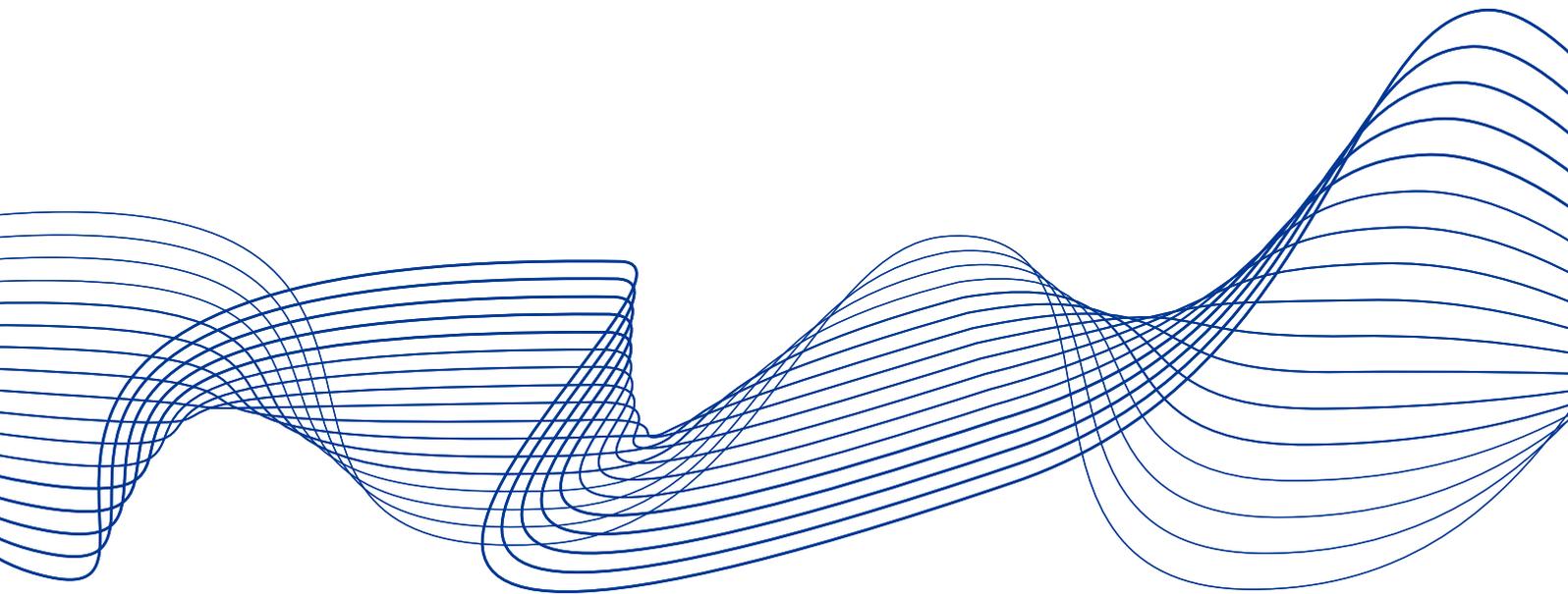


**Macroprudential
implications of
financial instruments in
Levels 2 and 3 for
accounting purposes**

February 2020



ESRB
European Systemic Risk Board
European System of Financial Supervision

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Executive summary

As the global financial crisis showed, it is difficult to determine the fair value of some financial instruments, given the lack of liquidity in the relevant markets, the complexity of some of those instruments and the need, in a significant percentage of cases, to use unobservable inputs. Taking the current accounting framework as a given, this report discusses the macroprudential implications of financial instruments that are measured at fair value according to IFRS 9 and IFRS 13 (with a focus on those classified in Levels 2 and 3, since they are typically measured using models and other market-based techniques, as well as affording the greatest degree of discretion).¹ The prudential regulatory framework distinguishes between exposures in the banking book and the trading book on the basis of the intentions underlying the holding of the financial instruments in question, with the former subject to prudential requirements relating to credit risk and the latter to prudential requirements relating to market risk. These instruments are also subject to the requirement to consider prudential valuation adjustments for all financial instruments measured at fair value.

Given the limited evidence on the impact that the fair values of financial instruments in Levels 2 and 3 have on financial stability, this report adopts a descriptive approach, relying on supervisory reporting data provided by the European Banking Authority (EBA), a review of academic literature,² and the financial statements of a small sample of European banks.³

On the basis of those data, financial assets measured at fair value totalled approximately €7,279 billion in December 2018 (accounting for around 25% of total assets), with €2,379 billion in Level 1, €4,600 billion in Level 2 and €300 billion in Level 3. Debt securities (72% of which are classified in Level 1) and derivatives (the majority of which are allocated to Level 2) make up more than two-thirds of all assets measured at fair value.⁴ In terms of distribution across countries, banks domiciled in the United Kingdom, France and Germany account for two-thirds of all financial assets measured at fair value. As regards financial liabilities measured at fair value, they totalled €4,915 billion at the end of 2018 (equivalent to around 17% of total assets), with fair value liabilities strongly concentrated in deposits and derivatives in Level 2. The relative importance of financial assets and liabilities measured at fair value varies across EU countries and can be explained by the prevailing business models of the banks domiciled in each country. Relative to the situation at end-2016, data as at end-2018 show a sizeable decline (of around €1.1 trillion) in the derivative positions reported on both sides of the balance sheet, which may be explained by (i) the obligation to clear certain derivatives centrally and (ii) the use of compression. After declining steadily

¹ Under IFRS 13, financial instruments for which there are quoted prices in an active market whose inputs are fully observable are allocated to Level 1. Inputs used in the valuation of financial instruments in Level 2 are not quoted market prices, but are still observable, either directly or indirectly. Finally, financial instruments are allocated to Level 3 if there are significant unobservable inputs. IFRS 9 sets out the criteria that determine whether financial instruments are to be measured at amortised cost or at fair value.

² See Annex 1.

³ The cut-off date for the contents of this report was 18 December 2019. Consequently, all references to the European Union include the United Kingdom, as do all data aggregates, as that country was a member of the European Union on that date.

⁴ Under IFRS, derivatives with a positive gross market value are shown on the assets side of a bank's balance sheet, and derivatives with a negative gross market value are shown on the liabilities side. Thus, the distinction between assets and liabilities is, in this case, not as neat as it is with other financial instruments, a fact that must be taken into account when looking at this report.



between 2014 and 2017, Level 3 assets increased in 2018, rising from €191 billion at end-2017 to €300 billion at end-2018.⁵

In terms of volume, holdings of Level 2 and 3 assets remain highly concentrated. In the recent EBA Transparency Exercise, five banks accounted for half of all Level 2 assets reported by banks in that sample, with ten banks accounting for half of all Level 3 assets. The majority of banks with large amounts of Level 2 and 3 assets have been classified as G-SIBs by the Financial Stability Board (FSB), reflecting the size of their balance sheets. In relative terms, when measured as a percentage of CET1 capital, the concentration of Level 2 and Level 3 assets remains high, with a significant right tail in both distributions (meaning that there is a limited number of banks with relatively high ratios of Level 2 and Level 3 assets to CET1 capital), although in the case of Level 3 instruments there is greater heterogeneity in terms of the main characteristics of the banks in question (size, country of domicile, etc.).

This report identifies three main areas where financial instruments measured at fair value can affect financial stability and thus have a macroprudential impact:

1. The correct valuation of financial instruments is crucial for an accurate determination of banks' solvency positions. If financial instruments are found to be misvalued, the correction of that misvaluation may generate a large loss for the bank in question and affect its solvency, via the profit and loss account and other comprehensive income. Given the significant degree of discretion that exists when allocating financial instruments to Levels 2 and 3 (as a result, for example, of the lack of any definition of observability and the lack of operational guidance covering the allocation of financial instruments to the various levels of the fair value hierarchy or the treatment of Day 1 profits) and the various incentives that may exist in this regard, macroprudential concerns are focused on those instruments. Transparency and disclosure can help to address market concerns about discretion in relation to Level 2 and 3 instruments, and they should be accompanied by efforts on the part of auditors, accounting enforcers and microprudential supervisors to ensure consistent application of regulatory and accounting frameworks.
2. In times of stress, Level 2 and 3 instruments may become even less liquid (or fully illiquid), their fair value may be imprecise or subject to greater variability (not reflecting the realisable sale price and potentially leading to sizeable fair value losses, losses on disposal, and even fire sales), and there may ultimately be an impact on banks' profitability and solvency. Moreover, the risk of imperfect modelling may be more pronounced in times of financial stress in the form of extreme valuations that can result in significant changes to the fair value of the underlying Level 2 or 3 instruments. Given the expected negative dynamics of Level 2 and 3 instruments in times of stress, accounting enforcers and supervisors should be aware of the importance of monitoring banks' exposures to complex financial instruments (which will typically be allocated to Levels 2 and 3).
3. The underlying risks stemming from financial instruments measured at fair value should be appropriately reflected in capital requirements. Level 2 and 3 financial instruments are

⁵ This may also have been influenced by the implementation of IFRS 9 as of 1 January 2018.



typically related to the trading activities of banks and, as such, will fall within the definition of “trading book” for regulatory purposes, with market risk-related capital requirements being applied to them. The global financial crisis highlighted deficiencies in the regulatory framework as regards market risk-related capital requirements, and the entry into force of the Fundamental Review of the Trading Book (FRTB) – and, to a lesser extent, the leverage ratio – is expected to improve the way in which market risk is considered for in the regulatory framework.

Vulnerabilities stemming from these three identified areas will affect financial stability through both a capital and a transparency channel. As accounting figures are inputs in the calculation of prudential regulatory requirements, banks’ behaviour, market perceptions and supervisory actions may be affected, depending on the extent to which Level 2 and 3 financial instruments are able to move banks away from their desired regulatory targets in time of stress. This channel is also influenced by the discretion that is afforded to management. As regards the transparency channel, the accounting framework for Level 2 and 3 financial instruments can also affect banks’ transparency and information asymmetries, which can, in turn, affect stability through the role they play in influencing market and supervisory discipline, financial frictions, debt overhang problems facing banks and opportunistic risk-shifting activities.

The analysis in this report seems to point to significant heterogeneity across banks as regards the relative importance of Level 2 and 3 assets and liabilities, as well as the underlying portfolios, instruments and models associated with them. Consequently, transparency and targeted action by relevant stakeholders (auditors, accounting enforcers and microprudential supervisors) are very important.

In terms of transparency, more comprehensive and more granular disclosure by banks (e.g. as regards the sensitivity of valuations or Day 1 profits) would support the efforts of regulatory authorities in this area and result in more effective market discipline.

Given the significant heterogeneity observed across EU banks, auditors, accounting enforcers and microprudential supervisors should make full use of their mandates as regards Level 2 and 3 instruments. Those efforts should be aimed at: (i) ensuring that banks treat similar instruments in a similar manner, and that uncertainty in the valuation of financial instruments is adequately reflected; (ii) conducting more detailed assessments of the prudential valuation framework for banks; (iii) understanding the performance of banks’ valuation models in the presence of market stress, and even back-testing models; and (iv) understanding how disclosures relating to financial instruments classified in Levels 2 and 3 under IFRS 13 are effectively put in practice by European banks, and ensuring that the disclosure requirements are adhered to.

Finally, the FRTB represents a significant improvement in the way that market risk is considered in banks’ regulatory capital requirements. It should be promptly implemented in the EU, so that capital requirements better reflect the underlying market risk, learning the lessons from the global financial crisis.



1 Introduction

As the global financial crisis showed, it can be difficult to determine fair values, given the lack of liquidity in the relevant markets, the complexity of some financial instruments and the need, in a significant percentage of cases, to use unobservable inputs. Financial instruments that are allocated to Levels 2 and 3 of the fair value hierarchy in IFRS 13 are, by definition, difficult to value accurately, owing to their possible complexity, a lack of liquidity and/or (in the case of Level 3 instruments) the use of unobservable inputs for their valuation. It is worth noting that the difficulty of obtaining an accurate value for Level 2 and 3 instruments does not necessarily mean that these instruments are always riskier or more complex than those in Level 1. Nevertheless, during the global financial crisis, there was significant misalignment between the fair values observed for certain financial instruments in financial markets and those reported in banks' financial statements. When the fair values reported in financial statements were aligned with the fair values observed in financial markets, banks incurred substantial losses. The Basel Committee on Banking Supervision (BCBS) noted in this regard that those valuation challenges (and losses) stemmed mainly from instruments which were initially classified as Level 1 when the crisis erupted, concluding that "[...] the uncritical use of 'level 1 prices' taken from 'virtual' secondary markets (or at least, markets with very reduced liquidity) was a clear source of trouble when it became clear that those 'alleged market prices' were not real" (BCBS, 2008).⁶

Following the global financial crisis, the accounting and regulatory frameworks for financial instruments measured at fair value have been enhanced. On the regulatory side, the first draft of the Fundamental Review of the Trading Book (FRTB) was published by the BCBS in 2016, and those rules were then finalised in January 2019 following a review of certain aspects, with a target implementation date of 2022.⁷ In the EU, amendments to the Capital Requirements Regulation envisage a reporting obligation for FRTB positions, awaiting the incorporation into the EU's regulatory framework of the international standard agreed in January 2019.⁸ On the accounting side, IFRS 9 introduced new criteria governing the classification of financial instruments as measured at fair value, which are expected to bring increased consistency (see ESRB, 2017).⁹ Moreover, the International Accounting Standards Board (IASB) carried out a post-implementation review of IFRS 13 between May 2017 and December 2018 and concluded that although follow-up measures were required in some areas, no major amendments were necessary for IFRS 13.¹⁰

⁶ On the basis of an earlier exercise conducted by the United Kingdom's Financial Services Authority, the European Banking Authority (EBA) showed in 2015 that €193 billion of UK banks' total losses of €240 billion had come from cash securitisation and monoline or leveraged loan positions (EBA, 2015).

⁷ It is worth noting that not all financial instruments that are measured at fair value will be classified as part of the trading book, as defined for prudential purposes.

⁸ See Recitals 40 and 41 of **Regulation (EU) 2019/876 of the European Parliament and of the Council of 20 May 2019 amending Regulation No 575/2013 as regards the leverage ratio, the net stable funding ratio, requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements, and Regulation (EU) No 648/2012.**

⁹ Under IFRS 9, financial instruments are measured either at fair value or at amortised cost, depending on two factors: (i) the business model within which the asset is held (the business model test); and (ii) the contractual cash flow for the asset. As regards the latter, the cash flows generated by financial instruments are assessed to determine whether they reflect solely payments of principal and interest (SPPI).

¹⁰ See **Post-implementation Review of IFRS 13 Fair Value Measurement.**



Under IFRS 13, financial instruments measured at fair value are allocated to one of three different levels depending on the inputs used in the calculation of the fair value.¹¹ If prices for a financial instrument are quoted in an active market and the inputs for those prices are fully observable, the instrument is allocated to Level 1. Inputs used in the valuation of financial instruments in Level 2 are not quoted market prices, but are still observable, either directly or indirectly. Level 2 inputs include (i) prices quoted for similar assets or liabilities in active markets, (ii) prices quoted for identical or similar assets or liabilities in markets that are not active, (iii) inputs other than quoted prices that are observable (e.g. interest rates and yield curves observable at commonly quoted intervals, implied volatilities or credit spreads) and (iv) inputs derived principally from or corroborated by observable market data by correlation or other means (“market-corroborated inputs”). Finally, financial instruments are classified as Level 3 if there are significant unobservable inputs. Unobservable inputs require the use of the best available information, may imply the use of own data and should take into account all information about market participant assumptions that is reasonably available.

The prudential regulatory framework has no equivalent to the fair value hierarchy set out by IFRS 13.¹² By contrast with IFRS 13, the prudential regulatory framework distinguishes between exposures in the banking book and the trading book, with the former subject to prudential requirements relating to credit risk and the latter to prudential requirements relating to market risk. The main criterion determining whether exposures are allocated to the trading book or the banking books is whether the financial instrument in question is held for trading purposes. However, prudential regulation does not provide for any more detailed classification of financial instruments measured at fair value, as prudential requirements focus on the types of risk that are embedded in financial instruments, rather than the manner in which the fair value is calculated. There is, though, a requirement to consider prudential valuation adjustments for all financial instruments measured at fair value (including financial liabilities), regardless of whether they are held in the trading book or the banking book. These prudential valuation adjustments are deducted directly from CET1 capital. However, according to the latest available data, prudential adjustments are not particularly significant.¹³

The objective of this report is to discuss the macroprudential implications of financial instruments measured at fair value – particularly those allocated to Levels 2 and 3 of the fair value hierarchy in IFRS 13. In the aftermath of the global financial crisis, there was a lengthy debate in academia and among policymakers about the contribution that fair value accounting makes to the difficulties experienced by banks around the world (Laux and Leuz, 2010; Schaffer, 2010; Acharya and Ryan, 2016). This report does not seek to contribute to the discussion about the most appropriate method for the measurement of financial instruments. Rather, it takes the current accounting framework as a given and analyses the possible macroprudential impact of fair value measurement, with a focus on financial instruments in Levels 2 and 3, since they are typically valued using models and other market-based techniques (leading, for example, to correlation with

¹¹ For further information on the accounting treatment of financial instruments measured at fair value, see Section A of Annex 2.

¹² For further information on the prudential treatment of financial instruments measured at fair value, see Section B of Annex 2.

¹³ The recent inclusion of a template on valuation in the supervisory reporting framework for EU banks will allow further insight to be gained into the use of prudential valuation adjustments and other value adjustments.



credit default swap spreads) and afford the greatest degree of discretion.¹⁴ There is currently limited evidence on the impact that financial instruments in Levels 2 and 3 have on financial stability, and this report tries to fill that gap to the extent possible. However, the information that is currently available is not granular enough to identify all relevant factors (e.g. the valuation method used by banks to calculate the fair value of their financial instruments in Levels 2 and 3 – be it prices quoted for similar assets, other observable inputs, etc.) that are necessary for a full and complete analysis of the macroprudential impact of Level 2 and 3 instruments.¹⁵ Consequently, this report adopts a descriptive approach and tries to present as much evidence as possible, using supervisory data, a review of academic literature and the financial statements of a small sample of European banks.

The report is structured as follows: Section 2 provides an overview of the use of fair value accounting by European banks, on the basis of supervisory data collected by the EBA; Section 3 elaborates on the main transmission channels between fair value accounting and financial stability; and Section 4 contains concluding remarks, with a focus on possible policy action. A brief literature review can be found in Annex 1 to the report, while Annex 2 describes the accounting and prudential frameworks that govern the valuation of financial instruments. Annex 3 contains a stylised depiction of EU banks' aggregate balance sheet, Annex 4 provides further insight into banks' use of fair value accounting, and Annex 5 contains additional information supplementing the analysis presented in Box 1.

¹⁴ For a discussion of the expected impact of the new criteria governing financial assets' measurement at amortised cost or fair value, see ESRB (2017).

¹⁵ Such information goes far beyond the current supervisory reporting framework for EU banks and the disclosure requirements in IFRS 13.



2 Overview of the use of fair value accounting by European banks

This section provides an overview of the use of fair value accounting at European banks. On the basis of consolidated supervisory data for 128 EU banking groups as at 31 December 2018 (provided by the EBA), it describes European banks' use of fair value accounting, paying particular attention to financial instruments in Levels 2 and 3.¹⁶ This will help to frame the assessment of the macroprudential implications of Level 2 and 3 instruments in subsequent sections. Annex 4 provides additional insight into the use of fair value accounting at European banks.

