note: Core countries includes: AT, DE, FI, FR, LU and NL; non-core countries includes: BE, CY, ES, EL, IT, PT, SK and SI (data for IE are not available). Short term bonds: bonds with a maturity of up to one year.

Source: ECB: securities statistics and own calculations.

This differentiated pattern is even more marked for gross issuance. The fragmentation between banks from core and non-core countries has only widened through the crisis: the proportion of short term bonds has substantially declined for banks from non-core countries but it has remained at similar levels for banks from core countries.

Chart 1.B.3: Bonds issued by Euro Area banks, implied maturity of long term bonds, years



Note: Core countries includes: AT, DE, FI, FR, LU and NL; non-core countries includes: BE, CY, ES, EL, IT, PT, SK and SI (data for IE are not available). Long term bonds: bonds with a maturity of more than one year.

Source: ECB: securities statistics and own calculations.

Similarly, the implicit average maturity of long term bonds (Chart 1.B.3) has followed a divergent evolution for banks from core and non-core countries. From the mid-2000s bonds from banks located in non-core countries had longer implicit maturities than bonds from banks located in core countries. With the decline in the policy rate and the consequent shift and rotation of the yields curves (see Chart 1.A.3 in the Annex), the implicit maturity has

declined for both types of banks. However, it has stabilised at around 4 years for banks from core countries since early 2009, while it has continued to decline for banks from non-core countries.

Financing through shorter maturities represents an advantage for banks from core countries as it is obtained at cheaper costs. Banks from core countries are not particularly stronger than banks from non-core countries but they benefit from their sovereign. Indeed, banks from Germany, France, the Netherlands, Luxembourg or Austria (and also from the UK) were the ones with the largest needs of capital and the first ones to be bailed out already in 2008 and 2009. By December 2009, public authorities from these five countries had injected almost €100 bn in their banks (€150 bn including the UK)³². Bailouts of banks in Greece or Ireland started later on, towards the end of 2009 or in 2010; in Spain, Portugal and Cyprus, it was even later, mainly in 2012 and 2013.

1.3.4 Capital obtained through the issuance of quoted shares

Volumes: market capitalisation of quoted shares

With a market capitalisation of €5,600 bn in December 2013 (see Table 1.A.4 in Annex), the size of the Euro area equity markets (quoted shares) is three times smaller than bond markets (Section 1.3.3) or the financing provided through bank loans (Section 1.3.2). NFCs issue the bulk of quoted shares (over 80 percent); the market capitalisation of banks and other financial institutions is much smaller.

The use of equity as a source of financing has two main advantages over debt (loans, bonds or other types of debt). First, equity is usually permanent, so that it does not need to be reimbursed. Second, if the company incurs in losses, equity does not need to be remunerated. Thus, from the point of view of an investor, equity can yield higher returns but it entails higher risks than debt: in economic downturns dividends can drop to zero and the value of the equity can also erode. This latter risk materialised during the crisis. Following the collapse in markets (see Chart 1.3.10), market capitalisation of quoted shares issued by Euro area residents shrank by half from €6,600 bn in 2007 to €3,500 in 2008. By 2013, market capitalisation had not yet come back to 2007 levels despite the significant issuance of equity throughout the crisis. Markets penalised particularly banks in spite of the massive capital injected by public authorities (see Section 2.2.3) and other capital increases received from private investors.

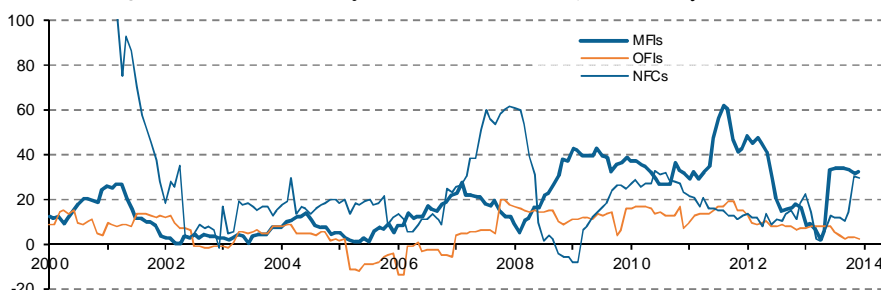
Net issuance of quoted shares

Net issuance provides information about the recourse to capital markets without the distortion of price movements (Chart 1.3.9). With the collapse of financial markets in late 2008, NFCs postponed the issuance of new shares until the recovery of 2009. Thereafter, net issuance of shares by NFCs came down to pre-crisis levels. With the improvements in the

³² European Commission (2014). Besides the capital injections showed in the previous paragraph, banks located in core countries were the ones which resorted the most to government guarantees for the issuance of bonds. See also Section 2.2.3.

markets towards late 2013, NFCs issued increasing amounts of shares. As in the case of bonds, the issuance of shares has somehow alleviated the credit constraints, however, in the aggregate it seems insufficient to compensate for the financing gap left by the drop in loans, in particular due to the fact that capital markets are accessible to the larger corporation, not to smaller businesses.

Chart 1.3.9: **Quoted shares issued by Euro Area residents, net flows, year to date, € billion**

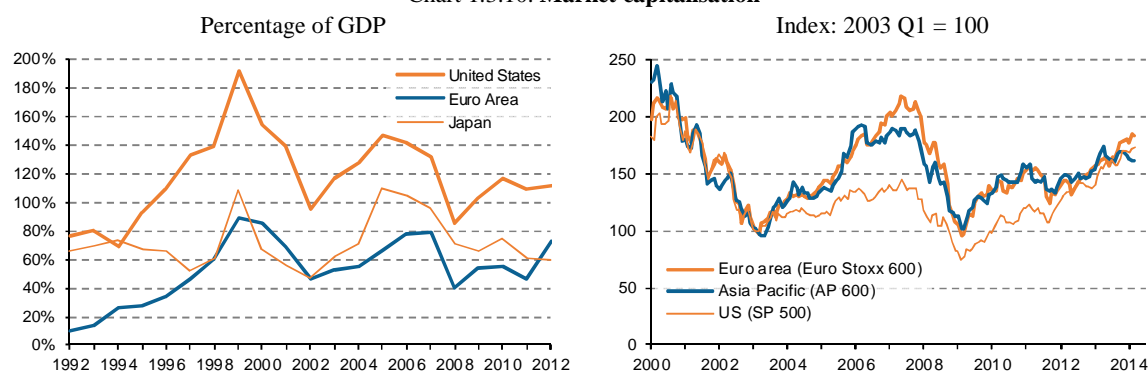


Source: ECB: Securities statistics and own calculations

The issuance of shares by MFIs followed a different pattern. Throughout the 2000s, it was rather limited; however, since early 2008, banks have been issuing increasing amounts of shares. As further detailed in Section 1.4.1, this was driven by, among other things, the need to absorb incurred losses, the need to provision expected losses or to ease the deleveraging process, but also the pressure stemming from both the regulatory reforms and the markets, including several rounds of stress testing and capital and transparency exercises. The willingness of banks to reinforce their capital positions ahead of the ECB comprehensive assessment may explain the additional increase in the issuance of shares by banks observed in the second half of 2013.

Market developments in equity markets

Chart 1.3.10: **Market capitalisation**



Source: ECMI.

Source: Bloomberg and own calculations.

Traditionally, equity markets are more developed in the US than in Europe or Japan (see Chart 1.3.10, left-hand panel). Equity markets were particularly impacted by the crisis with market capitalisation collapsing by half between 2007 and 2008 (Chart 1.3.10, right-hand panel). The recovery in the Euro area has been sluggish with respect to the US, where the S&P 500 reached pre-crisis levels already by mid-2013. Markets have remained on an upwards trend since mid-2012. Nevertheless, relative to GDP, market capitalisation remains far from 2007 values including in the US.

1.3.5 The banking system as provider of funding through bonds and equity

Volumes

Besides providing loans, banks are a major player in securities markets as over 20% of banks assets are securities (share, bonds and derivatives). In 2013 Euro area banks were holding €4,800 bn bonds out of the €16,600 bn issued by Euro area residents and €1,200 bn equity of Euro area residents compared to €5,500 bn of quoted shares issued by Euro area residents³³. With a share of about one third in those markets, banks' behaviour can have a significant impact in market developments³⁴. Bank holdings are also significant with respect to the size of the economy as they represent almost 60 percent of Euro area GDP.

Banks' portfolio of bonds is 4 times larger than the portfolio of equity. Furthermore, the bond portfolio has substantially expanded from €4,700 bn in 2006 to a peak of €6,200 bn in 2009. This is explained by banks using bonds for a diversity of purposes, including being used as collateral in repo operations to obtain liquidity (either from the central bank or from other investors) or being the outcome of securitisation of loans. There has been an increasing demand for collateral and capital stemming from both regulation (i.e. EMIR) and markets (flight-to-security effect), but this has also led to some concerns about asset encumbrance (see Section 1.4.4) and the decrease in the amount of assets that are left for honouring unsecured lenders.

Bank actions: net purchase of bonds

Banks hold proportionally more bonds and equity issued by financial institutions than their relative size on markets. This reflects several features. First, the purchase of bonds issued by other financial institutions is a flexible way of providing interbank lending. Second, the process of securitisation usually implies the repurchase of a certain amount of bonds by the bank itself. Finally, holdings of equity can reflect the cross ownership of banks and financial institutions to form large conglomerates. In this context, while the total capitalisation of banks dropped by two thirds between 2006 and 2011, holdings of bank equity increased by 35 per cent. These figures suggest that the crisis led to a higher concentration of the banking system in Europe (see also Section 1.4.1).

The profile of net purchases of securities by banks seems to be driven by the cycle. In moments of turmoil as in 2008-2009 and early 2012, banks increased the purchase of bonds and reduced the purchase of equity. The opposite pattern is observed during economic recovery such as during 2010-2011 and 2013 (Chart 1.3.11).

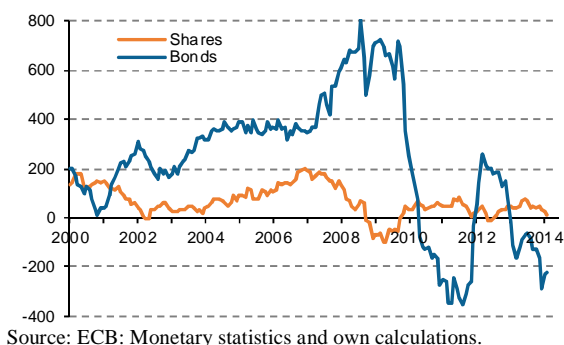
Looking at the sector breakdown (Chart 1.3.12), the significant expansion in the purchase of bonds issued by OFIs in 2008 and 2009 is mainly explained by on-balance sheet asset

³³ See Tables 1.A.5 and 1.A.6 in the Annex.

³⁴ For the analysis presented here, it is indifferent whether the banks purchase the securities in the primary or the secondary market. Either way, bank holdings and purchases are contributing to the overall provision of funding and to the depth of the market.

securitization ahead of the first round of ECB LTROs. Thereafter, securitisation activity declined and so did the purchase of OFIs bonds by banks³⁵.

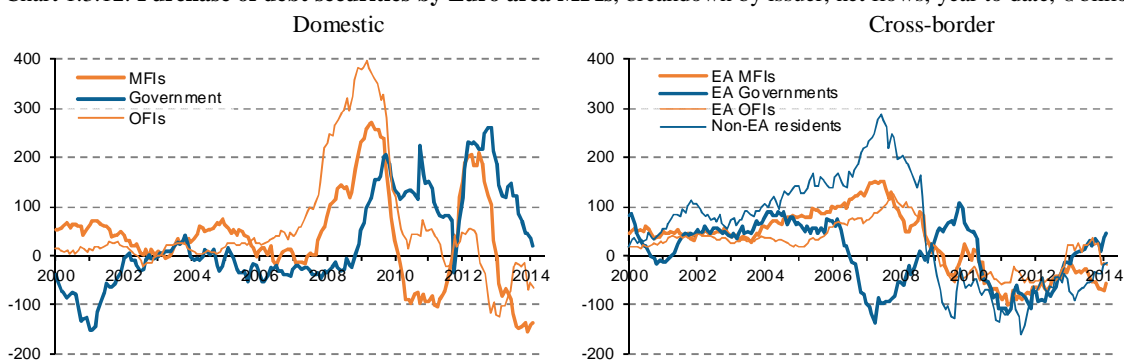
Chart 1.3.11: Purchase of securities by Euro area MFIs, net flows, year to date, € billion



The spikes in the purchase of government and bank bonds in late 2011 and early 2012 are most likely linked to the 3-year LTROs implemented by the ECB and the subsequent (early 2013) decline in the purchase of both government and bank bonds is probably linked to the early repayment of the LTROs (see Section 2.2.2). While many banks resorted to the LTRO to alleviate liquidity constraints, it cannot be discarded that the LTROs were also used to purchase sovereign bonds with higher returns (carry trade) (see also Section 2.2.2).

With respect to market integration, a clear domestic retrenchment is observed. Since the early stages of the crisis, banks have stopped purchasing (or rolling over) bonds issued by non-Euro area residents and foreign financial institutions (MFIs and OFIs). This pattern of "repatriation of funds" continued throughout the whole period 2009–2013. The outbreak of the sovereign debt crisis in 2010 induced banks to retrieve also from cross-border sovereigns even if they were simultaneously purchasing significant amounts of domestic government bonds. *Since early 2013, banks have, once again, expanded their net purchases of cross border sovereigns bonds. This may signal that the confidence in this segment is recovering.*

Chart 1.3.12: Purchase of debt securities by Euro area MFIs, breakdown by issuer, net flows, year to date, € billion



Notes: The category OFIs includes also bonds issued by NFCs as the breakdown is not available. The Eurosystem is excluded from MFIs.
Source: ECB: Monetary statistics and own calculations.

³⁵ For further details about securitisation, see Chapter 3.

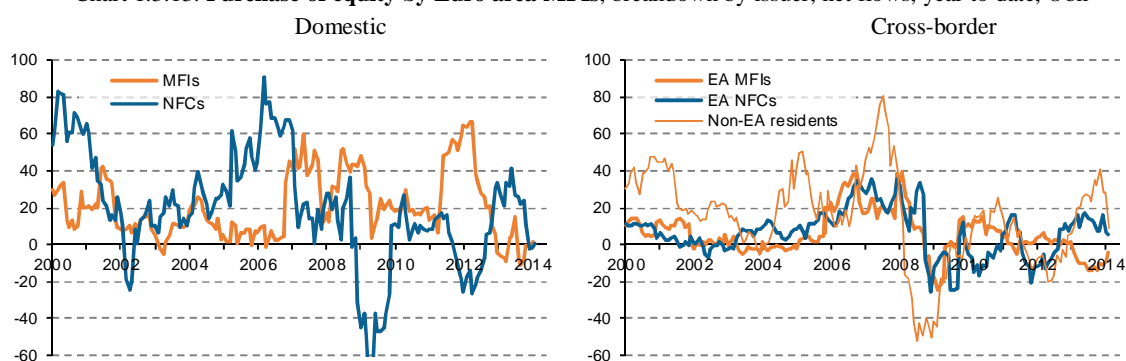
Bank actions: net purchase of equity

A higher volatility in the net purchase of shares with respect to the net purchase of bonds signals that income generation is the main purpose of this portfolio (see Chart 1.3.13). Banks buy and sell shares according to the evolution of stock markets (see Chart 1.3.10) but also to store liquidity³⁶, particularly for shares issued by NFCs and by non-Euro area residents.

The purchase of shares issued by banks seems to respond to controlling purposes or operations within financial groups and conglomerates. Indeed, from the outbreak of the crisis, banks significantly increased the purchase of shares, either stemming from autonomous decisions by banks or somehow promoted by public authorities (see also Section 1.4.1). According to the ECB, this reflects more within-group consolidation than actual mergers and takeovers³⁷. In some episodes, the purchase of bank equity seems to have been financed, to a large extent, by selling equity of NFCs and of non-Euro area residents, this was particularly the case in 2008, 2009 and early 2012.

Data suggest a continued concentration of the banking sector. The extent of merger and acquisitions throughout the crisis have gone much beyond what is suggested by the figures on purchase of equity as some operations do not need actual injections of funds (for instance, if they are set through exchange of shares).

Chart 1.3.13: **Purchase of equity by Euro area MFIs**, breakdown by issuer, net flows, year to date, € bn



Notes: Includes all equity: quoted shares, non-negotiated shares and other types of equity. NFCs includes financial institutions other than MFIs. The Eurosystem is excluded from MFIs.

Source: ECB: Monetary statistics and own calculations.

1.3.6 Overall provision of funding by banks: Euro area and country breakdown

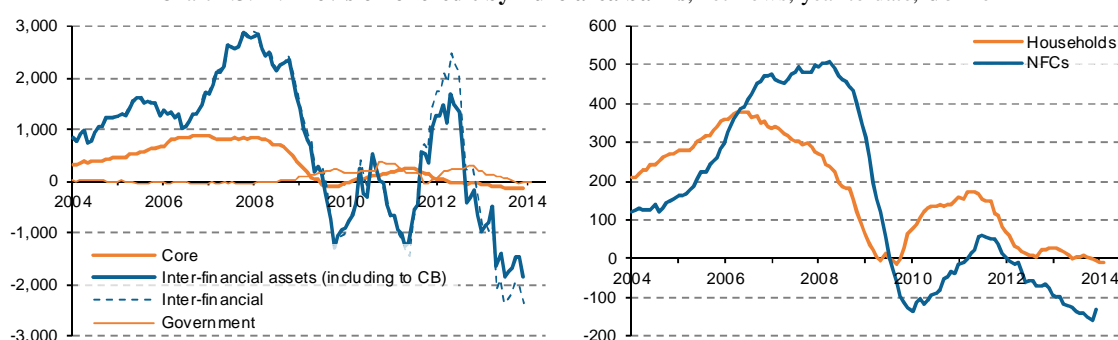
Several features stand out from the data on flows of credit provided by Euro area banks (Chart 1.3.14). First, as pointed out in Section 1.3.1, flows of inter-financial credit are significantly larger than flows of credit provided to the real economy.

³⁶ For instance, in 2009, banks were flooding the markets with up to €60 bn of NFCs equity in the secondary market to obtain liquidity for compensation the drain in interbank lending. At the same time, NFCs were issuing up to €40 bn in the primary market to obtain financing. Investment decisions by banks may be based on their intrinsic circumstances not necessarily linked to market developments (e.g. to fill a specific liquidity need, a bank may decide to sell a certain portfolio of shares). However, because of their large share in the market, banks' actions can have a significant impact on market developments. In this context, it cannot be discarded that the placement of equity in the secondary market by banks may have crowded out some of the capacity of NFCs to access capital in the primary market and driven equity prices down.

³⁷ ECB (2013b), p. 12.

Second, the build-up and burst of the financial bubble is also more pronounced for inter-financial credit than for credit to the real economy. Throughout the crisis, *swings in flows of inter-financial credit have been very volatile while flows of credit to the real economy have been less volatile*. This can be explained, to a large extent, by the fact that credit to the real economy typically has a long maturity (e.g. a mortgage) while inter-financial credit typically has a very short maturity (e.g. the bulk of unsecured interbank lending has a maturity of up to a few days). On top of that, inter-financial credit may formally have long maturities, but a much shorter effective maturity (e.g. bond holdings, which can be divested at any time independently of their face maturity). As a consequence, inter-financial credit can recuperate very quickly, but it can also be withdrawn more quickly. A series of regulatory reforms are being developed in order to address the financial instability generated by the swings in inter-financial credit (see Chapter 2 on policy developments and Chapter 3 on shadow banking).

Chart 1.3.14: Provision of credit by Euro area banks, net flows, year to date, € billion



Notes: Credit comprises loans and purchase of securities (equity, debt securities and derivatives). Core assets: credit provided to households and non-financial corporations. Inter-financial assets are computed by subtracting government and core assets to total assets.

Source: ECB: Monetary statistics and own calculations.

Third, within the real sector, flows of credit to NFCs were more strongly affected by the crisis than flows of credit to households, which remained virtually always positive. This is driven by the fact that the bulk of credit to households is backed with collateral (e.g. mortgage credit) and therefore the borrower can usually get better financial conditions. Other factors may also have an influence such as capital requirement rules, a lower demand of credit from NFCs due to the slowdown in economic activity. However, in some cases this can also be reflecting the difficulties faced by viable businesses in accessing affordable credit³⁸.

Country analysis³⁹

Similar patterns appear at country level. In big countries with a long banking tradition, inter-financial credit outweighs the credit provided to the real economy and has been particularly impacted by the crisis. This is clearly the case for Germany, France, the UK and Ireland. Banking systems in Spain, Italy and Portugal were more retail orientated, with inter-financial credit relatively smaller and, therefore, less impacted by the crisis.

³⁸ See European Commission (2014b).

³⁹ Charts are available in Annex 1.A.2.

The credit provided by banks in Poland, the Czech Republic, Romania or Hungary goes mainly to the real economy. However, about 80 per cent of the banking systems in these countries is owned by foreign groups (see Section 1.4.5). As a consequence, those banks participate in the developments in wholesale markets and other inter-financial credit through their parent companies and, therefore, they are exposed to strain in home countries. Indeed, there was a risk that the difficulties confronted by parent banks could spill over to their subsidiaries and branches in emerging Europe⁴⁰.

In most countries, the trough in credit to non-financial corporations appears with a certain lag with respect to the trough in credit to households. After the first trough in 2009–2010, credit to NFCs has followed divergent paths across countries. In Germany, France, Poland or the Czech Republic, credit flows to NFCs recovered to pre-boom levels but it remained subdued since early 2013. In Italy or Romania, credit flows to NFCs somehow recovered, but it was a short-lived episode with credit flows becoming negative thereafter. Finally, in Spain, Greece, Ireland, the UK, Portugal or Hungary, credit flows to NFCs hardly recovered and have remained negative for a long period; however, some signs of a turning point were observed in the last months.

*For most countries, recent developments on credit to households show that the cycle has bottomed out*⁴¹. Credit flows to households have, in general, been less volatile than credit flows to NFCs, with different patterns in terms of timing and shape observed across countries. In most Euro area countries, signs of a change in the cycle appeared as early as 2006 or 2007. Indeed, credit flows to households changed trend in Germany, France, Spain, Italy, Greece or Ireland, while credit flows to other sectors kept growing. Outside the Euro area, the UK presents a similar pattern.

Poland, the Czech Republic, Romania and, to a lesser extent, Hungary show no such early signs of cyclical change but rather a clear build-up of bubble in the run up to the crisis. Portugal, in the Euro area, could also be added to this group of countries. While credit to households in these five countries could somehow have been inflated, the emerging or catching up status of these countries entails a real economic need of credit. This interpretation is reinforced by the fact that countries like Poland and the Czech Republic maintained credit flows at significant levels throughout the whole crisis period.

The German banking system was not free of problems. The global investments of German banks (e.g. on the US subprime mortgages) led Germany to be one of the first countries to be affected by the financial crisis. The turmoil in the banking system spilled over into the credit provided to the real economy in Germany as reflected in the reduction in credit flows to households starting already in 2007.

However, Germany presents a unique pattern. Throughout the global financial crisis, and particularly since it became a sovereign debt crisis, German government bonds were considered blue chips. Many investors run to the "Bund" pushing down yields, which became

⁴⁰ To prevent that, a European Bank Coordination Initiative commonly known as Vienna Initiative was launched in January 2009, see Section 2.2.1.

⁴¹ See European Commission (2014c), p. 11.

even negative for the shortest maturities (see Chart 1.2.1). At the same time, German banks repatriated the credit that were previously providing to financial institutions in Spain, Ireland, Italy or Greece among others as reflected on TARGET2 balances (see Section 2.2.2). Therefore, German banks found themselves in a low yield environment and flooded with excess liquidity.

In this context, German banks probably found a way out for the low yield environment and their excess liquidity in providing credit to households, without significantly increasing risk. These dynamics were reinforced by the developments on the demand side. Germany is traditionally more oriented to renting rather than to house owning (not least because rent prices have been quite affordable); as a consequence, real estate prices have historically moved very slowly and flows of credit to households were never particularly large. However, the aging population and the low yield environment is making real estate markets more interesting for households either for residential purposes or for investment purposes as an alternative to stocks or other financial assets.

These supply and demand factors seem to be driving the increase in credit flows to households observed in Germany since mid-2009, which are following a unique pattern unrelated to any other country. While it seems still far from a bubble, these credit flows to households are something new in Germany⁴².

Similarly to other countries, net flows of credit provided by German banks to domestic NFCs have remained below net flows of credit provided to households. This may reflect a somehow riskier profile of NFCs than households but also the need for businesses to deleverage.

1.4 BANKING SECTOR

Section 1.4.1 analyses how capital reinforcement have increased the resilience and solvency of financial institutions but also increased interconnectedness within the banking system⁴³. Fragile capital positions of banks are linked to the expansion of bad assets and to the diminished capacity of banks to generate earnings (Section 1.4.2). Section 1.4.3 presents the evolution of leverage and complements the analysis of solvency and capital. Traditional bank assets (e.g. mortgage loans) have long maturities. The well-functioning of the financial sector depends on the ability of banks to obtain liquidity through money markets; the evolution of interbank markets is presented in Section 1.4.4⁴⁴. Finally, Section 1.4.5 contains structural indicators of the EU banking systems such as size, market concentration and cross-country ownership.

⁴² For further analysis about house prices in Germany, see Deutsche Bundesbank (2014), pp. 65-67. See also Chart 7.4.1.

⁴³ Government support played a crucial role in reinforcing capital positions of banks; see Section 2.2.3 for details.

⁴⁴ ECB measures were critical for the well-functioning of interbank markets and other segments, see Section 2.2.2 for details.

1.4.1 Capital

Context

Concerns about the strength of banks' balance sheets have been a constant throughout the crisis. They triggered regulatory measures to ensure banks' resilience, market pressures to reinforce balance sheets and restructuring obligations in compensation for state aid received by banks. Regulatory measures included higher capital requirements under Basel III (implemented in the EU as the CRDIV–CRR) and a series of transparency exercise undertaken by the EBA in the form of stress tests, capital exercises and balance sheet disclosures of the largest European banks⁴⁵. Market pressure was intertwined with regulatory measures either by encouraging public authorities to go ahead with those capital measures or by pressuring banks to comply with them⁴⁶.

As explained in Section 1.3.4, banks issued significantly higher amounts of shares during the crisis than in previous periods. Towards the end of 2013, data show a renewed intensification in the issuance of shares, which could be explained, to a large extent, by the will of banks to reinforce their capital positions ahead of the BSA, which will be based on the balance sheet of banks as of December 2013.

Table 1.4.1: **Capital of Euro area banks, € billion**

Concept	2008	2009	2010	2011	2012	2013-H1	2013	Increase 2008 - 2013H1
Aggregated capital	1,765	1,919	2,044	2,229	2,344	2,392	2,400	627
Consolidated capital	1,348	1,535	1,540	1,478	1,553	1,578		230
Interbank positions	417	384	504	751	791	814		396

Notes: Interbank positions have been computed as the difference between aggregate and consolidated positions. Comparisons of annual with semi-annual data should be interpreted with caution.

Source: ECB: Monetary statistics and own calculations.

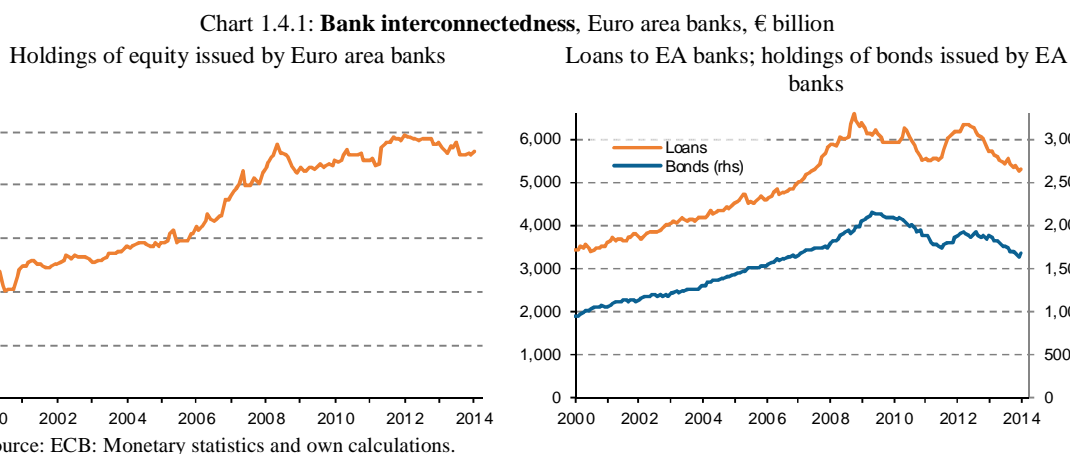
Interconnectedness

Banks have been among the largest investors in other banks⁴⁷, leading to an increased interconnectedness within the banking system. Increased bank interdependence can translate into higher systemic risk. On the one hand, problems in some banks can more easily be translated to other banks and, on the other, injections of capital provided from one bank to another do not really increase the overall amount of capital available in the banking system to absorb losses. These two phenomena are illustrated by comparing the aggregated balance sheet of Euro area banks with the consolidated balance sheet (which nets out interbank positions). Between 2008 and June 2013, out of the €630 bn of capital increase in aggregate terms, €400 bn correspond to increases in interbank positions and only €230 bn represent fresh capital injected from outside the banking system (Table 1.4.1).

⁴⁵ See EBA (2014) for further information about the different exercises coordinated by the EBA.

⁴⁶ See ECB (2014) and Section 2.3.

⁴⁷ European financial institutions have taken over failing banks as an alternative to public take overs or as buyers ensuing a public bail out. The integration of Fortis Belgium in BNP Paribas is just one of the latest examples, but similar cases have taken place in Germany, Ireland, Spain, Greece and other countries.



Interconnectedness through other instruments (bonds and loans) has declined after it peaked in 2009 (Chart 1.4.1, right-hand panel). Nevertheless, overall interconnectedness remains high: the counterparty for 24 percent of Euro area banking assets (or €7,400 bn) is another Euro area bank (December 2013). On a similar fashion, growing interconnectedness is also observed between the banking sector, the insurance sector and the shadow banking sector (see Section 1.3 and Chapter 3).

Solvency

Banks' regulatory capital ratios improved significantly between 2008 and 2013 H1 (Charts 1.4.2 and 1.4.3), enhancing the capacity of the system to withstand shocks. For instance, average Euro area Tier 1 ratio increased from 10.7 per cent in 2010 to 13.0 per cent by June 2013; overall capital ratios have also been reinforced (see Chart 1.A.11 in the Annex). By June 2013, banking systems in all EU countries presented Tier 1 capital ratios, well above regulatory requirements (even for the countries with the lowest ratios such as Slovenia, Spain or Italy). However, one should note that current legislation allows banks to use their own internal models to compute their risk-weighted assets.

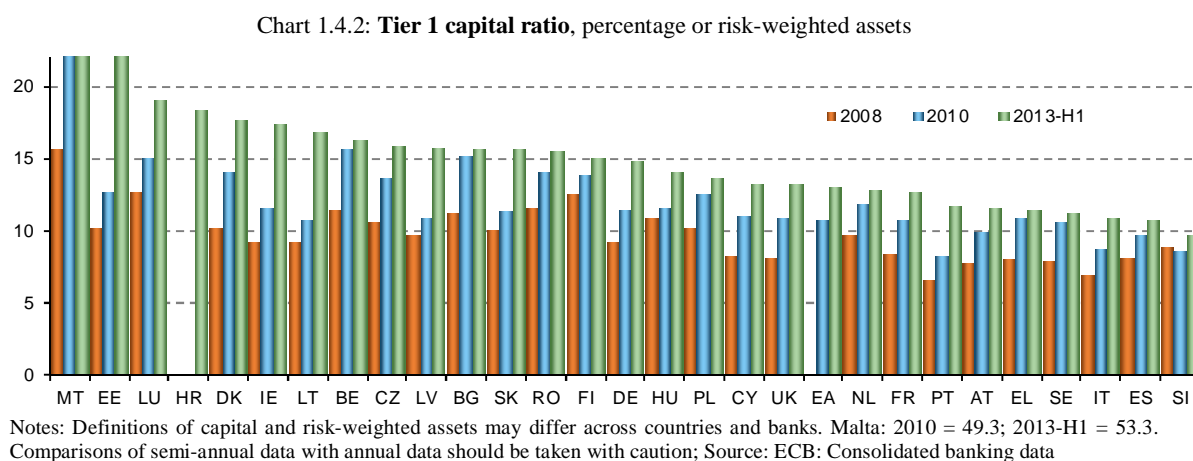
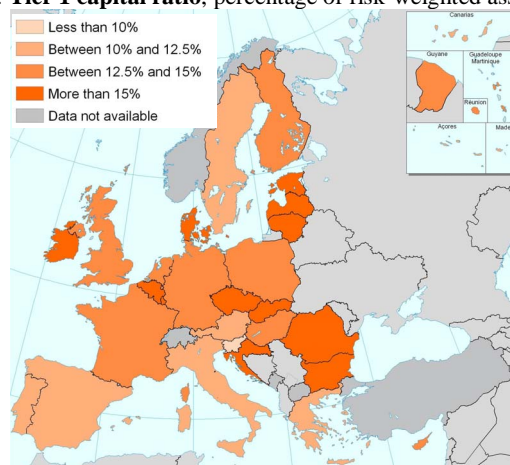


Chart 1.4.3: **Tier 1 capital ratio**, percentage of risk-weighted assets, 2013-H1



Source: ECB: Consolidated banking data.

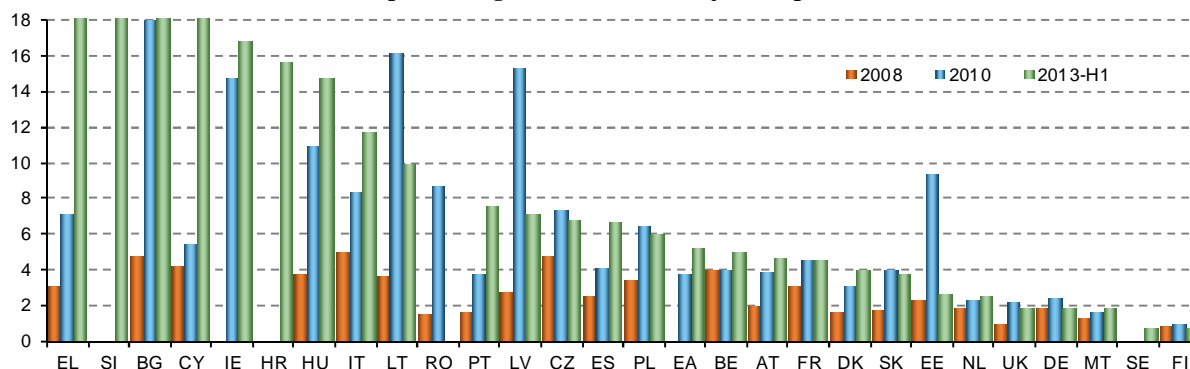
1.4.2 Internal factors influencing capital

Besides external injections, the capital position of banks depends on the capacity of banks to generate earnings. This section reviews those other factors affecting capital: asset quality indicators, income, profitability and efficiency. These factors are highly affected by cyclical developments so, in general, they have deteriorated during the crisis but they are improving in parallel with latest positive market trends.

Asset quality indicators: non-performing loans

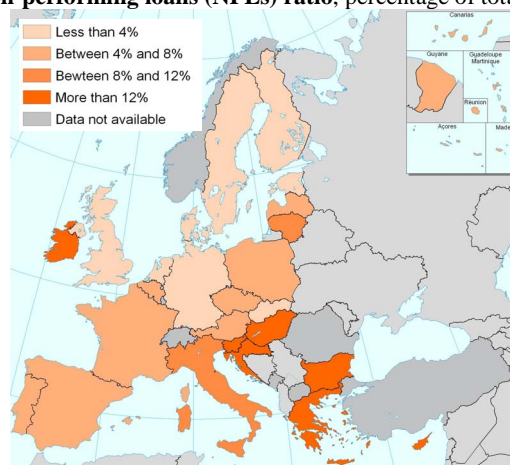
The CRR definition of NPLs for regulatory purpose ("*a loan that is 90 days or more overdue or for which there is well-defined weakness of the loan or the borrower*", art. 178) places a lot of discretion with national authorities. Secondary elements can noticeably influence the assessment of NPL and explain significant divergences across countries: whether restructured loans must be classified as NPLs or not, whether collateral or guarantees are taken into account, whether NPLs are reported in full outstanding value or for the part overdue only, and whether banks are required to downgrade all loans to a given debtor if any of their loans is impaired ("contagion" principle). On top of that, bank risk management policies also influence NPL ratios as some banks may tend to recognize NPLs earlier than others.

Chart 1.4.4: **Non-performing loans (NPLs) ratio**, percentage of total loans



Notes: Definitions of NPLs may differ across countries. Data for LU are not available. EL: 2013-H1 = 21.9%; SI: 2013-H1 = 20.5%; BG: 2012 = 17.9%, 2013-H1 = 18.8%. Comparisons of semi-annual data with annual data should be taken with caution; Source: ECB: Consolidated banking data

Chart 1.4.5: **Non-performing loans (NPLs) ratio**, percentage of total loans, 2013-H1



Note: Definitions of NPLs may differ across countries;
Source: ECB: Consolidated banking data

On top of that, troubled assets can be wider than the reported non-performing ones. Foreclosed assets and real estate assets received in exchange for impaired loans are also a useful indication of the quality of banks' portfolios. In some countries, banks classify some assets as substandard (those which have a high risk profile but have not defaulted). All these factors imply a diversity of practices across countries which can bias national data as suggested by recent studies⁴⁸. Therefore, cross country comparisons must be interpreted with caution.

EBA has proposed technical standards for a harmonising the definition of non-performing loans at EU level; however, it is not expected to enter into force before late 2014⁴⁹. The ongoing asset quality assessments are expected to provide further clarity on problem loans and on level of impairments⁵⁰.

Problems in the real economy have impaired the capacity of households and non-financial corporation to honour their debt and have translated into significant increases in NPLs across EU banking system (Chart 1.4.4). By June 2013, average NPLs ratio reached 5.2 percent in the Euro area and 4.4 percent in the EU as a whole. However, significant disparities are observed across Member States. Even taking into consideration all caveats and possible biases in measuring NPLs, banking systems from countries like Greece, Slovenia, Bulgaria, Cyprus, Ireland, Croatia, Hungary or Italy were suffering extreme values of bad loans in 2013-H1 (over 10 percent of gross loans); whereas banking systems in Finland, Sweden, Malta, Germany, the UK, the Netherlands and Estonia showed much lower levels (around or below 2%). While NPLs ratios have increased in all countries from 2008 to 2010, in the recent years they have receded in a number of countries such as Lithuania, Latvia, Czech Republic, Poland, Slovakia or Estonia. In other countries, the intensity of the deteriorating trend in NPLs ratios has abated.

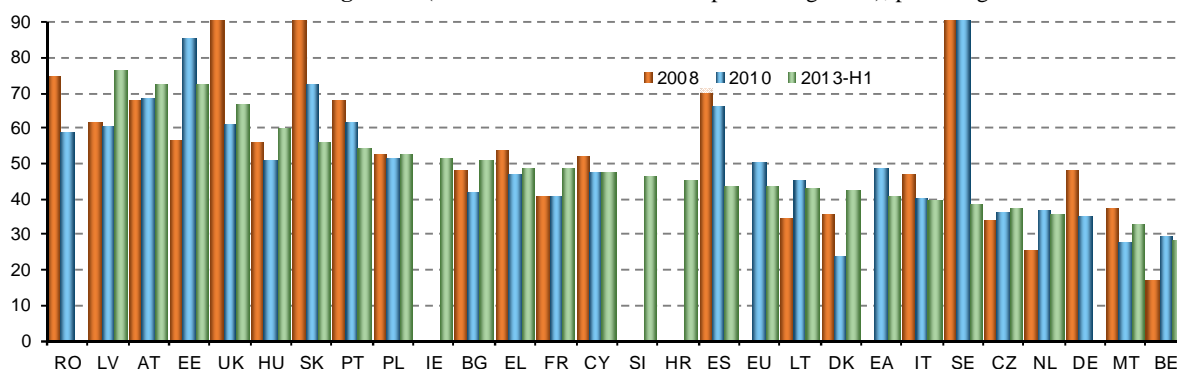
⁴⁸ See Barisitz (2013a and 2013b).

⁴⁹ See EBA (2013).

⁵⁰ See Joint Committee of the ESAs (2014), p. 8.

Asset quality indicators: coverage of non-performing loans with provisions and capital

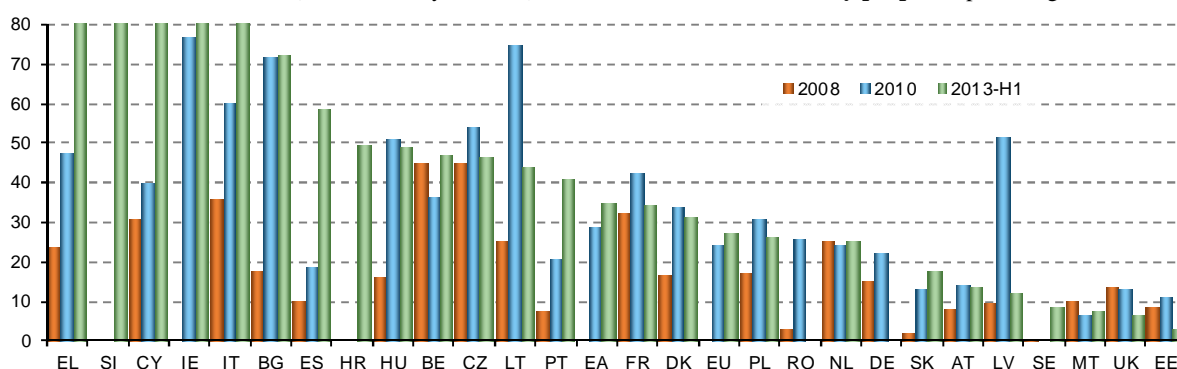
Chart 1.4.6: **Coverage ratio** (reserves for loan loss to non-performing loans), percentage



Notes: Definitions of NPLs may differ across countries. Data for LU and FI are not available. Comparisons of semi-annual data with annual data should be taken with caution
Source: ECB: Consolidated banking data

NPLs should be evaluated against the amount of reserves banks have set aside to cover those potential losses through provisioning. Despite the important surge of NPLs (and of loan losses) during the crisis, coverage ratios remained at relatively high levels in most Member States (Chart 1.4.6). All countries with the lowest coverage ratios (Belgium, Malta, Germany, the Netherlands, Czech Republic and Sweden) correspond to countries with a limited impact of NPLs ratios (see Chart 1.4.4).

Chart 1.4.7: **Net NPL (not covered by reserves) to total own funds for solvency purposes**, percentage



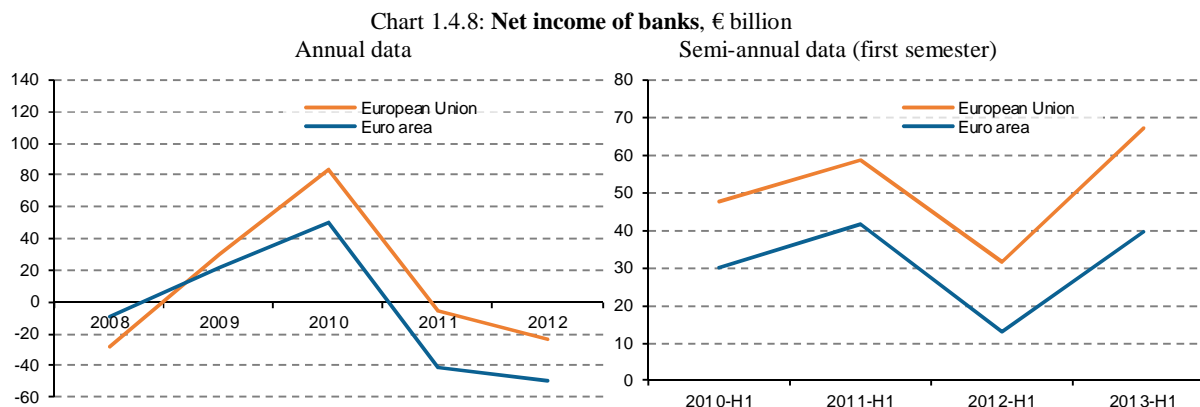
Notes: Definitions of NPLs may differ across countries. Data for LU and FI are not available. Comparisons of semi-annual data with annual data should be taken with caution
Source: ECB: Consolidated banking data

If losses stemming from NPLs were to materialise, they would first be absorbed by profits and provisions and thereafter by capital. According to data on net NPLs (the ratio of non-covered NPLs relative to regulatory capital), the highest risks appear in Greece, Slovenia, Cyprus, Ireland, Italy and Bulgaria, where the materialisation of NPLs could absorb at least 70 per cent of own funds for solvency purposes (Chart 1.4.7). On the other hand, net NPLs represent less than 30 per cent of own funds in a majority of countries. Increases in capital (see Section 1.4.1) have somehow alleviated the impact of increasing NPLs, but high levels of net NPLs imply a source of vulnerabilities in a number of countries.

Income

With the financial turmoil, retained earnings have been in many cases the main source of capital generation. One of the main drivers of the capacity of banks to generate earnings is the

general economic outlook. EU and Euro area banks incurred in losses at the peak of the crisis, in 2008, and, after a short recovery in 2009-2010, once again in 2011-2012 (Chart 1.4.8). Data for 2013 H1 suggest that bank income is recovering and that annual income could be similar or larger than the one of 2010. However, more than half of the income generated by EU banks in 2013 H1 concentrates in just three countries: the UK, France and Spain. Another factor that have drained profitability in the recent years is connected to the misconduct of a number of banks (e.g. manipulation of CDS or benchmark setting processes) which led to increased amounts of materialised or potential litigation costs and settlement payments⁵¹.



Note: 2013 (H1) data has been annualised. Comparisons of semi-annual data with annual data should be taken with caution
Source: ECB: Consolidated banking data and own calculations

The ECB indicates that while asset quality deteriorated as a consequence of the crisis and negatively impacted profitability, underlying income and cost developments have been more stable. This suggests that the euro banking sector should be able to return to a more stable performance once current cyclical challenges have been overcome⁵².

Looking at country figures, income seems to have stabilised or improved in most Member States. When comparing the income of 2013 H1 with the one of 2012 H1, the situation seems to be substantially better for the banks in Spain, Greece or Ireland; increasing income levels are also observed in the UK, Germany, Belgium or Denmark. On the negative side, income has deteriorated in Austria, Italy and Portugal. In most other countries, income seems rather stable. However, end-of the year accounting adjustments (e.g. provisioning) may have a significant impact in income figures so that comparisons of annual and semi-annual data should be taken with caution.

Profitability

Latest data on return on assets (RoA) confirm the positive evolution in bank profitability: average EU RoA increased from negative values in 2011 and 2012 to a positive 0.3 per cent in 2013 H1. A similar positive trend is also observed for the Euro area average and in most countries. However, profitability data show a high degree of heterogeneity across countries.

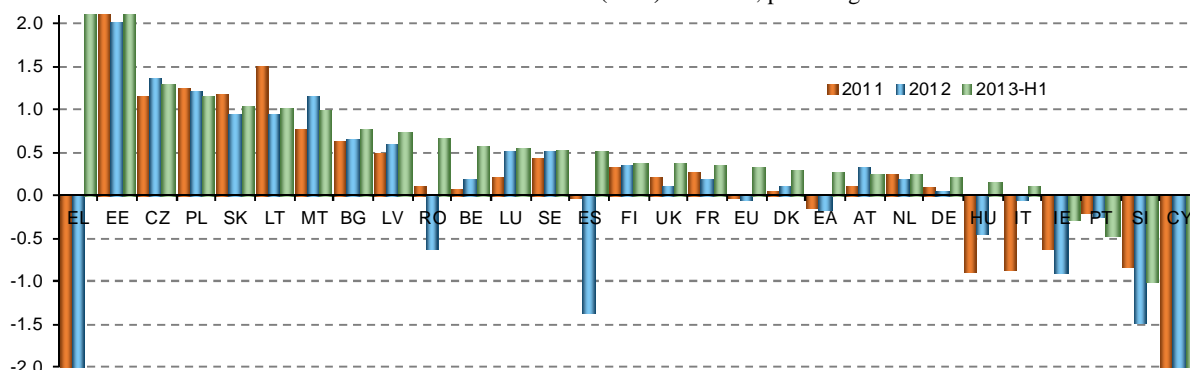
⁵¹ According to an EBA (2013b, pp. 35-36) survey, 40 percent of banks have paid over €100 million in the form of compensation, redress and similar payments since 2007 and 16 percent paid over €1 bn. These amounts do not include legal fees which were also substantial. See also ECB (2013b), p. 21. In the U.S., banks paid out \$100 bn in fines and legal settlements (see McGregor and Stanley, 2014).

⁵² ECB (2013b), p. 20.

The highest returns appear in non-Euro area countries (over 1 per cent of RoA in Estonia, Czech Republic and Poland followed by Lithuania, Bulgaria and Latvia). In the Euro area, Estonia, Slovakia and Malta show similar profitability (Chart 1.4.10).

In countries with large banking systems, RoA appear at much lower levels (e.g. France, the UK or Germany). In Ireland, although still negative, RoA has significantly improved with respect to previous years. A number of countries have returned to profitability (Romania, Spain, Hungary and Italy). On the other hand, some countries were still suffering bank losses in 2013 H1 (Portugal, Slovenia or Cyprus). Data on RoE provide a similar picture (see Chart 1.A.12 in the Annex). On average, RoE has increased between December 2012 and June 2013 from -1.0% to 5.8% for the EU as a whole and from -3.2% to 5.0% for Euro area banks.

Chart 1.4.10: Return on assets (RoA) of banks, percentage



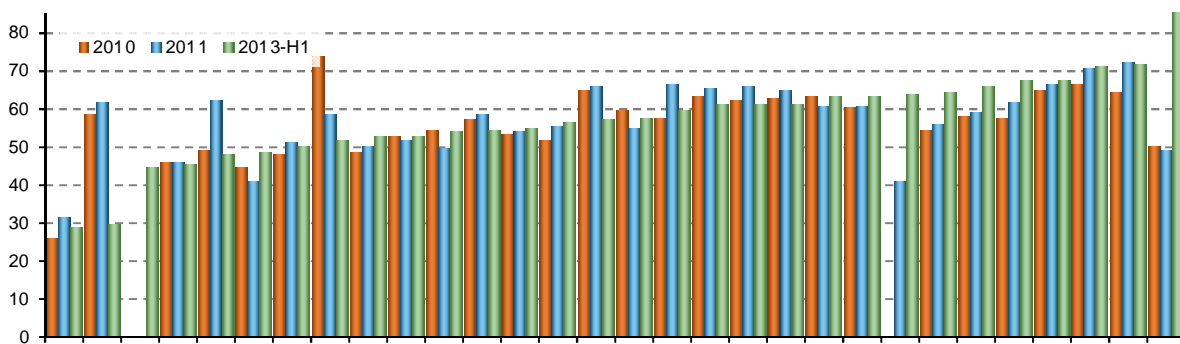
Notes: EL: 2011(H1) = -2.5%, 2012 = -2.9%, 2013(H1) = 3.3%. CY: 2011 = -4.0%, 2012 = -3.4%, 2013(H1) = -3.6%. Comparisons of semi-annual data with annual data should be taken with caution
Source: ECB: Consolidated banking data

A number of factors have driven profitability developments, among others, weak economic activity, declines in assets prices, market volatility, impaired loans, higher funding costs in some countries and generally weak loan growth.

Efficiency

The cost-to-income ratio (CTI) indicates how much resources are needed to generate €100 of revenue. With less than 50 percent of CTI, the most efficient European banking systems are located in Malta, Greece, Czech Republic Luxembourg, Estonia and Spain followed by Latvia, Bulgaria, Poland, Slovakia and Sweden. On the other hand, Austria, Germany, France and Portugal are among the less efficient banking systems (Chart 1.4.11).

Chart 1.4.11: Cost-to-income ratio of banks, percentage



Note: Comparisons of end-of-year data with semi-annual data should be treated with caution.
Source: ECB: Consolidated banking data.

According to the ECB, banks staff costs for large banks have increased from 2011 and 2012 and they remained at much higher levels than staff costs for small banks, which did not increase⁵³. These data suggest that large banks are not necessarily more efficient than smaller banks and that bonuses and other staff compensation may not necessarily be linked to profitability.

1.4.3 (De)leveraging

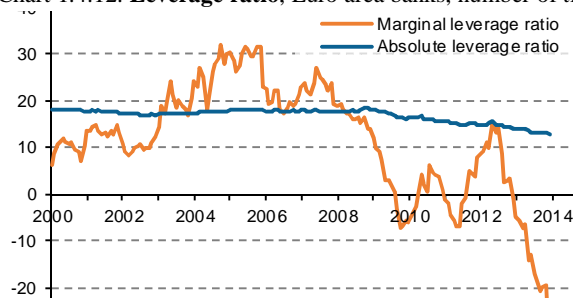
In principle, a leverage ratio expressed as total assets to equity seems like the inverse to the capital ratio and therefore would not provide additional information. However, the denominator of regulatory capital ratio is risk-weighted assets while the leverage ratio uses the headline figure of total assets. From this "unweighted" perspective, the leverage ratio provides valuable information about banks' risks and solvency on top of the one conveyed by regulatory capital ratios. On these grounds, the CRR includes a leverage ratio as an additional prudential tool (see Section 2.3)⁵⁴.

A certain amount of leverage is needed for the well-functioning of an economy. Some authors⁵⁵ argue that, within a certain range, increasing leverage is positive for welfare and growth. But, the relationship would be more like an "inverse U" with the impact of increasing leverage positive up to some level and negative beyond that.

Leverage accumulation in the run up to the crisis has led to excessive risks in the banking system⁵⁶. Though "disorderly" deleveraging could represent a serious threat to macroeconomic and financial stability, deleveraging is necessary, however, for banks to correct the imbalances built prior to the crisis. The need to deleverage is intertwined with the need for banks to reinforce their capital positions (see Section 1.4.1).

Leverage ratio: assets to equity

Chart 1.4.12: **Leverage ratio**, Euro area banks, number of times



Notes: Leverage ratio is computed as the ratio of total assets to equity. The absolute ratios are computed from outstanding volumes of total assets and equity. The marginal ratios are computed from the respective annual flows. Annual flows are computed as the sum of net flows for 12 consecutive months through a rolling window. "Net" refers to new transactions minus redemptions.

Source: ECB: Monetary statistics and own calculations.

⁵³ ECB (2013b), p. 25.

⁵⁴ While the Joint Committee of ESAs (2014, p. 7) identifies a reduction of risk weighted assets as the predominant driver of the improvement in capital ratios, the variability in risk weights can be driven by differences in banks' modelling choices or in the supervisory approaches rather than reflecting real declines in exposures as confirmed by the BCBS (2013) and acknowledged by the ECB (2013b, p.27).

⁵⁵ See, for instance, Cecchetti and Kharroubi (2012).

⁵⁶ See Basel III, paragraph 152.

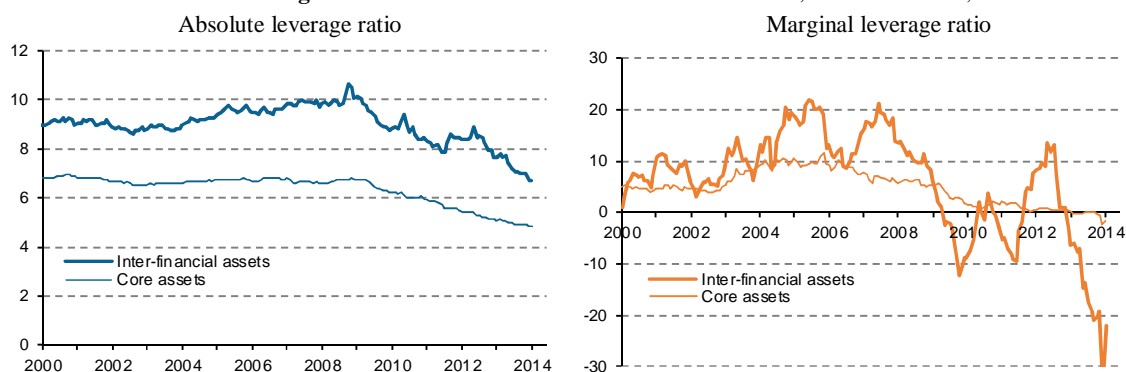
Data show that bank leverage has declined from about 18 to 1 on the outbreak of the crisis to less than 13 to 1 in December 2013 (see absolute leverage ratio on Chart 1.4.12). This was achieved through a very aggressive policy on new activities: the marginal leverage ratio remained below 10 to 1 since early 2009 (except for a short period in 2012). Since early 2013, marginal leverage ratio became negative, what indicates that the reduction in leverage is achieved not only by reinforcing capital but also by contracting total assets. The trend has even accelerated in the last months of 2013.

Partial leverage ratios

Bank assets can be split between the provision of credit to the real economy ("core" assets) and the credit that remained within the financial sector ("inter-financial" assets)⁵⁷ in order to compute partial leverage ratios: partial leverage of inter-financial assets and partial leverage of core assets⁵⁸ (Chart 1.4.13).

Inter-financial assets show a high volatility, which implies a source of potential instability (see also Section 1.3.6). In the run up to the crisis, the marginal leverage of inter-financial assets was twice as big as the one of core assets. Thereafter, inter-financial assets were the main drivers of the swings in the overall marginal leverage ratio and the ones banks are more intensively using to reduce their balance sheet⁵⁹.

Chart 1.4.13: **Partial leverage ratios for core assets and inter-financial assets**, Euro area banks, number of times



Notes: Partial leverage ratios compare data on the specific assets with total equity. Core assets: credit provided by banks to households through loans or the purchase of securities. Inter-financial assets are computed by subtracting core assets and government assets (not shown on the charts) from total assets. The absolute ratios are computed from outstanding volumes of assets and equity. The marginal ratios are computed from the respective net annual flows. Annual flows are computed as the sum of net flows for 12 consecutive months through a rolling window. "Net" refers to new transactions minus redemptions.

Source: ECB: Monetary statistics and own calculations.

Besides being a source of instability, high volatility also means that the (positive) trend in deleveraging bad assets can be reversed very quickly: banks might recuperate similar bad assets at a similar fast speed when the crisis is finally over. Indeed, the European Supervisory Authorities signal as a key risk that *"market participants are seeking higher yields in various ways, including investing in more risky and less liquid assets and investing through off-*

⁵⁷ For details, see Section 1.3.6. Inter-financial assets include assets with non-Euro area residents.

⁵⁸ The third category of "government assets" is not used in this Section.

⁵⁹ See also ECB (2013b), p. 27.

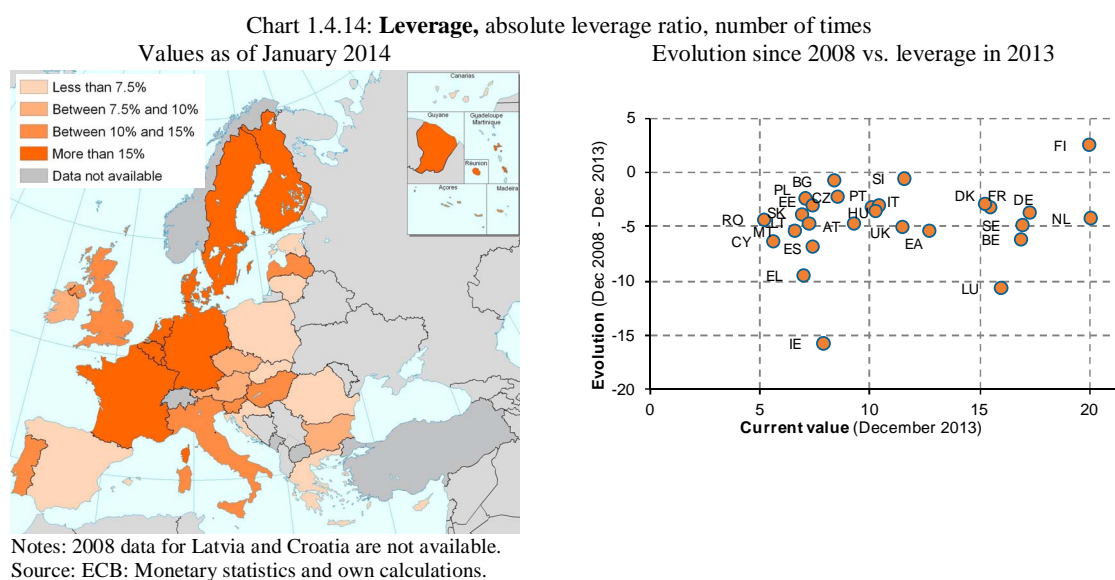
balance sheet investment vehicles"⁶⁰. *The ESAs report also points to the risks stemming from the deteriorating conduct of business of financial institutions; this could also pressure leverage up in the future.*

The marginal leverage ratio for core assets has evolved much smoother and has remained virtually always positive. Only in the most recent months, banks started to reduce their total volume of core assets (negative marginal leverage ratio).

Cross country comparison

While there has been a general trend to declining leverage, the Euro area average conceals a wide heterogeneity across countries (Chart 1.4.14). Against the market and regulatory pressures to deleverage presented in Section 1.4.1, one would have expected the banking systems with the highest initial leverage ratio to be the ones that have reduced their leverage the most throughout the crisis. However, data suggest that this has not been the case (see Chart 1.4.14, right-hand panel).

The decline in leverage for the banking systems with the highest leverage ratios (Denmark, France, Germany, Sweden, Belgium, Luxembourg and Finland) has only been marginal⁶¹ and, definitely, not larger than in countries with much lower initial leverage ratios⁶². Those banking systems were able to maintain these high levels of leverage and comply with regulatory capital requirements through risk-weight optimisation of their assets. It is quite likely that the banks from these countries will be impacted the most by the introduction of a leverage ratio (CRR). On the other hand, leverage has declined significantly in programme countries (particularly in Ireland, Greece, Spain and Cyprus) due to bank restructuring processes.



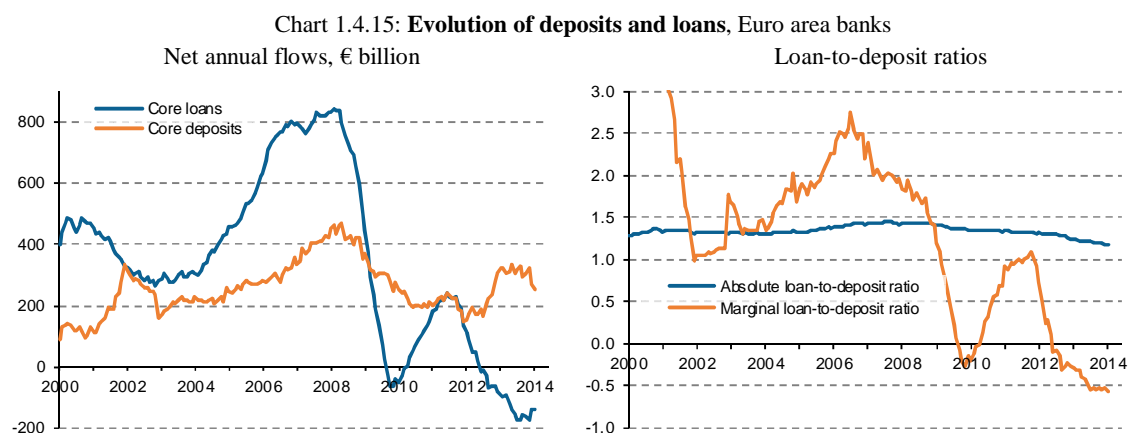
⁶⁰ Joint Committee of the ESAs (2014), p. 2. This risk is concentrated on wholesale markets, not having yet reached retail markets (p. 15).

⁶¹ In the case of Finland, leverage has even expanded between 2008 and 2013.

⁶² Luxembourg is an exception. It had a very high initial leverage ratio which has substantially decreased; nevertheless, leverage in Luxembourg remains still on the upper part of the distribution.

Loans and deposits

The analysis of leverage can be complemented by an approach through loans and deposits. In the run up to the crisis, Euro area banks financed the expansion in loans to the real economy half from core deposits and half from other sources (see Chart 1.4.15).



Notes: Core loans and deposits are the ones vis-à-vis the real economy (households and non-financial corporations). The absolute loan-to-deposit ratio is computed from outstanding volumes of core loans and deposits. The marginal loan-to-deposit ratio is computed from the respective net annual flows. Annual flows are computed as the sum of net flows for 12 consecutive months through a rolling window. "Net" refers to new transactions minus redemptions.

Source: ECB: Monetary statistics and own calculations.

With the outbreak of the crisis, wholesale funding dried up and banks had to use retail deposits to finance non-core activities (see Sections 1.3 and 2.2.2). Since early 2009, marginal loan-to-deposit ratio declined below one (Chart 1.4.15, right hand panel), what signals that banks have indeed used retail deposits, which continued to expand throughout the crisis, to finance non-core activities. As a consequence, new retail deposits became unavailable for financing new loans to the real economy.

1.4.4 Liquidity

With traditional bank assets having long maturities (e.g. mortgage loans), the well-functioning of the financial sector depends on the access to money markets to manage liquidity. With the outbreak of the crisis, money markets dried up and the central bank had to step in as a lender of last resort to avoid liquidity constraints to evolve into solvency problems and, ultimately, into the collapse of the financial system. Because of the importance of the ECB in ensuring the continuity of money markets, an overview of the ECB role throughout the crisis is presented within Section 2.2.2. This section discusses what the banks have used the liquidity received from the central bank for and the consequences in terms of asset encumbrance.

What have the banks used the liquidity for?

Sometimes, it has been argued that banks have used the cheap liquidity obtained from the central bank to buy bonds with a high profitability instead of providing credit to the real economy. A series of factors suggest that this type of "carry trade" was only possible to a limited extent.

On the one hand, most of the liquidity injected by the central bank was deposited back in the

central bank, so that the overall increase in liquidity was rather limited (see Charts 2.2.3 and 2.2.4). On the other, many banks were confronted with high levels of funding stress and made recourse to the Eurosystem's refinancing operation to honour financial outflows⁶³. On top of that, many banks were recurring to ELA, which has a much higher cost than normal open market operations (see Charts 2.A.2 and 2.A.4 in Chapter 2).

Table 1.4.2: **Holdings of bonds and use of central bank liquidity**, Spanish banks, outstanding volumes, € billion

Holdings of bonds	Nov 2011	May 2012	Increase		Dec 2012	May 2013	Increase
Domestic	509.4	578.0	68.6		565.8	598.4	32.7
Sovereign bonds	165.3	241.6	76.4		243.3	290.7	47.4
Bank bonds	60.0	68.5	8.5		76.7	63.8	-13.0
OFIs bonds	284.1	267.8	-16.3		245.8	244.0	-1.8
Non-domestic	62.9	67.1	4.1		86.2	84.1	-2.1
Total	572.3	645.1	72.8		652.0	682.5	30.6
Liquidity obtained from the central bank	116.2	342.8	226.6		361.1	253.6	-107.5

Source: ECB: Monetary statistics, Banco de España: Boletín Estadístico and own calculations.

The case of Spanish banks, which were larger users of LTROs, can be used as an illustration. Between November 2011 and May 2012, Spanish banks increased their recourse to central bank liquidity by €226 bn. At the same time, they increased their holdings of Spanish sovereign bonds by €76 bn, while they reduced their holdings of bonds issued by OFIs (by €16 bn). So that, the maximum amount that can be considered to have been used for "carry trade" would be around €60 bn (€76 bn minus €16 bn) and the bulk of the liquidity obtained from the central bank (at least €166 bn) was used for other purposes (Table 1.4.2).

On the other hand, even when Spanish banks were repaying the LTROs (e.g. €107 bn by May 2013), they kept increasing their holdings of sovereign bonds (by €47 bn), which were, therefore, bought from a different source than central bank liquidity.

The increase in the holdings of sovereign bonds seems to respond more to a "flight to security" effect and the need of collateral to access liquidity than a carry trade motivation. This has indeed led to some concerns about assets encumbrance.

Asset encumbrance

During the crisis, liquidity became available only against collateral either in private repo operations, by issuing secured bonds or by pledging assets in the central bank. As a consequence, a significant proportion of banks' assets became encumbered. While the use of collateral has allowed some banks to access financing at relatively low costs, the amount of assets to back unsecured debt has diminished.

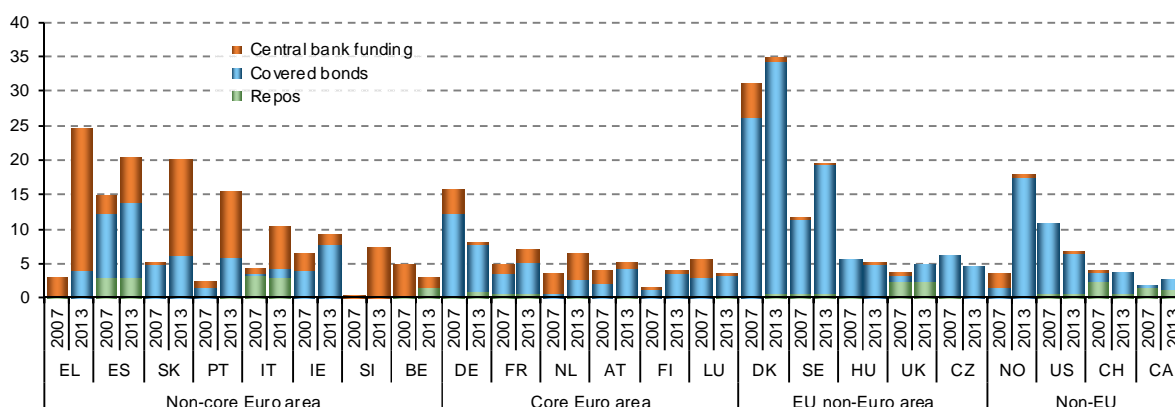
Data show how banks in peripheral Euro area countries increased their asset encumbrance due to central bank lending. However, banks from some core countries and non-Euro area countries also have significant levels of asset encumbrance, although mainly in the form of covered bonds (Chart 1.4.16).

The overall effect of asset encumbrance on funding costs is ambiguous as it depends on the amounts of various types of funding instruments, the relative funding costs and the underlying riskiness of the banks' assets (both encumbered and unencumbered). The fact that asset

⁶³ See ECB (2012c), pp. 70-71.

encumbrance does not necessarily lead to increasing funding costs is confirmed by countries such as Germany, Denmark, Sweden, but also Norway and US, which have significant levels of asset encumbrance but favourable funding conditions⁶⁴.

Chart 1.4.16: **Asset encumbrance**, percentage of bank assets



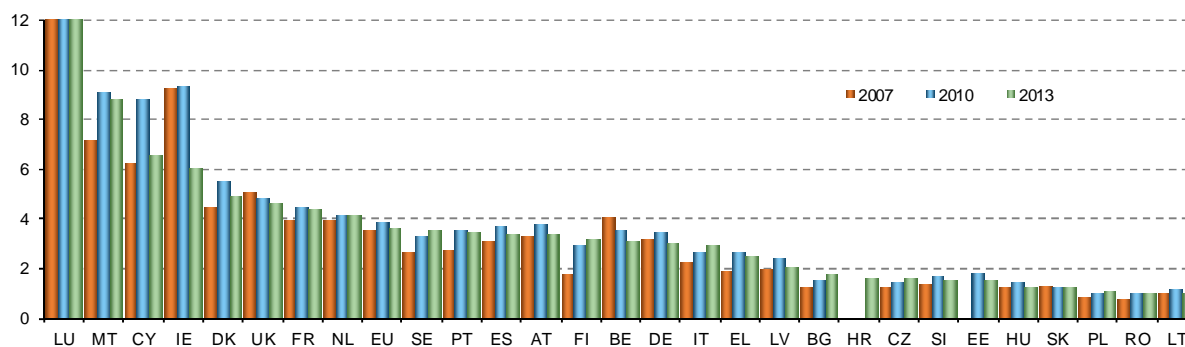
Note: Covered bonds include asset-backed securities.

Source: IMF

1.4.5 Other features of banking structure: size, concentration and cross border ownership

Banking structure of EU banks in terms of size, concentration and cross border ownership is very diverse from country to country. In most EU countries, total assets of national banking systems are between 2 and 4 times GDP. However, the size is significantly higher (more than 6 times GDP) in Luxembourg, Malta, Cyprus and Ireland, followed by Denmark, the UK, France and the Netherlands. The size of the banking systems is relatively smaller as compared to GDP in Romania, Lithuania, Poland and Slovakia (Charts 1.4.17).

