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Ulrich Bindseil, Marco Corsi,
Benjamin Sahel, Ad Visser

The Eurosystem collateral framework explained

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Abstract

The Eurosystem collateral framework (ESCF) has played a key role in the ECB monetary policy implementation since 1999. Moreover, the financial and sovereign debt crisis and with it the increased reliance of banks on central bank credit have underlined the importance of central bank collateral frameworks. Broad collateral frameworks have helped prevent large-scale liquidity-driven defaults of financial institutions in all major advanced economies. More recently, they have allowed central banks to provide a large amount of – at times targeted – longer-term credit. Nevertheless, a number of authors have argued that the ESCF is too forthcoming or broad and that it does not afford the central bank sufficient protection. This paper first explains and justifies the logic of collateral frameworks in general and that of the ESCF in particular. It then reviews the main critical comments. It concludes that the ESCF has been effective (i) in providing an adequate level of elasticity for Eurosystem credit, and (ii) in protecting the Eurosystem from financial losses despite the severity of the financial and sovereign debt crisis and the large amounts of longer-term credit provided by the Eurosystem.

Keywords: Central banking, Collateral, ECB, Eurosystem, Lender of Last Resort, Operations

JEL codes: E58

Executive summary

This paper provides background information on the role of collateral in monetary policy implementation and the design and evolution of the Eurosystem collateral framework (ESCF). It takes into account the specific characteristics of the Eurosystem as the system of central banks of a multi-country monetary union.

The ESCF has played a key role in the implementation of monetary policy since the euro was launched in 1999. It has also played a pivotal role in stabilising financial markets and institutions during the financial and sovereign debt crisis, while protecting the Eurosystem from losses in its credit operations.

Various observers have commented on the features and role of the ESCF over the years, arguing for example that the framework is too forthcoming, insufficiently differentiates across assets and issuers, creates undue financial risks to the Eurosystem and moral hazard on the part of banks, lacks transparency and is too complex or inconsistent.

These comments are not supported by the evidence and also often reflect misconceptions about the economics of a central bank collateral framework. On these economic aspects, the paper explains once again the differences e.g. with interbank repo markets: first, central banks are not subject to liquidity risk in the way “normal” market participants are, and can therefore accept less liquid collateral. Second, as the central bank has a zero default probability in its domestic market operations, collateral providers are willing to accept severe haircuts to obtain credit. The paper also notes that in recent years, the ESCF has helped maintain monetary policy accommodation in times when monetary policy could have been constrained by the lower bound on interest rates and in which large-scale asset purchase programmes, which can affect collateral availability and use, were needed to also help reflate the economy.

Turning to the technical details of the collateral framework, the paper uses real life examples and data to illustrate why the ESCF specifications are adequate in general and in terms of collateral eligibility and usage criteria, risk control measures and technical processes.

In addition, the ESCF maintains high standards of transparency on several elements, namely documentation and publication of rules, the list of eligible assets, haircut matrices, eligibility and use statistics, researchers’ access to microdata, etc. None of the other major central banks provide this level of transparency.

However, it is true that the ESCF is relatively broad in terms of the scope of eligible collateral and rather complicated. This is inevitable because of the diversity of financial institutions and markets in the euro area. Any simple and narrow framework would preclude significant parts of the euro area banking system from directly benefiting from central bank credit. This would be costly for the economy as a whole;

it could jeopardise the singleness of monetary policy across the euro area and have adverse effects on financial stability.

Going forward, the ESCF clearly needs to be maintained, modified and improved over time. Financial regulation, financial markets and institutions evolve, and so does the optimal design of the monetary policy implementation framework and, within it, the collateral framework. With gradual financial and economic normalisation taking root in the euro area following the 2008 and 2011 crisis peaks and ultimately, greater financial integration, there should also be scope for simplifying and redesigning a number of aspects of the framework. The comments reviewed in this paper provide a valuable source of ideas and inspiration for this ongoing work.

1 Introduction

The Eurosystem collateral framework (ESCF) has played a key role in the implementation of monetary policy since the euro was launched in 1999. It also played a vital role in stabilising financial markets and institutions during the financial crisis, while at the same time effectively protecting the Eurosystem from any losses – see, for example, European Parliament (2016).

This paper again explains the logic behind this framework¹ and discusses a number of related comments raised by mainly academic authors such as Buitert and Sibert (2005), Nyborg (2015), (2016a), Sinn (2014) and others. Some have asserted that the ESCF (i) is too forthcoming or broad, (ii) insufficiently differentiates across assets and issuers, (iii) creates undue financial risks to the Eurosystem, (iv) creates moral hazard on the part of banks, and (v) is non-transparent, complex and inconsistently implemented. As this paper explains, these comments can be questioned and challenged.

Central banks provide credit to banks conditional on collateralisation, applying eligibility criteria for the collateral to be provided. This has been a basic principle of central bank operations since their development in the 18th century. Availability of eligible collateral is also an effective constraint on banks' recourse to central bank credit. Since ensuring funding liquidity under any circumstances is one of the essential principles and necessities of banking, and as market-based liquidity is potentially unstable, central bank eligible collateral buffers are a crucial factor in the liquidity management and strategic planning of banks. The collateral framework of the central bank is therefore important not only for risk protection and the feasibility of central bank credit operations, but also for financial conditions, financial stability and the transmission mechanism of monetary policy, in particular in stress situations.

Central bank collateral framework considerations have a long history, and their relevance, which also goes beyond the protection of the central bank, has been documented for a long time – not only by central banks. The lender of last resort (LOLR) literature, such as Bagehot (1873) and King (1933), which is further discussed later in this paper, contains various references to central bank collateral. Aside the LOLR question, the importance of collateral frameworks to real economic activity and even foreign policy has, however, also been noted. For example, Kindleberger (1984) cites the role of central bank collateral in Europe's financial history on three occasions:

1. Role of collateral in LOLR (Kindleberger, 1984, p. 279): During the 1828 Alsace textile crisis, the Banque de France would have forgotten previous lessons and *“refused to accept any paper with Mulhouse or Basle signatures. Instead of alleviating distress, these actions spread panic.”*

¹ The ESCF is discussed, for example, in Bindseil (2014) and Mercier and Papadia (2011). Singh (2014) provides a more general discussion on the role of collateral markets in relation to central banks.

2. Role of accepting railroad bonds as collateral by the Banque de France during the economic upswing in the 1850s (Kindleberger, 1984, p. 69): “*The boom of the 1850s, for example, was by no means solely the result of the [gold] discoveries of 1849 and 1851. [...] The Credit Mobilier, first established in France in 1852, and later the action of the Banque de France in admitting railroad securities to discount in 1856, were of greater importance than the discoveries [...]*”
According to Leclercq (1982, p. 907), “*After the coup which led to the ‘Second Empire’, the government asked the Banque de France to accept the railway companies’ bonds and equities as collateral in discount operations and also for loans to any private person. It also asked the Banque de France to lend money to the railway companies ahead of new issuances and to place such issuances in the market. These measures helped the railway companies in financing their activities, at a time when they have faced constraints and had been prompted to merge among themselves by the government.*”
These measures gave significant support to the development of railway companies in France at the time until these companies, weakened in particular by rather high debts, were later forced into mergers and nationalised. The measures included not only favourable treatment of the railway companies’ bonds and stocks in the Banque de France’s collateral framework, but also purchases of these bonds and stocks by the Banque de France. While the purchases likely played a significant role, the same applied to the collateral framework measures, as shown by the fact that the amounts of credit granted by the Banque de France and the amount of railway company bonds and stocks used as collateral increased significantly in the years following the above-mentioned decisions, as reported in Plessis (1985, pp. 113-114). Further analysis related to the Banque de France’s collateral framework can also be found elsewhere, e.g. in Bignon and Jobst (2017).

3. Role of the “Lombardverbot”, the ineligibility of Russian bonds as collateral in Reichsbank operations (Kindleberger, 1984, p. 227). “*In the German Foreign Office about this time, Herbert Bismarck, the Chancellor’s son, proposed forbidding bank advances on Russian securities as an act of economic warfare [...] on 10 November 1887, an order was issued forbidding banks to lend on Russian securities – the famous Lombardverbot. Prices of Russian bonds fell further in Germany; some were bought back by Russian investors, a great many by French.*” The Lombardverbot was eventually lifted on 26 October 1894 (Wegner-Korfes, 1982, p. 62). According to Wegner-Korfes (1982, p. 57), and using vocabulary of the former German Democratic Republic, the Lombardverbot would have been “*in every respect an expression of the growing aggressiveness, militarism and imperialism of the eastern Prussian bourgeoisie and land-owning nobility*”. It certainly had a lasting impact on foreign debt

allocation within Europe and contributed to making French investors the by far largest group of victims of Russia's default following the Bolshevik revolution.²

Hjalmar Schacht's Harzburg speech on 11 October 1931, arguably the most political and controversial speech ever by a central banker, also contains a noteworthy reference to central bank collateral policies. Schacht (1953, p. 367) argued that the Reichsmark would be "*a currency that no longer serves the real economic activity, but to hide the illiquidity of our financial institutions and of the public sector [...]. Out of fear to make the public nervous, one does not tell that the collateral portfolio of the Reichsbank now only consists to a very small degree of actually eligible bills.*" It is of course ironic that the Reichsbank of 1931 is nowadays remembered for being too conservative and guilty of not lending freely enough to banks, thereby precipitating the banking crisis of July 1931. It is even more ironic that Schacht himself was rather ruthless in extending collateral rules under his second Reichsbank term (1933-1939) and in instrumentalising it to finance Germany's massive rearmament programme in the run-up to World War II. Defeat led to the second loss of monetary wealth in Germany, which crystallised in the monetary reform of 1948.

Central banks themselves have long been aware of the importance of the collateral framework, and some central banks have had a tradition of transparency in terms of both the eligibility criteria and the use of collateral. For example, more than a third of the 300-page work "Die Reichsbank – 1876-1900" is devoted to collateral issues (see English translation, Reichsbank (1910)). Central banks have also published lists of eligible securities that could be used as collateral for a long time (see e.g. Reichsbank (1935)) and have also documented the use of eligible collateral. For example, Reichsbank (1926, pp. 82-83) contains a detailed listing of collateral used in Lombard credit on an annual basis from 1876 to 1924 ("Bestände an Lombardforderungen und ihre Verteilung auf die verschiedenen Unterpfänder").

For the sake of transparency, the ECB published its collateral framework from 1999 onwards (ECB, 1998, section 6, pp. 39-51). The applicable framework is defined by means of various ECB legal acts, most importantly, the currently applicable Guideline ECB/2014/60³, which, inter alia, defines the collateral eligibility and use rules in its Parts Four and Five.

The rest of this paper proceeds as follows. Section 2 recaps on the basics or "ABC" of central bank collateral frameworks. Section 3 explains the logic behind the ESCF, and its specific features compared with other collateral frameworks, which mainly relate to the special nature of the euro area as a monetary union. Sections 4 to 7 discuss in depth the main types of critical comments made by observers of the ESCF. Section 4 provides an overview of critical comments, distinguishing between two categories, namely what authors believe is not optimally specified in the ESCF, and what authors believe are the consequences of alleged misspecifications.

² To assess the dimension of this issue, it is worth noting that of the USD 22 billion of foreign public debt in default at the end of 1933, USD 17 billion originated from the Russian default of 3 February 1918 (Winkler, 1933, p. 205).

³ Guideline (EU) 2015/510 of the ECB of 19 December 2014 on the implementation of the Eurosystem monetary policy framework (ECB/2014/60), OJ L 91, 2.4.2015, p. 3.

Section 5 reviews comments on the ESCF eligibility criteria, namely that the eligibility criteria are generally too generous. Sections 6 discusses comments on ESCF haircuts and collateral valuation. Finally, Section 7 turns to comments on the ESCF's transparency, its complexity, and the accuracy of its implementation.⁴

⁴ The data contained in the figures, if not available in existing sources, is included in a data file that is available here: http://www.ecb.europa.eu/pub/pdf/annex/ecb.op189_annex.xlsx.

2 The economic ABC of central bank collateral frameworks

The economics of central bank collateral frameworks have been discussed for example in Bindseil and Papadia (2006), Chailloux et al. (2008), Cheun et al. (2009), Tamura and Tabakis (2013), Bindseil (2013) and (2014), and Nyborg (2016a). Gonzalez and Molitor (2009) and ECB (2015) present methodologies for devising a central bank risk control framework for credit operations. A recap of some of the basic aspects of the economics of central bank collateral frameworks follows below in order to set the scene for the subsequent presentation of the ECB collateral framework and the discussion of recent comments.

2.1 Why central banks provide credit only against collateral

There are various reasons why central banks should not provide uncollateralised credit. Their task, and area of expertise, is the implementation of monetary policy, and not the demanding task of unsecured credit risk management. While access to central bank credit should be based on the principles of transparency, accountability and equal treatment, unsecured lending is a risky activity that requires discretion and extensive knowledge of the counterparty. Moreover, unsecured credit has a non-negligible probability to lead to some losses on the side of the creditor, which may disproportionately harm the reputation of central banks given that they ultimately manage “public” money and their losses are at the expense of the taxpayer.

Another argument against unsecured credit is that central banks need to act quickly when implementing monetary policy, and, exceptionally, also when conducting operations aimed at maintaining financial stability. Unsecured lending requires careful and time-consuming analysis. Central banks also need to deal with a large number of banks. This can include banks with a deteriorating and/or rather low credit rating, which one could argue do not qualify them at all for any kind of unsecured credit. However, central banks should avoid establishing credit lines with different interest rates which would reflect the differing creditworthiness of different banks. To reflect the different degrees of counterparty risk in unsecured interbank lending, banks charge different interest rates. By contrast, central banks have to apply uniform monetary policy interest rates and thus cannot use the price of credit to offset the different degree of risk taken.

In recognition of these arguments, central banks in advanced economies have long avoided any non-collateralised monetary policy credit operations or LOLR credit operations. As a result, all central banks invest significant energy in establishing and maintaining collateral frameworks for their credit operations.

2.2 Why central bank collateral frameworks should be conservative

For at least three reasons, central bank collateral frameworks should have a conservative design, with the focus on strict requirements for collateral quality and high haircuts.

First, strict quality requirements and firm risk control measures provide effective risk protection for the central bank and limit the temptation for banks to rely excessively on central bank credit (and the potential “moral hazard” associated with this).

Second, central bank collateral frameworks provide banks with leeway to use central bank credit and therefore typically allow some concentration risks to build up. With bilateral lending between banks, collateral and risk control measures can always be negotiated precisely. However, a central bank collateral framework is supposed to be general enough to accommodate all relevant counterparties and situations. To address in advance the more risky collateral use scenarios (e.g. a weaker bank borrowing significant amounts against concentrated and possibly somewhat correlated collateral), credit quality requirements and risk control measures need to go beyond what would be sufficient in the case of average recourse to credit by an average counterparty with diversified collateral.

Third, central bank collateral frameworks should prevent pro-cyclicality. Collateralised lending has significant potential for adding pro-cyclicality to the financial system, as noted e.g. by Kiyotaki and Moore (1997), Geanakoplos (2009) and Adrian and Shin (2009). Setting relatively high collateral quality standards and haircuts in normal times means that conditions do not have to be tightened in times of stress. There is still sufficient protection without contributing to pro-cyclicality.

2.3 What makes central banks special and allows them to accept a broader range of collateral than in interbank markets?

Central banks have at least two unique characteristics, which explain why they act as LOLR and why they accept a relatively broad range of collateral.

First, as central banks have been accorded a monopoly and freedom to issue legal tender, they are never threatened by illiquidity in their own currency. It seems only natural that, in the event of a liquidity crisis in which all agents attach a high price to liquidity, the central bank should remain more willing than others to hold (as collateral or outright) assets that are less liquid. This argument does not rely on the existence of negative externalities. Even if the central bank were a purely profit-oriented enterprise, its privilege of being spared any form of liquidity stress should make it ready to take over illiquid assets in a crisis (against a premium) or provide credit collateralised with illiquid assets.

Second, haircuts are a powerful risk mitigation tool if credit risk is asymmetric and the collateral provider (the repo borrower) is more credit-risky than the cash provider (the repo lender). The power of haircuts is limited if the cash borrower and cash lender are equally credit-risky. In this case, the haircut protects the cash provider, but exposes the collateral provider to an unsecured credit risk (Ewerhart and Tapking, 2008). The central bank, which is never at risk of illiquidity and is part of the public sector, can be regarded as the most secure counterparty, particularly during a financial crisis.

The fact that central banks engaged massively in LOLR operations during the financial crisis, protected by illiquid collateral at high haircuts, which saved the financial system without causing any financial losses, illustrates the strength of using these unique features of central banks for the benefit of society.

2.4 Desirable properties of collateral

Central bank collateral should have a number of desirable properties.

Legal certainty. It needs to be incontrovertible that the central bank has the right to and indeed can realise the collateral provided to it by the counterparty if a counterparty defaults.

Minimum credit quality. Central banks always set a credit quality threshold for collateral, for example a maximum probability of default of the asset's issuer. The argument that credit quality is reflected in prices, and that sound valuation is therefore sufficient to address different degrees of credit quality, is not wholly valid for the following reasons. First, lower-rated collateral has a higher probability of default, and an even higher probability of downwards migration. While credit migration can be addressed through haircuts, this is not the case for default risk. Second, lower-rated securities tend to be more information-intensive and more difficult to value; as a result, the central bank is also more prone to adverse selection by the counterparty.

Simplicity. Some securities are relatively simple, while others are more complex (e.g. pre-crisis multi-layer CDOs). Complexity entails devoting resources to due diligence to ensure that such securities and their inherent risks are understood and do not potentially lead to nasty surprises in the event of collateral liquidation. If the central bank is unwilling to spend these resources, it should not accept more complex assets.

Operational efficiency. This feature should ensure a smooth, safe and speedy handling of collateral by the central bank as well as by counterparties and securities settlement systems.

Market neutrality. A collateral framework and its criteria and/or requirements should not lead to the preferential treatment of distinct asset classes, issuers or sectors and should avoid market distortion (implying that e.g. individual issuers or sectors benefit unduly from eligibility requirements).

Market transparency / price availability. Some securities are traded on markets with established rules that also provide post-trading transparency and/or binding price quotations. Others are traded only over-the-counter (OTC), with no rules and regulations supporting the transparency of prices (and underlying trading volumes). Non-availability of prices means that a theoretical value needs to be given to assets, which requires resources. Even with sufficient resources, valuation is likely to remain less precise than pricing on the basis of observed market transactions.

Market liquidity of collateral. While some types of collateral are constantly traded (large-country government debt), others are rarely or never traded. Liquidity makes prices more likely to be available and means that the collateral can likely be sold easily (quickly, without depressing prices) if a counterparty defaults. Low liquidity can again be offset by careful, conservative (theoretical) pricing and higher haircuts. For a central bank, market liquidity may be less important as a desirable feature of collateral than for other market participants, for the reasons mentioned in Section 2.3. Nevertheless, higher liquidity can be translated into lower haircuts, which, other things being equal, makes the collateral more attractive to the counterparty.

Domestic currency denomination of collateral. Central banks tend to limit collateral eligibility to assets located and denominated in their own jurisdiction/currency. In a crisis, central banks are more inclined to relax such constraints, whereby (i) additional settlement costs may arise; and (ii) a currency mismatch typically needs to be addressed with an extra haircut.

2.5 How broad should the collateral set be?

Imagine that a list of all asset types that could be eligible as collateral in central bank credit operations in a certain currency area were drawn up first. The assets in the list would have different risk characteristics, which implies that different risk mitigation measures are needed to deal with them. The main aim of risk mitigation measures is to bring the risks associated with different asset types to the same level (the 'risk equivalence' principle), namely the level that the central bank is ready to accept.

Next, the potential collateral types should be ranked in decreasing order of efficiency, whereby the ranking should reflect: handling and analysis costs, the level of haircut required to achieve risk equivalence, the availability of the asset class in the banking system, etc. Finally, the central bank must choose (i) a cut-off line in the ranked assets on the basis of a comprehensive cost–benefit analysis, matching the marginal social benefits of central bank collateral with its increasing marginal cost; and then (ii) a set of haircut add-ons and other measures such as limits for further controlling, where necessary, the use of collateral in order to prevent it from becoming too concentrated in certain asset types, too imbalanced compared with outstanding amounts or too connected in terms of risk factors with the central bank's counterparties. The social benefits of broadening the collateral set are extremely high at the beginning, in particular because a collateral set that is too small interferes with smooth monetary policy implementation, and the implicit lack of liquidity buffers

in the form of central bank borrowing potential can be detrimental to financial stability.

With a well-constructed collateral framework, these benefits remain high as the set of eligible collateral expands, then gradually decline from some point onwards with an extremely large collateral set and associated higher central bank borrowing potential. Negative side effects may arise, such as overreliance of the banking system on central bank liquidity provision, excessive leverage, zombification and moral hazard. These considerations are further explained in Section 5.

A heterogeneous monetary area with different financial instruments prevailing in different parts of the area may create additional benefits for a broad collateral set. Indeed, it appears problematic if access conditions to central bank credit are extremely imbalanced across jurisdictions in a monetary area. This may call into question the use of a single monetary policy in the euro area and also raise financial stability issues. This will be addressed in Section 3.

2.6 Identical versus differentiated collateral sets for different monetary policy operations?

Central banks take various approaches in terms of differentiating their eligible collateral sets and assigning them to specific types of operations. Three types of operations are commonly distinguished in terms of the type of the eligible collateral pool by a part of the central bank community: (i) short-term credit operations to control the operational target (very short-term interest rates); (ii) long-term credit operations (providing longer term funding to banks); (iii) liquidity-providing standing facilities (the “discount window” in the US, the “marginal lending facility” in the euro area). Moreover, (iv) collateral sets for “emergency liquidity assistance” (“ELA”) are typically also defined separately. (ELA is further discussed later in the paper.)

Central banks that do not differentiate among the first three collateral sets for specific operations ((i) to (iii)) argue as follows. First, such differentiation means additional complexity and therefore needs solid justification. Second, imposing various levels of haircut can ensure ex post risk equivalence and thereby make central banks neutral about the type of collateral banks use (e.g. ECB, 2015). Third, if banks still excessively rely on certain assets as collateral, such as assets with low market liquidity, this is not a problem per se as the central bank is special in terms of its ability to take liquidity risk and it may thus be efficient for it to end up on average with e.g. less liquid collateral. Finally, if central banks end up with an unwarranted degree of concentration in a certain collateral category, then it is easier and effective for the NCB to set limits to avoid further concentration (e.g. on the share of one collateral class in the collateral portfolio submitted by a bank).

Central banks that insist on the need to have differentiated collateral sets depending on the type of the operation they secure will argue that not having differentiated collateral sets will in any case lead to over-use of illiquid collateral and that this

would be a form of market distortion. Table 1 illustrates the choices of four central banks with respect to differentiated vs. single collateral sets.

The ECB and the Bank of Japan (first row) distinguish between collateral for ELA and collateral for any monetary policy operation, including standing facilities. The Bank of England splits its monetary policy related collateral into three subsets, whereby at least currently the collateral sets for end-of-day credit and long-term credit have been set to be equal. Finally, the Federal Reserve has a similar collateral set for end-of-day overnight credit and for ELA, while it has another set for short-term and long-term credit open market operations (OMO).⁵

Table 1
Differentiated vs single collateral sets

ECB /Eurosystem Bank of Japan	ELA	End-of-day credit facility	Long-term credit open market operations (e.g. 3 months)	Short-term credit open market operations (control very short-term interest rates)
Bank of England	ELA	End-of-day credit facility	Long-term credit open market operations (e.g. 3 months)	Short-term credit open market operations (control very short-term interest rates)
Federal Reserve	ELA	End-of-day credit facility	Long-term credit open market operations (e.g. 3 months)	Short-term credit open market operations (control very short-term interest rates)

Note: Different colours indicate that different sets of collateral are accepted.
Sources: ECB, Bank of England, Bank of Japan, Federal Reserve.