Financial assets measured at fair value totalled approximately €2,279 billion in December 2018, accounting for around 25% of EU banks' aggregate balance sheet. This represents a marked decline relative to the €8,838 billion of fair value assets that were observed two years earlier.¹⁷ Meanwhile, assets valued at amortised cost totalled €17,613 billion (up slightly on 2016), accounting for 61% of EU banks' aggregate balance sheet. Banks' remaining assets consist of cash (8.5%)¹⁸ and other (non-financial) assets (approximately 5%). €2,379 billion of EU banks' fair value assets are in Level 1 (8.1% of total assets), €4,600 billion is in Level 2 (15.7% of total assets), and €300 billion is in Level 3 (1% of total assets). After declining steadily between 2014 and 2017, Level 3 assets increased significantly in 2018, rising from €191 billion to €300 billion (a 57% increase).¹⁹ In terms of capital, Level 1 assets are equivalent to 142% of EU banks' CET1 capital, with ratios of 275% and 18% being observed for Level 2 and Level 3 assets respectively. As Chart 1 shows, debt securities now account for the largest percentage of EU banks' fair value assets (€2,719 billion; 38% of fair value assets), overtaking derivatives (€2,244 billion; 29% of fair value assets). 95% of derivatives are classified as Level 2 instruments, while 72% of debt securities are in Level 1 and 26% are in Level 2. Other significant asset classes measured at fair value include loans and advances (€1,841 billion; 25% of fair value assets) and equity instruments (€475 billion; 6% of fair value assets). Derivatives and debt securities have both declined since 2016, falling by approximately €1,174 billion and €625 billion respectively, while loans and advances have increased by €376 billion. Derivatives tend to be held for trading purposes, with only 6% of all derivatives being held for the purposes of hedge accounting.²⁰ According to the EBA (2016), debt securities make up the largest percentage of small banks' fair value assets. Moreover,

¹⁶ The assets of the 128 EU banks in that sample represent around 90% of the total assets of the EU banking sector, according to consolidated banking data held by the ECB. See Annex 3 for a stylised aggregate balance sheet for the banks in that sample.

¹⁷ Supervisory reporting data do not allow us to differentiate between changes that are due to valuation changes (changes in prices) and changes that are derived from real transactions (changes in volumes). This limitation is particularly important when making cross-temporal comparisons.

¹⁸ Although cash is a financial asset measured at fair value, it is treated separately for the purposes of this report, given that it does not give rise to any of the macroprudential considerations which are typically associated with other financial assets and liabilities measured at fair value.

¹⁹ Changes observed in 2018 may also have been influenced by the entry into force of IFRS 9.

²⁰ It should be noted that the conditions which must be met in order to describe a derivative as being held for hedging purposes are fairly strict under IFRS. Indeed, a bank cannot designate a derivative as being held for hedging if the underlying asset is measured at fair value, so hedging may be more widespread than accounting figures would suggest. Similarly, the netting of positions is significantly more limited under IFRS than, for example, under US-GAAP rules.

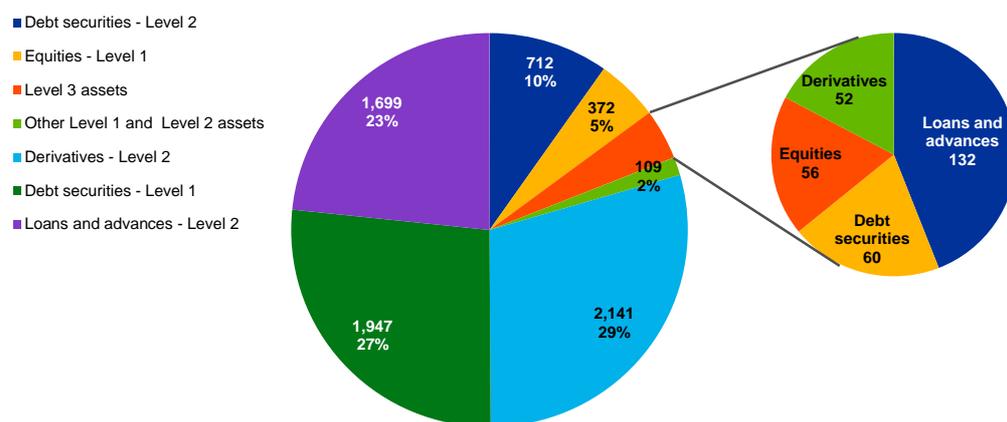


for these banks, fair value assets and liabilities account for around 15% of total assets and 1% of total liabilities.

Chart 1

Composition of fair value assets in the EU banking sector as at 31 December 2018

(EUR billions)



Sources: EBA and ESRB Secretariat calculations.

Note: These consolidated data refer to FINREP template F14.00 on a consolidated basis, and cover 128 EU banking groups.

In terms of the distribution of fair value assets across countries, banks domiciled in the United Kingdom, France and Germany account for two-thirds of the total (see Chart 2). If we look at absolute volumes of financial assets measured at fair value, British (€2,212 billion; 30%), French (€1,783 billion; 24%) and German (€1,049 billion; 14%) banks hold 68% of all fair value assets in the EU, reflecting the activities of large universal banks domiciled in these countries. Meanwhile, banks headquartered in Spain (€526 billion; 7%), Denmark (€464 billion; 6%),²¹ Italy (€377 billion; 5%), the Netherlands (€270 billion; 4%) and Finland (€215 billion; 3%) account for an additional 25% of EU banks' fair value assets.

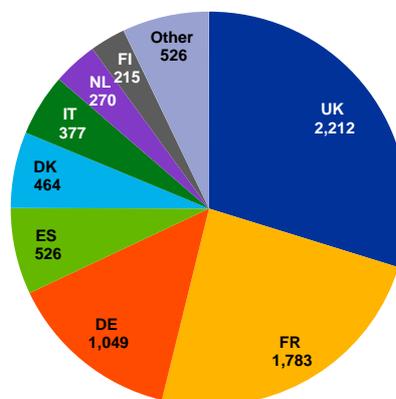
²¹ In the case of Denmark, the large amounts of fair value assets and liabilities are explained by specificities in the national mortgage market. Indeed, the fair value option is used by Danish banks in light of the institutional link between mortgage loans and the corresponding covered bonds.



Chart 2

Distribution of fair value assets across EU countries as at 31 December 2018

(EUR billions)



Sources: EBA and ESRB Secretariat calculations.

Note: These consolidated data refer to FINREP template F14.00 on a consolidated basis, and cover 128 EU banking groups.

Financial liabilities measured at fair value totalled €4,915 billion at the end of 2018, equivalent to around 17% of total assets, with liabilities strongly concentrated in Level 2 deposits and derivatives (see Chart 3). Similar to the marked decline observed for financial assets measured at fair value, the amount of financial liabilities measured at fair value in the balance sheet of European banks has declined by 16% since 2016. €804 billion of EU banks' total fair value liabilities are in Level 1 (equivalent to 2.8% of total assets), €3,942 billion is in Level 2 (13.5% of total assets), and €169 billion is in Level 3 (0.6% of total assets). Level 3 liabilities grew by around 5% in 2018, rising from €160 billion to €169 billion. As Chart 3 shows, Level 2 derivatives and deposits make up two-thirds of all financial liabilities measured at fair value.²² Since 2016, holdings of derivatives have declined by approximately 35% (€1,152 billion), while deposits have increased by almost 25% (€219 billion). 95% of all derivatives are in Level 2 of the fair value hierarchy, as are 97% of deposits, while debt securities are mainly allocated to Level 1 (35%) and Level 2 (57%).

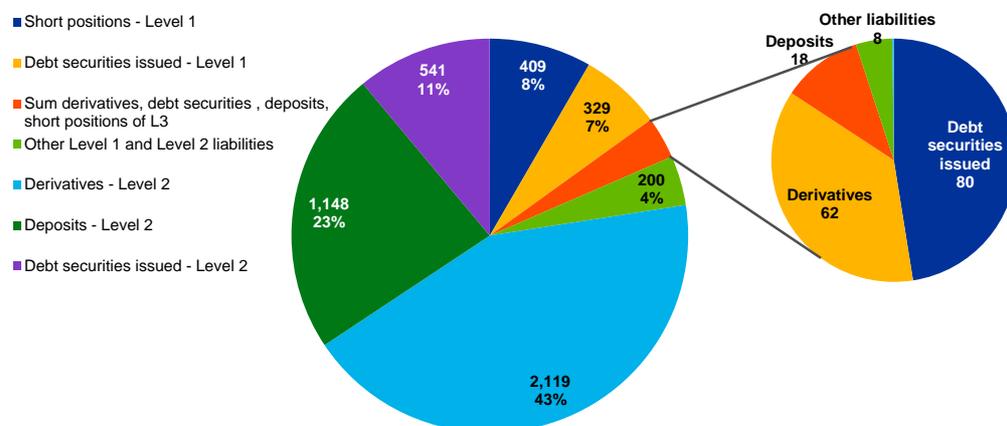
²² Deposits could, for example, be measured at fair value in order to manage interest rate risks.



Chart 3

Composition of fair value liabilities in the EU banking sector as at 31 December 2018

(EUR billions)



Sources: EBA and ESRB Secretariat calculations.

Note: These consolidated data refer to FINREP template F14.00 on a consolidated basis, and cover 128 EU banking groups.

The declines reported for derivative positions since 2016 are of a similar size on both sides of the balance sheet and can be explained by the obligation to clear derivatives centrally and the use of compression.

If we assume that market values for derivative positions have remained broadly stable over the last few years, that declining trend can also be observed at a global level. The Bank for International Settlements (BIS, 2019) explains that development as follows: “[...] the rise of central clearing has been an important structural change in OTC derivatives markets over the past decade. This change has gone hand in hand with an increase in trade compression – the elimination of economically redundant derivatives positions [...]. New practices such as settle-to-market – where banks, instead of posting collateral against the change in market value (i.e. variation margin), make outright payments to restore the market value to zero – have additionally contributed to the observed decline in their market values.”

There is significant variation across EU countries in terms of the breakdown of assets and liabilities by measurement method (see Charts 4 and 5).

The countries with the highest ratios of fair value assets to total assets are Denmark (65%), the United Kingdom (34%), Finland (31%), Luxembourg (29%), Germany (28%), France (26%) and Romania (20%).²³ With the exception of Romania, the same countries also have the highest ratios of fair value liabilities to total liabilities, whereby the distribution is even more concentrated (see Chart 5). Indeed, with the exception of Denmark (60%), Luxembourg (25%), the United Kingdom (24%), France (21%), Finland (20%) and Germany (18%), all countries have ratios of less than 10%. As regards Level 3 assets, the following EU countries have the largest amounts of Level 3 assets as a percentage of total assets: Luxembourg (€25 billion; 11.8%), Denmark (€45 billion; 6.3%), Portugal (€8 billion; 2.5%), Poland

²³ It should be noted that the various figures reported in relation to the assets of German banks do not add up to 100%. This data quality issue is currently being investigated.

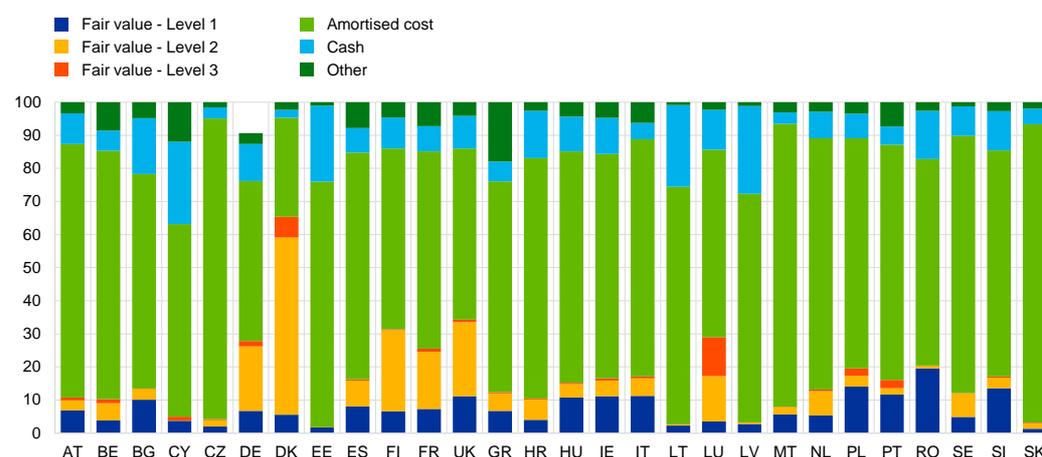


(€4 billion; 2.2%), Germany (€45 billion; 1.7%), Belgium (€12 billion; 1.2%) and Cyprus (€429 million; 1.1%).

Chart 4

Breakdown of total assets across EU banking sectors as at 31 December 2018

(percentage of total assets)



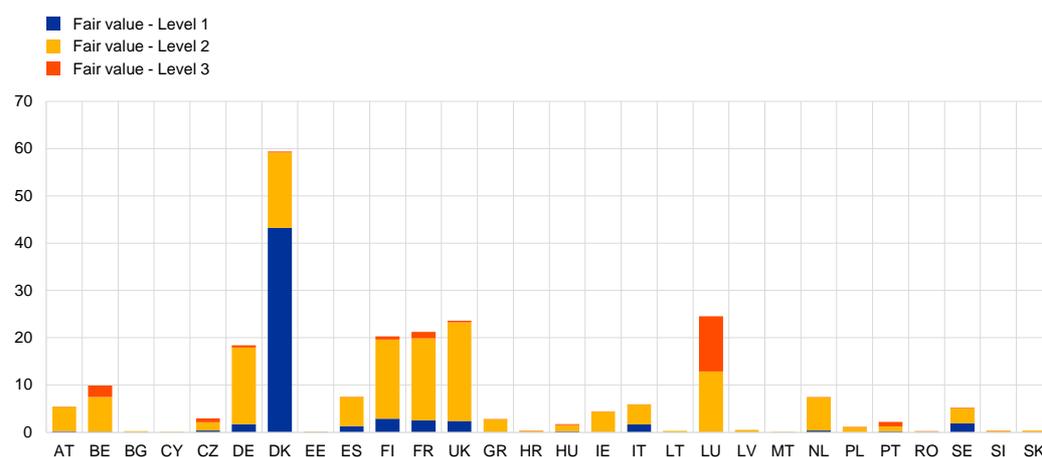
Sources: EBA and ESRB Secretariat calculations.

Notes: Data refer to FINREP template F14.00 and cover 128 EU banking groups. They were reported on either a consolidated or a sub-consolidated basis, depending on the country of residence.

Chart 5

Breakdown of total fair value liabilities across EU banking sectors as at 31 December 2018

(percentage of total liabilities)



Sources: EBA and ESRB Secretariat calculations.

Notes: Data refer to FINREP template F14.00 and cover 128 EU banking groups. They were reported on either a consolidated or a sub-consolidated basis, depending on the country of residence.

With the exception of French and German banks, debt securities account for the largest percentage of fair value assets in most EU countries. Although the value of derivatives has



generally declined since 2016, French and German banks – probably driven by the largest players – still have derivatives as the largest class of fair value assets. In general, use of derivatives is typically more pronounced in countries with larger banking systems.²⁴ In Denmark (and, to a lesser extent, Luxembourg), fair value assets are driven primarily by loans and advances, which are matched on the liabilities side by debt securities.²⁵ In terms of IFRS portfolios, the countries with the most assets and liabilities held for trading purposes as a percentage of total fair value assets and liabilities are Belgium, Germany, Finland, France, the United Kingdom and Sweden.

Level 2 and 3 financial assets vary significantly across EU countries as a percentage of total assets and CET1 capital (see Charts 6 and 7). Since the holdings of financial assets allocated to Level 2 are higher, their comparison with CET1 capital (which is used solely as a benchmark to facilitate comparison across EU countries) reveals that there are 11 countries where Level 2 assets (including derivatives) exceed CET1 capital (see Chart 6). Meanwhile, the following EU countries have the largest amounts of Level 3 assets as a percentage of CET1 capital: Denmark (€45 billion; 139%), Luxembourg (€25 billion; 105%), Portugal (€14 billion; 36%), Germany (€45 billion; 34%), Poland (€4 billion; 21%), Belgium (€12 billion; 20%) and France (€66 billion; 19%). Denmark and Luxembourg saw particularly strong increases in Level 3 assets in 2018, and those countries now have the highest ratios of Level 3 assets to CET1 capital. While no general pattern can be identified, most countries recorded increases in Level 3 assets in 2018 (a year that also saw the introduction of IFRS 9).

²⁴ In 2016, Finland, France, Germany and the United Kingdom were the only countries where derivatives were the largest class of fair value assets.

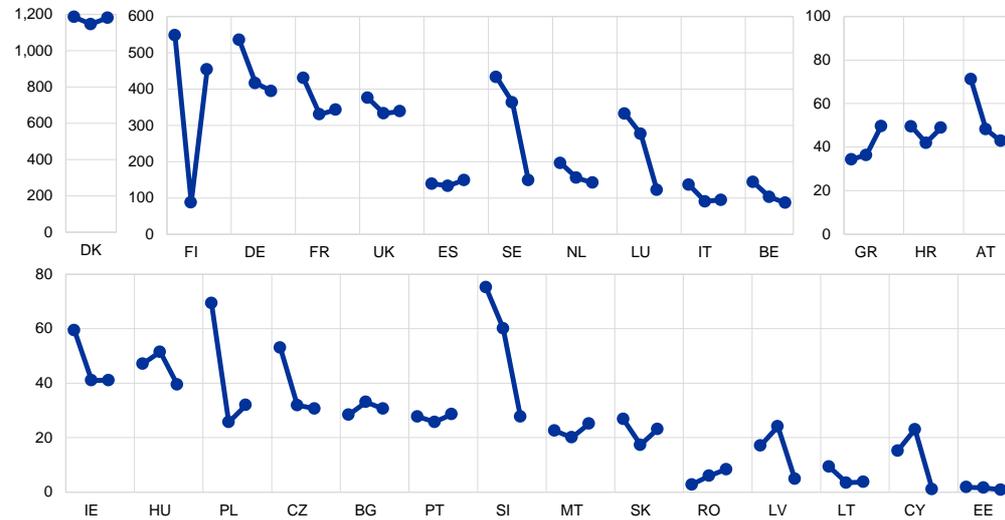
²⁵ In Denmark, this is due to the specific nature of the local covered bond/mortgage market, where a direct link exists between a mortgage loan and the corresponding covered bond, with an option for the borrower to repay the loan by buying the covered bond on the market and returning it to the bank. Thus, the value of the mortgage loan is connected to that of the covered bond, which allows banks to measure it at fair value. See also EBA (2013b).