Chart 1.4.17: **Size of banking systems**, total domestic assets to GDP, number of times



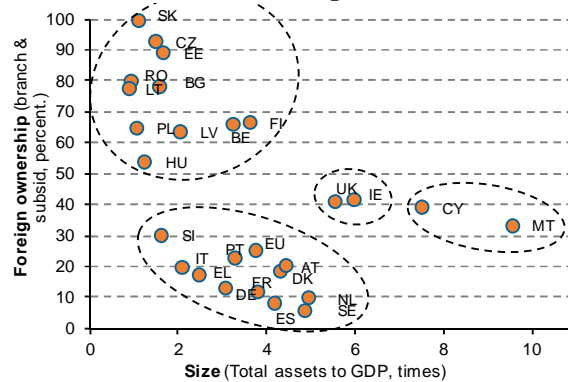
Notes: Domestic assets refer to banks operation within the country, including branches and subsidiaries of foreign banks. LU: 2007 = 34.5; 2010 = 32.2; 2013 = 27.3. Source: ECB: Monetary statistics, Eurostat and own calculations.

The relative size of banking systems should be understood against the existence of cross-border financial conglomerates and their internal organisation or how they distribute activities between headquarters and subsidiaries. Wholesale and investment activities typically concentrate in headquarters and are therefore accounted for at the parent company's

⁶⁴ For further discussion about the effects of asset encumbrance, see the IMF (2013), Chapter 3.

country. When these circumstances are taken into consideration (for instance, that the liquidity operations needed for a Polish subsidiary are undertaken from France through the parent company), the relative size of banking system is more even than what is suggested by "domestic" assets.

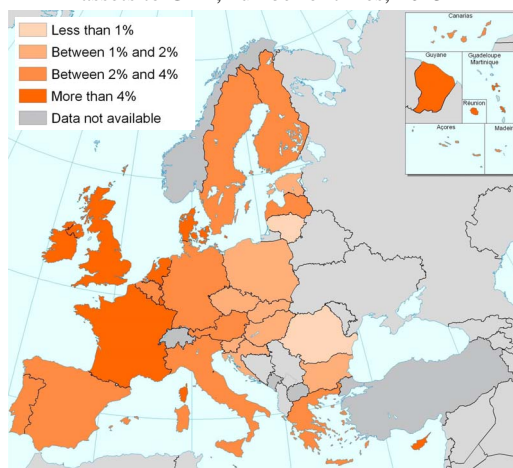
Chart 1.4.18: Assets under foreign control vs. Size, 2012



Note: LU: assets under foreign control = 92.9 per cent, size = 21.9 times.
Source: ECB – EU structural financial indicators and own calculations.

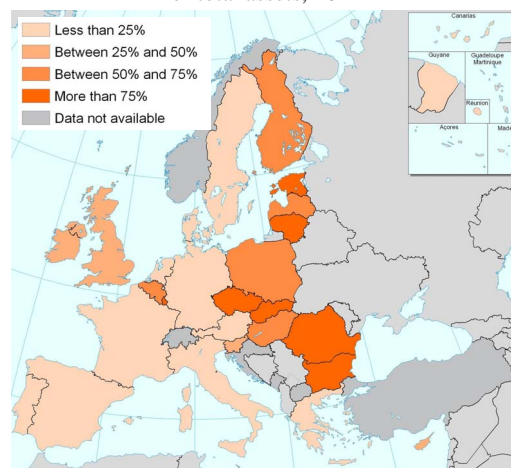
The size can be combined with the extent to which assets are owned by foreign groups to classify EU banking systems in three different business models (Chart 1.4.18). First, most Central and Eastern European countries have a small banking system (size around twice GDP) that is being developed under foreign guidance (foreign ownership larger than 50 per cent). Belgium and Finland constitute particular cases⁶⁵. In a second group, there are countries with a long tradition in banking (with a size of around 4 times GDP) and which are mainly domestically owned. Finally, a third group of countries of financial hubs with very large banking systems (6 times GDP or larger) and with a significant presence of foreign banks (about 40 percent foreign control): the UK, Ireland, Cyprus, Malta and Luxembourg.

Chart 1.4.19: Size of banking systems, total domestic assets to GDP, number of times, 2013



Source: ECB: Structural financial indicators and own calculations.

Chart 1.4.20: Assets under foreign control, percentage of total assets, 2012



Source: ECB: Structural financial indicators and own calculations.

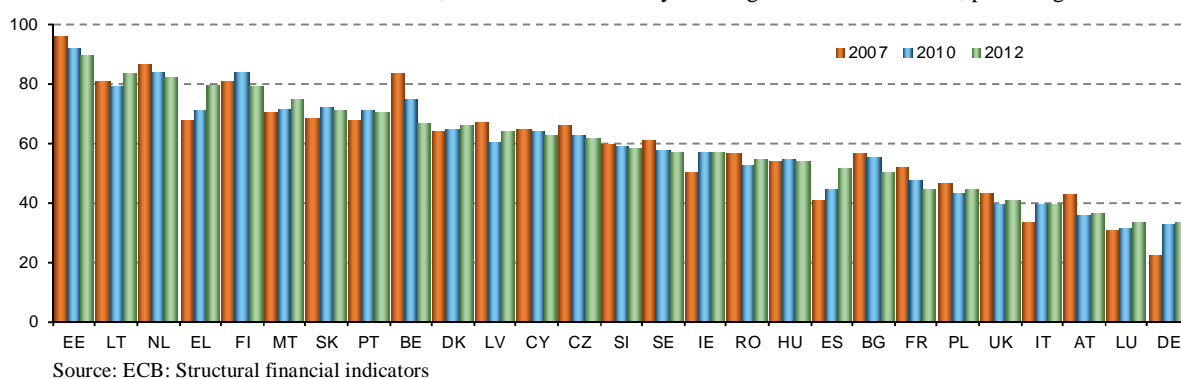
⁶⁵ Both countries have larger banking system than the other countries in the group because of a longer tradition. A number of Swedish banks have an international cross border tradition in Nordic countries, including Finland. The case of Belgium is explained by the takeover by the French BNP Paribas of one of the major Belgian banks (Fortis) after being bailed out by the Belgian government.

Charts 1.4.19 and 1.4.20 provide a geographical overview of those business models. In most cases, parent banks are located in Western EU Member States, with a long tradition in banking and, therefore, larger banking systems. To prevent that the crisis could negatively affect the relation between Western parent companies and Eastern subsidiaries and branches the so called Vienna Initiative was established in early 2009 (see Section 2.2.1).

Because retail activities requires banks to be close to their customers, the bulk of loans to households and non-financial corporations is provided by domestic banks (see Section 1.3.2). Financial integration for these activities is achieved through the ownership structure of banking groups rather than by the direct provision of services cross border. A high degree of financial integration is observed in Eastern European countries: in Slovakia, the Czech Republic, Estonia, Lithuania, Bulgaria or Romania (but also in Luxembourg), above 70 per cent of bank assets are owned by foreign groups. In Finland, Belgium, Poland, Latvia or Hungary, foreign ownership is also significant (see Charts 1.4.20 and 1.A.16 in the Annex).

In most of the other countries, foreign ownership is more limited or even marginal. For instance, in countries such as Sweden, Spain, the Netherlands, France or Germany foreign ownership is around or below 10% of total banking assets.

Chart 1.4.21: **Market concentration**, Share of total assets by five largest credit institutions, percentage



Market concentration of banking systems varies across countries: banking systems are relatively atomised in Germany, Luxembourg or Austria (where the top five banks hold less than 40% of total assets) and extremely concentrated in Estonia, Lithuania, the Netherlands, Greece or Finland (with top five banks holding 80% or more of total banking assets) (Charts 1.4.21). However, some specific asset classes or market segments could be dominated by a few banks even in the countries with a relatively low average concentration.

The financial crisis and the various merger and acquisitions operations within the financial sector have triggered some movements in the concentration of markets. An increasing concentration is observed in countries undergoing banking sector restructuring processes such as Greece, Ireland or Spain and in banking systems with relatively low levels of concentration (e.g. Germany, Luxembourg or Italy)⁶⁶; a decreasing concentration is observed in Estonia, the Netherlands, Belgium, Bulgaria or France.

⁶⁶ See ECB (2013b), p. 13.

For the combination of concentration with size and concentration with foreign ownership, countries are rather distributed throughout the whole range of possibilities; no particular business model is predominant (see Charts 1.A.17 and 1.A.18 in the Annex).

1.5 INSURANCE SECTOR

This section looks at market developments in the insurance sector in 2012 and to the extent available 2013, and also considers the challenges that insurers will face in the near future.

1.5.1 Market developments

Developments in sovereign bond markets in 2013 should have had – on balance – positive ramifications for the balance sheet of insurers. Another stabilizing factor has been the overall decrease in market volatility compared to 2012. However, the insurance industry continued to face a challenging macro environment as low economic growth and high unemployment in the EU were weighing negatively on demand for both life and non-life products. Also, the very low interest rate environment, in combination with the limited choice of asset classes that insurers can invest in⁶⁷ and the macroeconomic framework, put pressure on insurers' profitability and their capacity to offer attractive returns for existing and new products. In addition, insurers face increasing competition from banks who offer more short-term savings and investment products.⁶⁸ Hence, major risks, (i) the prolonged low interest rate environment, (ii) the subdued disposable income of private households, and (iii) the need for further fiscal consolidation in the public sector, could also be regarded as a single compound risk to profitability. A fundamental change in this risk environment would require renewed strong and self-sustained growth triggering a new hiking cycle on behalf of monetary authorities. In addition, the low interest rate environment creates a more challenging environment especially of life insurers in central and northern European markets⁶⁹ where products tend to have long maturities and be more rigid in terms of guaranteed returns.

Given their prominence in the investment portfolio of large European insurers, **credit risk** is closely linked to developments in sovereign bond markets. Losses on the market value of sovereign bonds or further rating downgrades of sovereign issuers have to be watched closely in spite of rather favourable developments in 2013 (see Section 1.2). Throughout the sovereign debt crisis, insurers have placed a rather stable share of around one quarter of their investment portfolio in sovereign debt instruments. Chart 1.5.1 shows the relative shares of types of investment of insurers in all 28 EU Member States.⁷⁰ In the run-up to the crisis, a progressive increase in investment into shares and other variable-yield securities could be observed and 2007 shows the highest share with 17.8% of total investment. This share slowly reduces over time, reaching 11.7% in 2012. On the other hand, over the same period investment in debt securities and other fixed income securities increases by 5.3 percentage points of total investment.

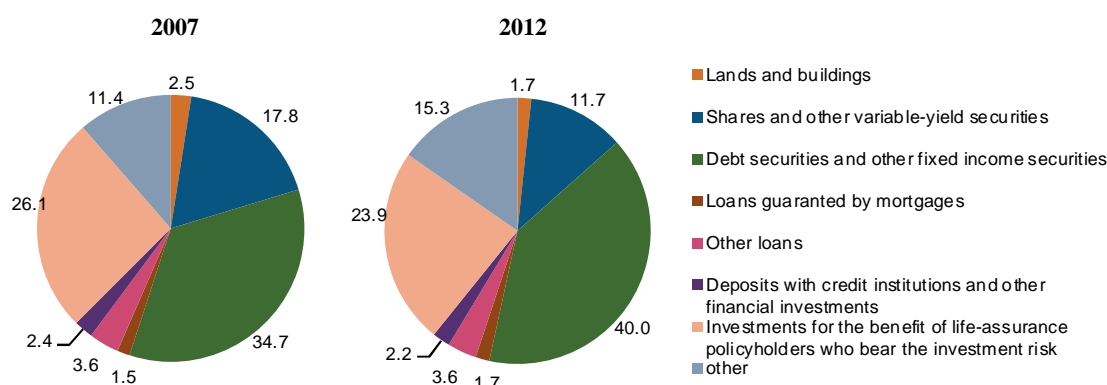
⁶⁷ Up to the entry into force of Solvency II / Omnibus II in 2016.

⁶⁸ EIOPA (2013).

⁶⁹ The same survey carried out by Swiss Re also showed that interest rate sensitivity was generally lower in Southern Europe and France, as well as in the UK.

⁷⁰ Croatia is only included in the 2012 data, not in the 2007 data.

Chart 1.5.1: Average **composition of the investment portfolio** of European insurers



Source: EIOPA and own calculations.

An important step in the regulatory development of the insurance sector was to decide which institutions shall be considered Globally Systemically Important Insurers (G-SIIs). On 18 July 2013, the Financial Stability Board, after consulting the national supervisory authorities published an initial list of nine global systemically important insurers (GSIIs),⁷¹ with five out of nine being European domiciled insurance groups (see Table 1.5.1), three being U.S.-American (MetLife, AIG, Prudential Financial) and one Chinese. The prominence of European insurers in this list partly reflects the fact that European insurance accounts for 33 per cent of market share on a global scale. The Americas account for 34 per cent (with 29 per cent U.S.) whereas Asia/Oceania/Africa account together for the remaining third.⁷²

In 2012, total assets of the five systemically important insurers increased by 7.1% and accounted for roughly half of total assets in the European market of all listed insurance companies.⁷³ In terms of profitability, GSIIs saw an improvement in their return on equity (ROE) to 8.4 per cent in 2012, from 7.0 per cent in 2011.⁷⁴ This compared to an (unweighted) ROE for all listed European insurers of 8.2 per cent in 2012, up from 5.0 per cent in 2011. GSIIs average return on assets (ROA)⁷⁵ increased slightly to 0.65 per cent in 2012 from 0.5 per cent in 2011. Growth of gross written premium has recovered in 2012 after negative growth between 2008-2011, but growth rates continue to be much lower compared to 2007.

Table 1.5.1.: **Some key data of systemically important European insurers, 2012**

	Gross written premiums		Total assets	
	€ bn	% of total	€ bn	% of total
Total	1,090		8,613.	
Allianz SE		7.8		8.8
Assicurazioni Generali S.p.A.		6.6		8.1
Aviva plc		6.0		5.1
Axa S.A.		2.6		4.5
Prudential plc		n.a.		4.7
Top 5		23.0		31.2

Note: The sum of shares for gross written premium excludes Prudential.
Source: S&P Capital IQ, SNL Financial, EIOPA.

⁷¹ A similar list of reinsurers was foreseen to be published in July 2014. As it is already current practice for banks, the list will be updated on an annual basis. Details on eventual needs to hold higher loss absorbing capacities are still to be developed in the case of insurers.

⁷² Swiss Re (2013).

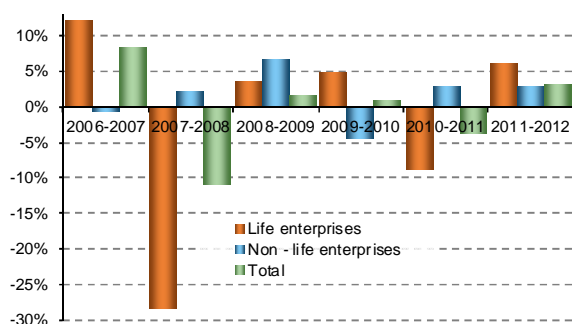
⁷³ Based on Standard and Poor's Capital IQ data (only listed companies).

⁷⁴ Weighted by total asset shares.

⁷⁵ Weighted by total asset shares.

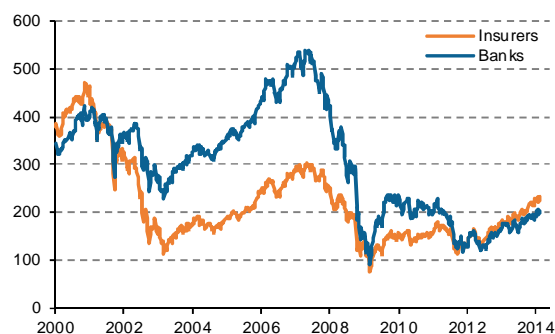
Since Omnibus II negotiations were ongoing in 2013, EIOPA’s Board of Supervisors decided to postpone the regular insurance stress test until April 2014 (solvency ratios are the key output of this exercise). For the same reasons, a “Low Yield” exercise originally foreseen in 2013 was postponed as well. The aim of the exercise was to assess the potential scope, timing and scale of the risks arising in the low yield environment, paying special attention to those insurers facing greater exposure due to their product mix.

Chart 1.5.2: **Gross written premium, annual growth rate, percentage**



Source: EIOPA.

Chart 1.5.3: **Stoxx indices, Stoxx 600, Europe**



Source: Bloomberg.

Profitability, as measured by the average return on equity, improved further in 2013 (based on quarterly survey data including the third quarter of 2013) and so did solvency.⁷⁶ Chart 1.5.3 displays an interesting development that merits continued monitoring. Insurers did not benefit as banks during the pre-crisis boom as far as the value of their stock is concerned, and during the crisis when banks were bailed out, bank shares recovered more strongly from the historic trough in March 2009. However, the most recent development shows a stronger performance of European insurers.

1.5.2 Insurers and financial integration

In its recent Communication⁷⁷, the Commission stressed the potential of insurers to play the role of patient investors with a view to contributing to an efficient division of labour within the financial system. To play this role more actively, insurers should be in a position to invest in a broader class of financial assets.

Substantial differences in the economic performance in Europe pose the risk of further market fragmentation with the impact on business models and strategies among internationally active insurance companies and occupational pension funds. The combined share of both financial and government bonds have been fairly stable over the period from 2009 to 2012, the share of the latter has increased slightly by 2 per cent (at the expense of financial bonds during this time).

Solvency II has finally been agreed, and will be fully implemented in 2016. Earlier EIOPA Financial Stability Reports highlighted the risks arising from uncertainty on the future regulatory framework of the European insurance industry in combination with the

⁷⁶ The solvency ratio is defined as the available solvency margin divided by the required solvency margin. See EIOPA (2013).

⁷⁷ European Commission (2014d).

acknowledged short-comings of the current Solvency I framework. The political agreement on Omnibus II reached removed the uncertainty around implementation of Solvency II, giving both insurance undertakings and supervisory authorities clarity on the shift to the new framework from 2016.

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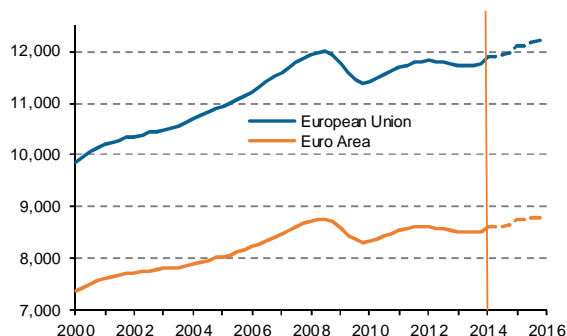
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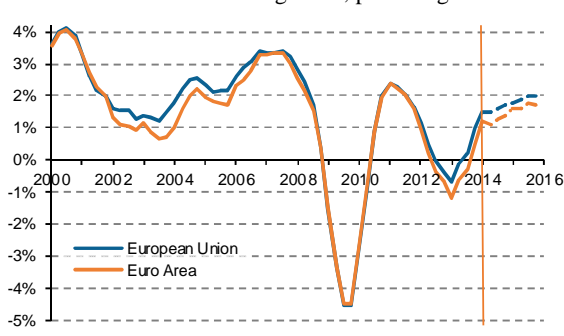
ANNEX TO CHAPTER 1: ADDITIONAL CHARTS

1.A.1 Additional charts on the general economic outlook

Chart 1.A.1: **Gross domestic product**, market prices, chain linked
€ billion



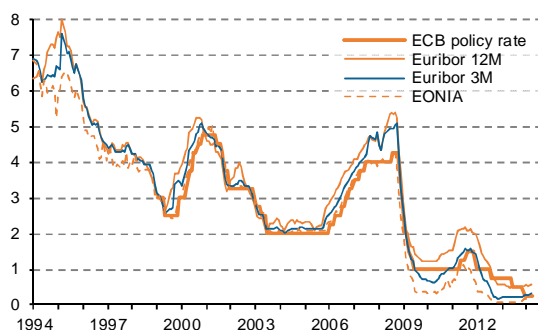
Annual growth, percentage



Notes: Data for 2014 and 2015 are forecast.

Source: Eurostat: National (quarterly) accounts, European Commission forecast and own calculations.

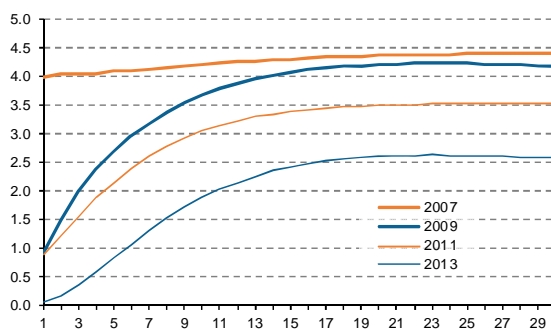
Chart 1.A.2: **Market rates and policy rate**, Euro area,
percentage



Notes: The lending and deposit rates are calculated as the composite rate (weighted by volumes) of the different type of retail loans and deposits, respectively. Retail refers to loans to and deposits from households and non-financial corporations.

Source: ECB Statistical Data Warehouse and own calculations.

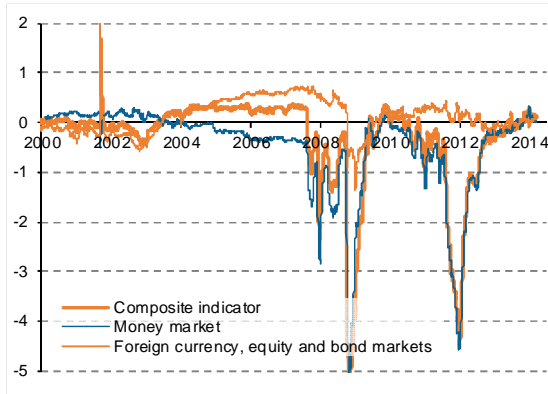
Chart 1.A.3: **Yield curve**, AAA Euro area government
bonds, percentage



This yield curve needs to be review to see what exactly corresponds to.

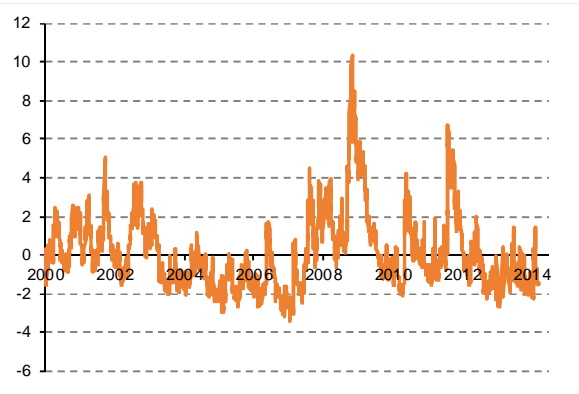
Source: Eurostat.

Chart 1.A.4: **Financial markets liquidity indicator**, Euro area



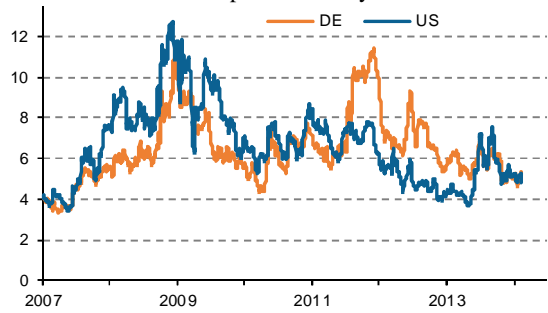
Source: ESRB Risk Dashboard.

Chart 1.A.5: **Global risk aversion indicator**

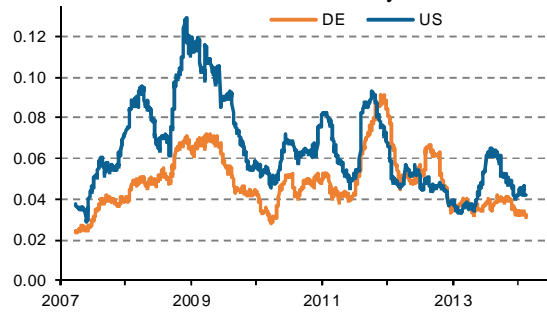


Source: ESRB Risk Dashboard.

Chart 1.A.6: **Volatility on bond markets**, market prices, chain linked
Implied volatility



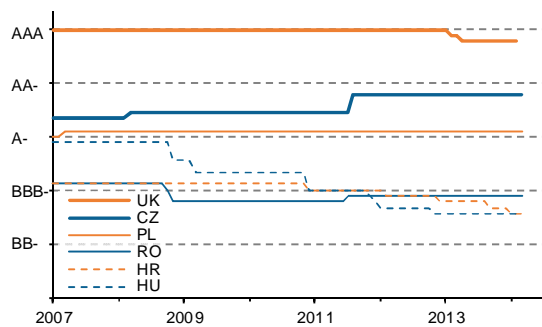
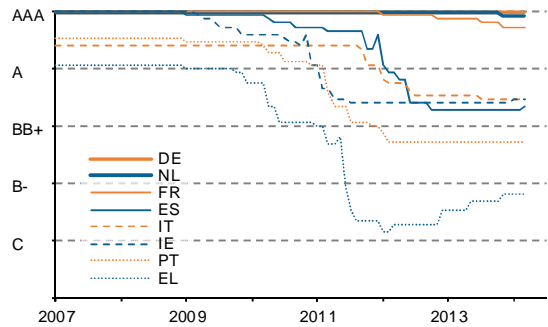
Historical volatility



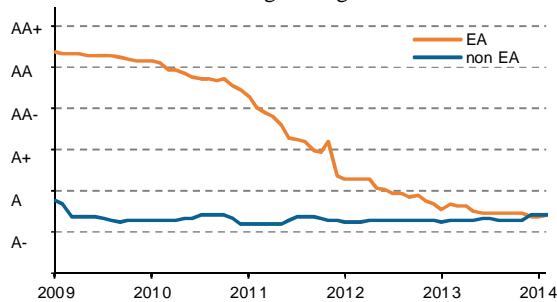
Notes: Implied volatility: three months implied volatility computed at 100% moneyness; Historical volatility: Standard deviation of daily changes.

Source: Bloomberg and Commission calculations.

Chart 1.A.7: **Sovereign ratings**



Average ratings

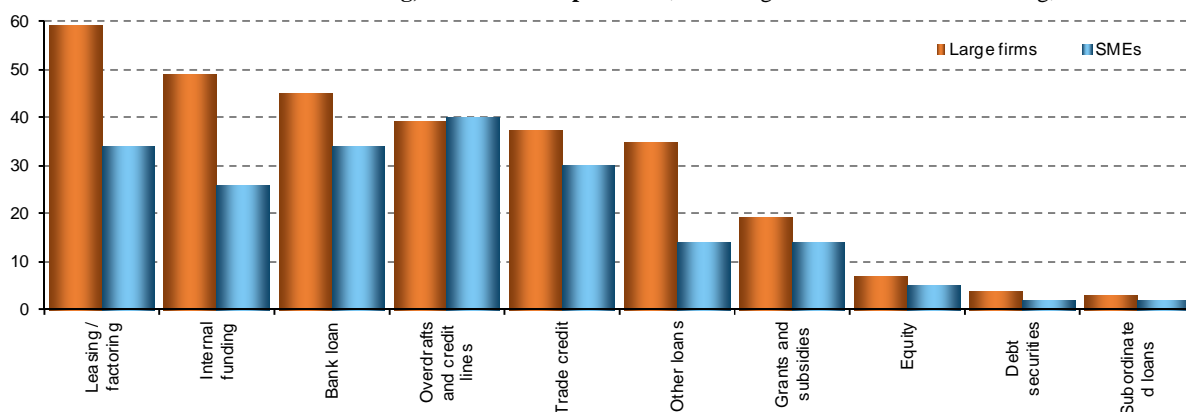


Notes: Ratings are calculated as the average rating provided by Standard and Poor's, Fitch and Moody's.

Source: Bloomberg and Commission calculations.

1.A.2 Additional charts and tables on financing economic sectors

Chart 1.A.8: Source of external financing, Euro Area corporations, % having used the source of financing, 2013 H1



Source: ECB: Survey on the access to finance of SMEs in the Euro Area.

Table 1.A.1: Sources of financing by sector, Outstanding amounts, Euro area, 2013 Q3, € bn

Sector	Loans	Bonds	Equity		Others	Total
			Quoted shares	Other equity		
Real economy	14,660	1,094	4,199	10,388	4,571	34,913
NFCs	8,501	1,094	4,199	10,380	3,874	28,049
Households	6,158	0	0	8	698	6,864
Government	2,278	7,581	0	4	864	10,727
Financial corporations	27,408	8,336	926	12,123	8,235	57,028
MFIs (banks)	23,024	4,875	493	2,112	1,155	31,659
ICPF	299	52	148	364	6,805	7,669
OFIs	4,086	3,409	285	9,646	275	17,701
Rest of the world	3,299	3,459	0	6,381	3,177	16,317
Total	47,644	20,471	5,125	28,897	16,847	118,984

Note: MFIs loans include interbank lending and the deposits received from other sectors. NFCs: non-financial corporations, MFIs: monetary and financial institutions, ICPF: insurance corporations and pension funds, OFIs: other financial institutions. Other financing for ICPF corresponds to insurance technical reserves. Other equity for OFIs corresponds to unquoted shares and mutual fund shares. Rest of the world refers to the financing provided by Euro area residents to residents outside the Euro area.

Source: ECB: Euro area accounts

Table 1.A.2: Loans by counterparts granted by Euro Area banks (MFIs), outstanding volumes, € billion

Counterparty	2006	2007	2008	2009	2010	2011	2012	2013
Interbank loans (excluding position at ECB)	4,763	5,412	5,824	5,511	5,131	5,297	4,856	4,767
Households	4,529	4,801	4,893	4,960	5,168	5,243	5,253	5,231
Non-financial corporations	3,840	4,389	4,827	4,691	4,668	4,720	4,536	4,343
Governments	814	959	973	1,002	1,218	1,160	1,153	1,082
Other financial institutions	771	958	1,055	1,132	1,191	1,200	1,251	1,075
Total loans to Euro area residents	14,716	16,519	17,572	17,297	17,376	17,619	17,048	16,499
Loans to non-Euro area residents	2,927	3,295	3,242	2,822	2,963	3,022	2,868	2,732
Total loans provided by Euro area banks	17,644	19,815	20,815	20,118	20,339	20,641	19,917	19,230

Notes: Other financial institutions include insurance corporations and pension funds, and other financial intermediaries. Interbank loans include also the positions of the banks at the central bank. The last rows of the table present this information; the domestic-cross border breakdown is not available.

Source: ECB: monetary statistics and own calculations.

Table 1.A.3: Bonds issued by Euro Area residents, outstanding volumes, € billion

Issuer	2006	2007	2008	2009	2010	2011	2012	2013
Governments	4,711	4,842	5,266	5,887	6,486	6,842	6,950	7,225
Banks (MFIs)	4,549	5,035	5,263	5,364	5,238	5,517	5,399	4,887
Other financial institutions	1,198	1,514	2,170	3,113	3,176	3,173	3,225	3,203
Non-financial corporations	592	636	695	802	852	874	993	1,071
Total	11,050	12,027	13,394	15,167	15,752	16,405	16,568	16,386

Note: Other financial institutions include insurance corporations and pension funds, and other financial intermediaries.

Source: ECB: securities statistics and own calculations.

Table 1.A.4: **Quoted shares issued by Euro Area residents**, outstanding volumes (market capitalisation), € billion

Issuer	2006	2007	2008	2009	2010	2011	2012	2013
Non-financial corporations	4,466	5,001	2,851	3,493	3,788	3,271	3,743	4,531
Banks (MFIs)	1,046	985	373	565	458	339	402	569
Other financial institutions	665	580	284	352	335	271	357	466
Total	6,177	6,565	3,508	4,410	4,582	3,881	4,503	5,565

Source: ECB: Securities statistics and own calculations.

Table 1.A.5: **Holdings of bonds Euro Area MFIs**, outstanding volumes, € billion

Issuer	2006	2007	2008	2009	2010	2011	2012	2013
Banks (MFIs)	1,637	1,740	1,976	2,080	1,886	1,852	1,851	1,704
Governments	1,278	1,197	1,245	1,482	1,524	1,396	1,627	1,745
Other financial institutions	428	767	1,150	1,280	1,358	1,353	1,267	1,244
Non-financial corporations	228	246	256	218	180	164	156	150
Total (Euro area bonds)	3,571	3,949	4,628	5,060	4,949	4,765	4,901	4,842
Non-Euro area issuers	1,109	1,234	1,227	1,148	1,052	932	873	807
Total	4,680	5,183	5,855	6,207	6,001	5,697	5,774	5,649

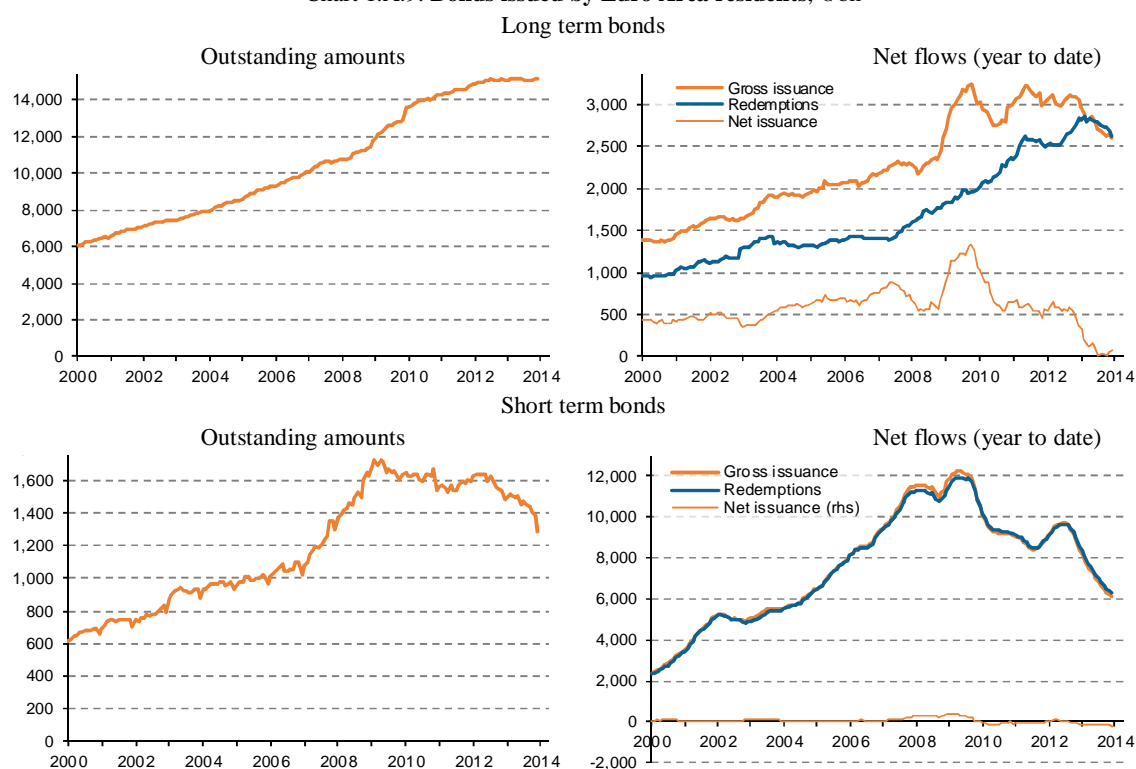
Source: ECB: Monetary statistics and own calculations

Table 1.A.6: **Holdings of equity Euro Area MFIs**, outstanding volumes, € billion

Issuer	2006	2007	2008	2009	2010	2011	2012	2013
Banks (MFIs)	373	424	422	435	445	484	476	458
Other financial institutions	302	375	306	340	480	444	444	451
Non-financial corporations	500	497	469	461	308	284	309	326
Total (Euro area shares)	1,173	1,295	1,197	1,236	1,233	1,212	1,228	1,233
Non-Euro area issuers	293	342	276	280	303	295	301	329
Total	1,466	1,636	1,473	1,516	1,536	1,507	1,528	1,562

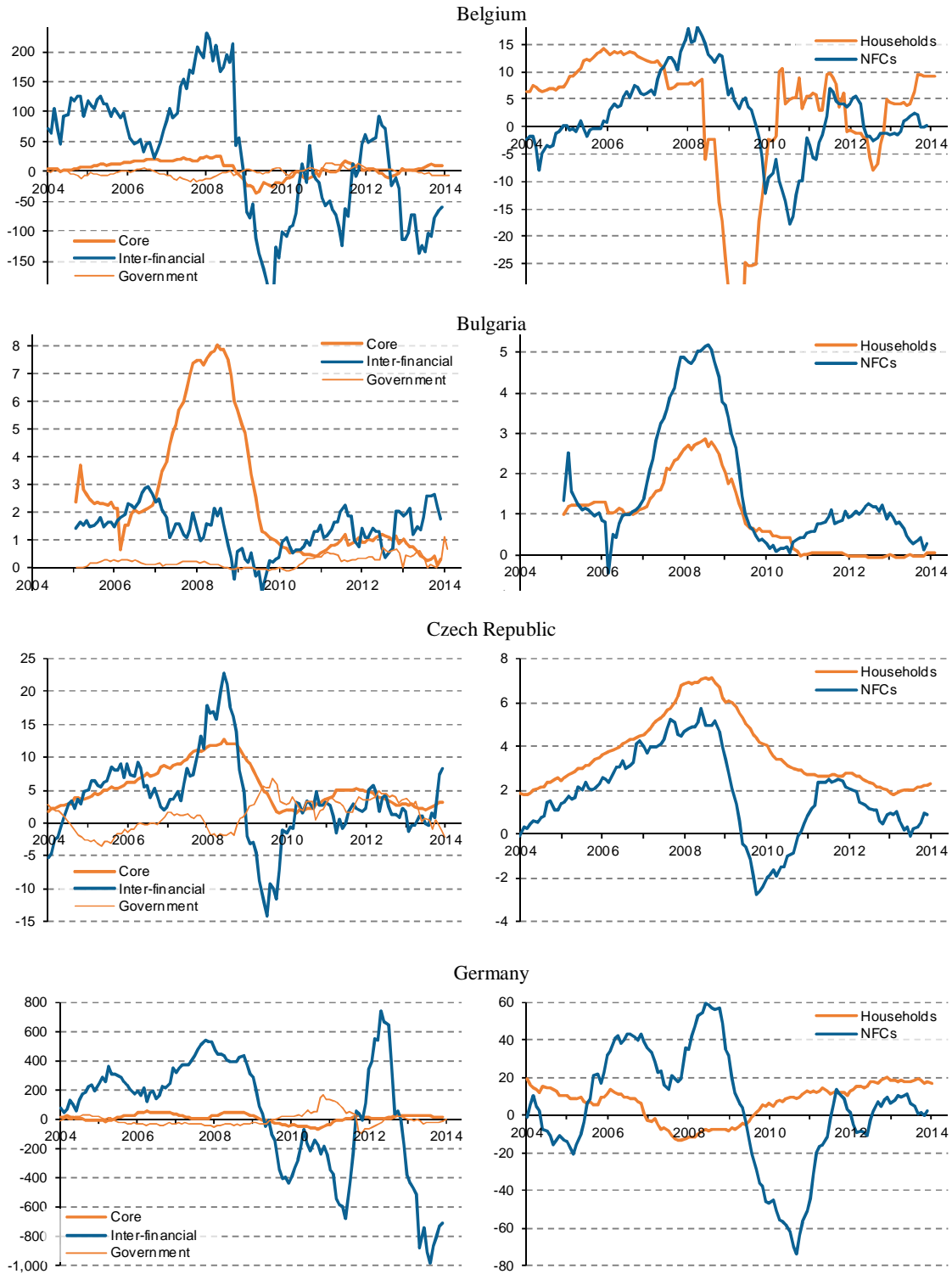
Notes: Includes all equity: quoted shares, non-negotiated shares and other types of equity. The Eurosystem is excluded from MFIs. Source: ECB: Monetary statistics and own calculations

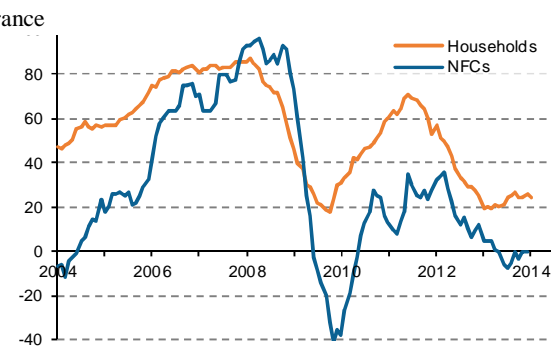
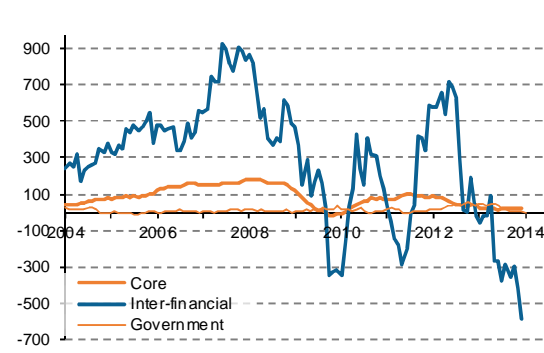
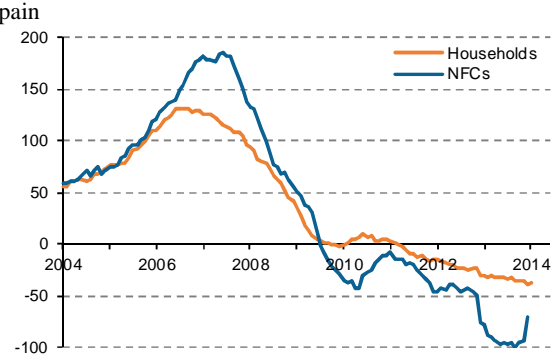
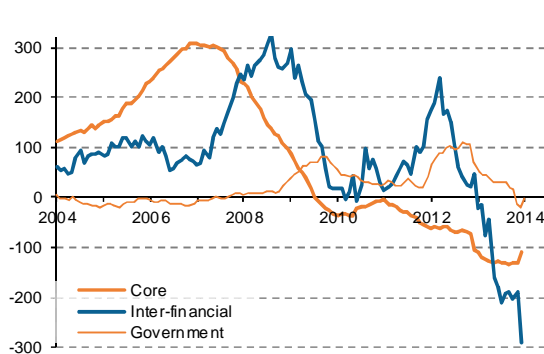
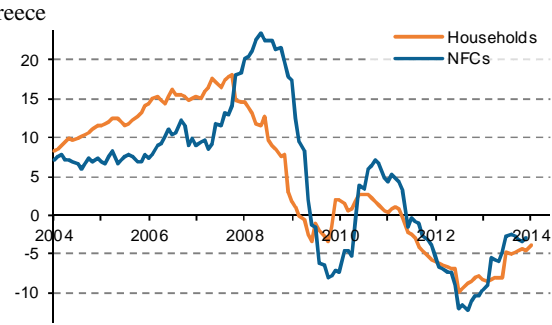
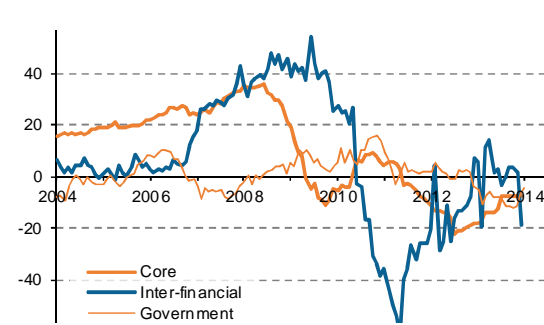
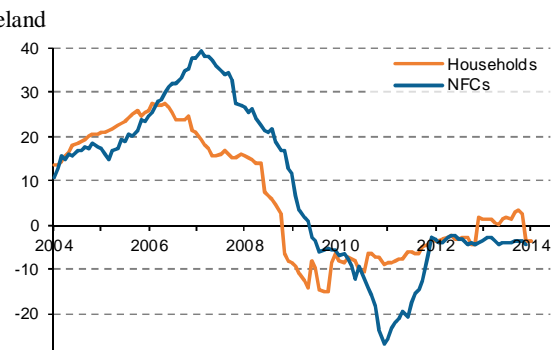
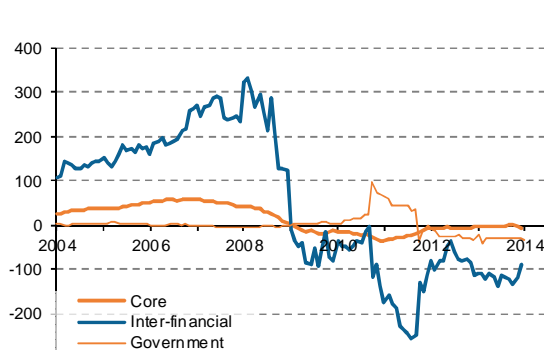
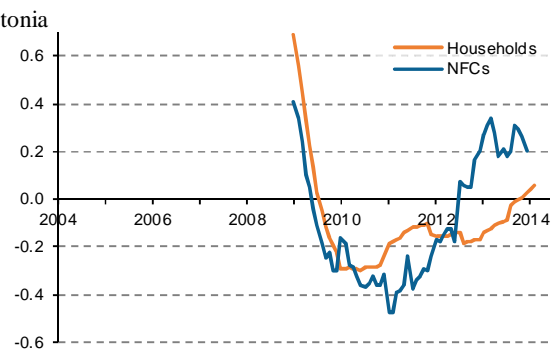
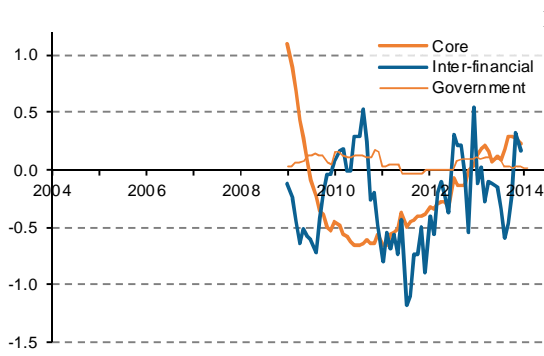
Chart 1.A.9: **Bonds issued by Euro Area residents**, € bn

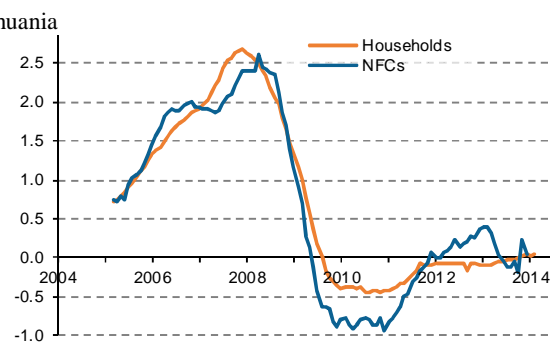
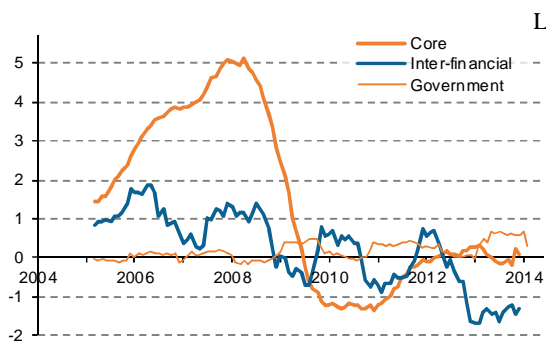
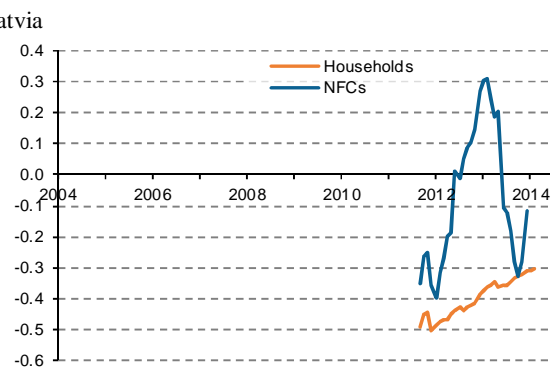
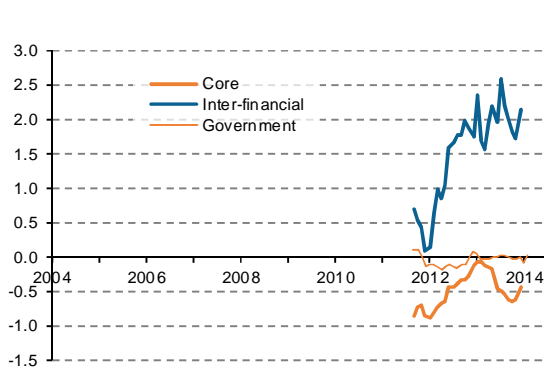
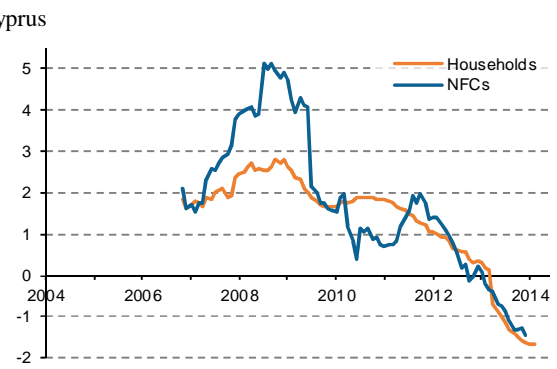
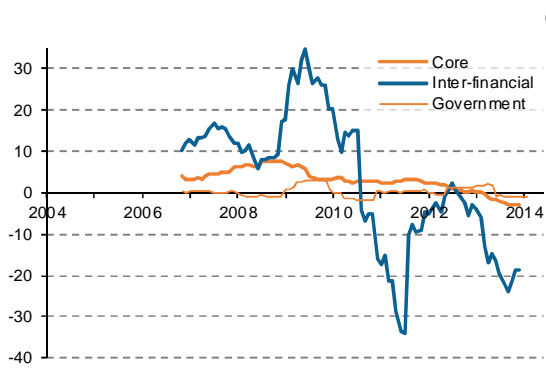
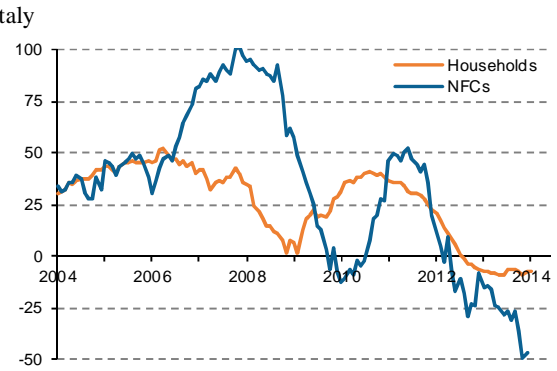
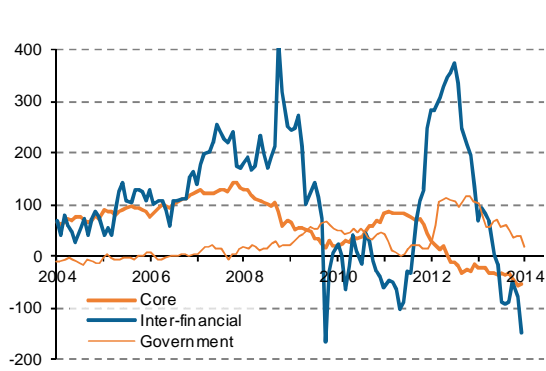
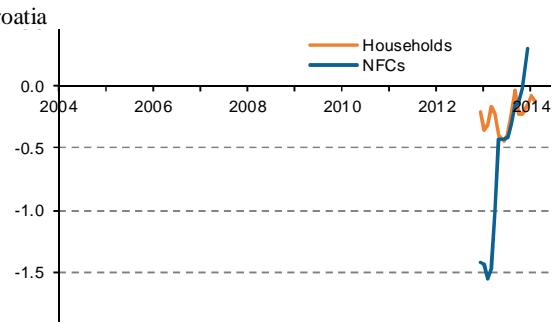
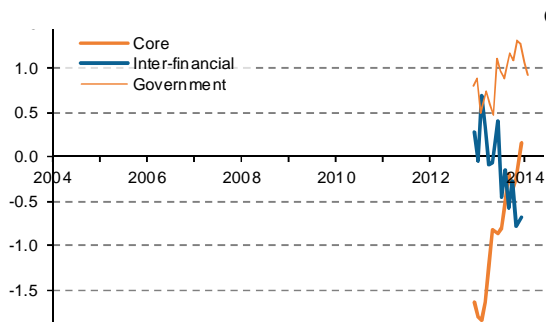


Source: ECB: securities statistics and own calculations.

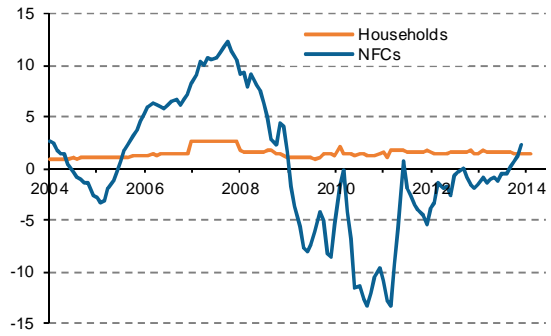
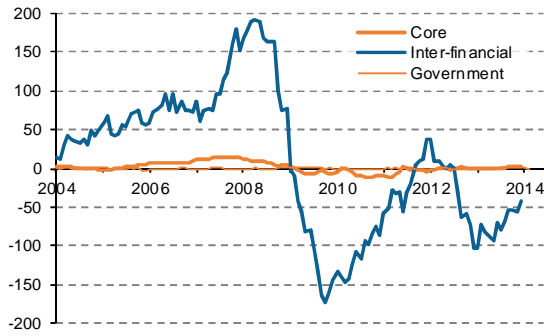
Chart 1.A.10: Provision of credit by banks from selected countries, net flows, year to date, € billion



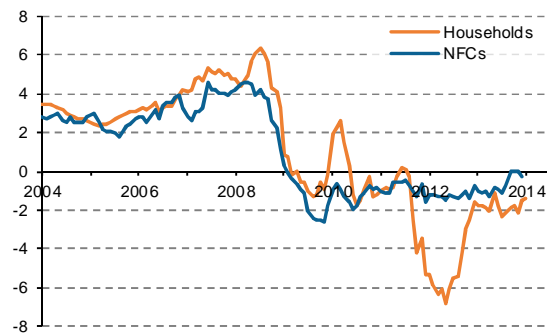
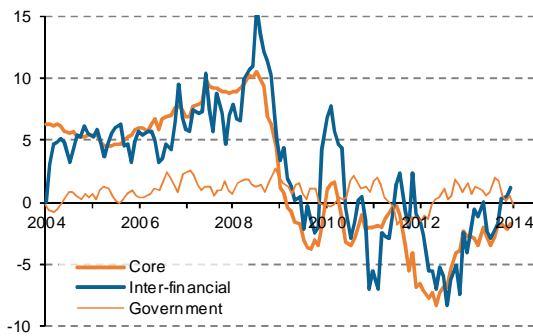




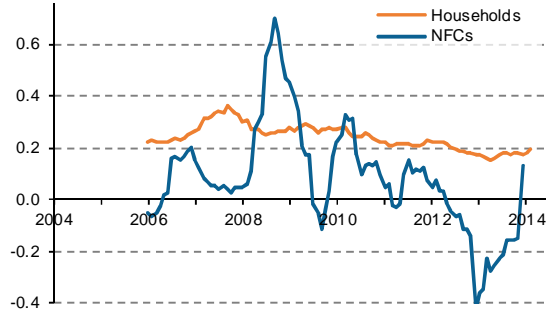
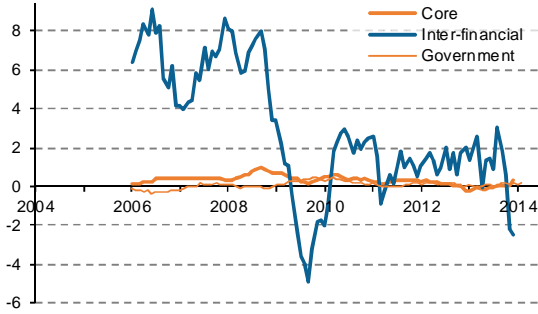
Luxembourg



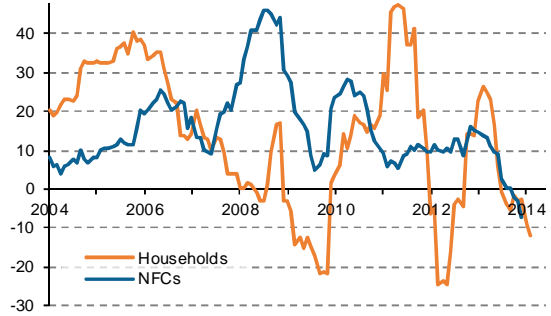
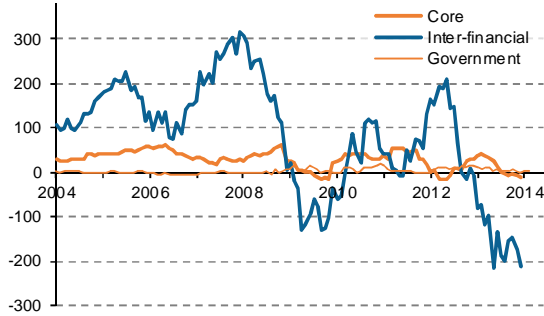
Hungary



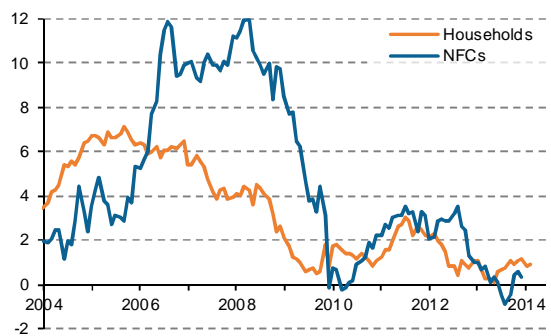
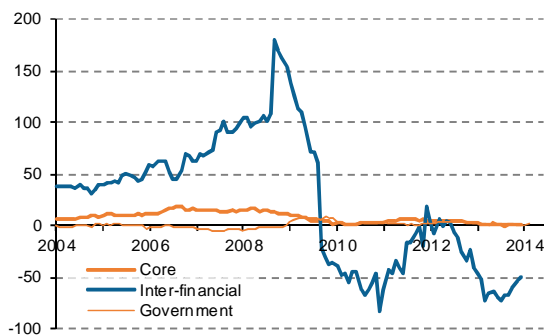
Malta



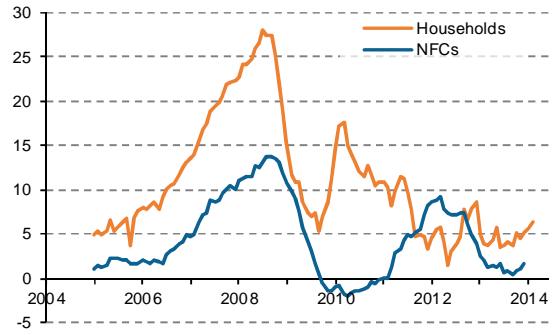
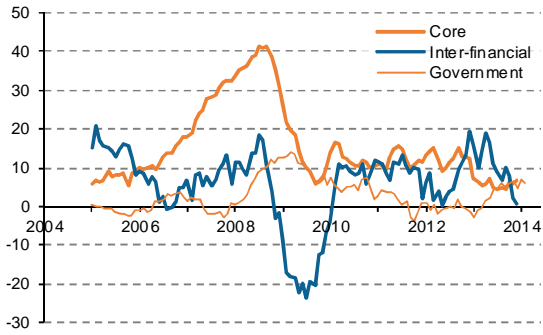
Netherlands



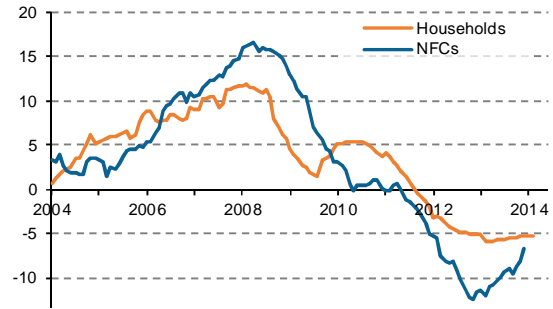
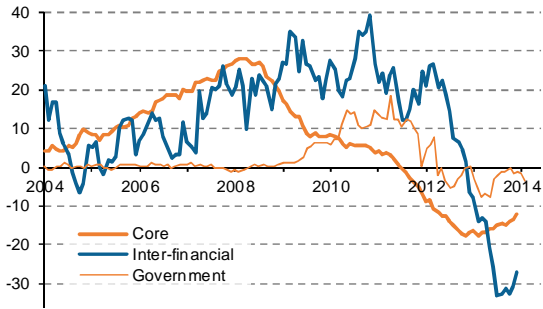
Austria



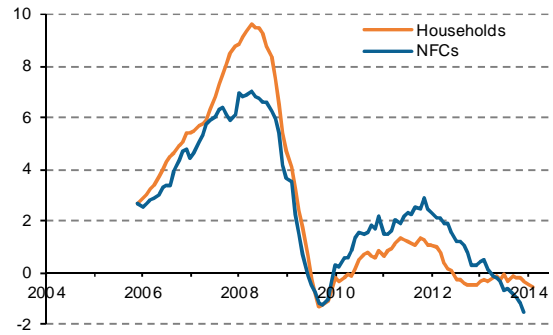
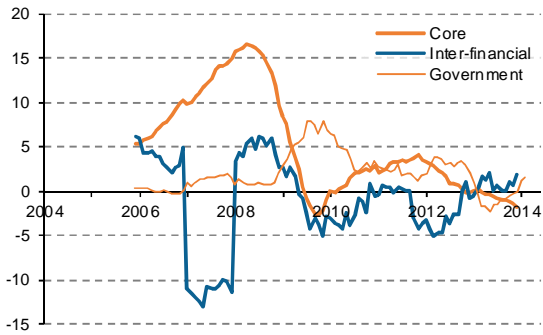
Poland



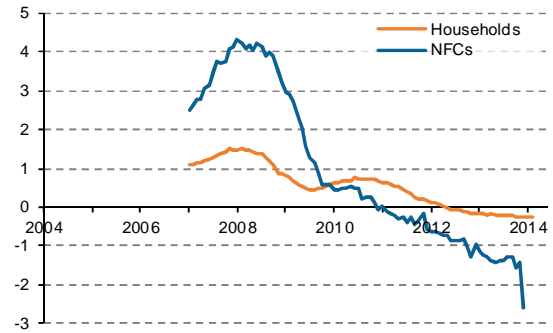
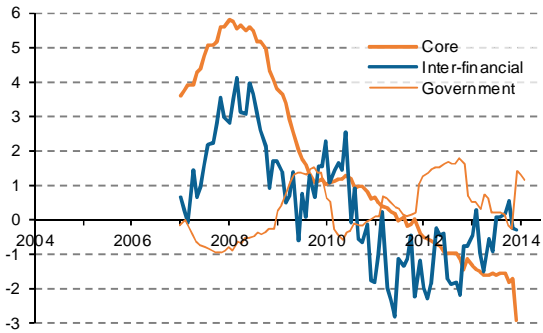
Portugal



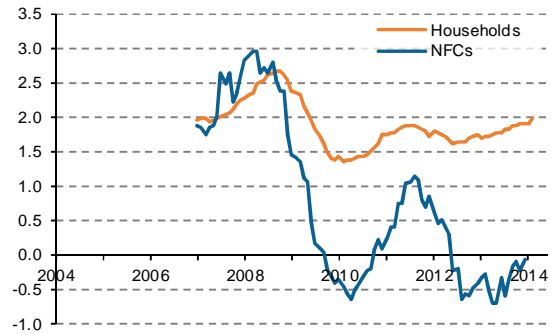
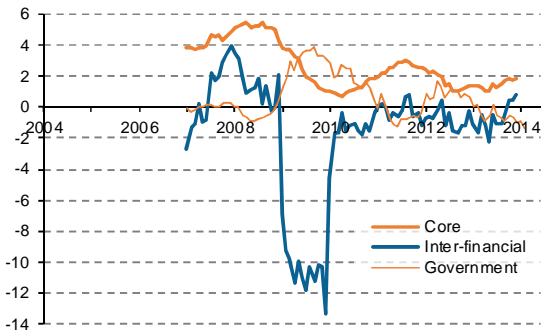
Romania

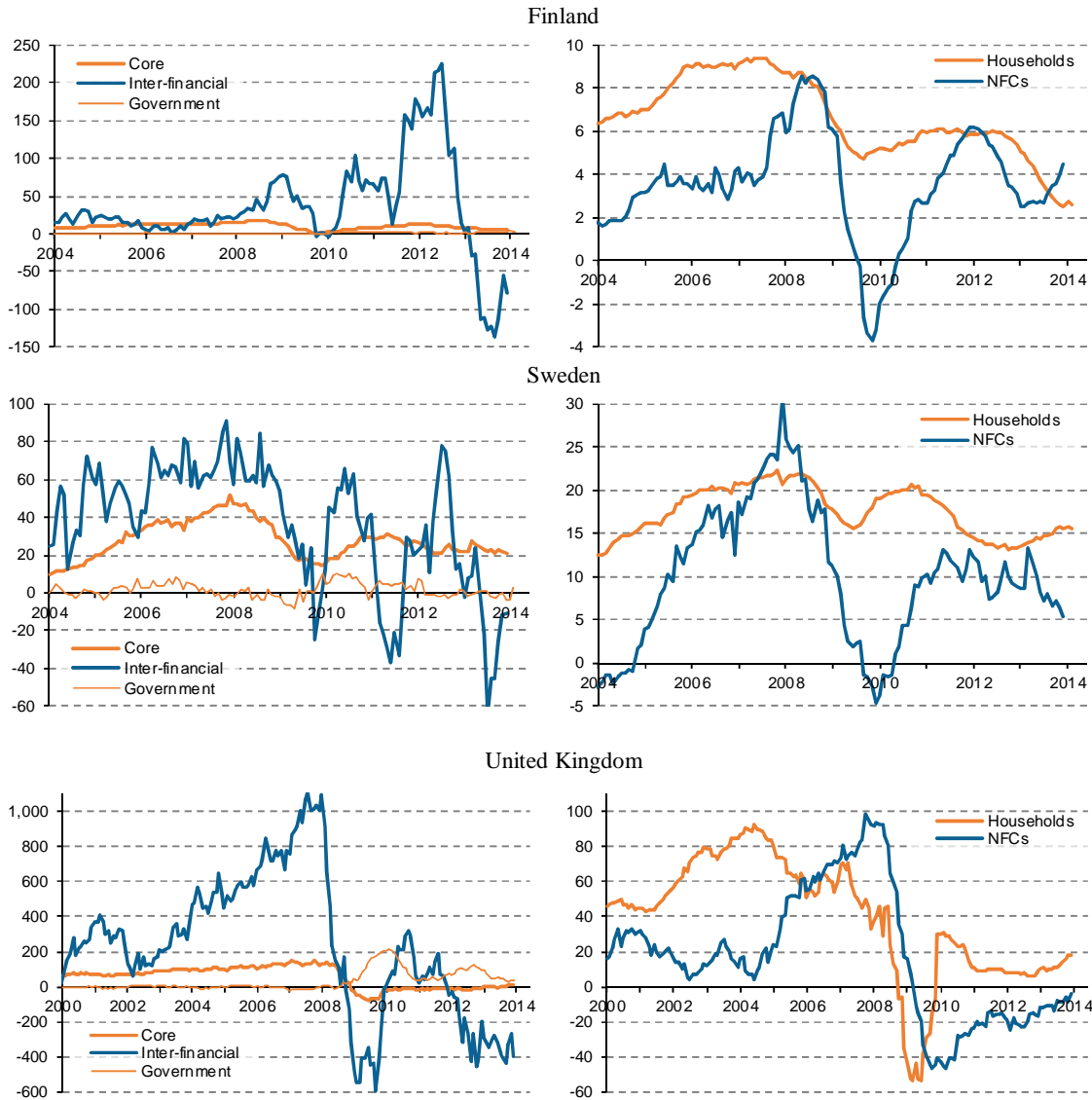


Slovenia



Slovakia

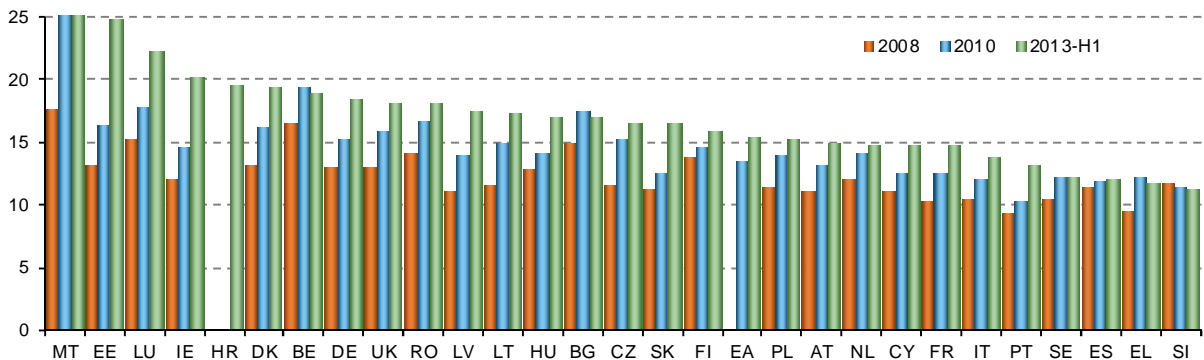




Notes: Credit comprises loans and purchase of securities (equity, debt securities and derivatives). Core assets: credit provided to households and non-financial corporations. Inter-financial assets are computed by subtracting government and core assets to total assets. Inter-financial assets include the positions of banks in the Central Bank (current accounts, deposit facility and fixed term deposits). Data for UK are in £ billion and were extracted from the Bank of England. Data for Denmark are not available. Source: ECB: Monetary statistics and own calculations.

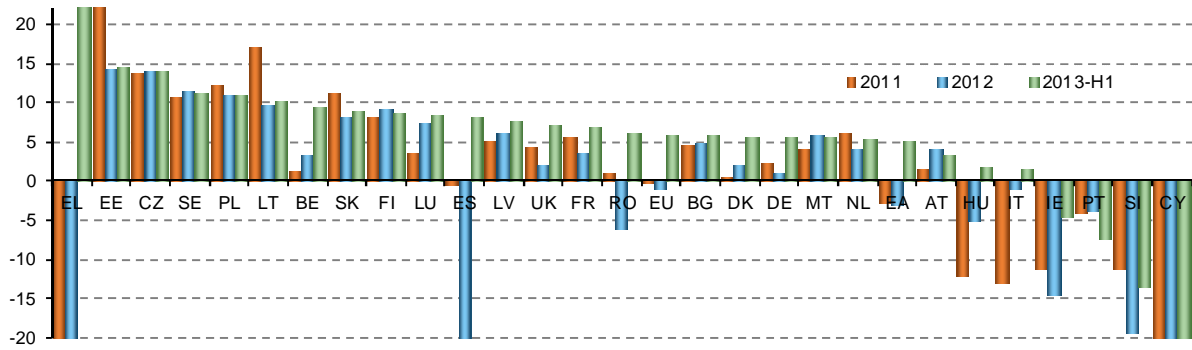
1.A.3 Additional charts on the banking sector

Chart 1.A.11: Overall capital (solvency) ratio, percentage of risk-weighted assets



Notes: Definitions of capital and risk-weighted assets may differ across countries and banks. Comparisons of semi-annual data with annual data should be taken with caution. Malta: 2010 = 52.0; 2013-H1 = 55.5; Source: ECB: Consolidated banking data.

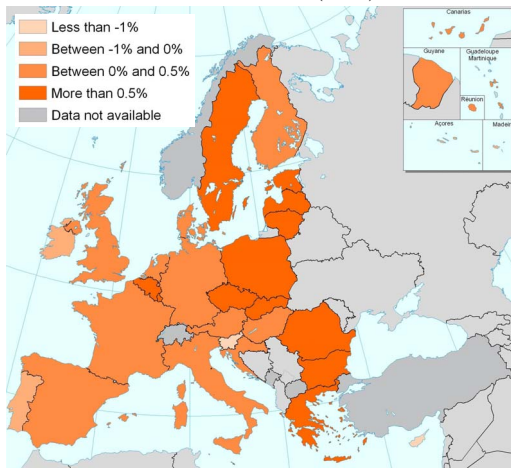
Chart 1.A.12: **Return on equity (RoE) of banks, percentage**



Notes: EL: 2011 = -43.5%; 2012 = -76.8%; 2013(H1) = 42.0%; EE: 2011 = 25.5%; ES: 2012 = -24.7%; CY: 2011 = -86.0%, 2012 = -90.3%, 2013(H1) = -44.3%. Comparisons of semi-annual data with annual data should be taken with caution
Source: ECB: Consolidated banking data.

Chart 1.A.13: **Profitability of banks, percentage, 2013-H1**

Return on Assets (RoA)



Source: ECB: Consolidated banking data.

