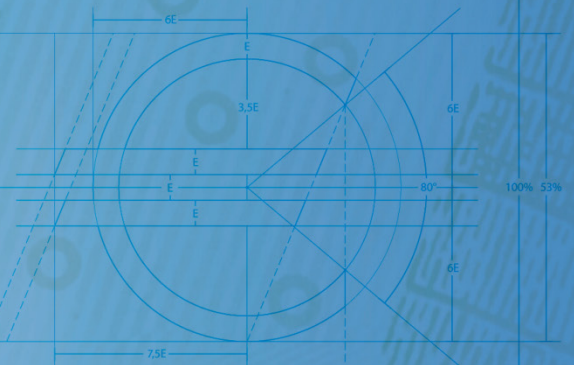




EUROPEAN CENTRAL BANK  
EUROSYSTEM

# The financial risk management of the Eurosystem's monetary policy operations

July 2015



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# Foreword

This publication provides a new resource for those who would like to know how the Eurosystem designs and conducts the risk management of its monetary policy operations. Monetary policy operations often involve the collateralised provision of funds to eligible counterparties on a temporary basis or the conduct of outright market transactions. These are financial operations entailing risks which need to be managed. Since the start of the financial crisis the Eurosystem has had to increase the size and complexity of its monetary policy operations, which has also led to an increase in risks to its balance sheet. This booklet written by staff from the European Central Bank's Directorate Risk Management describes the risks faced by the Eurosystem in the area of monetary policy operations and how they are mitigated, managed and reported.

The Eurosystem places particular importance on risk management. It aims to meet the highest governance standards in performing its risk management function and to apply well-established risk management practices. We cannot expect less from a function that is an integral part of policy decision-making. The Eurosystem aims to achieve its policy objectives with the lowest possible risk. In this sense, risk management means striving to ensure that the Eurosystem uses its risk capacity in the most efficient way in relation to the achievement of policy objectives. It is crucial that risks are measured in an objective and consistent manner. In this way decision-makers in the Eurosystem have the full picture of policy objectives and implementation options together with the related financial risks when taking decisions on monetary policy. This booklet provides insights as to how the management and measurement of risks is done in the Eurosystem.

Risk management is also key to ensuring that the trust given to the Eurosystem in relation to the management of public funds in its conduct of monetary policy operations is maintained. In designing and implementing its risk management framework, the Eurosystem aims to ensure adequate protection of its balance sheet over the economic cycle. Particular attention is paid to make sure that the risk management framework is not overly tightened during periods of stress. Protecting against risks while at the same time enabling the smooth implementation of monetary policy operations – sometimes in situations of financial market stress where few market operators dare to take on more risks – makes central bank risk management different from that of private institutions and underscores its public dimension. It is a fine balance and we in the Eurosystem aim to maintain this balance for the benefit of European citizens.

Risk management in the Eurosystem will continue to evolve. We need to be ready with risk management frameworks, systems and tools to provide solutions to the challenges ahead. I trust this publication will meet the need for a transparent, accessible and concise explanation for those interested in understanding the key elements of the Eurosystem's risk management function in the area of monetary policy operations.



Yves Mersch  
(Member of the Executive Board of the ECB)

# 1 Principles, objectives and the organisation of the Eurosystem's risk management function

## 1.1 Introduction

This booklet describes the Eurosystem's financial risk management framework for its monetary policy operations.

This booklet provides a concise description of how the Eurosystem manages the financial risks inherent in the implementation of its monetary policy operations. The Eurosystem's monetary policy operations have increased in size and complexity since the start of the financial crisis and accordingly the Eurosystem is facing additional and more significant risks in the implementation of its primary functions and policies. This booklet provides an overview of the fundamental aspects and techniques associated with the Eurosystem's risk management function in the implementation of these monetary policy operations. It places special emphasis on Eurosystem's credit operations and outright purchases. Written by staff members from the ECB's Directorate Risk Management, this booklet offers interested members of the general public and those concerned with the increasingly important task of managing the risks that a central bank faces as a result of its monetary policy operations a resource to find out more. Risks associated with the asset and liability management of the central banks and, in particular, risks originating from the holding and investment of foreign reserves and own funds are not covered in this publication.<sup>1</sup>

Eurosystem monetary policy instruments: mainly credit operations...