Chart 6

Evolution of the ratio of Level 2 assets to CET1 capital, 2016-18

(percentage of total CET1 capital)



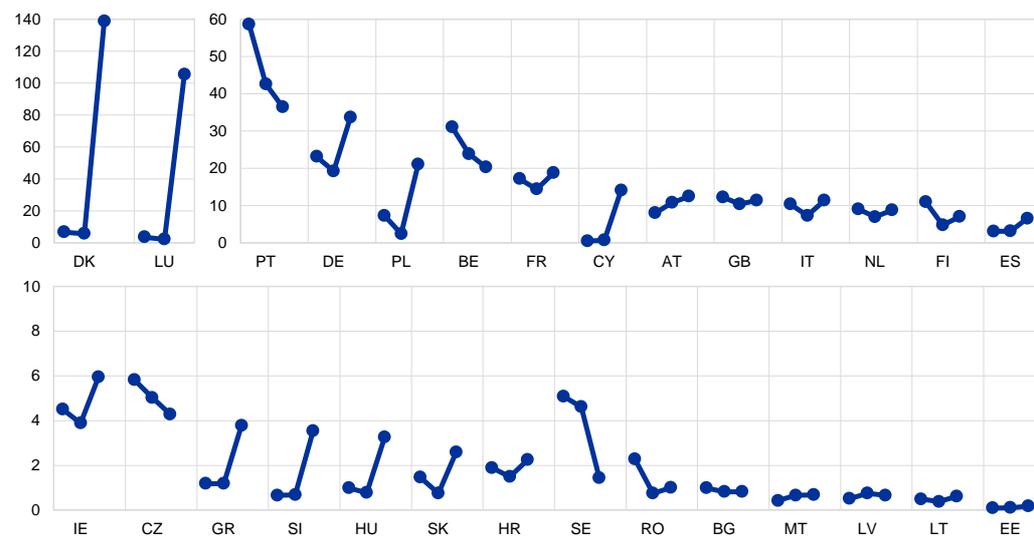
Sources: EBA and ESRB Secretariat calculations.

Notes: This chart shows Level 2 assets as a percentage of CET1 capital in the fourth quarter of 2016, 2017 and 2018. These consolidated data cover 128 EU banking groups.

Chart 7

Evolution of the ratio of Level 3 assets to CET1 capital, 2016-18

(percentage of total CET1 capital)



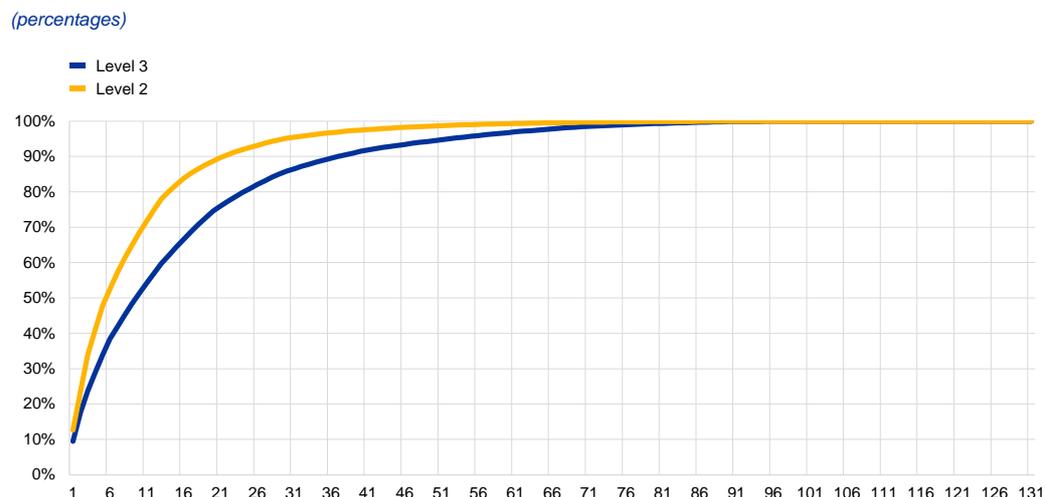
Sources: EBA and ESRB Secretariat calculations.

Notes: This chart shows Level 3 assets as a percentage of CET1 capital in the fourth quarter of 2016, 2017 and 2018. These consolidated data cover 128 EU banking groups.



Level 2 and 3 assets remain highly concentrated in terms of volume. Indeed, in the recent EBA Transparency Exercise, five banks accounted for half of all Level 2 assets reported by banks in that sample, with ten banks accounting for half of all Level 3 assets. The majority of those banks with large amounts of Level 2 and 3 assets have been classified as G-SIBs by the FSB (particularly those with the largest volumes of Level 2 assets). This mainly reflects the size of those banks' balance sheets, as G-SIBs do not necessarily have large amounts of Level 2 and 3 assets in relative terms, as a percentage of total assets or total CET1 capital.²⁶ As Chart 8 shows, 10, 20 and 37 banks respectively accounted for 50%, 75% and 90% of all Level 3 assets reported by participants in the latest EBA Transparency Exercise. What is more, the level of concentration is even higher for Level 2 assets, probably reflecting the more intensive derivative-based activities of the largest banks, with 5, 13 and 22 banks respectively accounting for 50%, 75% and 90% of all Level 2 assets reported.

Chart 8
Distribution of Level 2 and 3 assets across the sample of banks participating in the 2019 EBA Transparency Exercise



Sources: EBA and ESRB Secretariat calculations.

Notes: The x-axis indicates the number of banks, ordered by their holdings of Level 2 and 3 assets at the end of June 2019, as reported in the 2019 EBA Transparency Exercise. The y-axis indicates the cumulative proportion of the total that is accounted for by the banks on the x-axis.

The concentration of Level 2 and 3 holdings remains high when considered in relative terms. Looking at Level 3 assets as a percentage of total CET1 capital, it can be seen that the majority of the banks participating in the EBA Transparency Exercise are located on the left-hand side of the distribution, meaning that their ratio of Level 3 assets to CET1 capital is relatively low (see Chart 9). At the same time, there are 19 banks where Level 3 holdings represent more than 30% of CET1 capital, which could be subject to heightened stress if a sudden negative revaluation of those assets were to occur. Those banks, which are headquartered in eight different countries, have a total combined balance sheet of more than €4.2 trillion and Level 3 assets totalling just over

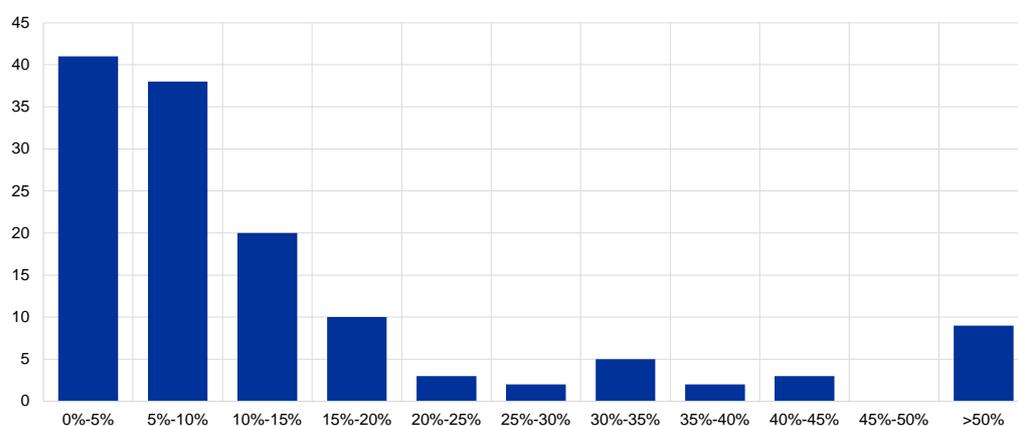
²⁶ One criterion that is used to identify and calibrate G-SIBs is the amount of Level 3 assets as a percentage of total assets.



€110 billion. A similar profile can be observed when looking at the ratio of Level 2 holdings to total CET1 capital – although, given the larger volumes for holdings of Level 2 assets, the resulting values for the ratios are much higher (see Chart 10). In this case, more than half of all banks participating in the EBA Transparency Exercise have values at the left-hand end of the distribution, while there are 21 banks where holdings of Level 2 assets are more than three times CET1 capital. These banks are not necessarily those with the largest balance sheets and show a certain degree of geographical concentration (reflecting, in some instances, particular features of national banking systems), as they are all headquartered in Sweden, Denmark, Germany, the United Kingdom, France or Finland.

Chart 9
Level 3 assets as a percentage of CET1 capital

(number of banks in each category)



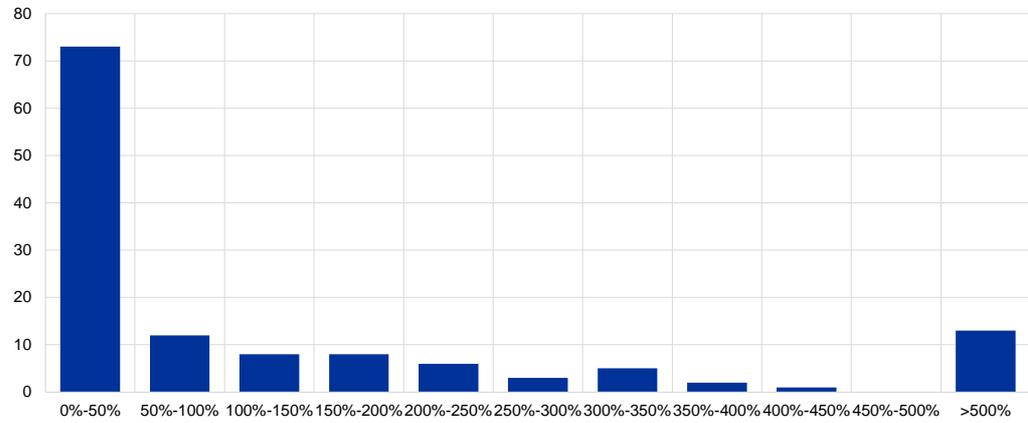
Sources: EBA and ESRB Secretariat calculations.

Note: This chart shows the number of banks in each of the various categories in terms of the ratio of Level 3 assets to CET1 capital.



Chart 10
Level 2 assets as a percentage of CET1 capital

(number of banks in each category)



Sources: EBA and ESRB Secretariat calculations.

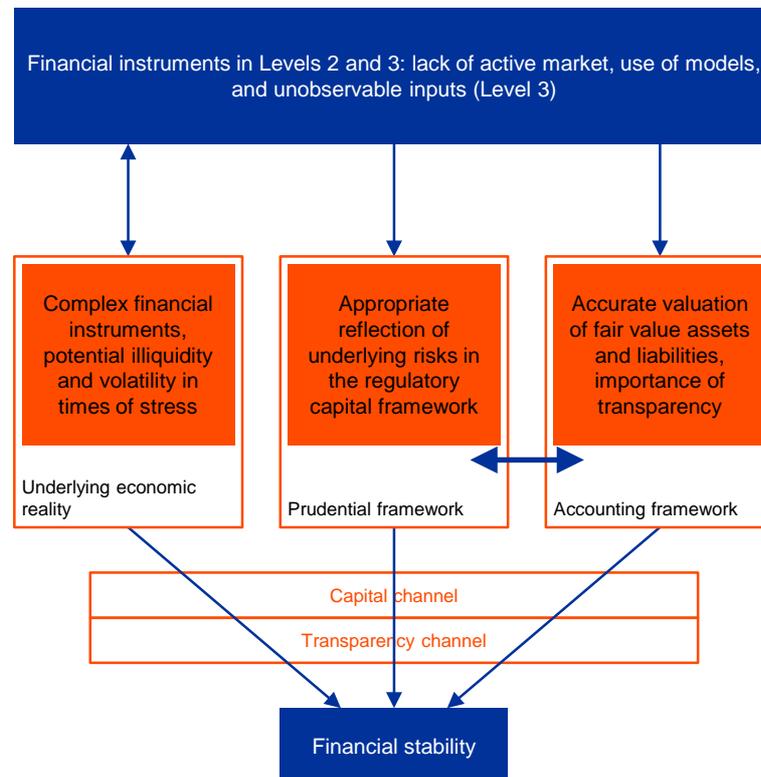
Note: This chart shows the number of banks in each of the various categories in terms of the ratio of Level 2 assets to CET1 capital.



3 Fair valuation of financial instruments and financial stability

This section discusses the channels through which fair valuation of financial instruments may affect financial stability. It identifies three main areas of concern (related to the accurate valuation of financial assets and liabilities, the potential for volatility and illiquidity in times of financial stress,²⁷ and the reflection of underlying risks in capital requirements), which are described in the paragraphs below. As outlined in Figure 1, these issues extend far beyond the accounting and regulatory frameworks. Indeed, they also reflect underlying economic phenomena (e.g. holdings of complex financial instruments, which are expected to be classified in Levels 2 and 3).

Figure 1
Fair valuation and financial stability



Source: ESRB.

Vulnerabilities stemming from these three areas will affect financial stability through a capital channel and a transparency channel, which may have macroprudential implications

²⁷ Financial instruments in Levels 2 and 3 are expected to be generally illiquid at all times. However, the importance of periods of financial stress for macroprudential policy means that the issue of illiquidity will be more relevant in these periods.



if large numbers of banks are affected during periods of financial stress. Accounting figures serve as inputs for the calculation of prudential regulatory requirements (as regards capital, leverage and bail-in debt) and other covenants (e.g. bail-inable bonds related to MREL requirements), so banks' behaviour, market perceptions and supervisory actions may be affected, depending on the impact that Level 2 and 3 financial instruments have in terms of moving banks away from their intended regulatory targets in times of stress. In principle, the extent to which regulatory requirements (capital, leverage and bail-in requirements) are affected by the vulnerabilities identified in this report may differ across banks (as may the mechanisms through which that impact occurs), making this primarily an issue for microprudential supervision. However, if several banks were to be affected simultaneously at a time of acute fragility in the financial system, concerns could spread to the macroprudential domain and affect financial stability. This channel is also shaped by the degree of discretion that is afforded to management. For example, discretion that permits delays in the recognition of declines in assets (or increases in liabilities) can heighten capital inadequacy concerns during downturns (when such information is revealed more fully). As regards the transparency channel, disclosures relating to Level 2 and 3 financial instruments can influence the transparency of banks' balance sheets and risk profiles.²⁸ The accounting framework for Level 2 and 3 financial instruments can also affect banks' transparency and information asymmetries – which, in turn, can affect financial stability, particularly at times of financial stress, through the role they play in influencing market and supervisory discipline, financial frictions, debt overhang problems facing banks and opportunistic risk-shifting activities.

Although empirical evidence remains limited in this area, an important channel through which Level 2 and 3 financial instruments can affect financial stability is the extent to which they allow banks' management to exercise discretion. In theory, credible disclosures can help to shape corporate governance and market and supervisory discipline as regards banks' risk taking (BCBS, 2015b). If accounting standards generally facilitate transparency, this may reduce uncertainty (e.g. uncertainty about a bank's underlying asset quality and, in turn, its capital adequacy and likelihood of failure) and the financial frictions associated with banks' efforts to raise capital (especially when capital is most needed), which can help to foster financial stability. At the same time, however, accounting standards often give reporting entities considerable discretion, with both positive and negative effects on financial stability. On the one hand, discretion creates scope for informational benefits by allowing larger amounts of private information to be incorporated into banks' accounting reports. However, it also increases the potential for opportunistic behaviour by managers. Ultimately, this can heighten investors' uncertainty about the fundamentals of the bank and weaken market discipline as regards risk-taking behaviour (see, among others, Bushman and Williams, 2012, 2015).²⁹ As accounting figures are used in the calculation of prudential capital requirements, management discretion may lead to inaccurate valuation of financial assets and liabilities, ultimately affecting the solvency position of the bank. Hence the importance of ensuring

²⁸ At this point, it is important to distinguish between disclosure and transparency, since it is often assumed – wrongly – that increasing disclosure will always improve transparency. Disclosure is the act of providing information to the financial markets, while transparency arises only if the information is reliable and appropriately interpreted and used by participants in those financial markets. It is the concept of transparency that underpins effective market discipline. In its broadest sense, market discipline is the mechanism through which market participants (e.g. shareholders, debtholders and depositors) monitor and discipline, through price and quantity responses, excessive risk-taking behaviour by reporting entities.

²⁹ Bushman and Williams (2012) find evidence suggesting that management discretion in the application of accounting standards which allows banks to manage earnings can inhibit markets' ability to discipline risk taking, which can be detrimental to financial stability.



that the valuations assigned to financial instruments are as accurate as possible. In addition, discretion that lowers transparency can increase financial frictions, inhibiting banks' ability to raise capital and increasing the risk of failure. To the extent that discretion also allows banks to conceal negative information, this can result in concerns about capital adequacy at a later date when that information is ultimately disclosed.

3.1 Valuation of financial assets and liabilities

From a macroprudential perspective, the correct valuation of financial assets and liabilities is essential for an accurate assessment of banks' capital levels and solvency positions.³⁰

Where assets are measured at amortised cost, valuation is based on the effective interest method and correct identification and estimation of impairment and uncollectability, resulting in sufficient provisioning. For fair value instruments, however, an accurate valuation involves the calculation of a fair value – equivalent, to the extent possible, to the market price of an arm's-length transaction. This is particularly challenging for Level 2 and 3 instruments, where market prices are not available, so various modelling techniques and a significant number of unobservable input parameters are used to determine the value of the relevant assets and liabilities.

The main concern about financial instruments measured at fair value is that financial assets and liabilities may be misvalued (i.e. overvalued or undervalued). More specifically, the overvaluation of financial assets (or the undervaluation of financial liabilities) will produce an overly optimistic impression of the bank's financial position which does not reflect the underlying economic reality. When such misvaluations are subsequently corrected, banks' overall solvency positions may be affected via an impact on the profit and loss account or other comprehensive income. Moreover, if such financial instruments are used to manage the bank's daily treasury activities, their overvaluation could also generate liquidity problems (which, in a worst-case scenario, could lead to a situation where financial obligations can no longer be settled on time, with subsequent indirect effects on the solvency position of the bank). The global financial crisis provided several examples of the problems that misvaluation can cause, with UBS, Citigroup and Deutsche Bank (and many other banks besides) posting significant losses derived from fair value assets (at all levels of the fair value hierarchy) between the end of 2007 and the spring of 2009.³¹

Given the significant degree of discretion that exists as regards Level 2 and 3 financial instruments and the various different incentives that apply when it comes to their valuation, such instruments may be the subject of macroprudential concerns.³² Given the principle-based nature of accounting standards, IFRS 13 does not provide exhaustive operational guidance on all specific aspects (e.g. which model to use, or whether or not inputs are observable)

³⁰ While this report focuses mainly on banks, many of the issues that it outlines are also relevant to other financial institutions, particularly insurance companies, given the introduction of the Solvency II regime based on fair valuation of assets and liabilities.

³¹ See, for example, **UBS Writes Down \$14 Billion, Loses Money for Year**, and **Citigroup to shed 9,000 jobs after posting \$5.1bn loss**.