Return on Equity (RoE)

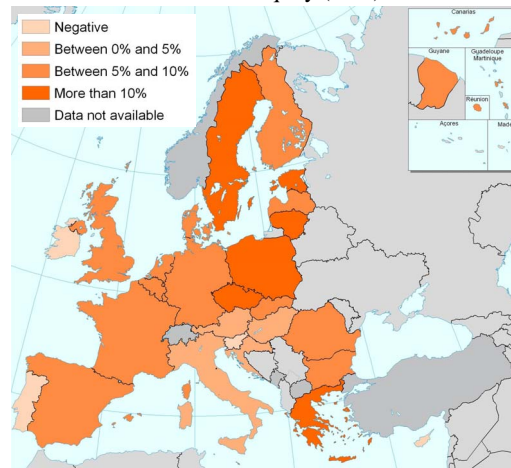
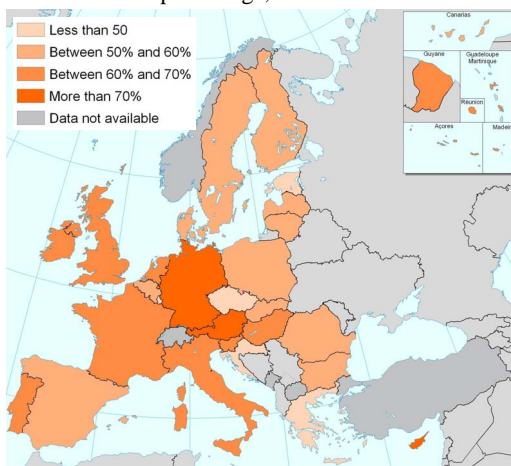
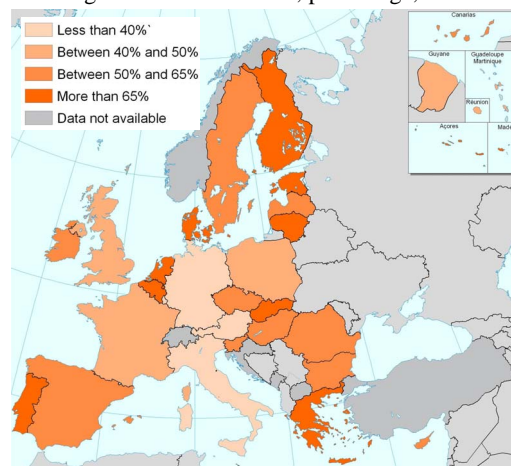


Chart 1.A.14: **Cost-to-income ratio of banks, percentage, 2013-H1**



Source: ECB: Consolidated banking data.

Chart 1.A.15: **Concentration, share of total assets by five largest credit institutions, percentage, 2012**



Source: ECB: Structural financial indicators and own calculations.

Chart 1.A.16: Assets under foreign control, percentage of total assets, consolidated basis

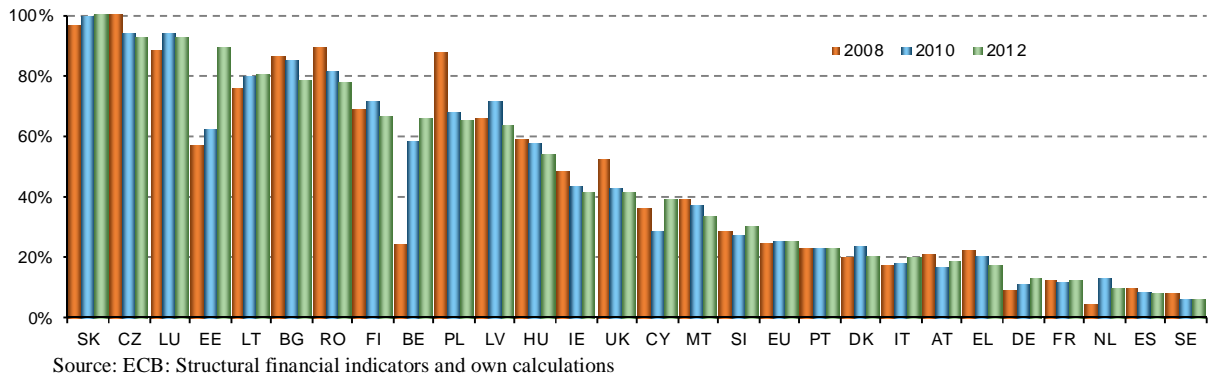
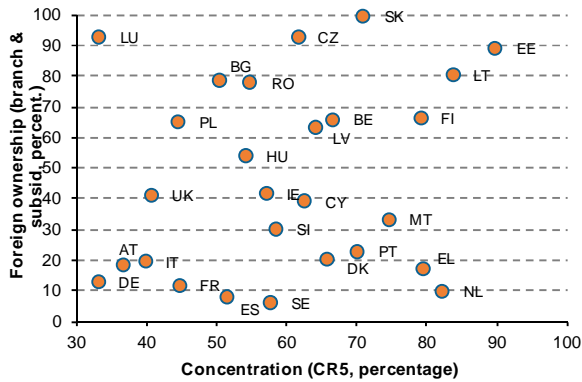
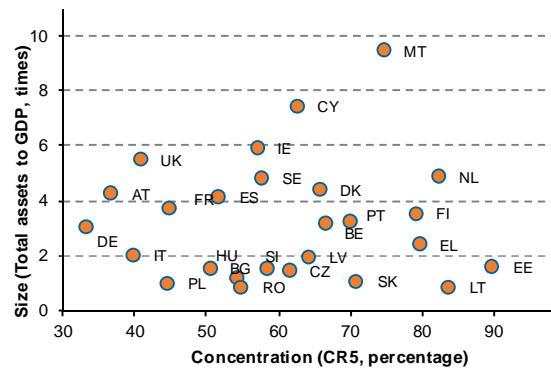


Chart 1.A.17: Assets under foreign control vs. concentration, 2012



Note: LU: size = 21.9 times, concentration = 33.1 per cent
 Source: ECB: Structural financial indicators and own calculations

Chart 1.A.18: Size vs. concentration, 2012



Source: ECB: Structural financial indicators and own calculations

CHAPTER 2: POLICY DEVELOPMENTS

2.1 INTRODUCTION

The interplay between the persisting fragilities of the financial sector and the pressures on governments' public finances and sovereign debt markets had become a mounting source of concern in 2011 and 2012. In order to resolve the crisis effectively and to restore the EU economy to sustainable long-term growth, the EU and Member States aimed for a coordinated approach to address both dimensions in parallel, i.e. the structural fragilities of the financial sector and the volatility of sovereign debt markets on one side, as well as underlying macroeconomic imbalances on the other side.

Concerning the former dimension, after 2012 was marked by the uncompromising commitment of the Union to the irreversibility of EMU, 2013 has further proven the capacity of the Union to act. The financial assistance programme for Cyprus has made clear that financial solidarity in the Union is effective. At the same time, moral hazard attached to such assistance needed to be addressed. Section 2.2 provides further detail on continued financial support measures in 2013 and early 2014.

Concerning the latter dimension, on 5 March 2014, the Commission published the results of its in-depth-reviews (IDRs).⁷⁸ The Commission identified excessive macro-imbalances in three Member States (Croatia, Italy and Slovenia). A need for decisive policy action was identified for another group of Member States (Ireland, Spain and France). In the case of Ireland and Spain monitoring will rely on post-programme surveillance. In the case of Greece, Cyprus, Portugal and Romania the enhanced monitoring of their imbalances and policies will continue in the context of their macroeconomic adjustment programmes. Finally, the so-called two-pack regulations had entered into force on 30 May 2013 completing the reform of economic and fiscal governance.⁷⁹

With respect to the integration and stability of the EU's financial system and its capacity to channel funds from savers to their most productive uses, the Commission in its Alert Mechanism Report 2014⁸⁰ identified the following priorities:

- (1) A (continued) restructuring and repair of banks, the swift adoption and implementation of Banking Union, an increased capacity of banks to manage risks in line with new capital requirements, with the upcoming asset quality reviews and stress tests in 2014 being important milestones on the way.
- (2) A need to continue to strengthen alternatives to bank financing (venture capital, SME

⁷⁸ COM(2014) 150 final, 5.3.2014, available at http://ec.europa.eu/economy_finance/economic_governance/documents/2014-03-05_in-depth_reviews_communication_en.pdf

⁷⁹ Regulation (EU) No 473/2013 of the European Parliament and of the Council of 21 May 2013 on common provisions for monitoring and assessing draft budgetary plans and ensuring the correction of excessive deficit of the Member States in the euro area; Regulation (EU) No 472/2013 of the European Parliament and of the Council of 21 May 2013 on the strengthening of economic and budgetary surveillance of Member States in the euro area experiencing or threatened with serious difficulties with respect to their financial stability.

⁸⁰ COM(2013) 790 final, 13.11.2013, available at http://ec.europa.eu/europe2020/pdf/2014/amr2014_en.pdf

bonds and alternative stock markets).

- (3) Close monitoring of private debt levels and associated financial risks, such as real estate bubbles, and the impact of corporate and personal insolvency regimes, where necessary. This also includes schemes creating a tax bias towards debt financing.

On the third priority, the Commission has adopted a Recommendation on a new approach to business failure, calling for more effective institutional settings for debt restructuring of viable going concerns ahead of formal insolvency proceeding as well as for a limitation of the discharge period for smaller non-financial undertakings.⁸¹

The evolution in 2013 and early 2014 of the wider financial sector reform legislative agenda, also addressing the first two priorities, is presented in section 2.3.

2.2 FINANCIAL ASSISTANCE PROGRAMMES AND FINANCIAL SUPPORT MEASURES

2.2.1 Financial assistance programmes

This subsection updates on developments with available financial assistance instruments, the evolution of programmes and the Vienna Initiative.

Available financial assistance instruments

Under the permanent European Stability Mechanism (ESM) (with a total authorized capital of €700bn⁸² the largest international financial institution in the world) members can access the following instruments:⁸³ ESM loans, a precautionary conditioned credit line (PCCL), an enhanced conditions credit line (ECCL), a primary market support facility, a secondary market support facility, and financial assistance for the recapitalisation of financial institutions. A direct recapitalisation of financial institutions will become available when the Single Supervisory Mechanism (SSM) is operational.⁸⁴ Furthermore, as of 1 March 2013, any granting of financial assistance under the European Stability Mechanism is conditional on ratification of the Treaty on Stability, Coordination and Governance (TSCG) in the Economic and Monetary Union⁸⁵ and transposition of the balanced budget rule into national legislation in due time.

Evolution of financial assistance programmes

As reflected in decisions taken in Greece in 2012 and in Cyprus in 2013, financial assistance has witnessed a shift in philosophy with private sector involvement, i.e. the bailing in of private creditors, becoming part of the restructuring of the sovereign's balance sheet. As with the bail-in rules for the resolution of financial institutions this was considered a necessary

⁸¹ C(2014) 1500 final, 12.3.2014, available at http://ec.europa.eu/justice/civil/files/c_2014_1500_en.pdf

⁸² See ESM website at <http://www.esm.europa.eu/>

⁸³ After 1 July 2013 no additional uses of instruments were foreseen under the European Financial Stability Facility (EFSF).

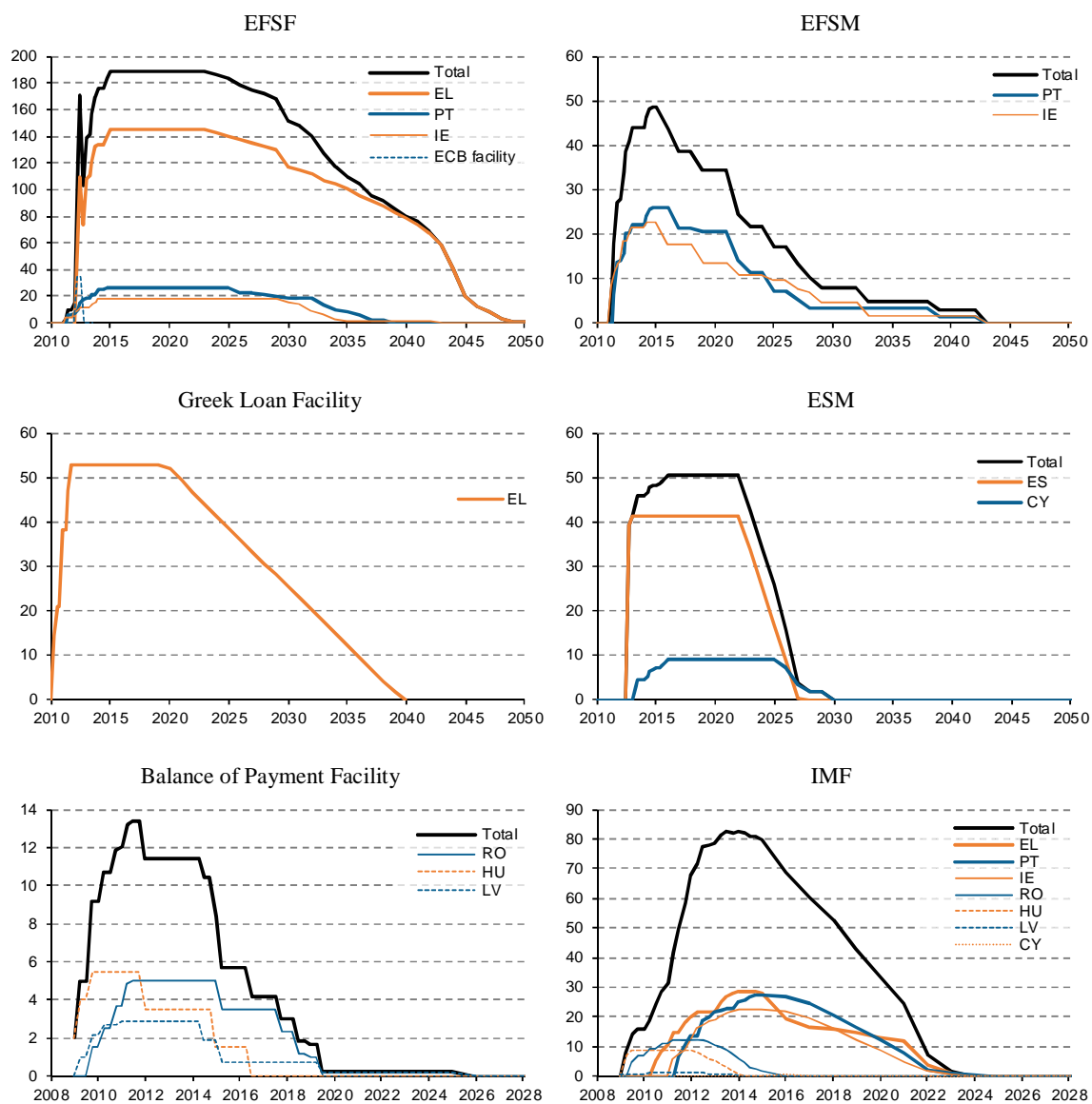
⁸⁴ 4 November 2014; see Article 34 of the SSM Regulation, COUNCIL REGULATION (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions, Official Journal of the European Union L 287/63 , 29.10.2013

⁸⁵ <http://www.eurozone.europa.eu/newsroom/news/2012/12/fiscal-compact-enters-into-force-on-1-january-2013/>

element to address moral hazard.

The programmes differed with respect to the provided loan amounts, the source of funds, the institutional set up for monitoring and the specific national problems covered in the programme conditionality. In each country, the programme addressed particular financial sector problems, in addition to fiscal and structural issues. Ireland's, Spain's and Cyprus's problems were mainly rooted in the banking sector. Accordingly, Spain and Ireland reorganised the sector, recapitalised viable banks and wound down nonviable banks, and is doing rigorous stress testing to properly value asset portfolios. Restructuring and resolution of banks has also been done in Cyprus, as well as quick and upfront deleveraging.

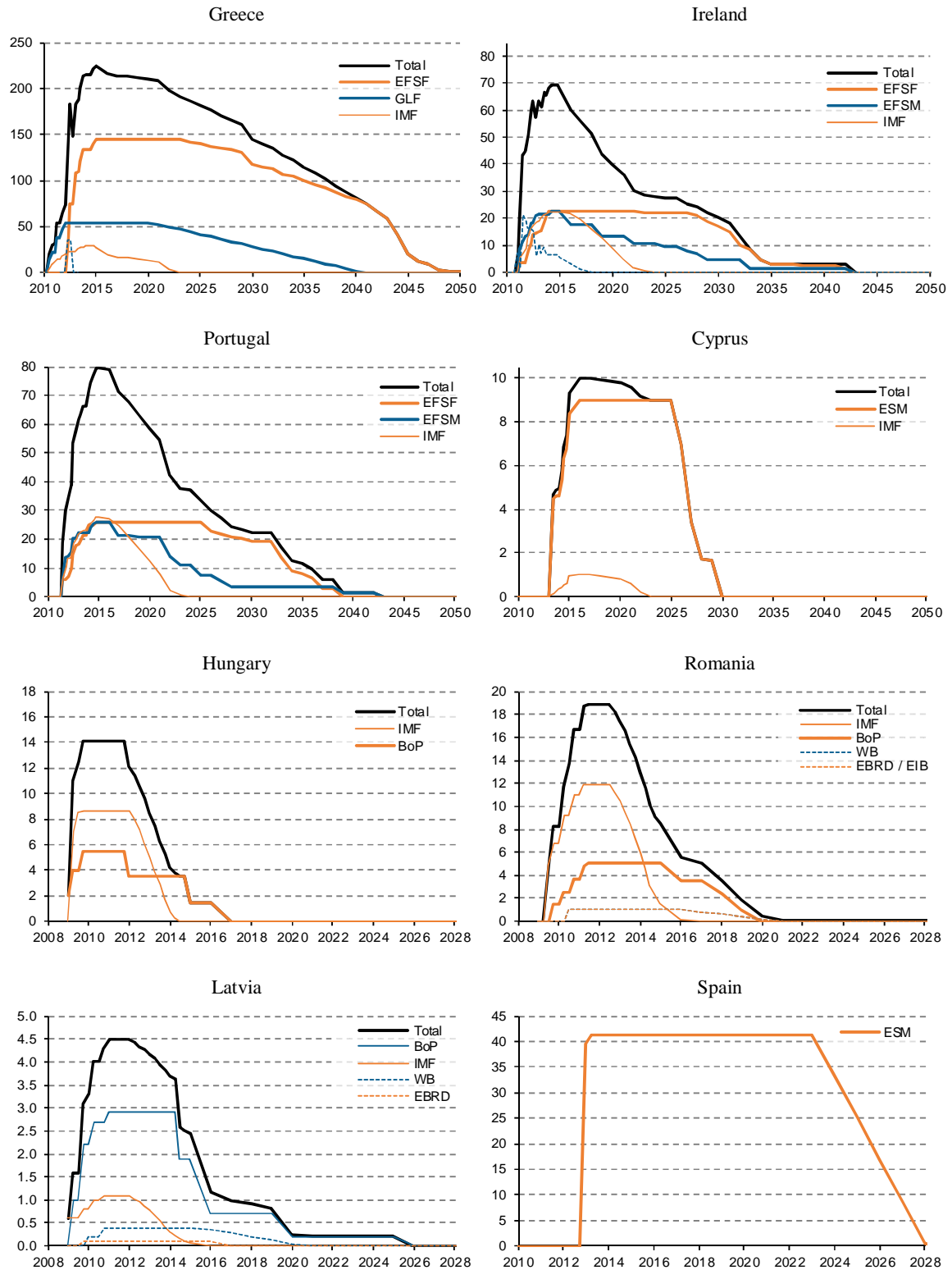
Chart 2.2.1: Net outstanding support by instrument (disbursements minus repayments), € billion



Notes: The amounts disbursed and their maturities are decided on a case by case basis following the quarterly review. As a consequence, future disbursements and their maturities are estimates based on available info in April 2014.

Source: IMF, European Commission, EFSF, ESM and own calculations.

Chart 2.2.2: Net outstanding support by beneficiary country (disbursements minus repayments), € billion



Notes: The amounts disbursed and their maturities are decided on a case by case basis following the quarterly review. As a consequence, future disbursements and their maturities are estimates based on available info in April 2014. EFSF for IE includes the bilateral contributions by UK, SE and DK.

Source: IMF, European Commission, EFSF, ESM and own calculations.

In 2013, four Member States⁸⁶ continued to benefit from financial assistance linked to a macroeconomic adjustment programme: Greece, Ireland, Portugal and Cyprus. Ireland has completed the programme in December.⁸⁷ This means Ireland has fully returned to market-based funding. Spain had received financial assistance for the recapitalisation of financial institutions between July 2012 and January 2014 (18 months).⁸⁸

Ireland and Spain remain under post-programme surveillance until at least 75% of the assistance received has been paid back.⁸⁹ The latest reviews of ongoing financial assistance programmes are published shortly after the completion of each review.⁹⁰ Portugal is expected to conclude its adjustment programme by mid-2014.

Among Member States that have not adopted the euro, only Romania continued to benefit from a financial safety net under the balance of payments (BoP) instrument until 2015.⁹¹ Hungary, having benefitted from BoP assistance between 2008 and 2010, and Latvia, having received assistance between 2009 and 2012, continued to be subject to post-programme surveillance in 2013.⁹²

Charts 2.2.1 and 2.2.2 show how the current level of financial assistance plays out across beneficiary Member States. Chart 2.2.1 shows net outstanding amounts of financial support *per instrument*, and Chart 2.2.2 displays support *per country*.

The Vienna Initiative 2.0

The European Bank Coordination Vienna Initiative,⁹³ which was created in January 2009 and renewed in March 2012, continued to bring together private and public sector stakeholders of EU cross-border banks present in the CEE region in 2013 and early 2014. Entering its sixth year, the initiative remained an important instrument for policy coordination to stabilize and manage the credit exposure to the region.

Analysing the implications of the crisis for cross-border provision of credit through branches and subsidiaries in the CEE region and mitigating its potential negative effects is the main goal of the Vienna Initiative. Market integration in the retail segment takes usually the form

⁸⁶ Since 2008 a total of eight EU Member States have benefitted from financial assistance programmes (Hungary (BoP, 2008-2010), Latvia (BoP, 2009-2012), Romania (BoP, since 2009 with a precautionary use since 2011), Greece (GLF, EFSF, since 2010), Ireland (EFSM, EFSF, 2011-2013), Portugal (EFSM, EFSF, since 2011), Spain (July 2012 - January 2014), Cyprus (ESM, since 2013); see also

http://ec.europa.eu/economy_finance/assistance_eu_ms/index_en.htm

⁸⁷ See the press release at http://europa.eu/rapid/press-release_MEX-13-1213_en.htm

⁸⁸ See statement of Commission VP Rehn at http://europa.eu/rapid/press-release_MEMO-14-51_en.htm

⁸⁹ See Article 14 of REGULATION (EU) No 472/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2013 on the strengthening of economic and budgetary surveillance of Member States in the euro area experiencing or threatened with serious difficulties with respect to their financial stability.

⁹⁰ http://ec.europa.eu/economy_finance/assistance_eu_ms/index_en.htm

⁹¹ The latest review can be found at

http://ec.europa.eu/economy_finance/publications/occasional_paper/2013/pdf/ocp165_en.pdf

⁹² The respective post-programme surveillance reports can be found at

http://ec.europa.eu/economy_finance/eu_borrower/balance_of_payments/pdf/lv_etc_note_4th_pps_mission_en.pdf (Latvia) and http://europa.eu/rapid/press-release_MEMO-13-1136_en.htm (Hungary)

⁹³ <http://vienna-initiative.com/>

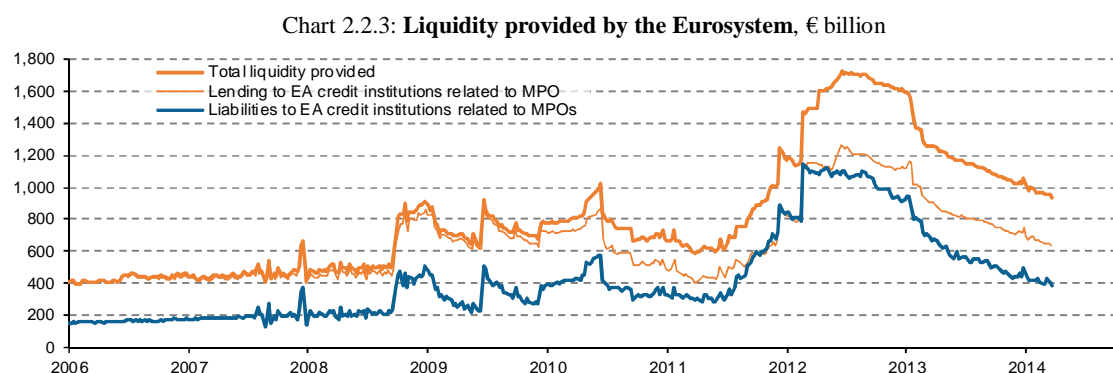
of cross-border ownership of banking assets. However, the loans provided by subsidiaries and branches of foreign groups to local households and non-financial corporations are computed as domestic in monetary statistics. Therefore, the series of domestic/cross-border loans fail to capture all the cross-border implications of these loans.

2.2.2 ECB financial support

This Section reviews the role the ECB continued to play over the recent period with a particular focus on how it has ensured the continuity of interbank markets.

ECB measures

With traditional bank assets having long maturities (e.g. mortgage loans), the well-functioning of the financial sector depends on the ability of banks to obtain liquidity through money markets. With the outbreak of the crisis, money markets dried up and the central bank had to step in as a lender of last resort to avoid liquidity constraints from evolving into solvency problems and, ultimately, into the collapse of the financial system. Since the outbreak of the crisis, the ECB reduced the policy rate from 4.25 percent to 0.25 percent (see Chart 1.A.2 in Chapter 1) and implemented a series of non-conventional measures, including providing as much liquidity as the banks asked for (against eligible collateral), extending the maturities of LTROs from 3 months to up to 3 years (see Chart 2.A.1 in the Annex) and purchasing bank and sovereign bonds (Chart 2.A.5 in the Annex). At its peak, total liquidity injected in the economy by the central bank reached €1,700 bn⁹⁴ (almost 20 percent of Euro area GDP) (Chart 2.2.3).



Notes: Total liquidity provided includes total lending to credit institutions related to MPOs, other claims on MFIs (this include, inter alia, ELA provided by national central banks) and securities held for monetary policy purposes (see right-hand panel); Source: ECB: Monthly bulletin and own calculations.

Source: ECB: Monthly bulletin and own calculations.

2013 was marked by early repayments of the 3-year LTROs. Banks were allowed to repay the LTROs at any time after one year had elapsed, which corresponded to January and February 2013. At that moment, banks repaid over €200 bn after which repayments continued at an average pace of €5 bn per week. While by March 2014 significant amounts had already been repaid, winding down central bank support might remain a challenge for

⁹⁴ On top of open market operations, the central bank also provided liquidity to the Euro area economy through Emergency Liquidity Assistance (ELA) (see Charts 2.A.2 and 2.A.4 in the Annex) and the purchase of securities for monetary purposes (see Chart 2.A.5 in the Annex). Chapter 1, Section 1.4.4 discusses what the banks have used the liquidity for and the consequences in terms of assets encumbrance.

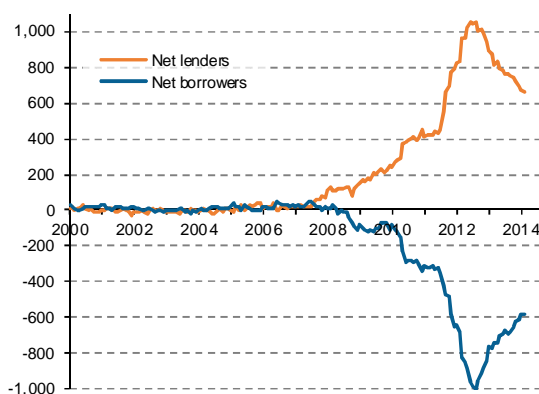
some banks.⁹⁵

The ECB implemented two additional measures in mid-2012. First, it reduced the remuneration of the deposit facility from 0.25 percent to zero and, second, it announced the Outright Monetary Transactions (OMTs) which substituted the Securities Markets Programme (SMP). Market tensions phased out and the OMT has not yet been activated⁹⁶. However, since February 2014, the OMT is on hold waiting for a decision by the ECJ on its compliance with the Treaty⁹⁷.

The intermediation role of the ECB

This massive liquidity provided by the ECB temporarily substituted for dysfunctional interbank markets. The ECB acknowledged its intermediation role already in 2009, but insisted that it would be a temporary one⁹⁸. Indeed, the ECB became a sort of clearing house among banks as the ones that deposited excess liquidity at the central bank were different from those that were borrowing from the Eurosystem⁹⁹. The evolution of TARGET2 balances (Chart 2.2.4) indicates that the intermediation role of the ECB has declined further in 2013 since the peak in 2012¹⁰⁰.

Chart 2.2.4: Net balance with the Eurosystem (TARGET2), lenders vs. borrowers, € billion



Note: Net lenders: Germany, Netherlands, Luxembourg, Finland. Net borrowers: Portugal, Ireland, Greece, Italy and Spain
Source: Institute of Empirical Economic Research – Osnabrück University (www.eurocrisismonitor.com) and own calculations.

Two factors helping the reactivation of interbank markets and the reduction in the intermediation role of the ECB were the decrease on the remuneration of the deposit facility to zero in June 2012¹⁰¹ and the repayments of the LTROs. By early 2014, the situation had significantly improved, but it had not normalised yet.

⁹⁵ See Joint Committee of ESAs (2014), p. 10.

⁹⁶ Besides ECB measures, other significant events occurred in the second half of 2012, particularly the ESM entered into force and European financial assistance for the Spanish financial institutions. At the same time, redemptions of bank guaranteed bonds declined substantially. See Section 1.3.3.

⁹⁷ The OMT was challenged on the German Constitutional Court who referred the case to the ECJ. See for instance, Wagstyl and Jones (2014).

⁹⁸ See ECB (2009).

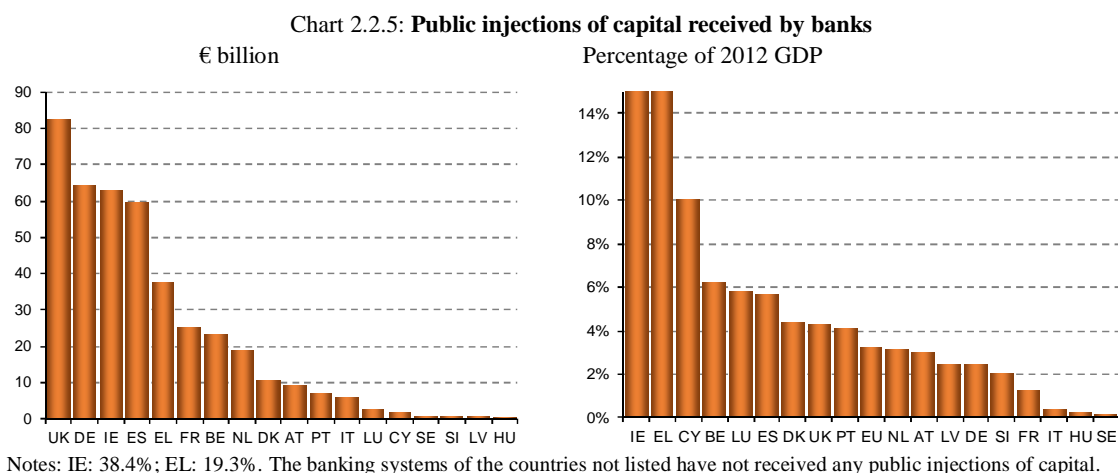
⁹⁹ See ECB (2012b), pp. 31-32.

¹⁰⁰ Several authors have indicated that the TARGET2 can be used to track the intermediation role of the ECB. See, for instance Cecchetti et al. (2012), p.2.

¹⁰¹ This interpretation is consistent with Feldstein (2013).

2.2.3 Public support to the financial sector

Section 1.4.1 discusses how banks increased their capital positions throughout the crisis. But this was not only obtained from private funding; governments, both in peripheral and core countries, had to bail out banks across the EU to avoid a systemic crisis and the collapse of the financial system.



Throughout the period 2008-2012, public capital injections in EU banks amounted to €413.2 bn¹⁰². Banks from the UK, Germany, Ireland and Spain received the largest injections with €60 or more each (Chart 2.2.5). In relative terms, total injections represent 3.2 per cent of the EU GDP in 2012, but they represent more than 10 per cent of the country's GDP in Ireland, Greece and Cyprus. Problems in the banking systems eroded public finance in those countries and ultimately led governments to ask for support to their partners¹⁰³. One of the goals of the Banking Union is to break the links between sovereign and banks. Once the SSM is fully operational¹⁰⁴, the European Stability Mechanism (ESM) will be able to directly capitalise problematic banks without impacting national debt and reducing the likelihood of a similar phenomenon in the future. Public capital injections were also significant (over 4 per cent of GDP) in Belgium, Luxembourg, Spain, Denmark, the UK and Portugal.

Some of the banks which received support in the early stages of the crisis have started to pay back the capital injected (notably in the Netherlands, Denmark, Germany or Italy); however, in other Member States, new injections were needed still in 2012 or 2013 (Spain, Greece, Portugal, Belgium or France, among others).

From a national accounting perspective, public capital injections are recorded as an asset when they can be considered as an investment with a value that is expected to be recovered and as public deficit when the capital injection is considered a loss. According to Eurostat

¹⁰² Some of the public injections were implemented in the form of shares, so that there are some overlaps between the €300 bn of capital issued in the markets and the €413.2 bn of capital provided by public authorities. Available data do not allow a consolidated figure to be calculated. Latest available figures from the State aid score board correspond to 2012.

¹⁰³ See Section 2.2.1.

¹⁰⁴ See Section 2.3.

data (Table 2.2.1), as of 2013, up to €153 bn were considered deficit increasing capital injections and additional €182 bn were considered an investment¹⁰⁵. Deficit-increasing capital injections concentrate in Spain (€49 bn), Ireland (€43 bn) and the UK (€16 bn). Capital injections accounted as investments were recorded mainly in the UK (€48 bn average for the period 2008-2013), the Netherlands (€31 bn), Germany (€27 bn) and Belgium (€18 bn). While some countries have recovered part of their investments, government participation remains significant in a number of Member States.

Table 2.2.1: **Effect of public interventions on public accounts, € million**
Capital injections recorded as deficit-increasing (capital transfer)

Country	2007	2008	2009	2010	2011	2012	2013	Total
Germany	0	1,100	3,817	1,400	500	0	0	6,817
France	0	0	0	0	x	2,585	0	2,585
Spain	0	0	0	0	5,137	39,068	4,661	48,866
Italy	0	x	x	x	x	x	x	0
Greece	0	0	0	0	395	265	14,383	15,043
Ireland	0	M	4,000	31,575	7,121	280	280	43,256
Netherlands	0	0	2,160	928	0	0	0	3,088
Belgium	0	0	0	0	121	2,915	0	3,036
Total EA8	0	1,100	9,977	33,903	13,274	45,113	19,324	122,691
Other EA countries	0	0	120	1,706	1,543	3,732	6,485	13,586
Total EA17	0	1,100	10,097	35,609	14,817	48,845	25,809	136,277
UK	0	3,099	12,727	0	0	0	0	15,826
Other non-EA countries	0	0	203	206	377	100	36	922
Total EU28	0	4,199	23,027	35,815	15,194	48,945	25,845	153,025

Assets: shares and other equity in financial institutions

Country	2007	2008	2009	2010	2011	2012	2013	Average
Germany	0	11,200	37,883	40,033	26,866	25,243	23,617	27,474
France	0	323	3,451	1,463	0	0	0	873
Spain	0	0	0	8,697	9,294	8,552	5,933	5,413
Italy	0	0	4,050	4,050	2,600	2,600	4,071	2,895
Greece	0	0	214	142	485	6,693	29,503	6,173
Ireland	0	M	-2,357	-243	-1,747	63	-187	-894
Netherlands	0	37,090	31,815	31,845	28,345	27,579	29,029	30,951
Belgium	0	16,400	20,064	18,656	19,539	17,552	15,079	17,882
Total EA8	0	65,013	95,120	104,643	85,382	88,282	107,045	90,914
Other EA countries	0	4,236	10,268	11,984	11,960	13,014	10,721	10,364
Total EA17	0	69,249	105,388	116,627	97,342	101,295	117,765	101,278
UK	0	13,069	51,357	67,028	35,421	57,329	63,798	48,000
Other non-EA countries	150	211	2,127	2,424	1,824	2,244	240	1,512
Total EU28	150	82,529	158,872	186,079	134,587	160,868	181,803	150,790

Source: Eurostat: supplementary tables for the financial crisis and own calculations.

Besides capital injections, governments also supported the financial system by guaranteeing their bond issuance. Government guarantees provided by EU Member States to bank liabilities peaked at €835 bn (7.1 percent of EU GDP) in 2009 and it has since then declined by half (€492 bn by December 2012) due to bonds reaching maturity and not being rolled over with a new guarantee. However, countries like Belgium, Spain, Italy and Portugal still issued new guarantees in 2012¹⁰⁶.

2.3 REFORM OF THE FINANCIAL SECTOR

The structural sources of vulnerability of the financial sector leading to the outbreak of the financial crisis in 2008 are well known. The general environment of ample liquidity and the related low interest conditions which prevailed globally encouraged excessive risk-taking.

¹⁰⁵ The investment figure increases due to new capital injections and decreased upon reimbursements by banks or upon divestments by public authorities.

¹⁰⁶ See European Commission (2014).

This excessive risk-taking was possible because, in turn: to put risk-taking off balance-sheets therefore also increasing leverage was possible; there was an inadequate management of maturity transformation and thus of the understanding of liquidity risks; there was financial innovation; and, remuneration and incentive schemes within financial institutions rewarded short-term expansion of the volume of trades rather than the long-term profitability of investments.

Risk became mispriced, and who ultimately held the risk unknown, creating uncertainty on the credit quality of counterparties. And these pressures were not managed from the regulatory and supervisory side.

These sources of vulnerability have been consistently identified¹⁰⁷ and, five years along the way, the EU has either proposed or approved all the building blocks in order to achieve resilient, efficient and integrated financial markets with a high level of consumer and investor protection, in line with the commitments taken by the G20, and with a view to improve the Single Market in financial services.

Between the publication of last year's EFSIR and today, the legislative agenda has advanced significantly¹⁰⁸ as follows:

2.3.1 Creating a banking union to strengthen the euro

The Banking Union is a vital part of a deep and genuine Economic and Monetary Union (EMU). It is instrumental for the EU and, in particular, the euro area, where the banking sector plays a central role in financing the real economy. In September 2012 The Commission adopted a communication laying down the roadmap to a fully-fledged Banking Union¹⁰⁹ which accompanied the proposal for a **Single Supervisory Mechanism (SSM)**¹¹⁰:

The objectives of the Banking Union are: to increase financial stability while minimizing costs to taxpayers, complete the EMU, restore confidence in the financial sector and reduce market fragmentation, and ultimately contributing to economic recovery. The Banking Union will achieve these objectives by (i) generating a higher quality of financial integration and thereby reverse the fragmentation of the internal market; (ii) ensuring the impartial application of high and common standards of prudential supervision and for the resolution of banks, and (iii) help ensuring the smooth transmission of monetary policy and breaking the link between sovereign and bank debt, sparing bail outs with public money; reinforcing financial stability and restoring confidence in the sector, fostering recovery.

¹⁰⁷ COM(2009) 114 and COM(2010) 301.

¹⁰⁸ A regularly updated leaflet on the state of play of the Commission's financial regulatory agenda can be found at: http://ec.europa.eu/internal_market/publications/docs/financial-reform-for-growth_en.pdf

¹⁰⁹ COM(2012) 510.

¹¹⁰ Regulations (EU) No 1024/2013 and No 1022/2013.

The SSM Regulation¹¹¹, which entered into force in November 2013, applies to all euro-area Member States and is open to the participation of other Member States who wish to embark on a path of deeper integration for supervision.

While the ECB will be responsible for the supervision of the whole banking system, i.e. around 6000 banks in the euro area, a division of tasks between the ECB and the national supervisory authorities will ensure practicable and efficient day-to-day supervision. The ECB will directly supervise around 128 significant banks and national supervisory authorities will remain in charge, under the guidance of the ECB to ensure the coherent and consistent application of the Single rulebook in participating Member States, of the supervision of non-significant banks.

To date, the other main building blocks of the Banking Union are in place: the **proposal for a framework for the recovery and resolution of credit institutions and investment firms**¹¹² (**BRRD**) was agreed by the co-legislators in December 2013 and the final vote took place in Parliament in April 2014, and the single rulebook in the form of Capital Requirements, the so called "**CRD IV package**"¹¹³, as explained earlier, applies as of 1 January 2014.

The **Single Resolution Mechanism** (SRM) complements the SSM. It was proposed by the Commission in July 2013¹¹⁴ and a political agreement between co-legislators was reached in March¹¹⁵ with the final vote in Parliament held in April 2014. The SRM will ensure that resolution decisions in the participating Member States are taken in a coherent and centralised manner. A **Single Resolution Board** will be set up, as an EU agency. Upon information from the ECB, in its capacity as a Single Supervisor, or on its own initiative after having previously consulted the ECB, the Board will propose a resolution scheme to restructure or liquidate in an orderly fashion failing or likely to fail banks.

The SRM will ensure that – notwithstanding stronger supervision - if a bank subject to the Single Supervisory Mechanism faces serious difficulties, its resolution, in particular in cross-border cases, can be managed efficiently with minimal costs to taxpayers and the real economy. The agreement reflects the division of tasks under the SSM. The Board will be directly responsible for the resolution planning and the resolution of banks directly supervised by the ECB and cross-border groups, while the national resolution authorities will be responsible for all other entities except where the resolution scheme foresees the use of the Single Resolution Fund.

Under the SRM, a failing bank would first be required to raise resources privately, including in capital markets. As a second step, it would be required to participate in resolution by converting or writing down its debt or equity. Only in case burden sharing by shareholders

¹¹¹ Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions, OJ L 287/63

¹¹² COM(2012) 280.

¹¹³ Directive 2013/36/EU and Regulation (EU) No 575/2013.

¹¹⁴ http://ec.europa.eu/internal_market/finances/banking-union/index_en.htm

¹¹⁵ <http://www.europarl.europa.eu/news/en/news-room/content/20140319IPR39310/html/Parliament-negotiators-rescue-seriously-damaged-bank-resolution-system>

and creditors were insufficient, would a bank be able to take recourse to funding from the **Single Resolution Fund**. This Single Resolution Fund will be funded through bank contributions, including through those collected ex-post when the resources in the Fund are insufficient. In such a manner, it will be ensured that EU taxpayers do no longer pay the bill for the resolution of banks.

The core functioning of the SRM will be governed by the SRM Regulation. An accompanying intergovernmental agreement will govern certain elements of the Single Resolution Fund, such as the transfer of bank contributions to the fund and progressive mutualisation of national compartments into the single Fund. Member States outside the euro zone which join the SSM will also join the SRM.

2.3.2 Building new rules for the global financial system

The G-20 has been instrumental in establishing the core elements of a new global financial regulatory framework, and the European Union has delivered on its G-20 commitments by having proposed or adopted the legislation linked to those commitments:

Legislation entered into force

The EU Regulation on **Credit Rating Agencies (CRAs)** is in force since 20 June 2013¹¹⁶. The Regulation ensures that the deficiencies that became evident during the crisis regarding CRAs and which related to failures in their integrity (mainly in relation to conflicts of interest), unsatisfactory quality of methodologies and ratings and the lack of transparency of the CRAs are tackled. The lack of effective supervision and enforcement which accentuated these deficiencies is also addressed.

The CRD IV package, which implements – via a Regulation and a Directive – the new global standards on bank capital (commonly known as the Basel III agreement) into the existing Union law applies since 1 January 2014, and tackles some of the vulnerabilities shown by the European banking institutions during the crisis:

- a) Management of liquidity risk: existing bank liquidity risk management approaches, including liquidity stress tests, and supervisory regimes were shown to be inadequate in fully grasping risks inherent to the underlying market practices, such as originate-to-distribute securitization, use of complex derivative instruments and reliance on wholesale funding with short-term maturity instruments;
- b) Eligibility of capital instruments and application of regulatory adjustments: The EU banking system entered the crisis with capital of insufficient amount and quality. Mounting losses forced banks to rebuild their capital bases at the time when it was most difficult to do so, in turn, necessitating governments to provide support to the banking sector in many countries and on a massive scale and contributing to the onset of economic downturn. The crisis has shown that certain capital instruments did not meet the expectations of markets and regulators with regard to their loss absorption, permanence and flexibility of payments

¹¹⁶ Regulation (EU) No 462/2013

capacity on a going-concern basis. This in particular pertains to hybrid capital instruments and certain types of non-hybrid instruments that make part of banks' Tier 1 capital;

c) Counterparty credit risk: The crisis revealed a number of shortcomings in the current regulatory treatment of counterparty credit risk (CCR) exposures arising from derivatives, repos and securities financing activities;

d) Pro-cyclicality of lending: pro-cyclical effects can be defined as those which tend to follow the direction of and amplify an economic cycle. In this regard, bank lending also can contribute to amplification of business fluctuations, which in turn may exacerbate financial instability;

e) Options, discretions and minimum harmonisation: a diverging application of the CRD would undermine the reform of the EU supervisory architecture and, therefore, may impair effectiveness and efficiency of supervision. Different application of legislation in different MS is in addition particularly burdensome for firms operating cross-border.

The Single Rulebook in banking regulation also comprises the binding technical standards (BTS) which are developed by the European Banking Authority, adopted by the European Commission and applied directly in all Member States.

Political agreement found but no formal adoption

In January 2014 political agreement between co-legislators was reached on the revision of the **Markets in Financial Instruments Directive (MiFID II)**¹¹⁷, and the final vote took place in Parliament in April 2014. The problems it aims to solve are: a) lack of a level playing field between markets and market participants as new players and new trading techniques developed; b) difficulties for SMEs to access financial markets; c) lack of sufficient transparency of the financial markets for market participants; d) lack of sufficient information and powers for national regulators regarding financial markets and intermediaries and inconsistent supervisory practice; e) existence of areas in which investor protection revealed deficiencies; and f) weaknesses in some areas of the organisation, processes, risk control and assessment of some market participants.

The MiFID II reform means that organised trading of financial instruments must shift to multilateral and well-regulated trading platforms. Strict transparency rules will ensure that dark trading of shares and other equity instruments which undermine efficient and fair price formation will no longer be allowed. MiFID II represents an important step in the right direction towards greater transparency in this area.

In addition, and in fulfilment of Europe's G-20 commitments, the introduction of a trading obligation for derivatives will complement the compulsory clearing requirements under the European Markets Infrastructure Regulation¹¹⁸.

¹¹⁷ COM(2011) 656, COM(2011) 652

¹¹⁸ Regulation (EU) No 648/2012

By introducing a harmonised EU system setting limits on the positions held in commodity derivatives, MiFID II will additionally contribute to orderly pricing and the prevention of market abuse, thus curbing speculation on commodities.

The establishment of a harmonised EU framework for non-discriminatory access to trading venues and central counterparties, as well as to benchmarks for trading and clearing purposes will lead to improved competition. Investment firms will have to meet stricter standards to ensure that investors can trust that they are being offered products which are suitable to them and that their assets are well protected.

The new rules ensure safe and orderly markets and financial stability through the introduction of trading controls, an appropriate liquidity provision obligation for high-frequency traders pursuing market-making strategies and by regulating the provision of direct electronic market access. MiFID will, finally, allow keeping pace with technological developments.

MiFID II has an explicit link to several key elements of the **Market Abuse Regulation (MAR)**¹¹⁹ and the **Criminal Sanctions Market Abuse Directive (CSMAD)**¹²⁰, the revision of which was agreed politically between co-legislators in early 2014¹²¹. After publication of the Directive in the Official Journal Member States will have two years to transpose the Directive in national law.

Adopted in early 2003, the first Market Abuse Directive (MAD) introduced a comprehensive framework to tackle insider dealing and market manipulation practices, jointly referred to as "market abuse". The Directive aimed at increasing investor confidence and market integrity by prohibiting those who possess inside information from trading in related financial instruments, and by prohibiting the manipulation of markets through practices such as spreading false information or rumours and conducting trades which secure prices at abnormal levels.

The MAD introduced therefore a framework to harmonise core concepts and rules on market abuse and strengthen cooperation between regulators. However, a number of problems remaining were identified by the Commission services: a) gaps in regulation of new markets, platforms and over the counter trading in financial instruments, b) gaps in regulation of commodities and commodity derivatives, c) impossibility of regulators to effectively enforce the legislation, d) lack of legal certainty, and e) administrative burdens, especially for SMEs.

With the revision there will be common EU definitions of market abuse offences and a common set of criminal sanctions; legal persons will be held liable for market abuses. In addition, the rules are extended to capture abuse on the electronic trading platforms that have proliferated in recent years. Abusive strategies through high frequency trading will be clearly prohibited. Those who manipulate benchmarks such as LIBOR will have committed market

¹¹⁹ COM (2011) 651

¹²⁰ COM(2011) 654

¹²¹ http://europa.eu/rapid/press-release_MEMO-13-773_en.htm?locale=en and http://europa.eu/rapid/press-release_MEMO-14-77_en.htm?locale=en

abuse and face fines or imprisonment. Market abuse occurring across both commodity and related derivative markets will be prohibited, and cooperation between financial and commodity regulators will be reinforced. Regulators generally will have reinforced investigative and sanctioning powers. The disclosure requirements for issuers on SME markets will however be adapted to their needs, and issuers on such markets will be subject to tailored rules for the requirement to draw up lists of insiders.

In December 2013 there was political agreement between co-legislators with the final vote in Parliament held in April 2014 on the revised Directive on **deposit guarantee schemes**¹²². The Directive tackles: a) differences in the level and scope of coverage of DGS, b) inadequate payout procedures (delays and modalities and set-off arrangements), c) insufficient depositor information, d) inappropriate financing of DGS, e) limited mandates of DGS and, f) fragmentation and limited cross-border cooperation between DGS.

The existing systems of national DGS are therefore reinforced: savings will be better and more uniformly protected across the EU; depositors will continue to benefit from a guaranteed coverage of € 100 000 if a bank cannot honour its obligations towards depositors, but access to the guaranteed amount will be easier and faster. Repayment deadlines will be gradually reduced from the current 4 weeks to 7 working days in 2024.

Political agreement between co-legislators was found in December 2013 and the final vote in Parliament took place in April 2014 on the new Directive establishing a framework for the **recovery and resolution of credit institutions and investment firms (BRRD)** – a fundamental step towards the completion of the Banking Union:

The financial crisis revealed that neither banks nor supervisors and other authorities had the sufficient tools to handle the failure of banks. Contingency planning for de-risking banking operations and resolving failing banks were not in place. Supervisors discovered problems within banks at too late a stage. Highly complex operations and business structures, a high level of interconnectedness between banks, and the size of banks impeded resolution or liquidation. There was no legislation at EU level governing the entire process of bank resolution and setting out how and under which conditions authorities should act in the event of a crisis arising in a bank. Moreover, financial supervisors and other (resolution) authorities concentrated only on the operations within their respective territories. .

During the financial crisis the lack of bank-specific resolution tools left authorities with no choice other than to intervene with public funds. This cost significant amount of taxpayers' money and in some cases even put the whole country at the risk of default.

With the BRRD banks in all Member States will be subject to harmonised provisions governing how resolution is carried out and how it is financed. The new rules provide authorities with the means to intervene decisively both before problems occur and early on in the process if they do. If, despite these preventive measures, the financial situation of a bank deteriorates beyond repair, the new law ensures that private stakeholders of banks have to pay their share – starting with bank shareholders and creditors, and backed by financial

¹²² COM(2010)368

support from resolution funds financed by the banking sector itself and not taxpayers. Deposits under EUR 100.000 will be entirely exempt from any loss, and deposits of natural persons and SMEs above EUR100.000 will benefit from a preferential treatment.

The Directive should in principle enter into force on 1 January 2015 and the bail-in system is to take effect on 1 January 2016. The Single Resolution Mechanism¹²³, once in place, will be the authority applying these new rules in the context of the Banking Union.

Finally, subsequent to the consultation launched by the Green Paper on shadow banking published in March 2012¹²⁴, the Commission presented in September 2013 a Communication setting out the issues at stake in relation to the **shadow banking** system and the measures already taken to deal with the risks related to it such as the rules governing hedge fund activity and reinforcing the relationship between banks and unregulated actors (the provisions related to securitisation exposures in the revised Capital Requirements legislation). The Commission will continue to closely follow any future Financial Stability Board's and G-20 recommendations to address the risks stemming from shadow banking.

The Communication was accompanied by a proposal for a **framework for money market funds** (MMFs)¹²⁵ that are domiciled or sold in Europe, and aims at improving their liquidity profile and stability:

MMFs are used by investors to place their cash for short periods of time. They represent a convenient tool for investors because they offer features analogous to bank deposits: instantaneous access to liquidity and stability of value. However, when investors perceive that there is a risk that the MMFs may fail to live up to these promises, they will start to redeem, possibly leading to a so-called "run" which can lead to financial stability risks and raise investor protection concerns.

With the proposal, liquidity shock absorbers are out in place by introducing daily and weekly thresholds of maturing assets (10% daily, 20% weekly).in order to allow the MMFs to repay investors who want to withdraw funds at short notice. Diversification standards will cap exposures to a single issuer. In addition, the proposal proposes a solvency shock buffer to remedy the dependence of constant NAV MMFs, that is investment funds where each share invested can be redeemed at a stable price, on discretionary sponsor support. This buffer will serve to absorb differences between the stable NAV per share and the real NAV per share.

The last measure in the area of shadow banking, and with the objective of preventing banks from attempting to circumvent these rules by shifting parts of their activities to the less-regulated shadow banking sector, the Commission adopted in January 2014 a proposal for a **Regulation on reporting and transparency of securities financing transactions**¹²⁶.

¹²³ Please see the subsection on creating a banking union to strengthen the euro.

¹²⁴ COM (2012) 102

¹²⁵ COM/2013/615

¹²⁶ COM(2014) 40

The proposal provides a set of measures aiming to enhance regulators' and investors' understanding of securities financing transactions (SFTs). These transactions have been a source of contagion, leverage and pro cyclical behaviour during the financial crisis and they have been identified in the Commission's Communication on Shadow Banking as needing better monitoring.

The proposal requires, in particular, that all transactions are reported to a central database, and the proposal introduces detailed reporting requirements to investors on the practices of investment funds engaged in SFTs and other equivalent financing structures on those operations. In order to improve the transparency of the re-hypothecation of financial instruments, the proposal foresees the setting of minimum conditions to be met by the parties involved, including written agreement and prior consent.

2.3.3 Establishing a safe, responsible and growth-enhancing financial sector in Europe

Legislation entered into force

The revised transparency and accounting Directives are in force since November 2013 and July 2013, respectively.

With the revised **Transparency Directive**¹²⁷ listed companies, including small and medium-sized issuers, will no longer be obliged to publish quarterly financial information, which will contribute to less administrative burden and should help discouraging short-termism on financial markets.

The revised Transparency Directive will prevent investors from building up hidden ownership; investors will now need to notify all financial instruments that have the same economic effect as holdings of shares.

The Directive equally ensures that the disclosure requirements for the extractive and forestry industries agreed in the Accounting Directive apply to all companies of those sectors that are listed in the EU.

As for the **Accounting Directive**¹²⁸ it simplifies the preparation of financial statements for small companies. It also introduces the obligation for each Member State to distinguish small companies from larger ones and limits the amount of information to be provided by small companies in the notes to the financial statements, even though they remain entitled to provide more information or statements on a voluntary basis.

Finally, the Directive requires that in cases where there is a single filing system, the information be similar to the tax returns, and provides no EU requirement for small companies to have an audit.

¹²⁷ Directive 2013/50/EU *OJ L 294, 06/11/2013, p. 13–27*

¹²⁸ Directive 2013/34/EU, *OJ L 182, 29/06/2013, p. 19–76*

The new framework on **Venture Capital Funds**¹²⁹ and **Social Entrepreneurship Funds**¹³⁰ applies since July 2013.

The proposal for a Regulation on European Venture Capital Funds makes it easier for venture capitalists to raise funds across Europe for the benefit of start-ups. The approach is the following: once a set of requirements is met, all qualifying fund managers can raise capital under the designation "European Venture Capital Fund" across the EU. By introducing a single rulebook, venture capital funds will have the potential to attract more capital commitments and become bigger.

The proposal for a Regulation on European Social Entrepreneurship Funds lays the foundations for a European market for social investment funds. It introduces a new "European Social Entrepreneurship Funds" label so investors can easily identify funds that focus on investing in European social businesses. The approach is similar to the Venture Capital proposal: once the requirements defined in the proposal are met, managers of social investment funds will be able to market their funds across the whole of Europe. Uniform rules on disclosure will ensure that investors get clear and effective information on these investments.

The **Directive on credit agreements relating to residential property** (also known as **Mortgage Credit Directive – MCD**)¹³¹, entered into force in March 2014. Once transposed into national legislation after 24 months it will increase consumer protection and foster responsible lending.

With the entry into force of the new MCD lenders will have to provide consumers with a standardised information sheet (ESIS), allowing them to shop around to identify the right product for them. Borrowers will also benefit from a guaranteed period of time before being bound by an agreement for a mortgage and will enjoy a general right to repay their loans early.

To ensure that borrowers can meet their credit obligations, the MCD will introduce Europe-wide standards for assessing the credit worthiness of mortgage applicants and will encourage lenders through high-level principles to apply reasonable forbearance when being confronted with consumers in serious payment difficulties.

The Directive will improve business conduct rules: lenders and credit intermediaries will be obliged to respect high-level principles in their direct contacts with clients: staff will have to have the appropriate knowledge and will be obliged to provide adequate explanation at the pre-contractual stage. There will also be standards for advisory services.

Lastly, the Directive establishes principles for the authorisation and registration of credit intermediaries and establishes a passport regime for those intermediaries.

¹²⁹ Regulation (EU) No 345/2013

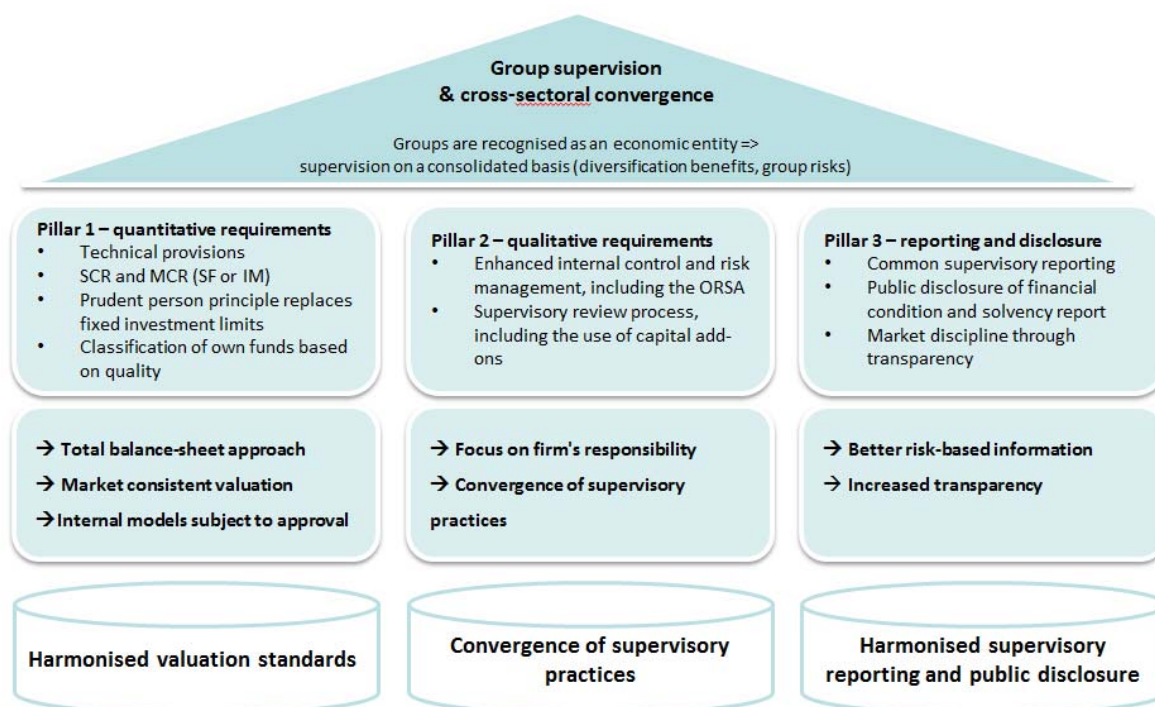
¹³⁰ Regulation (EU) No 346/2013

¹³¹ Directive 2014/17/EU

Political agreement found but no formal adoption

Political agreement between co-legislators was found in November 2013 regarding **Omnibus II** (which will amend Solvency II), and the final Parliament vote took place in March, thus adopting a modern and risk-based solvency regime for the insurance industry in Europe to be in place as of 1 January 2016.

Chart 2.3.1 The new EU regulatory framework for insurance undertakings



Source: Commission services

The previous regime was not risk sensitive; it did not ensure the removal of all restrictions preventing the proper functioning of the single market; it did not properly deal with group supervision; and it has been superseded by industry, international and cross-sectoral developments.

Omnibus II¹³² contains important provisions that should allow the insurance industry to continue offering long term guaranteed products (typically life insurance policies being paid out in a lump sum when the policy holder reaches a certain age or in the form of annuities). This policy is an essential part of retirement planning for citizens in many Member States. Moreover, it will ensure that insurance companies in general and life assurance companies in particular can match these long-term liabilities with investments in long-term assets such as infrastructure projects.

¹³² Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directives 2003/71/EC and 2009/138/EC in respect of the powers of the European Insurance and Occupational Pensions Authority and the European Securities and Markets Authority, COM (2011) 0008

The agreement also contains measures to alleviate the burden for small and medium-sized insurers in the area of reporting.

Finally, it confirms the powers of the European Insurance and Occupational Pensions Authority (EIOPA) which will now be able to ensure coherence of national supervisory practices and contribute to a single rule book on insurance supervision.

In February 2014 political agreement was achieved between co-legislators and the final vote in Parliament took place in April for the **revision of the Directive on undertakings for collective investment in transferable securities (UCITS)**¹³³, the so called "UCITS V", which modifies the 2009 Directive as regards depositary functions, remuneration policies and sanctions.

The revision strengthens the rules on eligible entities that can act as a depositary: only national central banks, credit institutions and regulated firms with sufficient capital and adequate infrastructure will be eligible as UCITS depositaries and will hold for safe-keeping all UCITS assets. It ensures that UCITS assets will be protected in the event of insolvency of the depositary through clear segregation rules and safeguards provided by the insolvency law of the Member States. It strengthens the liability of depositaries who will be liable for any loss of UCITS assets held in custody. Additionally, UCITS investors will always have the right of redress directly against the depositary and will not have to rely on the management company's ability to accomplish this task. Remuneration policies for all risk takers involved in managing UCITS funds, in line with those in the Alternative Investment Fund Managers Directive, have been introduced so that remuneration practices do not encourage excessive risk-taking but promote sound and effective risk management. The transparency of the remuneration practices has also been enhanced. Finally, the regime to ensure effective and harmonised administrative sanctions has been harmonised and strengthened. The use of criminal sanctions is framed so as to ensure the cooperation between authorities and the transparency of sanctions.

Political agreement on the Regulation on central securities depositories (CSD)¹³⁴ with the final vote in Parliament held in April 2014 completes the regulatory framework for securities market infrastructures by increasing safety in the financial system, opening the market for CSD services and improving the efficiency of securities settlement.

The Regulation aims to eliminate differences between domestic and cross-border securities settlements, enhance the safety and efficiency of the cross-border settlement and facilitate easier access to the depositories for the issuers, investors and depositories themselves.

The Regulation also ensures equal level playing field across the EU which should increase the overall market transparency and facilitate the movement of capital. It creates a common authorization, supervision and regulatory framework for CSDs and improves the securities settlement process by introducing the dematerialization requirement, harmonizing the settlement period and determining the settlement discipline measures.

¹³³ COM(2012) 350

¹³⁴ COM(2012) 73

Following a Commission proposal in April 2013 of a revision of the Directive on the **disclosure of non-financial and diversity information** by certain large companies and groups¹³⁵ agreement has been reached between the co-legislators with the final vote in Parliament held in April 2014 on the proposal.

Large companies with more than 500 employees will be required to disclose relevant environmental and social information in their annual reports. The approach taken ensures administrative burdens are kept to a minimum. Concise information which is necessary for understanding a company's development, performance or position would be made available rather than a fully-fledged and detailed "sustainability" report.

The Directive equally leaves flexibility for companies to disclose relevant information in the way that they consider most useful. Companies may use international or national guidelines which they consider appropriate (for instance, the UN Global Compact, ISO 26000, etc).

As regards transparency on boardroom diversity, large listed companies would be required to provide information on their diversity policy, covering age, gender, geographical diversity, and educational and professional background. Disclosures would set out the objectives of the policy, how it has been implemented, and results. Companies which do not have a diversity policy would have to explain why not, in line with the general EU corporate governance framework.

In May 2013 the Commission proposed, and political agreement was found in March 2014 with the final vote in Parliament held in April 2014 on the **Directive on the transparency and comparability of payment account fees, payment account switching and access to payment accounts with basic features**¹³⁶. The two main sources of market failure in relation to the issues that the Directive addresses are information asymmetries and misaligned incentives. In relation to switching and fee transparency, the current regulatory differences across Member States are exacerbated by the failure of self-regulatory initiatives; and with regard to access, by Member States' reluctance to implement the Commission recommendation on this issue.

The agreement tackles therefore three areas: a) the comparability of payment account fees; by making it easier for consumers to compare the fees charged for payment accounts by banks and other payment service providers in the EU, b) payment account switching; by establishing a simple and quick procedure for consumers who wish to change from their payment account to one with another bank or payment service provider and c) access to payment accounts; by allowing EU consumers who want to open a payment account, without being residents of the country where the payment service provider is located, to do so.

Moreover, these provisions will allow all EU consumers, irrespective of their financial situation, to open a payment account that allows them to perform essential operations, such as receiving their salary, pensions and allowances or payment of utility bills etc.

¹³⁵ COM(2013) 207

¹³⁶ COM(2013) 0266

Political agreement was equally reached in March 2014, with the final vote in Parliament held in April 2014 on the Regulation on key information documents for Packaged Retail Investment Products (PRIPs)¹³⁷:

The consequences of taking unexpected risks and facing consequent losses can be devastating for consumers, given that investments often form the backbone of a consumer's life savings. Given an EU retail investment market of up to 10 trillion euro, buying wrong or unsuitable products can quickly become a major problem.

The agreement aims to inform consumers in a format easy to understand by introducing a new, innovative standard for product information, one that is short and plain-speaking, and thus far more consumer-friendly. This document is called the 'Key Information Document' (KID).

Each KID will provide information on the product's main features, as well as the risks and costs associated with the investment in that product. Information on risks will be as straightforward and comparable as possible, without over-simplifying often complex products. The KID will make clear to every consumer whether or not they could lose money with a certain product and how complex the product is.

The KIDs will follow a common standard as regards structure, content, and presentation. In this way, consumers will be able to use the document to compare different investment products and ultimately choose the product that best suits their needs.

New Commission proposed legislation

In February 2013 the Commission presented a Directive on the **prevention** of the use of the financial system for the purpose of **money laundering** and terrorist financing¹³⁸ and a Regulation on **information accompanying transfers of funds**¹³⁹ to secure "due traceability" of these transfers. The proposals were necessary since existing rules were inconsistent with the recently revised international Anti-money Laundering (AML) and Combatting the financing of terrorism (CFT) standards, and they were differently applied across Member States leading to reduced legal certainty and inadequacies and loopholes.

The two initiatives complement other actions taken or planned by the Commission in respect of fight against crime, corruption and tax evasion.

Both proposals fully take into account the latest Recommendations of the Financial Action Task Force (FATF)¹⁴⁰, the world anti-money laundering body, and go further in a number of fields to promote the highest standards for anti-money laundering and countering terrorism financing.

More specifically, both proposals provide for a more targeted and focussed risk-based approach and foresee a reinforcement of the sanctioning powers of the competent authorities

¹³⁷ COM(2012) 352

¹³⁸ COM(2013) 045

¹³⁹ COM(2013) 044

¹⁴⁰ http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf

by introducing for instance a set of minimum principle-based rules to strengthen administrative sanctions and a requirement for them to coordinate actions when dealing with cross-border cases.

The Commission proposed in June 2013 a new investment fund framework designed for investors who want to put money into companies and projects for the long term. These private **European Long-Term Investment Funds**¹⁴¹ (ELTIFs) will only be allowed to invest in businesses that need money to be committed for long periods of time.

Investing in long-term assets, whether via financial instruments or in real assets, entails substantial risks when these investments are not properly managed. The first risk is that investors are misled as to the nature and risks of the assets they invest in due to the lack of a harmonized approach to these assets. Uncertainty exists over the identity of long term assets, their risk and return profiles and recommended holding periods. The second risk is linked to the characteristics of the assets, namely that they are illiquid in nature. The third risk is linked to the fact that funds offering access to these assets might not possess the relevant expertise in selecting and monitoring assets and tailoring a fund's return profile to the needs of potential clients. Due to these reasons, LTI funds have not always performed according to plan and investors have sometimes been misled about the return that has been promised.

With the proposal, the new Funds will be available to all types of investor across Europe subject to certain requirements. These include: the types of long-term assets and firms that the ELTIFs are allowed to invest in (for example, infrastructure, transport and sustainable energy projects), how the funds have to spread their investments to diversify risks, the information they have to give to investors, the obligation to have a depositary, the possibility to use derivatives only to manage currency risks in relation to the assets they hold, and limits to the amounts they can borrow.

Any ELTIF manager will, finally, also have to comply with all of the stringent requirements of the Alternative Investment Fund Managers Directive to provide adequate protection for its investors. ELTIF investors will not be able to withdraw money until the specified end date of their investment, and this will have to be disclosed clearly up front.

In July 2013, the Commission adopted a legislative package in the field of the EU payments framework: a **revised Payments Services Directive**¹⁴² (PSD2) and a **Regulation on Multilateral Interchange Fees**¹⁴³ (MIFs).

The rationale behind those proposals is: market fragmentation related to the degree of technical standardisation and interoperability; observed ineffective competition in certain areas of card and internet payments; diverse charging practices between Member States; a legal vacuum for third party providers (TPPs) for payment initiation services, account information services and other equivalent services; scope gaps, and; inconsistent application of the PSD.

¹⁴¹ COM(2013) 0462

¹⁴² COM(2013) 0547

¹⁴³ COM(2013) 0550

The revised **Payment Services Directive** brings therefore a number of new important elements and improvements to the EU payment market: it facilitates and renders more secure the use of low cost internet payment services by including within its scope new so-called payment initiation services; consumers will be better protected against fraud, possible abuses and payment incidents (e.g. in case of disputed and incorrectly executed payment transactions); and it increases consumer rights when sending transfers and money remittances outside Europe or paying in non-EU currencies.

The **Regulation on interchange fees**, combined with the revised PSD, will introduce maximum levels of interchange fees for transactions based on consumer debit and credit cards and ban surcharges on these types of cards. By complementing the enforcement of antitrust rules, the Regulation prevents excessive levels of these fees across the board.

In September 2013 the Commission proposed a **Regulation on indices used as benchmarks in financial instruments and financial contracts**¹⁴⁴:

Whilst the prices of financial instruments worth trillions of euro depend on benchmarks, and millions of residential mortgages are also linked to them, we have witnessed recently to the manipulation of the London Interbank Offered Rate (LIBOR) and the Euro Interbank Offered Rate (EURIBOR), resulting in multi-million euro fines on several banks in Europe and the US. Allegations of manipulation of commodity (e.g. oil, gas and biofuel) and exchange-rate benchmarks are also under investigation;

The Regulation, the proposal for which had even been amended in order to include manipulations of indexes as LIBOR and EURIBOR aims at tackling these two main risks: a) the risk of benchmark manipulation: there is ample evidence that conflicts of interest together with the inappropriate use of discretion, ineffective governance and lack of transparency lead to the tangible risk of benchmark manipulation and b) the risk of using benchmarks which are not robust, reliable or fit for purpose, particularly for retail consumers who may not be fully informed of the nature of the benchmark to which a financial contract they enter into is referenced and/or may not have any choice about the benchmark used.

The new rules will enhance the reliability and robustness of benchmarks and aim as well at facilitating the prevention and detection of their manipulation and clarify responsibility for and the supervision of benchmarks by the authorities, complementing the Market Abuse Regulation agreed in early 2014.

One of the most recent proposals, published in January 2014, is the **Regulation on structural measures improving the resilience of EU credit institutions**¹⁴⁵, which complements the new rules on capital requirements for banks and bank recovery and resolution in their aim to contribute to increasing the resilience of banks and to reducing the impact of potential bank failures by removing impediments to resolution and supervision and minimising distorted incentives for banks.

¹⁴⁴ COM(2013) 0641

¹⁴⁵ COM(2014) 43

The structural separation of the risks associated with banks' trading activities from its deposit-taking function tackles therefore the question of too-big-to-fail, too-big-to-save and too-complex-to-resolve.