2.7 Risk control measures

The methodology of a central bank risk control framework for collateral has been presented for example in ECB (2015) and in Gonzalez and Molitor (2009). The central bank cannot (and should not) protect itself fully from risks as some extremely unlikely events can always lead to a loss. Therefore, some optimal risk tolerance of the central bank needs to be defined as a basis for calibrating risk control measures. Since the risk associated with collateralised operations depends, before risk mitigation measures have been applied, on the type of collateral used, the risk mitigation measures will need to be differentiated according to the collateral type to ensure consistent compliance with the defined risk tolerance of the central bank and risk equivalence after the application of risk control measures. The following risk mitigation measures are typically used in collateralised lending operations.

Valuation and margin calls: Collateral needs to be valued accurately to ensure that the amount of central bank money provided to the counterparty does not exceed the actual collateral value. As asset prices fluctuate over time, collateral needs to be revalued regularly, and new collateral needs to be called in whenever a certain

⁵ It should be kept in mind that in general, ELA collateral policy has more and different dimensions than the collateral framework for monetary policy operations. When a bank asks for ELA, depending on the circumstances and at least in the initial stages, it is not the bank but rather the central bank which may choose which collateral is used for such operation. For example, the central bank may decide, because it is expedient and safe, to initially take all unencumbered assets of the bank as collateral when it provides ELA for an initial short period of time.

trigger level is reached. In a world without monitoring and handling costs, collateral valuation could be carried out in real time, and the trigger level for margin calls could be zero. In practice, costs create a trade-off, with central banks often stipulating daily margin calls and a trigger level to avoid an excessively high number of insignificant margin calls.

Haircuts: If a counterparty defaults, the collateral it has submitted needs to be realised (sold). This may take some time and, for less liquid assets, a sale in the shortest time possible would have a negative impact on prices, especially if the position to be sold is comparatively large. To reduce the probability of losses during the liquidation period, a certain percentage of the collateral value needs to be deducted when accepting the collateral. This helps establish the amount of credit that can be provided in exchange for the collateral. The percentage deducted from the collateral value to establish the borrowing potential is called the collateral haircut. The haircut should depend on the price volatility of the relevant asset and on the prospective collateral liquidation time. An additional haircut may address valuation uncertainty and wrong-way risks. For instance, if a theoretical value needs to be given to an asset, and if it is clear that the valuation method is not perfect, then an extra haircut can address this. The higher the haircut (against valuation uncertainty before counterparty default or against value changes after counterparty default), the better the central bank is protected, but the higher the collateral needs are for a given volume of central bank borrowing. This trade-off needs to be addressed by setting a certain confidence level against losses.

Limits: To avoid concentration risk, limits may be imposed. These typically take one of the following two forms:

- Limits on exposure to individual counterparties (e.g. limits on the volume of refinancing provided to a single counterparty).
- Limits on the use of specific collateral by single counterparties (e.g. percentage or absolute limits can be imposed per issuer or per asset type).

All of these measures, especially central bank practices on valuation and margin calls, may very much affect how collateral markets behave (see e.g. BIS 2015). Indeed, if the central bank does not regularly revalue collateral or does not apply margin calls when collateral values significantly change, then this may affect the behaviour of central bank counterparties using such collateral. This might ultimately affect market prices, wider demand and supply conditions for these assets. As a result, the central bank needs to take into account consistency with good market practice and potential market impact when designing not only its collateral eligibility and use criteria, but also its valuation and margining criteria. This also goes, albeit to a lesser extent, for its haircuts and limits.

2.8 The collateral framework of a central bank and LOLR function

The two unique characteristics of the central bank cited in Section 2.3, which explain why central banks can accept a broader range of collateral than banks, also form the basis of the central bank's role as LOLR. In exceptional financial stress situations, these characteristics allow central banks – without taking undue risks – to prevent solvent but temporarily illiquid financial institutions from defaulting, as this would cause unnecessary damage to society. Solvency that is conditional on liquidity is essential for the LOLR to be effective – it is only under this proviso that the LOLR can stabilise the liabilities of a liquidity-stressed financial institution (e.g. Bindseil, 2013).

- Some LOLR elements are built into the monetary policy operational framework: the elasticity of individual banks' recourse to central bank credit is essentially determined by the collateral framework. Moreover, the convenience to obtain credit from the central bank in case of need is determined by the relevant tender procedure (e.g. auction mechanism versus "fixed rate full allotment") and price disincentives to counteract reliance on central bank intermediation, as captured by the width of the corridor set by the central bank's standing facilities.
- The LOLR function can take the form of idiosyncratic credit operations offered to single banks outside the monetary policy framework, which the Eurosystem and by some other central banks call emergency liquidity assistance (ELA). The ELA framework of the Eurosystem is explained in ECB (2014): "*Euro area credit institutions can receive central bank credit not only through monetary policy operations but exceptionally also through emergency liquidity assistance (ELA). ELA means the provision by a Eurosystem national central bank (NCB) of: (a) central bank money and/or (b) any other assistance that may lead to an increase in central bank money to a solvent financial institution, or group of solvent financial institutions, that is facing temporary liquidity problems, without such operation being part of the single monetary policy. Responsibility for the provision of ELA lies with the NCB(s) concerned. This means that any costs of, and the risks arising from, the provision of ELA are incurred by the relevant NCB.*"

In the case of the banking crisis and euro area sovereign debt crisis, and also in other past episodes in various economies, both forms of LOLR operations actually played an important role⁶. The ESCF is closely related to the LOLR function: indeed, the collateral framework determines significantly the extent to which the LOLR function is provided through regular monetary policy credit operations.

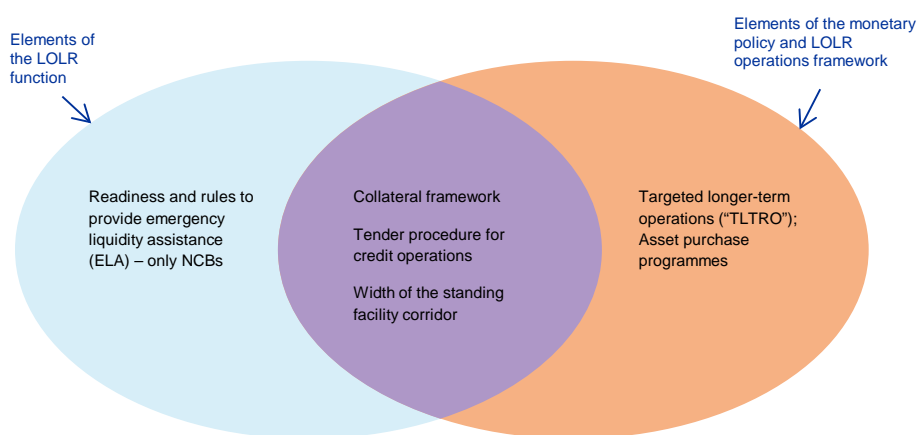
Collateral rules for ELA of Eurosystem NCBs are a distinct matter from the Eurosystem collateral rules, as defined by the Governing Council of the ECB, as the responsibility for the provision of ELA lies with the NCB(s) concerned. As ELA is not

⁶ Garcia-de-Andoin et al. (2016) discuss LOLR doctrines in the context of the Eurosystem liquidity provision during the financial and sovereign debt crisis.

rule based to the same extent as Eurosystem credit operations are, also the collateral framework for ELA is not rigidly defined ex ante. It is also important to note that during the crisis, various central banks strengthened the LOLR function embedded in monetary policy operations not only through extending collateral sets, but also in particular by switching from variable rate auctions as procedure to allocate monetary policy credit, to fixed rate full allotment operations, i.e. removing allotment uncertainty both regarding price and quantity.

Figure 1 illustrates how the elements that determine the LOLR function of a central bank relate to the elements that determine the monetary policy operations framework of a central bank. The collateral framework is in the intersection of the two, although it is not the only element in the intersection. The figure does not cover all elements.

Figure 1
 Relationship between elements determining the LOLR function and those determining the monetary policy operations framework



Source: Own calculations.
 Note: Terminology refers to Eurosystem operations.

3 The Eurosystem collateral framework

3.1 Initial design

The ESCF was designed before 1 January 1999, when the euro was created and the ESCF was implemented. It has evolved in the years since then, through a series of adaptations including fairly substantial ones which were implemented in 2005, 2009-2010 and 2011-2012. The design of the ESCF took into account that the ECB would implement monetary policy mainly through credit operations which would be offered regularly to a wide range of diverse counterparties and which would be rather large.

Indeed, the ECB decided before 1999 that the Eurosystem would initially not have holdings of securities for monetary policy purposes, which it referred to as "permanent operations", because securities once purchased may be held for a long period until they mature, and because permanent operations were considered less neutral towards capital markets. Hence, it decided that it would use credit operations, which it also referred to as "temporary operations" because they would have relatively short terms of usually one day (marginal lending facility), one week (main refinancing operations) and three months (longer-term refinancing operations). Moreover, the ECB had decided at the time that credit operations would be offered to all credit institutions operating in the euro area, provided they were supervised according to harmonised EU standards or according to standards of an equivalent quality and provided they were financially sound. Hence, the set of eligible counterparties, which were also subject to reserve requirements, was rather large, with several thousand institutions, and rather diverse, with a broad range of activities and business models across the euro area countries and across the various bank types. Table 2 compares the number of counterparties and the size of credit operations across major central banks.

Table 2
Number of counterparties and size of credit operations compared with other central banks

	Number of counterparties	Size of collateralised lending operations with banks (in % of total size of balance sheet)		
		Pre-crisis (2007)	Post-Lehman	2015
ECB	Standard tender operations: 1,749 Marginal lending facility: 1,979 Deposit facility: 2,455	51	60	45
Federal Reserve	Primary dealers: 21	2	28	0
Bank of England	Open market operations: 55 Discount window facility: 96 Reserves accounts and standing facilities: 117	60	83	0
Bank of Japan	Outright: 35-47 Loan: 66-257 Repurchase: 26-46	24	41	22

Source: T. Linzert and F. Smets, "Monetary policy in a banking union", in "Financial Regulation, A Transatlantic Perspective", edited by E. Faia, A. Hackethal, M. Haliassos and K. Langenbucher, Cambridge University Press, August 2015.

These decisions to have rather large credit operations, in volume terms, and a rather large and diverse set of counterparties located across a number of jurisdictions implied that the ECB needed to accept a rather broad set of collateral in these credit operations. This would ensure that there would be sufficient adequate collateral available in a fair way to all counterparties and thus a sufficient ability of counterparties to participate in the ECB's credit operations in terms of the amount and coverage across countries and bank types (ECB, 2013b).

This was important in particular because it was not obviously or immediately clear how the interbank market, and more generally the money market, would function in the euro area after the start of the euro. One could not be certain whether central bank reserves, and more generally liquidity in the money market, would circulate well after the creation of the euro and how prices in this market, i.e. short-term interest rates, would form and how fast and to what extent they would converge across countries and bank types. As a result, it was seen as prudent, and fair to market participants, that the ECB would offer access to its operations broadly, with a broad set of accepted collateral. Galvenius and Mercier (2011) describe the history of the process that led to the establishment of the ESCF.

In addition, the ECB aimed at sufficient continuity, in terms of accepted collateral, with the rules and practices applied by the national central banks (NCBs) of the countries which would form the euro area in the years preceding the start of the euro. Such continuity would contribute to avoiding transition problems when the euro would start or in the period afterwards, such as an unexpected reduction in the funding sources available to certain banks or other financial intermediaries, which could arise if certain collateral which was previously accepted by an NCB would no longer be accepted by the Eurosystem.

As a result, the ECB and the NCBs reviewed the collateral frameworks of the NCBs which existed at the time and took into account the composition of collateral hitherto accepted by the NCBs when designing the ESCF. The characteristics of the euro area's financial structure, to the extent that they are relevant to the ESCF, were described in various ECB speeches and publications, including Noyer (1999) and ECB (1999a, 1999c and 2000). The ESCF itself was further described in various other ECB speeches and publications, including ECB (1999b, 2001, 2006, 2009 and 2013b), Eser et al. (2012) and Tamura and Tabakis (2013), as well as several other papers, some of which are further quoted later in this paper.

Another element of continuity is the way in which changes to the collateral framework are effected and communicated to the public. Changes to the eligibility criteria are generally communicated publicly before the underlying legislative amendments become applicable, and may come along with a "grandfathering period" during which the assets, the eligibility of which of effected due to a new or amended requirement, still remain eligible for a specific period.

3.2 Interim assessments

The ESCF therefore aims to fulfil the objectives and abide by the constraints set out in Table 3.

Table 3
List of objectives and constraints

Main objectives	Support smooth conduct of monetary policy Protect the Eurosystem against losses in case of counterparty default
Main constraints	Consistency with broad set of counterparties Flexibility combined with continuity over time Market neutrality No adverse impact on financial stability
Secondary objectives	Cost efficiency Operational efficiency Simplicity Transparency

Source: ECB.

In the event, these principles were adhered to and the above-mentioned objectives (smooth transition and smooth functioning of the euro money market) were achieved, as documented in particular in Noyer (1999), ECB (1999a, 1999c and 2000). The ESCF boasts some unique features when compared with the collateral framework of other central banks, not only because of its underlying principles as described in Section 2, but also in part because of its history as outlined above.

First, it is broad, in essence because of the Eurosystem's decisions to (i) predominantly use credit operations as a tool to implement monetary policy; (ii) offer undifferentiated access to these credit operations to all credit institutions provided they are accordingly supervised and financially sound; and (iii) ensure some continuity with the frameworks previously in use across the euro area. A narrower framework would not have been compatible with these decisions. In particular, reducing the set of assets which are eligible as collateral to euro area government debt securities would not have enabled all credit institutions to borrow in the Eurosystem credit operations, reflecting their business models and the availability of such securities in the various countries, and would have created a bigger discontinuity with the practices which prevailed before the start of the euro. Moreover, it would arguably have provided an undue advantage to such securities over other securities, issued by the private sector.

As explained earlier in this section, in particular because of the breadth of its collateral framework, the ECB sought to simplify its operations by applying a single collateral framework rules across all of its credit operations. This implies that the same pool of collateral can be used by Eurosystem counterparties when borrowing from the various Eurosystem credit operations: the marginal lending facility, main refinancing operations and longer-term refinancing operations. This simplifies operational procedures both for the Eurosystem and for its counterparties.

Moreover, the ECB has been particularly transparent about its collateral framework, by publishing collateral eligibility criteria, rules for their use and data on eligible and

used collateral. The rules are available in ECB legal acts, such as Guidelines and Decisions, as listed in Annex I.

The list of eligible marketable assets is published on the ECB's website, where it is updated every day.⁷ The website also contains an archive of past lists. Data about the amounts of collateral used by counterparties is also available on the website and in various ECB publications. It is usually provided in aggregated form, on a quarterly basis and at the level of each collateral asset class in line with the principle of confidentiality. This reflects the need for the ECB not to reveal individual information about the amounts borrowed and the collateral used by Eurosystem counterparties; and it is consistent with the amount of interest manifested by the public so far for these kinds of data. If there is increased interest for some data, then the ECB may consider publishing additional data, e.g. additional breakdowns or more frequent snapshots, provided the confidentiality of individual data continues to be sufficiently protected.

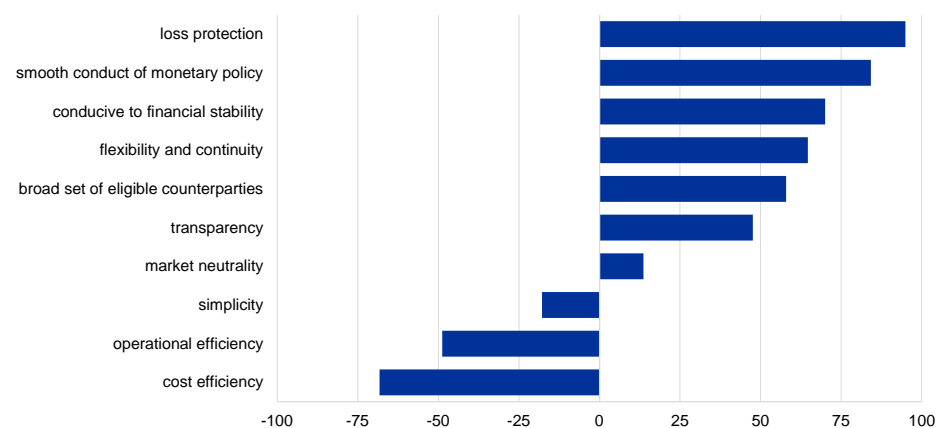
In other words, the ESCF is unique among the central banks' collateral frameworks not only because it is rather broad in terms of scope (assets), but also because it is single in terms of its use across all credit operations, and transparent, i.e. as eligibility rules, rules on the use of collateral, and data on eligible and used collateral are available to the public. However, also due to its wide scope, the ESCF is rather complex. Indeed, for each asset one needs not only to determine whether it is eligible but also: if it is eligible, whether and subject to what limits it can be used by a given counterparty; and, when it is used, for what collateral value after haircut and subject to which margin calls, depending on changes in prices or, if any, in the other characteristics of the asset. The complexity of the ESCF, or of any other collateral framework for that matter, therefore arises from the eligibility and use rules, pricing methods and risk control measures.

A summary assessment of the degree of fulfilment of the principles of the ESCF, showing how much each principle is supported by the ESCF rules, is shown in Figure 2. Some ESCF rules support the fulfilment of one or more principles but they do so at the expense of working against another principle. For example, the rule describing which coupon types are accepted for marketable assets contributes to better fulfilling the risk protection principle (by preventing the acceptance of assets with complex coupons and higher risks) but works against the simplicity principle (the rule's text is complicated). It is of course somewhat judgemental to decide whether each rule works for or against each principle and the assessment should in certain cases probably be more nuanced than bipolar. As depicted in Figure 2, nearly all relevant ESCF rules are supportive of the principles of loss protection and the smooth conduct of monetary policy operations. However, a rather large proportion of the ESCF rules do not support cost efficiency, operational efficiency or simplicity. This is clearly because there are trade-offs between these principles: although not impossible, it is sometimes hard to find collateral framework rules which offer sufficient protection against losses and are also simple and cost-efficient, while having to cope with the heterogeneity that exists in the euro area.

⁷ Please refer to an [archive of historical lists](#).

This suggests that improvements can still be made in the ESCF going forward on the position in these various trade-offs, especially including those between policy needs, risk protection, efficiency and simplicity.

Figure 2
How current rules contribute to the fulfilment of the ESCF principles



Source: Eurosystem central banks and own calculations.
Note: The chart shows the difference between the number of ESCF rules which support the principle (positive) and the number of ESCF rules which conflict with the principle (negative), divided by the number of ESCF rules which either support or conflict with the principle.

3.3 Main evolutions

Over the years, the ESCF has evolved in all three aspects - eligibility rules and rules on the use of collateral, pricing methods and risk control measures. As regards the first aspect, three milestones may be mentioned. The first milestone was reached during the period 2005-2007, when the ECB moved to a single list of collateral.⁸ This meant that some assets which had been accepted as collateral only in some euro area countries since 1999, to ensure sufficient continuity with the period before the start of the euro in these countries, stopped being eligible as collateral or became eligible throughout the euro area. Thus, equities stopped being eligible as collateral in Spain, the Netherlands and Portugal⁹; and credit claims, which had hitherto been eligible only in some jurisdictions¹⁰, became eligible throughout the euro area¹¹.

The second milestone came during the period 2008-2009, when eligibility rules (and also risk control measures) were amended for ABSs, in order to better mitigate specific legal, credit and market risks, which had become apparent within segments of this asset class during the preceding period, especially for complex ABSs.

⁸ The Eurosystem decided to introduce the single list of collateral in 2004. Eventually, it was implemented in 2005 for marketable assets and in 2007 for credit claims (without a minimum size threshold).

⁹ In Portugal they started to be eligible in 2003; in Spain and the Netherlands in 1999.

¹⁰ Pure bank loans were eligible in Spain, France, Germany and Austria, private claims in the Netherlands and mortgage backed promissory notes in Ireland.

¹¹ See "The single list in the collateral framework of the Eurosystem", ECB Monthly Bulletin, May 2006.

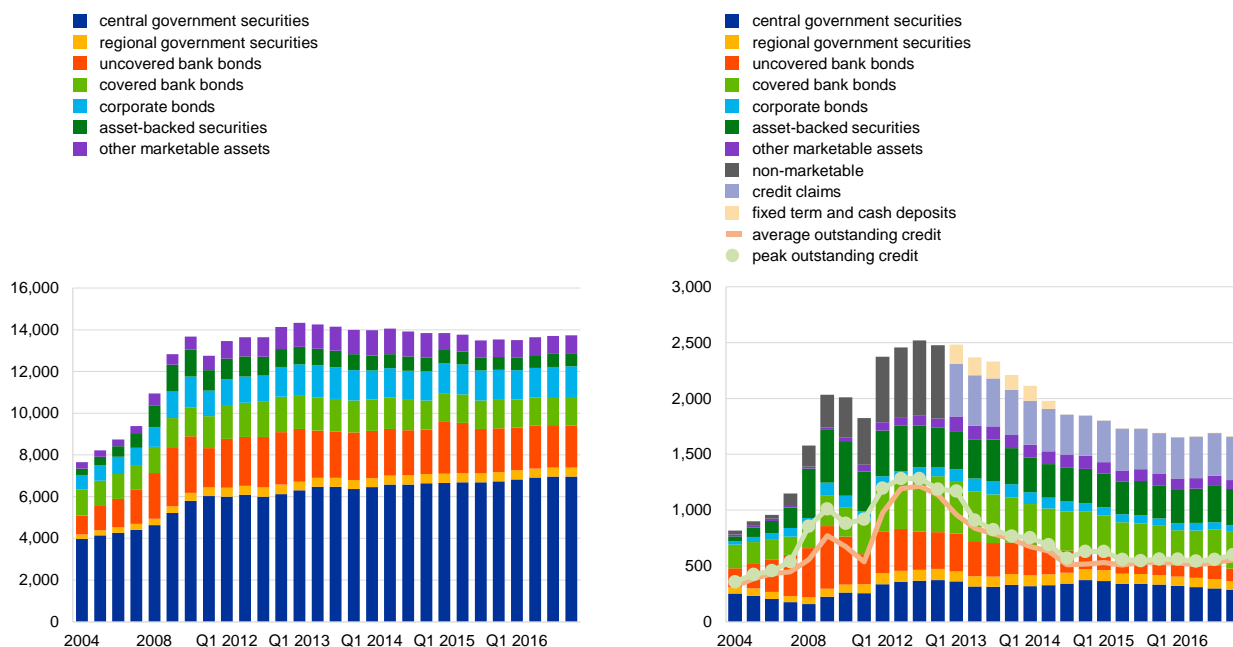
The third milestone was in 2008 and 2011-2012, when the collateral framework was further broadened in order to maintain and increase collateral availability for euro area credit institutions and thereby facilitate the provision of increased credit by the Eurosystem. Such further broadening took several forms, including among other things:

- a relaxation in minimum credit quality requirements (to include the full so-called "investment-grade" credit quality instead of just the upper part of it, thereby reflecting the weakening of the average credit rating of euro area issuers);
- a relaxation of requirements and risk control measures for the simpler ABSs (also in view of increased transparency in the form of ABS loan-level data); and
- the acceptance of additional types of credit claims in some euro area countries, subject to eligibility and use requirements and risk control measures which ensured that these additional credit claims were treated equally to the other eligible credit claims, from the perspective of the Eurosystem's risk exposure.

Figure 3 shows the development of eligible assets and the use of collateral since 2004. Annex I contains a list of the currently applicable ECB legal acts as regards the general collateral and the temporary collateral framework.

Figure 3
Eligible assets and use of collateral

(EUR billions; left-hand side: eligible assets; right-hand side: use of collateral)



Source: ECB.

Notes: collateral used is reported after valuation and haircuts in averages of end of month data over each time period shown.

Since 2013 Q1, the category "Non-marketable assets" is split into two categories: "Fixed term and cash deposits" and "Credit claims".