³² Anecdotal evidence indicates that a significant percentage of the financial instruments that are classified in Levels 2 and 3 are not complex (standardised derivatives and repos), and are therefore less likely to be misvalued, but this varies significantly across banks.



and judgement should be exercised by the reporting entity (see also EBA, 2017).³³ This, in turn, has the potential to result in a significant degree of discretion when it comes to the calculation of fair values, with the border line between Level 2 and 3 financial instruments becoming increasingly blurred. In terms of incentives, the inability to immediately recognise Day 1 profits for Level 3 instruments (by contrast with Level 2 and 1 instruments) may also be a factor when banks come to decide on the allocation of financial instruments across the fair value hierarchy.³⁴

Banks, auditors, accounting enforcers and microprudential supervisors all have a role to play when it comes to ensuring consistent application of the regulatory and accounting frameworks (particularly as regards the boundary between Level 2 and Level 3 financial instruments). Significant heterogeneity and a lack of transparency could potentially give rise to questions about whether institutions are exercising their limited freedom in a comparable manner or trying to gain comparative advantages by means of accounting and regulatory arbitrage. The boundary between Levels 2 and 3 is particularly relevant in this regard. Supervisory initiatives undertaken in this domain typically find shortcomings and flaws in the way that Level 2 and 3 instruments are measured in banks' balance sheets. For example, the ECB's 2014 comprehensive assessment revealed that only 67% of banks applying IFRS had a clear policy when it came to defining the term "active market" and only 72% had a clear policy on the definition of Level 3 inputs (ECB, 2014a).³⁵ What is more, that comprehensive assessment also revealed €4.6 billion in additional valuation adjustments stemming from Level 3 assets (out of a total of €37 billion for all asset value adjustments), as well as highlighting errors in the classification of fair value assets.³⁶

Transparency and disclosure can both help to address market concerns about the degree of discretion in relation to Level 2 and 3 financial instruments. Indeed, academic literature seems to point to a trade-off between the level of detail in disclosures about Level 3 instruments and the discretion that is exercised by banks in their valuations (Magnan et al., 2015; Chung et al., 2017; Robinson et al., 2018). Banks providing full and comprehensive disclosures seems to lead to lower discounts by market participants on their stocks of Level 3 financial instruments, while also preventing – or at least hindering – opportunistic behaviour by management when it comes to the calculation of fair values for Level 3 instruments. For market participants, such disclosures enable a full assessment of the risks relating to fair value assets and liabilities across various different institutions. Box 1 below looks at the disclosures that 22 EEA banks made about Level 3 financial instruments in their 2018 IFRS financial statements, finding further evidence of such a trade-off.

³³ In these circumstances, judgement is required by all valuation systems, with such requirements not being limited to IFRS.

³⁴ Technically, Day 1 profits can only be recognised immediately if the fair value of the financial instrument is evidenced by a quoted price in an active market or based on a valuation technique that uses only data from observable markets. Consequently, it is possible that some instruments in Level 2 will not satisfy the requirements for immediate recognition of Day 1 profits.

³⁵ It should be noted, though, that 2014 was the first year in which IFRS 13 was implemented, so those requirements were new and banks could still have been adapting to them.

³⁶ The manual governing the ECB's asset quality review (ECB, 2014b) describes the methodology used to assess Level 3 instruments (Level 1 and 2 instruments were not assessed in that exercise). The combined assets of all banks participating in the asset quality review totalled around €22 trillion, and the risk-weighted assets of all portfolios covered by the asset quality review totalled €3.72 trillion.



Box 1

Empirical analysis of disclosures made about Level 3 assets by a sample of EEA banks

Under IFRS 13, entities using fair valuation of assets and liabilities are required to disclose information on the valuation techniques and inputs used in the measurement of fair values.

Disclosure serves to enhance transparency and comparability, especially for assets in Level 3 of the fair value hierarchy (i.e. assets where the valuation process relies on significant unobservable inputs). The transparency and disclosure requirements in IFRS 13 include quantitative information on the significant unobservable inputs used in the valuation process, reconciliation of opening and closing balances for Level 3 assets, and details of the impact that reasonably practicable alternative assumptions would have on the valuation process.

The analysis in this box looks at a sample of 22 EEA banks in order to review the quality of the disclosures required by IFRS 13. That sample consists of the 11 G-SIBs that are domiciled in the EU, plus a further set of 11 banks with particularly large or small amounts of Level 3 assets.³⁷ Geographically, the sample comprises five UK banks, four French banks, three Dutch banks, two Austrian banks and two Norwegian banks, as well as one bank from each of Belgium, Denmark, Germany, Italy, Malta and Spain. The banks in the sample are diverse in terms of their business models, with the 11 G-SIBs sitting alongside cooperative banks, mortgage banks, and trade financiers, and some of them being not listed or state-owned. All reported amounts relate to 31 December 2018 and have been taken from the relevant consolidated annual report for 2018. On the basis of reported data, each bank has been categorised as “full disclosure”, “partial disclosure” or “no disclosure” for each specific disclosure requirement (for more information on the methodology applied, see Annex 5).³⁸

While G-SIBs exhibit high ratings across all disclosure requirements, the quality of other banks’ disclosures is found to decline as holdings of Level 3 assets increase (see Chart A).

In general, the quality of G-SIBs’ disclosures is high across all requirements in IFRS 13. However, when looking at other banks in this sample, six of the seven banks with the largest holdings of Level 3 assets (as a percentage of total fair value assets) do not disclose quantitative information on significant unobservable inputs. Interestingly, it seems that unlisted banks tend to have lower ratings in this regard. Furthermore, disclosure objectives relating to sensitivity analysis of fair value measurements and the impact that reasonably practicable alternative assumptions would have on the measurement of fair value are also frequently unmet. All banks reconcile opening and closing balances, but some either fail to disclose transfers into and out of Level 3 separately or fail to indicate the reasons for such transfers. The reporting of (deferred) Day 1 gains/losses for Level 3 instruments varies widely across the sample: while some banks even disclose balances for Day 1 gains/losses associated with Level 3 instruments as at the reporting date, a few others (including

³⁷ Ideally, the disclosure of this information under IFRS 13 would allow the use of a larger sample. However, owing to difficulties in the manual compilation of data, this exercise has been forced to focus on the largest EU banks, plus a small number of other banks with large holdings of Level 3 instruments (while also trying to span a variety of different business models).

³⁸ Where a bank is categorised as “no disclosure”, it may, of course, be the case that no underlying transactions requiring disclosure occurred, so no disclosure was necessary. Besides, there is also a materiality threshold in IFRS, whereby IFRS requirements (including disclosure requirements) need not be applied if the effect of not applying them is not material.

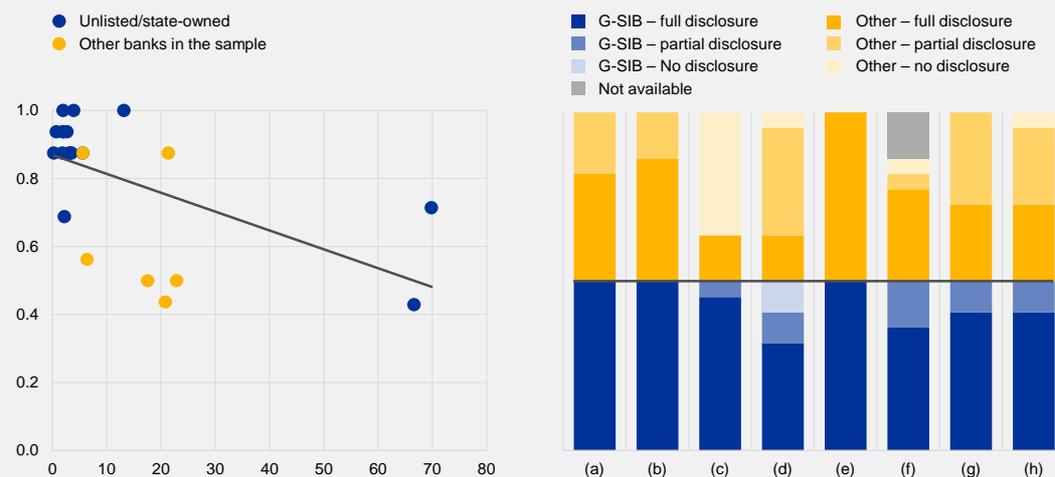


two G-SIBs) make no reference to them whatsoever in their annual reports. That being said, it should be noted that Day 1 gains/losses are not included in IFRS 13 transparency and disclosure requirements (stemming, instead, from IFRS 7).

Chart A

Banks' disclosure ratings and compliance with disclosure objectives

(left-panel, x-axis: Level 3 assets as a percentage of total fair value assets (%); units)



Sources: Banks' consolidated IFRS annual reports as at 31 December 2018 and ESRB Secretariat calculations.

Notes: The left-hand panel depicts banks' disclosure ratings and their holdings of Level 3 assets as a percentage of total fair value assets. The right-hand panel shows banks' compliance with eight individual disclosure and transparency objectives: (a) detailed Level 3 reporting; (b) description of the valuation process; (c) quantitative information on significant unobservable inputs; (d) Day 1 profits/losses; (e) reconciliation of opening and closing balances; (f) transfers into and out of Level 3 and reasons for those transfers; (g) narrative description of sensitivity of fair value measurement and possible relationships with unobservable inputs; and (h) effect that reasonably practicable alternative assumptions would have on the measurement of fair value.

An analysis of Level 3 assets by asset class shows that banks with large amounts of Level 3 assets (i.e. banks where they account for more than 10% of total fair value assets) exhibit a high degree of concentration in one asset class (see Table A). Most G-SIBs hold a relatively broad range of Level 3 assets, with the most prevalent asset classes being loans, derivatives (with positive gross market values) and securities. As regards the other banks in our sample, several of them do not provide a detailed breakdown of their Level 3 assets, and those that do provide such a breakdown seem to be fairly strongly concentrated in a single asset class (loans and advances, derivatives or securities).



Table A
Level 3 assets by asset class

(percentage of total Level 3 assets held by each bank)

	Loans and advances	Derivatives	Securities	Units in investment funds	Private equity	Repos	Other	Level 3 assets as a percentage of total fair value assets
NO1	99.8	0	0.2	0	0	0	0	69.9
MT1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	66.6
NO2	95	0	5	0	0	0	0	22.9
BE1	7.6	85.7	6.7	0	0	0	0	21.3
UK5	1.1	0	98.9	0	0	0	0	20.8
AT2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17.6
NL3	20.9	0	79.1	0	0	0	0	13.2
NL2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.4
AT1	30.9	23.3	44	0	1.8	0	0	5.6
FR2	39.9	13	47.1	0	0	0	0	5.6
DE1	29.1	34.6	24.1	0	0	0	12.2	3.9
NL1	63.6	3.6	23.9	0	0	8.9	0	3.6
IT1	14.1	22.9	46.7	16.2	0	0	0	3.3
ES1	32.3	17	50.7	0	0	0	0	3.1
UK2	32.2	37.7	13.4	0	1.4	5.5	9.8	2.7
DK1	0	15.4	84.6	0	0	0	0	2.2
UK1	0.3	14.5	13.2	0	33.3	0	38.7	2
FR4	30.7	41.4	28	0	0	0	0	2
FR1	12.7	0	83.5	0	0	3.8	0	2
FR3	12.9	11.7	75.2	0.2	0	0	0	1.9
UK3	27.5	0.7	71.8	0	0	0	0	0.7
UK4	0	0	100	0	0	0	0	0.3

Sources: Banks' consolidated IFRS annual reports as at 31 December 2018 and ESRB Secretariat calculations.

Notes: Purple shading on the first column indicates the 11 G-SIBs. The reporting of Level 3 assets in the annual reports of MT1, AT2 and NL2 does not allow for a breakdown by asset class. N/A stands for "non-available".

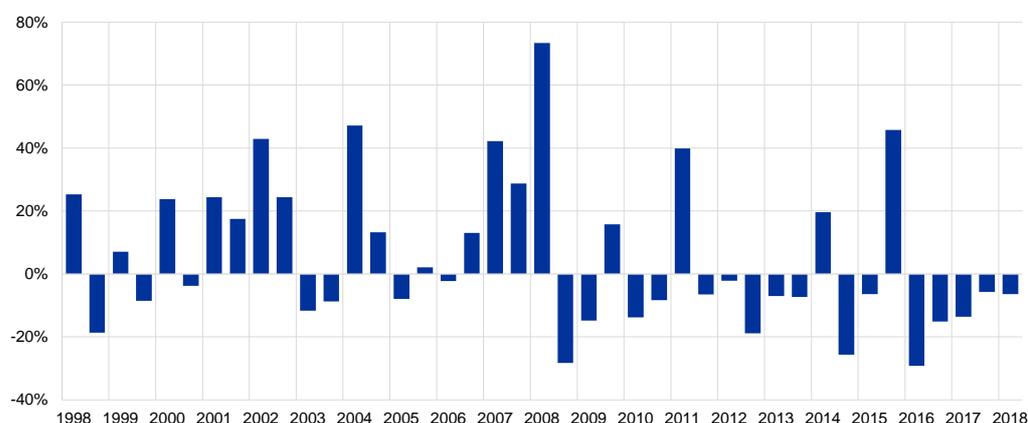
3.2 Potential volatility and illiquidity in times of financial stress

The fair value of derivatives (which account for the majority of fair value assets) may be volatile during periods of financial stress, with the potential to significantly affect banks' profitability and solvency. Derivatives are by far the largest component of EU banks' fair value assets and liabilities and are mainly classified as Level 2 (albeit some countries also have



significant amounts of derivatives classified as Level 3). Indeed, the balance sheets of European banks contain more than €2 trillion of derivatives, both on the assets and on the liabilities side. In times of financial stress, it may be difficult or costly for a bank to exit or hedge existing derivative positions, leaving the bank with two options: exit certain open positions at a known loss, or leave positions open and monitor fair value movements in a potentially volatile market, with a risk of further balance sheet deterioration via fair value losses. As Chart 11 shows, the fair value of derivatives may vary significantly in times of stress, generating losses in the profit and loss accounts of affected banks – which may, in extreme circumstances, negatively affect the solvency of the underlying institutions.³⁹ For that to occur, variations in the fair value of derivatives would need to be abnormally large or would need to affect a significant percentage of the derivatives held by the bank (which, in turn, would need to account for a large percentage of the total assets held by the bank).⁴⁰

Chart 11
Changes in gross market valuation of total derivatives



Source: BIS.

More generally, periods of stress may result in Level 2 and 3 instruments becoming even less liquid or fully illiquid, and fair values may be imprecise or subject to greater variability and may not reflect the realisable sale price, potentially leading to sizeable fair value losses, losses on disposal, and even fire sales.⁴¹ Level 2 and 3 instruments are classified as such

³⁹ To the extent that derivatives are used for hedging purposes, changes in their valuation should be offset by countervailing changes in the values of the hedged assets or liabilities. However, as the stylised balance sheet of EU banks in Annex 3 shows, derivatives are far more likely to be used for trading than hedging.

⁴⁰ In these situations, banks without offsetting derivatives exposures will be more vulnerable than banks whose derivatives positions have largely been offset.

⁴¹ Under IFRS 13, the fair value of a financial instrument should not be representative of a forced transaction (see Annex 2 for further details). So, in principle, a bank that decides not to dispose of a certain portfolio of financial instruments during financial turmoil will not be affected by the prices observed for similar transactions to the extent that it considers that they are forced (falling, therefore, within the category of “fire sales”). That, though, will involve discretion on the part of the bank when deciding which transactions may be considered to be “forced” and, as such, not representative of the fair value of the financial instruments that it holds. Banks may use this provision in IFRS 13 to avoid recognising fair value losses on their financial instruments. The impact that market volatility has on financial instruments may vary across the fair value hierarchy, with greater uncertainty probably surrounding the identification of “forced transactions” for Level 2 and 3 instruments.



because they are not traded in an active market and their fair value cannot be determined directly using market prices. The liquidity of Level 2 instruments can reasonably be expected to decrease even further during times of stress, while Level 3 instruments are generally illiquid even in normal times. In the presence of financial stress, data used for the valuation of financial instruments in Levels 2 and 3 may become highly sparse and volatile, potentially leading to greater variability in the valuation of these instruments.⁴² In such circumstances, liquidity concerns and uncertainty about valuations will probably increase, and banks will only be able to unwind their positions in these instruments with substantial losses. If, on the other hand, banks decide to keep these instruments on their balance sheets, their fair values will, in principle, be subject to significant variation, reflecting their lower levels of liquidity and high uncertainty about valuation. That will be the case if banks decide to avoid recognising financial instruments in Level 3 and are then forced to do so in the presence of financial stress (with poorly designed or untested valuation models). It is also possible that banks could decide to classify financial instruments in Level 3 in times of financial stress, in order to avoid reporting the significant fair value adjustments that would need to be disclosed if those instruments were classified in higher levels of the fair value hierarchy (IMF, 2008; Acharya and Ryan, 2016). These hypothetical situations highlight the importance of monitoring the boundary between Level 2 and 3 instruments. Either way, the losses involved, either via the disposal of Level 2 and 3 instruments or via adjustments to fair values, have the potential to be significant and impair the profitability of institutions in such times of stress (IMF, 2008; Acharya and Ryan, 2016; Roca et al., 2017). Indeed, the global financial crisis provides a recent example of large losses being caused by complex financial instruments (those related to mortgage-based securities), indirect contagion and fire sales (Kamin and DeMarco, 2010; Clerc et al., 2016). In such situations, the impact on financial stability will come through the capital channel, as large losses stemming from financial instruments in Levels 2 and 3 have the potential to negatively affect regulatory capital ratios.

While accounting standards aim to reflect the underlying economic value of Level 3 instruments in such instances, the potential macroprudential impact may warrant increased supervisory action. Accounting standards must, by definition, reflect the underlying economic value of the assets and liabilities of the reporting entity. Thus, declines in the fair values of Level 2 and 3 instruments in times of stress should not be watered down (by allowing banks to behave opportunistically in terms of their valuations or through amendments to reporting standards).⁴³ On the contrary, the expected impact of massive negative revaluations of Level 2 and 3 instruments should raise awareness among accounting enforcers and supervisors regarding the importance of monitoring banks' exposure to complex financial products (which will typically be classified in Levels 2 and 3), including the way relevant accounting policies are applied (IMF, 2008).

Finally, for Level 2 and 3 instruments, the risk of imperfect modelling (e.g. as regards the elasticity of prices to liquidity and the correlation with market prices) may be exacerbated in times of financial stress. The valuation of Level 2 and 3 instruments is heavily reliant on models,

⁴² Where valuations are based entirely on internal information, rather than on inputs available in the market, the perceived valuation uncertainty for these instruments will arguably increase.

⁴³ In 2008, for example, the IASB introduced an amendment to IAS 39 (the accounting standard governing the measurement of financial instruments that was in place at that time) allowing reclassification from fair value to amortised cost, bypassing its usual processes. For more details, see [IAS 39/IFRS 7 – Reclassification of financial assets](#). That amendment has also attracted the attention of academics (see Fiechter, 2011, and Lim et al., 2013).



and inputs are not usually easily observable. Those models may involve a certain degree of complexity and be subject to sizeable modelling risk, which may be particularly high in times of financial stress, when inputs deviate greatly from their average values (Danielsson, 2002). Modelling risk will materialise if (i) the fair value is not appropriate because the correct input variables are not captured, (ii) the assumptions made are not correct or change abruptly, or (iii) there is a significant difference between the estimated fair value and the current sale price (which can be exacerbated during periods of market stress, especially if the bank needs to sell the instruments in question). If modelling risk materialises in periods of stress, this can generate extreme valuations, which could result in significant changes to the fair values of the underlying Level 2 or 3 instruments.