The proposal will apply only to the largest and most complex EU banks with significant trading activities and it will: a) ban proprietary trading in financial instruments and commodities, i.e. trading on own account for the sole purpose of making profit for the bank; b) grant supervisors the power and, in certain instances, the obligation to require the transfer of other high-risk trading activities (such as market-making, complex derivatives and securitisation operations) to separate legal trading entities within the group ("subsidiarisation") and c) provide rules on the economic, legal, governance, and operational links between the separated trading entity and the rest of the banking group.

On 27 March 2014 the Commission adopted a **package of measures to channel funds to the real economy, in particular to long-term investment**. The package included a communication on the long-term financing of the economy¹⁴⁶, a legislative proposal for new rules for occupational pension funds (IORPs) and a communication on crowdfunding¹⁴⁷. The IORPs proposal¹⁴⁸ aims at improving governance and transparency of these funds in Europe, promoting cross-border activity, and helping long-term investment.

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¹⁴⁶ COM(2014) 168

¹⁴⁷ COM(2014) 172

¹⁴⁸ Proposal for a Directive of the European Parliament and of the Council on the activities and supervision of institutions for occupational retirement provision, COM/2014/0091

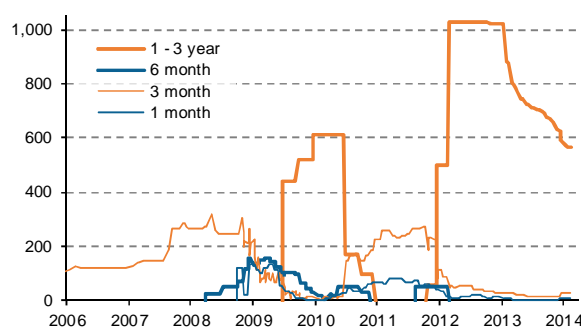
ANNEX TO CHAPTER 2: ADDITIONAL CHARTS

2.A.1 Additional charts on monetary policy

The traditional 3-month LTROs were substituted by operations with longer maturities, initially, 6-month operations and later 1-year operations. Since early 2012, the 3-year LTROs have phased almost out any other operations liquidity provided by the central bank through open market operations (Chart 2.A.1).

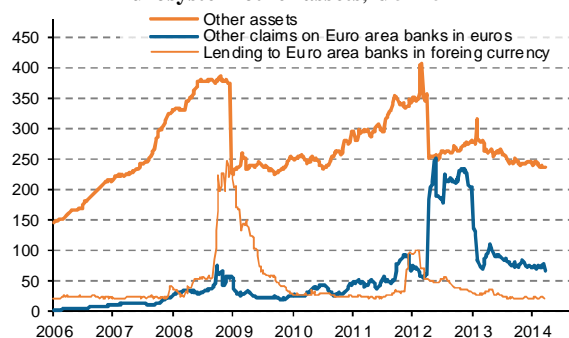
Access to open market operations requires banks to hold collateral of a certain quality. Whenever banks run out of collateral, they can still obtain liquidity through Emergency Liquidity Assistance (ELA), although at a higher price. The liquidity provided under ELA was initially included under "other assets" and later on under "Other claims"¹⁴⁹. After an intensive recourse to ELA in 2011 and 2012, banks seem to have used it to a much more limited extent in 2013.

Chart 2.A.1: Outstanding amounts allotted in LTROs: breakdown by maturity, € billion



Source: ECB: Monthly bulletin and own calculations.

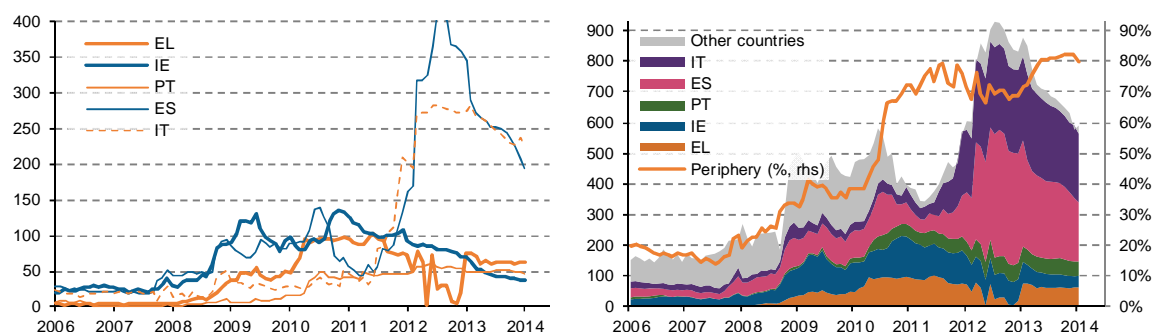
Chart 2.A.2: Eurosystem Other claims on MFIs and Eurosystem other assets, € billion



Notes: Part of the items "Other assets" and "Other claims on MFIs in Euros" includes emergency liquidity assistance. In April 2012, the ECB made a reclassification within those two items. Last available data: 10 September 2013.

Source: ECB: Monthly bulletin and own calculations.

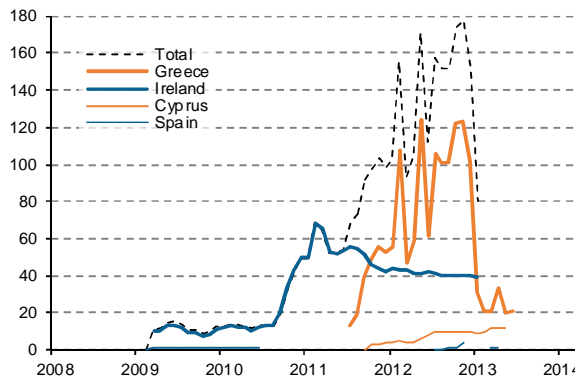
Chart 2.A.3: Liquidity provided by the central bank for monetary purposes, , € billion



Notes: Periphery includes: Greece, Ireland, Portugal, Spain and Italy.
Source: Bloomberg and own calculations.

¹⁴⁹ These two categories contain also items other than ELA. The use of ELA can be estimated by the difference with respect to the value of "other assets" or "other claims" in 2009.

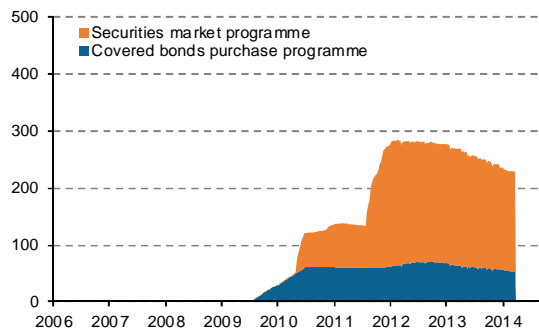
Chart 2.A.4: Emergency Liquidity Assistance (ELA) support in Greece, Ireland, Cyprus and Spain, € billion



Notes: Last available data vary per country: Ireland, January 2013; Greece, June 2013; Cyprus, May 2013; Spain, April 2013. The author is most grateful to Marcin Cecot for all his efforts to compile and estimate these ELA amounts.
 Source: ECB, Central Bank of Ireland, Bank of Greece, Central Bank of Cyprus, Bank of Spain and own calculations.

The SMP and the CBPPs were discontinued, but the bonds purchased remain in the balance of the Eurosystem until they reach maturity. By April 2014, both portfolios amounted still to over €200 bn. While the SMP is sterilised through the collection of fixed term deposits, the CBPP represents a net injection of liquidity by the central bank in the economy.

Chart 2.A.5: Securities held by ECB, € billion



Note: Holdings for monetary policy purposes.
 Source: ECB: Monthly bulletin and own calculations.

CHAPTER 3: REGULATING THE EU SHADOW BANKING SECTOR

3.1 INTRODUCTION

Following **financial innovation, deregulation and globalisation**, the financial system has grown rapidly in the decades preceding the financial crisis. Following a prolonged period of excessive growth of debt and leverage and the subsequent systemic crisis, the European Commission has undertaken the biggest reform of financial services ever seen in Europe (see Section 2.4). The aim of the unprecedented reform agenda is to restore the stability and resilience of the financial system, such that it contributes to sustainable economic growth. The Commission aims to address systemic risk comprehensively and effectively. Benefits achieved by strengthening certain actors and markets should not result in risks being merely shifted to less regulated sectors. Unregulated or less regulated activities should not grow at an unsustainable pace giving rise to systemic risk elsewhere in the financial system.

Over recent years, **shadow banking** has come to be identified within international policy debates as one of the main sources of possible concern about financial stability, giving rise to numerous policy initiatives to improve its monitoring and regulation. Shadow banking is understood as the **diverse system of entities and activities that perform bank-like activities, without being regulated and supervised like banks**. Shadow banking has grown rapidly in the run-up to the crisis and **is of systemic importance because of its size, leverage, scalability, complexity, interconnectedness and close links with the banking system**.

This chapter aims to provide answers to the following questions: What is shadow banking? What role does shadow banking play within the financial system? How large is the shadow banking sector and how is it evolving? Why did it grow so quickly in the run-up to the crisis and what is the current outlook? Is shadow banking able to step in for reduced bank appetite to make loans to SMEs and less creditworthy consumers? Should shadow banking be regulated? What are the regulatory and policy concerns linked to shadow banking? Which new shadow banking risks are possibly building up? What is the role of regulated European banks in the different shadow banking activities? What regulatory measures did the EU already take in the area of shadow banking and are additional measures required?

This chapter is built up as follows. Section 3.2 discusses the role of shadow banking within the EU financial system, defines and measures shadow banking, and points to remaining data gaps in the assessment of the systemic risks of EU shadow banking activities. Section 3.3 lists the main underlying drivers behind the rapid growth of shadow banking in the EU. Section 3.4 discusses the policy concerns related to shadow banking. Section 3.5 provides an overview of the EU shadow banking regulatory agenda by mapping the regulatory reforms against the policy concerns in shadow banking. Section 3.6 concludes.

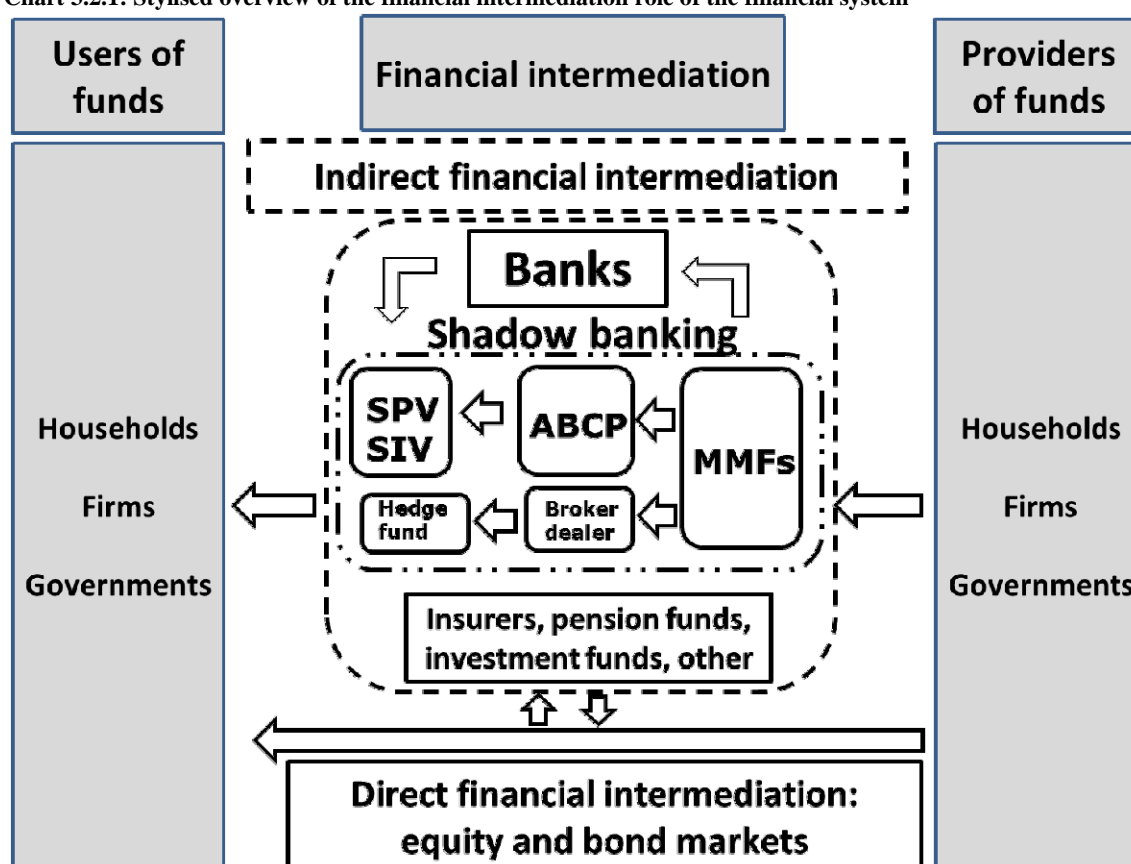
3.2 ROLE, DEFINITION, SIZE, RECENT DYNAMICS AND ROLE OF SHADOW BANKING

3.2.1 Role and definition of shadow banking within the EU financial system

One of the most important roles of our financial system is to act as a “**bridge**” between providers of funds and users of funds or “**financial intermediation**” in short. The bridge function played by the financial system is welfare-enhancing for the real economy for two

reasons. First, the channelling of funds **facilitates productive investment and efficient capital allocation in the economy**. For example, a young student or an entrepreneur may have an idea and tons of energy, but no money. The retired person may have money and wisdom and is looking for a good investment opportunity. The financial system makes both of them better off by bringing them together in an efficient way, which also benefits the wider economy through higher economic growth and capital allocation to its most productive use. Second, the channelling of funds also enables **life-cycle consumption smoothing and inter-generational resource transfers**. The financial system allows consumers to time their purchases and investments (better), which is welfare increasing. Note that this second objective will also make everyone involved in the transaction better off, but will not necessarily give rise to greater investment and economic growth. **Chart 3.2.1** provides a stylised overview of financial intermediation within the financial system and the role played therein by regular banks, shadow banks, other financial intermediaries, and financial markets.

Chart 3.2.1: Stylised overview of the financial intermediation role of the financial system



Source: Commission Services

Providers and users of funds can be linked **directly** through financial market transactions, i.e. basically sidestepping the financial intermediary.¹⁵⁰ Users of funds can issue debt or equity which is then purchased directly by investors. However, it turns out that a relatively small proportion of the funding needs of borrowers is provided by direct finance. Roughly 75% of

¹⁵⁰ In practice a financial intermediary will still be needed in its role as "soft broker" that matches buyers and sellers of securities, but it will not itself enter into a contractual arrangement with the buyer or the seller ("hard broker").

funding of corporates in the euro area comes from bank borrowing and only a relatively small percentage from debt and equity issuance. **Why is direct intermediation relatively unimportant?** Why do savers not simply lend directly to borrowers or invest in the debt paper issued by the borrowers? Why do savers typically prefer to deposit their savings in intermediaries such as banks which in turn lend it out to ultimate borrowers?

It turns out that **financial intermediaries** have important advantages over financial markets in **indirectly** linking savers and borrowers. First, intermediaries lead to **cost savings**. Pooling savings by using intermediaries allows reaping economies of scale and scope and lowers transaction, contracting, and search costs for savers. Without intermediaries the latter costs would be prohibitive for otherwise mutually beneficial transactions to take place. Second, intermediaries lead to **risk diversification and liquidity insurance**. Pooling savings by using intermediaries allows investing in more illiquid, but more profitable securities, while preserving desired liquidity. It also allows households to smooth their consumption pattern across time and is hence welfare enhancing (Diamond and Dybvig, 1983). Third, intermediaries lead to **valuable information production**. Intermediaries act as specialist delegated monitor for lenders and ensure that borrowers use the funds effectively and efficiently. Without intermediaries it would be prohibitively costly to monitor borrowers (Diamond, 1984). Finally, intermediaries **reduce asymmetric information**. Intermediaries actively reduce information problems related to borrowers' adverse selection and moral hazard by creating long-term customer relationships, requiring collateral, screening ex ante, and monitoring ex post. Asymmetric information between relatively unknowledgeable savers and knowledgeable borrowers may give rise to market collapses or missing markets.

Regular **banks** typically act as the main bridge between ultimate providers of funds and ultimate users of funds in the EU. Ultimate providers of funds are lenders, savers, or investors (households, firms, or governments with an excess of funds) that often want to run little risk although they are unable to monitor borrowers and want to retain access to their funds at short notice. Ultimate users of funds are borrowers, entrepreneurs, or spenders (again households, firms, governments, but different ones as they have a shortage of funds) that often need control over the funds for a relatively long time to realise their ideas, but which cannot issue a safe promise. Regular banks issue short term liabilities (such as retail deposits) and hold long term assets (such as loans), leading to a fundamental maturity mismatch between their assets and liabilities and making banks structurally exposed to liquidity risk. To avoid costly and inefficient runs, governments have introduced public safety nets such as deposit guarantee schemes and lender of last resort facilities. Traditionally, deposit runs have always been perceived as a key bank vulnerability, but the financial crisis has taught us that another important source of liquidity risk within modern banks stems from the liquidity demands from borrowers (such as through credit lines) and the use of short term wholesale market financing.¹⁵¹ A materialisation of funding liquidity risk can lead to the drying up of liquidity in entire market segments, such as in the unsecured interbank markets. There are also powerful feedback effects between solvency risk and liquidity risk.

¹⁵¹ Although wholesale funding does not benefit from *public* safety nets, they often concern short term collateralised borrowing, whereby the collateral is a kind of *private* safety net for the creditor.

However, as **Chart 3.2.1** illustrates, regular banks are not the sole intermediaries that can play this important bridge function. Non-bank intermediaries such as **insurers, pension funds, and regulated investment funds** also link providers and users of funds. These intermediaries: are typically not highly leveraged; do not engage in maturity transformation to a similar extent; and do not enjoy explicit public safety nets. However, these intermediaries are still being regulated to address information asymmetries and other market failures. When retail consumers are at a disadvantage relative to professional market agents, in particular financial market intermediaries, regulation can help protecting them against potential conflicts of interest or market abuses.

The Financial Stability Board (FSB) defines "**shadow banking**" broadly as "**credit intermediation that involves entities and activities fully or partially outside the regular banking system**" or "**non-bank credit intermediation**" in short.^{152,153} Shadow banking is an important alternative financial intermediation channel, alongside financing through regulated banks, thereby playing a similar role and yielding similar benefits for society.¹⁵⁴ A recently developing sector of shadow banking are creditors which are formally not credit institutions in the meaning of Article 4(1) of Regulation (EU) No 575/2013. As such, they are not covered by the prudential supervision, and, due to their number and frequent non-requirement of any licence, they escape the relevant regulation, namely the Directive 2008/48/EC on credit agreements for consumers¹⁵⁵.

Shadow banking is a phenomenon that defies institutional boundaries and comprises a chain of interconnected financial intermediaries that conduct either all three or any one of the classic banking functions **-maturity, credit, and liquidity transformation-, but without access to the explicit public safety nets** of the deposit guarantee schemes and/or the central bank emergency liquidity assistance programmes.¹⁵⁶ Maturity transformation broadly relates to the use of short-term liabilities to fund investment in long-term assets. This is often, but not necessarily, complemented by liquidity and credit transformation. Liquidity

¹⁵² The literature has formulated a number of criticisms with respect to the FSB shadow banking definition. First, the FSB definition focus on activities outside the regular banking system may underestimate the role played by large regulated banking groups (Pozsar and Singh, 2011; Cetorelli and Peristiani, 2012). Second, the FSB definition may cover entities that should not be thought as being part of the shadow banking sector based on a liquidity, maturity, leverage, and interconnectedness risk assessment (such as leasing companies, finance companies, corporate tax vehicles, etc.). Third, the FSB definition may not allow to pro-actively detect new shadow banking activities. Claessens and Ratnovski (2013) put the focus on the presence of a backstop or safety net and on systemic risk and propose as an alternative definition for shadow banking "all financial activities, except traditional banking, which require a private or public backstop to operate".

¹⁵³ The term "shadow banking" system is in fact quite new and credited to the economist Paul McCulley in a 2007 speech at the annual financial symposium hosted by the Kansas City Federal Reserve Bank in Jackson Hole, Wyoming: "Unlike regulated banks [...], unregulated shadow banks fund themselves with uninsured commercial paper, which may or may not be backstopped by liquidity lines from real banks. Thus, the shadow banking system is particularly vulnerable to runs." In McCulley's talk, shadow banking mainly referred to nonbank financial institutions that engaged in maturity transformation. Nowadays, it is generally perceived to be broader in scope.

¹⁵⁴ Shadow banking should however not be confused with "shadow economy" and certainly does not deserve a similarly negative connotation. A less confusing and more neutral term could be "parallel banking sector."

¹⁵⁵ Some types of lenders (e.g. pawnbrokers or those lending small sums) are not under the Directive 2008/48/EC.

¹⁵⁶ European Commission (2013a) refers to shadow banking as including entities raising funding with deposit-like characteristics, performing maturity and/or liquidity transformation, allowing credit risk transfer or using direct or indirect leverage.

transformation refers to the investment in illiquid assets while acquiring funding through more liquid liabilities. Credit transformation refers to the investment in assets that carry default risk, while acquiring funding that is allegedly risk free (often thanks to the use of adequate collateral or other financial innovation). Hence, similar to traditional banking, shadow banking is also characterised by liquidity, maturity, leverage, and interconnectedness risk. Hence there are **similarities** between traditional banking and "shadow" banking. At the same time, there are also important **differences** between the two types of intermediation, implying that different regulatory approaches are appropriate. For example, the "shadow banking" sector is often operated by sophisticated professional market players, in contrast to the traditional banking sector, which interacts regularly with less informed market participants, such as retail depositors and household borrowers. Different levels and forms of regulations are therefore appropriate.

3.2.2 Size and recent dynamics of EU shadow banking

Identifying and measuring shadow banking is **challenging** for a number of reasons. First, shadow banking brings together a group of **heterogeneous entities and activities**. Second, it is **easily scalable and can hence quickly evolve**. Third, it is **not always easy to distinguish from traditional banking**. Regulated banks often engage in activities deemed part of shadow banking activities. Finally, there are significant data gaps to date in the area of shadow banking. As a result, there is significant uncertainty about the precise size of shadow banking and different approaches result in different estimates. See **Box 3.2** for a review of the different approaches and corresponding EU and US shadow banking estimates.

Measuring the size and dynamics of shadow banking is nevertheless important given the fact that **important policy concerns arise in the area of shadow banking** (see section 3.4 below). The FSB reports that the size of the shadow banking sector in the EU (more precisely euro area and UK combined) is greater than in the US, and that the decline in US shadow banking since the financial crisis is more than compensated by increasing shadow banking volumes in UK, euro area, and other jurisdictions (FSB, 2012; FSB, 2013a). The FSB estimates that worldwide aggregated financial assets of "other (financial) intermediaries"¹⁵⁷ reached 71.2 trillion USD at the end of 2012, which is equivalent to 24% of total financial system assets (or 117% of the corresponding aggregate GDP).¹⁵⁸ The **"EU" non-bank financial intermediation accounts for 31 trillion USD** (22 trillion USD for the euro area and 9 trillion USD for the UK), whereas the US non-bank financial intermediation amounts to 26 trillion USD. ESRB (2014) estimates of EU shadow banking assets are broadly in line with this.¹⁵⁹ ESRB (2014) reports that **the EU shadow banking sector is estimated to have grown by 67% in the 7 years between December 2005 and December 2012. In contrast,**

¹⁵⁷ FSB defines "other financial intermediaries" as all financial institutions that are not classified as banks, insurance companies, pension funds, public financial institutions, and central banks.

¹⁵⁸ FSB uses flow of fund data from 20 jurisdictions plus ECB data for the euro area. Box 3 in Pozsar and Singh (2011) succinctly summarise the limitations and data gaps of Flow of Funds data for measuring shadow banking activities and entities.

¹⁵⁹ ESRB (2014) aggregates funds (MMFs, bond funds, equity funds, private equity funds, real estate funds, ETFs), financial vehicle corporations engaged in securitisation, security and derivative dealers, and financial corporations engaged in lending.

EU banks according to ECB Monetary Financial Institutions (MFI) statistics have grown by only 34% or roughly half that much over that same time period.

Table 3.2.1 presents a rough estimate for the relative size of shadow banking entities by using the proxy of “other intermediaries” in the euro area financial system as of mid-2012.¹⁶⁰ Total assets of “other intermediaries” is the residual group of financial entities after excluding regulated banks, insurance companies, pension funds, and regulated investment funds from the euro area financial system.¹⁶¹ Insurance companies, pension funds and most investment funds are excluded as these intermediaries do not face the risk of a run on their liabilities. On the other hand, MMFs are included, as their liabilities are a close substitute for regular bank deposits. Total assets of regulated banks made up roughly 55% of the total assets of the entire euro area financial system. The residual is made up as follows: 13% by insurance companies and pension funds, 11% by investment funds other than money market funds (MMFs), and “other intermediaries” account for 20.3% of total assets of the euro area financial system.

Table 3.2.1: Relative size of financial institutions in the euro area (total assets)

	2012Q2	
	EUR trillion	% total
Regulated banks	29.3	55.2
“Other intermediaries”	10.8	20.3
Money Market Funds (MMFs)	1.0	1.9
Financial vehicle corporations	2.1	4.1
“Other miscellaneous intermediaries”	7.6	14.4
Insurance corporations and pension funds	7.0	13.3
Regulated investment funds other than MMFs	5.9	11.2
Total assets of euro area financial institutions	53.0	100.0

Memo: Repo market outstanding value in the EU (lending and borrowing);

Source: ECB (2013)

The category “other intermediaries” includes: **MMFs, financial vehicle corporations (financial vehicles engaged in securitisation), and other miscellaneous intermediaries (such as securities dealers, venture capital companies, leasing and factoring companies, and financial holding companies).**

¹⁶⁰ This proxy is not fully comparable with the measures provided in the US literature (Adrian and Ashcraft, 2012a, 2012b; Adrian et al., 2013; Claessens et al., 2012; Pozsar et al., 2013). The information from the US Flow of Funds allow for a more granular breakdown of the liabilities of the different sectors. Lacking this type of data granularity, the “other intermediaries” proxy covers most of the institutions engaged in shadow banking activities, but not only and not all. See **Box 3.2** for more on methodology.

¹⁶¹ Total assets of hedge funds are not included in the non-banking aggregate “other intermediaries” but are reported to amount to 0.1 trillion EUR. This number is underestimating the relative importance of the European hedge fund industry, as many hedge funds engaging in business with euro area residents are actually located outside the euro area and are therefore not covered by the available European Economic Area (EEA) and monetary statistics.

Progress has been made in determining the size of the shadow banking sector by ESMA (2013, 2014), Bouveret (2011), Bakk-Simon et al. (2012)¹⁶², FSB (2012, 2013a), and ESRB (2014). However, these initiatives all necessarily compile and combine several databases that are managed by central banks, industry associations, and commercial data providers and that often have not been designed for these purposes. Moreover, no official data are available for certain shadow banking activities and entities, rendering a precise estimate of the complete "shadow banking" sector challenging. For example, almost 70% of the assets of the "other intermediaries" aggregate in the euro area are held by miscellaneous financial institutions for which regular statistical information is not available (Bakk-Simon et al., 2012).

Maturity transformation by the shadow banking sector is also difficult to assess and map given the existing databases. The available breakdowns often only refer to original maturity, rather than residual maturity. Furthermore, data collected by industry or within other publicly available surveys, has weaknesses in terms of level of granularity, coverage of instruments and of institutions, and level of geographic coverage across Member States. Data on lending activity of shadow creditors are gathered only by some Member States and they are not systematically reported by the ECB. In sum, the **economic and financial statistics collected for the EU to date are insufficient to fully understand some of the important policy concerns in the area of shadow banking**. Better data on the size, scope and interactions of shadow banking sector is needed to investigate the leverage and maturity transformation within the shadow banking sector, as well as the possible contagion channels towards the regulated banking sector. Creating a time series of statistics across Member States and at EU level would help evaluate the need and/or impact of current and possible future regulatory measures at the European level.

Box 3.2: Measuring the size of shadow banking

There are two main points of view to define shadow banking (Bouveret, 2011). The **"institutional" point of view** focuses on the balance sheet size of the entities identified as shadow banking entities, whereas the **"functional" point of view** focuses on selected activities performed by the shadow banking system.

Both points of view have their drawbacks in assessing the size of shadow banking, given the current lack of consensus on which institutions and which activities are deemed part of the shadow banking sector. In the institutional point of view, complexities arise with respect to deciding whether all the assets or liabilities of entities identified as doing shadow banking activities can be labelled as shadow banking and monitoring and dealing with the entrance of new institutions. In the functional point of view, complexities arise with respect to the measurement of activity volumes (given data gaps), how to capture new activities spurred by financial innovation and whether or not to add the shadow banking activities performed by the regulated banks themselves.

To operationalize these points of view and given current data gaps, two approaches have been followed in the existing empirical literature: the "subtractive" approach to

¹⁶² Bakk-Simon et al. (2012) analyse in more detail the following shadow banking activities and entities in the euro area: (i) securitisation activities, (ii) money market funds, (iii) the repo market, and (iv) hedge funds.

operationalize the institutional point of view and the “additive” approach to operationalize the functional point of view.

The “**subtractive**” approach¹⁶³ defines the shadow banking system as the residual after subtracting the assets of regulated financial credit institutions, insurance and pension funds and public sector financial entities from the total assets of the financial system. The result is called “other (financial) intermediaries” and is taken as a proxy for shadow banking. The use of the “subtractive” approach is linked to the fact that existing statistics, especially at the European level, tend to focus on credit institutions (banks) and insurance companies, while the remaining financial entities (with the exception of investment and money market funds) are merged into an “other financial intermediaries” category. This approach can be criticised for mixing very different entities such as brokers and derivatives dealers as well as leasing corporations and mixing different activities performed by other financial intermediaries, but has been used by the Financial Stability Board for assessing the size of the global shadow banking system. The FSB also provides an assessment based on the narrow shadow banking system, which consists in subtracting some entities from the broad measure, such as entities consolidated in banking groups or that benefit from public backstops, investment funds that cannot be characterised as engaging directly in shadow banking activities (equity funds) and securitisations retained on bank balance sheet.

Several comments need to be made. First, the insurance sector is not included in the perimeter of shadow banking, although some activities of insurance companies might qualify as shadow banking activity. Second, typical shadow banking activities, such as securities financing transactions, cannot be allocated to the sectors recognised in the national accounts on the basis of available data. Third, there are significant data gaps in the coverage of EU entities. For the EU as a whole, the ESCB provides flow of funds data on other (financial) intermediaries, and the ECB also provides more granular data (monetary statistics) for the euro area by disentangling between investment funds, finance companies, securities derivatives and dealers, financial vehicle corporations (securitisation vehicles) and financial corporations engaged in lending. However, even for the euro area there are significant data gaps.

The “**additive**” approach¹⁶⁴ aggregates individual shadow banking financial instruments such as securitized products, securities lending transactions and the money market funds (as a product, not as an entity). The main financial instruments relate to the securitisation process. The additive approach hence sums up asset backed securities (ABS) resulting from the securitisation of loan pools transferred to, or originated by, shadow banking entities, asset backed commercial paper (ABCP) subsequently issued to fund the purchase of those ABS or the short-term instruments such as repo and securities lending transactions that were also used for funding these ABS products, and the money market investors that subsequently purchased the ABCP. This approach therefore focuses on the “liabilities” that connect the different steps in the securitisation process and is referred to as “liabilities of the shadow banking”. The focus on the chain of the securitisation process implies that this approach may

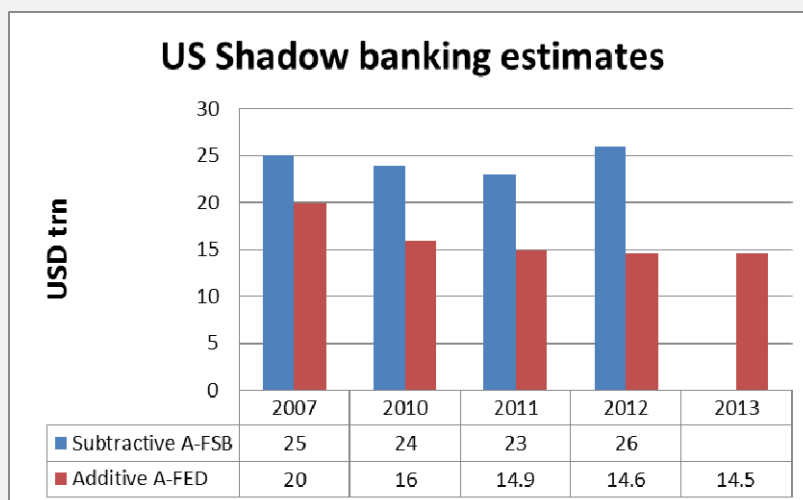
¹⁶³ Used in Bakk-Simon et al. (2012), ECB (2013) and FSB (2012).

¹⁶⁴ Used by Pozsar et al. (2013), Adrian and Ashcraft (2012a,b) and Bouveret (2011)

have a backward bias as it does not capture future products that might be created by shadow banking in order to pursue new activities, for example collateral or liquidity swaps in the collateral transformation process.

The additive approach also mirrors the shadow banking statistics that the Federal Reserve Board discloses in their quarterly Flow of Funds. To collect the same data for the EU is not straightforward. The ECB provides data for the euro area but they are not entirely fit for purpose. Data on securitisation can be compiled from ECB Financial Vehicle Corporations (FVCs) but the collection only started in 2009:Q4, therefore reliance on the data provided by Association for Financial Markets in Europe (AFME) is needed. For the repo market, the main dataset for Europe is the half-yearly survey from the International Capital Market Association (ICMA), although ICAP through its Brokertec platform provides some transaction-level data but only for short maturities and the ECB money market survey provides also some qualitative information. For securities lending, the Risk Management Association provides quarterly data, while Markit allows subscribers to retrieve aggregate and individual information on securities lending.

The estimates provided by the different approaches are shown in the next two charts in USD trillion. The subtractive approach numbers are taken from FSB reports. For the additive approach, the US Federal Reserve Bank flow of funds statistics are reported for the US, whereas ESMA statistics are reported for the EU.

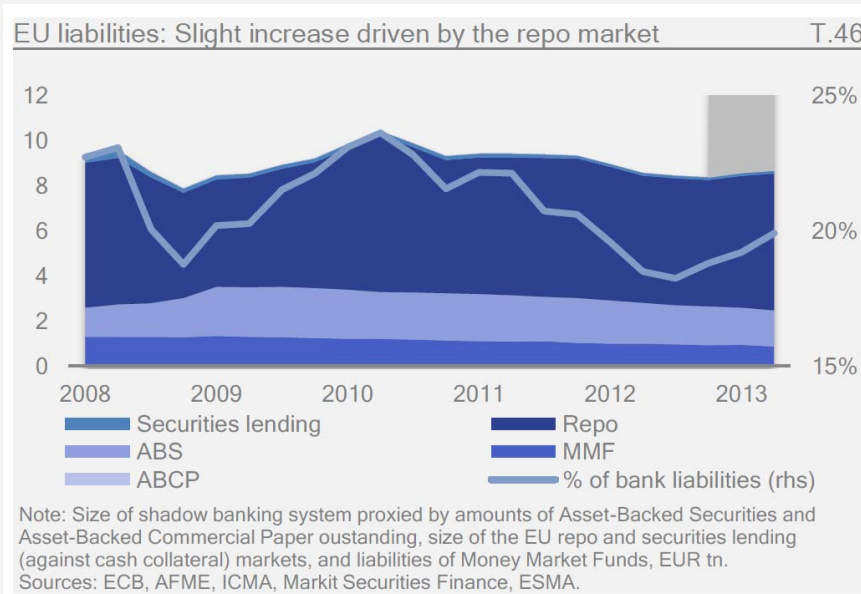


EU Shadow banking estimates

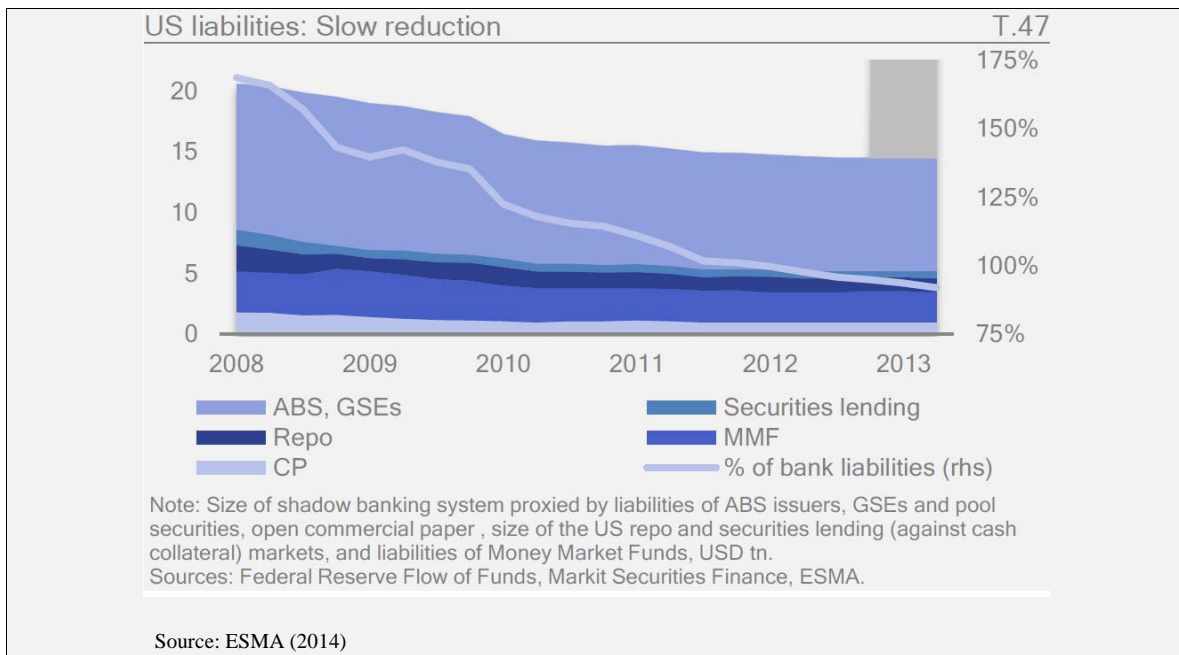


For both the US and EU evidence, we observe that the subtractive approach results in significantly higher estimates than the additive approach. The subtractive approach may overestimate the shadow banking figures whereas the additive approach may underestimate the shadow banking size. However, the gap is significantly larger for the EU (Euro area + UK), possibly due to the fact that is harder to aggregate evidence across EU countries. Whereas a subtractive approach would conclude that the EU shadow banking sector is approximately 5 trillion USD larger in size than the shadow banking sector in the US in 2012, the inverse is approximately true for the additive approach.

The additive approach charts below (ESMA, 2014) illustrate that repos are the main shadow banking liability components in the EU, whereas ABS and liabilities of the government sponsored entities (GSE) are the main components in the US. This chart also show that the relevance of shadow banking thus measured has decreased from more than 175% weight over the bank liabilities to 130% in 2013 since 2008 in the US, whereas for the EU the relative importance fluctuates between 18-23% of bank liabilities with a non-persistent trend upwards or downwards.



Source: ESMA (2014)



Below we highlight selected and important residual data gaps by type of shadow banking activity or entity (ESRB, 2014).

Securities lending is an important shadow banking activity. However, there is no publicly available data on securities lending transactions in the EU. Several private data vendors conduct private market surveys on securities lending. FSB (2013b) provides a summary of the data available to regulators on securities financing transactions (SFTs, see below for a definition), showing the lack of frequent and granular data on EU securities financing markets. Similarly, ESRB (2013) concludes that the information available to EU regulatory authorities is not sufficient for the purpose of monitoring the systemic risks that may arise from SFTs. There is no data on securities lending aggregated transactions by instrument, agent lender, counterparty, or country. There is no data on haircuts or initial margins to assess leverage. There is no data on collateral reuse and collateral re-hypothecation. Existing industry data or data collected in other publicly available surveys displays weaknesses in relation to the level of granularity, coverage of instruments and of institutions and their geographic coverage across Member States. This makes it particularly difficult to compare and use the data from different surveys for prudential purposes. For **repo activity**¹⁶⁵, scarce and non-standardised survey data is the only source, with limited granularity. There is no data on exposures between MFIs, hence it is difficult to measure the interconnectedness. There is no data on the original maturity of repo transactions, just semi-annual survey data on residual maturity. There is no data on haircuts. There is only limited information on the type and origin of collateral used. The EU rules on capital requirements require supervisory

¹⁶⁵ A repo transaction is a maturity transforming transaction consisting of the provision of funds by counterparty A to counterparty B against the guarantee of collateral issued (or guaranteed) by counterparty C for a limited and pre-specified period of time. As market participants A, B, and C are all subject to credit or liquidity risk, any change in the actual or perceived credit or liquidity constraints for any of them, may have implications for the other participants in the transaction, possibly triggering reaction chains that amplify the initial liquidity or credit shocks and which ultimately may result in runs or broad withdrawals of market participants.

reporting of aggregate data on repo transactions of credit institutions, but existing requirements are not detailed and frequent enough for the purposes of monitoring financial stability. ECB, AFME, Markit, and Dealogic all provide data on **securitisation activities**, but there is still limited data on prices (spreads), tranches, trading volumes, and who effectively holds securitised products other than monetary financial institutions (MFIs). Cetorelli and Peristiani (2012) infer a lot of insights from mapping the M&A activity and expansion over time of US Bank Holding Companies. A similar mapping of the corporate structure of regulated EU banking and insurance groups over time is lacking to date, so as to get more insight into the **role played by large EU banks, notably in securitisation and securities finance transactions**. Securitisation is an activity that defies institutional boundaries and in which numerous entities play a role and we lack good information on the relative importance of the different players.

Important work is currently being undertaken by the European Central Bank (ECB), European Systemic Risk Board (ESRB) and European Supervisory Authorities (EBA, EIOPA, ESMA) to **fill EU shadow banking data gaps**. Important **measures to improve the transparency of securities financing transactions** activities (i.e. securities lending and repo) have been proposed by the Commission. In January 2014, the European Commission published a proposal for a Regulation requiring the reporting of SFTs to trade repositories in the EU. This reporting will allow central banks and supervisors to monitor closely the build-up of system risks related to SFTs. These initiatives will shed light on shadow banking activities, in particular with a view to add granularity in (i) the breakdown within non-bank financial institutions so as to better identify leverage and maturity transformation concerns, (ii) the counterpart information to monitor relationships between regulated banks and shadow banks, and (iii) the residual maturity breakdowns of exposures (current statistics often focus on original maturity only). If agreement is reached with the co-legislators and the regulation gets adopted, the transparency measures are expected to enter into force in 2016. To ensure that regulators have access to the information, the proposal requires that all SFTs are reported to a trade repository, or, if that is not possible, directly to ESMA. In order to ensure that investors have sufficient information over the use of SFTs, periodical reports and fund's pre-investment documents such as the prospectus will include detailed information. Finally, to ensure that counterparties are informed over re-hypothecation activities of the collateral that they provided, specific transparency requirements have to be met by contractual agreement. The Commission has entrusted the EBA with conducting a comprehensive study on legal and quantitative aspects of the regulatory treatments applied to **financial entities carrying out similar activities to those performed by banks** without being classified as a credit institution in every Member State.¹⁶⁶ As such, this study will help the Commission to have a

¹⁶⁶ The entry into force of the Capital Requirements Regulation (CRR) – which is a regulation as opposed to the previous situation where the definition of credit institutions was contained in a Directive - means that only financial entities fulfilling both deposits-taking and credit activities will be qualified as “credit institutions” starting from 2014. Until now Member States have been allowed to define a credit institution more broadly when transposing the Directive 2006/48/EC. For instance, in some Member States, non-deposit taking credit providers, such as finance companies, may be qualified as credit institutions and hence be required to fulfil EU banking prudential rules. Some Member States might take the decision to continue to apply the banking prudential requirements or adjusted prudential requirements to these credit providers. Others might decide not to and to apply specific rules. This may result in different prudential treatments across Member State as

better view of all non-bank financial entities across the EU. The Alternative Investment Fund Managers Directive (AIFMD, see section 3.5.1 for details) includes a data collection process on **hedge funds, private equity funds, real estate funds, funds of funds, and MMFs**. The phase in takes place gradually until 2018 and will fill a number of data gaps in terms of portfolio exposures (assets under management, turnover, strategy breakdown, main exposures, and concentration) and fund risk profile (liquidity, leverage, etc.). In the meantime, market databases, surveys, and ECB data need to be relied upon. Maturity and liquidity transformation of EU MMFs is assessed exclusively on the basis of Fitch data on EU MMFs, thus excluding two thirds of the market of MMFs funds not rated by Fitch and excluding data before January 2012. Section 3.5 below elaborates on some of the above initiatives.

3.3 DRIVERS BEHIND RAPID SHADOW BANKING GROWTH IN THE EU

Why did shadow banking grow so rapidly? The drivers behind shadow banking growth are briefly discussed below, by referring to securitisation and securities financing transactions as examples of shadow banking activities that have grown rapidly, in particular in the run-up to the financial crisis. As to alternative lenders to consumers, a main driver of their development is reticence of regulated banks to lend to some categories of consumers (e.g. with lower creditworthiness) or of some categories of loans (low value or short term).

Securitisation refers to the process that creates (often tradable) assets through pooling, tranching, and repackaging cash flows from underlying risky loans and other assets. Securitisation transactions enable banks to refinance loans, by pooling assets and converting them into securities that are attractive to institutional investors. From a bank's perspective, such transactions can unlock capital resources, reduce borrowing costs (through credit arbitrage), and promote other balance sheet benefits, thereby increasing the ability of banks to expand their lending and finance economic growth. For institutional investors such securities, if of sufficient size, offer liquid investment opportunities in asset classes in which they do not invest directly, e.g. SMEs or mortgages.

Securities financing transactions (SFT) mainly consists of repurchase agreements and securities lending.¹⁶⁷ SFTs are techniques that are used by almost all actors in the financial system (banks, securities dealers, insurance companies, pension funds, investment funds, etc.) and use assets to either obtain funding from another entity or lend them out to another

regards entities which do not fulfil the requirements of the definition of a credit institution in CRR. Including in this assessment all financial entities performing activities similar to those performed by banks without being classified as credit institutions will help to assess the differences in national prudential treatments. EBA is requested to assess the size of those financial entities falling outside the scope of European banking prudential regulation. In case this impact is significant, the Commission could clarify, by means of a delegated act, the definition of a “credit institution” for the purposes of prudential banking regulation, in order to leave less scope for divergence and possibly regulatory arbitrage across Member States.

¹⁶⁷ SFT involve practices such as collateral rehypothecation and cash collateral reinvestment. Collateral rehypothecation is any use of financial instruments received as collateral by the collateral taker in its own name and for its own or for the account of another counterparty. Re-hypothecation of the same piece of collateral over and over again grosses up the level of activity in the shadow banking sector, even though the net amount of borrowing at the end of the chain is small.

entity against a fee. SFT are instrumental in allowing market participants to finance their assets and, consequently, in building up leverage at the institutional and market level (and hence also interconnectedness and maturity transformation).

The **drivers behind the rapid growth of shadow banking** (entities and activities) can be grouped into four categories: **genuine benefits or efficiencies, the ability to generate allegedly safe assets and additional collateral, regulatory arbitrage, and institutional factors.**

Genuine efficiencies – In the pre-crisis conventional wisdom, key shadow banking activities such as securitisation and SFT were generally believed to deliver a number of benefits to society, such as improved price discovery, enhanced market efficiency, additional credit creation, market liquidity and economic growth, and increased financial stability. For example, it was believed that all types of securitisation would provide benefits to the originators of loans (i.e. banks) as it would result in superior balance sheet management (allowing to realise economies of scale from their loan origination platforms, branches, and call centres), superior portfolio and risk management (allowing to limit the concentration to certain borrowers, loan types and geographies), superior funding management (allowing to raise long term maturity-matched funding to manage their asset-liability mismatches), price discovery by “liquefying” previously illiquid assets (allowing for third-party discipline and market pricing of assets that would be opaque otherwise), and lower capital requirements. It was believed to also provide benefits to investors from being able to invest in alternative asset classes (allowing risk diversification across geographies and asset types), enjoying greater risk-return flexibility (instruments being better tailored to the investor needs, preferences and profile), and achieving greater insulation from the originator’s credit risk. In addition, the financial system as a whole would also become more stable, as credit risk was believed to be dispersed away from highly leveraged banks and towards those that are most willing and best suited to bear the risks. Similarly, SFT was believed to support secondary market liquidity and increase the credit creation potential of the financial system through a money multiplier effect analogous to the traditional money creation process. Collateral is like base money: the haircut is equivalent to the reserve ratio and the number of re-pledges (the length of the collateral chain) is equivalent to the money multiplier. SFT was further believed to complete financial markets and to improve the monetary policy transmission mechanism. The current wisdom -after the crisis- is that such generalisations are inappropriate and need to be qualified.

Accommodating investor demand for safe assets and financial institution demand for collateral - Investor demand for safe and liquid assets has increased significantly because of risk-aversion or regulatory reasons and has exceeded the available pool of insured deposits and government bonds. Shadow banking growth effectively allows accommodating the excess investor demand for safe and liquid assets, as shadow banking creates safe, short-term and liquid instruments, i.e. quasi money, from risky, long-term and illiquid assets. Securitisation has played an important role in this process, and SFT further increases the quasi-money creation potential of the financial system. Likewise, the collateral demand from financial institutions has also increased significantly, following the materialisation of counterparty risk in the financial crisis. First, increased counterparty risks materialised in the financial crisis and made secured funding more attractive. Second, market participants are

seeking the security of collateral to underpin a wider range of claims to execute arms-length transactions in an increasingly integrated global financial system. New regulations may also have increased the demand for collateral-based operations. Regulatory reforms such as the European Market Infrastructure Regulation (EMIR) require eligible (standardised) derivative contracts to be cleared through central counterparties (CCPs). If a contract is not standardised and eligible for CCP clearing, enhanced risk management techniques must be applied to reduce bilateral counterparty credit risk. EMIR requires non-centrally cleared trades to be appropriately collateralised through the posting of initial and variation margins.

Regulatory arbitrage - Another shadow banking driver has been the desire of private actors to avoid traditional and regulated banking intermediation.¹⁶⁸ Regulatory arbitrage certainly explains part of the growth of shadow banking in the US and Europe (Acharya and Schnabl, 2009). In the pre-crisis period, banks could reduce regulatory capital charges by the use of allegedly bankruptcy remote special purpose vehicles (so-called conduits and structured investment vehicles) that relied on implicit (thus not requiring capital charges) and explicit credit and liquidity support from banks or by simply holding securitised assets on their own balance sheet which received better credit ratings than the original non-securitised assets (Acharya et al., 2010). Or through investments in structured products where capital charges did not adequately reflect underlying risks. Regulatory arbitrage has exploited loopholes and has led to a sharp build-up of risk and leverage along the way.¹⁶⁹

Institutional factors may explain certain discrepancies in shadow banking trends between the US and the EU throughout the crisis. In the early crisis stages, US ABCP and US ABS markets have collapsed (despite unprecedented policy action) whereas ABS issuance in euros peaked in the euro area in 2008 and early 2009. The role of institutions and the different nature of financial system intermediation is illustrated and emphasized in explaining this discrepancy (Bouveret, 2011). Specifically, unlike the Fed and Bank of England, the ECB monetary policy framework allowed for a wide range of collateral to be used for ECB open market operations. As a result, almost all of the EUR ABS issuance in 2008 was retained by the issuer and used as collateral for ECB refinancing operations. This was one of the ways in which the ECB provided liquidity backstops to the euro area banks (ABS issuers).

3.4 POLICY CONCERNS RELATED TO SHADOW BANKING

Shadow banking has **important benefits** as intermediation channel and can help foster sustainable economic growth, as explained in section 3.1. Hence, policy makers are concerned about undue stigma attached to sound, simple, and transparent shadow banking intermediation in the post-crisis era. The policy focus has shifted to **reviving sound, simple, and transparent securitisation markets** to unlock and diversify funding sources of non-financial corporates (see section 3.4.2 below). Despite the disappointing financial crisis

¹⁶⁸ Tax arbitrage may have been another driver behind securitisation growth. Certain shadow banking entities have been used as instruments to hide illicit activities such as tax fraud or money laundering strategies (European Commission, 2012). Tax arbitrage is outside the scope of this paper. Alworth and Arachi (2010) investigate the impact of taxes and tax avoidance activity on the recent financial boom and bust more broadly.

¹⁶⁹ In this context one can mention that shadow lending institutions may also move to another jurisdiction while still lending in a given country, or close and then re-open their business, thus making supervising them even more difficult.

experience with complex securitisation, there are significant potential benefits to be achieved through securitisation if performed in a crisis-resilient way.

On the other hand and despite the significant potential benefits, **shadow banking can still give rise to systemic risk**. The crisis demonstrated how systemic risks can build up quickly through certain shadow banking activities. The systemic importance of shadow banking is driven by: its sheer size and interconnectedness with the regulated banking sector, regulatory arbitrage, gross miss-pricing of risks, and moral hazard (see section 3.4.1).

Where market failures exist, regulation is needed. Curtailing the generation of systemic risk in the shadow banking sector is an important regulatory driver. This is why the EU has already brought forward a number of legislative proposals¹⁷⁰, many of which have already been adopted, to help tackle some of these risks (see section 3.5 below). It is clear that more time is needed before the full impact of all these reforms can feed through into the market. So, at this time, it is hard to assess exactly what impact they have had and where potential gaps remain. It may be premature to strengthen or weaken these regulations before considering what a proportionate response may look like. Further important work continues at the international level with the FSB, and so the European rules will need to remain aligned with any future international agreements in this area.

3.4.1 Curtailing systemic risk

The shadow banking **size** has already been documented and discussed above in section 3.2.

A second factor that raises systemic risk concerns is the high level of **interconnectedness between the shadow banking system and the regulated sector**, particularly **the regulated banking system**. Prudentially regulated banks can become involved in shadow banking in a number of ways, thereby giving rise to interconnectedness and contagion. Firstly, banks could move risks that they themselves would ordinarily be exposed to off-balance sheet for reasons of regulatory arbitrage through establishing non-bank entities that perform elements of credit intermediation. While regulatory arbitrage is not acceptable, this practice should be distinguished from that arising from market demand. Secondly, banks are often naturally connected to the broader system of non-bank intermediation, and these connections may represent channels of contagion. There is further work to do here to precisely understand these contagion channels (partially due to data constraints set out above), and it is by no means the case that all connections to banks have to the shadow banking sector are risky (or indeed systemic).

Several shadow banking activities are executed within systemically important banks or in a chain in which systemically important banks play an important role (Adrian and Shin, 2010b). The **shadow banking system is “much less shadowy than we thought”** (Cetorelli and Peristiani, 2012). It turned out that securitisation often did not actually transfer risks, but

¹⁷⁰ For example, CRR/CRD IV has strengthened banks' resilience to risks outside the banking system. Solvency II does the same for insurers. MiFID carries prudential provisions to relevant investment firms. UCITS V and AIFMD include measures to address systemic risks posed by large EU domiciled funds. MMF and SFT proposals are also other legislative proposals in the pipeline to help address risks from the shadow banking sector.

effectively concentrated risks in the run-prone leveraged financial sector (Acharya et al., 2010b). In the EU, shadow banks provide up to 7% of banks' liabilities, and banks hold up to 10% of their assets issued by the shadow banking system (ESRB, 2014). Given that the EU financial system is bank-intermediated, compared to the much more market-intermediated US financial system, the EU faces a greater urgency to map and understand the role of large EU banks in shadow banking activities.

Shadow banking is a phenomenon that also defies geographic boundaries and there are important cross-border and even trans-Atlantic links between regulated banking and shadow banking. It turns out that the **large EU banking groups have become intimately linked and connected to the US financial system in the run-up to the crisis**, notably through the US shadow banking sector. At the peak of the crisis, the large EU banking groups are documented to significantly (i) rely on US MMFs funding, (ii) sponsor USD ABCP vehicles, (iii) perform repo with US collateral, and (iv) invest in US MBS & ABS (Bouveret, 2011; Shin, 2012).

Third, **regulatory inadequacies, regulatory arbitrage possibilities and regulatory gaps** may drive shadow banking sector growth and in turn raise concerns about the stability and leverage of the financial system. Capital charges for securitised assets have for example been inadequately reflecting underlying risks and potential losses in several cases, particularly in the US sub-prime markets. Highly rated securitisation exposures received too low risk weights. AAA-rated RMBS (residential mortgage backed securities) received a 20% risk weighting in the standardised approach of Basel II, but only a 7% risk weighting in the IRB (internal ratings based) approach of Basel II, implying a capital requirement of merely 0.56% of the exposure (Chart 3.4.1). Trading book assets tended to attract risk weights appropriate for dealing with market but not credit risk. This meant it was capital-efficient for banks to bundle loans into tradable structured credit products for onward sale through securitisation. Indeed, by securitising assets in this way, it was hypothetically possible for two banks to swap their underlying claims but for both firms to claim capital relief. The system as a whole would then be left holding less capital, even though the underlying exposures were identical. As a result, large EU banking groups relying on the IRB approach were able to significantly increase their volume of AAA-rated RMBS assets without requiring more capital and were unable to absorb losses on these securities when they occurred.¹⁷¹ With the benefit of hindsight and given the experienced losses on these instruments in some markets, capital adequacy rules did not adequately reflect risks and seemed to have failed in putting in place the appropriate shock absorbers (compare **Chart 3.4.1** and **Chart 3.4.2**).¹⁷²

¹⁷¹ Note that such a balance sheet expansion may have further fuelled the bubble and may have given rise to valuation gains (risk premium reductions) on these securities that in turn allowed for even greater balance sheet expansion (Adrian and Shin, 2010a). In this sense, financial regulation is said to contribute to the natural procyclicality of the financial system.

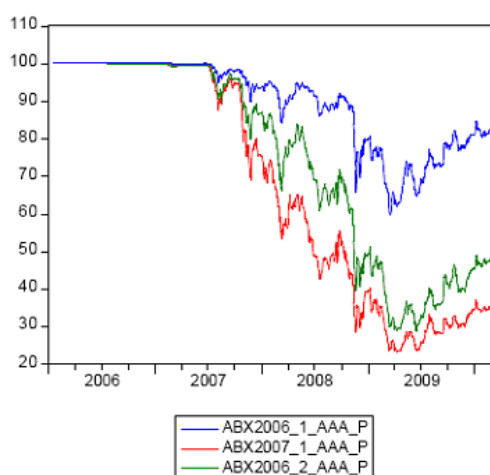
¹⁷² There was also a mechanistic reliance on external ratings. Deterioration in credit quality of the underlying pool led to cliff-effects in capital requirements, which gave rise to sales of securitisation exposures which in turn increased downward price pressures and led to additional losses.

Chart 3.4.1: RMBS risk weights and total capital requirement according to Basel II IRB approach

Rating	Risk weight	Total capital requirement
	In % of nominal amount of exposure	In % of nominal amount of exposure
AAA	7%	0.56%
AA	8%	0.64%
A+	10%	0.80%
A	12%	0.96%
A-	20%	1.60%
BBB+	35%	2.80%
BBB	60%	4.80%
BBB-	100%	8.00%
BB+	250%	20.00%
BB	425%	34.00%
BB-	650%	52.00%
B+ and below	1.250%	100.00%

Source: Commission Services.

Chart 3.4.2: Performance of AAA-rated indices according to vintage year



Source: Bloomberg.

In addition, **maturity and liquidity mismatches increased sharply outside the regulatory perimeter** (through structured investment vehicles or SIVs, broker-dealers, etc.). The underestimation of correlation enabled financial institutions to hold insufficient amounts of liquidity and capital and to sell cheap insurance against negative shocks. **Tail risks are not adequately priced and controlled in the shadow banking sector** because shadow banking entities are not regulated like banks and because financial actors often neglected risks for behavioural reasons (e.g. to meet short-term performance objectives), thereby giving rise to an **overinvesting and underpricing in the boom and excessive collapse of real activity and negative externalities in the financial sector in the bust**. “Complex” securitisation did not prove to be crisis-resilient. Many of those assets alleged to be safe assets (e.g. senior collateralised debt obligations (CDO) tranches) turned out to be risky assets, and allegedly “safe entities” (e.g. MMFs) became much riskier than expected. The danger is that if regulation and supervision of shadow banking activities and entities is inadequate then, the reinforced banking regulation could drive substantial systemic risks of banking activities beyond the boundaries of traditional banking and towards shadow banking.

Fourth, **shadow banking can be prone to bank-like runs**, given the absence of explicit public safety nets, as recently shown by the MMF crisis in the US. The crisis of 2008 can be understood as a run on repo and wholesale funding has given rise to additional procyclicality, possibly stronger than already is the case in the traditional banking sector. Excessive leverage arose in the financial system and when wholesale funding dried up throughout the system, an unprecedented systemic crisis has been triggered which to date requires significant and exceptional government and central bank intervention. The financial system has proven to be highly unstable and excessively procyclical. Negative feedback loops and strong procyclicality arose (loss-price-loss spirals, haircut deleveraging, etc.).¹⁷³ The

¹⁷³ Margins and haircuts implicitly determine the maximum leverage of a repo-funded financial institution. If the margin is 2%, the borrower can borrow 98 euro for 100 euro worth of securities pledged. Hence, to hold 100 euros worth of securities, the borrower must come up with 2 euros of equity. Thus, if the repo margin is 2%,

procyclicality of funding liquidity created by private financial players, especially shadow banking entities, can be disruptive if not controlled and curtailed. The rehypothecation of collateral to support multiple deals, in particular securities lending and repurchase agreements, helped to fuel the financial bubble and allowed for increased liquidity as well as the build-up of hidden leverage and interconnectedness in the system.

Fifth, shadow banking regulation is required to **curtail moral hazard coming from implicit public safety nets** (Singh, 2012). Given their de facto similarity to regulated banks, numerous shadow banking activities and entities have (directly or indirectly through sponsoring banks) enjoyed the ex post coverage of public safety nets. Safety nets serve useful purposes ex post, but create incentives for excessive risk-taking and significant competition and other distortions ex ante. As is the case in the bank structural reform debate (see section 1.4 and European Commission 2013b), the question arises why and to what extent shadow banking activities necessarily need to enjoy (implicit) taxpayer support. It may need to be ensured that public safety nets only cover (i) activities essential to the economy and (ii) liquidity risk (not solvency risk), so as to curtail moral hazard and aggressive and inappropriate growth of the activities under consideration. If performed by entities more alienated from safety net enjoying commercial banks, shadow banking activities may not create systemic risks to the same extent.

3.4.2 Repairing sound, simple, and transparent shadow banking intermediation

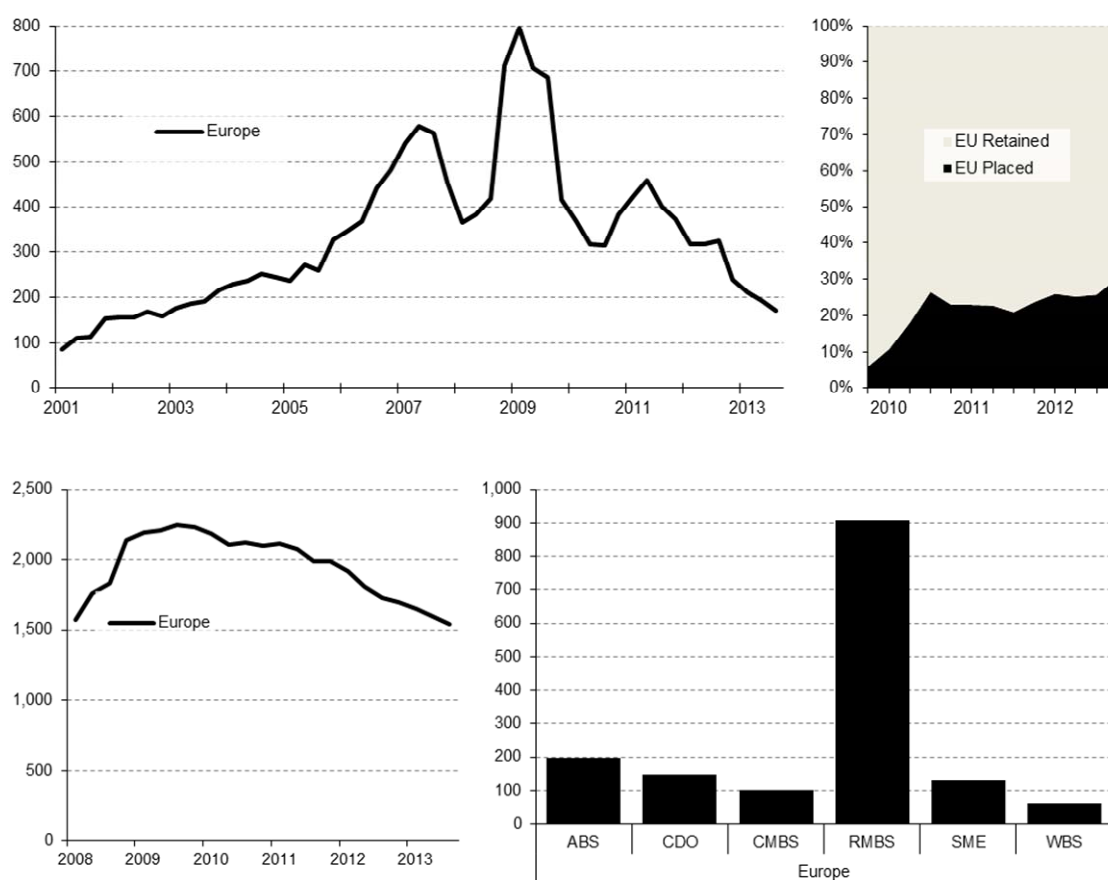
The economic and financial crisis has impaired the ability of the financial sector to channel funds from providers to users of funds. Heavy dependence on bank intermediation, combined with the need for banks to deleverage their balance sheets have reduced funding to all sectors of the economy.¹⁷⁴ Furthermore, a weak economic outlook and uncertainty about the future have reduced the confidence and risk appetite of both borrowers and providers of financing. Policy concerns in the area of shadow banking are hence not solely driven by systemic risk concerns. Regulation can and should also help in **repairing an impaired credit intermediation channel**.

the maximum permissible leverage is 50 (=100/2). The liquidity impact of increased margins can be enormous. If margins would increase from 2% to 4%, the permitted leverage halves from 50 to 25. The borrower either must raise new equity so that its equity doubles from its previous level (difficult in crisis times), or it must sell half its assets, or some combination of both. The evidence in the crisis has been that margins on repo agreements have increased rapidly from very low to high levels. Haircuts on US Treasuries for example increased sharply from 0.25% in April 2007 to 3% in August 2008, for invest-grade bonds from 0-3% to 8-12%, for prime MBS from 2-4% to 10-20%, etc. which imply massive and acute deleveraging pressure on highly leveraged financial institutions, giving rise to price decreases and endogenous second-round effects. Brunnermeier and Pedersen (2009) emphasise that "funding liquidity", "market liquidity" and asset values are linked in self-reinforcing procyclical cycles. The example also makes clear that increases in haircuts will do most harm when they start from very low levels. In this sense, the low risk premiums at the peak of financial cycles is of particular concern. When haircuts rise, all balance sheets shrink in unison. Thus, there is a generalised decline in the willingness to lend.

¹⁷⁴ Despite low interest rates, according to the ECB, bank lending in the euro area decreased by 3.9 percent between November 2012 and November 2013. In November 2013, bank lending to private companies fell by 13bn EUR compared to the previous month. For instance, bank lending in Italy decreased by almost 6 percent, while a decline of 13.5 percent was recorded in Spain. Banks have been reported to tighten their credit standards for non-financial corporates in the crisis (ECB, 2013b; ECB, 2014).

Chart 3.4.3 illustrates that **no substantial recovery of (publicly and privately placed) securitisation transactions** has been observed to date. There are a number of temporary and structural reasons for the very limited recovery of the EU securitisation markets since the crisis. The **temporary factors** that can partially explain the muted recovery in securitisation in Europe include: weak funding demand by large banks that are trying to shrink their balance sheets; the availability of cheap alternative funding sources, including from central banks; uncertainty over the final form of regulations relating to securitisations; and a lingering stigma attached to securitisation given its role in the crisis. There may also be **structural factors** impeding the development of a well-functioning securitisation market. These could include: a lack of standardisation of structures and information about asset performance; the difficulty of modelling cash flows of underlying assets (for example due to prepayment options); the lack of mechanisms for smaller issuers to pool assets to overcome the fixed costs of issuance and hence the high barriers to entry.

Chart 3.4.3: A bird's eye view on securitisation activity in Europe



Source: AFME, as processed by Commission Services. Top-left panel: annual issuance of securitised products in Europe; Top-right panel: breakdown of issuance by retention; Bottom-left panel: outstanding aggregate amount over time; Bottom-right panel: outstanding aggregate amount per type as of 2013:Q3.

Chart 3.4.3 illustrates that the peak of annual issuance of securitised products was reached in 2009:Q1 with almost 800bn EUR. In 2013:Q3 it had dropped to 2002 levels again of 170bn EUR. Roughly 70% to 75% of the issuance is retained on the balance sheet or used for repo, whereas the remainder is placed with investors. The total outstanding amount has peaked at 2250bn EUR in 2009, but has dropped to somewhat more than 1500bn EUR in 2013:Q3. RMBS make up 60% of outstanding securitised notes.

Ensuring effective and efficient intermediation channels for long-term financing is a complex and multi-dimensional task. The Commission adopted a Green Paper¹⁷⁵ on the long-term financing of the European economy in March 2013 that opened a public consultation period. Its purpose was to initiate a broad debate about how to foster the supply of long-term financing and how to improve and diversify the system of financial intermediation for long-term investment in Europe. While a well-defined and stable regulatory environment was underlined as very important, many stakeholders also called for better calibration of regulatory reform to take account of long-term financing objectives. Responses to the consultation contributed to further assessment by the Commission of the barriers to long-term financing, with a view to identifying possible policy actions and feeding the overall debate on this at European and international level.

In March 2014 the Commission published the follow-up to this work: a **Communication¹⁷⁶ on long-term financing of the European economy** proposing a set of actions focusing on (i) mobilising private sources of long-term financing, (ii) making better use of public funding, (iii) developing European capital markets, (iv) improving SMEs' access to financing, (v) attracting private finance to infrastructure, (vi) fostering the development of sustainable securitisation markets; and (vii) enhancing the overall environment for sustainable finance. An important question is whether Europe's historically heavy dependence on bank intermediation in financing long-term investment will give way to a more diversified system with significantly higher shares of direct capital market financing and greater involvement of institutional investors and alternative financing.

Small and medium-sized enterprises ("SMEs") contribute significantly to economic growth in the European Union. More than 99% of all European businesses are SMEs. They provide two out of three private sector jobs and contribute to more than half of the total value-added created by businesses in the EU. SMEs are essentially responsible for wealth and economic growth, innovation, research and development in the European Union.¹⁷⁷

Securitisation is one of the possible tools to help stimulate funding to SMEs and other non-financial corporates through market-based financing by non-banks.¹⁷⁸

However, specific **asset-class characteristics may have prevented the securitisation of SME loans from taking off** even in the pre-crisis era. The assessment of creditworthiness of an SME loan is much more complex and difficult compared to a mortgage loan. The monitoring effort is significant, due to the heterogeneity of the businesses and information limitations. This makes securitisations of SME loans more complex and difficult than

¹⁷⁵ COM(2013) 150 final.

¹⁷⁶ COM(2014) 168 final.

¹⁷⁷ Lawless and McCann (2011) and "Fact and figures about the EU's Small and Medium Enterprise (SME)": http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/index_en.htm; EU "Access to Finance" Days - helping to shape an SME-friendly financing market (EC): http://ec.europa.eu/enterprise/newsroom/cf/itemdetail.cfm?item_id=7011

¹⁷⁸ Next to securitisation, non-bank direct lending also provides funding to SMEs and other borrowers for which bank appetite has decreased. Non-bank institutions (e.g. insurance companies, pension funds, private equity funds) have recently initiated or stepped up their lending activities in order to fill the void left by deleveraging banks. Despite their desirability, these and other alternative direct lending initiatives to SMEs currently still represent a small fraction of total funding needs of SMEs.

securitisation of a pool of mortgages. The granularity of the underlying asset pool is crucial to the tranching exercise, and relatively chunkier SME loans entails higher idiosyncratic risk which can result in quick credit enhancement depletion and senior tranches being hit after just a small number of individual defaults. The average tenor of SME loans tends to be around 4-5 years in most jurisdictions (if not shorter), which compared to around 20-25 years for mortgages could make them a less desirable investment for investors such as pensions funds and insurance companies with long-dated liabilities to match against. For these reasons, aside from any potential regulatory hurdle, there are other challenges that policy makers will need to address if serious about the growth in the SME securitisation market.

General factors which may have an important impact on a **securitisation market revival** and are the subject of regulatory efforts are (i) differentiation between “high-quality” and other securitisation instruments, (ii) prudential treatment, (iii) transparency rules, and (iv) risk retention rules.