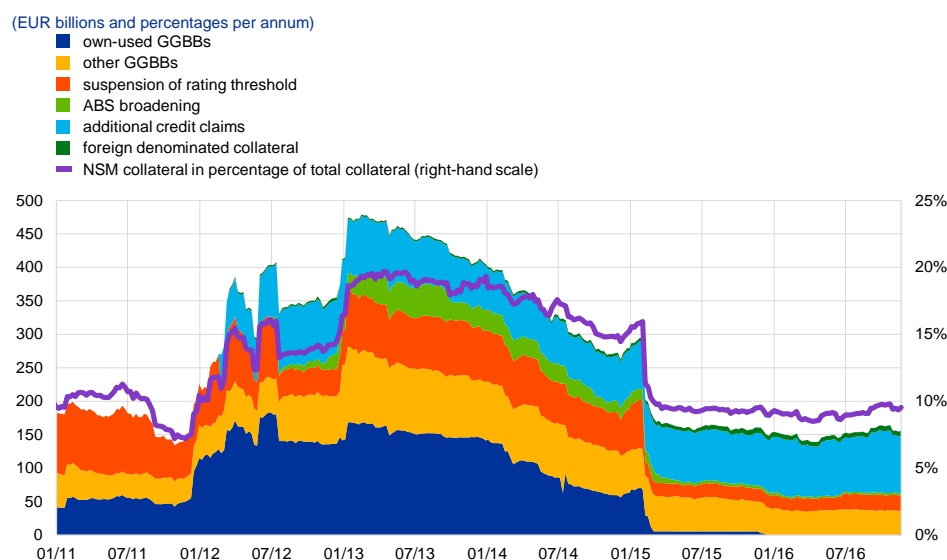
Last observation: 2016 Q4.

Some of these measures are part of the Eurosystem temporary collateral framework (which is wider than the general collateral framework) and may be discontinued at

some point, while others, possibly after some adaptations, may become permanent, i.e. by transforming a temporary collateral requirement or rule to a permanent one. In fact, this already happened when a few earlier temporary measures became permanent features. Reflecting the temporary nature of their eligibility and the calibration of the risk control measures applied to them, the temporarily eligible additional collateral assets have been used rather moderately by the Eurosystem's counterparties, as shown in Figure 4.

Despite its importance in some jurisdictions and to some counterparties, especially at certain points in time, the temporary broadening of the collateral framework probably exerted its effects mostly in an indirect manner, by sending a signal that collateral availability would remain ample for some time to come. Hence bank funding stress would be avoided at the aggregate level and the ability of banks to take up liquidity in the Eurosystem's credit operations, and thereby to support credit to households and firms, would not be constrained by collateral availability.

Figure 4
Use of temporary collateral



Source: ECB and own calculations.
Last observation: 29 September 2016.

The features of the ESCF and its effects, also following the above-mentioned changes, have been studied on various occasions, e.g. in ECB (2006 and 2014) and in Tamura and Tabakis (2013). From these studies, the following main results are noteworthy:

- The ESCF's changes have had the intended effects, be it on confidence in the banking sector's ability to avoid funding stress at the aggregate level, on demand in the Eurosystem credit operations or on ABS structuring practices.
- There is no clear permanent effect of eligibility as collateral on market prices or market issuance amounts but there have probably been some temporary such

effects when changes in eligibility rules, use rules or risk control measures took place.

- The haircut schedule embedded in the ESCF has remained fairly stable over time, despite changes in markets and changes in the framework.¹²

This latter point is illustrated in Figures 6 and 7. Some of the changes in the ESCF led to one-off changes in the average haircuts for assets that are eligible or used by counterparties as collateral at these specific points in time. An example of the latter was when the Eurosystem started to accept BBB-rated assets as collateral in October 2008 (with higher haircuts than for assets with stronger ratings) or when it increased haircuts for unsecured bank bonds and ABS in February 2009. (A list of collateral framework changes can be found in Annex II.)

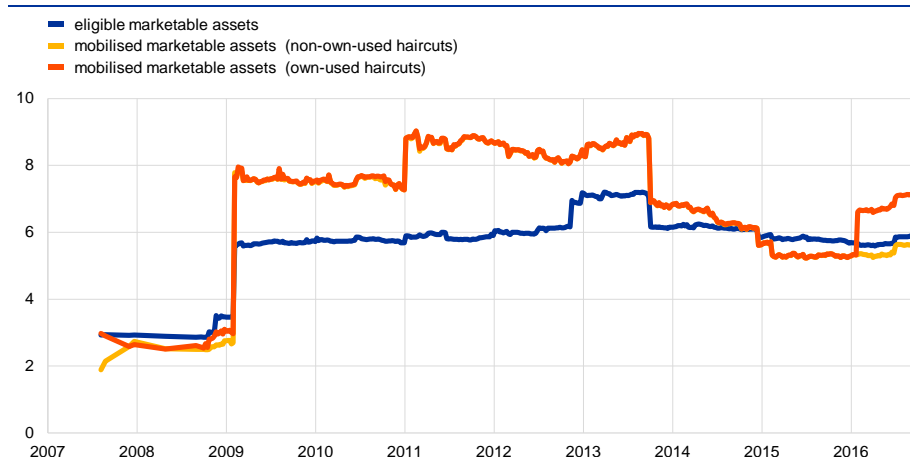
However, there is no obvious trend in the average haircuts. Under the assumption that the haircuts, which the ECB reviewed periodically over time, were appropriate as risk control measures, this can be interpreted as meaning that the average riskiness of eligible collateral and of used collateral remained stable during this period, with the possible exception of an upward trend for credit claims from early 2012 to late 2013, which has since abated. This suggests that the ESCF has successfully stabilised the average potential and actual risk exposure of the Eurosystem per euro of credit granted by the Eurosystem over these years.¹³ This notwithstanding, the residual risk exposure of the Eurosystem did change over the period, in particular because haircuts were adjusted periodically, not continuously. These considerations are further explained in Section 6.

¹² See ECB (2015) for an overview of the Eurosystem's risk control framework.

¹³ The calculation, which relies on average haircuts, does not take into account changes in risk exposure which may arise from increases or decreases in risk correlations across assets or between assets and counterparties. Such effects are, however, taken into account and, where relevant, addressed by the ECB when it regularly reviews its risk control framework for the ESCF.

Figure 5

Average haircuts for eligible and mobilised marketable assets



Source: ECB and own calculations.

Notes: Weighted average haircuts are computed based on nominal values (outstanding and submitted). The third series includes the haircut add-ons introduced in January 2015 for own-used covered bonds (which replaced the valuation markdowns previously applied to covered bonds when more than 75% was own used).

Last observation: 29 September 2016.

Figure 6

Average haircuts for mobilised non-marketable assets



Source: ECB and own calculations.

Notes: Weighted average haircuts are computed based on nominal values. The chart includes ACCs, which partly explain the higher average haircuts since 2012.

Last observation: 29 September 2016.

These three main results confirm the expectations held when designing and implementing the collateral framework and changes to it. However, the number of in-depth studies on the topic remains limited, especially when considering the range of possible research topics and the breadth of available data. At the same time, some other central banks have considered (i) moving in the direction of a single list collateral framework across the various types of credit operations, or (ii) a broad collateral framework spanning various asset classes, or (iii) more transparency about collateral. Against this background, it is to be welcomed that the ESCF has recently drawn more attention, including critical comments. The remainder of the article

describes and addresses some of these critical comments and thereby explains how the ESCF works.

4 Views on the general provisions of the ESCF

Over the years, in particular since the start of the global financial crisis, academics, researchers and reporters have commented on multiple aspects of the ESCF, ranging from its design to its implementation. These contributions have provided useful compendia of the changes to the ESCF and insightful analysis on the implications of such changes for the markets and the economy as a whole. Nevertheless, at the same time, on more than one occasion commentators have criticised the ESCF on various grounds. Sometimes, such criticisms have been presented with only partial evidence or have described the potential effects in a biased or hyperbolic way. Moreover, several contributions have presented lines of reasoning which result from misconceptions or incomplete analysis.

The following three sections aim at clarifying some of the ESCF's provisions which have been criticised and offering alternative views based on day-to-day experience with the ESCF. In most cases, a feature of the ESCF is claimed to have some negative consequences. Despite various qualifications, these negative consequences can broadly be stated as having three broad implications: financial market distortions, impairment of market discipline, and central bank risk-taking. As such implications are frequently claimed to stem from more than one of the ESCF's specifications, the implications are first presented and discussed in this section. The various criticisms will then be addressed in Sections 5 to 7, where the issues are ordered not according to their effects but according to where in the ESCF they allegedly occur.

4.1 Does the ESCF “distort” financial markets?

Some authors argue that wrongly defined collateral frameworks, which in their view include the ESCF, introduce distortions in financial markets and the wider economy (e.g. Nyborg, 2016a). To address this point, one needs to better qualify what qualifies as a “distortion” in this context. There seem to be three perceived distortions caused by central bank collateral frameworks.

First, the existence of a central bank and its readiness to supply currency in an “elastic” way and to provide credit to individual banks will of course make a difference. As stated in Section 2.3, the central bank has unlimited liquidity and banks consider a central bank as a credit risk-free counterparty. Both features make central banks unique and allow them to engage in activities which other economic entities cannot easily engage in. Usually, from studying the history of central banking and financial markets (as summarised e.g. in Bagehot, 1873), one would think that the central bank adequately performing its LOLR functions would have the effect of improving welfare. These effects impact the financial system and the economy, but in a positive sense, which does not qualify them as ‘distorting’.

A second perception of distortion could relate to the fact that the ESCF is broader than the standard interbank collateral set. But again, does this constitute a distortion? As mentioned in Section 2, the central bank is a risk-free entity and not subject to liquidity risk. Therefore it can hold collateral after counterparty default for a longer time period, without the need to sell into the worst market conditions that may typically prevail in the context of a significant counterparty default. These unique characteristics of central banks imply that it would be abnormal for the central bank to impose upon itself a collateral set that might be the right one in a very different context. This would appear ad hoc and more 'distortive' than acknowledging and applying central banks' idiosyncratic privileges.

Third, and maybe this is simply another perspective on the previous point, it may be argued that accepting illiquid or less than top-rated collateral is distortive because it increases the demand for these assets, which reduces spreads towards highly liquid assets. However, the evidence on the impact of central bank eligibility on asset prices suggests relatively limited and/or temporary effects.¹⁴ Moreover, the premia on eligible versus non-eligible assets will fall when the collateral set is increased. This would suggest that a broader collateral framework is less distortive than a narrow one, as the status of being eligible or not as central bank collateral tends to become less relevant for the value of the asset. Moreover, a broader collateral framework gives more room for counterparties to select the assets which they use when borrowing from the central bank. This can help alleviate pressure arising in collateral markets when collateral demand or velocity change.

4.2 Does the ESCF impair market discipline or create moral hazard?

According to some authors (e.g. Nyborg, 2016a; Sinn, 2014) some ESCF specifications impinge on market discipline. It is true that a supportive LOLR makes it possible to avoid a situation where deposit outflows or a temporary inability to roll over debt lead to default of a bank. The absence of an LOLR will therefore make banks extremely prudent, i.e. banks will take an extremely conservative liquidity risk approach, which could be interpreted as a positive effect of market discipline. At the same time, it would be very costly for banks to hold capital and liquidity buffers high enough to fully insulate themselves from liquidity risk, thus potentially impinging on bank lending activities and, eventually, the economy at large. However, a restrictive LOLR approach, even if providing incentives for a restrictive maturity and liquidity transformation by banks, does not imply the absence of runs and liquidity-induced default (with the associated social costs), in particular in a systemic crisis, as history has illustrated on various occasions (see for example Bignon and Jobst, 2017).

The potential undermining of market discipline by the ESCF should be put into perspective. The balance sheets of credit institutions established in the euro area amount to around EUR 30 trillion. The liquidity deficit in the euro area banking

¹⁴ See e.g. Bindseil and Papadia (2006), Ashcraft et al. (2011), Corradin and Rodriguez-Moreno (2016).

system towards the Eurosystem is around EUR 0.5 trillion. Therefore the Eurosystem, under normal circumstances, finances less than 2% of bank balance sheets. Some banks have over-proportional recourse to the central bank. There have been cases of stressed banks financing up to or even above 10% of their balance sheet temporarily through the central bank. This reflected the readiness of the Eurosystem to act as LOLR and the lower cost of refinancing at the central bank compared with market funding, as explained in Section 2.8. Of course, both markets and supervisors particularly focus on these banks, which tend to be under high pressure to demonstrate that this is temporary and that they can normalise their liability structure again. In other words, market discipline will always continue to apply, as even the banks relying heavily on the central bank will still have 90% of their funding in other forms. In addition, banks have every incentive to try to stabilise this funding and expand it for the sake of reducing central bank credit to more normal levels. In fact, the elasticity of central bank credit will only help to smooth out short losses of market access, but it will not change the solvency perception of a bank and therefore will not eliminate market discipline. In extreme cases of overreliance on central bank borrowing and, therefore, increased likelihood of undesirable effects (see more in Section 5.2), the central bank could implement an over-proportional borrower framework which applies a surcharge once participation exceeds a given threshold (Bindseil, 2016).

4.3 Is the ESCF insufficient to protect the Eurosystem?

Several contributions point to the financial risks the ESCF creates for the Eurosystem (in particular Sinn, 2014, but not only). In this respect, the following two considerations are also relevant, and again would allow for a more comprehensive assessment of the relevant trade-offs.

First, also central banks with a relatively broad collateral framework have not experienced losses during the financial crisis that started in 2007, which is even more remarkable as this global financial crisis is considered to have been the worst for 80 years.¹⁵ One could argue that while “moral hazard” and “undermining market discipline” are concepts that are difficult to measure, central bank losses are measurable, and they have been immaterial throughout all central banks of advanced countries. This suggests that supportive collateral framework decisions by central banks do not necessarily lead to higher risk taking or that such risks have not yet materialised.

Second, riskiness of central bank exposures (such as exposures measured in probabilities of default) is endogenous to central bank collateral decisions, particularly in times of crisis. A more restrictive collateral framework (or a general refusal to act as LOLR) may intensify a financial collapse in a way that eventually leads to more central bank losses through the downturn of the economy as a whole than those which would have materialised if the LOLR had been available. It is

¹⁵ This is partly attributable to actions by governments to support failing banks.

plausible that this situation applied during the recent crisis years. Bindseil and Jablecki (2013) illustrate the case in a simple LOLR model. This risk endogeneity issue has been known about for a long time (as already Bagehot stated that sometimes “only the brave plan [of the central bank] is the safe plan” for it).

In the following three sections, critical comments will be reviewed not according to these three categories of alleged distortive effects, but according to the concrete misspecifications that the commentators perceive. Again, three broad categories were identified, namely perceived misspecifications relating to: (i) eligibility of collateral (Section 5); (ii) valuation and haircuts (Section 6); (iii) the implementation of collateral rules and transparency (Section 7).

5 Views on the ESCF eligibility criteria

A number of commentators consider that the ESCF's set of eligible assets is excessively broad. In the following, this paper will discuss and challenge the key arguments brought forward in connection with this claim one by one.

5.1 Which asset classes should the Eurosystem accept?

Commenting on the different asset classes eligible as collateral with the Eurosystem, Sinn (2014) seems to suggest that only corporate bonds would be suitable collateral. In a quick review of the different asset classes, government bonds are considered as “a convenient process for indirect government financing” (Sinn, 2014, 157), ABSs as a “mix of dubious claims that would otherwise have been difficult to pledge as collateral on their own” (Sinn, 2014, 159), secured and unsecured (bank) bonds as a “strange aspect of the collateral policy” (Sinn, 2014, 160) and credit claims of banks towards non-financial corporates as “a major tool of expanding refinancing credit, and in fact [...] the collateral category showing the greatest dynamism” (Sinn, 2014, 164). By exclusion, the author seems to suggest that corporate bonds are the only non-problematic asset class eligible in the ESCF. However, relying exclusively on corporate bonds in the ESCF would have a number of drawbacks:

- It is a relatively illiquid asset class and small in terms of market size. It constitutes less than 5% of the list of eligible securities (EUR 1.4 trillion) as illustrated in Figure 3 (non-financial corporates are within the third liquidity category in the Eurosystem's classification).
- It would create concentration risks to only rely on one type of collateral.
- The fact that over the last few years the corporate sector performed relatively well and experienced relatively few defaults does not guarantee that corporate bonds are universally a superior asset class.
- Such a narrow collateral set would distort relative securities prices: if corporate bonds were the only type of eligible collateral, they would be traded at a possibly significant eligibility premium relative to other asset classes.

As pointed out in Section 3, the broad set of collateral accepted within the Eurosystem was initially dictated by the need to ensure a smooth transition from many different collateral frameworks across the euro area to a more homogenous single list and by the great variety of counterparties allowed to participate in the Eurosystem's credit operations. In other words, the breadth of the collateral framework (and related mobilisation) is a function of the range of the Eurosystem's counterparties and their expected refinancing needs. On this point, Müller et al. (2016) show that the collateral stock can be (partly) forecast using the refinancing volume, but not vice versa, implying that collateral submission is adjusted in anticipation of refinancing operations. Subsequently, in times of crisis, the expanded

set of accepted collateral reflected the heterogeneity in access to credit across the euro area. Such expansion was essential for the central bank to perform its LOLR role across the euro area and explains why the rating requirement was relaxed in 2008 despite the “*excess of eligible collateral*” (Nyborg, 2016a, 81) available at aggregate level, as explained in Section 2. Therefore it is no surprise that changes to the collateral framework “*at times coincide with important (un)conventional monetary policy initiatives*” (Nyborg, 2016b, 12).

More generally, central banks’ collateral frameworks should not be examined as stand-alone frameworks, but within the overall operational framework of each central bank. Larger collateral pools are needed when commercial banks need to hold large required reserves at the central bank and where there is a large structural liquidity deficit (Chailloux et al., 2008).¹⁶ In addition, the weight of temporary operations within a central bank’s operational framework affects the breadth of the collateral framework. When temporary operations get larger vis-à-vis the size of the domestic government bond market (to which commentators sometimes suggest the collateral framework should be limited), as in the case of the Eurosystem, or when collateral velocity in the market is rather low, eligibility of collateral needs to be expanded to private sector securities or non-marketable assets. Otherwise, exclusive reliance on government bonds could engender collateral shortage and bid up prices of eligible bonds (Cheun et al., 2009).

Moreover, both Sinn (2014) and Nyborg (2015) wrongly classify a number of assets they refer to. For example, the Eurosystem has never accepted “*deposits of public sector entities or of international and supranational institutions as collateral*” (Sinn, 2014, 164). The Eurosystem has only accepted as collateral fixed-term deposits of eligible counterparties with the Eurosystem.¹⁷ Some inaccuracy in asset classification is also found in Nyborg (2015, p. 17), where ‘other marketable assets’ are considered lower quality collateral.¹⁸ In fact, other marketable assets include debt issued by supranational issuers (multilateral development banks or international organisations) and agencies (both credit and non-credit institutions), which tend to have a high credit rating and relatively high liquidity.

5.2 Does the breadth of the ESCF impair market discipline?

Nyborg (2015, 2016a) strongly claims that several features of the ESCF would impinge on market discipline. For example he argues that “*there is vastly more eligible collateral than what is needed in aggregate*” and that “*it is unclear this is optimal*” (Nyborg, 2016a, p. 179).

¹⁶ During the crisis, despite a reduction in required reserves, the liquidity deficit stayed large due to autonomous factors.

¹⁷ These deposits constituted a liquidity-absorbing instrument in the context of liquidity-absorbing operations conducted between May 2010 and June 2014, which sterilised asset purchases under the Securities Markets Programme (SMP). As Eberl and Weber (2014) rightly point out, a haircut of 0% is applied to these deposits as they are cash-equivalent liquid assets.

¹⁸ This was subsequently corrected in Nyborg (2016a, p. 52).

Consider two extreme scenarios. On the one hand, the most LOLR-supportive collateral framework accepts all assets of banks as collateral at fair values and provides central bank credit via fixed-rate full allotment tender operations. This would imply that no solvent counterparty could ever default for liquidity reasons. On the other hand, in the least LOLR-supportive collateral framework, the central bank implements monetary policy only against the most liquid, risk-free assets,¹⁹ covering its asset side through outright holdings of the risk-free asset.²⁰ With this collateral framework, banks have no discretionary access to the central bank at all to close possible funding gaps, i.e. the collateral and operational frameworks have zero LOLR content. Why then would central banks not want to choose the least LOLR-supportive collateral framework, as this framework would appear to maximise market discipline and minimise both the banks' scope for both moral hazard and the central bank risk-taking?

As recalled in Section 4, there is extensive literature explaining why central banks should to some extent provide elastic credit to individual banks and allow solvent banks to fill under some conditions temporary funding gaps with central bank credit. From an ex post perspective, the central bank in its LOLR function avoids welfare-destroying runs on solvent banks (see Bindseil, 2013).²¹ More generally, elastic central bank credit (which needs to rely on a sufficiently broad collateral set) makes it possible to enhance financial stability and reduce the frequency and/or extent of financial crises with their disruptive effects on growth and welfare. This interpretation is at odds with that provided in Nyborg (2016a), where, analysing potential implications of central banks' acceptance of illiquid collateral from a financial stability standpoint, the author claims that "*a central bank that favours illiquid collateral may end up promoting investments in illiquid real assets, such as housing*" and that the promotion of liquid assets "*stands in sharp contrast to the policy pursued by the Eurosystem*" (Nyborg, 2016b, p. 3).

From an ex ante perspective, the anticipation by banks that a somewhat supportive collateral framework provides for additional buffers preventing bank runs allows banks to provide more maturity and liquidity transformation as services to society. Indeed, this is one of the reasons why banks exist. In the most restrictive collateral framework, households will have to accept that they have to hold more long-term and less liquid assets, and the real economy will have to accept that financing of long-term projects is scarce and more expensive. As a consequence, growth and social welfare will be lower.

At the same time, the most LOLR-supportive collateral framework may have at least some of the following drawbacks:

¹⁹ Think of central government paper or highly liquid AAA-rated paper.

²⁰ It may also conduct at the margin some repos against risk-free assets, but in a bilateral way in which it chooses its counterparties and always goes for the most secure ones.

²¹ Bindseil (2013) shows that in the case of a run, the bank needs to be liquidated and fire sale losses are incurred by society, whereas if the run can be avoided thanks to available central bank credit buffers, the viable and solvent bank can continue to operate. As the run is avoided, additional credit from the central bank is not necessarily used, i.e. the existence of collateral buffers is in itself sufficient to switch the equilibrium to a no-run one.

- Zombification: unless the supervisor can fully substitute market discipline, unviable banks or less efficient banks will be able to operate for longer. It is unlikely that supervisors can fully substitute for market discipline, since, as Hayek (1945) noted, knowledge in society is decentralised, and the market contributes to the aggregation of information in an effective way. At the same time, market discipline is not fully undermined under the most supportive collateral framework: equity holders always have an incentive to monitor the bank, and equity prices will continue to reflect a bank's performance. Also, bond holders can lose out if the bank turns out to be insolvent and is closed by supervisors. Therefore bond holders and depositors should also remain alert.
- Moral hazard and risk taking: bank managers may try to exploit the weaker market discipline.
- Impairment of central banks' balance sheet: without haircuts, the central bank takes risks. Even a correct valuation at the time of counterparty default does not protect the central bank against a deterioration of collateral value until the collateral is liquidated. Moreover, there will be cases where the valuation was inaccurate. The fact that mistakes are ex ante unbiased does not imply that expected returns from collateral liquidation are also unbiased, as possible profits have to be handed over to the insolvency administrator of the defaulted bank.
- Financial instability: under the most supportive collateral framework, problems could build up for longer, possibly spilling over beyond the banking system. By contrast with a less extreme approach, this may weaken financial stability. Here again, however, the risks to financial stability may be addressed through bank supervision and macro-prudential policy. Supervisory requirements related to banks' liquidity positions play an important role in this respect.

In sum, the optimal collateral framework will be an intermediate one, i.e. neither the most nor the least LOLR-supporting collateral framework, as outlined above. Discussing the optimal collateral framework requires looking at both sides, so as to obtain the relevant trade-offs which are the basis for finding an optimal collateral framework.