3.3 Reflection of underlying risks in capital requirements

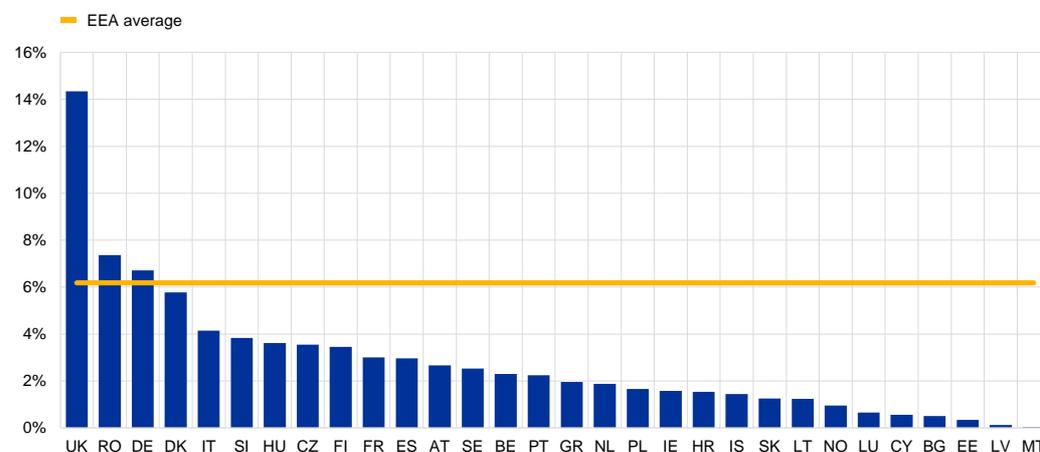
Within the regulatory framework, sources of vulnerability stemming from Level 2 and 3 instruments are most likely to be addressed through the market risk component (which generally generates low risk weights). Level 2 and 3 financial instruments are typically associated with banks' trading activities and, as such, will typically fall within the definition of "trading book" for regulatory purposes.⁴⁴ Consequently, they should be subject to market risk-related capital requirements, together with other financial instruments in the trading book that are classified as Level 1 instruments. Looking at the regulatory framework as a whole, risk-weighted assets that are subject to market risk-related capital requirements make up around 6% of total risk-weighted assets, with substantial cross-country heterogeneity (see Chart 12). Low risk weights are typically assigned to market risk exposures, since they are held for trading purposes and subject to continuous turnover in the balance sheet of the bank.

⁴⁴ Anecdotal evidence suggests that around 70% of all financial instruments in Levels 2 and 3 are included in the trading book.



Chart 12

Risk-weighted assets for market risk as a percentage of total risk-weighted assets in the EEA



Source: EBA Risk Dashboard.
 Note: Data indicate the situation as at end-2018.

Overall, the use of prudential valuation adjustments seems to be fairly limited. In the prudential regulatory framework, there is a requirement to calculate prudential valuation adjustments for financial instruments that are measured at fair value in order to take account of situations where those instruments are illiquid or particularly complex, or their valuations are based on models or third-party calculations. According to data published by the EBA in the context of the 2019 Transparency Exercise, prudential valuation adjustments totalled €24 billion in the second quarter of 2019, equivalent to 0.2% of total risk exposure and 1.08% of total own funds.

The entry into force of the Fundamental Review of the Trading Book (and, to a lesser extent, the leverage ratio) is expected to improve the way in which market risk is taken into account in the regulatory framework. Fair value accounting may generally have a procyclical impact on banks' regulatory capital at times when market illiquidity reduces estimated fair values (IMF, 2008). The global financial crisis revealed flaws and shortcomings in the existing regulatory framework as regards capital requirements for market risk. In response, the BCBS published in 2016 (with subsequent revisions) its Fundamental Review of the Trading Book (BCBS, 2019), with the aim of improving the way in which market risk is incorporated into regulatory capital requirements for banks. In particular, as regards the manner in which market liquidity is incorporated into the new prudential framework for market risk, the FRTB does away with the previous ten-day horizon, as the liquidity of transactions is often dependent on risk factors, and instead introduces liquidity horizons which are mapped to risk factors. For example, the volatility risk factor for foreign exchange rates has been assigned a liquidity horizon of 60 days. Those liquidity horizons indicate the time that is required for a transaction to be executed in the presence of market stress without affecting the price of the hedging instrument. In other words, they can be seen as the time that it takes to eliminate exposure to a risk factor. Initial estimates of the impact of the FRTB point to a substantial increase in capital requirements for market risk, which should better reflect the underlying risks in those positions. For example, an interim impact assessment by the BCBS points



to an average increase of 41% in risk-weighted assets for market risk (BCBS, 2015a), and the EBA anticipates that the impact will be greater for banks adopting the standardised approach to market risk than it is for banks using internal models (EBA, 2016).⁴⁵ The recently published amendments to the Capital Requirements Regulation envisage an obligation requiring EU banks to report on the impact of the FRTB, with a view to incorporating the FRTB into capital requirements as the next step. Finally, the introduction of a binding regulatory requirement for leverage ratios also addresses situations where accounting valuations for financial instruments depart significantly from the relevant risk-weighted amounts (ESRB, 2015).

⁴⁵ The EBA is currently working on an updated report on the FRTB's impact on European banks, based on the latest text published by the BCBS.



4 Concluding remarks

There is significant heterogeneity across banks as regards the relative importance of Level 2 and 3 instruments, as well as the underlying portfolios, instruments and models associated with them. The data analysed in this report suggest that the relative importance of Level 2 and 3 instruments varies significantly across EU banks and is not always directly correlated with the size of the bank. At the same time, the underlying financial instruments also vary considerably, ranging from plain interest rate derivatives which might be cleared centrally in major currencies (typically classified as Level 2)⁴⁶ to more complex and opaque products with values based on unobservable variables. In that context, transparency is particularly important, as are targeted actions by relevant stakeholders (auditors, accounting enforcers and microprudential supervisors).

There are several ways of improving banks' transparency as regards Level 2 and 3 exposures. Academic literature has identified several concerns regarding the information that is disclosed about these instruments, which revolve around the reliability of data and the potential for opportunistic behaviour (see Annex 1 for further details). Consequently, it is not always easy for market participants to assess whether Level 2 and 3 financial instruments are being valued accurately. This relates to the transparency channel described in Section 3. Misvalued financial instruments can have a significant impact on accounting figures – and, in turn, regulatory capital.⁴⁷ More comprehensive and granular disclosures about Level 2 and 3 financial instruments (e.g. disclosure about the sensitivity of valuations or Day 1 profits) would potentially allow more market discipline to be exercised by helping market participants to compare banks (see also EBA, 2017). The IASB is currently setting up a project with the aim of achieving targeted improvements to the disclosure requirements in IFRS 13.⁴⁸

Enhanced disclosure by banks would support the efforts of regulatory authorities in this area. ECB Banking Supervision publishes supervisory information on the fair value hierarchy for the banks under its supervision.⁴⁹ Similarly, the EBA Risk Dashboard provides information on Level 2 and 3 financial instruments on a quarterly basis.⁵⁰ In addition, the 2019 EBA Transparency Exercise provided, for the first time, bank-level data on Level 2 and 3 financial instruments. Besides, liquidity and model uncertainty shocks, and Level 2 and 3 financial instruments are now also considered in the EBA's stress test exercises (EBA, 2018).⁵¹ Against that background, it would be helpful if the ESRB Risk Dashboard could also report information on Level 2 and 3 financial instruments.

⁴⁶ Under the current regulatory framework in the EU, only interest rate swaps denominated in major currencies (euros, pounds sterling, US dollars and Japanese yen) have to be cleared centrally, while those denominated in other EU currencies are still cleared on a bilateral basis. There are also other exemptions to central clearing (e.g. where one of the counterparties is an EU pension scheme).

⁴⁷ By virtue of their nature, Level 3 instruments (and, to a lesser extent, Level 2 instruments) will always involve a certain degree of valuation uncertainty.

⁴⁸ See [Disclosure Initiative: Targeted Standards-level Review of Disclosures](#), November 2019.

⁴⁹ See [Publication of supervisory data](#).

⁵⁰ See [EBA Risk Dashboard](#). The [EBA Risk Assessment Report](#), which is published on an annual basis, also contains information on Level 2 and 3 instruments.

⁵¹ See [EBA 2019 EU-wide transparency exercise](#).



The significant heterogeneity that can be observed across EU banks means that auditors, accounting enforcers and microprudential supervisors need to make full use of their mandates when it comes to Level 2 and 3 instruments. Financial instruments that are held by banks for trading purposes and measured at fair value (some of which – like derivatives and relatively illiquid instruments – are classified in Levels 2 and 3 of the fair value hierarchy) may be subject to sharp corrections and reassessments of their risk premia, which could trigger large adjustments to fair values.⁵² This is particularly relevant in the current macro-financial environment, where the repricing of risk premia is estimated to be a source of systemic risk for the EU financial system. Against that background, auditors, accounting enforcers and microprudential supervisors should be encouraged to make full use of their mandates (which could be strengthened if necessary), in order to:

- ensure that banks treat similar instruments in a similar way, and that the allocation of financial instruments to the fair value hierarchy adequately reflects the uncertainty surrounding the valuation of the instruments in question;
- carry out more detailed assessments of the prudential valuation framework for banks, with appropriate supervisory action being taken when deficiencies and/or unsatisfactory practices are detected;
- understand the way that banks' valuation models perform in the presence of market stress (and even perform back-testing of models), in order to establish a sound understanding of the way that the value of Level 2 and 3 financial instruments varies in response to changes in the macro-financial environment;
- understand how the disclosure requirements for Level 2 and 3 financial instruments under IFRS 13 are effectively put into practice by European banks (ESMA, 2017) and ensure that the disclosure requirements of IFRS 13 are adhered to.

On the regulatory side, the FRTB represents a significant improvement in terms of the way that market risk is reflected in the regulatory capital requirements for banks – and, as such, should be promptly implemented in the EU. The prompt incorporation of the FRTB in the EU's regulatory framework should ensure that capital requirements for banks are better at reflecting market risk, learning from the developments seen in the global financial crisis. A key feature of the FRTB in this regard is the introduction of observability requirements for the assessment of the modellability of risk factors. This is particularly important following the withdrawal of prudential filters (which means that any unanticipated negative changes in fair values impact banks' CET1 capital ratios in periods of stress)⁵³ and the accumulation of vulnerabilities over time, which typically materialise in sudden and sharp price movements (such as the volatility spike in February 2018 or the correction in stock markets at the end of 2018). The fact that the FRTB will result in an increase in total capital requirements should not prevent it from being faithfully implemented in the EU. At the same time, in order to reap the full benefits of the FRTB, microprudential supervisors need to be

⁵² Moreover, it is important to note that the allocation of financial assets and liabilities to higher levels of the fair value hierarchy does not necessarily mean that significant losses are impossible, and also that the level to which an asset or liability is assigned is no reflection of the volatility of the value of the underlying instrument.

⁵³ That being said, some countries continue to use these filters in relation to the distribution of profits.



able to validate and challenge the models that are used by banks to assess the capital requirements resulting from their trading books. Supervisors could also look at the estimation of fair values, including prudential adjustments, in dedicated on-site inspections. To that end, it could be useful to develop benchmarks against which such models could be tested. In addition, even if the FRTB does not enter into the accounting domain, it could prove to be useful in addressing some of the concerns that have been identified in relation to Level 2 and 3 instruments. In effect, the FRTB will largely be based on the same market data as the current assessment of the observability of inputs in the accounting domain, with similar representativeness assessments. Consequently, additional work exploring the possibility of greater convergence between the FRTB and IFRS 13 could be considered.



References

- Acharya, V. and Ryan, S. (2016), "Banks' financial reporting and financial system stability", *Journal of Accounting Research*, Vol. 54, Issue 2, pp. 277-340.
- Altamuro, J. and Zhang, H. (2013), "The financial reporting of fair value based on managerial inputs versus market inputs: evidence from mortgage servicing rights", *Review of Accounting Studies*, Vol. 18, Issue 3, pp. 833-858.
- Ayres, D.R. (2016), "Fair value disclosures of level three assets and credit ratings", *Journal of Accounting and Public Policy*, Vol. 35, Issue 6, pp. 635-653.
- Badia, M., Duro, M., Penalva, F. and Ryan, S. (2017), "Conditionally conservative fair value measurements", *Journal of Accounting and Economics*, Vol. 63, Issue 1, pp. 75-98.
- Barth, M.E. (2007), "Standard-setting measurement issues and the relevance of research", *Accounting and Business Research*, Vol. 37, Special Issue: International Accounting Policy Forum, pp. 7-15.
- BCBS (2008), *Fair value measurement and modelling: an assessment of challenges and lessons learned from the market stress*, June.
- BCBS (2015a), *Fundamental review of the trading book – interim impact analysis*, November.
- BCBS (2015b), "The interplay of accounting and regulation and its impact on bank behaviour: Literature review", *Working Paper Series*, No 28, January.
- BCBS (2017), "The interplay of accounting and regulation and its impact on bank behaviour", *Working Paper Series*, No 31, July.
- BCBS (2018), *Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement*, July.
- BCBS (2019), *Minimum capital requirements for market risk*, January.
- BIS (2019), *OTC derivatives statistics at end-December 2018*, May.
- Bischof, J., Daske, H. and Sextroh, C. (2014), "Fair value-related information in analysts' decision processes: evidence from the financial crisis", *Journal of Business Finance & Accounting*, Vol. 41, Issue 3-4, pp. 363-400.
- Bosch, P. (2012), "Value relevance of the fair value hierarchy of IFRS 7 in Europe: How reliable are mark-to-model fair values?", *Working Papers SES*, No 439, Faculty of Economics and Social Sciences, University of Fribourg.
- Bushman, R. and Williams, C. (2012), "Accounting discretion, loan loss provisioning and discipline of banks' risk-taking", *Journal of Accounting and Economics*, Vol. 54, Issue 1, pp. 1-18.



Bushman, R. and Williams, C. (2015), "Delayed expected loss recognition and the risk profile of banks", *Journal of Accounting Research*, Vol. 53, Issue 3, pp. 511-553.

Chung, S.G., Goh, B.W., Ng, J. and Yong, K.O. (2017), "Voluntary fair value disclosures beyond SFAS 157's three-level estimates", *Review of Accounting Studies*, Vol. 22, Issue 1, pp. 430-468.

Clerc, L., Giovannini, A., Langfield, S., Peltonen, T., Portes, R. and Scheicher, M. (2016), "Indirect contagion: the policy problem", *ESRB Occasional Paper Series*, No 9.

Couch, R. and Wu, W. (2017), "The fair value option for liabilities and stock returns during the financial crisis", *Quarterly Review of Economics and Finance*, Vol. 59, pp. 83-98.

Curtis, A. and Raney, R. (2016), "**Fair value estimates and delayed updating**", working paper.

Daifei, Y., Percy, M., Stewart, J. and Hu, F. (2018), "Determinants of discretionary fair value measurements: The case of Level 3 assets in the banking sector", *Accounting and Finance*, Vol. 58, pp. 561-597.

Danielsson, J. (2002), "The emperor has no clothes: Limits to risk modelling", *Journal of Banking & Finance*, Vol. 26, Issue 7, pp. 1273-1296.

Dong, M., Doukakis, L.C. and Ryan, S. (2017), "**Banks' discretion over the debt valuation adjustment for own credit risk**", working paper.

Du, H., Li, S.F. and Xu, R.Z. (2014), "Adjustment of valuation inputs and its effect on value relevance of fair value measurement", *Research in Accounting Regulation*, Vol. 26, Issue 1, pp. 54-66.

EBA (2013a), *Technical advice to the Commission on possible treatments of unrealised gains measured at fair value under Article 80 of the Capital Requirements Regulation (CRR)*, December.

EBA (2013b), *EBA FINAL draft Regulatory Technical Standards on close correspondence between the value of an institution's covered bonds and the value of the institution's assets relating to the institution's own credit risk under Article 33 of Regulation (EU) 575/2013 (Capital Requirements Regulation – CRR)*, September.

EBA (2014), *Guidelines on the criteria to determine the conditions of application of Article 131(3) of Directive 2013/36/EU (CRD) in relation to the assessment of other systemically important institutions (O-SIIs)*, EBA/GL/2014/10, December.

EBA (2015), *EBA report on Credit Valuation Adjustment (CVA) under Article 456(2) of Regulation (EU) No 575/2013 (Capital Requirements Regulation – CRR) and EBA review on the application of CVA charges to non-financial counterparties established in a third country under Article 382(5) of Regulation (EU) No 575/2013 (Capital Requirements Regulation – CRR)*, February.

EBA (2016), *Response to the European Commission's CFA on standardised approach for counterparty credit risk and own funds requirements for market risk*, November.



- EBA (2017), *IASB Post-Implementation Review of IFRS 13 Fair Value Measurement: Letter from the EBA Chair*, September.
- EBA (2018), *EU-wide stress test results*, November.
- ECB (2014a), *Aggregate report on the comprehensive assessment*, October.
- ECB (2014b), *Asset quality review – Phase 2 manual*, March.
- ESMA (2017), *Review of fair value measurement in the IFRS financial statements*, July.
- ESRB (2015), *ESRB Handbook on Operationalising Macroprudential Policy in the Banking Sector – Addendum: Macroprudential Leverage Ratios*, June.
- ESRB (2017), *Financial stability implications of IFRS 9*, July.
- Fiechter, P. (2011), “Reclassification of financial assets under IAS 39: impact on European banks’ financial statements”, *Accounting in Europe*, Vol. 8, Issue 1, pp. 49-67.
- Filip, A., Hammami, A., Huang, Z., Jeny, A., Magnan, M. and Moldovan, R. (2017), “Literature Review on the Effect of Implementation of IFRS 13 Fair Value Measurement”, paper distributed at the IASB’s January 2018 public meeting, November.
- Freeman, W., Wells, P. and Wyatt, A. (2017), “Measurement Model or Asset Type: Evidence from an Evaluation of the Relevance of Financial Assets”, *Abacus*, Vol. 53, Issue 2, pp. 180-210.
- Gaynor, L.M., McDaniel, L. and Yohn, T.L. (2011), “Fair value accounting for liabilities: the role of disclosures in unravelling the counterintuitive income statement effect from credit risk changes”, *Accounting, Organizations and Society*, Vol. 36, Issue 3, pp. 125-134.
- Ghio, A., Filip, A. and Jeny, A. (2018), *Fair Value Disclosures and Fair Value Hierarchy: Literature Review on the Implementation of IFRS 13 and SFAS 157*, report commissioned by the French Accounting Standards Authority (ANC).
- Goh, B.W., Li, D., Ng, J. and Yong, K.O. (2015), “Market pricing of banks’ fair value assets reported under SFAS 157 since the 2008 financial crisis”, *Journal of Accounting and Public Policy*, Vol. 34, Issue 2, pp. 129-145.
- Hsu, P.-H. and Lin, Y.R. (2016), “Fair value accounting and earnings management”, *Eurasian Journal of Business and Management*, Vol. 4, Issue 2, pp. 41-54.
- Huang, H.-W., Dao, M. and Fornaro, J.M. (2016), “Corporate governance, SFAS 157 and cost of equity capital: evidence from US financial institutions”, *Review of Quantitative Finance and Accounting*, Vol. 46, Issue 1, pp. 141-177.
- IMF (2008), “Fair value accounting and procyclicality”, *Global Financial Stability Report*, Chapter 3, October.



Kamin, S. and DeMarco, L. (2010), "How did a domestic housing slump turn into a global financial crisis?", *International Finance Discussion Papers*, No 994, Board of Governors of the Federal Reserve System.

KPMG (2017), *Fair value measurement: questions and answers*, December.

Laux, C. and Leuz, C. (2010), "Did fair-value accounting contribute to the financial crisis?", *Journal of Economic Perspectives*, Vol. 24, pp. 93-118.

Lawrence, A., Siriviriyakul, S. and Sloan, R.G. (2016), "Who's the fairest of them all? Evidence from closed-end funds", *Accounting Review*, Vol. 91, Issue 1, pp. 207-227.

Lim, C.Y., Lim, C.Y. and Lobo, G. (2013), "IAS 39 reclassification choice and analyst earnings forecast properties", *Journal of Accounting and Public Policy*, Vol. 32, Issue 5, pp. 342-356.