The Eurosystem<sup>2</sup> implements its monetary policy using a variety of financial instruments. These instruments include liquidity-providing credit operations, outright transactions, the issuance of ECB debt certificates, minimum reserve requirements, standing facilities, foreign exchange swaps and the collection of fixed-term deposits. Out of these instruments, credit operations have traditionally been the Eurosystem's most important tool in the conduct of its monetary policy. Credit operations are also called 'liquidity-providing reverse transactions' and are implemented as collateralised loans or repurchase agreements ('repos') and involve the provision of liquidity against the provision of adequate collateral for a pre-specified period of time.<sup>3</sup> Since Emergency Liquidity Assistance (ELA) is implemented in the same way, ELA is also covered in this booklet although it is not a monetary policy instrument.

... and more recently, outright transactions.

More recently, the Eurosystem has, as part of its non-standard monetary policy measures, shifted a significant part of its monetary policy implementation toolbox

<sup>1</sup> For readers interested in this topic please refer to Bernadell et al. (2004).

<sup>2</sup> The Eurosystem consists of the European Central Bank (ECB) and the national central banks (NCBs) of those member states of the European Union whose currency is the euro.

<sup>3</sup> In this booklet, the term "credit operations" is used as a synonym for "liquidity-providing reverse transactions", whereas in Guideline (EU) 2015/510 of the ECB of 19 December 2014 on the implementation of the Eurosystem monetary policy framework (ECB/2014/60) (henceforth "Guideline ECB/2014/60") the term covers both "liquidity-providing reverse transactions" and "intraday credit". Section 2.1 provides further information about the link between intraday credit and credit operations.

temporarily towards outright transactions.<sup>4</sup> Outright transactions are those where the Eurosystem buys or sells eligible assets outright in the market.

All the financial instruments used to implement monetary policy inherently involve risks for the Eurosystem that need to be managed and controlled. For example, the Eurosystem faces risks in credit operations if a double default occurs, i.e. if both the counterparty and the collateral issuer default. Even if only the counterparty defaults, the Eurosystem faces risks associated with the liquidation of the collateral which the Eurosystem receives upon default of the counterparty. By contrast, in outright purchase operations there is no provision of collateral and the Eurosystem mainly faces the risk of the issuer of the purchased debt instrument defaulting.

This booklet starts by explaining the objectives, principles and organisation of the Eurosystem's risk management function. It then provides in Section 2 an overview of the risk management aspects of the traditional collateralised liquidity-providing credit operations that have been used by the Eurosystem since the introduction of the euro and describes how the risks stemming from these types of operation are managed. This is followed in Section 3 by an explanation of the risks associated with outright transactions and how these risks are mitigated. The ECB's internal risk monitoring and the public risk reporting are described in Section 4, before Section 5 concludes.

## 1.2 Why manage risks?

Some people may ask why we should bother managing financial risks since the Eurosystem is able to create money. There are several answers to this.

First, central bank revenues are public funds, which means that any financial loss incurred by a central bank is a loss of public funds. Losses affect the net income generated by the ECB's financial operations. The ECB pays this net income to the ECB's shareholders, i.e. the national central banks (NCBs) of the Eurosystem, which in turn pay dividends to the respective governments of the euro area countries.

Second, the damage which financial losses can inflict on the central bank's credibility and reputation is potentially significant for the Eurosystem and this could in turn affect the credibility of its monetary policy implementation.

Third, the implementation of a monetary policy which strives for consistency across assets and financial markets from a risk management perspective (risk equivalence) is important for the avoidance of market distortions and undue risk transfers.

Fourth, financial losses could affect the Eurosystem's financial independence. In order to undertake its functions independently in line with its mandate, the ECB and the NCBs need to have enough net equity – in case of losses – in order to minimise reliance on capital injections, stemming ultimately from the treasuries of the euro

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<sup>4</sup> See, for instance, Eser et al. (2012).

area countries. The role of risk management is to preserve the capital held by the ECB and NCBs by managing and mitigating the risks to which they are exposed.