Some securitisation and similar “originate-to-distribute” models were **inadequately regulated in the past** (see also section 3.4.1). The weaknesses of these models have been identified early on and addressed in the subsequent EU financial reform agenda (see also section 3.5). **Risk retention (“skin-in-the-game”) requirements** that align incentives of the different parties involved in securitisation transactions have been in place in the EU banking sector since 2011 and have been widened to all financial sectors.

In addition, **disclosure obligations** applicable to originators and sponsors have been reinforced to allow investors to develop a thorough understanding of the instruments in which they invest. **Transparency** is a key factor to enhance investors’ confidence in these instruments. Many concrete actions are being taken by the authorities to make securitisation transactions more standardised and transparent, thereby enhancing investors’ confidence. EU institutions and agencies need to increase their cooperation and develop synergies, for instance in terms of the standardisation of reporting templates. In addition initiatives led by industry such as the implementation of labelling provide an essential contribution to enhancing transparency and standardisation over time.

Many stakeholders have called for a **differentiation of securitisation instruments** for prudential purposes in order to foster the development of sustainable securitisation markets. As indicated in the Commission Communication on long-term financing of the European economy, EIOPA advocated an approach identifying **“high quality” securitisations** for the insurance sector in December 2013. It is worth exploring the possibility of incorporating such an approach in the calculation of insurers' capital requirements. A reflection is justified on whether a similar approach could be adopted for other financial sectors to ensure a consistent approach for securitisation products taking into account the specificities of each sector. Rules on retention, high quality standardisation and transparency should be consistent in order to avoid regulatory arbitrage across countries and sectors.

3.5 EU REFORM AGENDA IN THE AREA OF SHADOW BANKING

Shadow banking is a phenomenon that defies institutional and geographic boundaries. The EU regulatory response has therefore been **internationally coordinated through the G20 and the FSB**. FSB (2013c) lists the policy recommendations intended to strengthen the oversight and regulation of the shadow banking system. The policy recommendations to

strengthen the oversight and regulation of the shadow banking system are the culmination of almost three years' work.

The FSB has been mandated by the G20 at the November 2010 Seoul Summit. This followed the completion of the new capital standards for banks (Basel III) and reflected the G20 Leaders concern of the potential risk that regulatory gaps may emerge between the banking and shadow banking sectors. The policy recommendations have been considered and endorsed by the G20 leaders at their meeting in St. Petersburg in September 2013. At the end of 2011, the FSB initiated **five general work streams aimed at identifying the key risks of the shadow banking system**.

These work streams focus on the following policy concerns:

- Limiting spill-overs between shadow banking entities and regulated banks;
- Reducing the vulnerability of money market funds to runs;
- Identifying and controlling the systemic risks from new and unregulated shadow banking entities;
- Assessing and aligning incentives associated with securitisation activities; and
- Dampening the risks and procyclicality associated with securities lending and repo.

The Commission has been very active in addressing the above policy concerns and has explained its shadow banking regulatory agenda in a **Communication** (European Commission, 2013a; COM(2013) 614 final) which sets out the concrete policy objectives and the timing of the reform proposals.

Table 3.5.1: Overview of EU policy measures in the field of shadow banking

		2009-2013	2014 and beyond
General initiatives	Transparency of Shadow Banking	<ul style="list-style-type: none"> Monitoring / risk metrics under development (eg. ESRB working group, FSB annual monitoring report). Establishment of the LEI Regulatory Oversight Committee IMF-FSB initiative to close Data Gaps. Shortselling regulation implementation (increased transparency for CDS and banning uncovered sovereign CDS) Amendment to IFRS 7 in 2011 (incl. certain securitisation risks) 	<ul style="list-style-type: none"> COM regulation proposal to increase transparency on securities financing transactions and on rehypothecation (trade repository) Entry into force of the reporting requirements for derivatives transactions to trade repo (12/02/14) Monitoring / Risk metrics to be completed by authorities (eg. ESRB working group), Legal identifier (LEI) implementation interim phase / final phase as of 2015 MIFID revision / increase the scope of transparency (political agreement Jan 14) Implementation of amendments to IFRS 10, 11, 12 (consolidation requirements / disclosure)
	EU Supervisory framework	<ul style="list-style-type: none"> Commission consultation on the ESFS framework (2013) FSB policy recommendations to identify "other shadow banking entities" (2013) 	<ul style="list-style-type: none"> Commission Report recommends possible extensions in medium term of the current mandates of ESAs to cover shadow banking (early 2014). FSB to develop information-sharing process within its policy framework for "other shadow banking entities" (2014) / FSB peer review on member implementation of its policy framework (2015)
Approach by entities	Banking sector FSB -WS 1 & 3	<ul style="list-style-type: none"> CRD 2 implemented in 2010 CRD 3 implemented in 2011 Launch of EBA assessment on the scope of credit institutions across EU (final report in 2014) 	<ul style="list-style-type: none"> CRD 4 application as of 01/01/2014 COM proposal on structural reform (29/01/2014) including ban on investments in hedge funds FSB recommendations on indirect approach to be finalised (eg. consolidation, investment in funds). Finalisation of the EBA assessment on the scope of credit institutions EBA report on possible limits for bank's exposures to unregulated counterparties
	Insurance sector	<ul style="list-style-type: none"> Political agreement on Omnibus II (Dec 2013) 	<ul style="list-style-type: none"> Delegated Acts for Solvency II (including capital requirements and risk management requirements)
	Asset management FSB -WS 2 / 3 & 5	<ul style="list-style-type: none"> IOSCO/FSB/ESRB work on policy recommendations for Money Market Funds (2012) AIFMD implementation (transposition deadline 22/07/2013) COM regulation proposal for Money Market Funds (04/09/2013) 	<ul style="list-style-type: none"> COM regulation proposal to increase UCITS/AIF transparency/reporting on securities financing transactions to investors (29/01/2014) IOSCO peer review on the implementation of its MMF standards (end 2014) UCITS review including investment techniques and strategies of the funds
	Resolution tools for non-banks FSB -WS 3	<ul style="list-style-type: none"> COM public Consultation on non-bank resolution Works at int'l level (CPSS-IOSCO on recovery of MFIs / FSB on methodologies to identify Non-Bank/non-Insurance SIFIs) 	<ul style="list-style-type: none"> Finalisation of the FSB methodologies to identify Non-Bank/non-Insurance SIFIs
Approach by activities	Securitisation FSB -WS 4	<ul style="list-style-type: none"> FSB/IOSCO recommendations on securitisation (2012). Risk retention requirements implemented in the EU regulatory framework (CRD, AIFM...) 	<ul style="list-style-type: none"> IOSCO peer review on the implementation of its standards (end 2014) Cross-sectoral initiative to develop criteria to identify and promote simple, transparent and high quality securitisation structures (IOSCO-BCBS working group)
	Derivatives	<ul style="list-style-type: none"> EMIR in force since 2012 Adoption of technical standards adopted (March 2014) 	<ul style="list-style-type: none"> Technical standards on contracts subject to mandatory clearing to be adopted (Q2) and to enter into force (Q4) Margin requirements for non-centrally cleared trades to be adopted by Q4 2014 and to enter into force Q4 2015
	Securities financing transactions FSB -WS 5	<ul style="list-style-type: none"> FSB work on policy recommendations related to repo and securities lending transactions 	<ul style="list-style-type: none"> FSB works to continue on policy recommendations (mainly on minimum haircuts) COM regulation proposal to increase transparency on securities financing transactions and on rehypothecation (29/01/2014) ESRB surveys on securities financing transactions/rehypothecation practices in the EU

Source: Commission Services

Amongst others, reinforced requirements have been imposed on banks in their dealings with the shadow banking system, securitisation arrangements have been strengthened, a harmonized framework for alternative investment funds managers has been introduced, a framework for risk transfer instruments has been introduced, the framework for rating agencies has been enhanced, the framework for MMFs and undertakings for collective investment in transferable securities (UCITs) will be enhanced, transparency has been increased. **Table 3.5.1** summarises and reviews all policy measures in the area of shadow banking.

The below sections focus on three specific areas where a new regulatory framework has either been adopted (AIFMD) or proposed (MMF, SFT).

3.5.1 Alternative Investment Fund Managers Directive (AIFMD)¹⁷⁹

Before the G20 and the FSB looked at the shadow banking system, hedge funds were singled out as an area of concern. The Commission proposed in April 2009 a directive on Alternative Investment Fund Managers (AIFMD), which also covered managers of hedge funds.

Non-harmonised investment funds or so-called Alternative Investment Funds (AIFs) invest in a wide variety of asset types and employ very different investment strategies. Inter alia, hedge funds, private equity funds, infrastructure funds, commodity funds, real estate funds or other special funds can all be classified as AIFs. The AIF sector is estimated to represent around €2.5 trillion in assets.

Macro- and microprudential problems with alternative investment funds

AIFs **amplified the boom and bust**. Certain types of AIF managers have exhibited a strong appetite for credit derivatives and ABS and have contributed to the rapid growth of these markets. AIF managers may also have contributed to the pre-crisis asset price inflation in many markets, in particular those managing large and leveraged hedge funds. The same actors may also have contributed to the speed and scale of the market correction witnessed in the early stages of the crisis. On average, AIFs lost significant value during 2008 and assets managed by EU-domiciled managers contracted by 11.5%. In addition to adverse market conditions, many managers were faced with increased redemption demands from investors and with tighter lending conditions from banks. Leveraged funds were forced to unwind positions (hedge fund leverage for example has declined from around 3 to 1.5). Faced with such pressures, in particular hedge funds were often forced to sell assets into declining markets, thereby realising losses and adding further pressure on declining asset prices. This pro-cyclical behaviour may have undermined financial stability and contributed to a deepening of the crisis.

AIFs had **inadequate liquidity and capital (i.e. shock absorbers)**. Excessive reliance on counterparties and trend-following at the expense of sound risk management and due diligence were observed by many market participants, including managers of alternative funds. The combination of increasing redemption requests and illiquid asset markets resulted

¹⁷⁹ COM(2009) 207 final

in major funding liquidity risks for several AIFs. Many AIFs experienced net outflows of funds. Others unable to exit illiquid investments had to activate gate provisions in order to limit withdrawals and some offered lower fees in exchange for longer lock-up periods. The counterparty risks faced by hedge fund managers were demonstrated by the near-failure of Bear Stearns and the bankruptcy of Lehman Brothers that highlighted the importance of monitoring the security of the cash and security balances held with prime brokers.

Adopted measure

The AIFMD aims to put in place a **comprehensive and effective regulatory and supervisory framework for managers of alternative investment funds in the EU**. Concretely, the AIFMD makes all AIF managers subject to appropriate authorisation and registration requirements, allows monitoring of macro and microprudential risks, and introduces several investor protection tools. Another objective is to develop a single market in the area of AIFs.

The AIFMD has been adopted by the co-legislators in 2011. As from July 2013, the Member States should have finished their transposition of the directive so that the provisions start applying.

- In order to be authorised as an AIFM, a number of key conditions have to be met. The AIF must hold sufficient capital; have appropriate arrangements in place for the risk management, the valuation, the assets safe-keeping (depository), the audit and the management of conflict of interests.
- In order to provide competent authorities and investors the necessary information that is needed to monitor the macro- and microprudential risks, AIFMs are subject to detailed reporting requirements on their activity, including their positions and risks to their counterparties.
- A specific set of rules has been established on AIFMs that manage leveraged AIFs (typically the hedge funds). These funds are subject to more stringent reporting requirements. Competent authorities may decide to limit the use of leverage should they assess it poses a substantial risk to the financial system.

Expected benefits

Due diligence will be facilitated on an ongoing basis. Each AIF manager will be required to set a limit on the leverage it uses and will be obliged to comply with these limits on an ongoing basis. AIF managers will also be required to inform competent authorities about their use of leverage, so authorities can assess whether this use of leverage contributes to a build-up of systemic risk in the financial system. This information will be shared with the European Systemic Risk Board. The AIFMD will also create powers for competent authorities to intervene to impose limits on leverage when deemed necessary in order to ensure the stability and integrity of the financial system. ESMA will advise competent authorities in this regard and will coordinate their action, in order to ensure a consistent approach. As a result, the procyclicality of the financial system is expected to be dampened

by the AIFMD. In addition, investor protection will improve, mainly through the increased transparency of the AIFs and markets.

3.5.2 Money Market Funds (MMFs) Regulation¹⁸⁰

In Europe, MMFs are an important source of short-term financing for financial institutions, corporates and governments. Around 22% of short-term debt securities issued either by governments or by the corporate sector are held by MMFs. MMFs hold 38% of short-term debt issued by the EU banking sector. MMFs in Europe manage assets of around €1 trillion. The EU market is equally split between Variable Net Asset Value (VNAV) MMFs and Constant Net Asset Value (CNAV) MMFs. While VNAV MMFs behave like any mutual fund with a NAV or share that fluctuates in line with the value of the investment assets held in the portfolio, CNAV MMFs maintain a constant share price (e.g. 1 EUR or 1 USD per share), irrespective of fluctuations in the value of the MMF's investment assets.

Problems

MMFs give rise to **contagion** and are **vulnerable to runs**. The inherent liquidity mismatch between the maturity of MMF assets that generate investor returns and the commitment to provide daily redemptions may prevent an MMF from meeting all redemption requests during stressed market conditions. Both CNAV and VNAV funds tend to attract particularly risk-averse investors, which can therefore be more "flighty" in run scenarios. The liquidity mismatch can cause redemption bottlenecks for both CNAV and VNAV MMFs. During the crisis, several EU based MMFs had to suspend redemptions due to their inability to sell illiquid assets (mostly securitized products like Asset Backed Commercial Papers (ABCP)). If one MMF stops redeeming investors, investors in all other MMF tended to "rush to the exit" by withdrawing their money as well. As a consequence, banks and corporate issuers lose an essential channel to distribute their short-term debt. Their vulnerability to runs is a particular concern given their significant involvement in key short term funding markets and their often close relationship with sponsoring banks.

CNAV MMFs are structured as an investment fund where each share invested can be redeemed at a stable price (unlike other investment funds). Events in 2007/08 and again in 2011 have shown that stable redemption prices cannot be maintained during stressed market conditions. In these situations, the MMF has to either decrease its NAV or share price or the sponsor has to provide financial assistance to "prop up" a stable redemption price. The first situation (decrease in value) is often referred to a "breaking the buck" (breaking the dollar or breaking the euro) because the fund must decrease its NAV from 1 EUR per share to reflect current market value of its shares. "Breaking the buck" is an event that can trigger **massive outflows**, in particular when coupled with a general deterioration in the credit quality of one or more MMF issuers. When the Reserve Primary Fund in the US broke the buck, it led to **investor panic** that ultimately obliged the Federal Reserve to provide a 3 trillion USD guarantee to the entire CNAV sector. The second situation is less transparent because the injection of sponsor support avoids that the MMF is obliged to formally "break the buck". Instead, the MMF sponsor (often a bank) needs to make up the difference between the stable

¹⁸⁰ COM(2013) 615 final

redemption price and the real value of the NAV out of its own means. Because banks did not build capital reserves directly linked to their exposure to the risk of MMFs decreasing in value (regulatory arbitrage), **sponsor support often reached proportions that exceeded the sponsor's available reserves.**

Proposed measure

The MMF regulation proposal aims to prevent the risk of contagion to the real economy (the issuers of short-term debt) and to the sponsors (usually banks). The MMFs should have adequate liquidity to face investor's redemption requests and their structure should be transformed such that the stability promise can withstand adverse market conditions.

In September 2013, the Commission adopted a regulation proposal that intends to make the MMFs that are managed and marketed in the EU safer. Liquidity and stability aspects are at the core of the Commission proposal. The proposal is now with the co-legislators which may introduce amendments in the course of negotiations. Under the current proposal, the rules are expected to enter into force in 2015.

Liquidity shock absorbers are put in place. During the crisis numerous MMFs had to suspend redemptions or even to close the fund. To respond to that problem, MMFs should always have "natural" liquidity at hand in order to provide orderly redemptions. This is achieved in the Commission proposal by introducing daily and weekly thresholds of maturing assets (10% daily, 20% weekly). The second aspect is to ensure that the portfolio is of appropriate duration and sufficient quality. This is ensured in the proposal by introducing new diversification standards (5% cap on individual issuers in CNAV MMFs), including new maturity and credit requirements for those MMFs that invest in Asset Backed Securities (ABS), in particular ABCP. The third point is on the investor side. Under the current proposal, managers will be obliged to "know their customers" better (in terms of redemption cycles, amounts, etc.). This in order to better anticipate the redemptions patterns of their investors.

The proposal puts in place **solvency shock absorbers**. Stable redemptions are often impossible without the support of the sponsor. To remedy to this unhealthy dependence on 'discretionary' sponsor support the Commission proposal introduces an obligation that all CNAV MMF gradually establish a capital buffer amounting to 3% of the MMF's NAV. This buffer will serve to absorb differences between the stable NAV per share and the real NAV per share.

Expected benefits

The MMF proposed regulation is expected to render the European MMFs more secure in adverse market conditions, mitigating related systemic risk concerns. The proposed regulation is expected to give retail investors a fairer treatment (compared to institutional investors). By increasing the MMF safeguards, more retail investors will be attracted to these markets. With regard to SMEs, their protection will be enhanced when acting as investors. SMEs, like corporates of larger size, may use MMFs to place their excess cash for short periods. Reducing the probability to face limits or suspensions of redemptions will prevent SMEs from suffering cash shortfalls.

3.5.3 Transparency of Securities Financing Transactions (SFTs) Regulation¹⁸¹

SFTs are used by almost all actors in the financial system, be they banks, securities dealers, insurance companies, pension funds or investment funds. SFTs use assets belonging to an entity to obtain funding from another entity or to lend them out to another entity against a fee. The main purpose of SFTs is therefore to obtain additional cash or to achieve additional flexibility in carrying out a particular investment strategy.

Problems

SFTs have the propensity to **increase the build-up of leverage** in the financial system as well as to **create contagion channels** between different financial sectors. The recent financial crisis showed that securities financing markets are vulnerable to bank-like runs and fire sales of the underlying collateral, especially when the value of the assets is decreasing. Moreover, the assumption that securities financing is always robust even in stressed market conditions proved to be flawed, as interconnections among markets and market participants led to contagion.

EU regulatory **authorities lack the necessary data** to better monitor the use of SFTs and the risks and the vulnerabilities for the stability of the financial system that they imply. Investors are also often not properly informed about the extent to which the investment fund in which they have invested or plan to invest has encumbered or intends to encumber investment assets by means of SFTs. The same can be true for other equivalent financing structures that would create additional risks for the investors. Finally, insufficient contractual transparency makes clients uncertain about the extent to which their assets can be rehypothecated, or about the risks posed by rehypothecation.¹⁸² When market conditions deteriorate, rehypothecation can amplify market strains. Simply put, rehypothecation re-introduces counterparty risk in case a trader fails. Rehypothecation increases the linkages between traders. As dealers grow unsure of the quality of their counterparty, they prefer to take precautionary measures regarding their collateral. It is, therefore, natural that in a time of crisis, dealers become reluctant to agree to rehypothecation to ensure that they know where their collateral is. Traders can become wary about agreeing to rehypothecation when conditions deteriorate. As a consequence, funding liquidity needs can increase and amplify market strains.

Proposed measure

To ensure that the use of SFTs is properly monitored, the regulatory authorities should have access to **frequent and granular information on SFT markets**. With better access to the information, competent authorities would be in a better situation to overview the general risks posed by SFTs. In order that investors regain trust in the financial markets, they should have better access to the information over the use of SFTs by entities in which they have

¹⁸¹ COM (2014) 40 final

¹⁸² “Rehypothecation” is defined as any pre-default use of assets collateral by the collateral taker for its own purposes. Rehypothecation is used in bilateral transactions between commercial market participants (dynamic rehypothecation) and between intermediaries and their clients (static rehypothecation).

placed their money; this would also include contractual transparency over rehypothecation activities.

Together with the Commission proposal on bank structural separation adopted in January 2014, different measures on the transparency of shadow banking activities have been proposed. Under this proposal, the transparency measures would enter into force in 2016. The proposal will be discussed by the co-legislators.

To ensure that regulators have access to the information, the proposal requires that all SFTs are reported to a trade repository, or, if that is not possible, directly to ESMA. In order to ensure that investors have sufficient information over the use of SFTs, the proposal requires periodical reports and fund's pre-investment documents such as the prospectus to include detailed information on the use of those SFTs by fund managers. To ensure that investors are informed over rehypothecation activity, the proposal includes specific transparency requirements which have to be met by the parties involved, including written agreement and prior client consent.

Expected benefits

Transparency in the area of SFT is important as it provides the information necessary to develop effective and efficient policy tools to **prevent systemic risks**. The reporting of SFTs to trade repositories will allow supervisors to **better identify links between banks and shadow banking entities**. It will also shed more light on the funding operations of shadow banking entities. Supervisors and regulators will then be able to monitor the market and, if necessary, design better-targeted and timely actions to address any risks to financial stability that emerge. Transparency in the use of SFTs by investment funds is vital. At present, there is very little information available on the use of these transactions by funds, in particular with regard to securities lending and total return swaps. The Regulation will therefore not only benefit investors, but also enable regulators to access valuable information. This, in turn, will allow them to assess the risk linked to the use of these instruments and propose further measures if necessary. Finally, the harmonised rules with respect to rehypothecation will limit potential financial stability risks and remove uncertainty about the extent to which financial instruments have been rehypothecated.

3.5.4 Vigilance is required as new shadow banking risks can build up quickly

Will the strengthened regulation of banks and the regulation of certain shadow banking entities and activities spur the growth of new shadow markets and activities? If so, can worrisome new forms of shadow banking be identified quickly and pro-actively? Where should we look for new shadow banking risks? And how can we identify implicit safety nets? These are important questions that require vigilance and analysis.

Several pre-crisis shadow banking activities ceded to exist. New activities have arisen and are growing rapidly. New risks may arise, given that shadow banking intermediation is evolving rapidly. New concerns may hence arise, in particular if activities benefit unduly from implicit public safety nets. In the US, new areas of potential policy concern have been identified in the areas of leveraged loans, Real Estate Investment Trusts (REITs), and re-insurance (Adrian et al., 2013).

At the riskiest end of lending activities, leveraged loans, of which a sizeable proportion is syndicated to non-banks, have experienced buoyant activity recently. US leveraged loan volumes collapsed in 2008 but rebounded quickly. The sharp increase is driven by the refinancing prospects in a low interest rate environment. Covenant lite loans have increased from 0% in 2010 to 60% in 2013 in the US. There is an increased presence of retail investors through CLOs and funds, whereas sophisticated investors like banks and hedge funds are exiting. Leveraged loans are funded through mutual funds and ETFs. In the EU, leveraged and high yield loan issuance has also increased.

Over the past few years new and improved REIT regimes have been introduced in the EU to meet the growing demand from investors for tax efficient real estate investments vehicles. REITs own and often operate income-producing real estate and rely on liquidity and leverage, but are typically not under prudential regulation rules. REITs perform liquidity transformation and are vulnerable to crises which trigger forced deleveraging and haircut spirals and contagion to dealer banks. REITs can obtain leverage from dealer banks outside the EU, and vice versa.

Policies to mitigate new shadow banking risks may require significantly enhanced monitoring and an expanded regulatory scope including macroprudential policies (such as leveraged lending guidance, minimum haircuts, etc.).¹⁸³

3.6 CONCLUDING REMARKS

The financial crisis revealed deep financial system flaws such as regulatory arbitrage, ineffective supervision, opaque markets and overly-complex financial products, highlighting the need to improve regulation and monitoring not only in the traditional banking sector but also in the area of what is called “shadow banking”.

Shadow banking or "non-bank credit intermediation" is significant in size and has grown rapidly in the run-up to the crisis. The EU regulatory response to the shadow banking sector has been grounded in an understanding of the dynamics that drove its rapid growth, the social usefulness and sustainable economic growth that follows from its intermediating role, and the market failures and systemic risks that it unintentionally creates (e.g. the extent to which shadow banking activities amplify and increase the natural procyclicality of the EU financial system).

However, to date one cannot but conclude that shadow banking remains relatively unexplored by official statistics. The available EU economic and financial statistics collected are not sufficiently detailed, nor have sufficient coverage to allow for a full understanding of shadow banking related policy concerns. Important data gaps still exist to allow an adequate assessment of the systemic risk of shadow banking. To analyse the impact of the current reforms and whether further measures may be needed requires an improvement in the availability of data and other related qualitative information. Important work to fill data gaps

¹⁸³ Turner (2012a, 2012b) argues that macroprudential policies are essential, that an expanded regulatory scope is required, and that limits need to be imposed on the total amount of leverage and maturity transformation within the financial system to curtail the excessive procyclicality of the financial system.

is ongoing within the European Central Bank (ECB), European Systemic Risk Board (ESRB) and European Supervisory Authorities (EBA, EIOPA, ESMA).

Important progress has been made in recent years but more work needs to be undertaken to fully understand the possible systemic issues within shadow banking. In particular, there is a need to understand the relative importance of the drivers behind the growth of shadow banking (i.e. increased demand for safe assets, genuine benefits, regulation and regulatory arbitrage, role of the ECB collateral framework, etc.) and the role of the regulated EU banking sector in shadow banking activities.

Shadow banking may raise systemic risks, but is and should remain an important financial intermediation channel alongside regulated banks. Shadow banks have for example recently stepped up their lending activities in order to fill the void left by deleveraging regulated banks. The shadow banking sector may even be able to do this more efficiently and cheaply than banks are able to, by specialising in particular aspects of credit intermediation, and by connecting corporations directly to sources of funding in the capital and financial markets. Moreover, the provision of services outside the banking sector can reduce the systemic importance of banks, helping to reduce too big to fail concerns. It is therefore important that efforts to further reform shadow bank take these contributions into account. Regulation should not be so strict so as to remove its potential and positive impact.

Systemic risk and important market failures may arise in the area of shadow banking. Any risk assessment should however examine the extent to which risks are already being addressed or accounted for by existing regulation. A first step should be to assess the success of the reforms being implemented, and track their effectiveness in mitigating risks in shadow banking. A focus on the system as a whole would be useful, in particular to aid macro-prudential surveillance and monitoring, to help regulators keep up with the fast pace of innovation, and to help understand where the future risks are likely to arise and build up.

The Commission will continue to assess how to respond to the ongoing changes in the shadow banking system, which is constantly adapting in the regulatory context. Monitoring should focus on shadow banking's potential to increase systemic risk, whilst retaining the genuine and potentially important benefits and efficiencies for the financial system. Ultimately, the aim is to ensure that the potential systemic risks to the financial sector are covered and that the opportunities for regulatory arbitrage are limited in order to strengthen market integrity and to increase the confidence of savers and consumers. For this, the Commission will continue to closely follow the future work of the Financial Stability Board and G-20, which addresses the risks stemming from shadow banking.

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CHAPTER 4: HFT REGULATION AND SOLUTIONS FOR THE SPEED RACE

4.1. THE EMERGENCE OF HFT AND ITS EFFECTS

“Asset markets rely on accurate pricing of risk. And financial regulation relies on an accurate reading of markets. Whether trading assets or regulating exchanges, ignorance is rarely bliss. It is this uncertainty (generated by HFT impact on markets) which makes this an issue of potential systemic importance.” Andrew G Haldane 2010

Over the last two decades, improved telecommunications and computing have all but rendered obsolete the old style floor based auctions which equity markets had been using for centuries. This technological change has disrupted the traditional market environment. It has also fuelled intense debate over the costs and benefits of the new world of electronic trading and specifically on the role of the so-called High Frequency Trading (HFT).

High frequency traders (HFTs) use powerful computers transacting a large number of orders at very high speeds. They apply complex mathematic algorithms to analyse multiple markets data and execute orders based on market conditions. All portfolio-allocation decisions (the volume of position and the length of time for which positions are held) are made by computerized quantitative models. Their diverse trading strategies are largely driven by their ability to simultaneously process large volumes of information, something human traders could not do in any comparable manner. HFTs move in and out of short-term positions geared towards extracting very small margins from each trading. In doing so, they generate large numbers of orders many of which are cancelled (or not executed) shortly after submission. They may trade either correlated financial instruments in the same venue or between different trading platforms at hyper fast speed. HFT firms usually do not employ significant leverage, accumulate positions or hold their portfolios overnight.

As explained in the Impact Assessment on MiFID¹⁸⁴, HFT represents an increasing share of transactions, especially on equity markets, creating new risks to the orderly functioning of markets, e.g. due to rogue algorithms or sudden withdrawals of liquidity in adverse market conditions. The analysis of the May 6th, 2010 flash crash¹⁸⁵ performed by US regulatory authorities has underlined the fact that even if HFT firms may not have been the cause of this crash, the way and the speed of their reaction has greatly amplified its effects. Even if the effect of this type of trading on the markets is still being investigated and discussed, with some arguing that it is beneficial in terms of liquidity and spreads while others consider that markets have become more shallow, it is obvious that this type of activity deserves to be properly regulated simply in light of the size that it represents in terms of trading as of today, and given the potential spill over effects across financial markets. The scale of HFT in Europe already accounts for a significant portion of equity trading in the EU and is expected to grow further. According to CESR¹⁸⁶, HFT trading accounts for between 13% and 40% of total share trading in the EU. In comparison, HFT traders account for as much as 70% of all U.S. equity trading volume¹⁸⁷.

¹⁸⁴ See Commission Staff Working Paper, Impact Assessment on MIFID (2011). Full text at http://ec.europa.eu/internal_market/securities/docs/isd/mifid/SEC_2011_1226_en.pdf.

¹⁸⁵ Findings regarding the market events of May 6, 2010; Report of the Staffs of the CFTC and SEC to the Joint Advisory Committee on emerging regulatory issues; 30 September 2010.

¹⁸⁶ Technical Advice to the European Commission in the context of the MiFID Review – Equity Markets,

The existing theoretical and empirical literature on HFT is vast and growing rapidly¹⁸⁸. However it is inconclusive as regards the beneficial effects or otherwise of HFT. Moreover, it is mostly centred on U.S. markets making it difficult to extrapolate results to EU market. Early U.S. studies were supportive and emphasized the benefits of HFT. Empirical research suggested that HFT was a natural evolution due to advances in technology and quantitative finance.

According to some experts, HFT helps improving liquidity in the securities markets. The huge volume of trade (made possible through HFT) guarantees the existence of highly liquid securities markets. Somehow, HFTs are makeshift market makers in so far as they are willing to sell or buy stocks when no other participants in the markets will. The bid/ask spreads made off their trading operations are considerably less than what is taken out of the securities markets by traditional market makers. Indeed, in the securities markets average investors have the ability to find a counterparty (high-frequency trader), prone to buy/sell stocks, as HFT trades can make up to 75% of a daily trading volume. This applies even more in the case of large companies.

HFT is also expected to have positive impacts on market efficiency according to the following reasoning: according to the Efficient Market Hypothesis (EMH), the prices of stocks traded in the securities markets incorporate both public and non-publicly available information. According to the EMH, stocks systematically trade at their fair value, thus making it impossible for any participants in the markets to sell overvalued stocks or to buy undervalued stocks. Thanks to HFTs there are large trades in the markets. HFTs profit from discrepancies in stock prices and benefit from market imperfections. Thus, with the use of HFT, the bid/ask spreads are smaller. Somehow, narrow bid/ask spreads make securities markets more stable.

Related to the above point, defenders of HFT argue that it reduces trading costs for small investors as it leads to a reduction of bid/ask spreads and margins. In addition, HFTs can break large fund transactions into smaller trades in order to considerably reduce the effect of a big buy/sell order. In sum, HFT according to this line of reasoning contributes to market quality via (i) greater liquidity (ii) lower volatility (iii) lower transaction costs and (iv) improved speed and accuracy of the price discovery process. In sum, HFTs are market makers providing liquidity to the market, lowering volatility and narrowing bid-offer spreads, thereby making trading and investing cheaper for other market participants.

However, deep concerns emerged after several flash crashes and turbulences attributed to the presence of HFTs¹⁸⁹. The recent empirical literature assessing these market episodes¹⁹⁰ and relying on more recent available data has concluded that HFT can also decrease liquidity, increase volatility, and adversely impact market confidence.

First, there are natural limits to the theoretical benefits of HFT. There is unhealthy competition among HF traders to acquire the capability to trade at ever higher speeds by investing in broadband cables, microwave technology, etc. This leads to a sort of speed race, or arms race, to

CESR/10-802, 29 July 2010.

¹⁸⁷ High Frequency Trading Technology, A TABB Anthology, TABB Group, August 2009.

¹⁸⁸ See Jones (2013) and Gomber et al (2011) for literature surveys; the references to this chapter include a representative sample of the relevant literature.

¹⁸⁹ See Popper (2012) Valetkevitch et al (2012), Bowley (2010).

¹⁹⁰ Boehmer et al 2012, SEC report of Flash Crash, Jarrow and Protter (2011), Cartea and Penalva (2010), Zhang and Powell.

profit from “low latency arbitrage”¹⁹¹. HFTs invest in speed to trade virtually one fraction of a second faster than other traders. As a result the fastest trader can know, with near certainty, where the market will be a fraction of a second ahead of everybody else, profiting at nearly zero risk. The problem is that, beyond a certain threshold, this speed race becomes essentially a zero sum game with a severe potential negative impact on efficiency of the markets.

A second concern is that any increased market quality is only ephemeral and it comes at the expense of HFTs taking advantage of institutional liquidity providers whose presence ensures the adequate valuation of tradable securities in the long-term. The claim is that HFTs may gradually push institutional investors out into dark pools, where HFT activity does not take place. There is anecdotic evidence that institutional investors, at least in some instances, have chosen to execute their orders through systems that do not involve any pre trade transparency. By using voice trading systems or dark pools they ensure that their orders cannot be picked up by HFTs. While this may be in the investors individual interest it is not in the interests of the market as a whole; by increasing dark trading the market price formation mechanism is harmed. If, as feared, the speed race among HFTs ends up shifting market quality participants away from exchange markets, this could have severe negative impact on market efficiency and discourage long-term investment trading in exchange markets.

In sum, technology is a key driver of innovations and growth but also raise some risks in the market place, therefore global market regulation is confronted with a tough challenge; maintain the integrity of the markets while at the same time not suffocating advances in their development.

An additional concern is whether regulators and the regulatory process can keep up with the fast paced and evolving nature of technology and, in particular, the impact of high frequency trading and its unintended consequences. For example, as recently pointed out by financial journalist and analyst Michael Lewis in his account of the inner workings of the HFT industry¹⁹², it is already spreading to other markets such as foreign exchange (FX) markets. Indeed HFT already accounts for more than 35 percent of spot currency volume in October 2013, up from 9 percent in October 2008, according to consultant Aite Group LLC¹⁹³. It's the opposite of equities, where their proportion shrank to 50 percent in 2012 from 66 percent four years ago, according to Rosenblatt Securities Inc.

As brokers get better at cloaking orders and volume shrinks in stocks, speed trading remains a growth business in the \$5.3 trillion foreign-exchange market, where authorities on three continents are examining the manipulation of benchmarks. While some see them as a sign of transparency, the tactics are catching on just as their role in equities is probed by the New York state attorney general and Federal Bureau of Investigation.

¹⁹¹ Low-latency trading uses computers that execute trades within microseconds, or "with extremely low latency" in the jargon of the trade. Low-latency traders profit by providing information to their algorithms, such as competing bids and offers, microseconds faster than their competitors.

¹⁹² Michael Lewis (2014) “Flash Boys”.

¹⁹³ About 30 to 35 percent of transactions on EBS, an electronic trading platform owned by ICAP Plc that facilitates currency deals, are high-frequency driven, the Bank of International Settlements said in a December report. The rise in electronic and algorithmic trading is prompting firms to set up shop close to the servers of electronic platforms, a strategy to reduce transmission time that has long been popular in stocks.

The aim of this chapter is, however, more narrowly construed. First it provides a comprehensive overview and summary of the far reaching measures taken at EU level, notably included in MiFID/R to mitigate and control the risks and concerns associated with HFT. Effective implementation of these measures across Europe shall ensure that HFT lives up to its promise of improving market quality without endangering or distorting the adequate functioning of securities markets either in normal times or in times of market stress.

In the second part of the chapter we assess the economic rationale and regulatory appeal of measures specifically targeted to curtail a possible zero-sum speed race, which is largely driven by the existing market design. Proponents and researchers have argued that some of these measures, in particular batch auctioning, could be considered in the context of drafting and implementing secondary legislation derived from MiFID II.¹⁹⁴

4.2. HFT REGULATION IN THE EU

The Commission, in its proposal to revise the MiFID set out a comprehensive framework to address HFT risks. Political agreement between co-legislators on this file was reached on 14 January 2014.¹⁹⁵ The proposal strengthens the organisational requirements for trading venues and HFT traders, including a requirement for authorisation along with some more granular measures such as a requirement for continuous liquidity provision by market makers.

What constitutes HFT activity?

At the outset, EU legislators acknowledged that assessing the market impact of HFT activity is a challenge since its effects often depend on who is undertaking that behaviour and/or why, at any given time. For example a proprietary hedge fund may use a computer program to execute or issue an order rapidly in order to front run and profit from long term investors. This type of HFT activity is often considered harmful because it transfers profits from long term investors to short term speculators. On the other hand a pension fund or asset manager may use a computer program that cuts up an order and executes it swiftly, reducing transaction costs to the benefit of clients engaged in long term investments. Thus identifying and classifying HFT, let alone assessing its overall market impact, can be controversial, because it involves making value judgements about different types of investors and behaviours.

Indeed, there is no commonly agreed and precise definition of what constitutes HFT. Divergences relate to the specific trading strategies¹⁹⁶ employed and the identity and objectives of the traders. Empirical studies assessing the effects on securities markets of HFT to date use different definitions and hence, unsurprisingly sometimes come to divergent results and conclusions.

One approach to identify HFT activity is to select HFTs based on an existing listing or by relying on trades flagged as HFT by market participants themselves. The main problem with this

¹⁹⁴ Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on markets in financial instruments repealing Directive 2004/39/EC of the European Parliament and of the Council, Brussels, 20.10.2011, COM(2011) 656 final, 2011/0298 (COD).

¹⁹⁵ See http://europa.eu/rapid/press-release_MEMO-14-15_en.htm?locale=en

¹⁹⁶ Financial trading jargon not easy for the general public appears constantly in relation to HFT. A dedicated glossary at the end of this chapter briefly defines the most common terms used by market participants.

approach is that it focuses on firms whose primary activity is HFT, excluding other firms which do not engage in HFT as a primary activity, for example investment banks that have a HFT desk. Comparability across countries is also difficult since not all trading venues oblige traders to flag HF trades. In addition, there exist severe constraints for other researchers to replicate (let alone falsify or validate) prior empirical studies on the effects of HFT on securities markets.

An alternative, indirect approach, or lifetime approach¹⁹⁷, identifies HFT activity based on the use of market data. However, this requires access to large amount of non-anonymous data from trading venues and/or firms and the capabilities to handle and process it, in order to identify HFT strategies.

Identification problems explain the large divergence on the results of empirical research devoted to HFT. In addition, the lack of comparability of empirical results is particularly acute in EU equity market. This is because of market fragmentation in Europe. Research on HFT is traditionally focused in one venue¹⁹⁸ or one country. This largely because it has had not been possible¹⁹⁹ to build a consistent database covering 27 different countries with their different venues. ESMA recently²⁰⁰ has made a first attempt to overcome this constraint but controversy on its HFT identification methodology might continue to undermine the reach of its results.

For regulatory purposes, EU legislators have opted for a broad definitional approach that covers not only the conduct but also the identity of the participants and its intent when engaging in the activity in question. In MiFID, HFT trading is defined as “any algorithmic trading technique characterised by:

- (a) infrastructure intended to minimise network and other types of latencies, including at least one of the following facilities for algorithmic order entry: co- location, proximity hosting or high speed direct electronic access;
- (b) system determination of order initiation, generating, routing or execution without human intervention for individual trades or orders; and
- (c) high message intraday rates which constitute orders, quotes or cancellations.”

Such trades will then be identified through flags.

MiFID introduces a comprehensive regime to address the causes, risks and impacts to financial markets posed by HFT, including:

- An authorisation requirement for HFT traders along with organisational obligations to control risks. This effectively will allow supervisors to impose sanctions if needed since all HFT participants are identified independently on the institution in which they operate.
- Provides supervisors with all the necessary tools to oversee HFT trading and intervene when necessary. In particular supervisors will be provided with information about where HFT

¹⁹⁷ Jovanovic et al (2012), Kirilenko et al (2010) Baron et al (2013) and Weller (2012).

¹⁹⁸ See for example: Jarcenic and Snape (2010) and Brogard et al. (2013b) for LSE, Gomber and Gsell (2009) and Hendershott and Riordan (2013) for Xetra, Hagströmer and Nordén (2013) for Nasdaq-OMX, Jovanovic and Menkveld (2010) for NYSE Euronext Amsterdam and Chi-X.

¹⁹⁹ Due to clock synchronization, legal issues and different country disclosures.

²⁰⁰ Trend Risk and Vulnerabilities report 02-2014.

trading is taking place and by whom. Record keeping obligations then ensure that a paper trail exists to ensure that any market abuse or other breaches of the rules can be detected and sanctioned by the relevant competent authority.

In addition to these general provisions, more targeted requirements and measures to address specific concerns include:

- A **continuous liquidity provision obligation**: flash crashes may be caused or accentuated by HFT trading systems shutting down whenever there is an unforeseen movement in the market. This has the effect of withdrawing liquidity for the market, accentuating any fall. To address this problem algorithmic market makers are required to provide liquidity into markets continuously and could be sanctioned for any failure to provide such liquidity.
- **Minimum tick sizes**: minimum tick sizes limit the quote life or latency of the quote to a certain measure and are adopted to reduce the chances of the disorderly trading in markets. HFT strategies frequently exploit minor differences in prices (which is only possible where tick size are small) to step ahead of more long term investors. Long term investors by contrast are less likely to make trading decisions on the basis of small price differences. Imposing minimum tick sizes may therefore reduce HFT trading opportunities whilst favouring long term investors.
- **Minimum order to trade ratio**: HF trading strategies frequently involve the issuing of numerous orders, to spoof or test the market, which are then rapidly withdrawn. To address this concern a minimum ratio of unexecuted orders to executed trades is imposed on market participants.

Restrictions on distortive fee structures: in some cases the fee structures of venues may encourage distortive HFT practices and so restrictions are imposed to ameliorate this. Restrictions are in particular required to ensure that co-location services are offered on a non-discriminatory basis and do not create incentives for disorderly trading. A requirement for the testing of algorithms by the persons using the algorithms; this ensures not only do the firms using such algorithms understand them both for their own risk management purposes and also to reduce risk in the system as a whole.

Going forward regulators still face a number of challenges. For example, competent authorities will need to clearly specify which algorithmic trading techniques and to what level of detail need to be reported and described, presumably on an annual basis (in line accordance with Clause 17.2). Other challenges relate to massive trading order cancellations ('spoofing strategy' made possible through the use of HFT) that may disrupt the markets, through the use of complex algorithms and CBT systems. Possible responses include setting speed limits for HFTs or imposing resting periods in the markets, forcing HFT not to cancel too quickly the trading orders posted in securities markets²⁰¹.

²⁰¹ The SEC recently implemented a new algorithm technology 'Midas' to record all trading orders posted in the securities markets, whether they are effectively executed or cancelled. By doing so, the SEC will be able to clearly know when manipulative HFT strategies are implemented, in so far as Midas will be able to identify trading order cancellations. Thus, this new technology is expected to prevent dramatic market events. Midas should enable regulators to take emergency measures if they see that orders are being cancelled massively in the markets, and, by extension, dramatic events (such as Flash Crashes) could be prevented.

The Commission proposed amendments to MiFID aimed to considerably change the growth trend in HFT by restricting the extent of naked access to stock markets. A key goal is to level the playing field so that no one segment in the securities market has an advantage over another one due to a lack of homogeneity in risk checks in the industry. The Commission shall continuously evaluate and assess whether the adoption of MiFID II is having a real concrete impact on the market and its objectives are being met.

4.3. EFFECT ON MARKET QUALITY OF A HFT SPEED RACE TO ZERO

4.3.1. Low Latency arbitrage and its incentives

Algorithmic trading may allow traders to react to market events faster than the competition and thereby increase profitability of trades. For example, when executing arbitrage strategies the opportunity to “arb” the market may only present itself for a few milliseconds before parity is achieved. To demonstrate the value that clients put on latency, a large global investment bank has stated that every millisecond lost results in \$100m per annum in lost opportunity.²⁰²

What is considered “low latency” is therefore relative. There are many factors which impact on the time it takes a trading system to detect an opportunity and to successfully exploit that opportunity, including: (i) Distance between the exchange and the trading system (ii) Distance between two trading venues, in the case of for example arbitrage (iii) Efficiency of the trading system architecture, for example networking infrastructure choice: Copper or fibre or microwave.

“Latency arbitrage” refers to trading strategies that exploit the advantage of achieving a faster speed while accessing and responding to market information earlier than competing traders. This arbitrage allows the HFT trader to know, with near certainty, where the market will be a fraction of a second ahead of everybody else.

The private value of relative speed result from two types of activities:

- 1) Exploiting or defending stale passive orders (orders placed by non HFT institutional investors) and from aggressive orders (orders placed by HFT). This practice has been estimated²⁰³ to account for, at minimum, 21bln\$ profits per year in US markets.
- 2) Obtaining a better position in order book queues than competitors with similar information and strategies. The strategy is estimated to worth at least \$500bln per year worldwide²⁰⁴.

These figures, whilst significant, only constitute a minimum estimate as they do not take into account the fleeting near-arbitrage opportunities generated from trading the same or similar instruments across different exchanges – or fragmentation. Market fragmentation has been driven by both technology and regulation: technology has made setting up an electronic exchange much cheaper, while regulation has encouraged and facilitated competition in the exchange market. The result is that more exchanges have been set up and that financial instruments are more frequently traded on more than one exchange.

²⁰² ["Wall Street's Quest To Process Data At The Speed Of Light"](http://en.wikipedia.org/wiki/Low_latency_%28capital_markets%29). Information Week., quotes in Wikipedia http://en.wikipedia.org/wiki/Low_latency_%28capital_markets%29.

²⁰³ Schneider (2012).

²⁰⁴ Skouras and Farmer (2011).

But fragmentation of securities markets across multiple exchanges is associated correlated with increased and significant investments in speed. In 2010, Spread Networks invested \$300mm to dig a high-speed optic cable from New York to Chicago which saved 3 milliseconds in round-trip data transmission. But only 1 year later, Spread's cable was already obsolete and the company moved to implement microwave technology. There are reports of speed races occurring at the level of microseconds (millionths of a second), nanoseconds²⁰⁵ (billionths of a second) and even picoseconds (trillionths of a second). This is also happening in EU markets: the life cycles of orders in European equity markets were in 2010 as short as seven microseconds (with “low latency” strategies of 40 microseconds, “market making” strategies of 180 microseconds and “statistical arbitrage” has 200 microseconds).²⁰⁶

Unfortunately it has been impossible for regulators, academics or even exchanges to estimate the profits available from fleeting near-arbitrage opportunities as this would require data synchronized at the location of trading servers and time-stamped within microsecond accuracy, which is affordable only to HFT firms themselves.

Of course, latency arbitrage comes at a private cost. Investments in speed (dedicated computer hardware and software, co-located servers on exchange floors called “proximity hosting” or even construction of dedicated communication lines) need to be continuously updated. However, any benefits result only from being faster than competing traders, resulting in a speed race that is costly for all engaged in it, even if they would all benefit from setting up a limit to the level of such investments in increasing speed. More importantly, it is doubtful that trading ever closer to the speed of light leads to any benefits in terms of market quality, as explained in the next section.

4.3.2. Empirical evidence that ever-lower latency “arms race” does not enhance market quality

The fact that HF traders only profit from higher speeds to the extent that they are faster than competing traders begs the question whether the speed race can, at least as by product, provide benefits to non-HFT participants or more generally improve market quality. Recent and independent economic research, both empirical and theoretical, suggests that this is not the case: the speeds race is a sort of prisoners dilemma and harms all participants, including many HF traders themselves, other than the few that manage to win the zero-sum race, even if such benefits are likely to be ephemeral.

Absence of benefits

Several authors, notably Gai, Yao and Ye (2013)²⁰⁷, have empirically assessed the negative externalities of this HFT speed race. They conclude that ever increasing speed has no beneficial impact on market quality: whether in terms of quoted spread, effective spread, trading volume or variance ratio. In sum higher speeds allowing for low latency strategies contribute neither to liquidity nor price discovery. However, improving speed increases the cancellation/execution ratio and the short term volatility while decreasing the market depth. Thus, speed allows HFTs to play more complex games without any accompanying social benefit. These researchers conclude

²⁰⁵ WSJ June 14, 2011 “Wall street’s need for trading Speed: the nanosecond age”.

²⁰⁶ See AMF (2011).

²⁰⁷ Presented and discussed in FED, BoE, ECB, Shanghai, NASDAQ.

there will always be an overinvestment in speed that will create a negative externality to non-HF traders.

The costs of the speed race

Three different teams of academics have also investigated separately and independently the claim that “speed race” is an outgrowth of continuous limit order book (CLOB) that dominates global stock and futures markets, but also certain FX, options and bond markets²⁰⁸. These researchers have shown that CLOB introduces a severe flaw in financial market design. CLOB is a transparent system continuous in time trading and execution that matches customer orders and on which priority is assigned based on the price of quotes and their arrival order. Investors can see market depth or the "stack" meaning they can view bid orders for various sizes and prices on one side vs. viewing offer orders at various sizes and prices on the other side. The CLOB is by definition real-time, anonymous and low cost in execution. Nevertheless, continuous markets are computationally unrealistic since exchanges can’t possibly keep up in real time - not least since this is mathematically impossible. CLOB also incentivize HFT algorithms to sacrifice efficiency for speed. Importantly, if and when there is a crisis, regulators can’t piece together what happened because the paper trail is confusing. The combination of continuous trading with fragmented markets make it hard to figure out in what order orders arrived or trades took place.

Farmer and Skouras (2012) state that it is difficult to find theoretical reasons why current speed levels incentivized by CLOB might confer significant benefits compared to its costs to society. They summarize their cost benefit approach in the following table:

Sources of potential benefits	Sources of potential costs
Faster price discovery	Speed may be achieved at the expense of more operational risks
More accurate price discovery	Increase in probability of systemic instability & collapse
Gains from trade sooner rather than later	Increase in instability in market location
	Reduces competition because it is a barrier to entry
	Wasteful arms Race
	Regulation is harder

Whereas for them the potential benefits can be easily neglected at current nano-second speeds, all but the two last sources of potential cost are high and self explanatory. For the last two, they consider speed a wasteful arms race as it results in a transfer of wealth from investors and market participants to technology participants. A winner-takes-all outcome may eventually cause competitors to exit the race decreasing competitive pressure on the winner. They also consider speed interferes with good regulation as regulators have incomparably smaller resources and incentives to collect and analyze market data than HFT firms. As a result the capability to analyze many issues of concern lags reality because markets change faster than the needed studies can be done. In sum, for them we have long reached the point where diminished returns to speed have kicked in.

Experimental and simulation evidence confirms the above findings. For example Wah and Wellman (2013) develop an agent-based model populated by representative trading strategies interacting within carefully specified market mechanisms. Their model comprises a latency arbitrageur and multiple non-HF traders, with a single security whose trading is fragmented

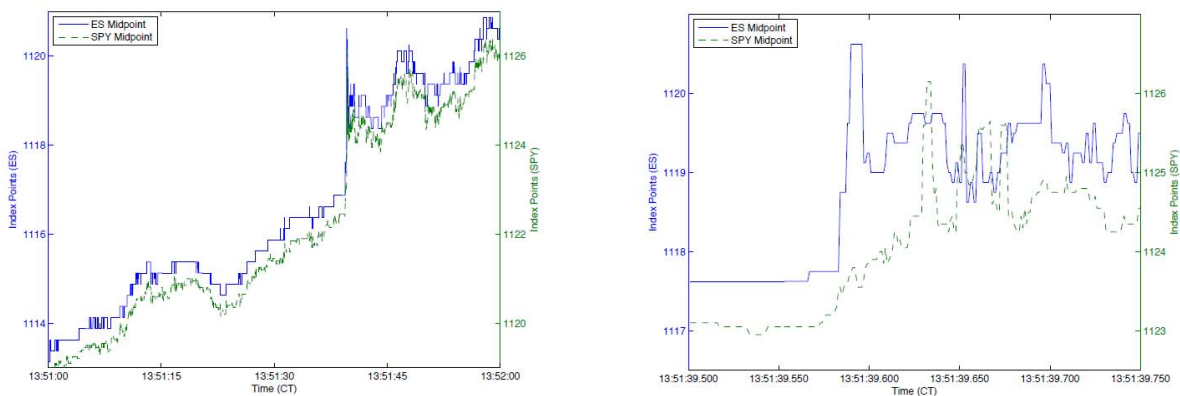
²⁰⁸ CLOB dominate global stock and futures markets, but also appear in certain FX, options and bond markets.

across two markets. They implement their model in a discrete-event simulation system which affords the precise specification of temporal changes in system state. Their experiment evaluate: presence of latency arbitrage, market fragmentation, market clearing rules, allocative efficiency, liquidity, volatility and price discovery. They find that the presence of a latency arbitrageur reduces total surplus and has a mixed effect on market liquidity, reflected in slightly improved execution times but widened bid-ask spreads. Consequently, they demonstrate that market efficiency is negatively affected by the actions of a latency arbitrageur, with no countervailing benefit in liquidity or any other measured market performance characteristic. For them as markets employ continuous trading, enables speed advantaged traders to make risk-free profits over fragmented markets and which degrades overall efficiency.

Flawed market design?

The absence of benefits in terms of market quality associated with the low-latency speed race in the context of CLOB, together with potential significant costs has shifted attention to alternative market designs that would further minimise the risks of ever-lower latency trading - essentially, by stopping the zero sum speed race but without affecting the positive effects of HFT activity.

Graph 4.3.1 Time Series at Human-Scale and High-Frequency Time Horizons



A recent simulation study by Busish, Cramton and Shim (2013) suggests one way to do this. It uses millisecond-level data from exchanges. It shows that the CLOB market design does not actually work in continuous time: market correlations that function properly at human-scale time horizons completely break down at high-frequency time horizons (see Graph 4.3.1). That is because continuous time markets don't actually work in continuous time. Nothing in market structure allows correlated securities prices to change at exactly the same time therefore correlation breakdown is inevitable.

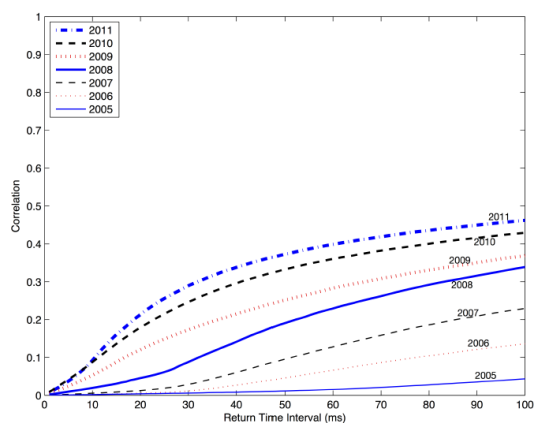
This correlation breakdown has real consequences: it creates purely technical arbitrage profits, available only to whoever is fastest. They subsequently show that while the duration of this arbitrage has decline over time (see Graph 4.3.2), the profitability is extraordinarily constant.

These findings suggest that while there is an arms race in speed, the arms race does not actually eliminate the arbitrage opportunities; rather, it just continually raises the bar for capturing them, meaning this inefficiency is not competed away over time.

Informed by these empirical facts they develop a theoretical model that shows that liquidity providers usually lose the race, even if liquidity providers can invest in speed technologies. In a

competitive market, liquidity providers must incorporate the cost of getting sniped into the bid-ask²⁰⁹ spread (meaning that HFT may make a profit for setting the wrong price – therefore liquidity providers widen the spread to compensate and reduce the chance of this happening) that they charge; this is a purely technical cost of liquidity provision caused by the CLOB market design.

Graph 4.3.2 Arbitrage durations per year



Therefore ultimately all of the money that market participants invest in speed technology comes out of the pockets of fundamental investors via these wider bid-ask spreads. A related implication is that CLOB markets are unnecessarily thin. The equilibrium of their model can be interpreted as the outcome of a prisoner’s dilemma. If all of the market participants – both liquidity providers and those looking to snipe stale/old quotes – could commit not to invest in speed, they would all be better off. But, each individual market participant has incentive to deviate and invest in speed. Therefore for them the HFT arms race is an inevitable consequence of the CLOB market design.

4.3.3. Alternative regulatory approaches to limit the HFT speed race

The latest studies find the speed arm race to be harmful and so propose a resetting of the current financial market design to decrease this externality. Proposals are sorted from most radical to least disruptive or feasible.

Pigovian taxes

As relative increases in speed are seem to have harmful externalities a Pigovian tax to internalize its cost is a straightforward proposal. The tax can be imposed on any investments in speed (Biais, Foucault, Moinas, 2011). The other alternative is to tax rapid order cancellation, which is accomplished through a cancellation fee. Friederich and Payne (2013). Also, when a trader’s investment in speed can be neutralized by the same investment by his competitors in a positional game, a restriction on this type of investment may benefit all traders in the market as long as the restriction does not change the relative ranking of speed. Also a broad Financial Transaction Tax could curb speed dramatically. However, these proposals are not without risk since they would indiscriminately kill large and diverse niches of trading activity with far reaching unintended

²⁰⁹ This just means that someone may make a profit for setting the wrong price – therefore they widen the spread to compensate and reduce the chance of this happening.

consequences. They would also disrupt liquidity and distort price formation and unless done globally will allow huge regulatory arbitrage opportunities to arise.

Direct regulation on speed

A minimum quote life (or resting order) could be applied to liquidity providers. However the general consensus is that this requirement may not slow down the market but it is widely expected to have a big impact on liquidity. Indeed, liquidity providers will suffer losses if they cannot cancel orders when the market moves against them. As a result they may simply widen spreads or exit the market entirely. This measure may also increase the speed of execution relative to cancellation.

An alternative proposal is to decrease the importance of time priority below the millisecond level, where orders that arrive at the same millisecond share priority. This policy would change the relative speed of liquidity providers and liquidity demanders, which leads to an ambiguous effect. Decreasing the importance of time priority, however, affects all traders in a similar manner.

Private Arms control Agreement

Collectively, the high-frequency traders may be better off by not investing in speed, but the individual rationale of each trader provides a strong incentive to deviate. The private solution to this problem is called the positional arms control agreement (Bernanke and Frank, 2012), in which market participants agree not to engage in mutually offsetting investments or activities. One challenge to this solution is the difficulty for a trader to verify the actions of his competitors. As a result, the consolidated audit trail to be created by the regulators is the first step for this type of solution.

Batch auctions

Several specialised researchers and expert academics have proposed introducing Batch Auctions as a way to address the core fatal flaw in CLOB that fuels the HFT zero sum speed race. This proposal involves requiring exchanges to replace CLOB with uniform-price sealed-bid auctions run at frequent but discrete time intervals, such as every 1 second or 100ms (i.e. batch auctions; see process flow in Chart 4.3.3 as proposed by Budish et al (2014))²¹⁰.

This is seen as a more subtle way to contain the private benefits to speed for HFT racers, reducing speed without having much direct impact on trading strategies that are not predicated on speed i.e. it will slow down markets a lot relative to continuous trading but most investors won't be able to tell the difference and would not be negatively impacted in any way. This is more of a technocratic, backend, proposal than a radical "slowing down" of markets. Batching eliminates the arms race for two reasons.

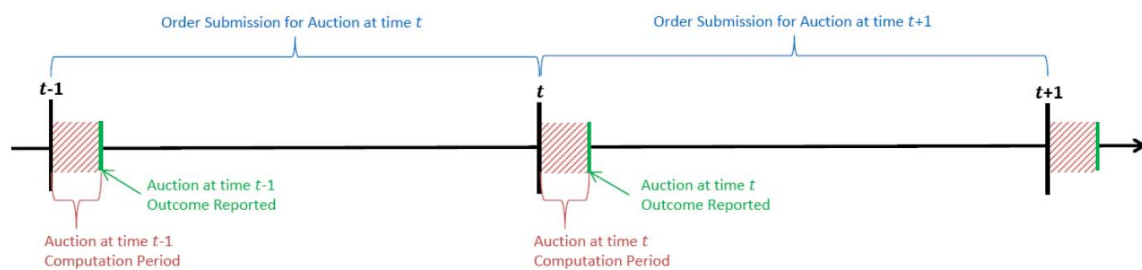
- i. First, batching substantially reduces the value of a tiny speed advantage while otherwise affecting markets as little as possible.

²¹⁰ Different researchers propose slightly different minimal specific differences on the duration of the auctions but the essence of their proposal is similar. For Farmer and Skouras (2012), Wah and Wellman (2013) and Busish, Cramton and Shim (2013) frequent batch auctions are the best market design response to the HFT arms race.

- ii. Second, batching changes the nature of competition among fast traders, encouraging competition on price instead of speed. This ultimately benefits fundamental investors, via deeper markets with better prices (narrower spreads, especially for large lots).

Batch auctions also benefits market surveillance providing cleaner paper trail. Intuitively, in the CLOB market design, it is possible to earn a rent based on a piece of information that many fast traders observe at the same time because it process orders serially, and somebody is always first. In the batch market, by contrast, if multiple traders observe the same information at the same time, they are forced to compete on price instead of speed. For these reasons, frequent batch auctions eliminate the cost of liquidity provision in CLOB markets associated with stale quotes getting sniped. Batching also resolves the prisoner’s dilemma associated with CLOB markets, and in a manner that allocates the welfare savings to fundamental investors. In equilibrium of the frequent batch auction, relative to CLOB, bid-ask spreads are narrower, markets are deeper, and social welfare is thereby enhanced unambiguously.

Chart 4.3.3 Process flow for frequent batch auctions



Source: Budish, Cramton and Shim (2014)

Proponents of batch auctioning also suggest that it may offer market stability benefits:

First, frequent batch auctions give exchange computers a discrete period of time to process current orders which simplifies the exchange’s computational task, perhaps making markets less vulnerable to incidents like the August 2013 NASDAQ outage, and also prevents order backlog and incorrect time stamps (issues that occurred during the Facebook IPO and the Flash Crash). Second, batching also reduces the incentive to trade off code robustness for speed; error checking takes time.

Third, frequent batch auctions produce a better paper trail for regulators, exchanges, market participants and fundamental investors, i.e. all market participants.

Lastly, the market thickness resulting from the theoretical model can also be interpreted as a stability benefit of frequent batch auctions, since thin markets are more vulnerable to what have come to be known as “mini flash crashes”.

Despite all the available empirical and theoretical evidence indicates that introducing batch auctions is very likely to limit the zero sum speed race which HF traders are trapped in, to the benefit of all market participants (possibly including HF traders themselves) and market quality there exists certain obstacles to the adoption of batch auctioning to improve market design,

whether through self-regulation by market participants or by regulatory fiat. These are discussed in the next section.

4.3.4. Obstacles to the Implementation of Batch Auctioning

Auctions have long been used by exchanges to set opening and closing prices, so the idea of auctions is not something that is in any way novel to them. However, auctions are predominantly used at the opening and closing trading period as these are the times when liquidity is greatest and there is a need to set a price that is an average of a number of orders. Auctions are a fair and efficient way of doing this. However if during the rest of the day, there may not be sufficient liquidity in the market (meaning there will not be HF trading) to sustain an auction process on an ongoing basis.

More importantly, one may reasonably ask why market forces have not delivered a trading mechanism based on batch-auctioning if it is as effective as claimed by proponents and as suggested by the empirical evidence.

One obstacle is, naturally, the opposition from those HFTs and infrastructure providers that for different reasons stand to benefit from the continued race to faster trading ever closer to the speed of light: *“When you solve an arms race, the key losers are the arms dealers and anyone who had an arms stockpile. Arms dealers in this case are the exchanges, cable, microwave providers. And who has arms stockpile are HFT firms who are presently fastest”*. Hence, here will be some market participants who will lose from adopting proposed batch-auction mechanism, especially stakeholders in the private value of speed. These include trading operations as well as market venues where the competitive edge comes from their own speed. Some market venues in fact may become redundant in slower markets. For example, and somewhat ironically, an important reason for why “dark pool” markets have become popular is because such markets decrease the advantage of high frequency traders. To the extent this is true, batch-auctions would in fact undermine the commercial viability of dark pools and related markets. This would seem of relatively little importance other than to the stakeholders in the companies that own these market mechanisms.

Regulatory arbitrage is also a concern. Auctions are a system of execution that has been long authorised under the current MiFID in EU markets. Hence there is nothing in the legislation standing in the way of replacing CLOB with a different market design that relies primarily on batch auctions every ever second, or every 100ms. This, however, is not the case in the US. US legislation has historically adopted a far more prescriptive approach to the order matching system – for example the new US Swaps regime requires that trading venues can only use a CLOB.

A related but rather technical consideration is that for the batch auction proposal to work optimally it might require that no transparency takes place during the auction process (at 1 or half a second); many exchanges have expressed their concerns on the gaming issues that would arise if bids in a batch auction were displayed before the auction is conducted. It is not clear whether this lack of transparency is absolutely critical for the batch-auction mechanism, but it seems reasonable to expect that such a requirement would probably lessen its effectiveness. Nonetheless, even if pre-trade transparency may limit the magnitude of the benefits of batch-auctioning it does not in any way undermine the mechanism through which such benefits arise, in particular as regards slowing down the zero sum speed race.

Moreover, from a policy perspective alone, it is well understood that pre-trade transparency is an absolute necessity in cases where humans are engaging in trading decisions, and equally useful even in the case of automated trades that typically last half an hour or a portion of a day. However, the general consensus is that there are decreasing marginal benefits of pre-trade transparency as trades approach a second or a millisecond duration, that is, at the nano-second or pico-second speeds. At these speeds only HFTs engaged in a speed race can make use of pre-trade bid and ask quotes to develop ever more sophisticated and complex algorithms to continue to extract rents from millisecond latency advantage, even if this is at the expense of institutional market makers and liquidity providers.

Hence, building of the principles and objectives enshrined in MiFID II it may be appropriate in the context of drafting and implementation of secondary legislation to give due consideration to the calibration of pre-trade transparency requirements in the very single and very specific case of batch auctions, possibly through a system of limited waivers and only for certain markets.²¹¹ Indeed, already for non-equities, pre trade transparency waivers based on market model are already permitted.²¹²

However, the primary reason that a batch-auction mechanism is unlikely to evolve to limit the speed race among HFTs, without regulatory intervention, is that competition among markets has essentially become a competition to attract the handful of institutions that provide liquidity and these institutions use high frequency technology. It is therefore very difficult for a “slow” market to threaten incumbent fast markets, even though this might be a more efficient market structure and could have been the observed outcome were it not for path dependency and various historical accidents including previous regulations.

All exchanges would benefit from stopping the speed race but there would then be an inevitable and unilateral incentive for one exchange, provided all others introduced batch auctioning, to deviate and reintroduce CLOB thus allowing the speed race to continue and attracting all HF traders to its venue. In sum, in the absence of regulatory coordination or incentives it seems unlikely that markets will choose to slow themselves down voluntarily, even though introducing market design relying on batch-auctions as opposed to CLOB has been shown empirically and theoretically to mitigate the negative externalities of a race towards trading at the speed thereby inducing a more efficient market structure conducive to greater market quality.

Regulators, however, can still overcome some of the above obstacles in various ways: First, getting stakeholders to agree that “in an ideal world” they should prefer frequent batching to continuous limit order books would be an important first step. Second, it is clear from the above discussion that some form of regulatory coordination is essential. A fragmented batch auction doesn't work.

²¹¹ Moreover, to the extent the batch auction market design discourages or eliminates the zero sum race towards trading at the speed of light, this would obviate the need for supervision and regulation of HFT at ever shorter speeds, and the very significant associated costs, both to ensure adequate enforcement and supervision as well as compliance costs to all participants.

²¹² Although it is not clear how attractive batch auctions could be held for most non equities given their liquidity profile.

Looking ahead, there will be delegated or implementing acts for which the Commission is empowered under MiFID. They will also deal with the question whether listing companies could have the right to choose frequent batch auctions.

4.4. CONCLUSION AND OUTLOOK

The risks posed by HFT have been identified and measures to address these risks adopted in the agreement on the MiFID review. An updated MiFID II will introduce new safeguards for algorithmic and high frequency trading activities which have drastically increased the speed of trading and pose possible systemic risks. The proposals plan to introduce a series of safeguards both on market participants who use algorithms as part of their trading strategies as well as on trading venues where algorithmic and high-frequency trading takes place:

- Information requirements towards regulators on the strategies of various algorithmic traders will be enhanced, and stricter checks will be imposed on arrangements whereby members of trading venues allow other firms employing high-frequency algorithms to access public markets through their systems. Currently, regulators do not know which kinds of strategies are being used, by which strategy an order is generated, and members may not check what sort of strategies the persons using their systems are using and how those persons control their strategies.

- Trading venues will also be required to have robust controls against problems such as disorderly trading, erratic price movements, and capacity overload. To mitigate the latter, limits will be placed on how many orders per transaction participants can place as well as on how far venues may compete in attracting order flow for example by reducing the size by which prices may rise or fall ("tick size") or through the design of their fee structures. The order to transaction ratio and the minimum tick size will be determined in subsequent measures.

- Additionally, requirements for algorithmic traders to trade on a continuous basis are foreseen to reduce volatility and contribute to more orderly trading.

- Finally, venues shall be required to be able to halt trading in case of significant price movements ("circuit breakers") in a harmonised fashion.

It is hard to imagine what markets will look like ten years from now, even if the measures introduced in MiFID II will be successful and all the intended benefits will materialise. In some sense, regulation and supervision of HFT activity is a moving target.

However EU regulators should be fully conscious of the risks. In the next decade, what "minute" means will change with technology but the basic nature of the speed race is likely to remain the same. Regulators can intervene if necessary and appropriate, relying on all the available theoretical and empirical evidence on the effects of HFT, in order to ensure market quality, integrity and efficiency.

The recent evidence reviewed in this chapter suggests conclusively that the replacement of continuous-time limit-order book by discrete-time frequent batch auctions would reduce some of the non-disputed harms produced by HFT dynamics. We have argued that, in principle, its adoption would not necessarily be dependent on regulatory intervention. For example, a listing exchange may choose to run frequent batch auctions instead of continuous trading, for a subset of securities. In addition, the exchange may offer the listing company the option to elect frequent batch auctions instead of continuous trading. If a company were to elect batch auctions, its stock

would trade only on the listing exchange, since otherwise fragmentation would undermine the batch–auction system: one needs a single unified order book to discover the market-clearing price. In this set up, competition occurs at the level of competition for listings.

However, regulatory oversight and action may be advisable, in the event that individual incentives for exchanges restrict or discourage the adoption of batch auctions for certain securities, even if this would be collectively beneficial to the listing companies, and ultimately to most exchanges²¹³, as the theoretical and empirical evidence reported in this chapter suggests. Nonetheless any regulatory intervention would need to be supported in a thorough analysis of all the available evidence and due consideration is needed of possible unintended consequences and the costs to exchanges of re-designing their systems.

Glossary of Chapter 4²¹⁴

Dark pools: Networks that allow traders to buy or sell large orders outside the exchanges without pre-trade prices (the price at which shares are offered for sale).

Ping orders: The practice of entering small orders to ascertain the level of hidden orders.

Quote stuffing: The practice of entering large numbers of orders to create uncertainty for other participants which is called congestion.

Layering and spoofing: The practice of entering manipulative orders that are not executed in the end.

Momentum ignition: The practice of entering orders intended to start or exacerbate a trend.

Sniping or picking off of passive stale orders: The practice of taking advantage of liquidity providers through speed.

Consolidated order-level audit trails: Is a chronological consolidated set of records that provides documentary evidence of the sequence of activities that have affected at any time a specific operation.

Minimum cancel to fill ratio or order cancellation ratio: Puts an upper limit on the order-to-execution-ratios to encourage traders to cancel fewer orders.

Excess message fees: Fees imposed on HFT that generates too much message traffic in the exchanges.

Minimum tick size: The smallest allowable increment between quoted prices in a market.

Minimum quote life or minimum resting times: Specify a minimum time that a limit order must remain in force.

Kill switches or circuit breakers: Tools to quickly stop trading algorithms from running.

Pigovian tax: Is a tax applied to a market activity that is generating negative externalities.

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²¹³ This is a coordination failure reminiscent of the traditional prisoners dilemma, where it is a dominant strategy for each participant to act in a self-interested way, but in doing so, all players end up worse-off than if they had acted to maximise collective benefits or profits. Coordination failures of this kind are one of many instances of market failure defeating or reversing the presumption that the purely self-interested conduct of market participants interacting through even perfectly competitive and unfettered markets, tends to enhance collective welfare.