Lin, Y., Lin, S., Fornaro, J.M. and Huang, H.S. (2017), "Fair value measurement and accounting restatements", *Advances in Accounting*, Vol. 38, September, pp. 30-45.

Magnan, M. (2009), "Fair value accounting and the financial crisis: messenger or contributor?", *Accounting Perspectives*, Vol. 8, Issue 3, pp. 189-213.

Magnan, M., Menini, A. and Parbonetti, A. (2015), "Fair value accounting: information or confusion for financial markets?", *Review of Accounting Studies*, Vol. 20, Issue 1, pp. 559-591.

Magnan, M., Wang, H. and Shi, Y. (2016), "Fair value accounting and the cost of debt", *Scientific Series*, No 2016s-32, Center for Interuniversity Research and Analysis on Organisations.

Robinson, D., Smith, T. and Valencia, A. (2018), "Does managerial opportunism explain the differential pricing of level 3 fair value estimates?", *Journal of Financial Research*, Vol. 41, Issue 2, pp. 253-289.

Roca, R., Potente, F. (coordinators), Ciavoliello, L.G., Conciarelli, A., Diprizio, G., Lodi, L., Mosca, R., Perez, T., Raponi, J., Sabatini, E. and Schifino, A. (2017), "Risks and challenges of complex financial instruments: an analysis of SSM banks", *Banca d'Italia Occasional Papers*, No 417.

Shaffer, S. (2010), "Fair value accounting: Villain or innocent victim – exploring the links between fair value accounting, bank regulatory capital and the recent financial crisis", *Federal Reserve Bank of Boston Working Papers*, No QAU10-01, January.

Siekkinen, J. (2016), "Value relevance of fair values in different investor protection environments", *Accounting Forum*, Vol. 40, Issue 1, pp. 1-15.

Song, C.J., Thomas, W.B. and Yi, H. (2010), "Value relevance of FAS No. 157 fair value hierarchy information and the impact of corporate governance mechanisms", *Accounting Review*, Vol. 85, Issue 4, pp. 1375-1410.

Tama-Sweet, I. and Zhang, L. (2015), "The value relevance of fair value financial assets during and after the 2008 financial crisis: evidence from the banking industry", *Journal of Finance and Bank Management*, Vol. 3, Issue 1, pp. 11-24.



Watts, R.L. (2003), "Conservatism in accounting part I: Explanations and implications", *Accounting Horizons*, Vol. 17, Issue 3, pp. 207-221.



Annex 1: Literature review

This annex reviews existing academic literature on the interaction between Level 2 and 3 instruments and financial stability, without looking at the wider topic of fair value accounting.

The academic community has spent a number of years discussing the most appropriate way of measuring financial assets (historical cost or fair value) – a discussion that has gained attention in the aftermath of the global financial crisis. The ESRB's 2017 report on IFRS 9 considered these discussions, and some useful references can be found there (ESRB, 2017). Similarly, the BCBS has published two working papers on the interaction between accounting and regulation, and their interaction with banks' behaviour, which also review existing literature on the subject (BCBS, 2015b and 2017). The post-implementation review of IFRS 13 that was carried out by the IASB between May 2017 and December 2018 also prompted the publication of a comprehensive review of literature on the implementation of IFRS 13 (Filip et al., 2017). Another useful resource in this regard is the literature review carried out by Ghio et al. (2018).

Academic coverage of the interaction between Level 2 and 3 instruments and banks' behaviour and financial stability has grown in recent years, albeit it usually looks at US banks.

Accounting standards applied in the United States also define a hierarchy for fair value measurements, which is similar to that set out in IFRS 13 (KPMG, 2017). IFRS 13 was issued in 2011, and FAS 157 (the equivalent US accounting standard) was substantially amended in the same year, and academic work on this subject seems to have intensified in the last few years. At the same time, that analysis tends to be based primarily on data from US reporting entities, probably because it is easier to access data in the United States. However, given the strong commonalities between IFRS 13 and FAS 157, findings in papers covering US banks can typically be extended to cover EU banks as well.

There is agreement in the academic community that fair value estimates are important for investors, with estimates for instruments in Levels 2 and 3 usually found to be less important.

In general, it is possible to establish a statistical relationship between accounting values for financial instruments measured at fair value and stock market performance (Barth, 2007; Magnan, 2009; Bosch, 2012). However, within the fair value hierarchy, investors seem to penalise Level 3 instruments, finding their fair values to be less reliable. Song et al. (2010), Bosch (2012), Goh et al. (2015), Tama-Sweet and Zhang (2015), Siekkinen (2016) and Freeman et al. (2017) all find that Level 2 and 3 valuations are less relevant than those of financial instruments classified in Level 1. Accordingly, Du et al. (2014) suggest that the relevance of fair value measurements increases when assets are transferred out of Level 3. At the same time, other academic papers find that Level 3 estimates provide more accurate information about the future cash flows of the relevant instrument (Altamuro and Zhang, 2013; Lawrence et al., 2016).

Another stream of academic literature tries to identify the features that determine the size and reliability of Level 3 estimates.

The reliability of Level 3 fair value estimates may depend on individual characteristics of the bank – particularly its performance and capital adequacy. Daifei et al. (2018) find evidence that less profitable banks (measured by the return on assets), larger banks, less well capitalised banks, banks that are not audited by one of the "Big Four" and banks in countries with less developed capital markets and legal systems are all more likely to use Level 3



inputs. In the study by Altamuro and Zhang (2013), determinants for the allocation of financial instruments to Levels 2 and 3 were found to include bank size, accounting choice and mortgage risk. Bosch (2012) finds that the market perceives fair value estimates to be less reliable at banks with lower capital ratios, possibly because these banks are considered more likely to use accounting discretion for opportunistic reasons. In a similar vein, Ayres (2016) shows that there is a negative correlation between the amount of Level 3 instruments and the credit rating of the reporting entity, Magnan et al. (2016) find evidence that, for a sample of financial institutions between 2007 and 2014, higher Level 2 and 3 exposures are associated with higher debt costs, and Huang et al. (2016) identify a positive correlation between Level 3 exposures and the cost of capital in the United States during the global financial crisis.

Academic literature has also tried to confirm the conjecture that fair value estimates provide significant room for managerial discretion (Watts, 2003). According to Robinson et al. (2018), when reported capital ratios are near the regulatory target, bank managers tend to increase their estimates of Level 3 valuations in order to report higher unrealised gains and boost capital adequacy ratios. Similarly, Hsu and Lin (2016) document a positive correlation between the amount of financial instruments in Level 3 and manipulation aimed at meeting or beating earnings targets. Lin et al. (2017) use accounting restatements as a proxy for the quality of financial reporting, arguing that the probability of a restatement is significantly higher for Level 3 fair values than it is for Levels 1 and 2, consistent with the idea that using less reliable fair values has a negative impact on the quality of financial reporting. Finally, Curtis and Raney (2016) show that managers tend to delay the incorporation of negative information into the fair values reported for Level 3 assets.

Improvements to disclosure and enhanced corporate governance may help to constrain opportunistic behaviour in respect of Level 3 instruments. Providing investors with more transparent information regarding the measurement of fair values usually leads to lower discounting of Level 3 instruments by market participants.⁵⁴ Magnan et al. (2015) show that the disclosure of inputs for fair value estimates helps to improve the information provided to market participants. Chung et al. (2017) show that additional disclosures regarding the measurement process for fair value estimates serve to alleviate investors' concerns and reduce uncertainty around fair value measurements (particularly for instruments in Level 3). Furthermore, according to evidence provided by Robinson et al. (2018), banks that are close to internal capital ratio targets are less likely to boost capital through unrealised gains from Level 3 instruments after enhanced disclosure policies have been implemented. What is more, the reliability of fair valuations for Level 3 instruments has been found to be positively correlated with the strength of corporate governance within the reporting institution (Song et al., 2010; Siekkinen, 2016; Badia et al., 2017).

Academic research on financial liabilities measured at fair value has focused on the potential for misinterpreting the manner in which changes in fair value are reflected in the profit and loss account. In general, financial liabilities classified as Level 2 or 3 are much less significant than financial assets assigned to those levels of the fair value hierarchy, with most of them being derivatives (Badia et al., 2017). The main focus of academic research concerns the counterintuitive finding that a deterioration in the credit risk of the reporting entity generates a gain in the profit and loss account. Gaynor et al. (2011) note the important role that disclosures have to

⁵⁴ See also ESMA (2017).



play in terms of unravelling this counterintuitive effect, while Bischof et al. (2014) find that, for a sample of 49 banks from 30 countries over the period 2008-10, most conference call questions and references in financial analysts' reports related to fair value reclassifications and changes to fair value liabilities stemming from banks' own credit risk. Looking at a sample of European banks over the period 2007-15, Dong et al. (2017) find evidence consistent with the idea that banks exercised discretion when it came to the fair values of their financial liabilities in order to smooth earnings. Similarly, Couch and Wu (2017) studied the adoption of the fair value option for liabilities (FVOL) in the United States and found that financially vulnerable firms were more likely to adopt the FVOL and that adopters were more likely to receive TARP bailout funds, suggesting that the adoption of the FVOL revealed information which had not previously been priced in by financial market participants.



Annex 2: Accounting and regulatory frameworks

This annex provides an extensive description of the accounting and prudential requirements for financial instruments measured at fair value. The first section focuses on accounting requirements (most of which are set out in IFRS 13), while the second discusses the prudential requirements for fair value instruments, which relate mainly to the determination of regulatory capital ratios.

1 Accounting framework

1.1 Key principles

IFRS 13 sets out the framework governing the measurement of fair values, and its requirements are applied to both financial assets and liabilities.⁵⁵ A fair value is defined as “the price that would be received to sell the asset or to transfer the liability in an orderly transaction between market participants at the measurement date under current market conditions”.⁵⁶ IFRS 13 makes it clear that a fair value is a market-based measurement, and that it should take account of the specific characteristics of the instrument in question. This means that any restrictions on the sale or use of the instrument can influence its fair value. However, only instrument-specific restrictions (i.e. restrictions that would be transferred with the sale of the instrument) are relevant for measurement purposes, not entity-specific restrictions (i.e. restrictions that are specific to the entity in question and would not, therefore, be transferred in a sale). For example, a limitation on dividend distribution for participation exceeding certain thresholds would not be relevant for the measurement of fair value, since that limitation would not be transferrable in a market transaction.

The relevant price is the amount that would be received in an orderly transaction under current market conditions. For the computation of fair values, the considered transaction would need to take place in the principal market for the financial instrument, with market participants acting in their best economic interest. Only markets to which the entity has access can be considered for valuation purposes. The principal market for the financial instrument is defined as the market with the greatest volume or level of activity. Otherwise, the fair value of a financial instrument must be calculated on the basis of a transaction in the most advantageous market. Since different entities with different activities may have access to different markets, IFRS 13 allows different entities to have different fair value outcomes for the same instrument. When performing that evaluation, the entity should adopt the assumptions that market participants would use when measuring the instrument in question. Market participants are assumed to possess the following characteristics: they are independent of each other; they have a proper understanding of the instrument in question; and they are motivated (i.e. they are not being forced) to enter into the transaction.

⁵⁵ IFRS 13 is also applicable to tangible and intangible assets, which lie outside the scope of this report.

⁵⁶ See IFRS 13, paragraph 9.



IFRS 13 is also applicable to the measurement of financial liabilities and provides for an ad hoc approach when prices are not available. In this case, an asset-side measurement is required: the entity should measure the fair value from the perspective of a market participant that holds an identical item as an asset. Adjustments are applied if the price quoted for an asset is influenced by factors that are not applicable to the liability or equity instrument in question (e.g. where the asset has a higher credit quality).

While IFRS 13 generally relates to stand-alone financial instruments, a specific exemption is made for a group of financial assets and liabilities that are managed collectively on the basis of net exposure to either market risk or credit risk. In this situation, in order to properly take account of the entity's approach to the management of the group of financial assets and liabilities, this can be measured on a net basis – i.e. using the price of the equivalent net long (or short) position.

1.2 Valuation techniques

IFRS 13 provides little guidance on the use of valuation techniques, pointing out that valuation techniques should be appropriate and sufficient data should be available.⁵⁷ As a general guide, the use of observable inputs should be maximised, and the use of unobservable inputs should be minimised.

IFRS 13 describes two types of valuation technique for financial instruments: a market approach and an income approach. Other approaches are not prohibited, but the valuation approach selected should be consistent with one or more of the techniques presented. If an entity relies on valuation techniques, a single approach is only appropriate in certain circumstances – e.g. when evaluating an instrument using prices quoted in an active market for identical instruments. If multiple valuation techniques are used, the final outcome should be identified within the range of results by selecting the point that is most representative of fair value. The central outcome (i.e. the mid-point) is not necessarily the best estimate of fair value. Valuation techniques should be applied consistently over time and across instrument classes. Changes to either the technique itself or its application (e.g. a change of weighting where multiple approaches are used) are appropriate if they lead to a more representative measurement of fair value (e.g. where new information becomes available, or information that was used previously ceases to be available).

The market approach is based on prices and other relevant information generated by market transactions involving identical or comparable financial instruments (e.g. the market multiples obtained by a group of comparable entities). Another example of such information, which IFRS 13 refers to specifically in the case of financial instruments (and debt securities in particular), is matrix pricing, which relies on quoted prices and the security's relationship with other quoted securities that act as benchmarks.

The income approach comprises a group of evaluation techniques that are based on the conversion of future amounts (cash flows or income and expenses) into a single discounted

⁵⁷ See IFRS 13, paragraph 24.



amount. Thus, the fair value represents current market expectations about future amounts to be obtained/delivered through the possession of the asset/liability. This includes several different kinds of evaluation technique: present value techniques, option pricing models (such as the Black-Scholes-Merton formula or binomial models) and multi-period excess earnings methods (applicable to some intangible assets). Present value techniques are expected to capture the following: an estimate of future cash flows, expectations about variability in the volume and timing of cash flows, the time value of money, the risk premium for accepting the inherent uncertainty associated with cash flows, other factors that market participants would take into account, and the risk of non-performance in the case of a liability (i.e. the entity's own credit risk).

Discount rates and cash flows should be consistent, in order to avoid double-counting or omitting risk factors. In other words, if the uncertainty surrounding expectations of future cash flows is reflected in the discount rate, contractual (i.e. risk-free) cash flows can be used. The same discount rate would not be appropriate if expected cash flows were used in the evaluation, as expected cash flows already reflect assumptions about the uncertainty of future outcomes.

IFRS 13 requires the inclusion of a risk premium to account for the uncertainty of present value techniques, allowing this to be based on either discount rates or expected present values. Uncertainty is embedded in present value techniques, as cash flows are estimated rather than being certain amounts (with even contractual cash flows being dependent on absence of default). Consequently, IFRS 13 requires the use of a risk premium in all instances, even where it could prove extremely difficult to calculate. Risk adjustment can be achieved using either discount rate adjustment techniques or expected present value techniques.

- **Discount rate adjustment techniques are based on a single set of cash flows, which can be either contractual, promised or most likely cash flows.** The principal characteristic of this set of cash flows is that it is conditional on the occurrence of specified events (in the case of a bond, the absence of default on the part of the debtor). The discount rate is derived from observed rates of return for comparable instruments that are traded in the market. Analysis is required in order to assess the comparability of selected instruments. In the absence of a single comparable instrument, the discount rate should be derived using several comparable instruments in conjunction with the risk-free yield curve.
- **Expected present value techniques use a single set of cash flows, representing the probability-weighted average of all possible future cash flows.** Thus, by contrast with discount rate adjustment techniques, all possible cash flows are taken into consideration in the probability weighting (i.e. they are not conditional on the occurrence of any specified event). IFRS 13 envisages two possible ways of adjusting expected cash flows in order to take systematic risk into account.⁵⁸ The first method provides for an adjustment to the expected cash flows (i.e. a deduction), to make them equal to the certainty-equivalent cash flows (i.e. the certain amount that is equivalent to an expected and risky amount). The risk-free rate is then used for discounting. The second approach involves adjusting cash flows by applying a risk premium to the risk-free interest rate.

⁵⁸ Paragraph B24 of IFRS 13 refers specifically to portfolio theory, according to which only the systematic risks of holding a financial instrument are remunerated if markets are in equilibrium.

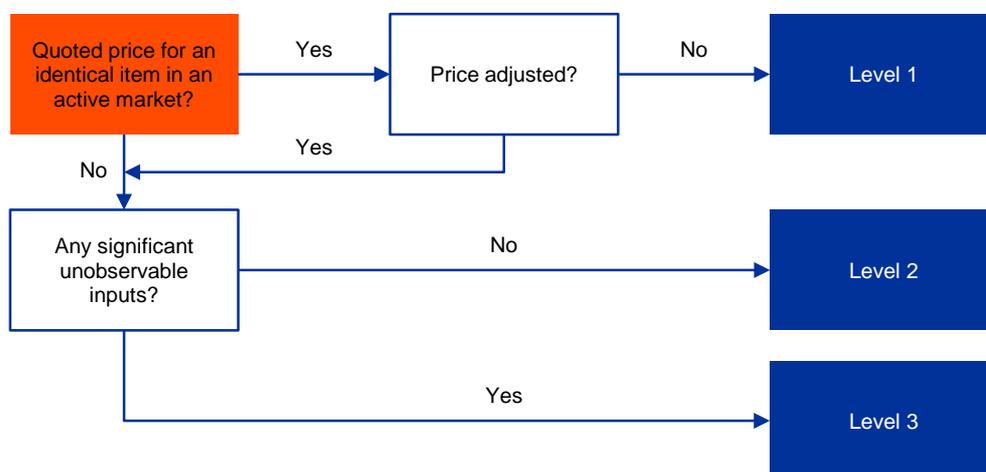


1.3 Types of input

IFRS 13 categorises inputs for valuation techniques on the basis of a three-level fair value hierarchy (see Figure A.1), whereby observable inputs (Level 1 inputs) are preferred to unobservable inputs (Level 3 inputs). The input level determines the fair value level: a measurement based solely on Level 1 inputs results in a Level 1 fair value. Where inputs from different hierarchical levels are used, the fair value is categorised on the basis of the lowest level of input that is significant to the measurement as a whole. The significance of an input in relation to the measurement as a whole should be assessed with discretion, and no precise guidelines are provided. In addition, where an adjustment needs to be based on unobservable inputs and the measurement leads to a significantly different value, the fair value is categorised as Level 3.

Figure A.1

Allocating financial instruments to fair value levels



Source: KPMG (2017).

Level 1 inputs are “quoted prices in active markets for identical assets or liabilities that the entity can access at the measurement date”.⁵⁹ These are considered the most reliable evidence of fair value and are used for many financial instruments.⁶⁰

Level 2 inputs are “inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly”.⁶¹ Level 2 inputs include the following: prices quoted for similar instruments in an active market; prices quoted for identical or

⁵⁹ See IFRS 13, paragraph 76.

⁶⁰ Adjustments to Level 1 inputs are only allowed in specific circumstances: when the entity holds a large number of similar (but not identical) instruments and a quoted price in an active market is available, but not readily accessible, for each individual instrument (with a simplified approach – such as matrix pricing – being envisaged where individualised measurement of fair values is difficult owing to the large number of non-identical instruments); when a quoted price in an active market does not represent a fair value on the measurement date (e.g. when a significant event or announcement takes place after a market closes but before the measurement date); and when liabilities and own equity are measured on the basis of a quoted price for an identical item traded as an asset, and the price needs to be adjusted for factors specific to the item. Markets that present observable inputs include exchange markets, dealer markets, brokered markets and principal-to-principal markets (where transactions are negotiated independently, without intermediaries).