## 1.3 Principles of the Eurosystem's risk management function

Main principles of the Eurosystem's risk management framework:

There are principles with which all risk management functions need to comply, regardless of the way the institution is organised or its goals. These principles are important to ensure the long-term viability and continued success of any financial institution in the pursuit of its mandate. Central banks are not exempt from having to act in accordance with certain risk management standards. In this respect, the Eurosystem's risk management function is characterised by a set of principles, which also reflect its public role and the constraints associated with this role. The main principles with which the Eurosystem risk management function complies in order to adequately fulfil its role are examined below.

Integral part of decision-making

- **Risk management is an integral part of decision-making.** It seeks to enable the achievement of policy objectives with the lowest possible risk for the Eurosystem and the ECB. In this sense, risk management strives to ensure the use of the Eurosystem's risk capacity in relation to the achievement of policy objectives in the most risk-efficient way. In addition, risk management must allow the central bank to conduct its monetary policy operations smoothly, even for large operations at very short notice. In practice a balance needs to be found between monetary policy goals, and even financial stability considerations, and risk management concerns. This balance is most likely to exist during a significant financial crisis. Given the inherently pro-cyclical nature of the financial system, central bank risk management should aim to provide adequate protection over the financial cycle without the need to tighten risk measures in times of stress, so that it does not contribute to pro-cyclicality.

Objective risk measurement

- **Risk is measured in an objective and consistent way,** based on generally recognised estimation methods and objective assumptions which are updated when necessary. This provides current information and comparability across various financial operations and a disciplined approach to the measurement of risks. The quantification of risks relies on well-known risk measures such as the expected shortfall (ES) and value at risk (VaR). These measures are complemented with other methods, such as sensitivity and stress scenario analyses, in order to provide a complete picture of the risks of the Eurosystem's monetary policy operations on an ongoing basis.

State-of-the-art risk management framework and governance

- **Risk management follows well-established risk management practices,** such as adequate risk governance and organisation. It strives to maintain a state-of-the-art risk management framework and infrastructure in order to assess risks proactively and to promote a value-added financial risk management culture across the Eurosystem, which in turn facilitates the decision-making process.

Transparency and simplicity

- **Risk management strives to pursue transparency and simplicity** in the

conduct of its business internally and externally. Risk management calls for the necessary external disclosure of risks, so that the public can understand the risks the Eurosystem takes. As part of its public role, central bank risk management can positively influence the disclosure standards of financial assets that are used in central bank policy operations. This not only improves the analysis of risks by the central bank, but also the capacity of market operators to conduct more robust risk management, which, in turn, can have positive externalities on financial stability. At the same time, the disclosure of specific risk management information by the central bank, particularly if it affects specific counterparties or assets, may be interpreted by market participants as having significant “signalling effects”. Only if such signalling effects are intended and warranted is the public disclosure of risks appropriate both from a policy and a risk management perspective. Prudence and discretion are thus called for when it comes to public risk disclosure. Lastly, the risk management function also strives to minimise complexity where possible in its risk management frameworks in order to facilitate their understanding by internal and external parties, and to ensure the risk protection of the Eurosystem through a more efficient framework which is less prone to operational risk.

Avoiding asset price distortions

- **Risk management seeks to avoid distortions of asset prices** or overly influencing market processes and market participants’ behaviour. This promotes a level playing field across assets and financial markets and ensures a sufficient level of consistency across central bank operations from a risk management perspective, with the aim of providing risk-equivalent treatment across assets. The Eurosystem abides by the rules of a proper financial market, acting objectively, responsibly and with integrity, not favouring some financial assets and markets over others. If the latter approach were pursued there would be an overall loss of economic welfare.

## Box 1

### Risk efficiency and risk equivalence in the implementation of monetary policy

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#### Risk-return efficiency and equivalence from a financial perspective

The “modern portfolio theory” (MPT) and the “capital asset pricing model” (CAPM) capture the trade-off between risk and returns by means of a risk-return efficient frontier. Returns are usually expressed in terms of their expected values, whereas risks are usually measured in terms of the standard deviation of the portfolio return.<sup>5</sup> The efficient frontier represents the portfolios that minimise risks for a certain level of expected returns. In this context, efficiency is typically measured as a ratio of expected returns (or returns in excess of the risk-free rate) over some measure of risk.<sup>6</sup>

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<sup>5</sup> Modern portfolio theory and the capital asset pricing model are typically associated with the work of Harry Markowitz and William Sharpe; see, for instance, Markowitz (1952) and Sharpe (1964).