5.3 Is the Eurosystem promoting low quality collateral?

One of the main weaknesses of the breadth of the ESCF, some authors argue, is the quality of the collateral accepted. Nyborg (2015, p. 18) argues extensively about the "promotion of lower quality collateral" by the ESCF. Similarly, Eberl and Weber (2014) point to the qualitative broadening of the collateral pool as being "in contrast to Bagehot's call for good collateral". First, it is important to distinguish between the concepts of "quality" and "liquidity", which the authors do not always do. "Quality" is typically associated with the creditworthiness ("credit quality") of an issuer and related market risks, i.e. risks of adverse movements in the market valuation of an asset. To address quality concerns, central banks usually apply a number of risk

control measures, as explained in Section 2.7. These include higher haircuts to eligible assets of lower credit quality and to assets of lower liquidity aiming at risk equivalence across eligible assets. In the case of relatively liquid investment grade assets, the bulk of haircuts cover for market risks.²² Table 4 provides examples of the range of haircut schedules applied to different asset classes. Within each haircut schedule, credit quality steps (CQS),²³ which represent the maximum probability of default of a given level over a one-year horizon,²⁴ classify assets in terms of credit quality. The table illustrates the strong differentiation of haircuts across liquidity and credit quality.

Table 4

Examples of haircut schedule ranges applied by the Eurosystem to different asset classes as of 31 January 2017

	Credit quality	Minimum haircut	Maximum haircut
Marketable assets ¹⁾	CQS 1-2 ("AAA – A")	0.5%	25.5%
	CQS 3 ("BBB")	6%	38%
Credit claims (fixed interest payments) ²⁾	CQS 1-2 ("AAA – A")	12%	45%
	CQS 3 ("BBB")	19%	63%
Additional credit claims (ACCs) (minimum haircut schedule) ^{* 3)}	CQS 1-2 ("AAA – A")	12%	45%
	CQS 3 ("BBB")	19%	65%
	CQS 4 ("BB+")	42%	80%
Greek government-related bonds after reinstatement of the waiver ⁴⁾	CQS 5 ("BB")	54%	85%
	Government bonds	15%	71%
	Government-guaranteed bonds	23%	81%

* Example of the application by the Central Bank of Ireland. ACCs' eligibility and risk control measures are established by NCBs, as laid down in the Guidelines of the ECB (ECB/2014/31) of 9 July 2014 on additional temporary measures relating to Eurosystem refinancing operations and eligibility of collateral.

Sources: 1) Guideline ECB/2015/35, as amended by Guideline 2016/32, Annex , Table 2; 2) Guideline ECB/2015/35, as amended by Guideline ECB/2016/32, Annex , Table 3²⁵;

3) <http://www.centralbank.ie/mpolbo/mpo/Documents/Supplementary%20Documentation%20on%20Monetary%20Policy%20Instruments%20and%20Procedures%202014.pdf>;

4) Decision (EU) 2016/1041 of the ECB of 22 June 2016 on the eligibility of marketable debt issued or fully guaranteed by the Hellenic Republic and repealing Decision (EU) 2015/300, Annex²⁶.

That credit quality and liquidity should not be mixed up is illustrated further by the fact that the two are only loosely correlated. To take an important example in the context of the Eurosystem collateral framework, the credit quality of Italy is in the BBB area, but the Italian government bond market is among the most liquid euro area bond markets. There is a very high number of AAA-rated private assets (ABSs, covered bonds) which have a much lower liquidity than Italian government bonds. As

²² Credit risk, intended as default risk of an asset's issuer during the liquidation period after default of the counterparty, is negligible for most eligible marketable assets.

²³ Guideline (EU) 2016/65 of the ECB of 18 November 2015 on the valuation haircuts applied in the implementation of the Eurosystem monetary policy framework (ECB/2015/35), OJ L 14, 21.1.2016, p. 30.

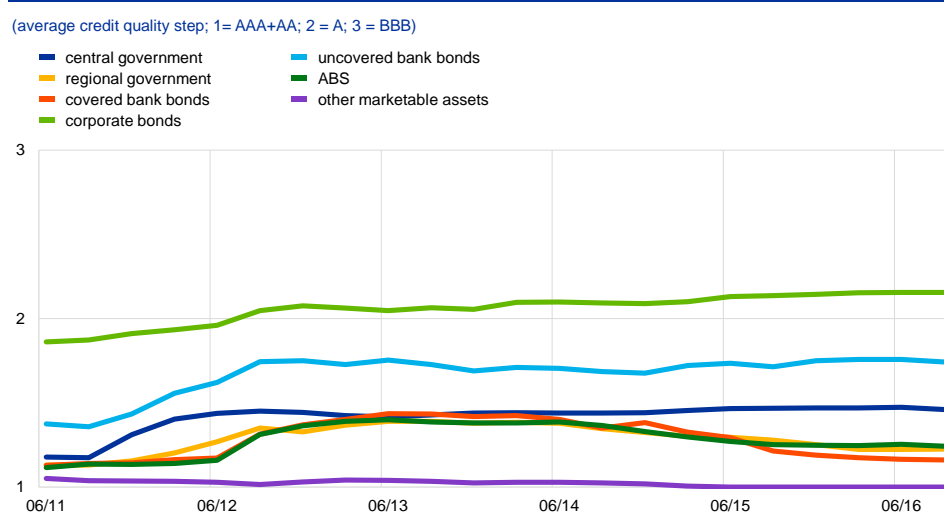
²⁴ For example CQS 2 corresponds to the maximum probability of default of 0.10% over a one-year horizon.

²⁵ Guideline (EU) 2016/2299 of the ECB of 2 November 2016 amending Guideline (EU) 2016/65 on the valuation haircuts applied in the implementation of the Eurosystem monetary policy framework (ECB/2016/32), OJ L 344, 17.12.2016, p. 117.

²⁶ Decision (EU) 2016/1041 of the ECB of 22 June 2016 on the eligibility of marketable debt instruments issued or fully guaranteed by the Hellenic Republic and repealing Decision (EU) 2015/300 (ECB/2016/18), OJ L 169, 28.6.2016, p. 14.

illustrated by Figures 7 and table 5, the average credit quality of both covered bonds and ABSs is higher than that of central government debt in the euro area, while their liquidity is lower, as reflected in their classification in haircut categories 3 and 5, respectively.²⁷ Assuming a counterparty defaults, the likelihood of a government default during the typically short liquidation period is practically negligible compared with a private issuer. Figure 7 also illustrates the evolution of the different eligible asset categories' credit quality over time. The average credit quality of corporates, banks and sovereigns deteriorated in particular during 2011-12 in the context of the further spread of the sovereign debt crisis.

Figure 7
Weighted average credit quality step, by asset class



Sources: ECB and own calculations.
Note: Data are based on quarterly averages.
Last observation: 2016 Q3.

Table 5
Weighted average credit quality step by asset class

Asset class	Haircut category	2011	2013	2016
Central government	I	1.18	1.42	1.47
Regional government	II	1.13	1.39	1.22
Other marketable assets	II	1.05	1.04	1.00
Covered bank bonds	II (Jumbo) / III (traditional)	1.13	1.44	1.16
Corporate bonds	III	1.86	2.05	2.16
Uncovered bank bonds	IV	1.37	1.75	1.76
ABS	V	1.12	1.40	1.25

Sources: ECB and own calculations.
Notes: Table's values refer to the June value of the respective year. Haircut categories are defined in Guideline ECB/2015/35, 2016/65, Art. 2. (as amended by Guideline ECB/2016/32).

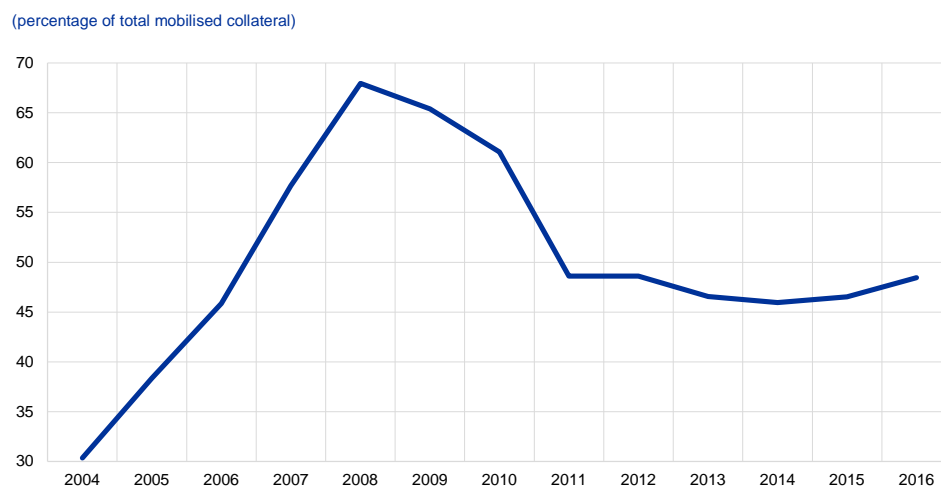
Turning to liquidity, the Eurosystem's share of less liquid mobilised collateral increased during the financial crisis, reaching a peak in 2008-09 before gradually

²⁷ See Guideline ECB/2015/35, as amended by Guideline ECB/2016/32,, Article 2 and Table 1 in the Annex.

decreasing afterwards, albeit remaining above pre-crisis levels (Figure 8). Such mobilising of less liquid collateral with the central bank was the direct consequence of a shortage of liquidity in the interbank market, where, as explained above, only the most liquid securities tend to be accepted as collateral. In other words, as the banks' opportunity cost of pledging more liquid securities with the central bank increases in times of crisis, banks have an incentive to refinance the most liquid assets on the repo market (at a lower rate than the central bank rate) and mobilise more illiquid assets with the central bank, as these latter have little or no alternative use during a crisis. Chailloux et al. (2008) refer to this phenomenon as "Gresham's law of collateral". However, the general claim that the Eurosystem collateral framework introduces "a bias which increases over time through banks' creating illiquid collateral to take advantage of the good terms on such collateral on offer in Eurosystem repos" (Nyborg, 2015, p. 30) is not confirmed by the evolution of eligible assets data.

Since 2008, eligible covered bank bonds (which partially²⁸ are among the most liquid private assets, in particular jumbo covered bonds) increased by less than 10% in nominal value, while both uncovered bank bonds and ABSs (less liquid categories) decreased, by around 10% and 40% respectively. In comparison, the more liquid central/regional government securities and corporate bonds increased by around 50% (Table 6). The absence of an adverse effect can also be seen in the amounts of collateral used by counterparties (see Figure 3).

Figure 8
Share of mobilised collateral belonging to less liquid asset classes collateral



Source: ECB and own calculations.
Notes: Asset classes defined in the chart as less liquid are uncovered bank bonds (IV), asset-backed securities (V) and non-marketable credit claims. The aggregation does not control for idiosyncratic cases of assets belonging to the more liquid categories, which might become less liquid over a specific period of time. Data are based on yearly averages.

²⁸ One could argue that liquidity is lower when the share of own-use covered bonds mobilised vis-à-vis the total issue outstanding is significant.

Table 6

Growth in eligible assets' nominal value outstanding, 2008/2016 (Q3), by asset class

Asset class	Haircut category	Growth in nominal value outstanding
Central government	I	50%
Regional government	II	43%
Other marketable assets	II	52%
Covered bank bonds	II (Jumbo) / III (traditional)	9%
Corporate bonds	III	52%
Uncovered bank bonds	IV	-7%
ABS	V	-40%

Sources: ECB and own calculations.

The Eurosystem is legally bound to refrain from special treatment of sovereign issuers compared with private issuers. If the ESCF limited itself to highly liquid assets, it would be biased towards sovereign paper, which obviously is more liquid. Doing so would also likely be criticised by those who occasionally argue that the Eurosystem tends to adopt policies that support a bail-out of stressed sovereigns. For example, Sinn (2014) speaks about indirect state financing when referring to bonds issued or guaranteed by the Greek government.

Moreover, the Eurosystem groups assets in haircut categories and credit quality steps in a way which balances simplicity and precision. Simplicity requires a small number of categories/steps. For the sake of precision, a different category/step is required where risk exposures significantly differ. Based on this trade-off, five haircut categories and three credit quality steps are currently applied.

5.4 Is the Eurosystem credit assessment framework (ECAF) properly designed?

Nyborg (2016a, p. 132) casts doubts on whether the ECAF's design is optimal, in particular regarding the ratings selection necessary to determine the asset's eligibility. In analysing the pivotal roles of some rating agencies with regard to ESCF's eligibility the author concludes: *"That one rating agency can have such a large impact is the result of the rating within the Eurosystem's collateral framework being determined by the highest external rating rather than, for example, an average"*.

However, it should first be noted that even under an average rating approach, the rating decision of one rating agency can be pivotal for eligibility (as the decision by one agency can influence the average rating by moving it either below or above the threshold).

Second, while it is true that an average rating aggregates the information content of ratings more efficiently than a first best rating rule, one would not expect the effect of switching from one rule to the other to lead to a general tightening of collateral policies, assuming that before such a switch, the central bank was satisfied with the effective level of the credit quality requirement imposed by its credit assessment framework. Therefore, the switch would need to be considered in conjunction with the level of the rating threshold.

Third, the performance of rating agencies is assessed on a regular basis. If one rating agency is an outlier in terms of the default or migration probability of its ratings, then the mapping of the rating scale of that rating agency into the ECB internal rating scale is changed. In any case, the Eurosystem regularly monitors its ECAF to ensure high credit standards for all eligible assets, including different ratings aggregation options. Alternatives have been analysed and, at times, applied. For example, the second-best rule has been applied to ABSs since 2010. The author correctly points out, for example, some consistency issues that could have arisen in the past for similar bonds over the way issuer and issue ratings, and ratings from different rating agencies were aggregated (Nyborg, 2016a, p. 115-117). However, as the author points out, this inconsistency is no longer possible following a new rule introduced in December 2014, whereby issue ratings do not count towards the decision on the haircut for sovereign bonds²⁹.

In a detailed description of developments in ratings acceptance in the ESCF, Nyborg (2016a, p. 106) reports that “if the issue does not have a long-term rating from one of the approved agencies, one looks at the external rating of the issuer and, if applicable, the rating of the guarantor. The highest of these is then picked to determine the rating of the issue.” To be precise, the Eurosystem credit assessment framework in force in 2007 stipulated that, should the issue not have a long-term rating, an issuer rating could be used instead. Only in the absence of an acceptable issue rating could high credit standards be established on the basis of guarantees provided by financially sound guarantors. The first-best rule (i.e. best available external credit assessment institution (ECAI) credit assessment) was applied when multiple and possibly conflicting ECAI assessments were available for the same issuer/debtor or guarantor. Hence, at the time (pre-crisis) guarantees could not override issue or issuer ratings.³⁰

²⁹ Decision of the ECB of 1 September 2014 amending Decision ECB/2013/35 on additional measures relating to Eurosystem refinancing operations and eligibility of collateral (ECB/2014/38), OJ L 278, 20.9.2014, p. 21. Repealed.

³⁰ The rules have changed in recent years, in particular in the following ways: (i) for ABS, only ECAI issue ratings are considered; for marketable assets issued by central governments, regional governments, local governments, agencies, multilateral development banks or international organisations, only ECAI issuer ratings and ECAI guarantor ratings are considered; and for other marketable assets, ECAI issuer ratings and ECAI guarantor ratings may be considered in the absence of any ECAI issue rating. These changes were prompted not by deficiencies in the previous rule but instead by the observation of which rating types are more available and more relevant for the various asset classes.

5.5 Why does the Eurosystem accept private rating models?

Speaking about private ratings models, Nyborg (2015, p. 29) argues that they “pose a potential problem. Given the abundance of eligible collateral on the public list, it is an open question as to why privately eligible collateral is allowed”. The Eurosystem accepts NCBs’ in-house credit assessment systems (ICASs), counterparties’ internal rating-based systems (IRB) and third-party rating tool providers (RT) as private credit assessment sources.³¹ These sources are mostly used for assessing non-marketable assets (to be) submitted as collateral for which no external ratings exist. Therefore, their role is more limited than that of the ECAs, given the share of non-marketable assets pledged as collateral with the Eurosystem. Before a new system is accepted, a number of requirements (regulatory and operational) need to be met. For example, IRB systems have to be authorised for capital requirements purposes by the relevant banking supervisor.³² Moreover, to monitor their performance, the Eurosystem conducts due diligence on all credit assessment systems through the “ECA performance monitoring process”. Overall, while ECAs represent by far the largest source of credit assessment within the Eurosystem, the increase in the number of ICASs in recent years and the ongoing enhancement of due diligence aim at further reducing the Eurosystem’s reliance on credit rating agencies.³³ Of course, this is accompanied by regular data quality checks to dynamically assess also the performance of credit assessment systems other than credit rating agencies, which are not necessarily superior.

5.6 Why does the Eurosystem accept marketable assets admitted to trading on certain non-regulated markets?

The acceptance of certain non-regulated markets - in accordance with the three principles of safety, transparency and accessibility contributes to the establishment of a level playing field among regulated and certain non-regulated markets that are considered acceptable by the Eurosystem. This, in turn, contributes to expanding the potential amount of eligible collateral. However, the acceptance of specific non-regulated markets is at times surrounded by scepticism, as in the view of some commentators it would unduly broaden the collateral framework. Nyborg (2015, p. 25), for example, argues that “in the run-up to the second three-year LTRO, the ECB weakened collateral eligibility criteria by admitting 10,516 securities trading on non-regulated markets to the public list of eligible collateral”. Hence, Nyborg (2016a, p. 179) concludes that one would expect “prices in such markets to be fairly unreliable”³⁴ and that this “is strong support for the thesis that market forces and discipline are not central pillars of the Eurosystem’s collateral framework”. On 21 September 2011, the Eurosystem communicated changes to its general collateral

³¹ Guideline ECB/2014/60, Article 119(1).

³² Guideline ECB/2014/60, Article 122(3).

³³ ECB (2015). The financial risk management of the Eurosystem’s monetary policy operations, Section 2.3.

³⁴ Also see Section 6.4.

framework³⁵ which became effective in January 2012. Among those changes, the Eurosystem abolished the eligibility requirements that debt instruments issued by credit institutions, other than covered bank bonds, had to be admitted to trading on regulated markets. However, the Eurosystem correspondingly amended its risk control measures, that is, it reduced the limit for the use of unsecured debt instruments issued by a credit institution or by any other entity with which the credit institution has close links.³⁶ The threshold for the use, initially set at 10% in 2009, was subsequently reduced to 5% in 2012 and to 2.5% as of 1 January 2017.³⁷ These measures became later part of the permanent collateral framework after their introduction as temporary measures as early as 2008. Hence, these changes to the collateral framework aimed at permanently ensuring a level playing field for collateral purposes and expanding the potential amount of eligible collateral once the principles of safety, transparency and accessibility are met. They were de facto independent of the subsequent decision to allot the two three-year LTROs in December 2011 and February 2012, these latter being temporary non-standard measures. This is confirmed by the fact that the acceptance of uncovered bank bonds traded on non-regulated markets was not pivotal for any bank which participated in either of the two three-year longer-term operations.³⁸ Going forward, the current rules may be reviewed, in particular in light of the changes in regulatory definitions and practices for regulated markets, which have gone in the direction of more harmonisation and standardisation at EU level in recent years. Indeed, it may be possible for the Eurosystem to rely solely on regulated markets and recognised trading venues at some point in the future. This would make the category “acceptable non-regulated markets” redundant and would be a simplification of the ESCF.

5.7 What is the role of government guarantees?

Nyborg (2015, p. 29) states that “*government guarantees reduce the role of markets and potentially enhances the role of politics*”. Government guarantees are a legitimate instrument to increase, among others, the credit quality of securities issued by liquidity constrained solvent banks. Their role acquired particular relevance in the aftermath of the Lehman Brothers bankruptcy, when euro area governments made guarantees available by means of a coordinated action and on a larger scale

³⁵ See the [press release](#); the Guideline of the ECB of 20 September 2011 on monetary policy instruments and procedures of the Eurosystem (recast) (ECB/2011/14), OJ L 331, 14.12.2011, p. 1. which is a predecessor of the currently applicable Guideline ECB/2014/60.

³⁶ ‘Close links’ are defined as the counterparty owning shares of 20% or more of the other entity or vice versa. Moreover, a close link exists also when a third party owns 20% or more of the counterparty and 20% or more of the other entity.

³⁷ The latest adjustment of the collateral eligibility criteria as regards certain unsecured debt instruments was triggered by the implementation of the EU Bank Recovery and Resolution Directive (BRRD).

³⁸ Considering ex post the participation in the two operations of banks which posted uncovered bank bonds trading on a non-regulated market, the amount of collateral of different nature posted in their collateral pool would anyway have been sufficient to collateralise the two operations. Hence, no bank which posted any uncovered bank bonds trading on non-regulated markets would have been prevented from participating in the three-year longer-term operations had uncovered bank bonds trading on non-regulated markets not been accepted.

with the aim of preserving the capital market access of banks.³⁹ Nyborg (2015) focuses his analysis on Italian government guarantees. It is true that in Italy the number of credit institutions which issued government-guaranteed bank bonds (GGBBs) increased rapidly to 250, in correspondence with the date of the allotment of the second three-year LTRO, and that the number fell in the second half of 2014. However, as Figure 9 illustrates, the reliance on GGBBs changed over time with circumstances but always stayed moderate in relative terms (compared with the size of the banking system) and more recently has declined significantly.⁴⁰ Part of these GGBBs were own-used, a feature which turned out to be undesirable and which was therefore phased out as of 1 March 2015, with possible temporary exemptions under strict conditions.⁴¹ As a matter of fact, currently only covered bonds complying with the Capital Requirements Regulation (CRR) can be own-used with the central bank after the application of an additional valuation haircut⁴². Overall, this points to increasingly stricter rules regarding the mobilisation of own-use collateral with the central bank since the beginning of the sovereign debt crisis. To ensure the enforcement of such rules, the Eurosystem made substantial investments to set up an effective infrastructure to detect close links among institutions.

In a case study on ABSs' eligibility for the ESCF, Van Bakkum, Gabarro and Irani (2016) conclude that it increased the credit risk transferred to the state. They reached this conclusion based on the argument that a change in eligibility (lower rating threshold) gave banks more incentive to originate mortgages which ended up in arrears, in particular when mortgages were state-guaranteed. The authors' analysis, however, does not control for the role securitisation performs vis-à-vis asymmetric information. Albertazzi et al. (2015) show that securitised mortgages have a lower default probability than non-securitised ones as banks mitigate the effects of asymmetric information by securitising loans that are typically less opaque and less risky than those that stay on their books. Similar conclusions for securitised small and medium enterprises' (SME) loans can be found in Albertazzi et al. (2017). At the same time, it is important to stress that responsibility for issuing guarantees against a set of specific requirements lies with the government, not the central bank.

³⁹ https://www.ecb.europa.eu/pub/pdf/other/recommendations_on_guaranteesen.pdf

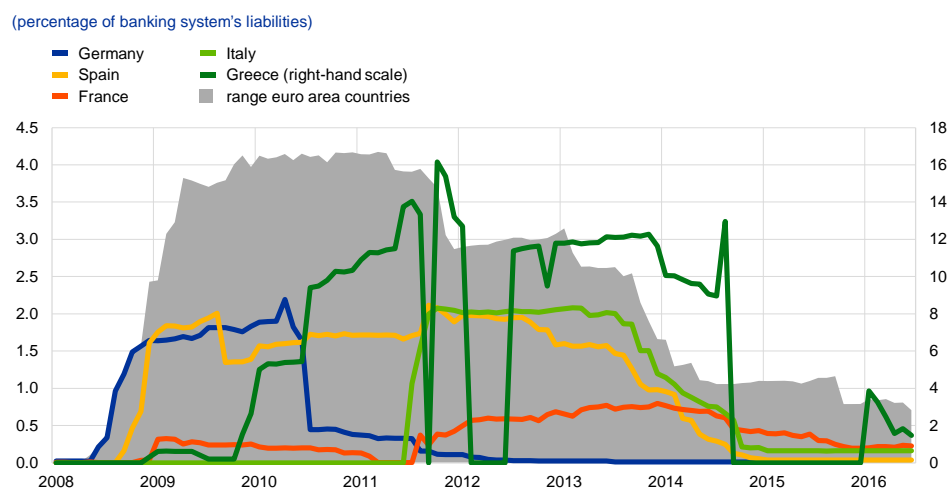
⁴⁰ With the exception of Greece, where reliance increased up to 15% during 2011 and 2012.