²¹⁴ See also the glossary at http://ec.europa.eu/internal_market/securities/docs/glossary_en.pdf

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CHAPTER 5: CHANGES AND DEVELOPMENTS IN COMMODITY DERIVATIVES MARKETS AND THEIR REGULATION

5.1. INTRODUCTION - MOTIVATION OF THE CHAPTER

Commodity markets have changed considerably over the last fifteen years. This transformation has been both quantitative and qualitative, and is the result of a number of structural developments that happened during the 1990s and 2000s. Among those are a dramatic rise in global trade, market deregulation in the US, important technological and legal developments, increased liquidity and access to finance for commodity markets participants.

The commodity markets structure that evolved and formed around this new environment is one where **commodity-linked financial transactions have grown in size, complexity and purposes**. Financial participants have entered or re-entered financial, and to a lower degree also physical, commodity markets, raising concerns about their role and influence in both markets.

The financial crisis did not spare commodity markets. On the contrary it revealed, through price developments and market events, **how intertwined commodity markets' assets, participants and structures are with those of financial markets**. In the framework of the G20, and in the context of the FSB and of IOSCO's work on financial and commodity markets reform, policy makers and financial supervisors are currently in the process of responding to this new set of relationships with a view to implementing appropriate policy responses.

The objective of this chapter is primarily to take stock of the important changes that happened in the commodities sphere over the last fifteen years and to convey the on-going debate on risks arising from these changes. Further, the chapter analyses current developments from a policy point of view and describes the **state of play of regulatory reform of commodity markets in the EU**.

Section 2 provides an overview of the key features of commodity markets and explains how commodity derivatives are used to manage risk across market segments. It also provides a brief overview of recent developments and trends in commodity markets and exposes the large impact of the financial on those.

Section 3 discusses risks attached to commodity markets, focusing on the lack of transparency and market concentration, leading to asymmetry of information for market participants and regulators and to counterparty risks. It also examines the regulatory responses to address those risks, mainly in the US through the Dodd-Frank Act in the US and in the EU through the EMIR²¹⁵, MiFID II²¹⁶ and revised MAR²¹⁷ package and the Commission proposal for a regulation on benchmarks²¹⁸.

²¹⁵ Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties (CCPs) and trade repositories (TRs) (EMIR).

Section 4 concludes that whilst it is not possible yet to determine the overall impacts of the commodity derivative markets reform, recent phenomena in commodity derivatives markets, such as the ‘futuresisation’ trend driven by regulatory developments, point out to potential positive impacts on transparency, decrease of information asymmetries and reduction of counterparty risks. It also looks at potential new challenges in the regulation of commodity markets.

5.2. THE GROWTH OF COMMODITY FINANCIAL TRANSACTIONS IN TERMS OF SIZE, COMPLEXITY AND PURPOSES.

Alongside physical commodity markets, financial commodity markets (also referred to as commodity derivatives markets) allow for risk transfer amongst market participants using either **exchange-traded standardised contracts (futures contracts and listed options)** or **over-the-counter (OTC) bilateral contracts (forwards, swaps and OTC options)**. Thus, commodity derivatives markets play an important role in facilitating the management of a number of risks attached to physical commodity markets and in doing so, they support the development of international commodity trade. In addition, because of their relationship with physical commodity markets, commodity derivatives markets are essential to facilitating price formation and discovery also in the physical markets.

In addition to these risk transfer and risk management functions, over the last fifteen years, commodity derivatives markets have grown as an asset market through their "financialisation". Financialisation refers to the various uses of commodities derivatives for investment purposes (be it mutual funds, hedge funds, exchange-traded vehicles, over-the-counter swaps, structured debt instruments, etc.). With financialisation, new market participants have entered these markets adding to their complexity. Therefore, commodity derivatives markets have grown in size, scope and interconnectedness.

Following the period of high volatility of commodity prices and the sustained price increase for some commodities in the run-up to and during the crisis, there is an ongoing debate about potential negative effects of the financialisation of commodity derivatives markets.

To provide a framework from which this chapter can be understood and avoid confusion on the main instruments and vehicles used by market participants, their definitions are provided below as well as other trading jargon.

²¹⁶ Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on markets in financial instruments repealing Directive 2004/39/EC of the European Parliament and of the Council, Brussels, 20.10.2011, COM(2011) 656 final, 2011/0298 (COD).

²¹⁷ COM(2011) 651

²¹⁸ Proposal for a Regulation on indices used as benchmark in financial instruments and financial contracts (COM(2013) 641 final) of 18 September 2013, which objectives and content are explained more detail in section 2.3.

Trading jargon

For all instruments, the party agreeing to buy a commodity is said to take a long position and the party agreeing to sell a commodity is said to take a short position. Commodity derivative contracts can be consummated or settled physically, with the underlying commodity being delivered on the expiration date from the seller to the buyer, or by cash.

Commodity derivatives markets instruments

1. Exchange traded commodities derivatives

- Commodity futures contracts (or ‘futures’) are standardised contracts, traded on an exchange between two parties, to buy or sell an agreed quantity of a commodity at a specified future time and at a price agreed upfront. Future contracts can be settled in cash or physically. Detailed futures markets data is directly available through futures exchanges and providers of financial markets data.

2. OTC Commodities derivatives

These types of bilateral transactions always involve a financial intermediary or dealer which is called “sell side”, and the rest of investors in this market which are called “buy side”. In addition to the economic risk, the “buy side” bears the counterparty risk that the “sell side” may not honour its commitment to pay. The market data is opaque.

- A Commodity forward contract is a non-standardised contract between two parties to buy or sell a commodity at a specified future time at a price agreed upfront. Commodity forwards are commonly settled physically but can also be settled in cash. Its economic essence is the same as that of future but it is traded OTC.
- A Single commodity swap is an agreement between two parties under which the cash flows that need to be exchanged are dependent on the price changes of the underlying commodity during the life of the contract. This type of contract works essentially as a series of cash settled commodity forward contracts.
- A Commodity index swap is an agreement between two parties under which the cash flows that need to be exchanged are dependent on a commodity index performance. A commodity index is an index that tracks a basket of commodities to measure their performance. These indexes are often traded on exchanges, allowing investors to gain easier access to commodities without having to enter the futures market. The value of these indexes fluctuates based on that of their underlying commodities, and this value can be traded on an exchange in much the same way as stock index futures. Periodic payments will be made to account for any change in the level of the index versus the agreed fixed price. In entering the swap, the dealer is effectively short in the index and manages the risk by establishing long positions in the index underlying commodities futures contracts. This instrument can also be referred to as a commodity investment swap, and it can be classified as an investment vehicle as it represents for some institutional investors (pension funds, insurance companies, etc.) the typical vehicle to access commodity markets as investors.

3. Mix of exchange traded commodities derivatives & OTC Commodities derivatives

- Commodity options can be exchange-traded, if they are standardised or OTC-traded, if they are bespoke. The terms of the OTC options are tailored to individual needs. These contracts give the buyer the right but not the obligation to buy or sell a certain quantity of that commodity at a particular price after a particular period of time.

Investment vehicles in commodities

- Investment funds such as Mutual funds and Hedge Funds, which are invested in commodities either through directly holding commodity futures or through commodity index swaps
- Exchange Traded Products (ETPs), also referred to as Exchange Traded Vehicles (ETVs), comprise Exchange Traded Funds (ETFs), Exchange Traded Notes (ETNs) and Exchange Traded Commodities (ETCs).
 - ETFs are exchange-listed investments which track the performance of a commodity instrument, through full replication (purchase of futures) or through synthetic replication (swap agreement). ETFs are funds and not debt instruments.
 - ETNs are structured investments issued by financial intermediaries that track the performance of a commodity instrument and they are a type of unsecured, unsubordinated debt security listed on exchange. They can be collateralised or uncollateralised (fully exposed to counterparty risk).
 - ETCs are similar to ETFs and track the performance of commodities through either a physical replication approach (storage – especially for precious metals) or through a futures contract replication technique. ETCs are fully collateralised secured debt securities.
- Commodity-linked medium-term notes (MTNs) are linked to either the price of a single commodity, a basket of commodities, or a commodity index. These are structured products issued by investment banks to investors who are attracted to commodities but prefer the fixed income form of assets (coupon interest payment and principal repayment at maturity), just as ETNs. The investor also has to bear the full counterparty risk of the issuer in the event of a default. The buyers of these products are normally interested only in the potential returns offered by commodity markets, and do not have any underlying positions to hedge.

The vehicle for investing in financial commodity markets should not be confused with the actual instrument in which a vehicle invests, although markets instruments can also be used as direct ways to invest in commodities. For example, an institutional investor can directly buy a single commodity swap or a commodity index swap to an investment bank. Alternatively, the institutional investor can buy into a mutual fund or a hedge fund invested in commodities or an ETF tracking the performance of commodities (in that case the fund manager or the hedge fund manager buys the commodity swap to the investment bank). Some fund managers can take the route of building their commodity exposure by buying

futures contracts instead, leaving to themselves the task of rolling the futures contracts maturities when they approach expiry.

5.2.1. Growth in size

To compare correctly the size of commodity markets it is important to use the right metrics.

For exchange-traded derivatives: Open Interest is the key variable to measure size. Open interest is the total of all futures and option contracts entered into and not yet offset by any opposite transaction. The aggregate of all long (buy) open interest is equal to the aggregate of all short (sell) open interest. As commodity futures contracts are traded on organised exchanges, data on total open interest for particular commodity futures is available through the exchanges or financial data services providers.

For OTC derivatives: Notional amounts outstanding are the relevant variable to measure size. Nominal or notional amounts outstanding are defined as the gross nominal or notional value of all contract deals which will be settled in the future.

Other exchange data exist like the number of contracts or volume of transactions but are not comparable with the notional amounts outstanding in value for OTC markets and they provide only a fragmented view of the size of these markets.

Ideally in the future, and in particular in the case of OTC markets, useful data to collect should include gross and net notional values, trade count and open interest, broken down by dealers/non-dealers and commercial/non-commercial from participants others than financial intermediaries, this is, the buy side. The data should also be grouped per commodity type, as different underlying commodities exhibit very different characteristics. These data could then be combined with the exchanges data to explore the links between OTC derivatives and their underlying commodities future markets. These data could help regulators to detect and monitor the presence of undesirable underlying market outcomes arising from OTC commodities drivers.

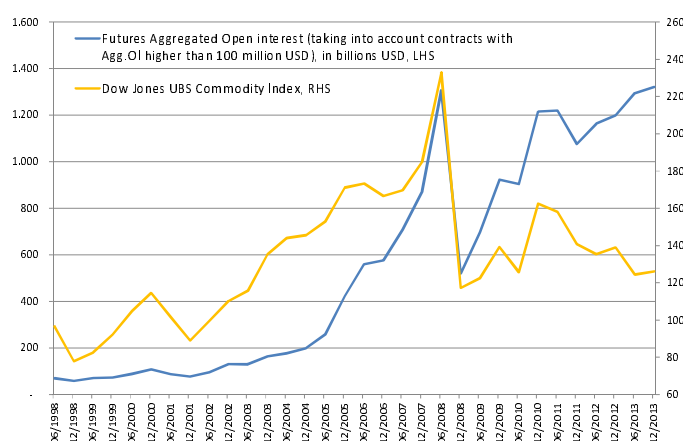
Futures markets

Using open interests as measure of size, the commodity futures market has grown from around \$70 billion in 1998-1999 to \$1307 billion in June 2008 (see Chart 5.1). Prior to the crisis growth was supported by the rise of commodity prices: between June 1998 and June 2008 the Dow Jones-UBS Commodity Index²¹⁹ increased by 141%. The drop of total open interest during the second half of 2008, from \$1307 billion to \$519 billion in Dec 2008 (-60%) was in tune with the evolution of commodity prices (for the same period the DJ-UBS Commodity Index fell 50%) and suggests a large value effect at the time.

²¹⁹ The Dow Jones-UBS Commodity Index (DJ-UBSCI) is a broadly diversified index that allows investors to track commodity futures through a single, simple measure. It is one of the two main commodity markets benchmark, the other one being the Standard & Poor's Goldman Sachs Commodity Index (S&P GSCI). The DJ-UBSCI is composed of commodities traded on U.S. exchanges, with the exception of aluminium, nickel and zinc, which trade on the London Metal Exchange (LME). For more information see <http://www.djindexes.com/commodity/>

Interestingly, since then, the aggregated open interest has totally recovered to reach \$1349 billion in Dec 2013, while the DJ-UBS Commodity Index stayed at the same level.²²⁰ The increase of open interest from 2008 until 2012 beyond the increase in the commodity index could be explained by the run out of financial markets at the beginning of the crisis accompanied by the increase of liquidity provided by central banks. Nevertheless, the change in the positive correlation between these two variables since 2012 is mostly explained by the “futurisation” phenomena (see next section).

Chart 5.1. Evolution of future open interest versus DJ UBS Commodity Index



Source: Bloomberg, EC calculation. Note: The chart above computes, for commodity futures markets, the worldwide sum of the aggregated (all maturities for any given contract) open interests in USD, taking into account only contracts with aggregated open interests in excess of USD 100 million in Dec 2013.

When looking at the breakdown per commodity and per region (Table 5.1), US exchanges currently hold the lion's share of the total aggregated open interest. This is especially true for energy refined products (gasoline, heating oil, RBOB gasoline, etc.) and natural gas, where the shares of US exchanges are 73% and 89.1% respectively. US exchanges also hold also a very large share of the aggregated open interest for agricultural commodities such as soybean²²¹, corn and wheat (61.7%, 88.4% and 75.8% respectively).

European futures exchanges exhibit sizeable market shares in crude oil (Brent crude oil and WTI crude oil futures contracts from ICE Futures Europe exchange²²²), with 53.7% market share, and industrial metals through the London Metal Exchange.

²²⁰ These figures are in line with the trend and figures reported by the industry. See for example J.P.Morgan, Global Commodities Research (3 January 2012), "Commodity Investment Flow Monitor" page 8 reporting the listed open interest of 43 commodity futures markets from 2000 to Dec 2011. At the end of Dec 2011 the open interest of this set of commodity futures stands at \$ 873 bn and close to the 2008 peak (\$ 975bn). It increases progressively from 2000 (below \$ 100bn) and then strongly up to 2008.

²²¹ The aggregated open interest for soybean is for the soybean complex, i.e. including futures contracts for soybean, soybean oil and soybean meal.

²²² Established in 1981 as the International Petroleum Exchange of London (IPE), and acquired by ICE in 2001, ICE Futures Europe is the largest regulated energy futures exchange in Europe, and the second largest in the world. Its Global benchmark ICE Brent Crude is relied upon to price two-thirds of the world's physical oil. It is

Table 5.1. Breakdown of futures open interests by type of commodity and geography of the trade

Commodity Sector	Commodity Sub-Sector	Aggregated Futures Open Interest (\$ bn)	US Exchanges (\$ bn)	US Exchanges (World share in %)	European Exchanges (\$ bn)	European Exchanges (World share in %)	Chinese Exchanges (\$ bn)	Chinese Exchanges (World share in %)
ENERGY	Crude Oil	424,0	194,2	45,8%	227,8	53,7%		
	Refined Products	188,2	137,4	73,0%	48,4	25,7%	0,3	0,2%
	Natural Gas	130,7	116,4	89,1%	14,2	10,8%		
	Electricity	48,6	7,1	14,6%	38,4	79,1%		
	Coal	43,3	15,0	34,6%	13,6	31,5%	14,7	34,0%
	Total Energy	834,8	470,0	56,3%	342,4	41,0%	15,1	1,8%
METALS	Industrial Metals	154,3	13,9	9,0%	69,5	45,0%	67,3	43,6%
	Gold	58,8	46,6	79,2%			14,5	24,6%
	Other Precious Metals	28,7	19,8	69,3%			7,4	25,8%
	Total Metals	241,7	80,3	33,2%	69,5	28,8%	89,2	36,9%
AGRICULTURE	Soybean	101,1	62,4	61,7%			33,7	33,3%
	Corn	28,6	25,3	88,4%	0,4	1,4%	1,4	4,9%
	Wheat	26,3	19,9	75,8%	4,1	15,6%	1,4	5,4%
	Other Grains	16,6	0,4	2,4%	1,7	10,2%	9,1	54,4%
	Sugar	23,7	15,1	63,5%	1,7	7,0%	6,6	27,8%
	Cocoa	12,2	5,9	48,1%	6,3	51,9%		
	Coffee	8,3	6,6	79,2%	1,6	19,5%		
	Other Foodstuff	17,4	2,7	15,6%			7,0	40,1%
	Fibers (Cotton...)	8,7	6,7	76,9%			1,5	16,9%
	Livestock	30,0	29,8	99,5%				
	Total Agriculture	272,8	174,7	64%	15,8	5,8%	60,6	22,2%
Total	1.349,4	725,0	53,7%	427,7	31,7%	164,8	12,2%	

Source: Bloomberg, European Commission – DG Internal Market's calculation. Note: For commodity futures markets, the worldwide sum of the aggregated (all maturities for any given contract) open interests in USD, taking into account only contracts with aggregated open interests in excess of USD 100 million in Dec 2013.

It is worth noting the increasing size of Chinese exchanges (Shanghai Futures Exchange, Dalian Commodity Exchange and Zhengzhou Commodity Exchange), mainly for metals and agricultural commodities. Their importance has grown rapidly over the last few years and they represent, as of Dec 2013, a global market share of 12.2% (by aggregated open interest).

OTC markets

According to the BIS²²³, in the run-up to the crisis the size of the OTC commodity markets ballooned reaching \$7783 billion in June 2008²²⁴. The commodity OTC markets size experienced a 30-fold increase in ten years (from \$256 billion in June 1998 to \$7783 billion in June 2008), presenting a considerably larger increase than that of the size of the commodity futures markets mentioned before. This very significant growth in the notional value of OTC commodity derivatives since the mid-2000s corresponds to a period of increased participation by non-commercial traders in commodity markets.

regulated by the U.K. Financial Conduct Authority, with oversight by the U.S. CFTC for linked contracts. For more information https://www.theice.com/futures_europe.jhtml

²²³ <http://www.bis.org/statistics/derstats.htm>

²²⁴ Notional amounts outstanding of OTC commodity derivatives, including only forwards and swaps, i.e. excluding options. Notional amounts outstanding of OTC commodity derivatives forwards and swaps represent a comparable metrics to aggregated open interest for futures contracts.

In percentage terms, the burst of the financial crisis was as devastating to the commodity OTC markets as it was to their futures counterparts. The notional amounts outstanding of OTC forwards and swaps decreased 66% during the second half of 2008 while the fall was 60% for the aggregated commodity futures open interest. Remarkably, contrary to commodity futures markets, OTC commodity markets have continued to shrink post-crisis and the size difference between both is now at a 15 year low (see Chart 5.2).

While in the run-up to the crisis the OTC commodity markets became significantly larger than the commodity futures markets (6 times larger by June 2008), their relative size has been converging recently. This is due not only to the growth of the futures markets but also to the simultaneous contraction of the OTC markets post-crisis, which suggests that a shift from OTC to equivalent exchange-traded transactions is taking place. We explore one of the drivers of this market development in the next section.

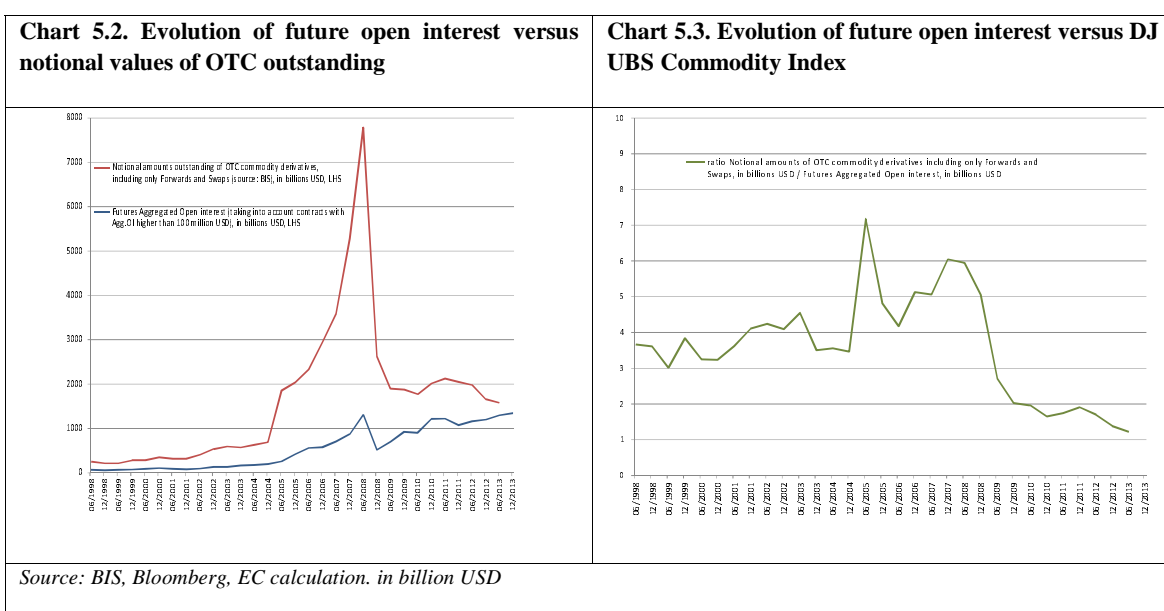


Table 5.2. Financial Commodity Markets

(in \$ bn)	Exchange-traded		Over-The-Counter		Total
	Futures		Forwards & Swaps		
Jun 1998	70	(21%)	256	(79%)	325
Jun 2005	259	(12%)	1.857	(88%)	2.116
Jun 2008	1.307	(14%)	7.783	(86%)	9.089
Jun 2011	1.220	(36%)	2.129	(64%)	3.349
Jun 2013	1.295	(45%)	1.579	(55%)	2.874

Source: Bloomberg, European Commission, BIS, in billion USD

Futurisation

As described in the previous section, exchange-traded commodity markets have renewed their growth in the aftermath of the crisis while OTC markets have shrunk (see Charts 5.2

and 5.3). This market development happened with no support from commodity prices (DJ-UBS Commodity Index up only 6% from Dec 2008 to Jun 2013) and suggests that some of the OTC derivatives market moved to exchange-traded futures. In line with the G20 commitments of 2009 on the regulation of OTC derivative markets, whereby all standardized swaps should be traded on exchanges or electronic platforms and cleared through central counterparties by the end of 2012, a set of global regulatory proposals has been developed (see chapter 3 for further details). In reaction to the emerging regulatory landscape, commodity exchanges have organised for a swift conversion of already cleared OTC swap contracts into economically equivalent futures contracts.²²⁵ Consequently many commercial entities found it unnecessary to apply for swap dealer regime avoid certain Dodd-Frank regulatory requirements. This market shift has been precautionary market behaviour that anticipates global regulatory changes - facilitated by the "**swaps to futures**" migration plans put in place by the commodity. As a consequence, market participants are using futures to replicate the risk allocation functions that OTC swaps play in the market in a development called "futuresisation". This replication works by using a series of futures equal to the times the swap have to make a monetary exchange and with the same duration. So for example a swap that has 4 point in time exchange of cash will evolve into 4 futures each of it with the a different maturity mirroring the life cycle of the swap.

Noticeably, as the changes to the regulation do not target physical end-users of derivatives, market participants can continue to use uncleared bilateral OTC swaps, potentially tailored to very specific needs, to hedge genuine exposure to commodity risk (in line with the Dodd-Frank act's exemption for commercial end-users).

5.2.2. Growth in complexity and scope

Technological progress

Structural changes in commodity markets, notably in terms of technology but also in terms of international standard agreements established by the market, have significantly impacted their organisation, supported their growth, increased their sophistication and extended their scope.

The bespoke nature of certain commodity transactions, a historical lack of automation as well as the fact that commodity markets were until the turn of the millennium rather out-of-fashion compared to other markets (equity markets notably) resulted in these markets long resisting innovation.

However, the supporting fundamental trends of the recent years and the participation of financial institutions in the sector stimulated a number of important **technological and market standards agreements developments**. Technological developments, such as **modern infrastructure technology** and '**electronification**' of trading, have been drivers of

²²⁵ For more information on the "Futures transition" or "Swaps to Futures" development and a list of ICE's cleared swap and option products listed on ICE Futures U.S. and ICE Futures Europe see for example https://www.theice.com/s2f_products.jhtml

growth and have increased the geographical dimension of commodity markets and commodity transactions. These changes have also substantially modified the commodities market microstructure. In parallel, market participants have grown in number and sophistication, and so have instruments, infrastructures, techniques and strategies as will be described later.²²⁶

Technological changes have been particularly numerous as exchanges favoured them as a way to compete with each other. With the trend of liberalisation of exchanges in the 1990s, commodity exchanges moved away from their original role of public utility and started competing to increase the volume transactions and enhance the appeal of exchange-traded products. Another area of the business development for exchanges has been to extend and create services linked to the trading of commodity derivatives (clearing, execution facilities, settlement systems, etc.), again with a view to increasing the volume and ease of transactions. **New market auto regulation such as** standardised trading terms for exchange-traded derivatives and the standards developed by ISDA for OTC transactions²²⁷ have facilitated the ease and growth of transactions on both market settings. As a consequence, and in order to safeguard commodity markets' integrity, the impact of ongoing legal and technological developments needs to be properly monitored and addressed by supervisors and regulators.

A changing mix of market participants

It can be argued that the growth in sophistication and reach of commodity transactions is directly linked to the behaviour of market participants as well as their role in commodity markets. Again, as for technological and market innovation, commodity markets' fundamentals of the last fifteen years have supported the growth of commodity market participants in general.

Aside from the traditional participants such as commodity producers and consumers, growth opportunities have presented themselves to commodity exchanges (increased volume of transactions, development of new or improved trading-related services) that can offer vehicles such as ETFs for retail investors, institutional investors (pension funds, private banks, insurance companies, assets managers, sovereign wealth funds) and to commodity trading firms.

Commodity trading firms, which have traditionally owned commodity transportation and storage facilities and offered intermediary services (physical and financial) to commodity producers and end-users, have profited enormously from the increase in global trade. In 2011 the top five commodity trading houses generated revenues of more than \$765 billion (see table 5.3). Opportunistically, during the commodity boom, many commodity trading firms bought commodity production and transformation capacities, especially in the metals and energy sectors and have now become major commodity producers.

²²⁶ For example some advances in market access and order routing have bred new trading practices like high frequency trading.

²²⁷ <http://www2.isda.org/asset-classes/energy-developing-products/>

Table 5.3. Key trading companies by total revenues, in billion USD, 2003 vs. 2011

		Ownership	Country	Total Assets		Total Revenues		2003-11 CAGR
				2003	2011	2003	2011	
1	Vitol	Private	Netherlands	na	na	61*	297	22%
2	Glencore	Public	Switzerland	59,90**	86,16	142,34**	186,15	-
3	Trafigura	Private	Netherlands	na	na	na	121,5	-
4	Noble group	Public	Hong Kong	1,07	17,43	4,28	80,73	44%
5	Gunvor International	Private	Cyprus	na	na	na	80	-
6	Mercuria	Private	Switzerland	na	na	na	75	-
7	Marubeni	Public	Japan	41	65	75,2	55,63	-
8	Xstrata	Public	Switzerland-UK	10	74,83	3,47	33,88	33%
9	Mearquard & Bahls AG	Private	Germany	0,78	5,63	5,44	25,84	22%
10	System Capital	Private	Ukraine	na	28,45	na	19,55	-

Source: CEPS (Centre for European Policy Studies) "Price formation in commodities markets: Financialisation and beyond" – Sept 2013

Financial intermediaries are also called “Sell-side” These can be dealers and brokers, who make markets and match trades on OTC commodity derivatives. They also deal and make markets in exchange-listed derivatives. Dealers can manage their own exposure by pooling opposite positions from different clients and trading with each other (inter-dealer trading). The largest dealers in the market are investment banks, who tend to dominate the sell-side of the market.

These participants have been quick to respond to the new environment and have championed themselves in servicing the other market participants. They have provided access to credit, sell-side trading and hedging services to commodity producers, users and commodity trading firms alike. They have also been the main architects of the "financialisation" of commodity transactions²²⁸ and consequently have provided investors with commodity investment vehicles structured through OTC derivatives contracts.²²⁹ It has been argued by financial intermediaries that in order to provide trading and hedging services, and despite the extremely low rate of physical delivery²³⁰ they needed the ability to physically settle commodity positions, i.e. to take the delivery of the product that underlies the contract. Thus, some of the financial institutions active in commodity markets have acquired significant assets in the fields of commodity storage, commodity transportation and logistics, as well as directly in production resources.²³¹

Remarkably, business media reports are the main source of information regarding financial intermediaries' forays into physical commodity activities. *"Contrary to what one might expect, there is no meaningful public disclosure of banking organizations' assets and activities related to physical commodities and energy."*²³² Another way of finding

²²⁸ See section 2.3.2 after

²²⁹ See Table 5.2 for a list of commodity derivatives markets instruments and investment vehicles.

²³⁰ Only 1-2% of futures contracts are settled through physical delivery at maturity.

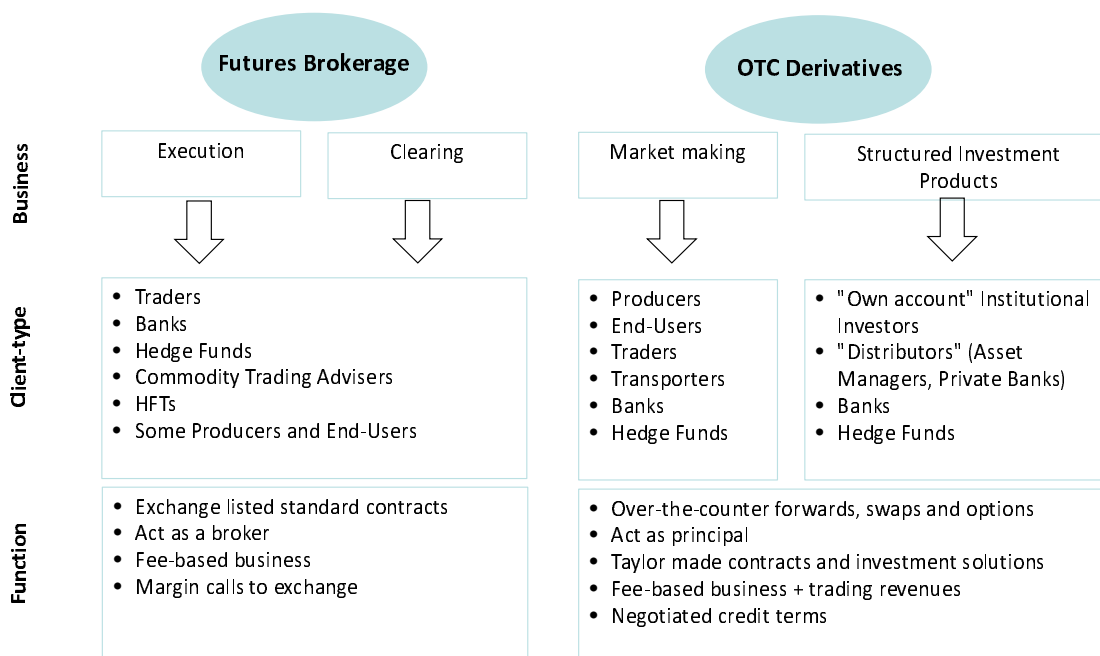
²³¹ On the growth of banks into physical commodity production, transportation and storage activities, its legal base and the risks it creates see Saule T.Omarova (24 November 2012), "The Merchants of Wall Street: Banking, Commerce, and Commodities", Minnesota Law Review, Vol. 98, 2013

²³² Saule T.Omarova (24 November 2012), "The Merchants of Wall Street: Banking, Commerce, and Commodities", Minnesota Law Review, Vol. 98, 2013 p293.

information on banks holdings or ownership of firms that deal with physical commodities is by researching directly in the annual accounts of the main banks involved in these activities. For example, **Morgan Stanley** owns: 6 power plants (3 in Europe, 3 in the US), a fleet of roughly 100 vessels (through ownership control of Heidmar), several fuel and gas assets (through Transmontaigne Inc. and Heidmar).

However, this type of bank business might be advocated to end rapidly, as recent news²³³ state that the Fed has been reviewing banks' ownership of physical commodities and that it is asking for public input on whether to put restrictions on banks' trading and warehousing of physical commodities amid lawmaker scrutiny of potential market manipulation. In that sense, recent news state that JP Morgan is currently selling its physical commodity business to Mercuria for \$3.5 billion²³⁴, while Royal Bank of Scotland and Nomura have already quit the full commodity business due to higher costs of capital in the aftermath of the financial crisis.

Chart 5.4. Commodities Future Brokerage and OTC derivatives: Business, Clients and Functions



Source: European Commission

Financial intermediaries have also managed to re-invent the commodity markets as a new "asset class" with no generation of revenue stream *per se*²³⁵ but diversification properties and negative correlation of returns with some other asset classes. This has contributed to the growth of new financial instruments (mutual funds, exchange-traded funds, commodity structured products, etc.), allowing private investors to gain exposure to commodity prices'

²³³ "Fed Weighs Surcharge on Banks' Physical Commodity Businesses" Jan 14, 2014 WSJ.

²³⁴ "Macquarie eyeing JPMorgan's physical commodities unit" January 16, 2014 The Australian.

²³⁵ To be compared with the revenue streams of equities (dividends), fixed income instruments (interest), real estate (rents). At the noticeable exception of gold which can be lent.

developments. As a consequence asset management companies have expanded their involvement in commodity markets.

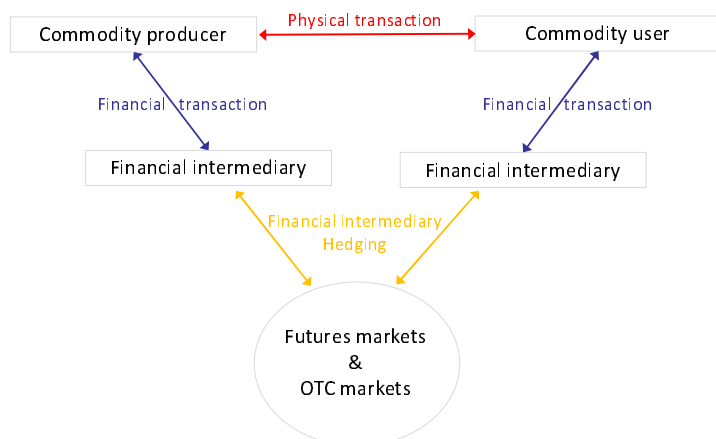
Therefore, as described in Chart 5.4., financial intermediaries, usually investment banks, can act as pure intermediaries in the brokerage of futures activity (executing and clearing futures for clients but not taking on credit and market risk) or act as principals (transacting swaps and options with clients – market making and taking on counterparty risk) in the OTC space.

5.2.3. Growth in purposes

Hedging, transferring and managing risk

Historically commodity derivatives played an important role in managing risks involved in trading physical commodities on the spot markets. By using derivatives, commodity producers, physical commodity traders and end-users could transfer, for a price, to other market participants, undesired risks attached to their physical commodity business activity. Amongst these risks stand out: **price risk** (risk of being exposed to price trends by holding too much or too little of the commodity); **transportation risk** (set of risks involved with the transportation of a commodity after the delivery point of the exchange); and transaction-specific risks like for example the **product risk** (risk the commodity delivered present different characteristics than the one agreed by the parties to the contract). Hedging a risk requires finding a party willing to take the opposite risk. This is most clearly the case when producers, who wish to have certain prices, trade with consumers who also wish to have certain price. In that sense the financial industry argues that speculators and arbitrageurs manage the risk that commodity producers and traders wish to hedge.

Chart 5.5. Hedging participants in Commodities markets



Investing in commodities with no hedging purposes): Financialisation

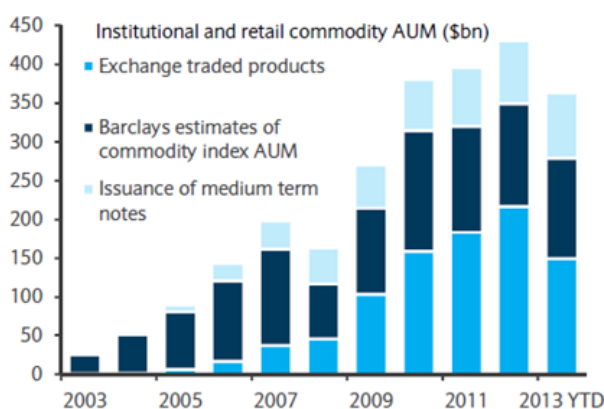
Financialisation is the term used to indicate the phenomenon of significant capital inflows from financial market investors into the commodity "asset class" through commodity investment products.

As mentioned previously, from the beginning of the 2000s, and with the support of the commodity boom, financial intermediaries have been swift to re-invent commodities into a new "asset class". Timing was especially convenient following the burst of the technology / internet bubble and the retreat of global stock markets at the time. To allow investors "to enter the commodity asset class" the financial industry provided them with a series of innovative investment vehicles in different formats to accommodate the needs of a large spectrum of investors: commodity index swaps, mutual funds, Exchange Traded Products ETPs and commodity linked medium-term notes MTNs.

The inflow of capital to commodity derivative markets has increased over the last few years in response to high liquidity, low yields on safe assets, positive fundamental background and promotion efforts by financial intermediaries even though return on commodity investments have been positively correlated with several other financial assets, notably equities. According to Barclays Commodities Research, total commodity assets under management were \$363 billion in August 2013²³⁶, off their peak of \$458 billion registered in April 2011, but at a much higher level than before the recent financial crisis (see Chart 5.6). Total commodity assets under management have grown strongly since 2003 where they represented below \$25 billion.

ETPs have experienced a fast since 2005 and in 2013 they represented almost 50% of the commodity assets under management (Chart 5.6). ETPs represent, especially for its ETFs sub-category, a more flexible, cost-effective and transparent way to invest in commodities.

Chart 5.6. Total commodity assets under management by type, 2003-2013, in billion USD



Source: Barclays Commodities Research Bloomberg, MTN-i, ETP issuer data

The impact of this investment in the price of the underlying commodity is mixed as it could generate a bandwagon effect but also a stabilizing effect. A Bandwagon effect describes interactions of demand and preference. The bandwagon effect arises when people's preference for a commodity increases as the number of people buying it increases. This interaction potentially disturbs the normal results of the theory of supply and demand, which assumes that investors make buying decisions solely based on price and their own personal

²³⁶ Source Barclays Commodities Research (1 October 2013), "The commodity investor: Still stop-go for commodities"

preference. On the other hand, a stabilizing effect related to this type of investment, is the phenomenon whereby a rise in the spot price relative to its long run equilibrium generates expectations of a price decline in the future, leading market participants to sell or short the commodity today and thereby dampen the price increase today.²³⁷

Not for hedging investment could be divided into three rational financial strategies, portfolio diversification strategy, carry-trade or inflation-hedge strategy and pure speculation.

1. Diversification strategy

A negative correlation between commodity and equity prices has historically been generally expected. Other things being equal, if equity prices are expressed in terms of discounted value of future dividends and if prices of inputs in the production process (energy, metals, raw materials) increase, firms should see their profits and dividends decrease. This is clearly the case for most companies in industrial, chemical, consumer discretionary, consumer staples and materials' sectors. In contrast, for a commodity producing company, an increase in commodity prices increases its profits / dividends, other things being equal. Given this supposed overall negative correlation commodities were seen as a countercyclical investment and a source of stability for a financial portfolio.

Somehow this strategy became really main-stream at the end of 2008 and it was said to be the first cause for the financialisation process of commodities. But once everybody uses this diversification strategy, its counter-cyclic and stabilising properties could decrease in effectiveness.

2. Inflation-hedge or carry trade strategy

In their role of inflation hedge, metals and energy commodities could be subject to the so called "carry trade strategy". This term was primarily associated with speculation in international fixed-income markets, where the spot price of concern is the price of foreign exchange and the "cost of carry" is the international difference in interest rates. In the commodity context, carry trade means a trade-off between interest rates on the one hand and market participants' expectations of commodities price changes on the other hand. Historically commodities were perceived to be clear negative carry assets, as they almost always incur storage costs.

Nowadays, due to the low interest rates environment across the globe, commodities carry trade have low opportunity costs and low costs of financing and therefore are attractive to investors. Passive investors, mainly index investors, can be seen as carry traders for commodities. Since 2008, CFTC reports show that one fourth of all the futures and options trades in exchanges are linked to index investment through index dealers. Index dealers provide passive investors, institutional and retail, with a commodity long exposure by selling OTC commodity swaps to investors, and then hedging their exposure by buying futures and options in the exchanges. Current research has evidenced a negative effect of interest rates

²³⁷ Frankel 2013

on the demand for inventories and thereby on commodity prices, and positive effects of expected future price gains on inventory demand and thereby on today's commodity prices.

3. Speculation

It is, at times, argued and debated that commodities investments are driven only by portfolio diversification requirements or carry-trade strategies, but it seems that some of the inflow is motivated primarily by investors seeking to profit from price volatility of commodities. This type of investment consist on purchases or sell the commodities, whether in physical form, via contracts traded on an exchange or OTC, in anticipation of a financial gain or lose at the time of resale. Like any other financial market, betting on the development of the price of an underlying asset (in that case a commodity) could contribute to liquidity and correct price formation. This type of strategy is blamed of producing excessive volatility in commodity markets, at it could confuse hedge investors and posse risk on the effective function of the markets related to price discovery.

5.3. TYPES OF RISK IN COMMODITY MARKETS AND REGULATORY RESPONSES TO ADDRESS THEM

The growth in size of commodities markets, their increasing complexity with the entry of retail and institutional investors and the new investment strategies mentioned in the previous section, had led to major market risks being detected since the inception of the crisis. The lack of transparency in OTC commodity instruments impacts on the efficiency of the markets due to asymmetry of information and unknown counterparty risks. This lack of transparency also generates uncertainty and contagion risk may lead to systemic problems. On the other hand, the concentration in OTC markets together with the presence of financial institutions in the physical markets has led to concerns on the potential market abuse practices. Furthermore, the concentration of OTC commodity markets and of the commodity markets structure increases the potential impact of counterparty risk.

In 2009 the G20 set up a roadmap to address the systemic risks and opacity of OTC derivatives, including for commodity derivatives. This roadmap provided a regulatory push for OTC transactions to be traded on exchanges rather than negotiated bilaterally, which would allow a reduction of opacity and a better measurement of risks to the financial system, its participants and the overall economy. This is said to be evidenced by the 'futurisation' phenomena described in section 2.1.3. The regulatory initiatives are also aimed at also decreasing counterparty and contagion risks through requirements for clearing of OTC derivatives and reporting to CCPs. The main financial jurisdictions are in the process of implementing the G20 mandate through regulatory measures including; the Dodd-Frank Act in the United States; the European Market Infrastructure Regulation (EMIR) and the updated Market in Financial Instruments Directive (MiFID II) and revised Market Abuse Regulation (MAR) in the EU; and Financial Instruments and Exchange Act (FIEA) in Japan.

Risk #1: Lack of transparency

In the past, OTC commodity transactions were exempt from the regulatory framework governing futures.²³⁸ As these OTC transactions grew in importance and complexity, and regulators and supervisors had no transparency regarding these transactions, it became difficult to measure and understand complex OTC derivatives transactions and the risks involved from a counterparty or systemic point of view. This lack of information was also a limitation for market participants who could consequently not make optimal financial decisions. Issues arising from lack of transparency of OTC transactions are especially acute during times of market stress when swift decisions regarding these transactions need to be taken, as revealed by the financial crisis.

A. Asymmetry of information faced by market participants and regulators

Financial intermediaries have gained important market informational knowledge in OTC commodity markets given their dominant roles as dealers or market makers. This could lead to adverse selection/immoral behaviour that takes advantage of asymmetric information *before* a transaction. In that sense, information asymmetries may impair the rest of participants (buy side sector) ability to evaluate the prices they are offered by dealers and to negotiate effectively to lower dealers' spreads. Thus, impeding correct price discovery.

In addition, by expanding dealers reach to physical commodity business moral hazard/immoral behaviour that takes advantage of asymmetric information after a transaction could appear. The access to information on the physical side and price equilibrium forces (supply, demand, evolution of inventories) in the spot markets allows financial intermediaries to trade and make market in OTC commodity derivatives in a more profitable way.

In the case of regulators, information regarding both the fundamentals of commodity markets and the pricing mechanisms of OTC commodity derivatives is patchy at best. The combined effect of complexity and innovation generates significant asymmetries of information and expertise between public regulators and private actors and exacerbated agency problems which pervade OTC commodity markets. At the same time, information asymmetries in OTC commodity markets left regulators behind the curve as these were not able to appropriately monitor and detect the building risk until 2008 crisis.

For these reasons there is no market incentive for these firms with the informational edge to provide more transparency to other market participants or regulators, on the contrary.

B. Counterparty risks leading to systemic problems

In commodity derivatives markets the risks and effects of default by a party to trade are of a very complex nature. The lack of transparency in OTC commodity markets combined with the uncertainty of the creditworthiness of many financial participants during crisis times could lead to systemic risks.

²³⁸ The exemption of oversight from regulatory framework for OTC transactions was written into law in the Commodity Futures Modernisation Act of 2000

On the OTC commodity markets side, in providing trading and hedging services to commodity market participants, financial institutions have become trading partners to many transactions. The opacity of these markets for the buy side in uncertain times could lead to panic and contagion deriving from concerns about the creditworthiness of an unknown counterparty. Liquidity concerns affect the perception of investors and may lead to a fast off set of a position or a fire sale that may irrationally affect the prices further.

Both in the physical and financial commodity markets, the physical and in some cases perishable nature of the commodity/underlying, as well as the logistical issues linked to its storage and delivery add to the complexity of the counterparty risks. Besides, as the underlying commodities hedged by the transactions are often used as factors of production in the economy, default on commodity derivatives may directly affect their prices, availability and delivery and therefore directly impact the real economy.

Regulatory response #1 to overcome the risk driven by the lack of transparency

In the US, the Dodd-Frank Act required the Commodity Futures Trading Commission (CFTC) and SEC to establish rules on the functioning and supervision of OTC derivatives markets, including for commodity derivatives.

Concerning transparency issues, measures include requirements for daily public reporting of all cleared derivatives trades, and for non-cleared swaps to be reported to a swap data repository. Requirements for mandatory reporting of trades and trade record retention, including requirements to record complete transaction and position information, and to keep basic business records, including minutes and audit documentation, have also been introduced.

In addition, the US requirements for mandatory clearing of swaps, with the exception of ‘bona fide’ hedging, together with capital and margin requirements (for non-cleared derivatives) and rules on segregation of collateral, should reduce the risks of default by one party extending to other party and leading to potential knock-on effects and systemic risk.

The European Union has also rolled out a series of measures to enhance the functioning and supervision of OTC derivatives markets, including commodity derivatives. EMIR, which entered into force in August 2012, and the updated Markets in Financial Instruments Directive (MiFID II) together with the Market Abuse regulation (MAR), which should enter into application in 2016 aim to provide for more safe, efficient and transparent markets in OTC commodity derivatives in the EU. The Commission proposal for a Regulation on benchmarks currently under negotiation by the co-legislators should also contribute to enhancing the price formation process for commodities price assessments and thus to enhance price formation for commodity derivatives.

The Commission proposal for a Regulation on banking structural reform adopted in January 2014 should also contribute to enhancing market stability in commodity markets by prohibiting banks from engaging in proprietary trading and thus preventing increased speculation in financial instruments, including commodity derivatives, and in physical commodities. In addition, the related Commission proposal on enhancing transparency for securities financing transactions (SFT), adopted in January 2014, ought to enhance

transparency for securities financing transactions (including lending or borrowing of commodities) as all SFTs will have to be reported to a trade repository and managers of investment funds will have to provide details to investors on the use of such technics.

EMIR requires OTC derivatives trades to be reported to trade repositories and those to be accessible to supervisory authorities as well as the reporting of exchange traded derivatives to trade repositories. In addition, under MiFID II trading venues will have to provide the regulator with a complete breakdown of the positions of all market members or participants, including the category and identity of their end-clients. This harmonised and more disaggregated information shall help regulators to detect counterparty and systemic risks and to assess how the role of speculation in these markets curves the information asymmetries.

MiFID II will set a pre and post-trade transparency regime for non-equities, including commodity derivatives. These requirements will be specified in delegated regulation and they will relate mainly to capturing pre-trade bid and offer prices and the depth of trading interests as well as to the “real time” publication of post-trade prices and volumes. Besides, the introduction of a consolidated tape will address the issue of data fragmentation on commodity derivatives. MiFID II will also introduce specific measures for commodity derivatives, such as a position reporting obligation by category of trader. Under it, trading venues that admit to trading or trade commodity derivatives will, where the numbers of traders and their open positions exceed certain thresholds, be obliged to make public a weekly report with the aggregate positions held by the different categories of traders of commodity derivatives traded on their platforms. Enhanced transparency will assist market participants in making optimal investment decisions thus addressing the previously detected information asymmetry.

To avoid counterparty risk arising for the lack of transparency, EMIR requires OTC derivatives which are eligible (standardised and sufficiently liquid)²³⁹ to **be cleared by central counterparties (CCPs)**²⁴⁰. The higher ability of CCPs to absorb the risk of default and avoid its contagion to other market players is key to protecting market stability and shielding the underlying commodities from price volatility and supply discontinuity derived from default. For derivative contracts which are not eligible and therefore not cleared by a CCP, different risk management techniques are to be applied (such as requirements to hold more capital). Furthermore, as CCPs are to take on additional risks, they are subject to stringent business conducts and harmonised organisational and prudential requirements to ensure their safety – such as internal governance rules, audit checks, greater requirements on capital, etc. Because of the EMIR requirements for central clearing, a situation where the collapse of one market participant causes the collapse of other market participants is less

²³⁹ When the clearing obligation comes into force ESMA will set out a register of financial instruments eligible for clearing. The criteria to be assessed by ESMA in determining their eligibility (based on their standardisation, volume and liquidity) are set in Art.7 of the Commission Delegated Regulation (EU) No 149/2013 of 19 December 2012; see

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:052:0011:0024:EN:PDF>

²⁴⁰ The mandatory CCP clearing obligation for commodity derivatives will likely come into effect in the second semester of 2014

likely to arise²⁴¹, at least through the channel of OTC derivatives and counterparty risks. In addition, and due to the significant interconnectedness between financial assets, physical assets and market participants, EMIR requirements, in reducing the possibility of default of market participants in specific markets, for example the equities market, shall lead to an overall reduction of market stress and contagion in general.

Risk #2: Market concentration

Concentration issues exist related to the sell side or financial institutions (dealers), both with regards to their increased involvement in the OTC commodity markets and in the physical commodities markets.

In OTC commodities derivatives markets a **few major dealers are counterparty in most transactions**. This situation leads to a **high level of interconnection and hence interdependence and systemic risk**.

A. Counterparty risks

A high degree of market concentration in the OTC commodity derivatives market amplifies the effect of individual counterparty risk to a system-wide level. In such markets, complex inter-linkages and interdependencies between derivative dealers can develop. The effect of one of these key dealers facing financial distress or defaulting altogether could ripple throughout the global OTC derivatives market.

More specifically, when it comes to OTC commodity derivatives, the sector appears to be highly concentrated. According to the consultancy Greenwich Associates, *"Nearly 60% of institutional commodities investors around the world use Goldman Sachs as a dealer for OTC derivatives. Next is J.P. Morgan, which is used as a dealer by 54%, followed by Barclays and Deutsche Bank at 46–47% and Morgan Stanley at 37%. These firms are the 2013 Greenwich Share Leaders in Global Commodities Investors — OTC Derivatives. The 2013 Greenwich Quality Leader in this category is Goldman Sachs."*²⁴²

On the physical commodity markets side, financial institutions influence and concentration are also important issues. The fact that the expansion into physical commodities has been mainly concentrated in the hands of Morgan Stanley, Goldman Sachs, JPMorgan Chase and Barclays raises serious concerns about the effects of a potential failure of any of these large dealers.

B. Damaging trading practices

As mentioned previously, both **commodity trading houses** and financial intermediaries (dealers) have gained important interests across different commodities markets, both in the physical and the financial marketplace, in terms of production, transformation, transportation and storage. These companies trade not only with their own proprietary capital, but also on

²⁴¹ For example the default of a financial participant leading to the collapse of a physical market participant, thereby putting the entire financial system at risk

²⁴² Source "2013 Greenwich Leaders: Commodities OTC Derivatives" - <http://www.greenwich.com/greenwich-research/research-documents/awards/2013/apr/cmd-2013-qsl>

behalf of other firms or as a direct counterparty to other commodity firms or financial institutions. **Their important use of financial leverage could have systemic implications.**

Theory predicts that investors will rebalance their portfolios in order to exploit any pricing differentials between derivative and underlying asset markets. In addition, there is empirical evidence that derivative prices either lead the movement of underlying asset prices, or that the two prices move together. **This means that price volatility in the OTC market could be transmitted to underlying markets.**

Besides, the fast development of the commodities business for financial institutions raises questions about the implications for competition and operational risks, in particular when the stake held in physical markets may exert dominant or oligopolistic pressure on price in conjunction with activities in financial operations. Aggregate disclosure of physical holdings and ownership stakes to properly oversee market manipulation. Damaging trading practices, such as cornering attempts or regulatory arbitrage, need to be addressed by regulators. Also, the principal-agent problem or agency dilemma concerns the difficulties in motivating one party (the "agent"), to act in the best interests of another (the "principal") rather than in his own interests.

On cornering attempts: in certain occasions market participants attempt to gain sufficient control of a particular commodity to allow for its price to be manipulated. This can be done, for example, by buying up a large number of futures contracts on a commodity and then selling them at a profit after inflating the price. One recent example is the case of Armajaro and the European cocoa market in 2010, where the hedge fund Armajaro Holdings purchased cocoa futures worth 7 per cent of annual global cocoa production driving up its price to the highest level in 33 years.²⁴³

On regulatory arbitrage: OTC commodity transactions have been used to get around certain commodity futures regulations like position limits. Market participants looking to circumvent these regulations would go to dealer banks and purchase a swap contract instead of a futures contract. The functional similarity would be created through the tailoring of the swaps to represent the equivalent exposure as the one which could have been gained through a futures contract. The dealer bank would then hedge "legitimately" the commodity exposure arising from the sale of the swap to a bank client, by buying or selling commodity futures, without falling under certain position limits which would have been applied directly to the bank client according to the category if falls under (commodity producer, hedger i.e. consumer, or speculator).

Principal-Agent problems: there is a need to identify the agency dilemma between the ownership of market infrastructures and of physical, futures or other financial holdings of market participants. For example, sponsored warehouses should be set by exchanges only once the interest of their shareholders in the external market infrastructure are properly disclosed and ultimately managed. One example is that of banks such as JP Morgan and Goldman Sachs being involved in brokerage, warehousing and as shareholders in the LME

²⁴³ Farchy, Jack (16 July 2010). "Hedge fund develops taste for chocolate assets". Financial Times. Retrieved 27 July 2010

(the world largest exchange for copper and aluminium), which poses important challenges to the management of conflicts of interest. For example, the FCA has collaborated with the LME in enhancing its warehousing rules. This followed allegations in summer 2013 that Goldman Sachs exploited rules by the LME and encouraged its clients to keep aluminium stored in its warehouses in order to generate rental income and to boost the “spot” price of the metal on global markets. This practice is said to have led to delays in the delivery of the metal of up to 16 months and increased prices for its users and to have originated potentially huge profits for the bank²⁴⁴.

Regulatory response #2 to overcome the problems concentrated market pose to the system

In the US to track concentration issues and systemic risks, requirements for swap-dealers registration, for the mandatory clearing of swaps (with the exception of ‘bona fide’ hedging) and for cleared swaps to be executed on an exchange or Swap Execution Facility (“SEF”) are already in place. As stated above, the CFTC has also proposed to introduce position limits for 28 core physical delivery contracts and their “economically equivalent” commodity derivatives, which hopefully will lead to less concentration and less systemic risks. Concerning the expansion of financial dealers into physical commodities, in the US, the FED is currently reviewing the permits granted from 2003 to 2008 to several investment banks to allow them to own tangible commodity production, transportation and storage facilities. The FED is also consulting currently on whether this would help ensure that physical commodities activities authorized for financial holding companies are conducted in a safe and sound manner and do not pose a threat to financial stability.

In the EU, on market structural concentration and systemic risk, as previously exposed, EMIR requires standardised OTC derivatives to be centrally cleared and MIFID II requires cleared OTC derivatives that are “sufficiently liquid” to trade on trading venues providing for multilateral interaction, i.e. Regulated Markets (RM), Multilateral Trading Facilities (“MTF”) or Organised Trading Facilities (“OTF”). MiFID II also empowers supervisors to ban specific products, services or practices in case of threats to investor protection, financial stability or the orderly functioning of markets. In addition, it introduces a harmonised position limits regime across the EU for commodities derivatives traded on trading venues and their OTC economically equivalent contracts.

On the physical side of the deals, the implications of the increased participation of financial players on physical commodity markets should be monitored. Besides, the scope of the market abuse regulation has been enlarged to cover the link between physical and financial markets. In order to address damaging trading practices and Principal-Agent problems, regulation to address market abuse and manipulation and business conduct standards has been introduced in both EU and US regulation of OTC derivatives, including for commodity derivatives.

In the US, under the Dodd-Frank Act, swap dealers and major swap participants are subject to the duty of fair dealing and good faith communication and to the duty to disclose material

²⁴⁴ Further information can be found on: <http://uk.reuters.com/article/2013/07/29/uk-fca-lme-idUKBRE96S0GY20130729?feedType=RSS&feedName=domesticNews>

risks, material incentives or conflicts of interest as well as to additional responsibilities with respect to "Special Entities" (e.g. states, municipalities, pension plans etc.). Derivatives Clearing Organisations are required to have in place structural governance and ownership policies mitigating conflicts of interests, organization and general conduct of business rules, and requirements with respect to: trading and products; surveillance; operations; compliance and financial information; and resource requirements. The proposed introduction of position limits for 28 core physical delivery contracts and their "economically equivalent" commodity derivatives by the CFTC²⁴⁵ should also contribute to enhancing integrity in commodity derivatives markets in the US.

In the EU, EMIR requires CCPs to act fairly, honestly and professionally in the best interests of their clearing members and to effect sound risk management. Besides, financial counterparties are subject to the conduct of business obligations set out in MiFID II including: ensuring that communications are fair, clear and not misleading; and to requirements in respect of record keeping, etc. In addition, MiFID II will provide for reinforced supervisory powers and a harmonised position limits regime for commodity derivatives markets in order to support orderly pricing and prevent market abuse. Under this system, competent authorities will impose limits on persons' positions in accordance with the methodology for calculation set by ESMA. Only positions entered into for hedging purposes by or on behalf of a non-financial entity will be exempt from this position limits regime.

The measures under MiFID II will be complemented by those under the revised Market Abuse regime which, amongst other things, extends its scope to market abuse cases occurring across both commodity and related derivatives markets²⁴⁶. Furthermore, under the new MAR, using derivatives to manipulate the price of the related spot markets or using transactions in the spot markets to manipulate derivatives markets will be clearly prohibited. The proposal also introduces an obligation to cooperate and exchange information between financial regulators and the regulators of spot commodity markets, where they exist. Besides, inside information will include price sensitive information relevant to both the spot and derivatives markets. In addition, the MAR/CSMAD texts clearly prohibit the manipulation of benchmarks, including commodity price assessments used to reference the returns under or to clear commodity derivatives, and makes such a manipulation a criminal offence. In addition, the Commission proposal for a Regulation on benchmarks will contribute to a more transparent and robust setting process for commodity price assessments by price reporting agencies. Thus, this should enhance the price formation process for commodity derivatives as well as physical commodities, as commodity price assessments by PRAs underpin this process for most commodities, as well as the clearing process for many commodity derivatives.

In the case where financial participants are also involved in physical markets (such as Goldman Sachs and Morgan Stanley²⁴⁷) those may have at their disposal information not

²⁴⁵ <http://dodd-frank.com/cftc-re-proposes-position-limits-on-physical-commodity-swaps/>

²⁴⁶ The scope of the market abuse prohibitions (including trades and orders to trade) is extended to instruments on MTFs, on new OTF category and also to OTC transactions.

²⁴⁷ <http://www.bloomberg.com/news/2013-10-01/fed-said-to-review-commodities-at-goldman-morgan-stanley.html>

available to supervisors, such as on delivery or storage issues impacting spot and future commodity prices, and benefit from these information asymmetries in their financial derivatives operations. The reporting obligation aims to help to detect and address asymmetries as supervisors will have transparency on the OTC commodity derivative operations by these market players. The revised MAR prohibits insider dealing and market manipulation, including the interaction between financial and physical markets, and subjects these practices to administrative and criminal sanctions, which should be a deterrent for companies illegally profiting from inside information. Besides, as a result of the introduction of a transparency regime for OTC derivatives and the consolidated tape requirement under MiFID II, information on orders and executed transactions both on trading venues and OTC will be easily accessible to market participants, whether financial or non-financial entities, thereby reducing information asymmetries for market participants.

The implementation of these measures in the EU and the US should help combating excessive speculation and market abuse in financial commodity markets. Recent events, such as the agreement for the sale of JP Morgan's physical commodity business to Mercuria reached in March 2014²⁴⁸, point to a reversal in the trend of large financial players investing in physical commodity markets. This would be driven partly by regulatory pressures worldwide, including the US Federal Reserve's review of banks' activities in physical commodity markets and the new Basel III leverage and capital rules requiring banks to maintain bigger capital cushions against potential losses – which can negatively impact profits in volatile markets such as electricity. Other drivers behind the retreat of banks from physical commodity markets are the falling profits from commodity trading for large banks since 2008²⁴⁹ combined with large risks in physical commodity markets which are not their core business, as well as potential exposure to large fines for market abuse if conflicts of interest are not appropriately managed.

However, whilst regulation exists to avoid market abuse in physical markets for some commodities, such as on wholesale energy trading under REMIT²⁵⁰, the next challenge for regulators could be to ensure integrity and transparency in physical markets for important commodities.

5.4. CONCLUSIONS

Evidence shows that commodity derivatives markets developed considerably in both quantitative and qualitative terms in recent years. This is due to technological, economic and regulatory developments that lead to commodity financial transactions growing on size, complexity and purposes. Besides, financial participants have entered financial and physical

²⁴⁸ Please see FT press report from 19/03/2014 at:

<http://www.ft.com/intl/cms/s/0/4c0894b0-af45-11e3-bea5-00144feab7de.html#axzz2wELOIZMr>

²⁴⁹ According to a report from London based consultancy coalition cited by the FT, commodity trading income at the world's top ten investment banks has fallen from a peak of more than \$14bn in 2008 to just \$5.5bn in 2012: <http://www.ft.com/intl/cms/s/0/4c0894b0-af45-11e3-bea5-00144feab7de.html#axzz2wELOIZMr>

²⁵⁰ REMIT: http://acernet.acer.europa.eu/portal/page/portal/ACER_HOME/Activities/REMIT

commodity markets space, raising concerns about their size, role, and influence in both markets.

The financial crisis revealed, through issues such as excessive price volatility and a large drop in trading on commodity derivative markets, important vulnerabilities and risks in commodity derivatives markets. It also exposed the high concentration and interdependence of commodity markets' assets, participants and structures among themselves and with those of other financial markets leading to counterparty and contagion risks. The difficulty for regulators and supervisors in predicting or effectively responding to these risks evidenced the opacity and growing complexity of these markets. Besides, recent scandals linked to speculation in physical and financial markets for commodities have brought to light the existence of conflicts of interest and asymmetries of information in these markets, particularly where financial entities are involved in both the physical and financial markets for commodities.

In the context of the G20, the FSB and IOSCO's work on OTC derivatives markets' reform, including commodity derivatives, policy makers and financial supervisors have responded to the risks posed by new market developments in commodity derivative markets through diverse regulatory initiatives. In the US through the Dodd-Frank Act and in the EU mainly through EMIR, MiFID II and revised MAR.

In the EU, the requirements for mandatory clearing and reporting to CCPs under EMIR will most likely come into force in the second semester of 2014. The requirements under MiFID II on transparency, stronger supervision of commodity derivatives markets, position reporting, position limits and for cleared derivatives to trade on regulated venues are not expected to enter into application until 2016. In the US, although most rules are already in place, some such as the one on position limits are still being implemented.

The overall effect of the regulatory reforms of OTC commodity derivatives in the EU and other jurisdictions needs to be assessed once the whole packages of measures enter into application and enough time has gone by to allow for the compilation of empirical evidence on their effects. However, phenomena such as the 'futuresisation trend' point out to potential positive impacts on transparency, reduction of information asymmetries and reduction of counterparty risks of recent regulatory developments

In line with the G20 commitments, regulatory efforts should keep pace with market developments, financial innovation and the increased complexity of commodity derivatives markets, including technological developments. The enhanced transparency provided by the requirements under EMIR and MiFID II should assist in detecting and responding to these developments in an effective way. The requirements under the MAR should help to address conflicts of interest and potential abuse in derivative markets. In addition, the proposal for a Regulation on benchmarks should contribute to a more transparent and robust price formation process for commodity derivatives as well as for physical commodities.

As in other areas of financial markets legislation, ESMA will be instrumental in further elaborating on the single rule book for the commodity derivatives markets in the EU created by MiFID, EMIR and MAR. Besides, although under the G20 mandate the approaches to reform OTC derivative markets are generally convergent, there is still room for closer

cooperation among regulators.. This would help to prevent regulatory arbitrage and to provide a global level playing field for commodity derivatives trading.

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CHAPTER 6: DERIVATIVES ACCOUNTING DYNAMICS IN BANKS' FINANCIAL REPORTING

6.1. INTRODUCTION AND MOTIVATION OF THE CHAPTER

Derivatives, traded on exchange or over the counter (OTC), were a frequent subject of research even before the financial crisis. But since the start of the crisis, literature looking at derivatives from different angles has exploded. Some of this recent research questions the assumptions in models of modern finance from which the benefits of derivatives had been derived.

The central role derivatives played during the crisis has also triggered new forms of regulation across the globe²⁵¹ in order to overcome some of the risks identified. In the EU, EMIR²⁵² provides for central clearing of OTC derivatives and for record keeping of transactions. This has led to some expected outcomes in the EU markets including greater transparency, increased safety via reduced counterparty risk and reduced operational risk.

Banks use derivatives for different purposes in relation to the following strategies and objectives:

- Banks *hedge* intrinsic risk by using derivatives to mitigate exposures faced due to their business activities, thus either eliminating the risk of future changes in the prices of the underlying assets or eliminating the variability of their cash flows.
- Banks *speculate (trade)* with derivatives, exposing themselves to different types of risks in the hope of higher returns (e.g. generation of revenue) based on their predictions of future changes in prices of the underlying assets.
- Banks *intermediate* in derivatives market on behalf of their clients, allowing them to obtain income from fees and to expand services to customers through product innovation and market making.

Therefore, as banks are major users, derivatives are also a central concept in banking regulation. For example, in Capital Requirement Directive (CRD IV), capital requirements related to these types of instruments were revised (compared to CRD III) as was the role of the credit valuation adjustments (CVAs). But bank regulators acknowledge the difficulties that these instruments pose due to reasons including their complexity, valuation issues and bilateral agreements. For example, for the bail-in tool in the Bank Recovery and Resolution Directive (BRRD), although liabilities originating from derivatives exposures should also be included, the effective application of the tool to those exposures is not as legally straightforward as for other types of liabilities.

Therefore, if bank resolution authorities applied their write-down and conversion powers to liabilities arising from derivatives they would quickly face several practical issues: (i)

²⁵¹ European Financial Stability and Integration Report (2012).

²⁵² The Technical Standards on the Regulation (EU) No 648/2012 on OTC Derivatives, Central Counterparties and Trade Repositories (known as "EMIR" - European Market Infrastructure Regulation) came into force in March 2013.

identifying the transactions subject to netting agreements and determining the net liability arising from those transactions, (ii) assessing the appropriate methodologies to determine the value of certain classes of derivatives and (iii) creating the justification for the relevant point in time at which the value of a derivative position should be established.

In any case, derivatives are constantly monitored by bank supervisors in their on-site and off-site functions. First, a bank's outstanding derivatives exposure is one of the key indicators that supervisors use to identify whether a bank is systemically important²⁵³, as it points to its interconnection and complexity. Credit counterparty risk, market risk, liquidity risk, maturity risk, collateral management and risk management levels are assessed using derivatives' notional and market value and its different features (maturity, type, etc.) as key variables. Supervisors also test and scrutinise the models (inputs, assumptions and outputs) banks use to calculate derivatives' fair value²⁵⁴. But most of the granular data on derivatives that supervisors track is not generally disclosed.

For the general public, banks' annual reports, which are subject to financial reporting rules, are the main source of information on their position, strategy and use of derivatives.

This chapter aims to provide a basic, rather holistic explanation of how to interpret the accountancy of derivatives in a bank's annual accounts. To that end, some elementary questions on the meaning of derivatives in bank reporting need to be addressed:

1. *Why are derivatives different, and what problems do they pose to accountants and analysts of banks?*
2. *In the EU, what do financial statements reveal about derivatives? Do derivatives accounted for on the balance sheet provide useful information to investors on the financial position²⁵⁵ of a given bank?*
3. *Do aggregated figures on derivatives inform or mislead investors on bank stability?*
4. *How can changes in the fair value of derivatives play themselves out in terms of balance sheet stability?*

The chapter is organised as follows: Section 6.2 gives a general overview of derivatives accounting and disclosure in financial statements. It is subdivided into six subsections: 6.2.1 gives a general background to how accounting rules imposed fair value on derivatives, 6.2.2 describes the specificities of derivatives accounting and the two types of derivatives with regard to their accounting at inception, 6.2.3 explains the impact of derivative valuation in accounting (with a visual illustration of which type of derivatives will be accounted for in the balance sheet), 6.2.4 explains the impact of different national accounting systems in the EU

²⁵³ At international level, the Basel Committee on Banking Supervision (BCBS) has developed a methodology for identifying *global systemically important banks* (G-SIBs). The assessment methodology refers to the following set of indicators: size, interconnectedness, cross-jurisdictional activity, suitability and complexity.

²⁵⁴ For OTC derivatives, fair value is measured with internal valuation techniques or valuation models (e.g. Black-Scholes model). For more details see *Section 6.2.3*.

²⁵⁵ Remember that the purpose of the balance sheet is to report to investors what a company is worth at one point in time.

on the comparability of accounting for derivatives, 6.2.5 describes accounting for held-for-trading (speculation) derivatives and hedge accounting, together with the problems related to effectiveness testing, and 6.2.6 explains some intrinsic features of derivatives such as netting and collateral that may affect banks' balance sheets. Section 6.3 explores empirically some of the theory expressed in section 6.2, showing the differences in banks' reliance on derivatives by country and by business model and exposing the different types of accounting disclosure of derivatives within an average bank. Some conclusions are drawn in section 6.4. Finally, section 6.5 contains an annex with the main types of hedge accounting.

6.2. UNDERSTANDING DERIVATIVES IN EU FINANCIAL STATEMENTS

6.2.1. The history of derivatives accounting

Following the stock market crash of 1929, generally accepted accounting practices²⁵⁶ (GAAP) aimed to establish what a company's profit was in a given year. This method was based on the traditional difference between revenues and costs.

In this context, revaluations, i.e. value changes that were not due to any transaction, were not considered profit given that there was no increase in liquidity that could be used to manage liabilities. The cornerstone of the whole accounting process was to determine the timing and recognition of that revenue as profit, i.e. the timing when revenues or expenses had transformed into more or less liquidity for the company (e.g. cash or other financial assets).

In accordance with the generally accepted accounting practices of those years, profits were recorded only when they had completed the entire productive cycle, i.e. the traditional process, money - goods - money. This only happened when it could be proven that there had been: 1) a sale or equivalent process, and 2) an increase in liquid assets.

That traditional measure of realising benefits was not suitable for recording and valuing derivatives. In most cases (e.g. interest rate swaps), derivatives do not require any initial investment, have zero cost and therefore accounting for derivatives based on historical cost provides very limited useful information to investors. Furthermore, the existence of liquid markets and the development of valuation methodologies accepted by financial market participants (e.g. the Black - Scholes - Merton model for European options) reduced the information value of the historical cost information provided in the financial statements for these instruments.

Consequently, in the early 1990s, the different financial reporting standard setting bodies (the IASB and FASB, essentially) issued rules that initially sought to address the problem of so-called "off-balance sheet" items, whereby assets and liabilities resulting from derivative contracts were not reflected in the balance sheet. Subsequently, they also addressed issues such as credit and market risk disclosure, the treatment of financial hedges for these risks, etc. These bodies agreed on the goal that was to be achieved, namely information

²⁵⁶ Until the establishment of the US Securities and Exchange Commission (SEC) in 1934, accounting criteria varied widely but none was a "*generally accepted accounting principle*" since there was no regulation of the profession. In the case of listed entities, the market itself guided the different principles used in presenting the financial statements. Any new accounting proposal was accepted as long as it lowered the financing costs for the entity.

transparency for financial instruments and the only solution found for this was *fair value accounting*.

However, it was sometimes not possible to reach consensus on the fair value of certain derivatives, either because the underlying asset was not actively traded, or because future contingent settlements depended on the decisions of others, such as a derivative that swaps the interest on a debt instrument for dividends paid by the stock of an entity. In situations where it was not possible to reliably value a derivative, under some national GAAPs in the EU²⁵⁷, it was deemed more appropriate to present the information regarding the fair value of the derivative as a range of fair value in the notes to the financial statements.