<sup>6</sup> A well-known reward-to-risk ratio is the Sharpe ratio; see Sharpe (1966).



If diversification and risk control measures sufficiently address idiosyncratic risks, then in efficient markets purchasing assets at market prices ensures risk-return equivalence and risk-return efficiency.

In the context of the risk efficiency of central bank operations, it is useful to recall two general propositions of the MPT and the CAPM. First, financial returns should appropriately compensate for financial risks. An efficient market provides no systematic arbitrage opportunities. A rational investor requires an appropriate level of return for their risk contribution to a given portfolio. In a diversified portfolio, the risk contribution of an asset stems from systematic risk components, which need to be rewarded and unlike idiosyncratic risks cannot be diversified away. In efficient markets the risk-return efficiency of all assets is the same in equilibrium. Second, the composition of the portfolio of a rational (and representative) investor should be diversified. Under the CAPM, the portfolio weights should be similar to relative market capitalisation weights combined with a risk-free asset, making relative market capitalisation weights relevant as a neutral benchmark allocation.

For risk efficiency and equivalence, diversified benchmarks and limits to avoid concentrations in risky assets are a powerful tool.

If markets are efficient, market prices ensure an appropriate remuneration of systematic risks, i.e. the risks that cannot be diversified away and generally affect the market portfolio. Therefore, if

diversification and risk control measures applied to monetary policy operations, for example haircuts, sufficiently address idiosyncratic risks, then in efficient markets transacting at market prices ensures risk-return efficiency, and a fair and consistent reward per unit of risk is achieved across assets (risk equivalence).

While the efficiency of capital markets and the ability of the MPT and the CAPM to describe the dynamics of financial markets can be challenged, in particular under the kind of circumstances giving rise to a central bank's intervention in the markets, the propositions described above still provide central banks with useful rules of thumb to determine the applicable pricing, risk control frameworks and benchmark portfolios for their policy operations.

In some cases, as in the case of the Eurosystem's credit operations, but also potentially in the context of some outright purchase programmes with a narrow and targeted purpose, the Eurosystem cannot conduct its operations acting as a price-taker at market prices because in those cases its monetary policy role is akin to acting as a price-setter for the operations involved. In these cases, risk-return efficiency and equivalence requires the risk control framework to be designed in such a way that ensures that the risks undertaken by the Eurosystem in the conduct of the operations is commensurate with the return that its pricing and policy strategy entails. For instance, if credit operations are conducted at a single policy rate against a broad set of collateral, the applicable risk control framework, including the eligibility, valuation and haircuts, among other things, should aim to ensure that the residual risks remaining after such risk controls have been implemented are equivalent across different assets. This approach not only ensures risk equivalence and efficiency for the Eurosystem, but also helps minimising potential distortive effects of the Eurosystem's actions on the markets.

### **Risk efficiency and risk equivalence from a monetary policy perspective**

The risk efficiency of policy measures can be expressed in terms of the expected effect of policy measures relative to their cost in terms of financial risks.

From a policy perspective, the risk efficiency of policy measures and frameworks can be expressed in terms of the expected effect of policy measures relative to their cost in terms of financial risks. This trade-off can be represented in terms of the risk efficient frontier for a policy

portfolio. The risk efficient frontier represents the portfolios that, for a given (target) policy impact

(for instance a given change in expected inflation), minimise risk – hence maximising risk efficiency subject to the achievement of the policy objective. This efficient frontier can only capture some of the relevant policy elements and risks in a stylised manner, but provides a useful framework to analyse the risk efficiency of monetary policy measures.

To ensure the effectiveness and efficiency of policy programmes and frameworks, their key features (for example eligibility, pricing strategy, generic benchmark definition and overall risk budget) need to first consider this policy-based definition of risk efficiency (policy impact per unit of risk), which may, in some cases, seek to have effective policy effects that are not market neutral. Financial risk-return efficiency and equivalence considerations (expected return per unit of risk) only play a role at a later stage when calibrating the remaining risk control and asset allocation parameters (limits, specific valuation methods, haircuts, specific eligibility criteria, detailed portfolio benchmark composition), meaning that on the one hand unintended allocative distortions are minimised and on the other hand the Eurosystem's balance sheet is protected.