⁴¹ Guideline ECB/2014/60, Article 139(2).

⁴² Guideline ECB/2015/35 of the ECB, Article 4.

Figure 9

Eligible bank bonds guaranteed by central government



Sources: ECB and own calculations.

Notes: Includes Austria, Belgium, Cyprus, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Slovenia and Spain. Data include bonds issued by credit institutions, excluding public banks which have always enjoyed a public guarantee. The higher range (blue area) between 2010 and 2012 is explained by the Slovenian time series (not shown separately in the chart). An increase in Belgium during 2015-16 is due to a single issuer (i.e. due to an idiosyncratic factor) and is therefore excluded from the range.

Last observation: December 2016.

5.8 Is the temporary framework too broad and/or inadequate?

In October 2008, in reaction to the rapid deterioration of conditions in the euro area money market, the ECB announced temporary measures aimed at expanding the collateral framework to ensure the provision of liquidity to the euro area banking sector.⁴³ Moreover, in the second half of 2011, the ECB introduced a number of additional non-standard monetary policy measures to support bank lending and liquidity in response to concerns that the access of some banks to additional refinancing operations, in particular the two three-year LTROs, might have been restricted by a lack of eligible collateral.⁴⁴ In the collateral framework the two major changes to increase collateral availability related to: (i) reducing the rating threshold for certain ABSs and (ii) accepting additional performing credit claims (ACCs) satisfying specific eligibility criteria. Finally, further measures were implemented in 2012 to improve the access of the banking sector to Eurosystem operations.

Eberl and Weber (2014) and Belke (2015) suggest that the temporary framework has become a permanent feature of the ESCF. Some of these measures were indeed effectively translated into the permanent framework, as they proved to be necessary beyond their initial expiration date (e.g. the minimum credit quality threshold at BBB). Several commentators argue that such measures were generally excessive and that

⁴³ See e.g. Guideline ECB/2008/18 on temporary changes to the rules relating to eligibility of collateral.

⁴⁴ ECB (2013b), The Eurosystem collateral framework throughout the crisis.

the collateral requirements were inadequate. Sinn (2014, p. 164) states that the crisis-times ESCF set “*extremely low collateral requirements*”.

Such a general statement seems questionable for a number of reasons. First, already before the crisis, the eligible collateral set was not limited to textbook risk-free assets. Between 1999 and 2008 the Eurosystem accepted collateral of credit quality of AAA, AA, and A. In addition, in 2008, it made BBB-rated securities eligible for most types of asset types (excluding ABSs). In other words, it extended the eligible range of ratings within the investment grade category from three to four rating grades. Such an extension was, however, not a novelty among major central banks. For instance, the Federal Reserve effectively lowered the rating requirement for collateral in its open market operations to allow pledging below-investment grade securities in its Primary Dealer Credit Facility (PDCF) in September 2008 (Adrian, Burke and McAndrews, 2009). Both central banks successfully contributed to stabilising the financial system and to preserving market access for solvent banks through the broadening of the collateral set, without central bank losses.

At the same time, Sinn’s analysis is incomplete when speaking of lower collateral requirements as he does not mention the application of the risk equivalence principle through higher haircuts and lower valuations of collateral (see Section 6). Similarly, Brendel, Eberl & Weber (2015) wrongly state that the relaxation of the ESCF requirements was not accompanied by appropriate adjustments in the risk control framework to take into account the riskier nature of the enlarged set of eligible assets. The authors also claim that the fact that over time the difference between the value of eligible collateral before and after haircuts has increased confirms that the quality of the collateral has decreased. However, even in this case the authors do not consider that such an increase in value difference actually shows that on average higher haircuts are being used to restore risk equivalence. In other words, the possibly lower average credit quality of the eligible assets has been compensated for by higher haircuts, which contradicts the assertion that the Eurosystem has increased the available collateral pool without taking into account the accompanying risks.⁴⁵ Figures 5 and 6 show the general increasing trend in haircuts observed over time, in particular for non-marketable assets. Moreover, the article fails to pay due attention to a significant risk control measure, namely the daily valuation of all marketable assets. The daily valuation of assets implies that lower credit quality is also taken into account via lower valuations.

Finally, it is worth reiterating that alongside easing measures, the ECB announced over time a host of tightening measures (Eberl and Weber, 2014, 36), including: (i) significant changes in ABS eligibility and use rules, e.g. requiring a second issue rating and a homogeneous pool of underlying assets and setting requirements on liquidity support; (ii) introduction of valuation markdowns for theoretically valued covered bonds and ABSs; and (iii) introduction of add-on haircuts for covered bonds used as collateral by the issuer or a closely linked entity.

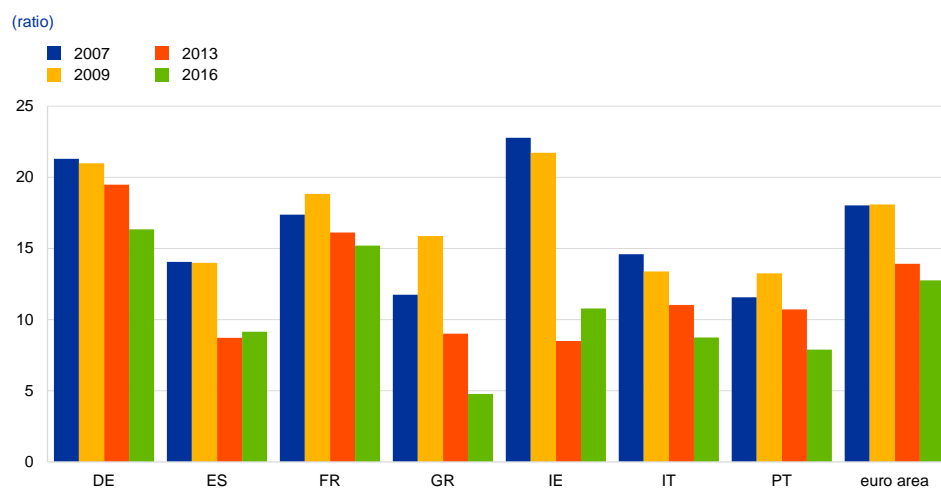
⁴⁵ There can also be other reasons for the on-average higher haircuts applied, e.g. an on-average longer maturity of the assets or a change in composition of the pool of eligible assets towards asset categories with higher haircuts.

Another clarification is needed in response to Sinn's (2014, p. 156) argument that *"the lowering of the rating requirement to triple B helped for a while, since it liberated a substantial fraction of bank assets to be used as collateral and allowed banks to acquire more such assets with fresh refinancing credit. However, even the collateral that satisfied this reduced standard was soon exhausted. The ECB reacted by reducing collateral requirements even further to allow crisis-ridden countries to draw more credit from the printing presses at the disposal of their NCBs"*. This statement must be corrected on two points.

First, the banks in *"crisis-ridden countries"* suffered losses of collateral value from loss of eligibility, higher haircuts and lower valuations. The ECB's collateral measures tended to counterbalance these effects to some extent but not completely. For example, if the ECB lowers the minimum collateral credit quality from A to BBB, and a country suffers a decline of its sovereign rating from A to BBB, then obviously the net effect in terms of the possibility to mobilise the asset is neutral. From early 2007 to the end of 2012, the average unweighted credit rating of the euro area declined from around AA+ to around A+;⁴⁶ in this sense, the lowering of the rating threshold from A to BBB mainly reflected the new reality of lower average ratings. It is therefore not true that for these countries the ECB measures *"liberated a substantial fraction of bank assets to be used as collateral"* – at least not if the reference was 2007.

Second, in response to the statement that the ECB thereby *"allowed banks to acquire more such assets with fresh refinancing credit"*, we would mention that banks under funding stress tend to deleverage and not use liquidity buffers, if any, to acquire new assets (van Rixtel and Gasperini, 2013). Indeed, the banking systems of all crisis countries shortened their balance sheet substantially over time between 2007 and 2016 (Figure 10).

⁴⁶ The calculations are based on the best long-term rating of the sovereign issuer prevailing in every period among the ECAs accepted within the Eurosystem (i.e. DBRS, Fitch, Moody's and Standard & Poor's).

Figure 10**Leverage ratio of monetary financial institutions excluding the Eurosystem**

Source: ECB and own calculations.

Notes: Leverage ratio is defined as total assets over capital and reserves. Based on monthly data as of January in each year.

Speaking about the Eurosystem's temporary collateral framework, the literature reports some examples as evidence of preferential treatment towards certain assets. Sinn (2014, p. 158), for example, in commenting the percentage of Greek government bonds and securities guaranteed by the Greek government pledged at the Bank of Greece, argues that "*the measures constituted indirect government financing through the ECB, and prevented the collapse of these states.*" The high share of government and government-guaranteed bonds in the collateral pool was due to the loss of eligibility of most private-sector securities, which tended to have sub-investment grade ratings, and did not benefit from the rating waiver for the Greek government linked to an EU/IMF programme. Moreover, issuing a state guarantee on a bank bond is obviously no source of funding for the government, but only a contingent liability, and therefore the ECB accepting such bonds also cannot be "indirect government financing".⁴⁷

Sinn (2014, p. 159) correctly reports that in June 2012 the Eurosystem lowered the minimum rating of ABSs to triple B and applied this reduction to a broad range of securities including residential mortgages, loans to SMEs, commercial mortgages, car loans, leasing and consumer loans. Eberl and Weber (2014, p. 38) complement this information by recalling that the ECB introduced generally conservative additional haircuts for these newly accepted ABSs, differentiated by type of the underlying asset (for example, higher for commercial mortgages). Moreover, the eligibility of these ABSs is limited to granular and simple ABSs, is subject to additional criteria previously introduced for other ABSs⁴⁸ and is obviously only

⁴⁷ Unless the bank uses the additional borrowed funds to purchase government bonds on the primary market.

⁴⁸ In December 2011 the Eurosystem introduced additional provisions within the temporary framework excluding non-performing loans, structured, syndicated or leveraged loans and prohibiting the counterparty (or any closely-linked entity) from acting as interest rate hedge provider (See Decision ECB/2011/25 on additional temporary measures relating to Eurosystem refinancing operations and eligibility of collateral).

applied to the senior tranche of these securities. This implies that the loss rates needed before the Eurosystem would experience a loss are of an extreme nature.

Van Bakkum, Gabarro and Irani (2016) conducted an event study on the effect of a change in the Eurosystem's collateral eligibility, specifically on the lowering of the ABS threshold to BBB- in 2012, pointing to its impact on the lending behaviour of the banks mostly affected by the change. Their conclusion is that this change in collateral eligibility triggered "*an expansion in mortgage credit, both in terms of lower interest rates and greater loan volumes*". While not excluding the potential effect of the Eurosystem's collateral policy on asset markets, it can be argued that this is not very plausible and cannot be seen in isolation from various other factors that might have contributed to the credit expansion (e.g. macroeconomic conjuncture, changes in banks' business models, regulatory impact, and other aspects of monetary policy). In addition, the identification strategy does not consider the fact that the great majority of eligible Dutch ABSs were in the prime/high-grade rating both before and after the eligibility change. For example, at the end of 2012, no eligible Dutch ABS was rated below A-. More generally, the proportion of BBB ABSs in the collateral pledged with the Eurosystem was negligible (less than 1% of the total ABSs posted as collateral at the end of 2012). Hence, one must cast some doubt on the causal relationship assigned to the change in ESCF.

6 Views on ESCF haircuts and valuations

A number of commentators have argued that haircuts applied to collateral tend to be too low, and the valuation of collateral is too high. Additional concerns regarding haircut setting point to distortions created by the ECB/Eurosystem in (i) determining haircuts also for the market (while at the same time setting its own haircuts without market input) and (ii) influencing market yields via the application of pooled haircuts which do not cater for different degrees of credit risk. Other claims point to the low frequency of haircut revisions and the divergent application of rules by NCBs. Regarding valuation, the main criticism is over the use and correct application of theoretical prices and the acceptance of collateral priced and traded in non-regulated markets.

6.1 Are the Eurosystem's haircuts adequate?

Before tackling the claims on haircut inadequacy, it is useful to view the setting of central banks' haircuts in the context of the underlying economic incentives in private markets. When a central bank increases its haircut, two countervailing forces are at play. On the one hand, the counterparty will have to provide more of an asset for a given amount of central bank credit. On the other hand, the higher haircut can trigger substitution with a lower-haircut asset.⁴⁹ Which effect dominates depends on the relative endowments of the counterparty and alternative funding availability. Cassola and Koulischer (2016) argue that a 5% higher haircut on low-rated collateral would reduce the use of this collateral by 10% and would increase the average funding cost spread between high yield and low yield banks by 5%. At the same time, central bank haircuts introduce an upper bound, i.e. a cap on market haircuts. For any haircut above the central bank's, the counterparty would repo the asset with the central bank, all other things being equal. In addition, some influence on market haircuts stems from the central bank assigning a haircut to a given asset, which discloses an implicit risk assessment (BIS, 2015).

A major criticism concerns the application of undifferentiated haircuts to assets bearing heterogeneous credit risk. Buiters and Sibert (2005, p. 1), for example, claim that *"since the inception of EMU market interest rates have not adequately reflected different degrees of default or credit risk associated with the debt issued by euro area governments and ... that the ECB's inappropriate practice towards the collateral used in its open market operations ends up suppressing, probably unintentionally, national sovereign default risk differences"*. The authors claim, among other things, that by applying the same haircuts to all central government debt (all euro area government debt fell into the CQS1/2 category at the time in 2005), the market yields of these assets were distorted. Hence, they suggest that at the very least a

⁴⁹ An example was provided by the introduction of additional credit claims (ACCs), as analysed in BIS (2015).

distinction should be made between CQS1 and CQS2, but a more granular haircut scheme would even be better. Along the same lines, Eberl and Weber (2014, p. 17) state that “*information on credit risk of collateral is left behind through the application of identical haircuts to distinct assets*” and that “*the pooled haircut corresponds to the risk profile of a rather safe asset and not of the lowest rated asset within each segment*”. On the other hand, Whelan (2014) points out that international comparison suggests the Eurosystem is generally more aggressive in its risk control measures than other major central banks.

First, as previously recalled, for relatively liquid assets such as government bonds haircuts are mostly calibrated for market risks, i.e. risk of adverse movements in the market valuation of assets. In this case credit risk, intended as the default risk of the asset during the liquidation period after default of the counterparty, is negligible for the assumed liquidation period. In this regard, Bindseil and Papadia (2006) show that for the AAA-A rating range, a haircut add-on for the higher credit risk in the A rating area is difficult to justify, considering the statistical properties and in particular migration matrices for ratings within these high rating levels.

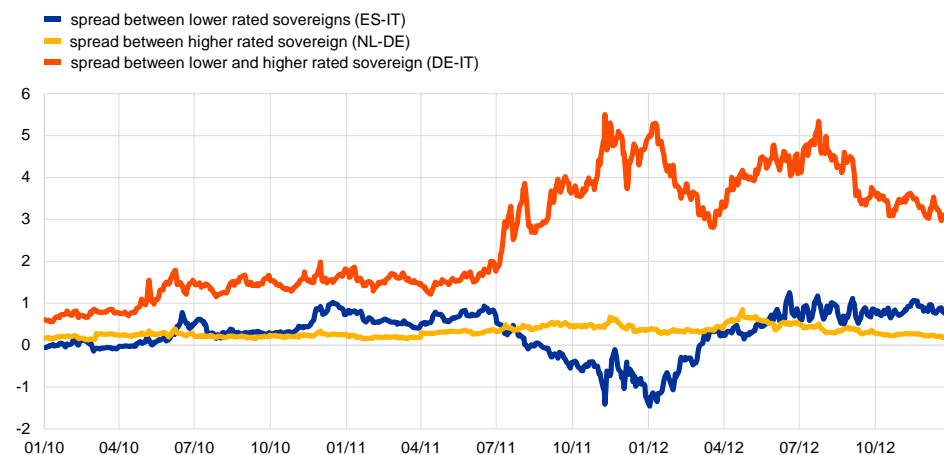
In the meantime, the period after the publication of Buiter and Sibert (2005) and Bindseil and Papadia (2006) has provided further evidence of the weakness of the main claim in Buiter and Sibert’s paper. During the sovereign debt crisis years of 2010-2012, markets actually managed to discriminate quite significantly between government debt assets, even between assets in similar credit ratings and with the same haircuts being applied to them. Figure 11 shows that the yield differential oscillated considerably during the acute phase of the euro area sovereign debt crisis, independently of the issuer’s credit quality. These developments suggest a refutation of the claim that the Eurosystem is suppressing national sovereign default-risk differences.

It is interesting to note that in their paper Buiter and Sibert (2005) suggest that the small government bond yield differences observed at the time of the sovereign debt crisis were not the result of there being an implicit or explicit bailout guarantee from the euro area governments or from the ECB. Such a bail-out commitment would indeed lead the market to treat all instruments as being of equivalent risk. During the sovereign debt crisis period and in the years thereafter some observers accused the ECB of effectively bailing out euro area governments through its unconventional policy measures such as the Securities Markets Programme (SMP) and the Outright Monetary Transactions (OMTs). However, this happened during a period of much larger government bond yield differentials than in the period before, during which the ECB was not being accused of bail-out commitments.

Figure 11

Spread in sovereign yields between selected jurisdictions

(percentages per annum)



Source: Datastream and own calculations.

Notes: spreads are computed from the yields of the relative 10-year government bonds.

Last observation: 31 December 2012.

Another claim found in Nyborg (2015, p. 32) is that “*haircuts which are independent of the counterparty have the potential to create distortions*”. In its monetary policy operations the Eurosystem does not apply differentiated haircuts that are conditional on the creditworthiness of the individual counterparty in order to maintain a level playing field among market participants.⁵⁰ However, “*the Eurosystem may at any time apply additional risk control measures if required to ensure adequate risk protection*” which “*may be applied at the level of individual counterparties*”⁵¹. Also, the ECB applies counterparty eligibility criteria and withdraws the counterparty status if these are no longer met.⁵² At the same time, the author argues that such policy “*provides incentives for a bank to submit collateral whose default probability is highly correlated with the default of the bank itself*” (Nyborg, 2015, p. 32). However, the Eurosystem applies a strict close link prohibition⁵³ which addresses this issue and introduced, when deemed necessary, dedicated risk-control measures such as haircuts to cater for so called “*wrong-way risks*” (for example for covered bonds that are “*own-used*”⁵⁴ by the issuer).

Nyborg (2015, p. 27) also highlights that “*revisions to Eurosystem haircuts are rare*”. The risk control framework, including haircuts, is reviewed every two to three years. Such a timespan makes it possible to cover longer time series of price and liquidity indicators in order to increase the stability, robustness and transparency of haircut schemes. This also prevents changes to the framework from being unduly pro-

⁵⁰ ECB (2015). The financial risk management of the Eurosystem’s monetary policy operations, Section 2.5.

⁵¹ Guideline ECB/2014/60, Article 127(2).

⁵² Guideline ECB/2014/60, Articles 55-57 and 158-159

⁵³ Guideline ECB/2014/60, Article 138(1)-(3).

⁵⁴ Guideline ECB/2015/35, Article 4(b).

cyclical.⁵⁵ Stable through-the-cycle haircuts are one tool to this end. At the same time, daily valuation and margin calls, and daily re-assessment against all relevant eligibility criteria, imply that news affecting the eligibility and the value of a security are reflected almost immediately.

Finally, some authors cast doubts on the uniform application of rules at Eurosystem level. Sinn (2014, p. 165) alludes to “*substantial divergence in the NCBs’ application of haircut rules*”, as the “*necessary evaluation is carried out locally*”. Along the same lines, Eberl and Weber (2014) highlighted that when the ECB suspended the application of the minimum credit rating threshold for some countries, valuation haircuts had only been amended for Greek and Cypriot government debt. This, however, is a confirmation of the conservative nature of Eurosystem’s haircuts, whose calibration pointed to their adequacy in the case of Ireland and Portugal.⁵⁶ By contrast, when the existing calibration indicated a potentially insufficient coverage, ad hoc haircuts were applied.

On the other side of the spectrum, there are authors (e.g. Gabor and Ban, 2016) arguing that the ECB’s haircut setting was at times excessively pro-cyclical, suggesting that the application of higher haircuts, for example in the case of Greece in 2010-11, “*dealt a heavy blow to low-rated government*”. Overall, while it is true that some specific rules were interpreted differently by NCBs at times, this did not have a material impact on collateral and such differences of interpretation were replaced by a common interpretation as soon as they were identified. According to the ECB’s analysis, there has not been a single case in which a bank would have been under-collateralised if the common interpretation had been applied from the start, instead of one specific interpretation of a rule. Moreover, the ECB devotes considerable resources to monitoring the implementation of collateral rules by NCBs, and can generally confirm that NCBs are unbiased and committed in implementing the rules precisely.

6.2 How are the Eurosystem’s and market’s haircuts calculated?

On the relationship between the Eurosystem’s and market’s haircuts, Nyborg (2015, p. 20) argues that “*haircuts are not determined in a market but directly by the ECB*”. Haircuts are determined by the Eurosystem to ensure the ex post equivalence of risk across different types of collateral assets. To this aim, the haircut schedules are very broad and tailored to specific asset classes or issuer groups (Table 4). However, it is not correct to say that the central bank determines haircuts without market input. Given its role as policy-maker, the central bank chooses the level of risk tolerance, i.e. what is the adverse scenario to be covered by haircuts, which in the case of the Eurosystem corresponds to the expected shortfall at a 99% confidence interval, i.e.

⁵⁵ ECB (2015). The financial risk management of the Eurosystem’s monetary policy operations, Section 2.5.

⁵⁶ The sovereign ratings of Ireland and Portugal reached a minimum of BB+ and BB- respectively, which are 8 and 6 notches higher than the minimum sovereign rating assigned to Greece and Cyprus (CCC-).

the average loss in the worst 1% of cases. This expected shortfall is estimated on the basis of market data, i.e. empirical price and yield time series⁵⁷. These estimates are reviewed and updated regularly. Therefore, it is not true that the setting of haircuts by the ECB is not based on market data.

Along the same lines, Nyborg (2015, p. 23) claims that “*haircuts in the secondary repo market are often taken directly from the Eurosystem’s collateral framework*”, by reporting the case of a central counterparty (CCP) which “*uses the same haircuts as the ECB in around 93% of cases*” as an example. It is worth stressing that the CCP in question (Eurex Clearing, in relation to the general collateral (GC) Pooling segment) offers an ECB GC pooling basket (and an extended version of it), which is a subset of the universe of the Eurosystem’s eligible assets. The CCP communicated⁵⁸ that, “*while ECB haircuts are used in the bond valuation process in their GC pooling basket, it has an interest in valuing bond collateral using its own risk parameters ... hence the CCP is applying supplementary margin if the ECB haircuts are not in line with its own risk evaluation*”. In addition, Eurex communicated that it applies dynamic haircuts, in which first the actual yield of the bond, calculated at market price, is shifted by a yield shift factor and then a theoretical bond price is calculated by using the shifted yield. The difference between the theoretical price and the market price is set in relation to the market price to obtain a percentage, which serves as a new haircut⁵⁹.