⁶¹ See IFRS 13, paragraph 81.



similar instruments in non-active markets; other observable inputs (such as interest rates and yield curves, implied volatilities and credit spreads); and market-corroborated inputs. Derivatives are typically categorised as Level 2 financial instruments. Adjustments to Level 2 inputs will vary depending on factors specific to the instrument in question (e.g. the volumes or levels of activity in the markets in which the inputs are observed). However, an adjustment that uses significant unobservable inputs can lead to categorisation in Level 3 if it is significant to the measurement as a whole. IFRS 13 includes some examples of Level 2 inputs for financial instruments. For instance, a LIBOR swap rate can be considered a Level 2 input for a swap if it is observable for substantially the entire residual life of the swap. If the residual life of a financial instrument exceeds the period for which the swap rate is observable, extrapolation of the yield curve is only allowed if it is not significant to the measurement of the swap's fair value as a whole.

Level 3 inputs are “unobservable inputs for the asset or liability”, and their use is allowed only when observable inputs are not available.⁶² Such inputs need to reflect the assumptions that market participants would employ when pricing the financial instrument, including assumptions about the risks that are inherent in the valuation technique and the inputs used. Level 3 inputs also include the entity's own data, which must be adjusted if there is evidence that other market participants would use different data. The requirement to take account of information about other market participants' assumptions only ceases to apply if that information cannot be obtained without disproportionate efforts. As an example of a Level 3 input, IFRS 13 cites the interest rate for a specified currency that is not observable and cannot be corroborated by observable market data. Historical volatility (i.e. volatility obtained from instruments' historical prices) is also a Level 3 input, as it does not typically reflect current market participants' expectations about future volatility. Examples of Level 3 instruments include illiquid emerging market corporate bonds and illiquid highly structured corporate bonds, as well as holdings of notes issued by securitisation entities, commercial and residential mortgage-backed securities, collateralised debt obligation securities and other asset-backed securities. Certain parameters for derivatives also represent Level 3 inputs (e.g. certain correlations, longer-term volatilities, prepayment rates, credit spreads and other transaction-specific parameters). Level 3 derivatives include options where volatility is unobservable and basket options in which the correlations between the referenced underlying assets are unobservable, as well as longer-term interest rate options, multi-currency foreign exchange derivatives and credit default swaps where the credit spread is not observable.

1.4 Day 1 profit

While the transaction price and the fair value will generally match, the two can diverge as a result of “Day 1 profit”. IFRS 13 is clear in defining the fair value as an “exit price”⁶³ (i.e. the price that would be received to sell the asset or paid to transfer the liability), rather than an “entry price” (i.e. the transaction price that would be paid to acquire the asset or received to assume the liability).

⁶² See IFRS 13, paragraph 86.

⁶³ See IFRS 13, paragraph 57.



In such cases, IFRS 9 adopts a differentiated approach, depending on how the fair value is derived.⁶⁴

Day 1 profit can only be recognised immediately if that fair value is evidenced by a quoted price in an active market (for all Level 1 financial instruments) or based on a valuation technique that uses only data from observable markets (for some Level 2 financial instruments). While IFRS 13 specifically mentions Level 1 inputs when talking about quoted prices, it does not refer directly to Level 2 inputs when talking about valuation techniques. It is possible, therefore, that a fair value obtained only from Level 2 inputs will not satisfy the requirements for immediate recognition of the difference between the transaction price and the fair value in the profit and loss account.

In all other circumstances, the financial instrument is recognised at its transaction price, with the Day 1 profit being suspended and recognised (as either a gain or a loss) only gradually. That is only possible if the difference between the transaction price and the fair value arises from changes to factors that market participants would take into account when pricing the instruments. For example, for a bond with a defined term, the difference can be recognised gradually during the residual life of the instrument. However, this is not mandatory, and IFRS 13 specifies that time is one factor that can be used, but not the only one. In other circumstances (e.g. in the case of a financial instrument with an indefinite residual life – such as an equity instrument), time might not be the most significant factor. Another approach involves releasing the initial reserves when unobservable parameters are deemed to have become observable. IFRS 13 does not, however, provide further guidance in this regard, so discretion should be applied.

1.5 Other technical issues in IFRS 13

IFRS 13 does not provide operational criteria that explain how to distinguish between active and inactive markets, or between observable and unobservable inputs, and discretion should be applied when deciding whether to allocate financial instruments to Levels 1, 2 or 3. According to IFRS 13, quoted prices in active markets must not be adjusted. Although the frequency and volume of transactions are cited as relevant indicators, deciding whether a certain frequency or volume is sufficient to categorise a market as “active” requires judgement. Similarly, the fair value of Level 2 instruments should be based on observable inputs, but again, there is no fully operational definition of this concept. Consequently, the distinction between Level 1 and Level 2 instruments, or between Level 2 and Level 3 instruments, is not defined with precision.

Another aspect that is specifically addressed by IFRS 13 is the impact on fair value measurement that stems from a significant decline in the level of activity for a financial instrument. The significance of that decline must be evaluated by the entity in question, taking note of factors such as the following: few recent transactions, significant variation in price quotations over time or across market-makers, loss of correlation between indices and financial instrument’s fair value, significant increase in implied liquidity risk premia/yields or performance indicators, increased bid-ask spreads, and declines in activity for new issues. However, a decline in

⁶⁴ See IFRS 9, paragraph B5.1.2A.



the level of activity does not automatically mean that the quoted price is not representative of fair value and an assessment is required. Only if the entity decides that the quoted price is no longer representative does an adjustment become necessary.⁶⁵

While non-orderly transactions (e.g. fire sales owing to financial difficulties on the part of the seller, or transactions carried out under duress) are irrelevant for the purposes of IFRS 13, in some cases they are the only possible transaction. The measurement of fair value relies on the concept of orderliness, regardless of the level of market activity (i.e. that also applies to inactive markets). However, there are certain circumstances where the only way to achieve an orderly transaction is through an early termination, which has to be negotiated with the same contractual counterparty. Such sales can occur for some Level 3 and complex Level 2 products. Here, the complexity of the underlying instruments, combined with the lack of an active market, may result in a material gap between the accounting value and the sale price.

A significant decline in the level of activity for an instrument does not automatically mean that transactions occurring in relation to that instrument are not orderly. In order to assess whether a transaction is orderly, many different factors have to be considered, such as the marketing period, whether the seller intends to market with a specific counterparty, and whether the transaction price is significantly different from other recent prices.

1.6 Disclosures

Disclosure requirements for financial instruments measured at fair value follow an objective-based approach. Entities are required to disclose the following information in order to help users to achieve specific objectives: (i) for instruments measured on either a recurring or a non-recurring basis, the valuation techniques and inputs used; and (ii) for recurring measurements based on Level 3 inputs, the effect that such measurements have on the entity's profit or loss and equity.⁶⁶ IFRS 13 specifies a minimum level of information; however, if those objectives are not met, additional information is necessary.

Disclosure requirements vary depending on the level of the fair value hierarchy, with more detailed information expected for Level 3 instruments. Generally speaking, transfers between categories need to be disclosed, as do the policies that determine when transfers are deemed to have occurred and the reasons for transfers. For instruments in Level 2 or 3, details of changes to valuation techniques are required. And for Level 3 instruments, quantitative information about significant inputs should be included (e.g. inputs such as prepayment speed, probability of default, loss given default and discount rate for asset-backed securities) – albeit such information is not necessary if the relevant data are not produced by the entity itself (as in the case of third-party pricing information). A description of the valuation process also needs to be provided. In addition,

⁶⁵ IFRS 13 does not specify any particular methodology for adjustments to quoted prices. While it sets out a general approach to valuation techniques, it also demands proper consideration of the risks that are inherent in the evaluation process (including a risk premium reflecting the amount that is demanded by market participants as compensation for uncertainty). A significant decline in the volume of activity can lead to changes to valuation techniques or changes to the weights that are associated with the various valuation techniques that are being used. In any case, IFRS 13 acknowledges that discretion needs to be exercised when assessing the facts and circumstances that lead to the adjustment of quoted prices.

⁶⁶ See IFRS 13, paragraph 91.



the entity must include a narrative description of the sensitivity of fair value to changes in unobservable inputs (i.e. an indication of whether changing those inputs would significantly affect the fair value). Instruments should be grouped together in different classes, taking account of their nature, characteristics and risks, as well as the fair value hierarchy. Greater diversification is expected for Level 3 instrument classes, given their higher degree of uncertainty and subjectivity.

Disclosure requirements for Day 1 profit are defined by IFRS 7.⁶⁷ Entities are required to disclose the accounting policy that governs recognition of the suspended gain/loss (i.e. describe the technique used and the factors considered), indicate the aggregate amount that is yet to be recognised and explain why the transaction price was not deemed the best evidence of fair value.

2 Prudential framework

The current regulatory framework for EU banks provides institutions with a limited degree of freedom as regards the classification and measurement of financial assets and liabilities. In the regulatory framework, the Capital Requirements Regulation classifies financial assets as belonging to either the trading book or the banking book (non-trading assets). The trading book is defined as all positions in financial instruments and commodities that are held by an institution for the purposes of (i) trading or (ii) hedging positions held with intent to trade.⁶⁸ The term “banking book” is not explicitly defined, but encompasses all positions in financial instruments that are not included in the trading book.

The mapping of financial instruments between the regulatory and accounting frameworks is not straightforward, as those two frameworks are not unified and serve different purposes. The regulatory and accounting frameworks are designed to meet different objectives, so they apply different criteria when it comes to the valuation of assets and liabilities. For example, the assets and liabilities that are classified as “fair value through profit and loss” in the accounting framework do not necessarily mirror those that are included in the trading book in the regulatory framework. Anecdotal evidence suggests that instruments included in the “fair value through other comprehensive income” accounting category are generally in the banking book, while those classified as “fair value through profit and loss” are spread between the trading book and the banking book.

Prudential capital requirements for credit risk apply only to the banking book and securitisation exposures in the trading book, while the trading book is subject to market risk-related requirements. The trading book and the banking book are subject to different prudential capital requirements. The ultimate goal in this regard is for prudential requirements for the relevant risks to be captured correctly across accounting classifications. Positions in the

⁶⁷ See IFRS 7, paragraph 28.

⁶⁸ See Article 4(1)(86) of Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012, OJ L 176, 27.6.2013, as amended by Regulation (EU) 2019/876 of the European Parliament and of the Council of 20 May 2019 amending Regulation (EU) No 575/2013 as regards the leverage ratio, the net stable funding ratio, requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements, and Regulation (EU) No 648/2012.



banking book are subject to capital requirements for credit risk to cover unexpected credit risk arising from the assets in question over a one-year horizon. Foreign exchange risk stemming from banking book positions is captured within the market risk requirements, and institutions are required to disclose information on the interest rate risk in the banking book. Trading book positions are not subject to the prudential credit risk charge, as it is expected that such positions will only be held for a short period of time. The aim of the capital charge is to cover short-term fluctuations in the market value of trading instruments (both assets and liabilities). Market risk requirements are based on net positions in identical instruments and include a capital charge for position risk and settlement risk (albeit that charge is significantly lower than the prudential credit risk charge). After the financial crisis, securitisation positions in the trading book were made subject to prudential credit risk requirements, given the limited scope for modelling the associated risks,⁶⁹ and a requirement to use a stressed value-at-risk for banks' internal models was also added.

Banks are required to apply prudential valuation principles to their fair value instruments and ensure a sufficient degree of certainty in their fair value estimates.⁷⁰ Banks should, in particular, consider valuation adjustments for less liquid positions when marking to model and in order to reflect model risk. They should also consider the need to apply a valuation adjustment when using third-party valuations, when marking to model and in the case of complex products.⁷¹ Against this background, the EBA has issued regulatory technical standards on the application of prudential valuation,⁷² which establish the need for institutions to calculate the total additional valuation adjustments (AVAs) that are necessary to bring fair values into line with prudent values. AVAs can be calculated using a simplified approach when certain conditions are met,⁷³ with a core approach being applied in all other instances. Under the core approach, total AVAs represent the sum of the AVAs that are calculated for the different categories: market price uncertainty, close-out costs, model risk, credit spreads, funding costs, concentrated positions, future administrative costs, early termination and operational risk. AVAs should only be applied to the proportion of the accounting valuation change that affects CET1 capital.

Prudential filters, which used to shield banks' capital positions from movements in the fair value of available-for-sale financial assets and liabilities in the aftermath of the global financial crisis, do not currently form part of the regulatory framework for banks.⁷⁴ Without prudential filters, unrealised fair value gains and losses that are directly recognised in the profit and

⁶⁹ See Recital 70 of Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012, OJ L 176, 27.6.2013.

⁷⁰ See Articles 34 and 105 of Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012, OJ L 176, 27.6.2013.

⁷¹ There is also a requirement to calculate a credit valuation adjustment (CVA) for banks' non-CCP-cleared derivative positions.

⁷² See Commission Delegated Regulation (EU) 2016/101 of 26 October 2015 supplementing Regulation (EU) No 575/2013 of the European Parliament and of the Council with regard to regulatory technical standards for prudent valuation under Article 105(14).

⁷³ The total absolute value of fair value assets and liabilities under the applicable accounting framework must be below €15 billion.

⁷⁴ See Article 35 of Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012, OJ L 176, 27.6.2013, which states that institutions must not make adjustments with the aim of removing from their own funds unrealised gains or losses on their assets or liabilities measured at fair value.



loss account (or in other comprehensive income) subsequently have an impact on the bank's capital position. Moreover, changes to fair values are considered when banks define policies governing the distribution of profits.⁷⁵ In periods of exuberance in financial markets, unrealised gains and losses from fair value assets may translate into a generous distribution of profits, an improvement in the bank's capital position where unrealised gains and losses play a significant role and, more importantly, a general – but false – sense of security as a result of the increases in profits and capital ratios. Furthermore, it should always be borne in mind that a proportion of these unrealised gains and losses are derived from Level 2 and 3 assets, where prices are not directly observable and there is substantial modelling and discretion involved.

However, the EBA (2013a) argues that there are prudential reasons for derecognising unrealised gains relating to banking book items in CET1 via the introduction of prudential filters. These prudential filters would cover “unrealised gains” recognised in both the income statement and the statement of other comprehensive income. These prudential concerns do not necessarily justify the introduction of prudential filters for items classified in the trading book, given, among other reasons, the existence of capital requirements for market risk and the intention to sell these instruments in the short term. The EBA expresses concerns “that unrealised gains may not be immediately available to absorb losses, as they can disappear as a result of negative movements in market prices; that own funds could be overstated if the fair values on which unrealised gains are based are not reliable; and the possible pro-cyclical effects if CET1 [...] are to a large extent composed of unrealised gains, which could reverse in a crisis situation and therefore exacerbate pro-cyclicality”. However, there is also recognition of arguments supporting the current treatment of unrealised gains for instruments measured at fair value. The introduction of prudential filters could, for instance, have a negative impact on the level playing field for European and non-European banks (with current Basel III rules not accounting for such prudential filters), and it could have consequences in terms of institutional behaviour, as banks could be given an incentive to realise items with unrealised gains in order to avoid the capital impact of the prudential filter.

The incorporation of the FRTB in EU law is expected to substantially improve the current regulatory regime for market risk, which was shown to be suboptimal during the global financial crisis. Soon after the peak of the global financial crisis, G20 leaders concluded that it was necessary to reform the way that trading instruments were considered in banks' capital requirements. The FRTB represents the outcome of that reform workstream. After its completion, the BCBS published the revised market risk framework in January 2016. In a nutshell, the FRTB (i) limits implementation and promotes consistency across jurisdictions; (ii) establishes a strict boundary between the trading and banking books; (iii) reviews internal models with a focus on tail risks, liquidity horizons, constrained diversification and observability standards for risk factors; (iv) introduces a stringent approval process for internal models at the level of trading desks; and (v) amends the standardised approach to make it more risk-sensitive. In December 2016, the BCBS announced that implementation would be delayed until 2022, and it also published various revisions in January 2019. The most recent revision of the Capital Requirements Regulation, which was published in June 2019, initially enforces the new market risk rules as a reporting requirement

⁷⁵ In some EU countries, there are restrictions on banks' ability to carry out distributions relating to mark-to-model assets. More specifically, (a) several EU countries have corporate legislation that restricts the ability to distribute “unrealised profits” and (b) regulatory prudential valuation adjustments effectively restrict distributions that are supported by mark-to-model valuations.



only. The European Commission adopted a delegated act in December 2019 in order to fully operationalise this new requirement. No later than one year after this delegated act starts to apply, institutions must start reporting market risk requirements on the basis of the revised standardised approach. Given that the implementation of the revised market risk framework represents a binding Pillar 1 requirement, the Commission must submit a legislative proposal by 30 June 2020.

Last but not least, holdings of Level 3 instruments are used in the quantification of banks' systemic importance. Indeed, Level 3 assets are one of the 12 indicators in the assessment methodology for G-SIBs, as Level 3 assets contribute to a bank's complexity, with that indicator currently having a weight of 6.7% in the final score (BCBS, 2018). Level 3 assets are also one of the optional indicators that are listed in the guidelines on the assessment of other systemically important institutions (EBA, 2014).



Annex 3: Stylised aggregate balance sheet for EU banks

ASSETS	EUR billions	% of total assets
Cash, cash balances at central banks and other demand deposits	2,482.4	8.5
Assets measured at amortised cost	17,613.4	60.1
Loans and advances	16,639.2	56.8
Debt securities	974.2	3.3
Assets measured at fair value (excluding derivatives)	5,035.2	17.2
Financial assets held for trading	1,882.7	6.4
Non-trading financial assets mandatorily at fair value through profit or loss	966.0	3.3
Financial assets designated as being measured at fair value through profit and loss account	359.2	1.2
Financial assets measured at fair value through other comprehensive income	1,827.4	6.2
Derivatives	2,246.6	7.7
Trading derivatives	2,100.4	7.2
Hedging derivatives	146.3	0.5
Other assets	1,556.1	5.3
TOTAL ASSETS	29,285.9	100.0
Level 1 assets (excluding derivatives)	2,328.3	8.0
Level 2 assets (excluding derivatives)	2,458.8	8.4
Level 3 assets (excluding derivatives)	248.2	0.8
LIABILITIES	EUR billions	% of total assets
Total equity	2,157.5	7.4
CET1 capital	1,670.7	5.7
Additional tier 1 capital	177.7	0.6
Tier 2 capital	309.0	1.1
Liabilities measured at fair value (excluding derivatives)	2,678.3	9.1
Financial liabilities held for trading	1,230.6	4.2
Financial liabilities designated at fair value through profit or loss	1,447.7	4.9
Derivatives	2,236.3	7.6
Trading derivatives	2,060.1	7.0
Hedging derivatives	176.2	0.6
Other liabilities	22,213.9	75.9
TOTAL EQUITY AND LIABILITIES	29,285.9	100.0
Level 1 liabilities (excluding derivatives)	748.7	2.6
Level 2 liabilities (excluding derivatives)	1,823.1	6.2
Level 3 liabilities (excluding derivatives)	106.5	0.4



Annex 4: Further insights into European banks' use of fair value accounting

This annex provides additional information on three fundamental issues relating to the measurement of financial instruments at fair value or at amortised cost, using supervisory data from the EBA. These fundamental issues relate to (i) the question of whether financial instruments measured at amortised cost generate more income than those measured at fair value, (ii) the issue of whether it is easier to determine a fair value for financial instruments measured at fair value or financial instruments measured at amortised cost, and (iii) the question of whether financial instruments allocated to Level 3 of the fair value hierarchy are traded less frequently than other financial instruments measured at fair value.