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## 1.4 The organisation and governance of the risk management function

Risk management integrates the entire process of policies, procedures and systems which the Eurosystem has in place to prudently manage all the risks resulting from its financial operations in order to ensure that they are within its overall policy and mandate.

In this regard the ECB, and the Eurosystem more broadly, have established three key organisational features.

Independent organisation of the risk management function within the ECB...

First, there is an organisational structure that guarantees the independence of the risk management function. Such an organisational structure ensures that the risk management function is represented at an adequate level of seniority and that it reports directly and independently to the Executive Board. At the same time the organisational structure of the ECB's risk management function is duly separated from the risk-taking areas of the bank in order to avoid conflicts of interest. This structure also ensures that decisions encompassing the balancing of policy and risk management considerations are taken by the relevant decision-making bodies. This is particularly important as in some situations, for instance financial crises, the implementation of monetary policy decisions may expose the central bank to considerable risks. These risks should be fully and transparently communicated to the ECB decision-making bodies as an important element of their decision-making processes.

... and within the Eurosystem.

Second, the Eurosystem has a dedicated Risk Management Committee (RMC) reporting to the ECB decision-making bodies, i.e. the Executive Board and the Governing Council. The RMC assists the ECB decision-making bodies in achieving an appropriate level of protection for the Eurosystem by managing and controlling the risks originating from its monetary policy operations. The RMC relies on a variety of technical groups to support its work and its advice to the decision-making bodies.

The RMC's responsibilities involve managing all financial risks within the remit of monetary policy operations and the provision of intraday credit, as well as in investment and foreign exchange operations. With regard to the monetary policy operations and the provision of intraday credit, the RMC contributes, among other things, to (i) the monitoring, measuring and reporting of financial risks and the definition and review of the associated methodologies and frameworks; (ii) the analysis of the financial soundness of counterparties participating in the operations; (iii) the risk control and valuation framework applied to collateralised operations (including discretionary measures); (iv) the design and implementation of non-standard measures from the risk management perspective, and (v) any other risk management issues relating to instruments used in monetary policy operations and, as requested by the Governing Council or consulted by other European System of Central Banks (ESCB) committees, to a potential interference of emergency liquidity assistance (ELA) operations with the objectives and tasks of the ESCB.<sup>7</sup>

With regard to the ECB's investment and foreign exchange operations, the RMC contributes, among other things, to (i) the monitoring, measuring and reporting of financial risks, compliance with the risk management framework and investment performance, as well as the definition of associated methodologies; (ii) the definition and periodic review of the financial risk management frameworks and the associated methodologies; (iii) the strategic asset allocation and currency distribution of foreign reserve assets and the definition of the associated methodologies. The RMC is composed of members of the ECB and all NCBs from their risk management functions.

A state-of-the-art risk management  
IT system

Third, a state-of-the-art risk management system is used, which forms a key component of a strong operational and risk management structure. Such a risk management system also comprises the IT infrastructure, which collects all the relevant data on a daily basis and allows regular as well as ad hoc monitoring and reporting on financial risks.

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<sup>7</sup> Under Article 14.4 of the Protocol (N°4) on the Statute of the European System of Central Banks and of the European Central Bank ('Statute of the ESCB'): *'National central banks may perform functions other than those specified in this Statute. Such functions shall be performed on the responsibility and liability of National Central Banks and shall not be regarded as being part of the functions of the ESCB'*.

## 2 Monetary policy instruments: the Eurosystem's credit operations

Article 18.1 of the Statute of the European System of Central Banks and of the European Central Bank establishes that the Eurosystem shall only provide credit to its counterparties against “adequate” collateral. This statutory requirement has to be translated into a set of concrete rules setting out what assets are accepted and how much liquidity can be lent against them. In other words, the Eurosystem has developed a framework for counterparty and collateral eligibility, i.e. criteria and rules for selecting which entities may act as counterparties in credit operations, which assets may be used as collateral and how they should be valued. The counterparty framework is described in Section 2.2, while Section 2.3 discusses the eligibility requirements for collateral. Valuation is addressed in Sections 2.4 and 2.5, dealing with “fair” market valuation and quantitative risk control measures, respectively.