At the same time, other CCPs (e.g. LCH Clearnet Ltd. and LCH Clearnet SA) created similar baskets (one narrower and one broader) where they do not strictly follow the Eurosystem haircuts in their valuation. Empirical evidence of divergences between the ECB’s and CCPs’ haircuts is documented in Corradin and Rodriguez-Moreno (2016) and Gabor and Ban (2016). In Nyborg (2016a, p. 92), too, one can find examples of different treatment by the Eurosystem and CCPs (Eurex in this case), with Eurex treating Spanish and Italian government bonds more conservatively than the Eurosystem. Overall, under the EMIR directive, CCPs are required to employ a defined and objective methodology that does not rely solely on external opinions and that takes into consideration a number of risks.⁶⁰ This calls for an independent decision on the level of risk tolerance and an autonomous assessment of the risks underlying the accepted collateral. A survey of market participants published in BIS (2015) indicated that collateral quality and price volatility of the underlying asset remained overall the main determinants of the haircut. In the case of the euro area, a majority of respondents viewed the Eurosystem’s haircut schedules as a baseline for private markets. Based on the above considerations, this can be simply seen as reflecting the view that the ECB’s calibration is reasonable and relies on an objective methodology.

⁵⁷ ECB (2015), The financial risk management of the Eurosystem’s monetary policy operations, Section 2.5.

⁵⁸ [Eurex clearing circular 085/12](#).

⁵⁹ [Eurex circular 167/03](#).

⁶⁰ ECB (2013c), Collateral eligibility requirements. A comparative study across specific frameworks, Section 2.3.1.

6.3 Do Eurosystem haircuts create the wrong incentives?

Drechsler et al. (2016) argue that the difference between the private market's and the central bank's haircut⁶¹ (what they call "haircut subsidy") creates an incentive for banks to pledge risky assets with the central bank. At the same time, the authors argue, the central bank charges a higher interest rate than the one charged on private repo loans. Hence, "*the combination of below-market collateral requirements and above-market interest rate adheres to the prescriptions of LOLR theory*". Along these lines, de Roure (2016) claims that "*banks exploit this subsidy from the ECB and are willing to pay a premium to acquire these assets*" (what they refer to as "risk-shifting premium").

Two observations can be made on this conclusion with reference to the case study.⁶² First, the general willingness and ability of stressed banks to buy lower-rated assets to be pledged in exchange for Eurosystem credit is not at all plausible. Second, even assuming this is the case, the use of the collateral of German banks during 2008 would have shown the relevance of BBB assets increasing with the liquidity stress faced by banks. Figure 12 shows this was hardly the case. The chart shows the share of over-collateralisation due to BBB assets (i.e. which share of pledged collateral in excess of liquidity provided was due to assets which became eligible once the rating threshold was lowered) as a function of banks' overreliance on central bank's liquidity compared with the liquidity need imposed by the central bank, measured by the ratio of liquidity provision over reserve requirements. To support the risk-shifting premium hypothesis, one would expect this share to be significant and increasing with the level of overreliance on central bank credit. As can be inferred by the absence of a clear relationship, BBB assets were hardly pivotal in accessing Eurosystem's refinancing, independently of the refinancing need of the bank. Therefore, the incentive of banks to pay a premium for lower-rated assets which, thanks to a lower haircut than the private market's, could be pledged for cheaper Eurosystem's liquidity, is not apparent.

The study by de Roure (2016) concludes that "*more differentiation rules among counterparties could help avoid the risk-shifting channel*". At the same time, the author rightly points out that "*discretionary decisions on transaction-by-transaction basis is not feasible because the estimation of the correlation risk between counterparties and collateral is not trivial since there are over 30,000 eligible assets and 1,000 counterparties in the eurozone.*"

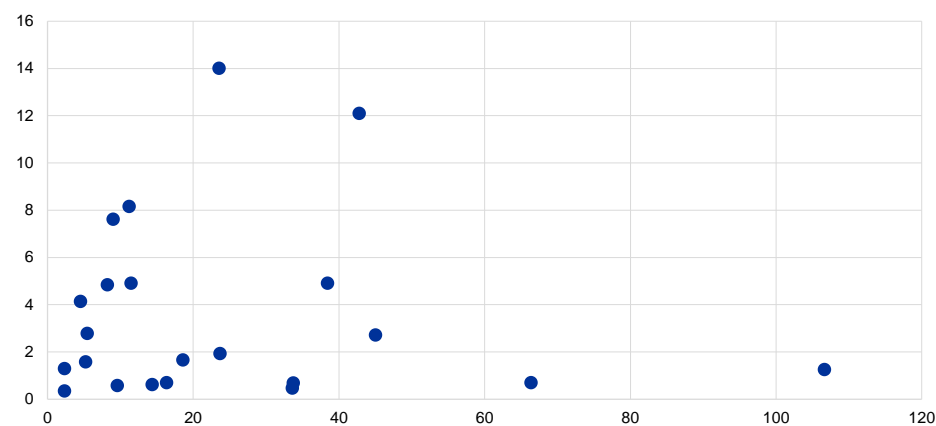
⁶¹ Their conclusion is based on the analysis of a representative Greek bond over 2007-11.

⁶² The data refer to 26 German banks and cover the year 2008. The event study is based on the change to minimum rating requirements for collateral eligibility (from A- to BBB) announced in October 2008.

Figure 12

Additional collateral buffers due to BBB assets as a function of banks' overreliance on Eurosystem credit

(y-axis: share of over-collateralisation due to BBB assets; x-axis: liquidity provision as a share of reserve requirements)



Source: ECB and own calculations.

Notes: The horizontal axis shows liquidity provided by the Eurosystem as a fraction of banks' reserve requirements, which gives an indication about overreliance on central bank's liquidity compared with the need imposed by the central bank. The vertical axis shows the share of over-collateralisation accounted for by BBB assets (i.e. the share of pledged collateral in excess of liquidity which was due to assets which became eligible once the rating threshold was lowered). To support the risk-shifting premium hypothesis, one would expect this share to be (i) significant and (ii) increasing with the level of overreliance on central bank credit. Neither of the two conditions is supported by the data. Data on use of collateral refer to mid-November 2008 and cover all German banks, as the subset of 26 banks is not disclosed in de Roure (2016).

6.4 Is the Eurosystem's asset valuation adequate?

Nyborg (2015, p. 20) analyses the pricing of Eurosystem's collateral and concludes that "*the percentage of collateral with theoretical prices is higher for lower quality collateral, which may help explain the heavy usage of such collateral*". The Eurosystem assigns a price to each marketable asset on a daily basis through its "Common Eurosystem Pricing Hub" (CEPH),⁶³ jointly run by the Banque de France (for the valuation of ABSs) and the Deutsche Bundesbank (for the valuation of other debt instruments). Theoretical prices calculated by the CEPH are based on observable market parameters. The high share of asset prices based on theoretical valuation rather than on market prices reflects the fact that a large proportion of the fixed income universe trades infrequently.

Nyborg (2015, p. 26) also points out that "*incidence of theoretical prices is much higher for collateral trading on non-regulated markets than for other collateral*." Assets traded on accepted non-regulated markets are subject to substantially the same scrutiny by market participants as assets traded on regulated markets. In the Eurosystem, these issuers and/or assets are subject to the same rating requirements⁶⁴ (and are rated by external rating agencies like other marketable assets), while bonds are issued under comparable terms to those which are traded on regulated markets. The prevalence of theoretical prices is of limited value as an

⁶³ <https://www.ecb.europa.eu/paym/coll/risk/valuation/html/index.en.html>

⁶⁴ Guideline ECB/2014/60, Articles 82-88.

indicator for market discipline because theoretical pricing does not necessarily imply that prices are not aligned with market prices or that pricing is subject to high uncertainty (and risk of over-pricing, in particular). For example, a significant part of assets traded on accepted non-regulated markets is composed of short-term instruments for which trading is limited because investors tend to hold them until maturity. However, these are typically from well-known issuers and can be priced with high certainty.

Moreover, the ECB requires that assets are listed in a regulated market or in an accepted non-regulated market which the ECB has assessed and deemed equivalent (see comments on this topic in Section 5).⁶⁵ Being listed in a market does not imply regular (e.g. daily) trading, as Sinn (2014) seems to suggest.⁶⁶ To give an idea of actual trading activity, the ECB eligible assets' liquidity classes are mapped with trade bands, i.e. monthly trading frequency of securities identified by international securities identification numbers (ISINs), provided by Trax®.⁶⁷ While the former reflect a static classification, each band of the latter dynamically maps the number of reported trades in each security. Table 19 shows that the majority of assets is characterised by less frequent trading across the ECB eligible assets' liquidity classes.

Eberl and Weber (2014, p. 14) stress that *“the potential for valuation errors remain ... in particular for own-use collateral, as such assets are never traded”*. When no direct and reliable quote is available, CEPH determines a theoretical value based on proprietary methodologies aiming at ascertaining their prospective market value. Obviously, the methodology has been extensively tested and avoids an upward bias on prices (prices tend to be “conservative” to limit the probability of overestimating prices). In addition, the methodology aims at ensuring that lower quality (stale, or outdated) market prices are not applied. A 5% valuation markdown is applied to theoretically-valued ABSs, covered bonds and senior unsecured debt instruments issued by credit institutions⁶⁸. This is to further protect against potential model errors, implying that after this markdown, theoretical valuation is strongly downward biased relative to genuine market prices.

⁶⁵ Guideline ECB/2015/60, Article 68(3).

⁶⁶ Sinn (2014, p. 158) states that ABSs are eligible *“provided they were traded in the market and had a rating of at least single A”* and that (2014, p. 162) *“the only safeguard against misuse [of bank bonds] was initially that the bank bonds needed to be traded”*.

⁶⁷ Trax® data consist of all deals reported by major securities dealers in a given month.

⁶⁸ Guideline ECB/2015/35, Article 4(a).

Table 7

Number of traded eligible assets, by liquidity class and trade frequency

Liquidity class	Number of monthly trades					Not traded	Total
	Up to 10	Between 11 and 50	Between 51 and 100	Between 101 and 250	More than 250		
Liq.class 1	447	173	59	163	220	1,187	2,249
Liq.class 2	650	202	12	3	-	2,724	3,591
Liq.class 3	785	501	70	19	4	6,608	7,987
Liq.class 4	804	685	148	52	13	17,949	19,651
Liq.class 5	129	7	-	-	-	775	911
Total	2,815	1,568	289	237	237	29,243	34,389

Sources: ECB, Trax® trade data and own calculations

Notes: Values refer to September 2015.

On the pricing of some Greek debt instruments, Sinn (2014, p. 158) argues that as the true value of state-guaranteed non-marketable debt was not known, “banks tended to price them at their face value, given that they were not traded”. Again, also in this case, prices were generally conservative and in addition exceptionally high haircuts were applied. As explained in Tamura and Tabakis (2013), credit claims are assigned a value corresponding either to the theoretical price or to the outstanding amount. In the latter case, higher haircuts apply. Obviously, it would have made no sense for Greek banks to have held these securities in their books at a lower than nominal value when issuing them: otherwise the mere act of issuing them would have consumed their capital, although, economically, issuing them of course had no negative effect on Greek banks’ solvency. It is also worth pointing out that Greek banks never posted as collateral credit claims whose eligibility was the consequence of a public sector guarantee.

7 Views on ESCF transparency, complexity and implementation

7.1 Is the ESCF transparent?

Transparency is arguably a key component of any central bank's collateral framework. As argued in Sections 1 and 3, the ECB made the ESCF highly transparent from the beginning.

Nevertheless, some authors have expressed doubts about the ESCF's transparency, particularly in the context of the Short-Term European Paper (STEP) market. In reviewing the acceptance of non-regulated markets for collateral purposes, Eberl and Weber (2014, p. 29) argue that *"the application of the principle of transparency ... was not only repeatedly suspended but also not rigorously applied"*. The acceptance of the STEP market is provided as an example of this claim. Similar claims about the STEP market are present in Sinn (2014, p. 160-161). The STEP market was included in the list of non-regulated markets in April 2007. At that time, however, the Eurosystem was already accepting securities issued by financial institutions (unsecured bank bonds and covered bonds), contrary to what is stated in Sinn (2014, p. 161).⁶⁹ The STEP initiative aimed to promote integration and development of European markets for short-term securities through convergence towards the best market standards. With regard to the collateral management function, the ECB has supported the STEP label as an important source of information on prices and quantities for short-term securities in the primary market, i.e. the first stage of price formation. The relevance of the primary market, as opposed to the secondary market, in the case of short-term securities is twofold. First, after issuance, short-term securities are typically held until maturity in investors' portfolios. Second, short-term positions are frequently rolled over on the primary market.

The STEP Secretariat is managed by the European Money Market Institute (EMMI), formerly known as Euribor-EBF, an international non-profit organisation whose members are national banking associations of the EU Member States. The STEP initiative is not supervised by the Banque de France as stated both in Sinn (2014, p. 161) and Eberl and Weber (2014, p. 30).⁷⁰ Moreover, the financial features of the affected assets are described in detail in the STEP convention, which are publicly available on the STEP market website.⁷¹ In addition, the availability of STEP statistics on yields and volumes of activity guarantees a high standard of transparency, from the viewpoint of market participants and in terms of the specific needs of Eurosystem collateral management.

⁶⁹ They have been accepted since 1999.

⁷⁰ When STEP was introduced, the Banque de France was already monitoring and publishing statistics on the French commercial paper (Billets de Trésorerie) market, i.e. the only non-government short-term paper included in the list of non-regulated markets.

⁷¹ www.stepmarket.org.

7.2 Is the ESCF too complex?

Since the beginning of the financial crisis, the ESCF has changed significantly, as documented in Eberl and Weber (2014). This has undoubtedly led to increasing complexity of implementation, as explained in Section 3. However, the issue of complexity is not something new. As noted in Galvenius and Mercier (2011), collateral policy was already the most complex issue when the Eurosystem monetary policy framework (together with the minimum reserve requirements) was established. The central bank needs to constantly strike a balance between the primary objectives of ensuring the smooth conduct of monetary policy operations and achieving sufficient risk protection and secondary objectives, such as operational efficiency, cost efficiency, simplicity and transparency. Hence, in line with the historical depiction and arguments set out in Section 3, it can be observed that what Belke (2015) presents as a wish (*“policymakers should strive for a simplification of the collateral system, while not forgetting that keeping collateral available to all counterparties in the euro area is crucial”*) is actually already an ECB objective.

7.3 Is the ESCF properly implemented?

This last section reviews some criticisms directed at the Eurosystem on the implementation of its collateral framework, either concerning mistakes in applying its rules or its allegedly excessive discretion exercised over time or across countries/counterparties/assets. For example, Brendel, Eberl and Weber (2015) identified some mistakes in the application of risk control measures. The ECB acknowledged that, in those cases, a limited number of instruments were not adequately handled. At the same time, compared with the scale of the framework, the number of assets involved in inaccuracy resulting in eligibility or higher haircuts was miniscule, and most cases arose from inaccuracies in reporting by credit rating agencies. Moreover, the assets did not involve material risks, as they were not used as collateral or the counterparties using these assets already had sufficient collateral. However, as the ECB takes every incident seriously, further regular checks on data quality were introduced.⁷² This formed part of the constant review of Eurosystem’s processes and procedures aimed at improving data quality while maintaining the highest level of operational efficiency. Considering the large number of eligible assets published every business day, the results of these checks have been pointing to a satisfactory level of data quality.

On other occasions, some alleged mistakes were actually not mistakes at all as those who made these claims overlooked some elements of the ESCF. An example of this can be found in Nyborg (2016a, pp. 144-146), where the author, providing detailed evidence on some Greek bonds, claimed that *“irregular haircuts”* applied to these instruments, *“would have benefited Greek banks and the holders of their*

⁷² The IT infrastructure dealing with receipt and processing of eligible assets on a daily basis was already performing automatic checks on compliance with collateral rules.

paper”.⁷³ In reality, the haircuts applicable to the four assets, which were short-term unsecured bank bonds (with quarterly maturity), were determined by the short-term asset ratings provided by Fitch (F1+).⁷⁴ Meanwhile, other one-off statements have appeared to suggest that some rules have been applied incorrectly, without any clear evidence to substantiate this. For example, Sinn (2014, p. 162) wrote: “*The ECB tried to prevent misuse [of bank bonds] by imposing quantity constraints on the use of uncovered bank bonds from closely linked issuers. Nevertheless, by the end of 2012, the stock of uncovered bank bonds that were in principle eligible as collateral for refinancing operations was EUR 2.5 trillion, while the stock of such bank bonds used as collateral was about EUR 329 billion*”. The author’s wording seems to imply that the Eurosystem failed to apply the quantity constraints cited, which is not the case. A counterparty is prohibited from using uncovered bank bonds issued by itself or by a closely linked entity. In addition, uncovered bank bonds of an issuer or closely linked entities (both not being the counterparty itself) can be mobilised up to a maximum threshold of the total value of collateral submitted by the counterparty.⁷⁵ The Eurosystem continuously monitors the data on the use of collateral to determine the correct application of the consented limits and rigorously sanctions counterparties should such limits be exceeded, even temporarily. Hence, the stock of pledged uncovered bank bonds, being systematically checked complies with the imposed quantity constraints.

One of the collateral rules where the Eurosystem has been accused of excessive discretion concerned the application of the minimum rating threshold. Nyborg (2015, p. 28) argues that “*collateral with ratings below BBB- are in principle not eligible, but exemptions from this rule for sovereign bonds with lower ratings are standard*”. Similarly, Sinn (2014, p. 157) claims that “[*t*he rating agencies published negative outlooks for the government bonds of Greece, Portugal, and Ireland and subsequently downgraded these bonds to non-investment grade ... The ECB Governing Council reacted by simply exempting the respective government bonds, as well as private securities guaranteed by these governments, from the minimum rating requirements”. The cases involving Greece (2010), Ireland (2011), Portugal (2011) and Cyprus (2013) saw the suspension of the rating threshold for debt instruments issued or guaranteed by the respective governments, based on the positive assessment of the EU/IMF programmes that were ongoing at the time. However, once developments had not hinted at the successful conclusion of the programme, such waivers were lifted, as in the case of Greece and Cyprus on several occasions. Therefore it is not correct to claim that applying a waiver is “standard”. Figure 13 shows the timeline of decisions regarding the suspension and reinstatement of minimum credit quality thresholds. It distinguishes between periods when assets were eligible due to their compliance with the Eurosystem credit assessment framework (in green), periods when assets became eligible only through

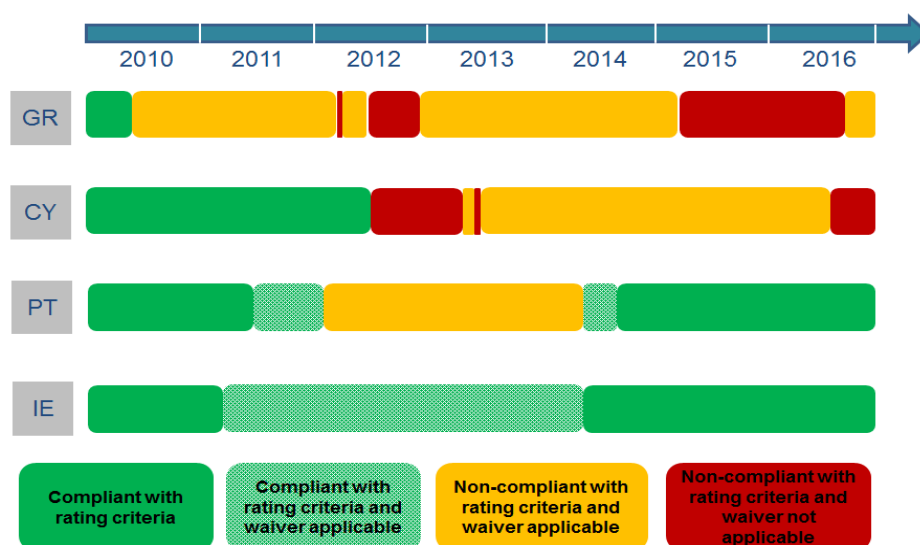
⁷³ More specifically, the author claims that the haircuts applied to four debt instruments guaranteed by the Greek government were incorrect, as commensurate with the AAA to A- rating instead of the expected BBB-.

⁷⁴ See Art 31(b) of Guideline of the ECB of 16 September 2010 amending Guideline ECB/2000/7 on Monetary Policy Instruments and Procedures of the Eurosystem (ECB/2010/13), OJ L 267, 9.10.2010, p. 21. Guideline ECB/2000/7 was a predecessor of the currently applicable Guideline ECB/2014/60.

⁷⁵ See Section 5 for more details about the threshold.

a waiver of the rating threshold (in yellow) and periods when assets were not eligible, the waiver not being applicable (in red). It appears that the application of a waiver is not “standard” in the sense that it can be taken for granted. It is only applied when an EU/IMF programme is in place and its implementation is on track. Figure 13 illustrates this point. Therefore, it does not undermine the relevant government’s commitment to implementing the programme.

Figure 13
Timeline of minimum credit quality threshold suspensions



Source: ECB and own calculations.

Finally, some authors have, wrongly in all cases, alleged that the Eurosystem occasionally displayed favouritism, misconduct or carried out illegal activities. For example, Brendel and Jost (2014) and Nyborg (2016a) linked an amendment of the ESCF⁷⁶ with the possible exit of Portugal from the EU/IMF programme. On the contrary, the two events were not causally related. The decision on the change to the collateral framework had already been taken in 2013, following regular monitoring of the performance of the Eurosystem’s credit assessment framework (ECAf) by the ECB Governing Council.⁷⁷ Hence, the motivations for the changes were unrelated to Portugal or any other country-specific considerations, although of course Portugal benefited in terms of the ESCF’s eligibility while the timing turned out to be beneficial to the ECB’s performance of its LOLR function. Even more serious claims are made in Sinn (2014, p. 163), where the author wrote that “a convenient side-effect of this trade [banks issuing bonds and mutually trading them in order to use them as

⁷⁶ This change concerned in particular the remapping of the BBB(low)-rating grade from DBRS, which was at the time the best rating for the Portuguese government.

⁷⁷ The Governing Council decided to revise the mapping of certain ratings of some credit assessment systems onto the Eurosystem harmonised rating scale. In particular, some short-term rating grades were re-mapped mainly to ensure consistency with the long-term rating scale of the rating agency and the DBRS ‘BBB(low)’-rating grade was included in credit quality step 3 (ECB Monthly Bulletin, April 2014, pp. 30-31).

collateral] was that it could be used to create equity out of nothing if trading took place above the bonds' face value. In principle, every bank participating in symmetric circular trading could book asset values above the liability it incurred by issuing its own bonds. This is a well-known aspect of circular trading of assets in general." In this, as in other cases (e.g. Belke, 2015), it is not clear what evidence the statement relies upon. Such misconduct is not plausible, as neither supervisors nor auditors would ever have accepted such valuations.

8 Conclusion

This paper shows that the ESCF has performed well over the 17 years of its existence:

- It has allowed effective euro area-wide implementation of monetary policy since 1999;
- It has allowed the provision of elastic LOLR-like Eurosystem credit during the financial and sovereign debt crisis to a variety of solvent but liquidity-constrained banks; and
- It has effectively protected the Eurosystem from any losses, despite the unprecedented scale and length of the financial crisis in the euro area.

The ESCF has also contributed to maintaining monetary accommodation at a time when (i) monetary policy could have been constrained by the zero lower bound on interest rates and (ii) large-scale asset purchase programmes (which could exert effects on available or used collateral) were needed to help reflate the economy.

Discussing one by one the numerous issues that some commentators have projected onto the ESCF, this paper argues that the ESCF was well designed to address the relevant trade-offs in a way that is deemed optimal. The paper also shows that the ESCF meets high standards of transparency in various ways, namely in documentation of the rules, the list of eligible assets, the haircut matrices, eligibility and use statistics, and access for researchers to micro-data. None of the other major central banks provides this degree of transparency.

While it is true that the ESCF is relatively broad in terms of collateral eligibility and may appear complicated, as illustrated by the length of the relevant ECB legal acts (see Annex I), these features have been accepted as a largely unavoidable result of the diversity of financial institutions and markets in the euro area. Any simple and narrow framework would preclude significant parts of the euro area banking system from directly benefiting from central bank credit, with related costs in terms of maintaining a single monetary policy and financial stability.

Reviewing the comments one by one, it argues that in some cases the critiques present only partial information as evidence or describe the potential effects in a biased or hyperbolic way. Moreover, several contributions presented some arguments which resulted from misconceptions or incomplete analysis. Finally, some comments which are presented as new are not really new, as central banks consider them to be relevant elements in the trade-offs underlying the design of their collateral frameworks, while some of them have been part of the public debate in the past.