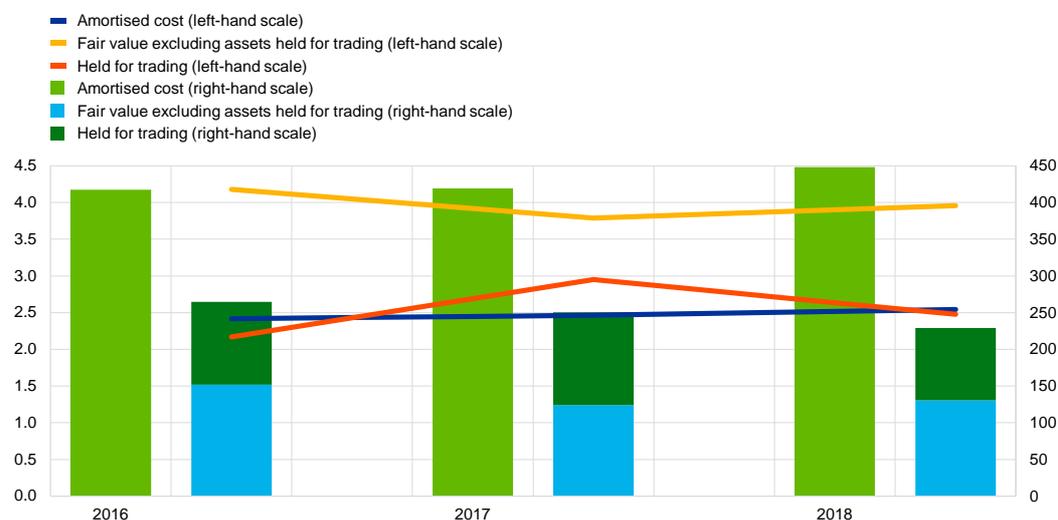
Assets measured at amortised cost are still the main source of income for EU institutions, as (with the sole exception of Danish banks) they continue to account for the largest percentage of EU banks' balance sheets (see Chart A.1). If we measure the relative profitability of financial assets measured at amortised cost and at fair value as income generated (mainly, interest, but also impairment, fair value gains and losses, and dividend income) as a percentage of total assets, it can be seen that the profitability of assets measured at amortised cost and the profitability of financial assets held for trading purposes have remained fairly stable over the last three years at around 2.5%. The income that is generated by assets measured at amortised cost has increased slightly in the last three years, in contrast with the decline observed for financial assets measured at fair value. As regards financial assets measured at fair value, those not held for trading purposes seem to be more profitable, probably reflecting the higher proportion of derivatives and equity instruments in these portfolios.



Chart A.1

Profitability of financial assets held by EU banks

(left-hand scale: return on financial assets in percentages; right-hand scale: income generated in EUR billions)



Sources: EBA and ESRB Secretariat calculations.

Notes: For financial assets measured at amortised cost, the return on financial assets includes interest income and impairment. For assets measured at fair value, it includes interest income, fair value gains and losses and dividend income. Dividend income is distributed on the basis of the ratio of equity instruments held for trading purposes to total equity instruments measured at fair value. Bars show the income that is generated per asset type in absolute terms. Data are as at December of each year.

Under IFRS 9, banks are also required to provide a fair value estimate for their financial assets held at amortised cost.

Both debt securities and loans and advances can be held at either amortised cost or at fair value, thus allowing for a comparison of the fair value hierarchy structure. This comparison is shown in Chart A.2 below. For loans and advances, portfolio structures have been largely stable since 2016. On average, 75% of loans and advances held at amortised cost would be classified in Level 3 of the fair value hierarchy, while almost all of the remaining 25% would be in Level 2. For loans and advances that are actually held at fair value, the structure is fairly different: in 2018, 92% were Level 2 assets, while 7% were in Level 3. In the case of debt securities, assets held at fair value have been regularly distributed since 2016, with 72% in Level 1 and 26% in Level 2. Debt securities held at amortised cost, meanwhile, have seen a shift in their portfolio structure, with Level 1 assets accounting for 61% in 2018, up from 45% in 2016. At the same time, debt securities that would be classified as Level 3 fell from 20% of assets in 2016 to just 8% in 2018. This could be regarded (among many other possible interpretations) as a sign that banks are electing to measure loans and debt securities at amortised cost because fair values are more difficult to determine (as in the case, for example, of loans to SMEs).⁷⁶

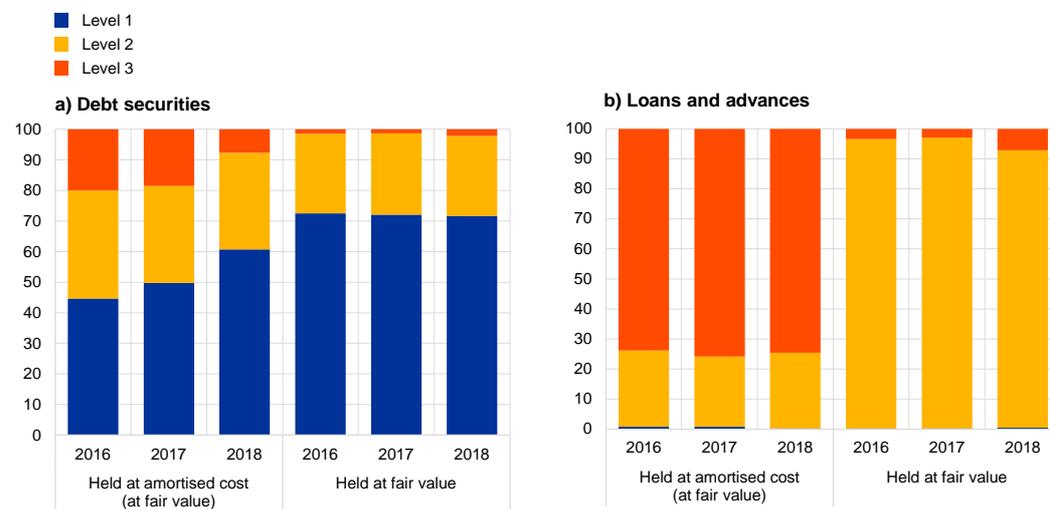
⁷⁶ This also ignores situations where contractual provisions or the use of embedded derivatives require that financial instruments be measured at fair value.



Chart A.2

Fair value hierarchy for debt securities, and loans and advances held at fair value and at amortised cost

(percentages)



Sources: EBA and ESRB Secretariat calculations.

Notes: The bars show the fair value hierarchy for debt securities and loans and advances held at fair value (template F14) and at amortised cost (template F41). Data are as at December of the year in question.

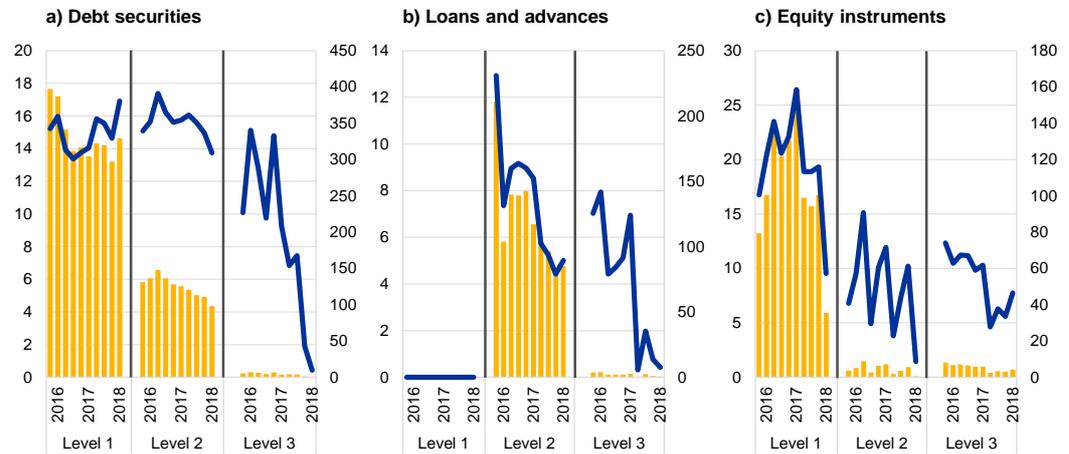
As regards the turnover of financial assets other than derivatives, it seems that debt securities and equity instruments in Levels 2 and 3 are traded less often than the equivalent instruments in Level 1. Using supervisory data, the turnover of financial assets can be defined as the accumulated change in fair value over the period in question as a percentage of the carrying amount at the end of that period. Given that financial instruments classified in Levels 2 and 3 are not quoted in financial markets and are relatively illiquid, one would expect them to be traded less often than equivalent financial instruments classified in Level 1. As Chart A.3 shows, this assumption holds for both debt securities and equity instruments, with turnover rates lower in Levels 2 and 3 than they are in Level 1. In the case of loans and advances, the turnover rate is lower for Level 3 than it is for Level 2, with only small amounts of holdings in Level 1.



Chart A.3

Turnover of financial assets measured at fair value (excluding derivatives) across the fair value hierarchy

(left-hand scale: turnover rate in percentages; right-hand scale: total accumulated change in EUR billions)



Sources: EBA and ESRB Secretariat calculations.

Notes: The lines represent the total accumulated change in fair value in the period in question as a percentage of total recognised balance sheet amounts at the end of that period (from template F14). The yellow bars show the total accumulated change in fair value in EUR billions.



Annex 5: Additional information on the empirical analysis of disclosures made about Level 3 assets by a sample of EEA banks

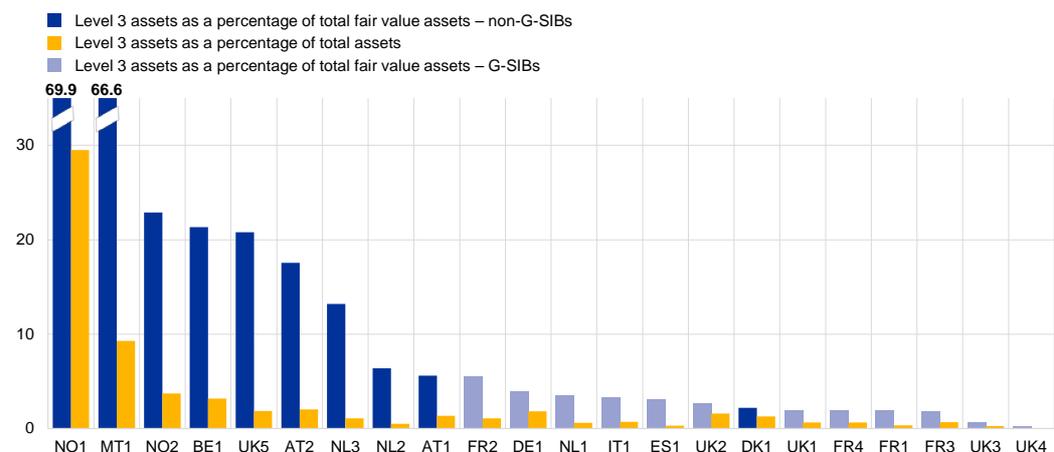
1 Descriptive statistics

The amounts of assets in Level 3 of the fair value hierarchy are relatively small for G-SIBs, while for other banks they usually exceed 10% of total assets held at fair value (see Chart A.4). G-SIBs' Level 3 assets generally account for between 2% and 5% of total assets held at fair value, with only one G-SIB exceeding 5%. Meanwhile, the 11 non-G-SIBs in our sample are all either (i) banks with a large concentration of Level 3 assets (with those assets totalling two-thirds or more of total assets held at fair value in two instances) or (ii) banks with a business model suggesting very small – if any – holdings of Level 3 assets.

Chart A.4

Level 3 assets as a percentage of total assets held at fair value and total assets

(percentages)



Sources: EBA and ESRB Secretariat calculations.

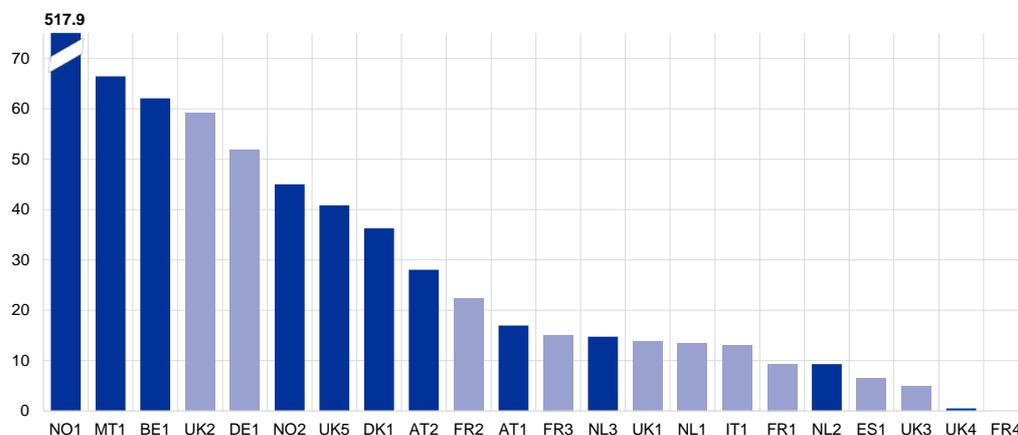
Notes: The blue bars for NO1 and MT1 have values of 69.9% and 66.6% respectively. Both were cut off for presentational reasons. Blue bars denote Level 3 assets as a percentage of total assets held at fair value, while yellow bars denote Level 3 assets as a percentage of total assets. Lighter shading of blue bars indicates G-SIBs.

When compared with their solvency ratios, there are five banks where Level 3 assets are equivalent to more than half of total CET1 capital (see Chart A.5). Three banks (which are not G-SIBs) have Level 3 asset holdings totalling more than 60% of CET1 capital, while two G-SIBs report Level 3 assets totalling slightly more than 50% of CET1 capital, with the majority of other banks reporting figures of less than 20%.



Chart A.5
Level 3 assets as a percentage of CET1 capital

(percentages)



Sources: Entities' annual reports and own calculations.

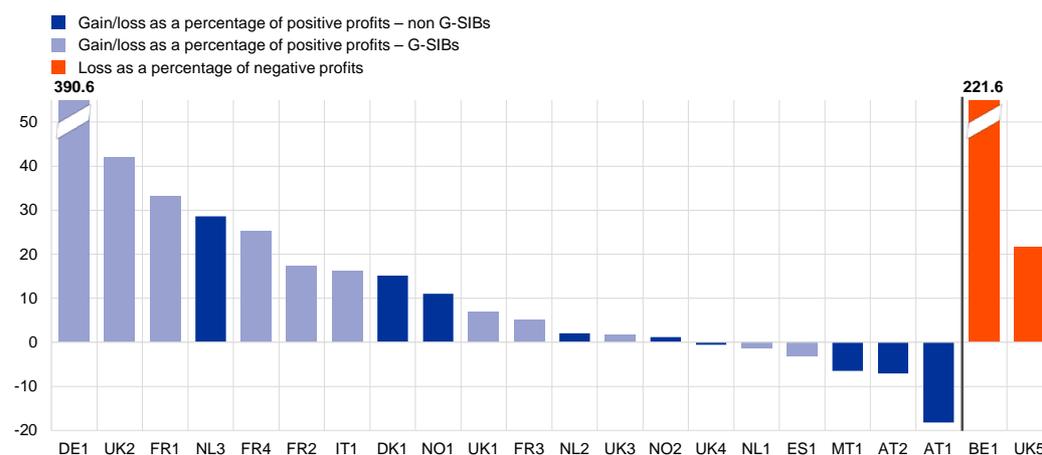
Notes: The bar for NO1 has a value of 517.9% and was cut off for presentational reasons. Lighter shading of bars indicates G-SIBs.

Gains and losses on Level 3 assets vary widely across the sample, with two notable outliers

(see Chart A.6). One G-SIB registered gains on Level 3 assets representing 390.6% of its total profits for the year 2018, while another bank in our sample incurred losses equivalent to 221.6% of total (negative) profits. It is also interesting to note that six of the eleven non-G-SIBs in our sample reported a loss on Level 3 assets, compared with only two of the eleven G-SIBs.

Chart A.6
Gains and losses on Level 3 assets as a percentage of total profits/losses

(percentages)



Sources: Entities' annual reports and own calculations.

Notes: The bars for DE1 and BE1 have values of 390.6% and 221.6% respectively, with both being cut off for presentational reasons. For BE1 and UK5, losses on Level 3 assets are shown as a percentage of negative profits. Blue bars denote gains and losses as a percentage of positive profits, while orange bars denote losses as a percentage of negative profits. Lighter shading of blue bars indicates G-SIBs.



2 Methodology for the assessment of disclosures

The assessment of Level 3-related disclosures by our sample of banks is based on a scoring system which assigns equal weights to all of the disclosure objectives set out in IFRS 13. That analysis uses information disclosed in the banks' most recent consolidated annual reports (as at 31 December 2018). The scoring system is fairly straightforward: a bank that meets a disclosure objective in full is awarded a score of 1 point, while partial disclosure is rewarded with a score of 0.5 point, and no points are awarded for non-disclosure. Scores for individual disclosure objectives are then totalled at the level of each entity. There are eight disclosure objectives, so there is a maximum score of 8 points for full disclosure across all objectives.

The minimum requirements that need to be satisfied in order to meet the eight disclosure objectives are as follows:

- Measurement of fair values at the end of the reporting period
- Description of the valuation processes used by the entity
- Quantitative information about the significant unobservable inputs that are used in the measurement of fair values (with some exceptions)
- Reconciliation of opening and closing balances
- Details of total amounts for all transfers into or out of Level 3 of the fair value hierarchy, an indication of the reasons for those transfers, and details of the entity's policy for determining when transfers between levels are deemed to have occurred
- A narrative description of the sensitivity of fair values to changes in unobservable inputs (i.e. an indication of whether changing those inputs to a different amount could potentially result in a significantly higher or lower fair value). If there are interrelationships between those inputs and other unobservable inputs used in the measurement of fair values, the entity must also provide a description of those interrelationships and explain how they could magnify or mitigate the effect that changes in unobservable inputs have on the measurement of fair values.
- If changing one or more of the unobservable inputs to reflect reasonably practicable alternative assumptions would change fair values significantly, the entity is required to indicate that fact and disclose the effect of those changes. The entity is also required to explain how the effect of that change to reflect a reasonably practicable alternative assumption was calculated.
- Disclosure of Day 1 profits/losses

The summed rating is divided by the number of disclosure objectives that could actually be assessed and is thus normalised to 1. Some entities did not register any transfers into or out of Level 3, so there was no way of knowing whether they would have met the relevant disclosure objective. Similarly, it is possible that immaterial transactions were not reported, as allowed by IFRS, which must be taken into consideration when assessing the results of this exercise.



Imprint and acknowledgements

This report has been prepared by the Exploratory Group on Accounting Developments and Financial Stability, which is chaired by Luca Serafini (Banca d'Italia). Comments from members of the Exploratory Group, the Advisory Technical Committee (chaired by Pablo Hernández de Cos) and the General Board (chaired by Christine Lagarde) are gratefully acknowledged.

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The cut-off date for the data included in this report was 18 December 2019.

ISBN 978-92-899-4255-3 (pdf)
DOI 10.2866/99792 (pdf)
EU catalogue No QB-02-20-130-EN-N (pdf)