In 2002 the European Union agreed that from 1 January 2005 International Accounting Standards/International Financial Reporting Standards (IAS/IFRS)²⁵⁸ would apply for the consolidated accounts of EU listed companies²⁵⁹. Therefore, under the IFRS framework, IAS 39²⁶⁰ *Financial Instruments: Recognition and Measurement* is the standard that sets out the requirements for recognising and measuring financial assets and liabilities, including derivatives.

6.2.2. Why are derivatives different?

A derivative can be defined as a financial instrument whose value derives from or is dependent on an underlying asset, such as the price of a financial instrument (e.g. the stock of a publicly traded company), a reference interest rate (e.g. LIBOR), a currency exchange rate, a commodity or a credit event/bond (e.g. a credit default swap).

Thus, the parties involved in a derivative contract are transferring the financial risk inherent in the underlying asset. Generally, derivatives grant to a party a contractual right or obligation vis-à-vis another party in the future under conditions that are potentially favourable or unfavourable. As a general rule, an entity shall register all derivatives in its balance sheet as an asset or a liability, depending on the rights or obligations arising under the contracts.

From an accounting point of view, it is important to distinguish between two categories of derivatives. Both have an impact on the balance sheet and the income statement.

The first type refers to derivative instruments that usually have a fair value different from zero at their inception. This is the case of the options. Its fair value is composed of two elements: the intrinsic value and the time value. Therefore, although the intrinsic value of an at-the-money (ATM) or out-of-the-money (OTM) option²⁶¹ is zero, the time value of the

²⁵⁷ This does not apply under IFRS, but under some national GAAPs in the EU.

²⁵⁸ Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards.

²⁵⁹ The application of IAS/IFRS only applies to listed companies that prepare consolidated accounts. However, throughout the EU some Member States also granted the option to other companies to apply the standards voluntarily.

²⁶⁰ The IASB is currently working on IFRS 9 *Financial Instruments*. When completed, an effective date will be added and IFRS 9 will completely replace IAS 39.

²⁶¹ Obviously, in-the-money (ITM) options have a positive intrinsic value.

option has a positive value, reflecting the potential for profit during the exercise period of the option.

At the time of inception (t_0), this type of derivative instrument implies the payment or collection of a premium when bought or sold, and thus it leads to the record of a financial transaction. The derivative instrument is registered in the balance sheet in the amount equivalent to the premium paid or received. It is recorded on the balance sheet as an asset if the company is buying the option, as the option represents a right, or as a liability if it is selling, as the option represents an obligation. It is worth mentioning that options usually represent a small portion of the total derivatives held by banks, falling within a range of 5 to 15 percent of their total derivative assets or liabilities.

The second category refers to derivative instruments (e.g. forwards and swaps) that do not usually require the recording of financial transactions at inception, because their market value is nil and they do not trigger any cash flows. Although at inception (t_0), there is no accounting record on the balance sheet, IAS 39 requires these derivatives to be reported in the notes to the financial statements. In the following period (t_1) when their fair value changes, the company records the derivative in the financial statements as an asset or liability.

In sum, for all derivatives except options, derivatives originate assets and liabilities during their life span depending on the amount and sign (positive or negative) of their valuation. They may shift suddenly from being assets to liabilities and vice versa, and this does not depend on who is the buyer or the seller of the instrument, but on whether the derivative instrument represents a right to receive or an obligation to pay cash in the future. This is different from other financial instruments recorded on the balance sheet, as an asset generally solely represents a right to receive cash in the future, and a liability generally solely represents an obligation to pay cash in the future and this economic position does not change during the life of the instrument.

If a derivative is recorded as an asset, any increase in its fair value represents a gain and any decrease loss. On the contrary, if the derivative is recorded as a liability on the balance sheet, any increase represents a loss, and any decrease is a gain. The bank recognises gains and losses resulting from derivatives that are held for trading immediately in the income statement, while gains and losses resulting from the derivatives that are accounted for under the hedge accounting rules are reported differently (in the equity or income statement), depending on the type of hedge. In other words, the value accounted for in the balance sheet of a derivative is dynamic²⁶² as it responds to price movements in an underlying asset which may make derivatives fluctuate between the asset and the liabilities side of the balance sheet during the contract's life span. Some derivatives require a very low initial investment while other financial instruments (loans, bonds and other types of debt) are usually fully funded from inception.

²⁶² The balance sheet would not be influenced by whether the derivative is classified as being held for trading or hedging.

In conclusion, derivatives provide a major challenge for accounting standards and market analysts due to the variety of ways in which they are used and the lack of homogeneity of their financial disclosure.

6.2.3. Impact of valuation of derivatives in the financial statements

The fair value measurement of financial instruments, including derivatives, is carried out according to IFRS 13 Fair Value Measurement. This standard gives priority to using quoted market prices available from active markets when determining fair value. However, most derivatives held by banks are traded either on illiquid markets or OTC thus fair value is measured with internal valuation models based on Level 2 and Level 3 inputs²⁶³. Valuation models are designed to apply observable market prices and rates as input whenever possible, but can also make use of unobservable model parameters. These parameters comprise interest rates, volatilities, correlations and other ad-hoc assumptions. If such information is not available, fair value can be estimated with a valuation model that reflects how market participants would reasonably be expected to price the instrument. In any case the lack of disclosure by banks on their internal models applied to valuates derivatives make it difficult to assess their appropriateness and accuracy and impede comparison between banks' derivatives portfolios. This problem has recently been acknowledged within the supervisory context by the ECB in its "*Asset quality review, Phase 2 Manual*"²⁶⁴. This review guides the national competent authorities to assess the pricing models related to accountancy standards in a consistent and comparable way. In any case the information that supervisors may have, while not perfect, is much more granular than that disclosed in the annual accounting reports, where disclosure on the models is non-existent.

The lack of reliable estimates for the value of a given financial instrument raises significant concerns with respect to the reliability of financial statements. This was the case at the beginning of the crisis when market participants became less confident in their OTC counterparties and put in doubt the valuation models for derivatives used in the banking sector.

Whenever models are used in lieu of observable prices, there is potential for management to introduce bias into the valuation process through the use of judgment and discretion. This issue becomes critical when valuing OTC derivatives on the basis of Level 3 inputs, given the high degree of discretion management have to determine the inputs in the valuation process. It could easily lead to overvaluing derivatives accounted for on the asset side or undervaluing a derivative accounted for on the liability side of the balance sheet. Taken to

²⁶³ The *IFRS 13 Fair Value Measurement* standard defines a 3 level "*fair value hierarchy*" system to reflect the level of judgment involved in estimating fair values. The hierarchy categorises the inputs used in valuation techniques into three levels. Priority is given to Level 1 inputs, which are quoted prices in active markets for identical assets or liabilities that the entity can access at the measurement date. In the absence of Level 1 inputs, managers can use Level 2 inputs composed of inputs other than quoted market prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. The lowest priority is given to Level 3 inputs represented by unobservable inputs for the assets or liabilities.

²⁶⁴ ECB (2014), "*Asset quality review, Phase 2 Manual*", Section 8.4 "Element 3: Derivative pricing model review".

the extreme, it can be the case that a derivative valued on a bank's balance sheet as an asset should in fact be classified as a liability, if inputs were adjusted for their valuation.

IFRS 13 also provides that the fair value for OTC derivatives should reflect the credit quality of the derivative instrument. This means that the valuation of a derivative instrument should be adjusted for the credit risk of the counterparty (counterparty credit risk) and that of the reporting entity (own credit risk). The valuation adjustment for counterparty credit risk requires a credit valuation adjustment (CVA), and an adjustment to a bank's own credit risk requires a debit valuation adjustment (DVA). Although CVA and DVA valuation methodologies are well advanced, they are still not standardised and vary among market participants, ranging from relatively simple (e.g. calculating the current mark-to-market value of the derivative and then adjusting the discount rates) to highly complex methodologies (e.g. simulated modelling of market risk factors and risk factor scenarios). Some entities cannot justify the high cost of technology, infrastructure and staff to perform this type of valuation and tend to opt for less costly alternatives such as spreadsheet models. Using simple valuation methodologies is subject both to input errors, and to a degree of management discretion.

Theoretical example: Swap accountancy dynamics, the special case of credit default swaps (CDS)

Credit default swaps or CDS are, as their name suggests, *swaps*, not options, guarantees or insurance. But under some EU national GAAPs applied to domestic non-listed banks, CDS are accounted as financial guarantees, insurance or even options (i.e. the pay-out from the CDS is reflected in the statement of a financial position only if credit event becomes probable so off balance sheet). However, under EU IFRS²⁶⁵, although CDSs in theory are eligible for hedge accounting, in practice CDSs normally do not meet the current accounting criteria for designation in a hedge relationship and consequently need to be measured at fair value in the balance sheet and their fair value changes recorded as a profit or loss. Furthermore, under IFRS, a CDS is fundamentally different to an option. In the case of an option, the *time value* paid is known from the inception whereas the "*CDS premium*" is contingent on the occurrence or not of a credit event and is paid over time, but only until a credit event occurs. Therefore, in the case of an option the total amount to be amortised is known, while that is not the case for a CDS.

Likewise, given that the buyer of protection cannot lose more than the premium paid, it should be explained "*how a CDS bought by the buyer of protection move from the asset side to the liability side?*" This can happen when the buyer is paying more for the protection than the current market conditions justify. Take the example of a 10 year CDS bought at a high of financial distress and suppose that no credit event occurred so no pay-out was effectuated. At the purchase date of the CDS the buyer locked in a 10 year annual payment of 1000 bps. In the following period, the current equivalent credit spread dropped to 500 bps. From an

²⁶⁵ A CDS does not meet the definition of a financial guarantee contract as stipulated in paragraph 9 of IFRS 39, given that in a standardised CDS contract the credit events triggering the pay-out may not directly relate to the failure to pay on that particular debt instrument (e.g. an entity can hold a naked position and the definition of credit events in a standardised CDS is broader than a failure to pay).

accounting point of view, this is an "*onerous contract*" as the buyer is currently paying more than the amount justified by the current pricing of the credit risk of the counterparty. Given the re-pricing of the market credit risk, the asset increased in value (gain). However, given that the buyer has locked in the credit risk, a corresponding liability (loss) needs to be recorded.

CDS accountancy creates confusion even among EU accounting experts and EU accounting standard setters which is why it deserves particular clarification.

CDS have many different, highly complex and detailed features and aspects. For pedagogical reasons, and in order to give a quick background to help the reader understand the impact that valuation and accountancy dynamics of CDS have in banks' balance-sheet, the following is a simplified summary of their definition and main characteristics:

Credit default swaps are designed to transfer the credit default risk of fixed income products between parties. A credit default swap (CDS) is also referred to as a credit derivative contract, where the purchaser of the swap makes payments in the form of a premium²⁶⁶ ("spread"), until the maturity date of the contract. Payments are made to the seller of the swap. In return, the seller agrees to pay a loss compensation²⁶⁷ (e.g. a third party debt or cash) to the buyer if the third party defaults on the underlying debt instrument(s).

The corresponding CDS contracts can be settled via physical settlement or cash settlement. In the case of cash settlement, the protection seller pays the face value minus the value of the defaulted bond to the protection buyer. In the case of physical settlement, the protection buyer hands the defaulted bond²⁶⁸ to the protection seller and receives the face value of the bond. The underlying asset on which the derivative is based does not need to be involved in these swaps.

As regards why EU banks use CDS by EU banks, the basic motivations are twofold: hedging and speculation²⁶⁹. Commercial banks are usually natural net protection buyers (through CDS) because they are motivated to cover credit risk, while banks acting as protection sellers (following a speculative strategy) focus on finding additional profitable investments. Dias and Mroczkowski (2010) found that banks' use of CDS is reflected in their net position. They state that if banks are net protection buyers it would indicate that they use credit derivatives primarily to hedge their excess risk while if they are net protection sellers it would mean that these products are used for intermediation or speculation purposes. Remember that for a protection seller the whole operation is fully leveraged as he receives the spreads from the buyer without making any upfront payment.

EU banks use CDS in a wide variety of ways, pursuing a combination of purposes, from hedging (both loans and bonds), risk management (both the overall credit risk and the risk of

²⁶⁶ The premium is usually referred to as "spread". It is quoted as an annual percentage in basis points of the contract's notional value, but usually paid quarterly.

²⁶⁷ Depends if it is "cash settlement" or "physical settlement".

²⁶⁸ Physical settlement does not require valuation of the bond and the protection buyer receives full "*insurance*" under a physical settlement.

²⁶⁹ Fitch Ratings (2010).

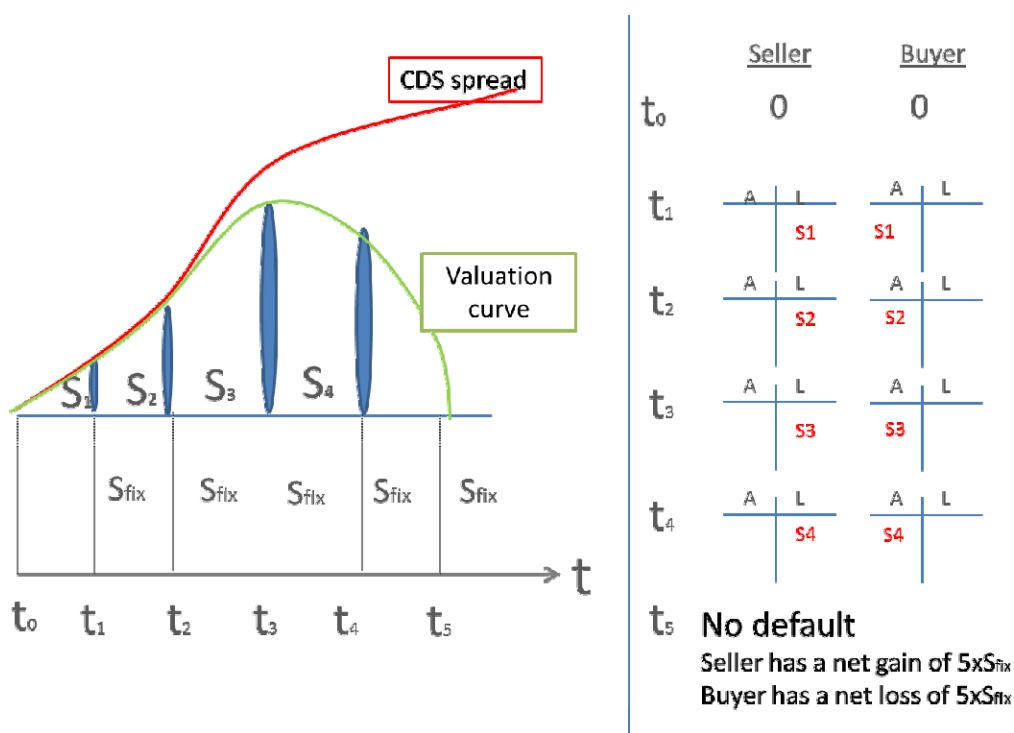
a single reference), mitigation of credit risk as regards the regulatory capital requirements, and dealing in these products for speculative (trading) purposes.

The following three examples illustrate a credit derivative life cycle balance sheet representation for a buyer and a seller of the contract depending on how the valuation of the CDS evolves.

Influences on the valuation of the CDS include the perceived likelihood of default, the recovery rate in the event of default, liquidity of the CDS, time to the end of the contract, and a simulation of the interest rate curve. At inception, the expected present value of the contingent leg (the present values of the sum of all payments to the extent they are likely to be paid, i.e. taking into account survival probability) is equal to the expected present value of the fixed leg (the present values of all expected accrued payments). Thus, the spread is set initially so that the value of the CDS is 0²⁷⁰.

During the life of the contract the banks will calculate the fair value of the contract which will be based on the CDS spread (if liquid), time value and other variables constituting the valuation curve.

Example 1 – Increase in the fair value of the CDS (spread widens)

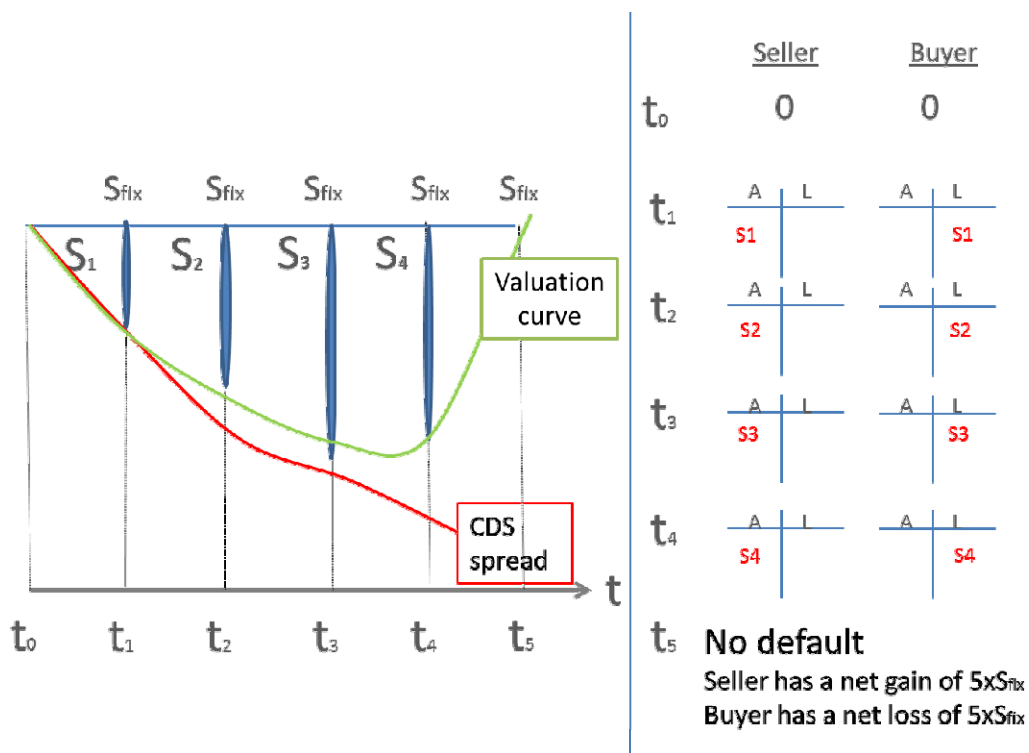


$$S = \frac{(1-R) \sum D(t_i)(q_{t_{i-1}} - q_{t_i})}{\sum D(t_i)q(t_i)d_i + D(t_i)(q_{t_{i-1}} - q_{t_i}) \frac{d_i}{2}}$$

Where: D(t) = discount factor for date t, q(t) = survival probability at time t, S = annual premium, d = accrual days, R = current interest rate.

In the first example, the spread of the CDS widens and the fair value of the credit derivative increases during the life of the contract. In the first period, the seller receives the spread (S_{fix}) fixed at the inception of the contract as cash. This amount will be consequently reflected in the asset side but exactly at the same time will acknowledge a potential loss of $S_{fix}+S_1$. Thus, in net terms S_1 will appear as the fair value of the contract on the liability side of the balance sheet. Exactly the opposite dynamic should be identified in the buyer's balance sheet. The same logic follows in the subsequent periods. The spread of the latest period will go down even if the market CDS spread widens as one of the elements of the valuation of the CDS is how far the contract is from maturity.

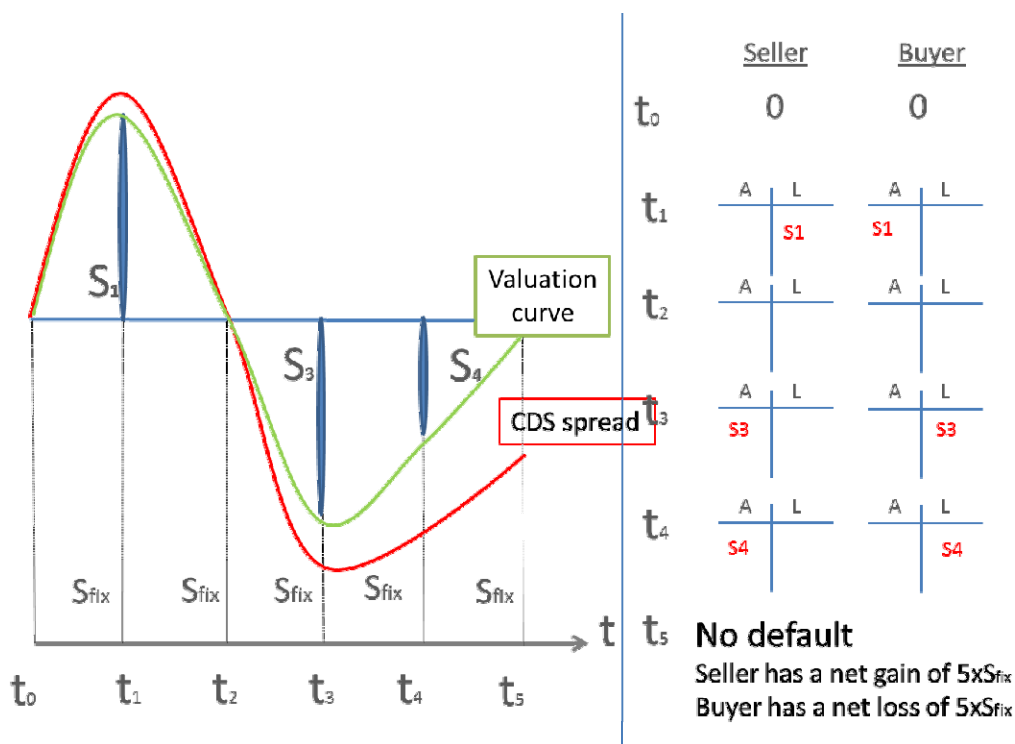
Example 2 - Decrease in the fair value of the CDS (spread tightens)



In the second example, the evolution of the underlying credit risk is the opposite of that in the first example. The spread of the CDS tightens and the fair value of the credit derivative decreases during the life of the contract.

In the third example, the spread of the CDS widens and tightens during the duration of the contract. Therefore, the fair value of the credit derivative increases in the first period, is zero in the second, and finally further decreases during the last two periods. This shows the volatility and impact of valuation on the balance sheet, as in the first period the seller has a net liability, nothing in the second period and net assets in the last two periods.

Example 3 – Increase followed by a decrease in the fair value of the CDS



In the final example, the spread of the CDS tightens for three periods, but between the third and the fourth period the underlying fixed income instrument suddenly defaults. During the first three periods, the fair value decrease of the CDS is recorded as an asset for the seller and a liability for the buyer. However, in the fourth period, the seller, instead of having an asset, has a *net loss* (equal to the notional of the fixed income minus the recovery value of the defaulted fixed income instrument and minus the fixed spread received from the buyer), whereas the buyer will have a *net gain* for the same amount. It should be noted that the buyer recorded the CDS on the liability side of the balance sheet, while in fact the instrument resulted in a gain.

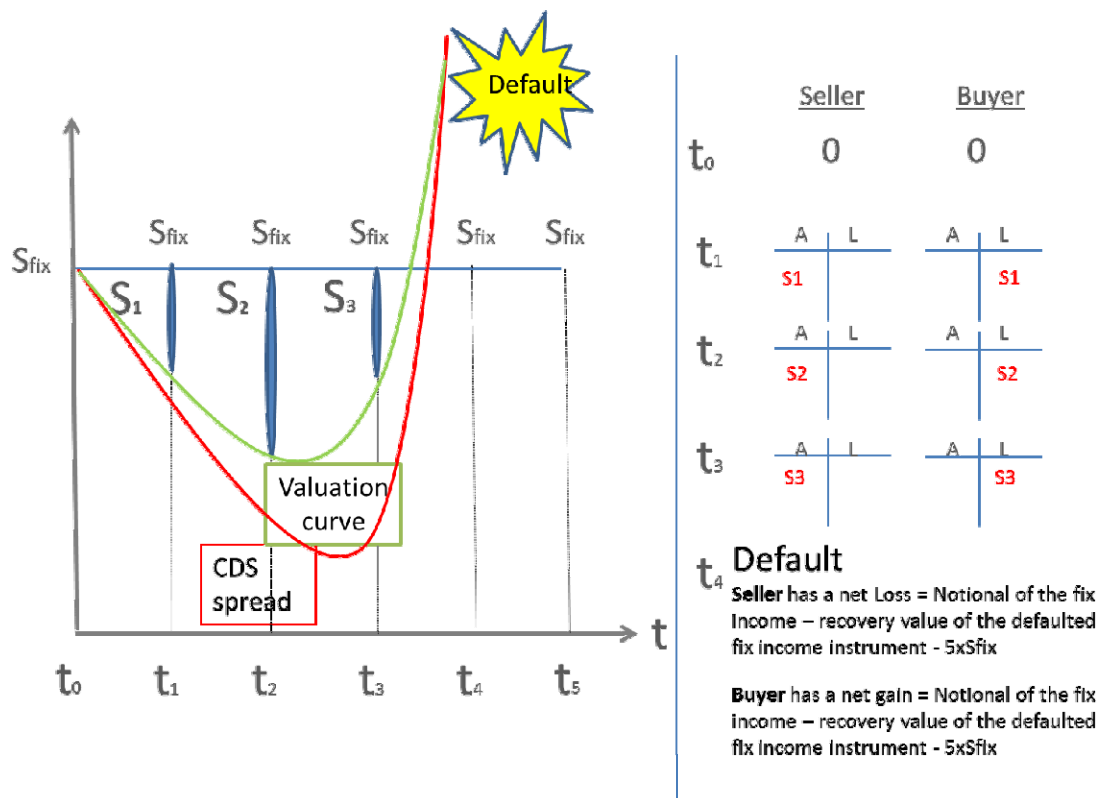
In the case of a sudden default of the fixed income instrument, the accounting representation of the CDS in the balance sheet might not be very informative as to whether this instrument is an asset or a liability for either the seller or the buyer.

In the first three examples, at the end of the contract, when the contract is no longer recorded on balance sheet, the seller will have had a net gain of five times the fixed spread and the buyer a net loss from recognising the expense (e.g. the premium paid) of the same amount. In the first example the representation of the CDS will appear as a liability for the seller over the life of the contract. In the second example, when the credit risk of the underlying asset decreases, the seller of the protection records the CDS as an asset, while in the third case the volatility of the valuation shifts the representation of the contract from the liability side to the asset side for the seller.

It could be concluded that during the life of the derivative, the fair value changes of the CDS could lead to increases or decreases on the balance sheet of the bank even if the purpose of

the contract was not to offset the position during its life. Furthermore, in the case of a sudden change of valuation due to an unexpected default, the representation of this instrument in the balance sheet will be confusing as to the nature of the instrument (whether it is an asset or a liability) and its impact on the income statement.

Example 4 – Unexpected default of the underlying asset



6.2.4. EU accounting differences and the problems of country aggregation

Until the move towards IFRS in the EU in 2005, banks disclosed information on their use of derivatives largely on a voluntary basis, so comparison analyses between banks within the EU related to derivatives were almost impossible. Since then, an increased level of transparency for derivatives was to be expected. In this respect, IAS 39 brought most of the derivatives that used to be off-balance sheet (either not disclosed or inappropriately disclosed) onto financial statements (i.e. balance sheets and income statements). Recognising derivative instruments on balance sheets led to grossing-up the balance sheet, had an impact on net earnings and increased the volatility of the income statement.

Nevertheless, there are some divergences between EU Member States with regards to the implementation, application and transposition of the IFRS standards in the national accounting systems²⁷¹. This leads to differences in the accounting treatment of derivatives

²⁷¹ Although there is an endorsement process for the IFRS standard at EU level, some differences persist between Member States. The differences between countries can be divided into two main types: (i) the degree to which IFRS has been mandated or allowed for particular companies or types of reporting, and (ii) the degree to which

between Member States that will generate some problems when analysing and comparing derivatives positions in different countries' banking systems. First, currently IFRS standards are only mandatory for the consolidated financial statements of European banks²⁷² whose securities are traded on a regulated securities market. In addition, in some countries an early voluntary adoption of a particular standard is allowed before its mandatory application date for all banks following its endorsement at EU level.

In most Member States, trading and use of derivatives are concentrated in the hands of rather large banks that prepare consolidated financial statements and report under IFRS. However, this does not mean that other credit institutions are not also active on derivatives markets. Although these credit institutions have a small share of the derivatives outstanding in EU banks' balance-sheets, the unfeasibility of assessing the risk that derivatives pose in their balance sheets in a consistent way across the EU, could represent a major obstacle for analysis and for detecting structural weaknesses²⁷³, primarily for the individual bank in question but also for the whole banking system.

For example, this lack of consistency does not only affect the smaller banks but can also be the case of a US subsidiary bank operating in the UK that is very active on the derivatives market²⁷⁴. According to the current accounting standards, this bank has to follow national GAAP, and as a result off-balance sheet disclosure of its derivative exposure may be allowed.

6.2.5. Strategies in derivatives accounting: trading versus hedging

The basic principle in IAS 39 is that all derivatives are recorded on the balance sheet at fair value with any gains and losses resulting from changes in their fair value recorded in the income statement. However, derivatives are commonly used to hedge assets and liabilities that are measured at cost or amortised cost. For example, if a bond is valued at cost (in the held to maturity portfolio), any changes in the value of the bond are not fully reflected in the income statement²⁷⁵, unlike with the changes in value of the derivative which are immediately registered in the income statement. This creates a mismatch in the timing of gain and loss recognition and calls for a special accounting treatment, namely hedge accounting, to adequately reflect the necessary financial coverage. Hedge accounting aims to avoid much of the volatility that would arise if the derivative gains and losses were reflected in the income statement as required by normal accounting principles. All that is not considered hedge accounting should figure under the held-for-trading portfolio ("speculation-normal accounting").

the practice of IFRS differs along national lines (e.g. under the influence of the previous national accounting practices).

²⁷² The EU IAS Regulation 1606/2002 gives Member States the option to require or permit IFRS as adopted by the EU in separate company financial statements (statutory accounts) and/or in the financial statements of companies whose securities do not trade on a regulated securities market.

²⁷³ In addition to these risks and lack of comparability, for some small entities operating in the EU and not reporting under IFRS we could also be faced with lower quality financial statements.

²⁷⁴ See also Figure 3 in section 6.3.1. on the weight that derivatives have in the total liabilities of the banking system in different Member States.

²⁷⁵ As the name of the "held to maturity" portfolio suggests, bonds are acquired with the intent to be held until maturity and not sold before.

Trading

In the case of derivatives held for trading purposes, derivatives are part of the held-for-trading portfolio and banks can engage in speculative activities on their clients' behalf or for themselves by taking risk and expecting favourable changes in market factors, which would generate extra profits. Moreover banks serve as the main market makers in many derivatives markets and hold large balanced or unbalanced positions in these derivatives in order to fulfil this role.

However, as the cost of entering into derivative transactions is usually lower than the cost of purchasing or short-selling the underlying asset, derivatives allow banks and other investors, include those who wish to hedge an exposure or portfolio, to benefit from financial leverage. This means the investor can create an exposure to a given risk without having the necessary resources for purchasing the asset to which the risk is originally attached.

For instance, in the case of a derivative, e.g. again with credit default swap, acquired with speculative purposes, the bank seeks to exploit both upward and downward trends in credit risk through direct marketing (selling or buying). When buying credit protection through CDS, a bank bets on an increase in the credit risk that will translate into an increase in the spread. This in turn will lead to an increase in the value of the CDS. When closing the position the bank will make a profit. When selling credit protection through CDS, the expected effect is the opposite.

In these situations the bank basically takes positions in the credit market with the objective of obtaining a return on its investment. The trading derivative is recorded in the held-for-trading portfolio on the balance sheet, and any change in its fair value is directly reflected in the income statement.

Hedging

A hedge is a strategy designed to minimise the unwanted risk of another transaction. A hedging item is an instrument or group of financial instruments that replicate the change in value of the hedged item, which is attributable to the risk hedged against.

Banks holding substantial investments and financing on capital markets are exposed to significant interest rate risk, i.e. they face the risk that the fair values or cash flows of assets or liabilities change in response to interest rate movements.

Additionally, banks with international operations are subject to another major risk, the foreign exchange risk, i.e. the risk that changes in the value of the currencies adversely affect the expected cash flows of the business in foreign currency. Derivatives can be employed to manage these risks, because they can offset the fair values and cash flows that otherwise would have adversely been affected by changes in the interest rate or the exchange rate.

An accounting concept that tries to capture a hedge in the financial statements is called hedge accounting. Hedge accounting distinguishes between three possible types of hedge accounting: 1) hedges of changes in the fair value of assets, liabilities or unrecognised firm commitments (fair value hedges); 2) hedges of the variability of future cash flows from highly probable forecast transactions and floating rate assets and liabilities (cash flow

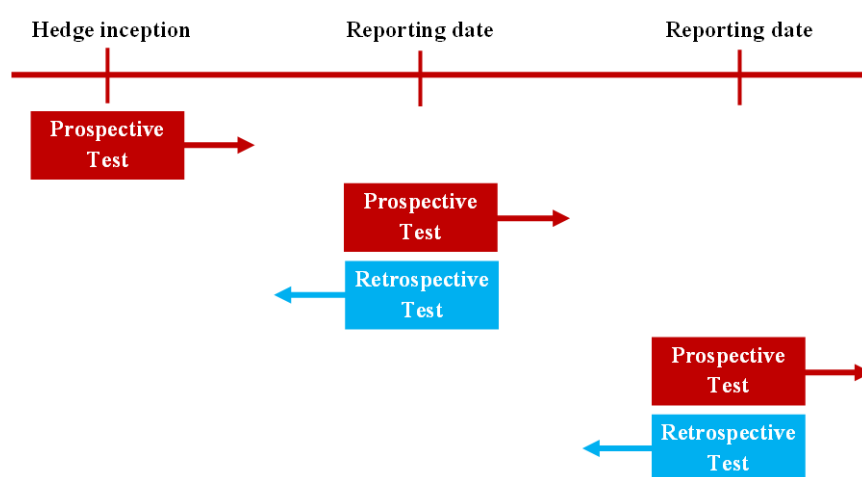
hedges); and 3) hedges of the translation adjustments resulting from translating the functional currency financial statements of foreign operations into the presentation currency of the parent (hedges of net investments in foreign operations).²⁷⁶

Hedge effectiveness and why hedge accounting does not represent the total hedging role of derivatives within banks' financial statements.

Under IAS 39 Financial Instruments: Recognition and Measurement the entity applying hedge accounting should assess hedge effectiveness both at the inception of the hedge and at future reporting dates. The standard requires two types of effectiveness tests:

- A *prospective (forward-looking)* test to see whether the hedging relationship is expected to be highly effective in future periods.
- A *retrospective (backward-looking)* test to assess whether the hedging relationship has actually been highly effective in past periods.

Chart 6.2.1. - Graphical representation of the effectiveness test



Source: *Analistas Financieros Internacionales (AFI)*

Although the standard does not explicitly state how the range of 80 to 125 per cent should be evaluated²⁷⁷, it seems clear that the correlation between changes of fair values or cash flows of the hedged item and the hedging instrument should stay within the range mentioned.

Both tests need to be highly effective at the start of the hedge and during the whole period hedge accounting is applied. A prospective test is highly effective if, at the inception of the hedge relation and during the period for which the hedge relation is designated, the expected changes in fair value of cash flows are offset. This means that during the life of the hedge, the change in fair value of the hedged item should be offset by the change in fair value of the hedged instrument. A retrospective test is highly effective if the actual results of the hedge are within the 80% - 125% range.

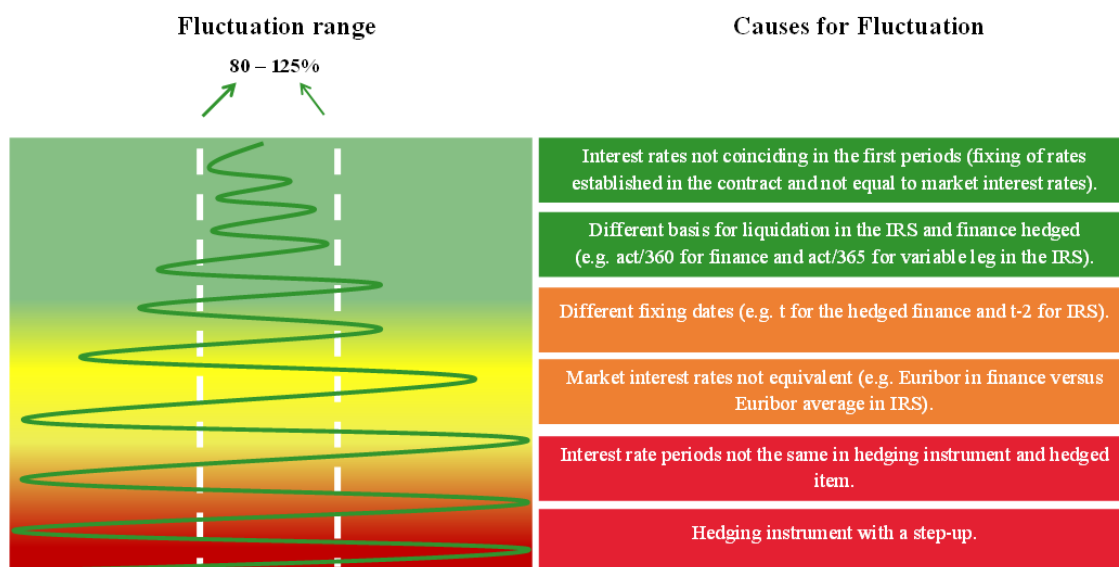
²⁷⁶ For more details on the three types of hedges see the annex.

²⁷⁷ IAS 39 does not establish a method to evaluate the effectiveness of a hedging instrument, except where it recommends the use of a hypothetical derivative in order to register accounting entries.

IAS 39 does not specify a single method for assessing the effectiveness of the hedge. The method used depends on the risk management strategy. The most common methods are:

- *Critical terms comparison* - this method consists of comparing the critical terms (notional, term, timing, currency, and rate) of the hedging instrument with those from the hedged item²⁷⁸. This method does not require any calculation.
- *Dollar offset method* - this is a quantitative method that consists of comparing the change in fair value between the hedging instrument and the hedged item. Depending on the entity's risk policies, this method can be performed on a cumulative basis (from inception) or on a period-by-period basis (between two specific dates). A hedge is considered highly effective if the results are within the 80% - 125% range.
- *Regression analysis* - this statistical method investigates the strength of the statistical relationship between the hedged item and the hedge instrument. From an accounting perspective this method proves whether or not the relationship is sufficiently effective to qualify for hedge accounting. It does not calculate the degree of ineffectiveness.

Chart 6.2.2. – Fluctuation range and causes for fluctuation: example with an Interest Rate Swap (IRS)



Source: Analistas Financieros Internacionales (AFI)

In addition, before the inception of the hedge, the company has to document the hedging relationship between the hedged item and the hedging instrument.

Taking into account the fact that in many circumstances the hedge becomes ineffective anyway and given the burden of the effectiveness test, for many banks it might be less expensive and more efficient not to use the hedge accounting criteria but “normal” derivative accounting (i.e. accounting derivatives as held-for-trading with all the changes in value

²⁷⁸ However, for hedge accounting this does not suffice. Retrospective effectiveness testing is required as well. For more details see IAS 39 IG.F.4.7.

recognised in the income statement) to hedge their different risk exposures²⁷⁹. This is empirically tested in section 6.3 to investigate the weight of hedge accounting over all derivatives.

6.2.6. Netting, offsetting, set-off and the collateral management

Exchange traded derivatives such as futures and options were traded in organised markets before the crisis. These markets have basic rules governing their organisation and functioning, with regards to the investors that can intervene, the general conditions of each negotiated contract, rights and obligations of the parties, the technical aspects of trading, pre-trade and post-trade transparency, clearing and settlement, etc.

In 2009, the G20 set up a roadmap to address the systemic risks and opacity of OTC derivatives and thereby provided a regulatory push for OTC transactions to be traded on exchanges rather than negotiated bilaterally. In the EU, EMIR and the updated Markets in Financial Instruments Directive (MiFID II) requiring that all trades in derivatives be reported to trade repositories, that standardised OTC derivatives be centrally cleared, and that cleared OTC derivatives that are "sufficiently liquid" be traded on trading venues providing for multilateral interaction.

However, many derivatives contracts are still traded on markets that are not organised (OTC markets) and therefore have no specific rules. Generally, the fundamental characteristics of OTC derivatives are that they feature contract terms that better meet the specific needs of the parties to the contract. Thus, the price is the result of the agreement between the parties; there is a direct relationship between the buyer and the seller; the guarantees are laid down in the negotiation, and the risks are fully borne by the parties to the contract.

Before the ongoing set of legislation, many associations and bodies²⁸⁰ established international standards for OTC derivatives contracts to reduce uncertainty in the trading of OTC derivatives. The ultimate goal was to develop standard agreements leading to a comprehensive self-regulatory framework capable of solving potential disagreements between contracting parties to these OTC derivative contracts. This type of agreement is applied to trades in OTC derivatives markets, providing solutions to any legal lacunae.

The International Swaps and Derivatives Association (ISDA), stands out for having succeeded in establishing an international framework for OTC derivatives contracts through its ISDA Master Agreement. This agreement covers the fundamental principles governing trades in OTC derivatives markets and establishes the terms and conditions of the derivatives transactions, both with other financial institutions and with end-users.

One of the main elements of the ISDA Master Agreement refers to the terms of netting, offsetting and set-off, which are often used to express the same notion, while being very different concepts. A better understanding of the terminology and the way in which

²⁷⁹ In addition, hedge accounting is voluntary and not obligatory under IFRS.

²⁸⁰ For example, the British Bankers Association (BBA) in UK, the Spanish Banking Association (AEB) in Spain, Deutscher Rahmenvertrag für Finanztermingeschäfte in Germany.

derivatives are settled provides some insight as to why accounting standard setters have agreed to report derivatives either on a net or gross basis on the balance sheet.

A right to **set off** is a legal right²⁸¹. It is the right that one party has against another party to use its assets (amount owed to it by the creditor or another party) in full or partial payment (or satisfaction) of what it owes the creditor.

The ISDA Master Netting Agreement creates a single contract between the two parties under which all transactions can offset each other. Therefore, each day, the ISDA master netting agreement allows for (i) the aggregation of all trades, and (ii) their replacement with a single net amount.

Netting is, therefore, the termination or cancellation of reciprocal obligations, the valuation of terminated obligations and their replacement by a single payment obligation. During the normal business of a solvent firm, netting takes the form of settlement netting (or payment netting) which involves combining offsetting cash flow obligations between two parties into a single net payable or net receivable. In the event of default or other termination of transactions outside the normal course of business, netting takes the form of close-out netting, which implies that all transactions with a given party should be netted down to a single amount.

Despite close-out netting, there may still be some sort of asymmetry between derivatives payable and receivable. When market participants are in distress, counterparties will tend to try to terminate contracts that are in their favour and leave the other contracts open. This means that when there is serious market stress, or when there is a significant fall in the creditworthiness of a single party, derivatives payable may underestimate the actual amount of risk.

Furthermore, close-out netting may incur general systemic risk and cause uncertainty within the financial markets. Close-out netting impedes contagion through derivatives, but interacts with the seniority of other debtors in the event of a bank default. Consequently, if a bank is perceived to be near default, there is an incentive to trade with this institution via derivatives, rather than providing any kind of funding. This may increase the cost of funding dramatically and drive the institution towards insolvency.

Finally, **offsetting** is a concept used for accounting and reporting purposes only. It refers to the net presentation of financial assets and financial liabilities on the financial statement as a result of an entity's right to set off. When the right to set off is enforceable in a jurisdiction, the derivatives trading partners under a master netting agreement have either a net asset or a net liability, but not both.

The different requirements that exist as regards offsetting mean that there are significant differences between amounts presented in statements of financial position (i.e. balance sheets) prepared in accordance with IFRS and those prepared in accordance with US GAAP, particularly for entities that are very active in derivatives. The key differences between US

²⁸¹ Because the right of set-off is a legal right, the conditions supporting the right may vary from one legal jurisdiction to another.

GAAP and IFRS lie in the exceptions to the general criteria that US GAAP grants. They allow companies with derivatives under a single master netting agreement with the same counterparty the possibility to report assets and liabilities (including cash collateral) on a net basis, even if they do not intend to settle the cash flows on a net basis. Unlike the US standards, there are no such exceptions in IFRS, which leads to a grossing-up of the balance sheet for companies preparing financial statements under IFRS.

Table 6.2.1 shows that reporting under IFRS, Deutsche Bank's total assets in 2009 amounted to USD 2,146 billion, of which 40 per cent (or USD 863 billion) were derivatives. In contrast, reporting under US GAAP, J.P. Morgan's total assets amounted to USD 2,032 billion, of which only 4 percent (or USD 80 billion) were derivatives. Furthermore, had J.P. Morgan been required to report under IFRS, they would have reported USD 1,485 billion of additional assets.²⁸²

Table 6.2.1. - Reported gross assets and the effect of offsetting derivative contracts for selected banks in 2009

US\$ billion	Potential Impact of Grossing Up	Reported Derivatives	Other Assets	Total Assets
BNP Paribas (IFRS)		527	2,415	2,942
RBS (IFRS)		711	2,021	2,732
HSBC (IFRS)		251	2,114	2,365
Barclays (IFRS)		671	1,549	2,220
DB (IFRS)		863	1,283	2,146
JP Morgan (U.S. GAAP)	1,485	80	1,952	2,032
Citi (U.S. GAAP)	600	67	1,789	1,856
BoA (U.S. GAAP)	1,414	81	2,143	2,224

Source: ISDA (2012)

Collateral posting (e.g. margin calls) is a transitory transaction meant to reduce the risk exposure of derivative contracts. In order to illustrate how margin calls work and what implication they have for banks' valuations, we take the example of Bank A that has bought from Bank B with a credit default swap (CDS). At inception (t_0), the value of the CDS is zero, but suppose in the next period (t_1) the spread widens and the value of the CDS increases. This translates into a positive fair value for Bank A's position and an increase in the corresponding asset on the balance sheet. At the same time, under the framework of the ISDA Master Netting Agreement²⁸³, Bank A sends a margin call request to Bank B equivalent to the exposure. For Bank A, the counterparty risk can be measured by the net derivatives receivable minus any collateral received. The funds received as collateral from Bank B reduce the risk exposure and are recorded on the balance sheet of Bank A as a "deposit by credit institutions". This creates a double accounting record on the assets side of

²⁸² Analysis by S&P Global Credit Portal (2011) ("Accounting proposal struggles to create global convergences in balance sheet offsetting", 21 September 2011), suggests that total assets for a sample of US banks would increase by about 70% if companies would not be allowed to offsetting derivatives subject to master netting agreements required on the balance sheet. Similarly, for a sample of European banks, total assets would decrease by about 23% if they would apply U.S. GAAP and opt to net eligible derivative assets and derivative liabilities.

²⁸³ Typically an entity first enters into an ISDA Master Netting Agreement with a bank or a dealer prior to transacting derivative instruments. The entity may sign an ISDA Credit Support Annex (CSA) that provides for the posting of collateral to cover all or portion of the net market value of the position to limit the exposure.

the balance sheet. Bank A records an increase in the value of assets due to the positive fair value of the CDS²⁸⁴ but also records an increase in the cash account for the collateral received²⁸⁵. One could think that this leads to double counting, but in fact, from an accounting point of view, it represents the real position of the bank that reflects its risk exposure, as the bank does not have the enforceable right of set-off and does not intend to set off these exposures. However, from an economic point of view, we see a grossing-up of the balance sheet. In addition, the collateral posted by Bank B served as a cheap financing source (at a low cost, e.g. EONIA) for Bank A. The lack of comprehensive information about collateral related to CDSs, and more generally to derivatives, seriously limits our ability to analyse derivatives in the annual accounts of banks and impedes supervisors' ability to effectively monitor this risk.

6.3. EMPIRICAL CHARACTERISATION OF THE PRESENCE OF DERIVATIVES IN BANKS' FINANCIAL REPORTING

6.3.1. Differences of banking systems in the Member States

EU Member States' banking systems differ widely with regard to reliance on derivatives, and thus there is a similar degree of variance in how much the accounting issues mentioned above affect their balance sheets. The figures²⁸⁶ on the weight that derivatives have in the total liabilities of banking system are taken as a proxy of the derivatives present in the balance sheet of the banking system due to the mirror correlation with the asset side of the balance sheet as shown in the next section.

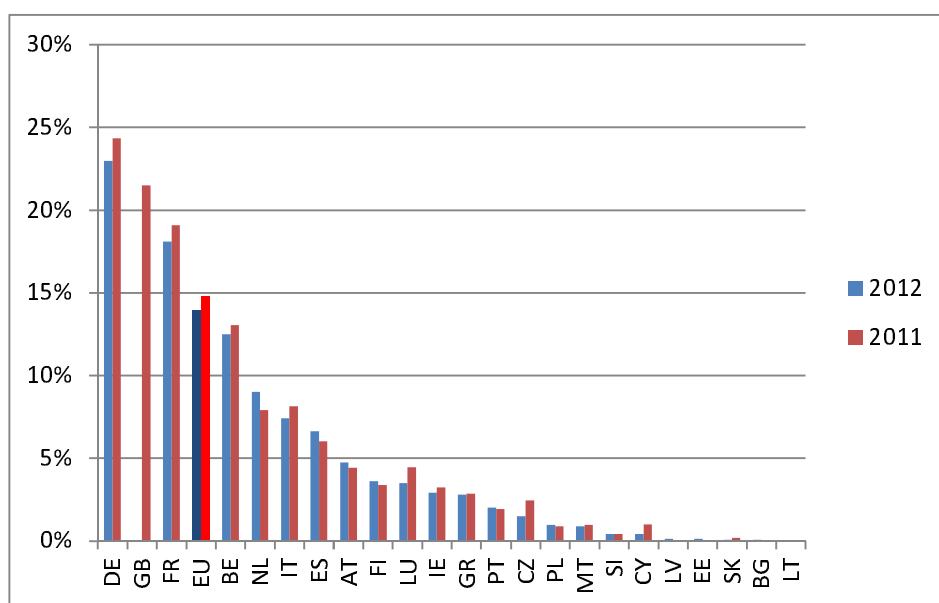
Among the EU Member States, only banking systems in three Member States (Germany, UK and France) had an above-EU average share of derivatives in total liabilities, i.e. 14% in 2012. The rest remained below the average (see Chart 6.3.1). Furthermore, for 16 countries the presence of derivatives in their balance sheet is minimal (below 2.5%), and for other three the weight is almost half of the EU average. Derivatives represent almost a quarter of the total balance sheets of the German and UK banking systems. That could be the consequence of the steep increase in their reliance on derivatives between the beginning of the crisis in 2007 and 2012.

²⁸⁴ We also record the "*unrealised gain*" in the income statement.

²⁸⁵ We also record the increase in the liabilities side, presented as "*deposits by credit institutions*".

²⁸⁶ Consolidated Banking Data from the ECB SDW (Statistical Data Warehouse).

Chart 6.3.1. - Share of Derivatives in total liabilities by Member State



Source: ECB SDW

This huge disparity might be due to the bank business models predominant in each country, and whether one of the nine large EU wholesale banks is present in a particular Member State. Nevertheless, as mentioned in section 6.2.4, it is very difficult to compare the aggregation of derivatives on a country by country basis due to different applicable accounting rules (EU banks might use different financial reporting frameworks that account for derivatives in a different way) and any such aggregation should therefore be interpreted with caution.

6.3.2. Differences in banks' business models

Differences in business models across the EU banking sector seem to be the key variable to explain the disparities in derivatives' role in individual banks' balance-sheet and in banking systems per Member State.

In the context of the BRRD, a sample of 44 EU banks separated into four clusters based on their key characteristics was compiled. The sample was divided in two different ways. First, a separation was made based on size: one cluster contained 25 large banks²⁸⁷, another cluster was made up of 19 medium-sized banks²⁸⁸. Second, the large banks were divided into two clusters linked to the different sources of funding: nine large "wholesale" banks where the main source of funding did not come from deposits²⁸⁹; and 16 large "retail" banks where the main source of funding was deposits²⁹⁰. Finally, an average bank was constructed out of the totality of the sample.

²⁸⁷ Those that have more than EUR 300 billion of total assets on their balance sheets.

²⁸⁸ Those that have between EUR 80 and 300 billion of total assets on their balance sheets.

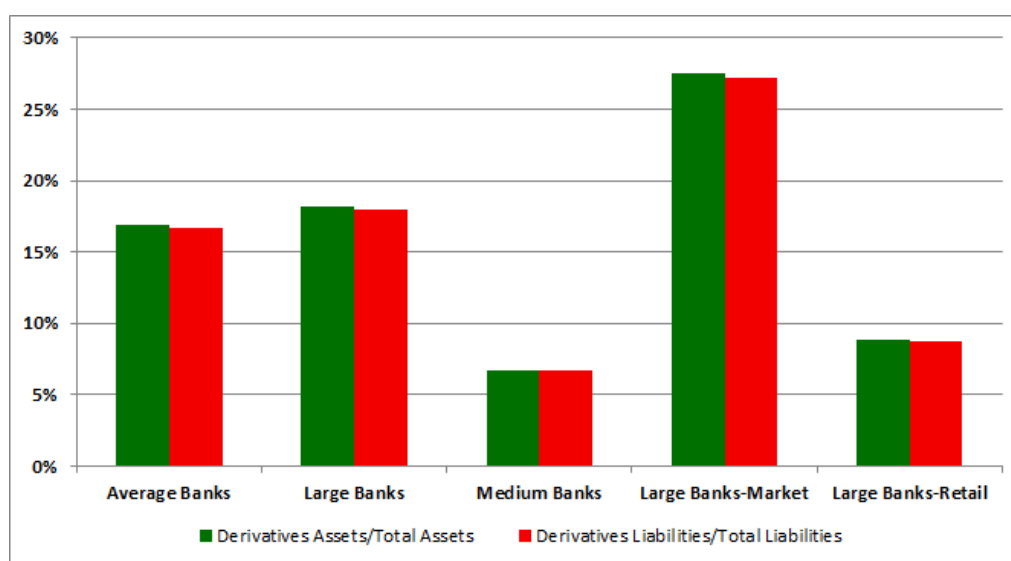
²⁸⁹ Those whose ratio of non-deposit liabilities over total liabilities is higher than 30%.

²⁹⁰ Those whose ratio of customer deposits over total liabilities is higher than 30%.

This type of cluster analysis helps to uncover structural funding differences between different types of banks. When expanding the methodology to the asset side of the balance sheets of the sampled banks with a special focus on derivatives there are several findings:

- The weight of derivatives on the asset side mirrors that on the liability side in all clusters.
- The share of derivatives on the assets and liabilities present large dispersion between business model.
- There is a positive correlation between the presence of derivatives in the balance sheet of a bank and its size: medium-sized banks' reliance on derivatives is around 7% of total assets while large banks' reliance is more than 17% on average.
- Within large banks, as expected, large wholesale banks have more than a quarter of their balance sheets in the form of derivatives (around 27%), while retail-oriented banks obtain their funding from customer deposits and on average the weight of derivatives as a share of their total balance sheets is around 8%.
- Medium-sized banks and large “retail” banks have nearly the same derivative dependence in their balance sheets.

Chart 6.3.2. - Share of Derivatives on the assets and liabilities by business model



Source: EC calculations with data retrieved from SNL Financial, Bloomberg, Dealogic DCM Analytics and S&P Ratings Direct on the Global Credit Portal

In short, derivatives trading and accounting is very concentrated in a small number of banks in the EU. Those banks that have more than 25% of their balance sheets linked to derivatives are mostly big dealers in the OTC derivatives market and are only present in four Member States (Finland, the UK, France and Germany).

6.3.3. Case study: analysis of a representative bank

In this section, we analyse derivatives reporting in the financial accounts of an average wholesale bank operating in the EU (hereafter *example Bank*²⁹¹). The aim of this empirical analysis is to allow the reader to put into perspective the theory stated in section 6.2.

The scope of our example Bank's operations includes typical banking activities in the retail and commercial areas (deposit products, credit products) and it is active in financial markets, including both trading activities (for risk management, liquidity maintenance and speculation) and sales activities (currency dealing in spot, forward and options), intermediation in the fixed-income market (mainly bonds and bills), interest rate derivative sales and compound investment products (commodity and equity options).

Balance sheet representation

This section highlights some of the issues relevant to the accounting and valuation of derivatives on a bank's balance sheet.

Table 6.3.1. – Balance Sheet: share of derivatives on assets and liabilities: trading versus hedge and swaps versus options

	Assets			Liabilities		
	2012	2011	Δ%	2012	2011	Δ%
Total Trading Derivatives	97%	99%	-32%	99%	100%	-32%
1. Swaps	87%	92%	-35%	88%	92%	-35%
3. Options	11%	7%	6%	11%	8%	0%
Total Hedging Derivatives	3%	1%	21%	1%	0%	60%
1. Swaps	3%	1%	21%	1%	0%	60%
2. Options	0%	0%	0%	0%	0%	-100%
Total Derivatives / Total Assets	18%	24%		17%	23%	

Source: Example Bank IFRS financial statements and EC calculations

In relative terms, the bank's derivatives account for 18% of its assets and 17% of its liabilities for the year 2012. This is a steep fall from the 2011 figures (down from 24% and 23% respectively). This dramatic fall is particularly acute in non-hedging swaps.

From an accounting point of view, our example Bank's derivatives trading versus hedging has been considerably asymmetric. In 2012, compared with the value of derivatives used for trading purpose (97%), the value of derivatives held for hedging is negligible (3%). Nevertheless, in 2011 the split between trading and hedging was 99% versus 1%, thus hedge derivatives increase by 400% in just one year. In any case the small amount of hedge derivatives over the total might be due to the fact that, as stated in section 6.2.5, it is not straightforward to design a derivative in a hedge accounting relationship.

²⁹¹ We have randomly selected an example Bank given its increased disclosure detail for derivatives in the reported financial statements and due to its not too large size.

Nevertheless is important to highlight that the trading derivatives held by banks with the purpose of economic hedges are not the same as those classified as accounting hedges²⁹². This could be for several reasons:

1. Derivatives do not meet the accounting requirements for effective hedges.
2. Derivatives are deliberately classified as held-for-trading to cover the exposure to assets or liabilities held in the same portfolio.
3. The hedge effective tests are too expensive.

For these reasons, theoretically, part of the trading derivatives disclosed in the financial statements, and in particular swaps, are assumed to be used as economic hedges. But financial reporting does not provide any information on those thus making it impossible for an analyst to test the theory²⁹³.

The above table also shows increased volatility from one year to the next in the fair value of swaps, futures and forwards, and less in the case of options. Therefore, options seem to be more stable from an accounting point of view²⁹⁴. Nevertheless, volatility in valuation could have a big impact on the size of the balance sheet, leading to some confusion by investors. The year-on-year changes in swaps might be an intrinsic feature of the selected bank due to the deleveraging process in the EU, but nothing is explained about that in the bank's financial reporting.

Finally, the Bank discloses the type of derivative it trades. This type of information is not mandatory and therefore is typically provided only by large wholesale banks. Interest rate swaps account for three quarters of total derivatives, followed by foreign exchange derivatives and credit derivatives with around 10% and 5% respectively. Commodity derivatives, equity derivatives and other derivatives are less important in Bank's balance sheet. The decrease of derivatives between 2011 and 2012 as stated above is very noteworthy, both on the assets and liability side. Volatility is higher for credit derivatives and lower for interest rate swaps, but it cannot be concluded that our example Bank is losing or gaining on its different derivative contracts. The structure of this type of liabilities is common to all large wholesale banks.

²⁹² For example, the case of a bank's exposure to a corporate bond or loan in a foreign country. In order to hedge the risk of that exposure, and in the absence of an appropriate hedge instrument, e.g. a CDS, the bank decides to hedge its risk (partially or entirely) by purchasing a CDS written on a correlated sovereign from a neighbourhood country which is liquid enough and not on the specific corporate. In this example, the coverage cannot be considered as an accounting hedge but it serves as an economic hedge of the risk. By including both instruments in the same portfolio, the bank manages to have a symmetrical accounting treatment of the changes in fair value of the hedged item and hedging instrument, which in turn are compensated in the income statement.

²⁹³ It is expected that the new proposed disclosure requirements related to hedge accounting envisaged by the IASB in developing IFRS 9 – Financial Instruments will better explain the accounting treatment of derivatives and its link to the overall risk management strategy.

²⁹⁴ Stability could also be driven by the fact that options do not shift from assets to liabilities and vice versa.

Table 6.3.2. - Balance Sheet: share of derivatives on assets and liabilities by type of derivative

	Assets			Liabilities		
	2012	2011	Δ%	2012	2011	Δ%
Total Derivatives	100%	100%		100%	100%	
1. Interest rate swaps	81%	74%	-29%	79%	73%	-30%
2. Credit derivatives	4%	8%	-70%	4%	8%	-69%
3. Equity derivatives	3%	3%	-45%	3%	4%	-42%
4. Foreign Exchange Derivatives	11%	12%	-39%	12%	12%	-35%
5. Commodity Derivatives	1%	2%	-58%	1%	2%	-55%
6. Other Derivatives	1%	1%	-48%	1%	1%	-43%

Source: Sample banks' financial statements and EC calculations

Income statement representation

The purpose of the income statement is to show to managers and investors whether the company was profitable or lost money during the period being reported.

Therefore, with regard to all financial instruments measured at fair value, any realised gains and losses, including interest income and interest expenses, are recognised as “net gain or loss from items at fair value” in the income statement.

As previously discussed, most Banks’ derivatives are held for the purpose of trading and less for hedging. Changes in the fair value of trading derivatives are also classified as “Net gain or loss from items at fair value” together with the changes in the fair value of the hedging item and hedging instrument in the case of fair value hedges and the ineffective portion of cash flow hedges and net investment hedges. At the same time, it should be mentioned that this account also records, apart from derivatives, changes in the fair value of all securities held for trading or held at fair value through profit or loss.

For the Bank, "net result from items at fair value" represents more than 40% of that bank's total operating profit in 2012. However, given the low disclosure detail in the bank's income statement with respect to the share of operating income attributable to derivatives, we cannot see the impact of these instruments on its net profit.

The value of gains or losses that was "recycled"²⁹⁵ from equity and recognised in the income statement amounts to less than 10% of the total operating profit for 2012. However, gains and losses recorded in equity resulting from a change in the fair values of the hedging instrument amounted to less than 2% of the bank's total equity for 2012.

²⁹⁵ For both cash-flow hedges and hedges of net investments in foreign operations, gains and losses are initially recognised in equity but are subsequently recognised in earnings when the gain or loss becomes realised (a process referred to as "recycling").

6.4. CONCLUSIONS

Derivatives are a major challenge for accounting standard setters and market analysts. First they are accounted at fair value. However, contrary to other financial instruments that are measured at fair value, derivative contracts are accounted as assets and liabilities irrespective of whether you are the seller or the buyer of the instrument. Instead, their accounting record is related to the fair value situation at each valuation point until maturity, and thus derivatives can easily switch from the asset side to the liability side in each period (e.g. derivatives can shift from a right to receive to an obligation to pay).

As most derivative financial instruments do not trade in an active market, how derivatives are valued and how they are reflected in banks' balance sheets relies mostly on internal models. Whenever models are used in lieu of observable prices, there is potential for management to introduce bias into the valuation process through the use of judgment. Managers' discretion in selecting the inputs to determine fair values creates significant differences in the valuation of financial instruments. This puts in doubt the valuation models for derivatives used by the banking sector and can create suspicions regarding the real financial position of an entity. The external verification of both the internal models used by banks and the inputs used (data and parameters) is virtually impossible for auditors, analysts, investors or (to a lesser extent) supervisors. Information disclosed by entities is insufficient. However, it is difficult to find a solution, given the thousands of contracts that are present in banks' balance sheets and their ever-changing character.

In addition, the fact that banks in the EU are not all obliged to adopt IFRS means that there are wide variations in how derivatives are disclosed in financial statements. This may make aggregated figures for countries, banking systems or for the EU as a whole misleading for analysts, contributing to this lack of consistency.

There is abundant research on definitions of derivatives accounting and guidance on how to account for hedging derivatives. Nevertheless, some basic questions regarding the meaning of derivatives in banks' reporting have not been answered. The empirical part of this chapter showed that, although there is a great focus on hedge accounting in accounting standards and the current accounting debate, this represents only a small portion of the total share of derivatives.

Netting, offsetting and collateral management contribute to mitigating the risks for OTC derivatives but also to grossing-up the balance sheet. This is particularly true when IFRS vs. US GAAP financial statements are compared, with US GAAP allowing companies to report derivatives (assets and liabilities, including cash collateral) on a net basis.

This chapter tried to shed some light on the complex dynamics of accounting for derivatives in banks' financial statements.

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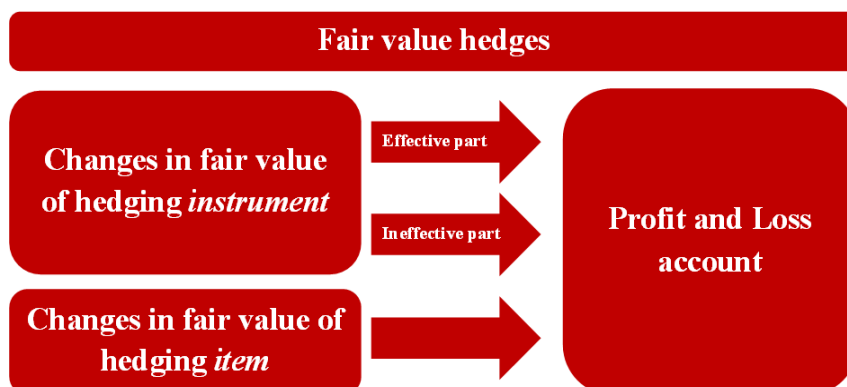
6.5 ANNEX: TYPE OF HEDGE ACCOUNTING

6.5.1. Fair-Value Hedge

A fair-value hedge is a hedge of the fair value of an asset, liability, or firm commitment. The goal of fair value hedge accounting is to offset the risk of changes in the fair value of an existing asset, liability or a firm commitment, which may increase the volatility of the entity's profit or loss. The fair value changes of the hedged item and the hedging instrument will offset and result in zero net impact on the profit or loss.

In a fair-value hedge, the changes in the fair value of the hedged asset, liability or firm commitment are recognised in the consolidated income statement along with changes in the entire fair value of the hedging instrument (the derivative).

Chart 6.5.1 – Fair-value hedge



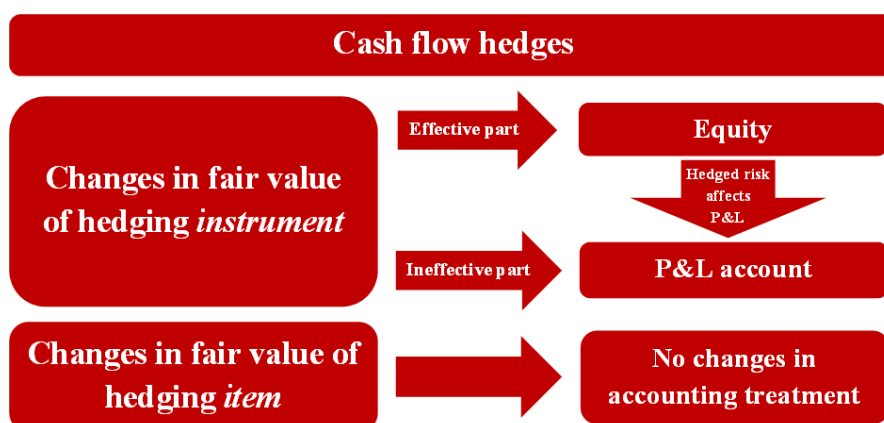
Source: *Analistas Financieros Internacionales (AFI)*

6.5.2. Cash-flow hedge

A cash-flow hedge is a hedge of future cash flows or of a forecasted transaction. The goal in a cash flow hedge is that the stream of cash flows from the hedged item is offset by an opposite stream of cash flows generated by the hedging instrument.

In a cash-flow hedge, the derivative is carried at fair value with changes in value reported initially in other comprehensive income to the extent the hedge is effective. Such gains or losses remain in other comprehensive income until the forecasted transaction or cash flow affects earnings. At that point, some or all of the deferred gains or losses are recognised in the consolidated statement of income. The ineffective portion of the gain or loss on the hedging instrument is recognised in profit or loss.

Chart 6.5.2 – Cash-flow hedge

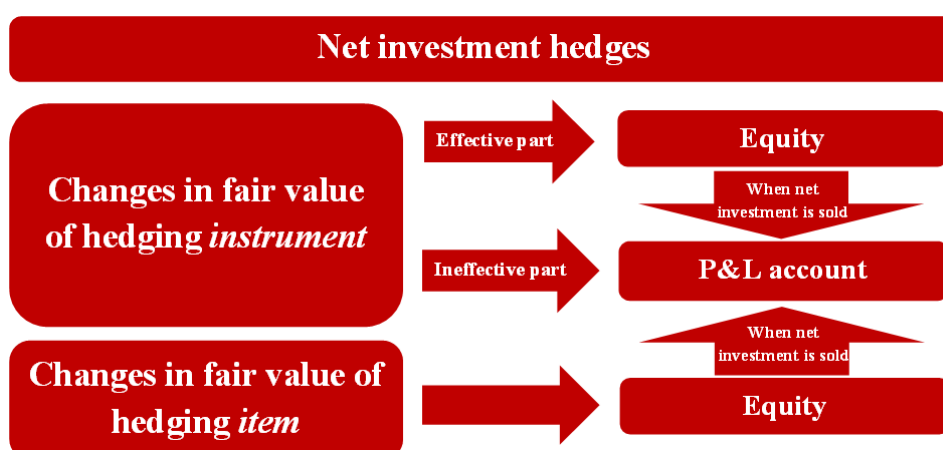


Source: Analistas Financieros Internacionales (AFI)

6.5.3. Hedges of net investments in foreign operations

For hedges of the translation adjustments resulting from translating the functional currency financial statements of foreign operations (hedges of net investments in foreign operations) into the functional currency of the parent, the portion of the change in fair value of the derivative due to changes in the spot foreign exchange rates is recorded as a foreign currency translation adjustment in other comprehensive income to the extent that the hedge is effective; the remainder is recorded as other income in the consolidated statement of income. Changes in the fair value of the hedging instrument relating to the effective portion of the hedge are subsequently recognised in profit or loss on disposal of the foreign operations.

Chart 6.5.3 – Net investment hedge



Source: Analistas Financieros Internacionales (AFI)

CHAPTER 7: FINANCIAL INTEGRATION VERSUS FRAGMENTATION: SOME MEASUREMENT ISSUES BEYOND BANK FUNDING AND DEBT MARKETS

7.1 INTRODUCTION AND MOTIVATION OF THE CHAPTER

Measurement issues always played a central role in the area of financial integration and the creation of a Single Market for financial services (SMFS).²⁹⁶ More than in other more standardized and regulated areas of the Single Market, the assessment of the economic benefits that could be achieved by creating a SMFS partly depended on what could be measured at a particular stage during the process.

The financial crisis has shown that some previously accepted concepts of measurement needed to be questioned, while others were found to be robust and to be continued. The ECB reviewed its set of indicators²⁹⁷ for monitoring financial integration in 2012.²⁹⁸ Data availability has improved. The market value of high quality economic data has increased and commercial data providers have made considerable investments in terms of IT infrastructure, but also in terms of methodology, e.g., how to compile data, make data comparable across countries, legal and accounting frameworks, etc. On the side of official statistics, efforts were concentrated on improving statistics and indicators in the area of financial stability where the ESFS, the ESRB and the ECB assumed new or enhanced mandates which created an urgent need for robust data.²⁹⁹

Finally, the economic and financial literature, and especially so since the onset of the financial crisis, has proposed new concepts for measuring financial integration. Overall, improved data availability and more robust theoretical concepts should benefit the capacity to assess the degree of completion of the SMFS. It therefore seemed timely to reflect on some of the concepts used in the Commission's annual monitoring report, and the present special feature is one input to such a reflection.³⁰⁰ In doing so, the present chapter follows the set of indicators proposed by Adam et al. (2002) and European Commission (2003). This set of indicators was not only largely followed in the annual Commission reports, but it also strongly overlaps with the indicator framework developed in parallel at the ECB.

The remainder of this chapter is organized as follows. Section 7.2 briefly recalls the history and mandate of the financial integration monitoring tool of the Commission. Section 7.3 contains a brief discussion of a subset³⁰¹ of the 20 indicators for monitoring financial integration developments recommended by Adam et al. (2002) and retained in European Commission (2003) and the following annual Commission reports. The following three sections discuss some of these indicators in more detail. Section 7.4 presents an assessment of the indicators related to price discovery. Section 7.5 revisits the indicators for the capacity of financially integrated economic areas to insure against shocks to consumption of private households and the capacity of the internal market to reallocate savings to their best

²⁹⁶ See European Commission (1983).

²⁹⁷ The first set was described in Baele et al (2004).

²⁹⁸ See the Statistical Annex in ECB (2013c).