Of course, this positive overall assessment of the ESCF does not imply a general denial that it needs to be maintained, modified and continuously improved over time. Financial regulations, financial markets and institutions evolve, and with them the optimal design of the Eurosystem's monetary policy implementation framework, and,

within it, the ESCF. Moreover, with a gradual return to financial and economic normality in the euro area after the 2008 and 2011 crisis peaks, and progression in financial integration, there should be scope for simplifying and redesigning a number of aspects of the framework. The comments reviewed in this paper provide a valuable source of ideas and inspiration for this ongoing work.

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Annex I

Legal texts describing the ESCF rules

The Eurosystem legal framework for collateral consists of the "General collateral framework" and the "Temporary collateral framework". The Temporary collateral framework complements, amends or overrules the General collateral framework (as *lex specialis* over *lex generalis*). The most relevant legal acts, which are also available on the ECB's website, are listed below.

General collateral framework	Temporary collateral framework
<p>Guideline (EU) 2015/510 of the ECB of 19 December 2014 on the implementation of the Eurosystem monetary policy framework (ECB/2014/60), OJ L 91, 2.4.2015, p. 3, as amended by:</p> <p>Guideline (EU) 2015/732 of the ECB of 16 April 2015 amending Guideline (EU) 2015/510 on the implementation of the Eurosystem monetary policy framework (ECB/2014/60) (ECB/2015/20), OJ L 116, 7.5.2015, p. 22.</p> <p>Guideline (EU) 2015/1938 of the ECB of 27 August 2015 amending Guideline (EU) 2015/510 of the ECB on the implementation of the Eurosystem monetary policy framework (ECB/2015/27), OJ L 282, 28.10.2015, p. 41.</p> <p>Guideline (EU) 2016/64 of the ECB of 18 November 2015 amending Guideline (EU) 2015/510 on the implementation of the Eurosystem monetary policy framework (General Documentation Guideline) (ECB/2015/34), OJ L 14, 21.1.2016, p. 25.</p> <p>Guideline (EU) 2016/2298 of the ECB of 2 November 2016 amending Guideline (EU) 2015/510 on the implementation of the Eurosystem monetary policy framework (ECB/2016/31), OJ L 344, 17.12.2016, p. 102.</p> <p>Guideline (EU) 2016/65 of the ECB of 18 November 2015 on the valuation haircuts applied in the implementation of the Eurosystem monetary policy framework (ECB/2015/35), OJ L 14, 21.1.2016, p. 30., as amended by:</p> <p>Guideline of the ECB of 2 November 2016 amending Guideline (EU) 2016/65 on the valuation haircuts applied in the implementation of the Eurosystem monetary policy framework (ECB/2016/32), 2.11.2016.</p>	<p>Guideline of the ECB of 9 July 2014 on additional temporary measures relating to Eurosystem refinancing operations and eligibility of collateral and amending Guideline ECB/2007/9 (recast) (ECB/2014/31), 18.7.2014, as amended by:</p> <p>Guideline of the ECB of 19 November 2014 amending Guideline ECB/2014/31 on additional temporary measures relating to Eurosystem refinancing operations and eligibility of collateral and amending Guideline ECB/2007/9 (ECB/2014/46), OJ L 348, 4.12.2014, p. 27.</p> <p>Guideline of the ECB of 2 November 2016 amending Guideline ECB/2014/31 on additional temporary measures relating to Eurosystem refinancing operations and eligibility of collateral (ECB/2016/33), OJ L 344, 17.12.2016, p. 123.</p> <p>Decision of the ECB of 20 March 2013 repealing Decisions ECB/2011/4 on temporary measures relating to the eligibility of marketable debt instruments issued or guaranteed by the Irish Government, ECB/2011/10 on temporary measures relating to the eligibility of marketable debt instruments issued or guaranteed by the Portuguese Government, ECB/2012/32 on temporary measures relating to the eligibility of marketable debt instruments issued or fully guaranteed by the Hellenic Republic and ECB/2012/34 on temporary changes to the rules relating to the eligibility of foreign currency denominated collateral (ECB/2013/5), OJ L 95, 5.4.2013, p. 21.</p> <p>Decision of the ECB of 28 June 2013 repealing Decision ECB/2013/13 on temporary measures relating to the eligibility of marketable debt instruments issued or fully guaranteed by the Republic of Cyprus (ECB/2013/21), OJ L 192, 13.7.2013, p. 75.</p> <p>Decision (EU) 2016/457 of the ECB of 16 March 2016 on the eligibility of marketable debt instruments issued or fully guaranteed by the Republic of Cyprus (ECB/2016/5), OJ L 79, 17.3.2016, p. 41.</p> <p>Decision (EU) 2016/1041 of the ECB of 22 June 2016 on the eligibility of marketable debt instruments issued or fully guaranteed by the Hellenic Republic and repealing Decision (EU) 2015/300 (ECB/2016/18), OJ L 169, 28.6.2016, p. 14.</p>

Source: ECB.

Annex II

Changes in Eurosystem collateral rules and risk control measures since 2006

Measure	Timing*	ECB press release and relevant other links, other relevant comments
Amendments relating to the eligibility of ABS: 1. The structure of the transaction: True sale 2. The composition of the pool of assets: cash-flow generating assets no transfer of credit risk (credit derivatives). 3. The seniority of tranches: 4. The issuer's country of residence: only EEA 5. The eligibility assessment: Possibility to request additional data.	AD:13 January 2006 ID:1 May 2006 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2006/html/pr060113.en.html
Units of French fonds communs de créance (FCCs) issued prior to 1 May 2006 will remain eligible for a transitional period until 31 December 2008	AD:13 January 2006 ID:1 May 2006 GF:remain eligible for a transitional period until 31 December 2008	http://www.ecb.europa.eu/press/pr/date/2006/html/pr060113.en.html Implemented in GD ⁷⁸ as announced by ECB on 30 October 2007
The Governing Council of the European Central Bank (ECB) has confirmed yesterday that the so-called New Global Note (NGN) arrangement for international debt securities is in compliance with the Eurosystem's "Standards for the use of EU securities settlement systems in ESCB credit operations" (http://www.ecb.europa.eu/paym/coll/standards/), provided that the respective NGN is held for safekeeping by an institution that has been positively assessed against these standards by the Eurosystem	AD: 13 June 2006 ID:13 June 2006	http://www.ecb.europa.eu/press/pr/date/2006/html/pr060613.en.html
Covered bank bonds issued from 1 January 2008 are treated in the same way as all other marketable assets by subjecting them to the same rating requirements. (Previously covered bank bonds were deemed to fulfil the Eurosystem credit standards if they complied strictly with the criteria set out in Article 22(4) of the UCITS Directive.)	AD: 22 February 2007 ID:1 January 2008 GF:Covered bonds issued before 1 January 2008 will continue to be assessed against the previously applied criteria until their maturity	http://www.ecb.europa.eu/press/govcdec/otherdec/2007/html/gc070223.en.html Implemented in GD as announced by ECB on 30 October 2007
Loss of eligibility of marketable assets issued by entities domiciled outside the EEA (non-EEA G10 countries), irrespective of whether a guarantee by an entity established in the EEA is available (with the exception of international or supranational institutions)	AD: 25 May 2007 ID:1 June 2007 GF:assets issued before 1 January 2007 will be grandfathered until 31 December 2011 and will only become ineligible after that date	http://www.ecb.europa.eu/press/pr/date/2007/html/pr070525_3.en.html Implemented in GD as announced by ECB on 30 October 2007
Marketable assets, issued prior to 31 May 2007 and traded on non-regulated markets that currently fulfil requirements for safety and accessibility, but not for transparency, will remain eligible until 31 December 2009 and will become ineligible thereafter. The uncovered marketable tier two assets issued by credit institutions will be phased out on 31 May 2007 and become ineligible after that date.	AD: 25 May 2007 ID:1 January 2010 GF:assets, issued prior to 31 May 2007 and traded on non-regulated markets that currently fulfil requirements for safety and accessibility, but not for transparency, will remain eligible until 31 December 2009 and will become ineligible thereafter.	http://www.ecb.europa.eu/press/pr/date/2007/html/pr070525_4.en.html Implemented in GD as announced by ECB on 30 October 2007

* AD: announcement date; ID: implementation date; GF: possible grandfathering period.

⁷⁸ GD refers to General Documentation, the rules for the conduction of monetary policy operations. The currently applicable version of it is Guideline ECB/2014/60.

Measure	Timing*	ECB press release and relevant other links, other relevant comments
Ineligibility of assets issued by entities established outside the EEA and the G10 ("IRXX" issuers)	AD:25 May 2007 ID:1 June 2007 GF:Until 31 December 2011 (for assets issued before 1 January 2007)	http://www.ecb.europa.eu/press/pr/date/2007/html/pr070525_3.en.html
Acceptance of the rating agency Dominion Bond Rating Service (DBRS) as a new ECAI source within the ECAF	AD:19 October 2007 ID:1 January 2008 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2007/html/gc071026.en.html
Biennial review of risk control framework: <ul style="list-style-type: none"> • Higher haircuts for unsecured bank bonds and ABS. • Strengthening close link prohibition between counterparty and asset in the case of ABS • Emphasis on transparency of ratings for ABS: requirement of publication of surveillance reports. 	AD:4 September 2008 ID:1 February 2009 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2008/html/pr080904_2.en.html
Expansion of collateral eligibility (Temporary measures): <ul style="list-style-type: none"> • Accepting collateral denominated in other currencies (USD, GBP, JPY) (haircut add-on of 8%) • Euro-denominated syndicated credit claims governed by UK law • Accepting debt instruments issued by credit institutions traded on some ECB-acceptable non-regulated market, e.g. certificates of deposit (haircut add-on of 5%) • Accepted subordinated debt instruments when protected by an acceptable guarantee (haircut add-on of 10% plus 5% valuation markdown if theoretically priced) • Fixed term deposits • Accepting marketable and non-marketable assets (other than ABS) rated below A- but at least BBB- (haircut add-on of 5%) 	AD: 15 October 2008 Technical specifications in press releases: 17 October 2008 12 November 2008 17 November 2008 ID: 20 October 2008: fixed term deposits as of 22 October 2008: lowering of credit threshold, accepting debt instruments issued by credit institutions traded on some ECB-acceptable non-regulated market, and subordinated marketable debt instruments as 17 November 2008: foreign denominated collateral GF:N/A	As announced on 15 October 2008, http://www.ecb.europa.eu/press/pr/date/2008/html/pr081015.en.html these measures will remain into force until the end of 2009 (see also announcement in May 2009 for extension) Technical specifications 17 October 2008: http://www.ecb.europa.eu/press/pr/date/2008/html/pr081017_2.en.html Further technical specifications 12 November 2008: http://www.ecb.europa.eu/press/pr/date/2008/html/pr08112_1.en.html Further technical specifications 17 November 2008: http://www.ecb.europa.eu/press/pr/date/2008/html/pr08117.en.html
The Governing Council of the European Central Bank (ECB), having further assessed the costs and benefits associated with accepting syndicated loans governed by the laws of England and Wales, decided on 21 November 2008 no longer to accept them as eligible collateral	AD:26 November 2008 ID:1 December 2008	http://www.ecb.europa.eu/press/pr/date/2008/html/pr081126_2.en.html
Additional risk control measures: <ul style="list-style-type: none"> • ABS - Rating of AAA/Aaa at issuance for all new ABS. The threshold of A- remains during the life of the security. • ABS - The pool should not consist of tranches of other ABS. • Uncovered bank bonds – Concentration limit of 10% of the total collateral pool. 	AD:20 January 2009 ID:1 March 2009 GF:1 March 2010 for uncovered bank bonds	http://www.ecb.europa.eu/press/pr/date/2009/html/pr090120.en.html
Amendment of rating requirements for ABS: Two AAA ratings for ABS required / "Second best" rule	AD: 20 November 2009 ID: 1 March 2010 for new ABS 1 March 2011 for all ABS GF:N/A	http://www.ecb.europa.eu/press/pr/date/2009/html/pr091120.en.html

* AD: announcement date; ID: implementation date; GF: possible grandfathering period.

Measure	Timing*	ECB press release and relevant other links, other relevant comments
<p>Extension of the eligibility of BBB-rated assets.</p> <p>New graduated haircut schedule differentiating BBB rated assets and fine-tuning the definition of liquidity categories</p> <p>Termination of the acceptance as eligible assets of:</p> <ul style="list-style-type: none"> i) non-euro denominated assets; ii) debt instruments issued by credit institutions traded in accepted non-regulated markets; and iii) subordinated debt instruments with acceptable guarantees 	<p>AD:8 April 2010</p> <p>ID:1 January 2011</p>	<p>Press release of the announcement 8 April 2010: http://www.ecb.europa.eu/press/pr/date/2010/html/pr100408_1.en.html</p> <p>Press release with technical details 28 July 2010: http://www.ecb.europa.eu/press/pr/date/2010/html/pr100728_1.en.html</p> <p>Annex for haircuts: http://www.ecb.europa.eu/press/pr/date/2010/html/sp090728_1annex.en.pdf?bc6436ae3d64b34ff66f57f5a05cd361</p>
<p>Suspension of the rating threshold for debt instruments issued or guaranteed by the Greek government</p>	<p>AD:3 May 2010</p> <p>ID:3 May 2010</p>	<p>http://www.ecb.europa.eu/press/pr/date/2010/html/pr100503.en.html</p>
<p>Introduction/clarification of requirements applied to ABS: i) on underlying asset pools (i.e. clarifying that swaps and synthetic securities must not be included in the asset pool); and ii) on the place of establishment/location of originators/obligors/related security</p>	<p>AD:9 October 2010</p> <p>ID:10 October 2010</p> <p>GF:Until 9 October 2011 for ABS included in the EADB as of 10 October 2010</p>	<p>http://www.ecb.europa.eu/press/pr/date/2010/html/pr101009.en.html</p>
<p>Application of close link provisions to structured covered bonds backed by residential real estate loans.</p> <p>New provisions for the framework for implementation of monetary policy in the euro area:</p> <ul style="list-style-type: none"> • Asset-backed securities (ABSs): clearer and more stringent provisions on the cash flow-generating assets backing ABSs, identifying swaps and synthetic securities as non-eligible cash flow-generating assets. In addition, in order to reduce claw-back risk with a view to limiting credit and legal risks, the amended provisions include restrictions on the geographical scope of ABS originators and the underlying assets to the European Economic Area (EEA). • No double layer structure, i.e. try to avoid two SPVs involved in the transaction. • Close links: the introduction of additional exemptions from the prohibition of close links. It relates to non-UCITS covered bonds that fulfil all criteria that apply to asset-backed securities, and are both backed by residential real estate loans and denominated in euro. • Discretionary measures: the enhancement of the formulation regarding the suspension, limitation or exclusion of counterparties and assets on the grounds of prudence or a default. <p>Collateralisation non-compliance: consistency between the treatment of cases where the counterparty fails to sufficiently collateralise a liquidity-providing operation on the settlement day, and cases where the counterparty fails to sufficiently collateralise the operation during the life of the operation.</p>	<p>AD:9 October 2010</p> <p>ID:10 October 2010</p> <p>GF:Until 31 March 2011 (for assets submitted as collateral before 10 October 2010 that did not fulfil all criteria applicable)</p>	<p>http://www.ecb.europa.eu/press/pr/date/2010/html/pr101009.en.html</p>
<p>Application of close link provisions to structured covered bonds backed by commercial mortgage loans</p>	<p>AD:16 December 2010</p> <p>ID:1 February 2011</p> <p>GF:Until 31 March 2011 (for assets submitted as collateral before 1 February 2011 that did not fulfil all criteria applicable)</p>	<p>http://www.ecb.europa.eu/press/pr/date/2010/html/pr101216_1.en.html</p>
<p>Acceptance of fixed-terms deposits as an eligible non-marketable asset type</p>	<p>AD:16 December 2010</p> <p>ID:1 January 2011</p> <p>GF:N/A</p>	<p>http://www.ecb.europa.eu/press/pr/date/2010/html/pr101216_1.en.html</p>
<p>Announcement of intention to introduce loan-by-loan information requirements first for residential mortgage-backed securities (RMBSs) and thereafter gradually for other ABSs</p>	<p>AD:16 December 2010</p> <p>ID:Within the next 18 months</p> <p>GF:N/A</p>	<p>http://www.ecb.europa.eu/press/pr/date/2010/html/pr101216.en.html</p>
<p>The ECB published a new version of the General Documentation</p>	<p>AD:4 February 2011</p> <p>ID:1 February 2011</p>	

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Measure	Timing*	ECB press release and relevant other links, other relevant comments
The Governing Council approved the rating tool of Coface Serviços Portugal, S.A. for use within the Eurosystem credit assessment framework (ECAAF).	AD:18 March 2011 ID:18 March 2011 GF:N/A	http://www.ecb.europa.eu/press/govcdec/otherdec/2011/html/gc110318.en.html
Suspension of the application of the minimum rating threshold to marketable debt instruments issued/guaranteed by the Irish government	AD:31 March 2011 ID:31 March 2011 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2011/html/pr110331_2.en.html
Announcement of intention to introduce loan-level data requirements also for commercial mortgage-backed securities (CMBSs) and small- and medium-size enterprise (SME) transactions accepted in the Eurosystem collateral framework.	AD:29 April 2011 ID:Within the next 18 months	http://www.ecb.europa.eu/press/pr/date/2011/html/pr110429.en.html
Suspension of the application of the minimum rating threshold to marketable debt instruments issued/guaranteed by the Portuguese government	AD:7 July 2011 ID:7 July 2011 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2011/html/pr110707_1.en.html
Updated version of the General Documentation: i) acceptance of debt instruments issued by credit institutions (other than covered bonds) admitted to trading in acceptable non-regulated markets; ii) reduction to 5% (previously 10%) of the limit applied to unsecured debt instruments issued by banking groups (or closely-linked entities); and iii) postponement of the date for the introduction of a common minimum size threshold for credit claims	AD:21 September 2011 ID:1 January 2012 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2011/html/pr110921.en.html
Temporary measures to increase collateral availability: i) relaxation of the rating requirements (at issuance) applied to ABS (only RMBS and SME), subject to the fulfilment of additional criteria in terms of underlying assets; and ii) acceptance of certain additional credit claims	AD:8 December 2011 ID: 19 December 2011 (for ABS) 9 February 2012 (for additional credit claims) GF:N/A	Press release: http://www.ecb.europa.eu/press/pr/date/2011/html/pr111208_1.en.html Press release on implementation details for ACCs (9 February 2012): http://www.ecb.europa.eu/press/pr/date/2012/html/pr120209_2.en.html
Approval of the first two waves of additional credit claims (ACC) frameworks proposed by IE, ES, FR, IT, CY, AT and PT.	AD:9 February 2012 ID:9 February 2012 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2012/html/pr120209_2.en.html Further changes were reflected on the ECB's website and on the relevant NCBs' websites
Temporary suspension of eligibility of marketable debt instruments issued or fully guaranteed by the Hellenic Republic for use as collateral in Eurosystem monetary policy operations. This decision takes into account the rating of the Hellenic Republic as a result of the launch of the private sector involvement (PSI) offer.	AD:28 February 2012 ID:28 February 2012 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2012/html/pr120228.en.html
Marketable debt instruments issued or fully guaranteed by the Hellenic Republic will again be accepted as collateral in Eurosystem credit operations, without applying the minimum credit rating threshold for collateral eligibility.	AD:8 March 2012 ID:8 March 2012 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2012/html/pr120308_1.en.html
NCBs are not obliged to accept as collateral for Eurosystem credit operations eligible bank bonds guaranteed by a Member State under an EU-IMF financial assistance programme, or by a Member State whose credit assessment does not comply with the Eurosystem's benchmark for establishing its minimum requirement for high credit standards.	AD:21 March 2012 ID:23 March 2012 GF:N/A	http://www.ecb.europa.eu/press/govcdec/otherdec/2012/html/gc120323.en.html
On 4 April 2012 the Governing Council • approved additional information requirements for modifications to asset-backed securities (ABSs) • decided that rating tools not compliant with the Basel II definition of default by 31 May 2012 would be excluded as Eurosystem credit assessment framework (ECAAF) sources until compliance has been achieved • approved the rating tool of Creditreform Rating AG for use within the ECAAF.	AD:4 April 2012 ID:4 April 2012 GF:N/A	http://www.ecb.europa.eu/press/govcdec/otherdec/2012/html/gc120420.en.html

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Measure	Timing*	ECB press release and relevant other links, other relevant comments
<p>Templates for consumer finance ABS, leasing ABS and auto loan ABSs were approved. This completes the Governing Council decision taken on 29 April 2011 regarding the approval of the templates for commercial mortgage-backed securities and small and medium-sized enterprise transactions</p>	<p>AD:18 May 2012 ID:18 May 2012 GF:N/A</p>	<p>http://www.ecb.europa.eu/press/go/vcdec/otherdec/2012/html/gc120518.en.html</p>
<p>Lower rating requirement at issuance from 'AAA' to 'single A', for ABS that comply with the December 2011 mitigating criteria and belong to the following segments: Auto loan, leasing, consumer finance and CMBS – standard 16% haircut.</p> <p>Rating requirement (at issuance and during lifetime) reduced to BBB-, for ABS that comply with the December 2011 mitigating criteria and belong to the following segments: RMBS, SME, Consumer ABS and CMBS – 26% haircut (32% for CMBS).</p> <p>Rating requirement during lifetime reduced to BBB-, for already issued ABS that do not comply with the December 2011 criteria but are deemed eligible following a credit risk and eligibility review by the Eurosystem. Measure restricted to the following segments: RMBS and SME – 32% haircut (collateral accepted at the discretion of NCBs under a non-loss sharing regime).</p>	<p>AD:22 June 2012 ID:22 June 2012 GF:N/A</p>	<p>http://www.ecb.europa.eu/press/pr/date/2012/html/pr120622.en.html</p>
<p>On 3 July 2012 the Governing Council adopted Decision ECB/2012/12 amending Decision ECB/2011/25 on additional temporary measures relating to Eurosystem refinancing operations and eligibility of collateral. The amendment freezes the prevailing levels of own-used government guaranteed bank bonds and requires ex ante approval by the Governing Council of a request accompanied by a funding plan for any subsequent request to increase such levels.</p>	<p>AD:3 July 2012 ID:3 July 2012</p>	<p>http://www.ecb.europa.eu/press/go/vcdec/otherdec/2012/html/gc120720.en.html</p>
<p>Further to the decision of 4 April 2012, when the Governing Council decided that rating tools not compliant with the Basel II definition of default by 31 May 2012 would be excluded from use as Eurosystem credit assessment framework (ECAAF) sources until compliance is achieved, the Governing Council decided on 5 July 2012 to exclude the following rating tools from use as ECAAF sources for the time being: ICAP, Coface Serviços Portugal and Cerved.</p>	<p>AD:5 July 2012 ID:5 July 2012</p>	<p>http://www.ecb.europa.eu/press/go/vcdec/otherdec/2012/html/gc120720.en.html</p>
<p>On 5 July 2012 the Governing Council decided to implement loan-level data reporting as a collateral eligibility requirement for asset-backed securities (ABSs) in the Eurosystem collateral framework. This decision included a transition period of nine months, in total, before full compliance with the reporting standards applicable to the loan-level reporting templates needs to be achieved. The transition period will apply from the dates on which reporting becomes mandatory for each ABS asset class. The Governing Council also decided on effective starting dates for reporting loan-level data for residential mortgage-backed securities, for securitisations of loans to small and medium-sized enterprises and for commercial mortgage-backed securities, as well as for auto loan ABSs, consumer finance ABSs and leasing ABSs.</p>	<p>AD:6 July 2012 ID:6 July 2012 GF:9 month transition period from the dates on when reporting becomes mandatory for each ABS asset class</p>	<p>http://www.ecb.europa.eu/press/pr/date/2012/html/pr120706.en.html</p>
<p>Due to the expiration on 25 July 2012 of the buy-back scheme for marketable debt instruments issued or fully guaranteed by the Hellenic Republic, these instruments will become for the time being ineligible for use as collateral in Eurosystem monetary policy operations. In line with established procedures, the Governing Council will assess their potential eligibility following the conclusion of the currently on-going review, by the European Commission in liaison with the ECB and the IMF, of the progress made by Greece under the second adjustment programme.</p>	<p>AD:20 July 2012 ID:25 July 2012</p>	<p>http://www.ecb.europa.eu/press/pr/date/2012/html/pr120720.en.html</p>
<p>Suspension of the application of the minimum credit rating threshold in the collateral eligibility requirements for the purposes of the Eurosystem's credit operations in the case of marketable debt instruments issued or guaranteed by the central government, and credit claims granted to or guaranteed by the central government, of countries that are eligible for Outright Monetary Transactions or are under an EU-IMF programme and comply with the attached conditionality as assessed by the Governing Council.</p>	<p>AD:6 September 2012 ID:6 September 2012</p>	<p>http://www.ecb.europa.eu/press/pr/date/2012/html/pr120906_2.en.html</p>
<p>Marketable debt instruments denominated in currencies other than the euro, namely the US dollar, the pound sterling and the Japanese yen, and issued and held in the euro area, are eligible to be used as collateral in Eurosystem credit operations until further notice, with appropriate valuation markdowns.</p>	<p>AD:6 September 2012 ID:9 November 2012 GF:N/A</p>	<p>http://www.ecb.europa.eu/press/pr/date/2012/html/pr120906_2.en.html</p>
<p>On 17 September 2012 the Governing Council approved the launch of the "Common Eurosystem Pricing Hub" (CEPH), which will replace the two existing valuation hubs currently operated by the Banque de France (for the valuation of asset-backed securities) and by the Deutsche Bundesbank (for the valuation of other debt instruments). The CEPH will provide the Eurosystem with an integrated single platform delivering unique prices that will be used by all Eurosystem central banks to value collateral submitted in Eurosystem credit operations. The go-live of the first release of the CEPH took place on 21 September 2012.</p>	<p>AD:17 September 2012 ID:21 September 2012 GF:N/A</p>	<p>http://www.ecb.europa.eu/press/go/vcdec/otherdec/2012/html/gc120921.en.html</p>

* AD: announcement date; ID: implementation date; GF: possible grandfathering period.