### 2.1 Risks

Credit operations are the standard tool for the Eurosystem's monetary policy implementation.

Central banks around the world steer interest rates in many different ways and the choice of instruments and operating targets for monetary policy implementation is usually rooted in history and institutional arrangements at least as much as it is based on practical issues.<sup>8</sup> The Eurosystem regulates the supply of central bank money primarily via different types of open market operations, usually in the form of credit operations. In particular, the main refinancing operations (MROs) – usually over one week – and longer-term refinancing operations (LTROs) – including recent non-standard measures, such as several three-year long-term refinancing operations<sup>9</sup> and the targeted long-term refinancing operations<sup>10</sup> – are implemented as the Eurosystem's credit operations. Fine-tuning and structural operations can also be implemented as the Eurosystem's credit operations. The marginal lending facility, which is the standing facility accessible for liquidity provision by means of reverse transactions, and intraday credit in the payment system TARGET2 are subject to the same collateralisation requirements as credit operations.<sup>11</sup>

<sup>8</sup> See, for example, Bindseil (2004) for a historical perspective on how traditions are slow to change in this area.

<sup>9</sup> See, for example, the ECB's press release of 8 December 2011, available at [http://www.ecb.europa.eu/press/pr/date/2011/html/pr111208\\_1.en.html](http://www.ecb.europa.eu/press/pr/date/2011/html/pr111208_1.en.html)

<sup>10</sup> See, for example, the ECB's press release of 5 June 2014, available at [http://www.ecb.europa.eu/press/pr/date/2014/html/pr140605\\_2.en.html](http://www.ecb.europa.eu/press/pr/date/2014/html/pr140605_2.en.html)

<sup>11</sup> The Eurosystem provides intraday credit in its payment system TARGET2 (see Annex III of the ECB's Guideline of 5 December 2012 on a Trans-European Automated Real-time Gross settlement Express Transfer system (TARGET2) (recast) (ECB/2012/27), available at [http://www.ecb.europa.eu/ecb/legal/pdf/l\\_03020130130en00010093.pdf](http://www.ecb.europa.eu/ecb/legal/pdf/l_03020130130en00010093.pdf). Intraday credit is associated with the same risks and is therefore subject to the same risk mitigation measures as the other Eurosystem credit operations; in particular, only assets eligible as collateral for monetary policy purposes are also eligible as collateral for intraday credit. The set of eligible counterparties goes beyond the counterparties eligible for the Eurosystem's credit operations as described in Section 2.2 (see Annex III of the Guideline on TARGET2 quoted above).

The Eurosystem lends to counterparties only against adequate collateral.

In credit operations, the Eurosystem provides loans to counterparties against adequate collateral.<sup>12</sup> These loans are subject to counterparty credit risk as a bank might not redeem the loan at maturity. The Eurosystem's counterparty framework described in Section 2.2 is the first layer of risk protection against this counterparty risk in the Eurosystem's credit operations.

The collateral framework addresses credit, market, liquidity, operational and legal risks.

The Eurosystem uses collateral as the second layer of protection. This collateral framework must adequately limit three kinds of financial risk, all of which arise only if the counterparty defaults.

- (i) The credit risk associated with the collateral accepted
- (ii) The market risk of an adverse movement in the price of an asset accepted as collateral occurring between the last collateral valuation and collateral realisation
- (iii) The liquidity risk of an adverse movement in the price of an asset caused by an attempt on the part of the Eurosystem to liquidate a potentially large position in that asset

In addition, operational and legal risks can arise from the specific credit operation and the collateral. For example, it needs to be operationally and legally ensured that the Eurosystem becomes the effective owner of the collateral if a counterparty defaults, so that it can actually liquidate the collateral. The Eurosystem's collateral framework described in Sections 2.3 to 2.5 sets out the concrete rules regarding which assets are accepted as collateral and how much liquidity can be lent against them.