²⁹⁹ See Israël et al (2013) for an overview.

³⁰⁰ The same can be said about the other special focus chapters contained in this report.

³⁰¹ The discussion of indicators based on optimal portfolio theory is deferred to a later stage.

alternative uses across borders (capital mobility regressions). Section 7.6 discusses corporate decisions on their funding structure and possible implications for indicators to better capture differences in access to finance and discusses some possible links to financial stability issues. Section 7.7 concludes in proposing, based on the discussions in the preceding sections, four additional indicators as part of a reframed set of indicators for monitoring financial integration.

7.2 THE COMMISSION IS TASKED WITH MONITORING THE EVOLUTION OF FINANCIAL INTEGRATION IN THE SINGLE MARKET

In 1988, a study by the Commission³⁰² used price data collected by a private consultancy³⁰³ to gauge the scope for welfare gains from the future SMFS. The Commission calculations using the macroeconomic model of the OECD at the time simulated a drop in costs for banking and insurance services by half compared to the situation prevailing in the mid-1980s.³⁰⁴ A decade later during so-called Monti review of the Single Market, the availability of data and indicators had clearly improved. While the estimated welfare gains had not been realized in full, the 1996/7 review had a more comprehensive approach towards measuring the efficient provision of financial services. It included detailed industry surveys, various econometric studies estimating the degree of competition in the financial services industry, and several detailed case studies. Following the European Council in Cardiff in June 1998, the Financial Services Action Plan (FSAP) was the next phase in the creation of the SMFS, and its implementation was monitored continuously.

Finally, in July 2000, the Council tasked the Commission to develop a new framework to monitor financial integration in the Single Market. The Commission ordered four external studies to assess the present degree of financial integration along several dimensions.³⁰⁵ One of the studies by Adam et al. (2002) was explicitly dedicated to the question which sort of indicators could and should be used to measure correctly financial integration going forward in order to identify those areas where policy action would be required to achieve an appropriate level of integration in line with the completion of the Single Market.

Taking into account the recommendations of the mentioned studies,³⁰⁶ the Commission working document in 2003 identified in a comprehensive manner suitable indicators for financial integration and established the monitoring framework for a decade of annual reports compiled by the Commission starting in 2004. Hence, last year's EFSIR completed a decade of reporting along these lines.

7.3 A SET OF 20 INDICATORS TO MONITOR FINANCIAL INTEGRATION

Adam et al. (2002) had recommended a set of 20 indicators for assessing the degree of financial integration in the Single Market as shown in table 7.3.1. This chapter discusses in

³⁰² European Commission (1988).

³⁰³ Price Waterhouse.

³⁰⁴ See European Commission (2003).

³⁰⁵ See references in European Commission (2003).

³⁰⁶ The study by Adam, et al. in 2002 shows how our appreciation of the degree of financial integration, or fragmentation for that matter, today is conditioned by measurement issues and the availability of appropriate indicators.

turn some³⁰⁷ of these indicators against the background of three intended outcomes of an integrated financial market. These favourable outcomes as compared to less integrated financial and economic area are:

- A. a more effective and economical price discovery (cost efficiency)
- B. improved risk sharing opportunities (shock absorption)
- C. an improved access to finance (allocation efficiency)

The role of this chapter is to start a discussion how to develop the set of indicators taking into account a number of measurement issues that emerged during the crisis, but also taking into account improved data availability.

Table 7.3.1: Set of recommended indicators of financial market integration in Adam et al. (2002)

The indicator measures the effect of financial integration on:	Price-based indicators	Quantity-based indicators
A. Credit and bond markets	Interest rate differentials in the money market (1), bond market (2), mortgage market (3), and corporate loan market (4)	Importance of foreign banks: asset shares (6) and number (7)
		Foreign assets (8) and liabilities (9) held by domestic banking sector
	Cross-border banking fees (5)	International Diversification of Bond (10) and Money Market (11) Funds
B. Stock Markets	Correlation of national stock market returns (12)	International Diversification of Equity Funds (13), Pension Funds (14), and Insurance Companies (15)
C.1 Household decisions	Saving-investment correlations (16)	
	Consumption correlation across countries (17)	
C.2 Corporate decisions	Cross-border M&A activity (18)	
D. Legal Institutions	Dispute Resolution Index (19), Dispute Duration Index (20)	

Source: Adam et al. (2002), table 4.1

Ad A.: Price discovery cannot simply be taken for granted. Interest rates and economic returns have more structure than previously assumed, competition issues have to be looked at more seriously (beyond the question of state aid), and the quality of benchmarks that play a crucial role in (the human choices in markets which bring about) price discovery needs to be safeguarded as benchmarks can be more or less efficient, and in the worst case become the

³⁰⁷ Indicators (11), (12), (13), (14), (15), (18), (19), and (20) are not discussed in this chapter; indicators (6), (7), (8), (9), and (15) are discussed also in sections 1.4 and 1.5 of this report; indicators (10), (11), (13), and (14) provide alternative measures of assessing the degree of diversification of financial risk and are discussed also in chapter 3 on shadow banking and chapter 5 on commodity derivatives markets.

object of manipulation and fraud. *A more integrated financial market is the market with a more (cost) efficient technology of price discovery.*

Ad B.: Risk sharing, insurance against idiosyncratic shocks to (total) consumption (and hence welfare) is a central advantage of a more integrated financial market. As Shiller (1993) pointed out, many (and as Shiller noted some of the largest) individual risks remain uninsured. Plus, as will be seen in the next section, the degree of risk sharing varies over time, and not necessarily in the direction of higher risk sharing.

Ad C.: The provision of an improved and less discriminatory access to finance *throughout* the EU has emerged from the crisis as a major desirable feature that one should expect the integrated financial market to deliver to a higher degree than a segmented conglomerate of national markets. However, measurement issues abound since supply and demand effects are difficult to disentangle. In any case, few still assume a pure version of the efficient market hypothesis to hold in the sense that every investment with an expected rate of return exceeding the risk-free rate will find its appropriate financing.

7.4 INDICATORS FOR PRICE DISCOVERY

7.4.1. Integration of money markets (1)

In 2002, Adam et al. found that convergence had been achieved in the market for 3-month (unsecured) interbank loans by January 1999 for the euro area and by September 2001 for the EU as a whole. In terms of indicators, the ECB is computing a dispersion index based on its panel of EONIA reporting banks.³⁰⁸

7.4.2. Integration of markets for sovereign bonds (2)

In 2002, Adam et al. found that convergence had been almost achieved in the market for sovereign bonds (10-year government bond benchmark yields), with the largest part of the reduction in interest-rate differentials having been achieved by 1997.

Discussion of the use of indicators (1) and (2):

These historical episodes of *measured* full convergence pose many difficult questions today. The *measured* full convergence was at least partly driven by perceptions of market participants which included the view that betting on divergence would not return any profit. Indicators (1) and (2) were among those having seen the most dramatic shifts since 2007. Their recent development is reported in sections 1.2 (sovereign bonds) and 1.4 (interbank loans) of this EFSIR. There is no straightforward approach how to correct for the failure in interbank markets and markets for sovereign debt to correctly price risk. Banks also failed during the pre-crisis period and unsecured lending was not without risk back then. Sovereigns failed as well in the sense of allowing either their actual liabilities, or their contingent liabilities to grow without bound.

³⁰⁸ See the Statistical Annex in ECB (2013c).

There is no agreement in the literature on the sustainable level of contingent liabilities. The bulk of contingent liabilities in EU Member States takes the form of pension and health care entitlements and the size of these contingent liabilities can be several multiples of the current stock of government liabilities. The structure of these contingent liabilities should matter as well. Here, in contrast with outstanding debt where some Member States have been vulnerable due to their significant levels in foreign-owned, and foreign-exchange denominated debt, contingent liabilities most of the time constitute a form of debt vis-à-vis citizens or residents of the same country, and hence there is no currency mismatch. More problematic are contingent liabilities that come in the form of state guarantees. In terms of structure they will more often resemble actual outstanding debt with all its implications from a financial stability point of view.

At the same time sovereign debt restructuring was considered, until recently, to be the exclusive right of heavily indebted poor countries (HIPC), and debt restructurings for these countries were discussed behind closed doors in the Paris Club (official creditors) and London Club (private creditors). For the monitoring of financial integration the circularity, or self-fulfilling character of perceptions in markets where trust and market liquidity are closely interdependent, is a real issue.

Even if it is not difficult to agree that 2007/2008 is a major structural break, it is not clear if this structural break is primarily of a statistical nature, or if behavioural and political/institutional assumptions that underlie the modelling of these markets have been invalidated as well.³⁰⁹ State guarantees, implicit or explicit, and the lender of last resort insurance against liquidity risk provided by central banks helped to lower risk perceptions. It took several major disruptions to undermine these perceptions, but once done financial institutions moved quickly to a bad equilibrium where lack of trust caused a sharp drop in unsecured lending.

Whereas the lack of trust in interbank markets could be partly substituted for by energetic intervention of monetary authorities,³¹⁰ the increasing significance of CDS markets has been viewed by some as being part of the change in attitude of market participants towards debt instruments. Clearly, the role of CDS markets for sovereign debt, in particular since the debt restructuring in Greece and Cyprus, has shifted the focus of analysis of sovereign debt markets from the previously dominating financial integration to a financial stability perspective; a shift which, in its present significance, had not been anticipated a decade ago.

7.4.3. Markets for mortgage loans (3)

In 2002, Adam et al. found that markets for mortgage loans had not achieved full convergence (by 2001), but the speed of convergence (beta-convergence) had increased

³⁰⁹ Israël et al (2013), page 11, note in this context that “(w)ith the crisis, business cycles are structurally distorted, which makes econometric modelling increasingly difficult”, and they see an increased importance for reliable “(s)tatistics, with a view to assessing economic and financial developments in the very recent past, adding expert judgement for the near future.”

³¹⁰ While the move to a full allotment policy by the Eurosystem effectively addressed liquidity risk in the system and the Eurosystem fully played out its role as lender of last resort in this respect, it also brought to an end the unsecured inter-bank lending which had continued up to that point.

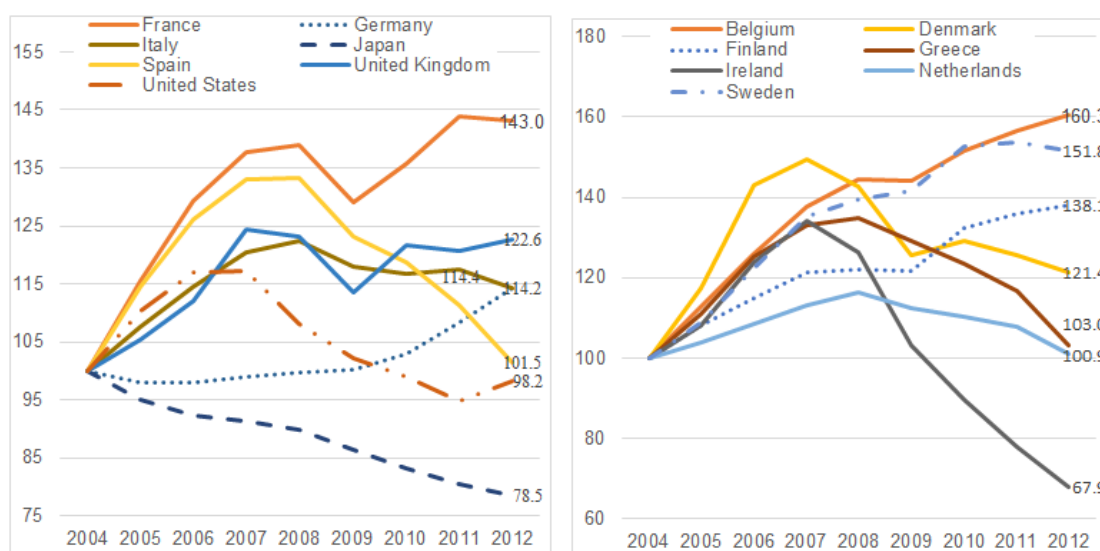
substantially to values comparable to those of interbank loan and government bond markets after the introduction of the euro.

Discussion of the use of indicator (3):

Sørensen and Lichtenberger (2007) observe that a significant part of mortgage rate variations across euro area countries cannot be explained by business cycles or structural factors. They conclude that country-specific institutional features, including enforcement procedures, tax subsidies and loan-to-value ratios, have an influence on mortgage rates in addition to local demand and supply factors.

Furthermore, it is difficult, since these markets have been domestic markets for a very long time, to decide if the lack of supply of, or demand for, certain banking products reflects a market for banking products that is not fully integrated, or a lack of competition, or if differences are due to local tastes that have become part of local cultural preferences. These preferences could reflect differences in labour mobility, the relative importance of the buy-to-let market and the market for renovation of residential real estate as compared to new constructions.

Chart 7.4.1: House price developments³¹¹



Source: OECD

According to data gathered by the OECD, national rates of home ownership differ widely across countries. It is remarkable that high per-capita income countries tend to be in the lower part of the distribution (lower shares of owner-occupied housing and higher shares of rental housing) which may reflect a greater variety of savings instruments available to private households, whereas the lower per-capita income EU Member States such as Portugal,

³¹¹ It is worth noting that, among the statistical gaps highlighted by the financial and economic crisis, real estate price statistics was considered one of the areas to be urgently developed. Particular attention has been devoted to developing internationally comparable House Price Indices (HPI). Starting from 2013, the European monitoring of changes in house prices is based on data regularly compiled by Member States and transmitted to Eurostat. This should be taken into account in future exercises.

Ireland, Spain, Greece, Hungary, Slovenia, Slovakia and Estonia have the highest home ownership rates which may reflect the lack of alternatives of long-term savings instruments in those countries.

Similarly, house prices continued to move at very different speeds across countries (Chart 7.4.1). Twenty years after the liberalization of the capital accounts including in the sections dealing with the acquisition of real estate in another Member State, a sudden shock to housing equity remains one of the main economic risks that households face over their lifetime (Shiller (1993)). Banks, insurers and the shadow banking system have achieved high degrees of international diversification of real-estate based assets and structured finance products, but the markets for the underlying assets have remained largely segmented along national borders, reflecting different national legal institutions and differences in taste, including for different real estate financial retail products.

Based on a new set of information from a recent bank survey, Villar-Burke (2014) finds such differences in taste for particular variants of mortgage products to be substantial between EU Member States. This could severely hamper the robustness of an indicator as mortgage loan rates for assessing interest-rate differentials throughout the SMFS. If changes in the central banks' main refinancing rates are passed through at very different speeds in a systematic way, even a simple indicator of variance of interest rates for mortgage loans would be systematically biased. The effect identified by Villar-Burke (2014) would indeed result in an increase in the dispersion of mortgage loan interest rates whenever the national Central Bank (or the ECB in the case of the Euro Area) changes the main refinancing rate. A straightforward question could be to test for asymmetries, i.e., if a rate hike produces the same bias as reductions in the key refinancing rate. The bias should be measured in all EU Member States. In the euro area, there could be the additional problem that such a bias translates into an uneven transmission of monetary policy in one of the most important market segments.

Even during “normal” times transmission of monetary policy to the real economy can have a non-trivial structure and a fully evenly transmission should not be taken for granted. Belke et al. (2013), exploiting a harmonized set of data and controlling for the crisis period, point to considerable differences in the size of the interest rate pass-through with respect to either different loan rates and with respect to different countries. In addition, they find that in the majority of cases the pass-through is incomplete and the dynamics of loan adjustment are different for reductions and hikes of money market rates.

Thus, the debt financing technology used and the location of the end user matter also during non-crisis periods. Favera and Imbs (2012) have an interesting result in the area of housing mortgage loans where regulatory change induces entry in local mortgage markets and only the new cross-border lending increased mortgage supply which in turn has a positive effect on house prices. Has the additional supply been achieved using the same lending standards, or have the new entrants accepted higher credit risk in return for getting the “foot in the door”?

7.4.4. Markets for corporate loans (4)

According to Adam et al. (2002) markets for corporate loans had not achieved full convergence (by 2001) and showed little signs of accelerated convergence even after the introduction of the single currency.

In a fully integrated financial market, interest rates of corporate loans to companies in the same sector, with firms being of comparable size and age, of similar legal and ownership structure should converge over time. However, similar as in the case of mortgage loans, the structure of demand and supply³¹² continues to vary across the EU, reflecting a multitude of factors that eventually motivate differences in interest rates for corporate loans of similar duration. Sections 1.3 and 1.4 of this report discuss in some detail the supply side factors active in this market segment. In this chapter, following the proposed new framework of indicators, section 7.6 discusses some aspects of demand for corporate loans from the angle of firms' capital structure choice.

7.4.5. Other recommended indicators for price discovery

There may be a need to have a fresh look at price and cost differentials faced by users in the EU's financial market (indicator (5)). Indeed, price differentials for similar financial services or products across countries, or the cost of a standardized cross-country credit transfer were among the first indicators to be used and monitored by the Commission in the early days of the Single Market.

Later the focus shifts towards ensuring the equal and non-discriminatory access to financial services (and this should become again more visible as a dimension of the financial market in its own right) and towards relying on increasingly competitive markets for financial services to take care of the elimination of remaining cross-country price differentials. Measurement issues can arise in so far as prices for retail financial services (see the case of mortgage loans above), as long as access is non-discriminatory, can reflect local tastes and may not be fully comparable. Stock market returns (indicator (12)) are not further discussed here, we only note that simple correlations do not seem to show much as noted already by Adam et al. (2002).³¹³

Financial benchmarks are proposed as an additional category under this heading. Benchmarks play an important role for price discovery in markets where products are complex and verifiability and direct comparability are too costly for individual market participants.³¹⁴

³¹² See the supply and demand factors as enumerated in ECB (2013a).

³¹³ Stock market returns could also figure under "access to finance" since, as shown by Whited and Wu (2006) financially constrained firms that are listed share common stock return characteristics which is a feature that can be exploited for the construction of financial integration indicators.

³¹⁴ For the purposes contained in the Directive on criminal sanctions for market abuse a benchmark is defined as any rate, index or figure made available to the public or published that is periodically or regularly determined by the application of a formula to, or on the basis of the value of one or more underlying assets, or prices, including estimated prices, actual or estimated interest rates or other values, or surveys and by reference to which the amount payable under a financial instrument or the value of a financial instrument is determined.

7.5 RISK SHARING IN THE INTEGRATED FINANCIAL MARKET

Adam et al. (2002) proposed two indicators to measure financial integration based on or triggered by the savings and investment decisions of households: (i) savings-investment correlations (16), and (ii) consumption-growth correlations across countries (17). The first indicator is based on the notion that in an integrated economic area, savings should not be strongly correlated to investments in any specific country.

7.5.1 Saving-investment correlations (16)

Adam et al. (2002), applying a concept first introduced by Feldstein and Horioka (1980), estimated the following regression for the 15 EU Member States between 1980-2000 and concluded that correlations between national savings and investment decreased after 1995 which signals increased financial market integration:

$$\text{Gross Investment Rate} = \text{Constant} + \text{Coefficient} \times \text{Gross Saving Rate} \quad (\text{Equation 1})$$

Estimating the same equation today delivers very similar results for the average estimated coefficient across the entire sample period (Table 7.5.1). The results do not change much if one extends the estimation period backward and forward to 1960-2012.

Table 7.5.1: Capital mobility regressions (1)

	<i>Adam et al. (2002)</i>	<i>EFSIR 2013</i>	<i>EFSIR 2013</i>
	1980-2000	1980-2000	1960-2012
Coefficient	0.30811**	0.40**	0.36**
Constant	0.11355**	0.14**	0.16**
Adjusted R-squared	0.5182	0.62	0.60

** denotes statistical significance at the 1% level, * at the 5% level; OLS panel regressions with country and period fixed effects; estimations were carried out with data from the Commission's AMECO database

To monitor the evolution of capital mobility, the same equation is estimated year by year, and the change of the estimated coefficient is monitored over time. Again, results are similar to what Adam et al. (2002) found. In their results very little capital mobility appears during the 1980s, only slightly more from 1990 to 1994, and as of 1995 until the end of their sample period in 2000 the estimated coefficient is negative and insignificant which according to the Feldstein-Horioka proposition points to full capital mobility.

This result may reflect a small sample bias. The change of the coefficient in 1995 is too abrupt, the actual liberalization of the capital account was more gradual. However, the small sample bias could be more relevant due to the 1995 enlargement round and the association agreements with Central and Eastern European countries (that would eventually join in 2004 and 2007).

Underlying assets or prices referenced in benchmarks can include equities (e.g. the FTSE 100 index), bonds (e.g. NASDAQ OMX fixed income), interest rates (e.g. LIBOR or EURIBOR), or commodities such as agricultural products (e.g. cocoa LIFFE London), metals (e.g. Gold COMEX) or oil (e.g. Brent oil ICE); see also European Commission - MEMO/14/78, 4 February 2014 available at http://europa.eu/rapid/press-release_MEMO-14-78_en.htm

Using a full sample of EU Member States we run the regressions for several sub-periods that have a relation to changes in the openness of Member States' capital accounts. There is clearly an increase in capital mobility over time until the beginning of the crisis. The evolution up to 2007 is in line with findings in the economic literature:³¹⁵ savings are invested increasingly in foreign assets (which corresponds to a decrease of home bias on national balance sheets) allowing for a higher degree of risk-sharing (against country-idiosyncratic or sector-specific shocks).

In the last period 2008-2012 the absolute size of the coefficient remains almost identical compared to the 1994-2007 period, i.e. the degree of capital mobility does not change, however the change in sign signals that the explained variance in the sample is deriving from situations where increased national savings are associated with reduced national investment, i.e. savings turn counter-cyclical whereas for smoothing purposes in line with the permanent income hypothesis private savings should be pro-cyclical.

Table 7.5.2: Capital mobility regressions (2)

	<i>EFSIR 2013</i>	<i>EFSIR 2013</i>	<i>EFSIR 2013</i>	<i>EFSIR 2013</i>
	1960-73	1974-93	1994-2007	2008-12
Coefficient	0.83**	0.46**	0.23**	-0.23*
Constant	0.06**	0.13**	0.18**	0.25**
Adjusted R-squared	0.72	0.69	0.67	0.74

** denotes statistical significance at the 1% level, * at the 5% level; OLS panel regressions with country and period fixed effects; estimations were carried out with data from the Commission's AMECO database

7.5.2 Consumption-growth correlations across countries (17)

As a second indicator for financial integration related to the decisions of households³¹⁶ Adam et al. (2002) proposed to estimate the degree of consumption risk sharing among EU Member States based on the risk-sharing indicator proposed by Cochrane (1991) and Mace (1991). Again, they argue in favour of using annual data from the national accounts.³¹⁷ Under full risk sharing, consumption should not depend on idiosyncratic shocks (as idiosyncratic risk is diversifiable), and consumption should be perfectly correlated with aggregate shocks. To estimate the degree of risk sharing, the growth rate of consumption of each Member State is regressed on the growth rate of GDP, the latter being the proxy for the idiosyncratic shock:

$$\text{Growth rate of consumption} = \text{Constant} + \text{Coefficient} \times \text{Growth rate of GDP} \quad \text{(Equation 2)}$$

³¹⁵ See, e.g. Sorensen et al (2007), Demyanyk and Volosovych (2008).

³¹⁶ The informational assumption on the household should be taken with some caution. It is correct that ultimately decisions of private households determine where private savings are invested, but the varying degree of intermediation of such decisions by financial service providers is an important factor to keep in mind. The changing savings-investment relationship within the integrated area and the changing degree of consumption risk sharing will reflect in many cases the decisions of financial intermediaries taken on behalf of private households seeking a decent return on their savings.

³¹⁷ Quarterly data would result in having more observations which may be preferable for estimating shorter sub-sample periods. However, as Adam et al (2002) point out as well, quarterly data is less robust as it contains itself a much higher share of estimated as opposed to measured data. In the worst case, regressions show high goodness of fit because the researcher has "found" the data generating process of the statistician who compiled the data in the first place. This risk is reduced in the case of annual data, albeit the "hardness" even of annual national accounts can vary significantly from one country to another.

Table 7.5.3 shows the results obtained by Adam et al. (2002) and our estimations for this report. We find very similar results with the main difference that we find higher levels of statistical significance including for the year-by-year regressions which allows identifying distinct sub-sample periods.

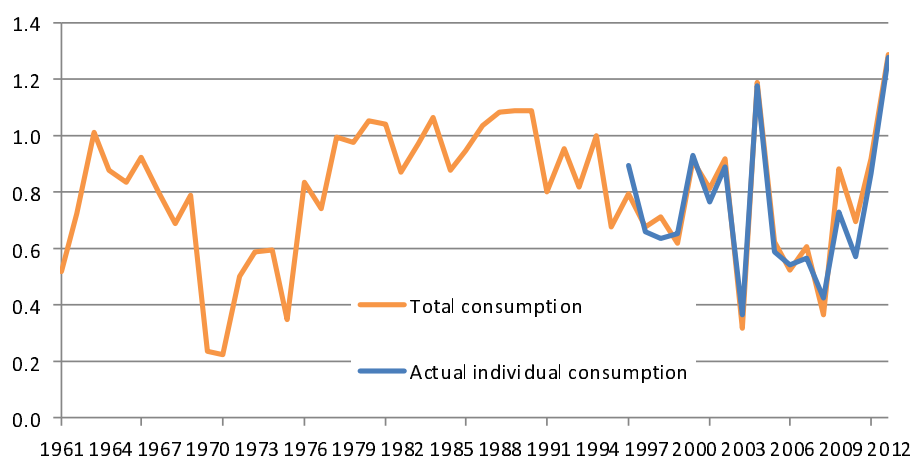
Table 7.5.3: Risk sharing regressions

	<i>Adam et al. (2002)</i>	<i>EFSIR 2013</i>	<i>EFSIR 2013</i>
	1980-2000	1978-1994	1995-2008
Coefficient	0.8446**	0.78**	0.40**
Constant	0.00867**	0.02**	0.03**
Adjusted R-squared	0.3839	0.94	0.77

** denotes statistical significance at the 1% level, * at the 5% level; OLS panel regressions with country and period fixed effects; estimations were carried out with data from the Commission's AMECO database

Between 1978 (when the effects of the oil price shocks have fully fed through into reduced consumption opportunities in EU Member States) and 1994 the degree of risk sharing is very low. The average coefficient is around 0.8, but yearly regressions have coefficients close to 1 (no risk sharing) basically for each and every year during this period. Shocks to national gross domestic products feed through almost unfettered to reduced or increased consumption opportunities during those years.³¹⁸

Chart 7.5.1: Degree of consumption risk sharing in the EU15



Source: own calculations with data from the Commission's AMECO database

The yearly regressions show even better a pattern that corresponds to the evolution of the liberalization of the capital account in the EU:³¹⁹ the first wave of liberalization measures in the 1960s sees a decline in the estimated coefficient from its previous range between 0.8 and 1 (very low level of risk sharing) to a lower range between 0.2 and 0.6. However, this period shows highly volatile capital flows, which are considered as too volatile from a financial stability point of view. The second period with a robust trend towards more risk sharing begins in 1995 and lasts until the onset of the crisis in 2007.

³¹⁸ In its Alert Mechanism Report 2014 (European Commission (2013c)), the Commission also raised the possibility of inefficient financial intermediation in this context.

³¹⁹ The European Commission monitors the free movement of capital as one of the four elementary freedoms within the Single Market. For an account of the historical evolution of the capital account see, e.g., Bakker and Chapple (2002).

The light line in Chart 7.5.1 displays the estimated coefficients for the year-by-year consumption risk sharing regressions using total (domestic) consumption. The dark line displays the estimated coefficients using a narrower concept of consumption, effective individual household consumption, which shows that the size of the coefficient does not depend in any significant way on changes in government consumption.

Discussion of the use of indicators (16) and (17):

There are several possible motivations for a continued use of these two indicators. First, as underlined by Adam et al. (2002), their calculation is comparatively simple and can be updated every year as new national accounting data becomes available. Second, as indicators they provide a good starting point for more detailed analysis how the actual risk sharing is achieved. After all, risk sharing is one of the desired features of a financially integrated Single Market to begin with.³²⁰

Several studies have taken equations (1) and (2), and variants of them, as starting points for their inquiry into the differences of risk sharing levels and dynamics. Comparing the EU experience to the U.S. experience³²¹ suggests that financial markets can provide a much higher amount of risk sharing and shock absorption than a system of integrated debt markets and (high) ex-post fiscal transfers from national social security systems. Two important stylized features of different risk-sharing technologies can be noted here:

(1) Risk sharing arrangements primarily based on integrated equity markets are capable of providing effective ex-ante risk sharing and are able to deal with both transitory and permanent shocks.³²²

(2) Risk sharing arrangements primarily based on integrated debt markets can also provide effective risk diversification, but in addition they can also accelerate the propagation of risks, as highlighted in a recent policy paper by the OECD.³²³ Debt markets are better equipped to deal with transitory shocks, and risk sharing takes place in an ex-post manner rather than ex-ante as in the case of equity markets.³²⁴

In the context of the desirable outcomes from a high degree of financial integration within the Single Market, the following questions emerge:

- Did the Single Market improve risk sharing/shock absorption capacity of financial markets in the EU?
- Where is the optimal trade-off between risk sharing and an acceptable level of exposure to shocks to the national balance sheet that cannot be insured against?

³²⁰ See e.g. Commission (1983, 1988).

³²¹ Asdrubali et al (1996), Demyanyk and Volosovych (2008), Jappelli and Pistaferri (2011).

³²² See also indicator 10, ECB (2013c), page 13: Country and sector dispersions in euro area equity returns; Adjaouté, K. and J.P. Danthine (2003).

³²³ See OECD (2012).

³²⁴ Commission, QREA (various issues from 2011-2013) provides evidence of the ex-post insurance function of debt markets in contrast to equity markets that insure instantaneously including against permanent shocks.

Financial assistance programmes as well as various ECB measures³²⁵ temporarily addressed a structural weakness in the EU's risk sharing mechanism which is its bias towards debt. However, the reliance on debt instruments as opposed to equity renders international risk sharing in the EU less powerful compared to other highly integrated economic areas such as the U.S. It is also more prone to ex-post political bargaining. In contrast, equity-driven international risk sharing is taking place mostly within the private sector. This does not exclude the emergence of an important burden sharing dimension on a case-by-case basis, e.g. in the context of bulky FDI.

Risk diversification, risk insurance, or risk sharing typically allows *some* exposure to all economic entities (countries, regions) as well as to different industrial sectors (both financial and non-financial) *across* the financially integrated economic area. In the run-up to the crisis in Europe Ireland and Finland had the best-diversified exposure in this sense, but Member States having the corresponding exposure to Ireland (and the Irish housing market) were poorly diversified themselves and had little offsetting bets. Also, part of the shock to the Irish balance sheet was part of a common euro area shock where risk sharing with other Euro area economies could not deliver sufficient protection.³²⁶

Risk sharing in the Single Market can take place, ideally, by households holding an optimally diversified portfolio of equity and debt securities. However, households may choose to diversify via financial retail products (banking and insurance products) where the actual investment decision is left to the financial institution. Even if the portfolio bought by the household this way is identical, the household is exposed to various forms of risk linked to the intermediation itself (in exchange for the comfort of not having to follow market developments on an ongoing basis). The intermediation risks which materialized during the crisis are certainly one factor explaining the increasing popularity of passive index tracking ETFs whereby households can avoid these risks.

Discussion of the use of indicators (8) and (9):

The degree by which foreign assets (indicator (8)) and liabilities (indicator (9)) are held by domestic banking (and insurance) sectors is of direct relevance for the study of financial integration and is closely linked to the capacity to insure against country- or sector-specific shocks.³²⁷ In that regard, Schoenmaker (2013) makes the following observations with respect to international diversification choices by banks and insurers that (i) throughout the crisis insurers have remained a high level of international diversification driven by those institutions that were already strongly diversified in the pre-crisis period, and that (ii) on average insurers' balance sheets are more internationally diversified than those of comparable MFIs.

If financial integration insures against idiosyncratic shocks primarily via debt markets there are obvious disadvantages compared to risk sharing primarily operating through integrated equity markets. The economic literature points to the fact that debt cannot insure against

³²⁵ See chapter 2.3 for additional detail.

³²⁶ See chart 16 in ECB (2013c).

³²⁷ Indicators (10)-(15) in tables 7.3.1 and 7.7.1 have a similar motivation and are not further discussed here.

permanent shocks and that the insurance operates only ex-post. This ex-post rather than immediate adjustment is even more problematic in the case of the EU for a number of reasons. Compared to the U.S., the EU's financial system is characterised by the presence of banks that are big in relation to their home country's GDP (and fiscal capacity).^{328, 329}

When country A's income experiences a negative external shock (temporarily), the reduction of consumption is avoided by an increase in A's use of savings from other countries that are members of the integrated economic and financial area. Let us pool these other countries and refer to them as "B", thus the financially integrated economic area comprises A and B. Also, if A has its own monetary authorities, lower interest rates will reduce the income to foreign banks during the adjustment period which further adds to equilibrating available resources for consumption in A and B.

For integrated debt markets to remain a viable insurance mechanism against the risk of suffering lower consumption after a shock to the national income in either A or B, the integrated economic area should have at least the following features:

- (A) shocks are more or less randomly distributed across A and B over time,
- (B) shocks are predominantly of a temporary rather than of a permanent nature,
- (C) there are no major informational asymmetries between A and B that could lead to a systematically biased appreciation of credit risk in cross-border credit operations,
- (D) A and B can both sustain the burden sharing arrangement which is an implicit or explicit feature of the decision to have integrated debt markets.

Major and persistent deviations from (A) could point to (i) government³³⁰ moral hazard, (ii) deeper structural economic issues that result in one part of the financially integrated area suffering shocks to its income more frequently than other parts, or (iii) bad luck. Moral hazard is a feature all insurance mechanisms have to struggle with, and the economic governance arrangements within the integrated economic area will be more or less successful in addressing it (see also chapter 2 of the present report).

The second possible explanation has become a recurrent topic in the EU's economic policy discourse. Sometimes countries that are more prone to experience shocks are referred to as "vulnerable" countries. The concept of "vulnerability" can be found close to discussions on the appropriate degree of exposure one country should accept with respect to different kinds of risk. In our present context of financial integration and insurance against consumption risk, risks can take the following forms:

³²⁸ The economics literature has studied consumption risk sharing mainly in the U.S. context, either using state-level data or data on municipalities and agglomerations.

³²⁹ This is in line with Rajan and Zingales (1995) and Antoniou et al. (2008) who study capital structure in bank-oriented (mostly Europe) vs. more market-based financial systems.

³³⁰ As in the current example the insurees are national jurisdictions of the financially integrated economic area, it is clearer to speak of government moral hazard as opposed to individual moral hazard when insurees are individual economic agents, such as private households.

A(ii)-1 Valuation risks: assets and liabilities held on the national balance sheet are subject to varying degrees of valuation risk, with some forms of risk remaining beyond the control of national policy makers. An asymmetric shock leading to an asset-liability mismatch can change how the country is perceived in international debt markets and impact the country's cost of and access to financing in those debt markets. A more or less pronounced maturity mismatch between the asset and liability sides will typically magnify such market reactions.³³¹

A(ii)-2 Foreign exchange risks: some assets and liabilities on the national balance sheets are denominated in foreign currencies and produce income streams in foreign currencies. This can give rise to currency mismatch and liquidity risks.

A(ii)-3 Growth risks: a country may be more or less exposed to macroeconomic risks beyond its immediate control due to the structure of its economic model of creating value added. An economy that is highly dependent on primary inputs for its domestic production (and not just for final consumption) is exposed to large and sudden changes in the price of those inputs. The risk can be magnified by a combination with exchange rate risk.

The more “vulnerable” a country, the less attractive it becomes as a member taking part in the international insurance mechanism in the integrated economic and financial area. It is obvious that persistent deviations from condition (A) will lead to a situation where the choice between possible explanations (i), (ii) and (iii) becomes even more blurred.

Turning to condition (B) we immediately notice that conditions (A) and (B) will not be easily distinguishable in all circumstances. Is the fact that economy A after a severe shock (e.g., due to the materialisation of one of the risks listed under A(ii)) does not return to the level of growth it enjoyed before the shock linked to the fact that (a) the shock was a permanent shock to A's potential growth. Or (b) is it linked to A's lack of resilience and therefore is, at least partly, the result of poor economic policies?

A prudent risk manager in the presence of uncertainty as to the true nature of the shock will assume the shock to be a permanent one and create room for positive surprises. Debt is obviously a poor insurance against permanent shocks to a country's capacity to generate income as under such circumstances the net present value of future income streams has diminished while the amount of debt (principal and interest) has remained the same in the best of all cases. If the interest part is variable and the lower income generating capacity results in a higher risk profile of the country, the interest rate will rise and with it the level of total indebtedness.³³²

Turning to the next item in our list, we find that condition (C) has not received sufficient attention before the recent crisis arose. There seems to be a real issue with functioning of

³³¹ See Catão and Milesi-Ferretti (2012) for an analysis how the structure of external liabilities has a stronger impact on vulnerability compared to the level of indebtedness. This is a finding at the level of sovereigns that resembles the finding for non-financial companies where financial leverage alone cannot explain the riskiness of funding structures.

³³² For decades this has been the situation of several highly indebted development countries where a combination of factors as listed under A (i), (ii) and (iii) led to situation where countries could not even service the interest payments on their national debt.

markets (in the sense of price discovery) in the joint presence of strong industry-specific growth and informational asymmetries. We will come back to this point in the next section.³³³

In the absence of a joint resolution regime and resolution fund, Condition (D) concerns the fiscal strength of the home sovereign ultimately backing banks that are lending cross-border. Once there is a joint regime it will contain an explicit burden sharing arrangement.

7.6 INDICATORS MEASURING THE ACCESS TO FINANCE

Different banking structure can have an impact on the access to finance. The relative importance of foreign banks in a domestic market, either in terms of asset shares (6) or in terms of number of foreign institutions operating branches or subsidiaries (7) continues to be used. Some studies try to relate banking structure variables to the question if borrowers (in particular non-financial companies) were credit-supply constrained during the crisis (IMF (2013), ECB (2013a)).³³⁴

Discussion of the use of indicators (6) and (7):

Again, we do not see particular measurement issues in this area. The ECB monitors structural developments in the banking sector and publishes an annual report with comprehensive information on (i) the number of MFIs, (ii) cross-border market penetration via branches and subsidiaries, (iii) M&A activity, (iv) the degree of competition, (v) the composition of banks' balance sheets, (vi) banks' capital structure choices, and (vii) the financial performance of MFIs. The latest such report was published in November 2013.³³⁵

As an indicator for financial integration based on corporate decisions Adam et al. (2002) proposed to look at the evolution of merger and acquisition activity. We think this indicator can be better exploited for assessing the degree of risk sharing, as merger and acquisition is an important means for achieving a certain risk profile on either side of the economic agent's balance sheet. Perhaps the previous choice reflected at least partly the data availability situation in 2000/02. Since then a growing number of commercial data providers has collected the information of annual financial statements of companies. The data are made comparable across different national accounting standards, and various financial metrics are computed. In general there remains a big data gap between listed and non-listed firms. However, data availability has improved sufficiently in order to motivate the inclusion of non-listed firms in the present chapter.

In the context of the monitoring of financial integration, one would like answers to the following questions with respect to corporate financial leverage: Do capital structure choices of non-financial companies reflect financial fragmentation at the firm level (before and

³³³ The link between leverage, sectoral growth and informational asymmetries is further explored in Kühnhausen and Stieber (2014).

³³⁴ Using data from the ECB Lending Survey, the IMF (2013) finds significant demand effects for loans to non-financial companies, but cannot find significant supply effects. See also sections 1.3 and 1.4 in this report.

³³⁵ The Banking Structures Report, November 2013; ECB (2013b).

during the financial crisis)?³³⁶ Is there evidence that non-financial companies in the EU used excessive leverage? Was “excessive” cross-border bank credit accessible to firms from all sectors?³³⁷ How relevant is debt bias in corporate taxation across Member States?³³⁸ Does the relative importance of short-term corporate loans differ strongly from country to country; are there different levels of competition between alternative funding sources from one country to another? What are the effects of more or less rigid bankruptcy regimes on debt leverage? To what extent do interest rates for corporate loans reflect local (risk) factors (similar to insurance retail products)?³³⁹

A recent comprehensive review of structural issues related to corporate finance and economic activity for the Euro area has pointed to the potential impact of capital structure choices for the financial stability and economic performance of the economy as a whole.³⁴⁰ In our analysis for this chapter we find very similar econometric results as in ECB (2013a) for a broader range of countries as to which firm-specific factors determine (i) the potential use of external funding by non-financial companies (NFCs) and (ii) its degree (leverage).³⁴¹

A stylized fact that motivated us to start our inquiry using firm-level data is the pronounced cross-country variation in NFCs leverage ratios. Apparently different models of funding structure are compatible with comparable levels of economic activity and well-being. At the end of the 1980s the bank-financed German and Japanese models were considered the most sustainable, where banks took important stakes in non-financial (manufacturing) industries and thus had their incentives aligned with the long-term funding needs of research and development intensive sectors.

The Japanese model has become infamous shortly after and Germany’s costly re-unification created a structural break in the economic data for a number of years. At present a normative model of a well-diversified funding structure is developed on the back of a major banking crisis. However, Germany and some other European economies have done managed well

³³⁶ Ferrando and Mulier (2013), Kühnhausen and Stieber (2014), ECB (2013a), European Commission (2013). One definition of “financial fragmentation” depicts a situation where economic agents, in particular non-financial corporations (NFCs), face a country-specific risk premium after controlling for any industry-specific factors that could lead to diverging user costs of capital (UCCs) across different industries within the internal market. At the same time, within the group of non-financial firms, the focus is on SMEs and large domestically orientated firms as compared to large international firms that have access to funding in different jurisdictions, including different money and capital markets.

³³⁷ Buch et al (2013) mentions “excessive” cross-border bank lending.

³³⁸ See Feld et al (2012) for an econometric meta-study; in this context it is worth noting that work on the CCCTB was ongoing within the Council during 2013 with a first technical examination concluded. In March, the high level working party agreed on the approach to the organisation of future technical work in this area. This approach was confirmed in the ECOFIN report to the June European Council. The Presidency is taking work forward in accordance with this approach and has put forward new compromise proposals.

³³⁹ See Reindl et al (2013) and Giroud et al (2012) on market implied bankruptcy cost: Is it possible to exploit better market data for indicators?

³⁴⁰ See ECB (2013a), page 13.

³⁴¹ We regress firms’ leverage on firm characteristics and other controls following the approach of Rajan and Zingales (1995) who had identified four relevant factors for leverage (tangibility, growth, size, profitability) and that of related empirical studies such as Faulkender and Petersen (2006), Antoniou et al. (2008), Bharath et al. (2009), Brav (2009), Frank and Goyal (2009), Psillaki and Daskalakis (2009), Degryse et al. (2012), Fan et al. (2012) and Köksal et al. (2013).

with rather high leverage rates and with NFCs using mainly financing intermediated by banks rather than capital markets.³⁴²

The analysis contained in this section takes as a point of departure the observation that some explanations of NFCs' seem to better allow for country heterogeneity along the financial leverage dimension than others.³⁴³ Consequently, testing such theories can help identify the presence of financially constrained firms or a presence of wide-spread information asymmetries. Such presence could create in turn the starting conditions for twofold adverse selection with its detrimental impact on asset quality of financial institutions.³⁴⁴

More specifically, if a theory of firms' financial structure can be confirmed empirically where equity is the least favoured source of financing, a number of policy considerations can be listed here:

- From a micro and macro prudential perspective the taxation bias in favour of (bank) credit³⁴⁵ could be more problematic in this case and the need for a more balanced fiscal treatment of different sources of funding could emerge.³⁴⁶
- If market-based funding can alleviate information asymmetries more successfully compared to bank finance, structural obstacles to a more diversified funding base (in addition to taxation issues) should receive more attention.
- For firms without access to corporate bond markets and/or firms lacking other mechanisms addressing effectively information asymmetries, changes to the local bankruptcy regime may not deliver the expected results. The trade-off between increased probability of default, funding costs and other frictional costs (such as those related to layoffs during a restructuring phase) will be a more complicated one compared to a situation where firms simply trade off cost of finance and cost of financial distress.

One motivation for the study of the role of the credit scoring and business information industry in European Commission (2013a) was the scenario where informational asymmetries lead to an adverse selection of riskier projects over viable low-risk projects. In turn such a situation could impact negatively risk-taking by NFCs due to a self-enforcing feedback loop between supply of bank credit and riskiness of projects to be financed. In the end, in a bank finance-based economy, the adverse selection bias is likely to become locked-in into banks' balance sheets resulting in a lower asset quality on average, with asset quality deteriorating gradually, and unnoticed, during the economic upswing.³⁴⁷ When the economic

³⁴² Accordingly, Aoki and Nikolov (2012) identify this possibility of a stable bank-financed economy and a possible increase in systemic risk as capital markets expand and diversify.

³⁴³ For an overview of capital structure choice theories including trade-off theory, pecking order theory, market timing theory, and agency theory see Myers (1977, 2001), Goldstein et al. (2001), or Bhamra et al. (2010).

³⁴⁴ See Kühnhausen and Stieber (2014) for additional detail.

³⁴⁵ The OECD identifies this taxation bias as one of the major factors that contributed to the financial fragility of countries in a world of free movement of capital; OECD (2012), p.7.

³⁴⁶ Feld et al (2013) exploiting all existing empirical studies on the size of the debt interest corporate tax shield estimate an elasticity of 0.27, i.e., an increase in the corporate tax rate by 10 percentage points increases leverage by almost 3 percentage points.

³⁴⁷ EC (2013) page 92.

boom comes to an end and banks need to deleverage and shed risk-weighted assets, forbearance and lacking incentives to acknowledge credit risk on banks' balance sheet could even strengthen the adverse selection bias during the deleveraging process.

While banks will try to protect low-risk assets they may be reluctant to recognize losses in the portion of their asset structure where the riskiest projects are located. As a consequence, and in the absence of external pressure to recognize losses e.g. in the context of a granular and stringent asset quality review, the part of the loan book containing medium risk projects could come under the strongest pressure. In this sense the deleveraging phase could result in pressure on NFCs funding of working capital even for those firms that have a viable going concern and that are in a medium-risk, medium-return category.

Finally, if information on the riskiness of investment projects is local, cross-border funding structures could be more exposed to adverse selection bias than local funding structures. Cross-border financial flows other than green-field foreign direct investment could contribute to a deterioration in the quality of funding structures, and the more so if rates of return in the host country exceed significantly economic returns in the home country and if the home country has excess liquidity in comparison which matches a lack of domestic savings in the host country. The dynamics of non-performing loans in some emerging markets in Central and Eastern Europe as well as in South-Eastern Europe could partly result from the described adverse selection bias having been active during the years of rapid credit growth before the crisis.

Table 7.6.1: Empirical tests of pecking order and trade-off theory of capital structure choices

Variables	Pecking Order Theory	Trade-off Theory	Rajan/Zingales (1995)	Faulkender/Petersen (2006)	Antoniou et al. (2008)	Brav (2009)	Frank/Goyal (2009)	Psillaki Daskalakis (2009)	Chen/Yu (2011)	La Rocca et al. (2011)	Degryse et al. (2012)	Fan et al. (2012)	Köksal et al. (2013)	Our Data
Size	?	+	+	-	+	+	+	+	-	+	+	+	+	+
Growth	+	-	-	-	-	+	-	?	?	+	+	-	?	?
Profitability	-	?	-	-	-	-	-	-	-	-	-	-	-	-
Tangibility	+	+	+	+	+	+	+	-	+	+	+	+	+	-
Liquidity	?	?	n.a.	-	?	-	-	?	?	-	?	?	-	-
Nickell	n.a.	n.a.	n.a.	n.a.	-	n.a.	-	n.a.	n.a.	n.a.	+	n.a.	n.a.	?
Total Ind. LR	?	+	n.a.	+	n.a.	n.a.	+	n.a.	n.a.	n.a.	+	n.a.	+	+
Ind. Growth	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	+	n.a.	n.a.	+	n.a.	n.a.	n.a.	+
Tax Shield	n.a.	+	+	+	+	n.a.	?	n.a.	n.a.	n.a.	+	+	+	+
Inflation	n.a.	+	n.a.	n.a.	n.a.	n.a.	+	n.a.	n.a.	n.a.	n.a.	-	+	?
GDP Growth	+	n.a.	n.a.	n.a.	n.a.	n.a.	+	n.a.	n.a.	n.a.	n.a.	+	-	?
Capital Flows	n.a.	n.a.	n.a.	n.a.	+	n.a.	+	n.a.	+	n.a.	n.a.	+	+	?
Unemployment	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-
Stock Prices	-	n.a.	n.a.	-	-	n.a.	-	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	?

NB: ? = theories are ambivalent or results are inconclusive (either coefficient is not significant or switching signs), n.a. = factor was not included in study

Source: Kühnhausen and Stieber (2014)

The main results of the empirical analysis³⁴⁸ are displayed in table 7.6.1: determinants of higher financial leverage of non-regulated non-financial companies are: the size of the firm, leverage of the industry and growth of the industry sector to which the firm belongs, as well as the tax shield.

³⁴⁸ See the Annex for detailed results of the regression analysis.

However, looking at year-by-year regressions, regressions for individual countries, or for individual industries, we find that company size, total industry leverage and industry growth do not remain relevant factors in all circumstances. Also, industry growth has a different impact (different sign) depending on the country which makes it less suitable as an indicator for policy analysis for the Single Market. Company size explains around a tenth of differences in leverage. Hence, its effect is rather small compared with the other main traditional explanatory factors of financial leverage: tangibility of assets and profitability.

On the other hand, the tax shield³⁴⁹ is not only highly significant, it has a relevant - because sizeable - impact on financial leverage of NFCs, and its impact is very robust and stable during our observation period running from 2003 to 2012. The distortion via the corporate income tax reaches on average the size of a quarter of the effects of the main explanatory factors for financial leverage, tangibility and profitability. On average, non-financial firms not only increase their level of indebtedness by the full amount of the tax advantage, but add 40% of additional debt on top of the absolute tax advantage. However, this is only the average effect.

The significance of the tax shield varies strongly from country to country. Among EU Member States we find the lowest tax shields in Romania, Austria and Hungary, the highest tax shields are found in Malta, followed by the Netherlands, Germany, and Belgium. Malta is a strong outlier with a tax shield around three times the tax shield compared to the country coming second, and Malta is the only country where the tax shield is the most important factor for explaining higher financial leverage. However, in the group of highly industrialized countries such as the Netherlands, Germany and Belgium, the tax treatment of external debt represents a highly significant factor next to the four variables identified by Rajan and Zingales two decades earlier. For the question of correctly measuring how financial integration in the Single Market impacts corporate decisions such a strong taxation bias represents a challenge as it potentially impacts a number of other indicators shown in table 7.3.1.

A logical extension of the analysis of non-regulated industries here would be to include the literature about the impact of corporate income taxes on banks' and other regulated industries' financial choices.³⁵⁰

Estimating determinants of financial leverage shows that the availability of tangible fixed assets is important as it serves as collateral for obtaining longer-term external financing. Industry growth is important, but as discussed in this chapter could be problematic from an asymmetric information point of view. The tax shield favouring debt financing over other forms of funding is highly relevant even for the average firm in our very large and diverse sample.

³⁴⁹ We define the tax shield as the difference in interest paid by companies not having any long-term debt and the companies having long-term debt.

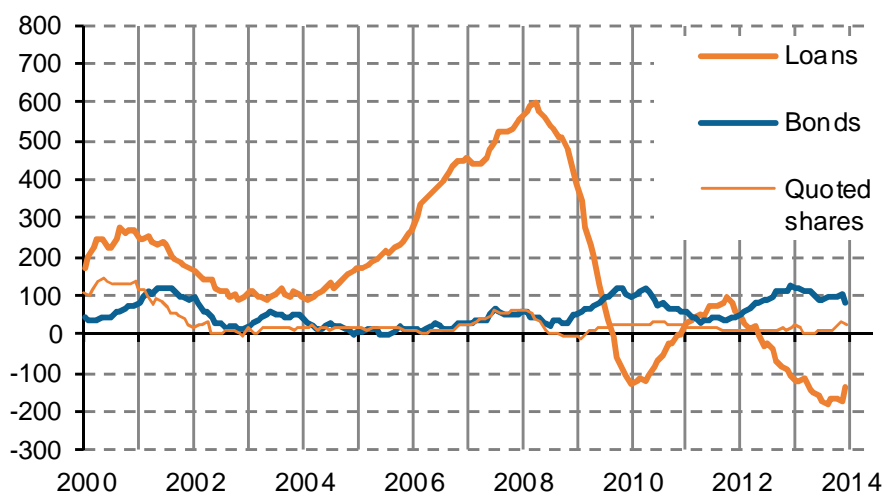
³⁵⁰ Some of these papers reinforce the case against the corporate tax debt bias, others are critical pointing out the interaction with regulation as a result of which eliminating the corporate tax debt bias may not have the desired effects in the banking sector; see for example Gropp and Heider (2010), Hemmelgarn and Teichmann (2013), Horvath (2013), De Mooij et al. (2013), Keen and De Mooij (2012), Devereux et al. (2013).

Could the presence of financially constrained firms of the type identified by Whited and Wu (2006)³⁵¹ give rise to adverse selection phenomena in the upswing of the credit cycle? And could deleveraging of banks after a credit bubble further exacerbate this adverse selection when banks reduce risk-weighted assets or if banks or supervisors exercise forbearance with regards to the most strongly mispriced risks?

The computation of Whited-Wu indices³⁵² of financially constrained firms gives the following results in the case of our data containing 1.2 million firms: during the 2003-2012 period, firms were not financially constrained in the sense that they could not achieve desired investment levels. Rather the indicator hints to a substantial number of firms that overinvest during that period.

There are several qualifying comments to make in this respect. First, the Whited and Wu index builds on a structural model of firm investment behaviour. The model itself is estimated with firm level data from 1975 to 2001. The major drawback of this firm-level data is that it only includes listed companies. Second, the monetary conditions during 2003-2011 were indeed not very restrictive compared to 1975-2001, so the result is in line with what could be expected ex-ante. Third, as pointed out in chapter 1 of this report, the part of bank funding that contracted the most was lending to other financial institutions. Fourth, the indicator could not be computed for 2012 (and 2013 is missing altogether). As a consequence, a credit crunch, especially one affecting smaller companies, in 2012 and 2013 is not excluded on the basis of our analysis. The index may underestimate therefore the degree of financial constraints since it is consistent with investment behaviour of listed non-financial companies (excluding all financial companies as well as regulated utilities).

Chart 7.6.1: Funding structure of EA NFCs, year-on-year monthly flows



Source: ECB

A logical extension of this index is to estimate the index allowing for a difference between listed and non-listed firms, as well as between firms being part of an international group with access to internationally diversified internal capital markets and stand-alone firms.

³⁵¹ In contrast to the growth-constrained firm studied by Kaplan and Zingales (1997).

³⁵² As proposed in Whited and Wu (2006).

The role of internal capital markets is in our view one of the most important elements to be explored further to better understand the information in some other existing indicators, e.g., diverging stock market developments. This is why we propose to include it, once we have identified an appropriate method to create such an indicator, into a revised indicator framework. Furthermore, we could so far only compute the index up to 2011 as 2012 still contained too many missing values in our database.

Chart 7.6.1 also seems to suggest that until the first quarter of 2012 firm did not suffer major credit supply shocks, in line with findings in the context of the IMF EU FSAP (IMF (2013)).

For the future monitoring of financial integration it would seem highly desirable to have a more differentiated set of indicators capable of tracking in a reliable manner how decisions of corporations relate to varying degrees of financial integration. These could vary with respect to companies' positions in the (sector- or industry-specific, or economy-wide) business cycle. In principle, the Whited-Wu approach shows how firms can under- but also over-invest depending on their firm specifics, but also specific features of their industry as well as their broader macroeconomic, fiscal and financial environment. Matching such an indicator with supervisory data on changing lending standards could further enhance our understanding how asymmetric information, agency problems and adverse selection bias respectively play themselves out to lay the foundations of a credit boom and its ensuing "boom" of non-performing loans.

7.7 SOME PRELIMINARY CONCLUSIONS

This chapter intends to launch a discussion on the need to revisit the set of existing indicators and identify new indicators for financial integration in the Single Market. In the first section, the advantage of more granular data for computing dispersion indices for interbank loans is recalled. Sovereign bond markets can be monitored comparing yields of varying maturity as well as CDS spreads. Several new empirical studies propose how to identify country-specific risk premiums and thereby to avoid an over-estimation of the degree of fragmentation of sovereign bond markets. On mortgage loan markets it is recalled that comparing interest rates needs to be enhanced by a more structural analysis of these markets that have remained strongly segmented along geographical borders and national tastes.

Finally, two sets of indicators that were proposed at the outset of the Commission's monitoring tool a decade ago are discussed in more detail. Capital mobility and consumption risk sharing regressions show indeed evidence of an increase in financial integration between the mid-1990s and the onset of the crisis in 2007/08. The period 2008-12 is not easy to study, but there are indications that while consumption risk has been "re-nationalised", at least capital mobility has not followed this trend to the same extent. The last observation is important for the last topic which deals with the capacity of the integrated financial market to offer non-financial firms a sufficient variety of funding sources, and access to funding which does not lead to under-investment.³⁵³

³⁵³ The issue of over-investment in this context would certainly deserve a discussion on its own.

To address new demands that emerged during the crisis, a reframing of the monitoring tool is proposed along three dimensions of a well-functioning financially integrated market: price discovery, risk sharing, and access to finance. All previously established indicators can be used. In some cases measurement issues need to be addressed. Finally, the discussion of additional indicators shall complement the refined existing ones in order to ensure a fit-for-purpose monitoring tool.

Thus, a slightly reframed set of indicators is presented in table 7.7.1, with four additional indicators (in bold).

Table 7.7.1: Reframed and augmented set of indicators of financial market integration

The indicator measures the effect of financial integration on the Single Market's capacity to further:	Financial institutions (MFIs, insurers and pension funds, other FIs)	Non-financial companies	Households
A. Price discovery	money market (1)	corporate loan market (4)	mortgage market (3)
	bond market (2), financial benchmarks (21)		
	cross-border banking fees (5)	Correlation of national stock market returns (12)	
B. Risk sharing	Foreign assets (8) and liabilities (9) held by domestic banking sector	Cross-border M&A activity (18)	Consumption correlation across countries (17)
	International Diversification of Bond (10), Money Market (11), Equity (13), Pension (14), and Insurance Companies (15) Funds; Saving-investment correlations (16)		
C. Access to finance	foreign banks: asset shares (6), number (7)	corporate loan market (4); FCI (22), stock market capitalisation (23), internal capital markets (24)	mortgage market (3)
	Dispute Resolution Index (19), Dispute Duration Index (20) (speed and costliness of bankruptcy regimes)		

Financial benchmarks (21) are an important element of the overall price discovery process. Their significance for the daily conclusion of financial contracts signals the importance of transactions costs even in highly developed financial systems. For the vast majority of market participants it is too costly to observe prices of financial contracts on a continuous basis. They rely on formulae-based benchmarks. The reliability of such benchmarks has been the focus of recent EU regulations. For the purpose of monitoring financial integration, the availability of benchmarks is equally important.

The study of corporate funding choices carried out for this report has underlined the need for additional indicators reflecting corporate financial choices in the Single Market. The financial constraints indicator (22) as proposed by Whited and Wu (2006) is a possible candidate in that regard. But also the impact of the relative and absolute sizes of local capital markets (23) as well as the role of internal capital markets (24) need to be explored in more detail. These additional indicators would be complementary to an important price-based indicator such as the interest rate, or the dispersion thereof, for corporate loans which received much increased attention in the aftermath of the crisis as one of the main indicator of financial fragmentation in the Single Market and the Euro Area.

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ANNEX: DESCRIPTION OF THE DATA USED IN THE FIRM LEVERAGE REGRESSIONS³⁵⁴

This Annex explains the data sample and the definition and motivation of variables used to estimate Equation (3) below, and estimation results are reported.

*Testing the predictions of different capital choice theories*³⁵⁵

The predictions of the pecking order as opposed to the trade-off theory are tested with a series of fixed effects panel regressions as follows:

$$L_{i,t} = \alpha_z + \beta X_{i,t-1} + \gamma Y_{s,t-1} + \rho Z_{k,t-1} + \delta_t + \varepsilon_{i,t} \quad (\text{Equation 3})$$

where indices $z=\{i,s,k\}$ represents firm-, industry- and country-specific fixed effects, respectively and t stands for time. L is the leverage ratio per firm and period. There are three measures that accordingly reflect short-term, long-term and total debt over total assets. X is the vector of firm characteristics while Y is the vector of industry-specific factors and Z is the vector of country factors. The regression model also includes α_z and δ_t to account for omitted firm-specific and year fixed effects, respectively.³⁵⁶

Data sample

The data set measures capital structures in Europe, Japan and the USA from 2003 until 2012. For firm-level data, we use the ORBIS database³⁵⁷ which contains company information for unlisted and listed companies. We include firms with either revenue above EUR 1 million, assets above EUR 2 million, or more than 15 employees which are active in all industry sectors except financial services.³⁵⁸ Macroeconomic data comes from the World

³⁵⁴ Based on Kühnhausen and Stieber (2014).

³⁵⁵ This part is based on Kühnhausen and Stieber (2014); the empirical strategy is similar to Frank and Goyal (2009), Fan et al (2012) and Köksal et al (2013). These authors analyse similar questions and provide valid frameworks to assess capital structure choices.

³⁵⁶ To reduce problems with endogeneity and to include all factors in the information set, we lag our independent variables by one time period. To account for firm heterogeneity, we use only ratios or logarithms of our variables; for additional details on the empirical strategy see Kühnhausen and Stieber (2014).

³⁵⁷ The data is from the ORBIS database of Bureau van Dijk.

³⁵⁸ NACE Rev. 2 classification Section K - industry codes 64, 65, 66.

Development Indicators of the World Bank. We identify different industries by using the two-digit industry codes of the European NACE Rev. 2 classification.

Table A.7.1 Summary statistics

Variable	Mean	Median	Std. Dev.	Min.	Max.
St LR	0.545	0.561	0.267	0	1
Lt LR	0.105	0.005	0.181	0	1
Total LR	0.650	0.696	0.249	0	1
Size	7.824	7.681	1.808	0	20.457
Growth	3.221	0.058	610.000	-1	877202
Profitability	0.080	0.056	0.127	-1	1
Tangibility	0.329	0.249	0.282	0	1
Liquidity	0.127	0.059	0.164	0	1
Nickell	0.293	0.059	43.050	-18505	83094
St Ind. LR	0.548	0.579	0.108	0.164	0.745
Lt Ind. LR	0.020	0.006	0.029	0	0.325
Total Ind. LR	0.693	0.694	0.053	0.381	0.821
Ind. Growth	0.058	0.065	0.057	-0.288	0.244
Tax Shield	0.005	0.005	0.005	0	0.063
Inflation	2.810	2.166	2.790	-4.481	25.296
GDP Growth	1.359	1.725	3.089	-17.955	12.233
Capital Flows	0.003	0.001	0.005	-0.020	0.042
Unemployment	8.185	7.900	4.452	2.300	49.700
Stock Prices	10.250	12.012	33.227	-82.190	189.230

Some preparation of the dataset is required: Any observations with missing data or implausible values for balance sheet items (e.g. negative revenues) are dropped. To eliminate coding errors and outliers, firms reporting short-term debt greater than total debt are deleted, similarly normalized ratios³⁵⁹ that exceed the interval [0,1] or [-100%,100%], respectively, are deleted. The final sample is an unbalanced panel of 1,366,497 firms with 7,238,829 firm-year observations. There are less than 10 years of data for some firms because each year some firms enter or exit the sample. The number of observations is further reduced as we include more explanatory variables. In the baseline regression with country fixed effects N takes the value of N=3,220,380 firm observations (table A.7.2).

³⁵⁹ This includes the different leverage ratios, tax rate, profitability, tangibility and liquidity.

Table A.7.2 Results of estimating Equation (3)

Variables	(1) Total Leverage	(2) Long-term Leverage	(3) Short-term Leverage
Size	0.006*** (0.000)	0.002*** (0.000)	0.003*** (0.000)
Growth	0.000 (0.000)	-0.000 (0.000)	0.000* (0.000)
Profitability	-0.158*** (0.001)	-0.062*** (0.002)	-0.127*** (0.001)
Tangibility	-0.029*** (0.001)	0.103*** (0.002)	-0.104*** (0.001)
Liquidity	-0.080*** (0.001)	-0.004** (0.002)	-0.076*** (0.001)
Nickell	0.000 (0.000)	0.000*** (0.000)	-0.000 (0.000)
Total Ind. LR	0.145*** (0.008)		
Lt Ind. LR		-0.092*** (0.014)	
St Ind. LR			0.161*** (0.007)
Ind. Growth	0.008*** (0.002)	-0.024*** (0.002)	0.031*** (0.002)
Tax Shield	1.104*** (0.020)	1.389*** (0.096)	-0.414*** (0.025)
Inflation	0.001*** (0.000)	-0.001*** (0.000)	0.002*** (0.000)
GDP Growth	0.001*** (0.000)	0.001*** (0.000)	0.000*** (0.000)
Capital Flows	0.188*** (0.034)	-0.329*** (0.045)	0.502*** (0.040)
Unemployment	-0.002*** (0.000)	0.001*** (0.000)	-0.003*** (0.000)
Stock Prices	0.000*** (0.000)	-0.000*** (0.000)	0.000*** (0.000)
Year FE	Y	Y	Y
Firm FE	Y	Y	Y
Constant	Y	Y	Y
Observations	3,220,380	1,776,342	3,218,498
Number of firms	872,905	590,893	872,590
R-squared	0.113	0.131	0.221

NB: Robust standard errors clustered at firm-level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Dependent variables, explanatory variables and underlying hypotheses

Three different measures for the capital structure of firms are used in the analysis: short-term, long-term and total debt over total assets, respectively, in line with Rajan and Zingales (1995) who demonstrate that ratios of liabilities to assets are an appropriate measure for financial leverage of companies as they serve as a proxy for what is left for shareholders in

case of liquidation.³⁶⁰ On the other hand, the data set consists of three different groups of independent variables: firm characteristics, industry-specific parameters and country-specific variables.³⁶¹ Table A.7.1 provides summary statistics.

Firm-specific Factors

Firm age: As proposed by La Rocca et al. (2011) the age of firms as derived from the respective date of incorporation is included as a proxy for reputation. Mature firms have had the opportunity to grow and build up a credit history making it easier to acquire debt, and maturity of a firm and leverage should therefore have a positive relation.³⁶²

Firm size: One of the key determinants of leverage is firm size. Larger firms are usually more established in their markets, diversified and less likely to fail; size can be seen as an inverse measure of bankruptcy risk. There are different approaches which proxy to use for size: Rajan and Zingales (1995), Psillaki and Daskalakis (2009), and Köksal et al. (2013) use revenues, Frank and Goyal (2009), La Rocca et al. (2011), Degryse et al. (2012) and Fan et al. (2012) use (total) assets.³⁶³

Firm growth: Another important leverage factor is future business of a company (Rajan and Zingales (1995)). How firms react to investment opportunities determines their profitability and status in their respective markets. Again, different proxies have been used in the literature: Brav (2009), La Rocca et al. (2011) and Köksal et al. (2013) use percentage changes in sales, Frank and Goyal (2009), Chen and Yu (2011) and Degryse et al. (2012) use growth in terms of assets.³⁶⁴ While the pecking order theory predicts a positive relation to leverage, the trade-off theory assumes a negative relation. Results from previous literature are mixed.³⁶⁵ In the present study a positive relation between growth and leverage is predicted.

Firm profitability: More profitable firms tend to generate more cash flow and firms tend to prefer financing projects with internal funds before looking for external funding. Since retained earnings increase with higher profits, the need for debt financing decreases with higher profitability. In line with Frank and Goyal (2009), Psillaki and Daskalakis (2009), and Chen and Yu (2011) profitability is defined as EBIT over total assets. While the trade-off theory is ambiguous, the pecking order theory predicts a negative relation, as is the consensus in the literature.

³⁶⁰ Subsequent studies have followed this approach while other definitions include market values of equity or assets in the denominator (e.g. Shyam-Sunder and Myers (1999), Welch (2004), Faulkender and Petersen (2006), Antoniou et al. (2008), Frank and Goyal (2009)) as a result of the critic against book measures being backward looking. In addition, some studies have used interest coverage or debt maturity to measure leverage of firms (Rajan and Zingales (1995), Welch (2004), Frank and Goyal (2009), Fan et al. (2012)).

³⁶¹ All financial data is in thousand EUR.

³⁶² Age of companies is typically used in investigations into corporate financial decisions during a firm's life cycle.

³⁶³ The pecking order theory is ambiguous but the trade-off theory postulates that leverage is positively affected by firm size as shown in most of the empirical studies.

³⁶⁴ In order to mitigate problems of multicollinearity we also use growth in sales since several of the ratios used in our analyses are in terms of assets.

³⁶⁵ Brav (2009) and Degryse et al. (2012) find a positive coefficient, while Rajan and Zingales (1995), Faulkender and Petersen (2006) and Fan et al. (2012) find a negative coefficient in their respective analyses.

Asset tangibility: We define tangibility as the fraction of fixed assets to total assets. The larger the fraction of fixed assets on a firm's balance sheet, the more assets it can pledge as collateral against debt and thus, diminish the agency costs borne by the investor. Also, liquidation values ought to be higher and easier to determine. Thus, it should be easier for a firm with more tangible assets to acquire loans. Both capital structure theories predict and the consensus in the literature is a positive relation between tangibility and leverage.

Liquidity: Firms with less liquidity may find it harder to attract debt as bankruptcy costs increase. Numerous definitions exist, for the present study cash equivalents over total assets are used as a good proxy for how well firms can demand payments from their debtors while holding off on their creditors. Both theories are ambiguous about the relation but Brav (2009) and Köksal et al. (2013) have shown a negative relation.

Debt Tax Shield / (Effective) Tax Rate: We also account for a country's fiscal policy. Taxes affect the size of the tax shield available to debt financing and also reduce retained earnings. Feld et al. (2013) carry out a meta-econometric analysis of the existing empirical literature and show that the marginal tax rate positively affects capital structures. However, Faulkender and Petersen (2006), Degryse et al. (2012), Fan et al. (2012) and Köksal et al. (2013) find that an effective debt interest tax shield is positively related to leverage, while effective taxation is negatively related to leverage. The pecking order theory is ambivalent about taxation, while the trade-off theory predicts a positive relation between tax rates and leverage.

Nickell Criterion of financial stress: This factor comes from Nickell and Nicolitsas (1999) and measures financial stress of a company in terms of how much of its cash flow the firm has to spend to cover debt expenses. Specifically, this flow measure allows to capture interest rate changes on debt.

Financial Constraint Index (FCI): This index measures how financially constrained a firm is in terms of a variety of different firm and industry characteristics. This is based on a structural model by Whited and Wu (2006).

Industry-specific Factors

Industry Leverage: As in La Rocca et al. (2011), Degryse et al. (2012) and Köksal et al. (2013), industry trends are picked up by the median leverage ratio of the group of firms with the same two-digit industry classification code. Early work by Harris and Raviv (1991) already suggested a strong relationship between industry affiliation and leverage ratios and highlights existing differences across industries but consistency within them. The trade-off theory suggests that inter-industry effects exist as the optimal leverage ratio may differ across industries. Also, the effects of aforementioned firm characteristics may vary across industries. The pecking order does not offer a clear prediction. Moreover, intra-industry effects can arise from competition and agency conflicts within a market. Firms may face higher pressure to assert to the optimal leverage ratio in more competitive situations while increasing leverage might deter takeover attempts or signal firm stability.

Industry Growth: To account for industry-specific demand shifts the development of industry size is picked up by average growth rates across groups of firms with the same two-

digit industry classification codes. There is an expected positive relationship with firm leverage.

Country-specific Factors

Inflation: Rising inflation decreases the value of debt and makes it cheaper for a firm. Also, tax deductions from debt financing are more valuable when inflation is expected to be higher. Indeed, the trade-off theory predicts and Frank and Goyal (2009) find a positive relation between inflation and leverage.

GDP Growth/unemployment/output gap: During times of economic prosperity collateral values increase and debt financing becomes easier. Agency problems between firms and investors become more severe in economic downturns. Thus, leverage should be pro-cyclical. However, internal funds of firms generally increase in economic expansion so that according to the pecking order theory firms might make less use of debt financing. Frank and Goyal (2009) find a positive relation while Köksal et al. (2013) find a negative one.

Stock Prices: We also want to take into consideration how expensive equity for public firms is. Thus, we include Standard & Poor's Global Equity Indices, which measure the performance of various stock exchanges around the world. Welch (2004) and Frank and Goyal (2009) argue that the effect of changing stock prices on capital structure may reflect overall growth prospects, relative price changes in asset classes or differences in agency costs. According to the market timing theory, equity issuance is pro-cyclical while debt financing is counter-cyclical. Firms may take advantage of mispricing in stock markets to reduce their capital costs. Thus, capital structure theories predict that stock price development and leverage ratios are negatively related.