Measure	Timing*	ECB press release and relevant other links, other relevant comments
<p>On 9 November 2012 the Governing Council, as a consequence of its decision on 15 June 2012 to discontinue the preparations for the Collateral Central Bank Management (CCBM2) project in its current form, decided to postpone the introduction of a uniform minimum size threshold for the acceptance of credit claims as collateral.</p>	<p>AD:9 November 2012 ID:9 November 2012 GF:N/A</p>	<p>http://www.ecb.europa.eu/press/go/vcdec/otherdec/2012/html/gc121123.en.html</p>
<p>Updated General Documentation:</p> <ol style="list-style-type: none"> 1) the reporting requirements related to the loan-level data for asset-backed securities. 2) Streamlined coupon types of eligible marketable instruments. Specifically, floating-rate coupons must be linked to a single standard euro interest rate reference or to a euro area inflation index. Complex coupon structures and inverse floaters are excluded. 3) Cover pools of eligible covered bonds may only contain asset-backed securities to the extent that these comply with Directives 2006/48/EC and 2006/49/EC, were originated within the same consolidated group and are used for transferring mortgages to the covered bond issuing entity. 4) Phase out of acceptance of unrated UCITS-compliant covered bonds issued prior to 1 January 2008. 5) Amendment of the close-link provisions in place for the own-use of covered bonds as collateral. 6) Providers of credit assessment systems accepted within the Eurosystem Credit Assessment Framework (ECAF) will be required to submit performance monitoring data on a disaggregated basis. Also, credit assessment systems will be required to provide a signed certificate confirming the accuracy and validity of the performance monitoring information provided. 7) A new information requirement for counterparties has been established which places the onus on the counterparty to inform the Eurosystem (i) one month in advance of any planned modification to an asset-backed security which it has submitted as collateral and (ii) upon submission of an asset-backed security, of any modification made to that asset in the six months prior to its submission, if the asset-backed security is own-used. 	<p>AD:28 November 2012 ID:03 January 2013</p> <p>GF:A grandfathering period of two years (starting as of 3 January 2013) for already issued covered bonds has been put in place.</p>	<p>http://www.ecb.europa.eu/press/pr/date/2012/html/pr121128.en.html</p>
<p>ECB announces rescheduling of loan-level data reporting requirements:</p> <ul style="list-style-type: none"> - For residential mortgage-backed securities, the reporting requirements will be mandatory as of 3 January 2013. - For asset-backed securities, where the cash-flow generating assets comprise loans to small and medium-sized enterprises, the reporting requirements will be mandatory as of 3 January 2013. - For commercial mortgage-backed securities, the reporting requirements will be mandatory as of 1 March 2013. - The nine-month transitional phase for each asset class, starting on the dates indicated above, will also be adjusted accordingly. <p>For other asset classes (i.e. auto loans, consumer finance loans and leasing receivables) the date of entry into force remains as originally announced, namely 1 January 2014.</p>	<p>AD:27 November 2012 ID:27 November 2012</p>	<p>http://www.ecb.europa.eu/press/pr/date/2012/html/pr121127.en.html</p>
<p>On 19 December 2012 the Governing Council adopted Decision ECB/2012/34 on temporary changes to the rules relating to the eligibility of foreign currency denominated collateral. The Decision, which enters into force on 3 January 2013, provides the legal basis for the suspension of certain provisions of the General Documentation and the continued eligibility as collateral of some assets denominated in pounds sterling, yen or US dollars.</p>	<p>AD:19 December 2012 ID:3 January 2013 GF:N/A</p>	<p>http://www.ecb.europa.eu/ecb/legal/pdf/en_ecb_2012_34_f.pdf</p>
<p>On 19 December 2012 the Governing Council adopted Decision ECB/2012/32 on temporary measures relating to the eligibility of marketable debt instruments issued or fully guaranteed by the Hellenic Republic. Decision ECB/2012/32 suspends the application of the minimum credit rating threshold in the collateral eligibility requirements for the purposes of the Eurosystem's credit operations in the case of marketable debt instruments issued or guaranteed by the Greek government, which, provided that they fulfil all other eligibility criteria, regain eligibility status for the purposes of Eurosystem credit operations, subject to special haircuts.</p>	<p>AD:19 December 2012 ID:21 December 2012 GF:N/A</p>	<p>http://www.ecb.int/press/pr/date/2012/html/pr121219.en.html</p>
<p>On 19 December 2012 the Governing Council approved the credit assessment system of Banka Slovenije for use within the Eurosystem credit assessment framework (ECAF). The full list of systems accepted by the Eurosystem for the purposes of the ECAF is available on the ECB's website.</p>	<p>AD:19 December 2012 ID:21 December 2012 GF:N/A</p>	<p>http://www.ecb.europa.eu/press/go/vcdec/otherdec/2012/html/gc121221.en.html</p>
<p>Entry into force of the new general documentation with modifications including:</p> <ul style="list-style-type: none"> - Stricter eligibility requirements regarding coupon structure - Reporting requirements for ABS loan level data - Cover pool of covered bonds may only contain certain ABS - Close link provisions for own-use of covered bonds 	<p>AD:28 November 2012 ID:3 January 2013</p>	<p>http://www.ecb.europa.eu/press/pr/date/2012/html/pr121128.en.html</p>

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Measure	Timing*	ECB press release and relevant other links, other relevant comments
The Global Exchange Market (GEM) was added to the list of acceptable non-regulated markets and Erste Abwicklungsanstalt (EAA) and the European Stability Mechanism (ESM) were accepted as agencies.	AD:N/A ID:17 January 2013 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2013/html/gc130125.en.html List of recognised agencies http://www.ecb.europa.eu/mopo/assets/standards/marketable/html/index.en.html#agencies
Regarding Uncovered Government-Guaranteed Bank Bonds 1) Until 28 February 2015 NCBs are only allowed to accept eligible own-used GGBBs as collateral in the nominal value of these bonds already submitted as collateral on 3 July 2012 (phasing out) 2) As of 1 March 2015, the use as collateral in Eurosystem monetary policy operations of uncovered government-guaranteed bank bonds that have been issued by the counterparty itself or an entity closely linked to that counterparty is not accepted anymore. As of that date, the Eurosystem will also no longer accept covered bonds issued by the counterparty where the asset pool contains uncovered government-guaranteed bank bonds also issued by that counterparty or an entity closely linked to that counterparty.	AD:22 March 2013 ID:22 March 2013 GF:Until 28 February 2015	http://www.ecb.europa.eu/press/pr/date/2013/html/pr130322.en.html Legal acts Regarding 1) ECB/2013/4 Article 5(3) Regarding 2) ECB/2013/6
Rating waivers for marketable assets issued or guaranteed by central governments under a European Union / International Monetary Fund programme (inclusion of provisions from previous Guideline for IE, PT and GR).	AD:22 March 2013 ID:22 March 2013 GF:N/A	Press release http://www.ecb.europa.eu/press/pr/date/2013/html/pr130322.en.html
Eligibility provisions for marketable debt instruments issued or fully guaranteed by the Republic of Cyprus 1. Suspension of eligibility in consideration of non-compliance with minimum rating threshold 2. Reacceptance with special haircuts as of 9 May 2013 3. Temporary Suspension as of 28 June 2013 4. Reacceptance with special haircuts as of 5 July 2013	AD: 1. N/A 2. 2 May 2013 3. 28 June 2013 4. 5 July 2013 ID: 1. N/A 2. 9 May 2013 3. 28 June 2013 4. 5 July 2013 GF: 1. N/A 2. N/A 3. N/A 4. N/A	N/A Press release Press release Press release
Revision of the Eurosystem's risk control framework. In particular, the most relevant changes were as follows: (i) Revision of the haircut schedule applied to marketable and non-marketable assets; (ii) Lowering of the rating requirements at issuance (from triple-A to single-A) for ABS that comply with loan-level information requirements (this measure did not come into effect at the same time for all ABS classes which have a loan-level template); (iii) Application of an haircut add-on (in the form of a valuation markdown) for own-used covered bonds; (iv) Adoption of a common methodology to calculate haircuts for pools of ACCs.	AD: 18 July 2013 ID: 1 October 2013 (for i and ii), 1 November 2013 (for iii) and 1 January 2014 (for iv) GF: N/A	http://www.ecb.europa.eu/press/pr/date/2013/html/pr130718.en.html
Acceptance of Cerved Group rating tool for the purposes of the Eurosystem credit assessment framework (ECAAF).	ID:6 September 2013 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2013/html/gc130920.en.html
Introduction of the 'comply or explain' approach for RMBSs and ABS backed by SME loans that are unable to reach the target compliance score (A1) by end-November 2013.	AD:9 September 2013 ID:16 October 2013 GF:Different tolerance horizons depending on the causes for the non-compliance.	http://www.ecb.europa.eu/press/pr/date/2013/html/pr130909.en.html

* AD: announcement date; ID: implementation date; GF: possible grandfathering period.

Measure	Timing*	ECB press release and relevant other links, other relevant comments
Enlargement of the Eurosystem ABS loan level initiative with the creation of a specific template for ABS backed by credit card receivables.	AD:19 September 2013 ID:1 April 2014 GF:Until 31 December 2014	http://www.ecb.europa.eu/press/pr/date/2013/html/pr130909.en.html http://www.ecb.europa.eu/press/pr/date/2013/html/pr130919.en.html
Revision of the framework for the assessment of securities settlement systems and links to determine their eligibility for use in Eurosystem credit operations.	AD:27 September 2013 ID:27 September 2013 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2013/html/pr130927_1.en.html
Acceptance of the credit assessment system of the Nationale Bank van België/Banque Nationale de Belgique for use within the Eurosystem Credit Assessment Framework (ECAF).	AD:N/A ID:14 November 2013 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2013/html/gc131122.en.html
Annual review of the list of acceptable non-regulated markets and issuers classified as agencies in the Eurosystem collateral framework. While the list of acceptable non-regulated markets remained unchanged from the previous review, three new entities were classified as agencies: Agence central des organismes de sécurité sociale (ACOSS), Union nationale interprofessionnelle pour l'emploi dans l'industrie et le commerce (UNEDIC) and Société de financement de l'économie française (SFEF).	AD:12 December 2013 ID:12 December 2013 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2013/html/gc131220.en.html http://www.ecb.europa.eu/mopo/assets/standards/marketable/html/index.en.html#agencies
Extension of the interim period before the introduction of a standard minimum size threshold for domestic credit claims. The introduction of a minimum size threshold of EUR 500,000 for domestic credit claims, initially planned for 1 January 2012, will be further postponed until at least the end of February 2015.	AD:24 January 2014 ID:N/A GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc140124.en.html
Clarification on the rating rules for ABS.	AD:12 March 2014 ID:1 April 2014 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc140321.en.html
Removal of repatriation requirement and the introduction of cross-border triparty collateral management services. Mapping of credit ratings to the Eurosystem credit assessment framework credit quality steps of the Eurosystem's harmonised rating scale. Ireland's exit from a European Union / International Monetary Fund programme.	AD: 12 March 2014 ID: 1.26 May 2014 2.1 April 2014 3.1 April 2014 GF:Until implementation	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc140321.en.html
In order to support the effectiveness of the TLTROs and to ensure that sufficient collateral is available for banks to participate in the scheme, on 5 June 2014 the Governing Council decided to extend the existing eligibility of additional assets as collateral, notably under the additional credit claims framework, at least until September 2018.	AD:20 June 2014 ID:N/A GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc140620.en.html
Inclusion, in the additional credit claims (ACC) framework, of certain short-term debt instruments issued by non-financial corporations that would not satisfy the Eurosystem eligibility criteria for marketable assets, provided they comply with a number of specific criteria.	AD:18 July 2014 ID:20 August 2014 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc140718.en.html
Portugal exits the European Union / International Monetary Fund programme on 30 June 2014. This leads to a removal of the waiver on credit assessment requirements to assets issued or guaranteed by the Portuguese Government. Portugal was thus removed from the list of countries under an EU/IMF programme.	AD:18 July 2014 ID:20 August 2014 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc140718.en.html
On 1 September 2014 the Governing Council adopted Decision ECB/2014/38 amending Decision ECB/2013/35 on additional measures relating to Eurosystem refinancing operations and eligibility of collateral. For the purposes of selecting the appropriate rating to be used for determining the eligibility of marketable assets for Eurosystem credit operations and their related haircut, a rule defining the priority of ratings is in place. The Decision caters for an adjustment of the rule as regards public issuers. The Decision, shall apply from 15 December 2014.	AD:19 September 2014 ID:15 December 2014 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc140919.en.html
The Governing Council has decided to modify the loan-level reporting requirements for asset-backed securities (ABSs) backed by auto loans, leasing receivables, consumer finance loans and credit card receivables that are used as collateral in Eurosystem monetary policy operations and are unable to satisfy the timeline announced on 27 November 2012.	AD:September 2014 ID:1 October 2014 GF:N/A	http://www.ecb.europa.eu/press/pr/date/2014/html/pr140904_1.en.html
On 19 November 2014 the Governing Council adopted Guideline ECB/2014/46 amending Guideline ECB/2014/31 on additional temporary measures relating to Eurosystem refinancing operations and eligibility of collateral. This new legal act implements the decision of the Governing Council to revise the haircut schedule applicable to marketable debt instruments issued or fully guaranteed by the Hellenic Republic in view of the overall improved market conditions for Greek marketable assets since the beginning of 2013. This legal act will be published in the <i>Official Journal of the European Union</i> and on the ECB's website.	AD:21 November 2014 ID:19 November 2014 GF:N/A	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc141121.en.html

* AD: announcement date; ID: implementation date; GF: possible grandfathering period.

Measure	Timing*	ECB press release and relevant other links, other relevant comments
On 30 October 2014 the Governing Council approved Euroclear Finland Infinity System as eligible for use in Eurosystem credit operations. The comprehensive lists of eligible SSSs available on the ECB's website will be updated on 2 February 2015 when the new system will go live	ID:30 October 2014	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc141121.en.html
End of grandfathering period for ABS not complying with new servicing provisions.	GF:1 October 2014	
End of grandfathering period for covered bonds with ineligible ABS included as cover pool assets.	GF:29 November 2014	
Revision of the haircut schedule applicable to marketable debt instruments issued or fully guaranteed by the Hellenic Republic	AD:21 November 2014 ID:19 November 2014	http://www.ecb.europa.eu/press/govdec/otherdec/2014/html/gc141121.en.html
End of grandfathering period for own-use of government-guaranteed bank bonds	AD:22 March 2013 GF:until 1 March 2015	
Lifting of the waiver regarding the minimum credit quality threshold for marketable debt instruments issued or fully guaranteed by the Hellenic Republic.	AD:4 February 2015	http://www.ecb.europa.eu/press/pr/date/2015/html/pr150204.en.html
<p>Entry into force of Guideline ECB/2014/60 (recast GD)</p> <ul style="list-style-type: none"> former classification of "international or supranational institutions" has been replaced with the concept of "multilateral development banks and international organizations" in order to align them with the definitions in other regulatory frameworks (Article 69); several changes have been made to the eligibility criteria of asset-backed securities (ABS) aimed at enhancing the security and transparency of the debt instruments accepted by the Eurosystem, which will also contribute to improving the functioning of the ABS market, namely: <ul style="list-style-type: none"> exclusion of ABS comprising receivables with residual value – with a 4 month grandfathering period for those ABS that will be on the list of eligible assets on 1 May 2015 (Article 73.7); introduction of additional criteria for the place of incorporation of mortgage trustees or receivables trustees in ABS transactions – with a 1 year grandfathering period for those ABS that will be on the list of eligible assets on 1 May 2015 (Article 74.3); enhancement of the framework on ABS surveillance reports requirement (Article 88.2); further specification of the rules governing the provision of liquidity support in respect of ABS – these provisions shall apply as from 1 November 2015 (Article 142); removal of the requirements for counterparties to inform the Eurosystem of modifications to the ABS that took place in the preceding six months and of any planned modification to the ABS. changes have been made to the rules governing the own-use of multi-cédulas issued after 1 May 2015 along with the clarification that the Eurosystem will consider the relation between each of the underlying cédulas issuers and respective counterparties for determining the existence of close links (Article 138). provisions restricting the own-use of government guaranteed unsecured debt instruments have been clarified (Article 139). <p>Guideline ECB/2014/60 is published on the ECB's website for information purposes. The Guideline in 23 official EU languages was published in the course of April 2015 in the Official Journal of the European Union.</p>	AD:20 February 2015 ID:1 May 2015	http://www.ecb.europa.eu/press/pr/date/2015/html/pr150220.en.html
Adoption of Guideline (EU) 2015/732 amending Guideline ECB/2014/60 in order to reflect changes to the Eurosystem's collateral framework relating to the acceptable coupon structures for marketable assets	AD:16 April 2015 (via publication in the ECB website) ID:1 May 2015	https://www.ecb.europa.eu/ecb/legal/pdf/oj_jol_2015_116_r_0005_en_txt.pdf
Enhancement of transparency requirements for asset-backed securities: reducing the tolerance levels for legacy IT systems and for legacy assets in the context of loan-level data, following an adaptation period of one year.	AD:25 June 2015	http://www.ecb.europa.eu/press/govdec/otherdec/2015/html/gc150717.en.html
A new class of eligible assets, namely the "non-marketable debt instruments backed by eligible credit claims (DECCs)", has been introduced in the Eurosystem collateral framework.	AD 31 August 2015 ID:2 November 2015	http://www.ecb.europa.eu/press/pr/date/2015/html/pr150831_1.en.html
<p>Specific provisions relating to Eurosystem valuation haircuts moved from the General Documentation [1] to a new, separate Guideline;</p> <p>Rules refined for valuation haircuts applicable to own-used covered bonds;</p> <p>Non-marketable debt instruments backed by eligible credit claims (DECCs) now for cross-border use via standard CCBM procedure</p>	AD 20 November 2015 ID:25 January 2016	http://www.ecb.europa.eu/press/pr/date/2015/html/pr151120.en.html
Reinstatement of waiver regarding the minimum credit quality threshold for marketable debt instruments issued or fully guaranteed by the Hellenic Republic	AD 22 June 2016 ID:29 June 2016	http://www.ecb.europa.eu/press/pr/date/2016/html/pr160622_1.en.html

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Measure	Timing*	ECB press release and relevant other links, other relevant comments
Changes to collateral eligibility criteria and risk control measures for unsecured bank bonds	AD 5 October 2016 ID:1 January 2017	http://www.ecb.europa.eu/press/pr/date/2016/html/pr161005.en.html
ECB reviews its risk control framework for collateral assets <ul style="list-style-type: none"> • adjustment of haircuts for marketable and non-marketable assets • WAL-dependent haircuts for ABS • General decision to introduce, at a later stage in 2017, maturity-dependent haircuts for floating rate assets • General decision to introduce, at a later stage in 2017, additional risk control measures for retained covered bonds with extendible maturities mobilised as collateral 	AD 3 November 2016 ID:1 January 2017	http://www.ecb.europa.eu/press/pr/date/2016/html/pr161103_1.en.html
Implementation of previously announced changes in the eligibility of uncovered bank bonds; Refinement of the rules on acceptable coupon structures; Clarification regarding designated repositories for ABS loan-level data	AD 3 November 2016 ID:1 January 2017	http://www.ecb.europa.eu/press/pr/date/2016/html/pr161103.en.html

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Abbreviations

Countries

BE	Belgium	HR	Croatia	PL	Poland
BG	Bulgaria	IT	Italy	PT	Portugal
CZ	Czech Republic	CY	Cyprus	RO	Romania
DK	Denmark	LV	Latvia	SI	Slovenia
DE	Germany	LT	Lithuania	SK	Slovakia
EE	Estonia	LU	Luxembourg	FI	Finland
IE	Ireland	HU	Hungary	SE	Sweden
GR	Greece	MT	Malta	UK	United Kingdom
ES	Spain	NL	Netherlands	US	United States
FR	France	AT	Austria		

In accordance with EU practice, the EU Member States are listed in this report using the alphabetical order of the country names in the national languages.

Others

ABS	asset-backed security
ACC	additional credit claims
BIS	Bank for International Settlements
BRRD	EU Bank Recovery and Resolution Directive
CCP	central counterparty
CGFS	Committee on the Global Financial System
CDO	collateralised debt obligation
CEPH	Common Eurosystem Pricing Hub
CQS	credit quality step
CRR	Capital Requirements Regulation
ECAF	Eurosystem credit assessment framework
ECAI	Eurosystem credit assessment institution
ECB	European Central Bank
ELA	Emergency liquidity assistance
EMIR	European Market Infrastructure Regulation
EMMI	European Money Market Institute
ESCB	European System of Central Banks
ESCF	Eurosystem collateral framework
EU	European Union
EUR	Euro
GC	general collateral
GGBB	government-guaranteed bank bond
ICAS	in-house credit assessment system
IRB	internal ratings-based system
IMF	International Monetary Fund
LOLR	lender of last resort
LTRO	longer-term refinancing operation
NCB	national central bank
OMT	Outright Monetary Transactions
OTC	over the counter
PDCF	Primary Dealer Credit Facility
RT	third-party rating tool provider
SME	small and medium enterprise
SMP	Securities Markets Programme
STEP	Short-Term European Paper
TLTRO	targeted longer-term refinancing operation
USD	United States dollar

Conventions used in the tables

“.” data do not exist/data are not applicable

“.” data are not yet available

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Ulrich Bindseil

European Central Bank, Frankfurt am Main, Germany; email: Ulrich.Bindseil@ecb.europa.eu

Marco Corsi

European Central Bank, Frankfurt am Main, Germany; email: Marco.Corsi@ecb.europa.eu

Benjamin Sahel

European Central Bank, Frankfurt am Main, Germany; email: Benjamin.Sahel@ecb.europa.eu

Ad Visser

European Central Bank, Frankfurt am Main, Germany; email: Ad.Visser@ecb.europa.eu

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Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.ecb.europa.eu

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