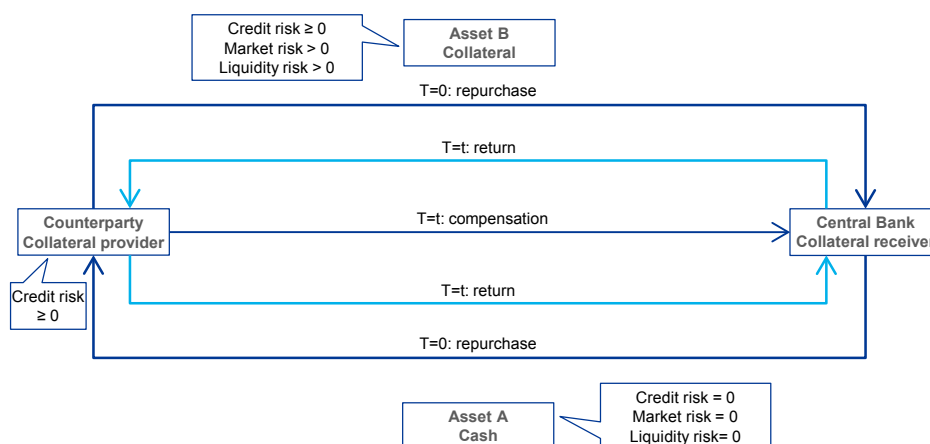
The transaction process of the Eurosystem's credit operations, the associated risks and risk mitigations are ultimately similar to collateralised lending operations by commercial banks. The difference is that the financial assets the central bank takes as collateral and that the lending rate it sets are determined as a matter of policy, and thus are the same for all borrowers. The application of a single policy rate, without differentiating across collateral types or counterparties, calls for the implementation of a risk control framework that aims to achieve risk equivalence across assets accepted as collateral. Figure 1 summarises the transactions involved in a credit operation undertaken by the Eurosystem and the associated risks.

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<sup>12</sup> All Eurosystem credit operations are conducted under a common risk management framework. Their technical implementation can differ across euro area countries because national central banks conduct the credit operations on behalf of the Eurosystem with their respective counterparties in the form of collateralised loans or repurchase agreements.

**Figure 1**

Risks involved in central bank repurchase transactions



Source: ECB

## 2.2 Counterparty framework

The set of eligible counterparties is broad, to ensure access to credit operations across the euro area.

Counterparties in the Eurosystem's credit operations are euro area credit institutions and euro area branches of non-euro area credit institutions subject to supervision and minimum reserve requirements. The set of counterparties eligible to participate in the Eurosystem's credit operations is broad. This reflects the breadth of the euro area banking system, where the financing of the economy is also much more reliant on banks than in other major economies. The broad set of counterparties helps banks to finance the euro area economy, transmitting the single monetary policy of the Eurosystem, while ensuring a level playing field and supporting the principles of a free market economy and efficient resource allocation.

To be eligible for participation in the Eurosystem's monetary policy credit operations, counterparties must be financially sound.

In order to address the risk of a counterparty defaulting, the Eurosystem requires its counterparties to be financially sound. The financial soundness criterion directly addresses counterparty default risk, i.e. the risk of a counterparty defaulting while it is receiving credit from the Eurosystem.<sup>13</sup>

The Eurosystem monitors the financial soundness of its counterparties on a regular basis. While the Eurosystem considers a wide range of qualitative and quantitative indicators in this regard, a minimum requirement for a counterparty to be considered financially sound is sufficient capital. In the EU, minimum capital buffers are set by the "own funds requirements" of the Capital Requirements Regulation.<sup>14</sup>

Supervision under the harmonised EU/EEA standard is another precondition for counterparty eligibility.

In addition, counterparties must be subject to harmonised EU/EEA supervision. Whilst the monetary policy and risk management functions of the Eurosystem assess the financial soundness of counterparties independently, credit institutions should be

<sup>13</sup> See Part Three of Guideline ECB/2014/60.

<sup>14</sup> See Capital Requirements Directive (CRD) 2013/36/EU, and Capital Requirements Regulation (CRR) No 575/2013.

subject to at least one form of harmonised EU/EEA supervision by national authorities. Financially sound credit institutions which are subject to non-harmonised supervision by competent national authorities of a standard comparable to harmonised EU/EEA supervision can also be accepted as counterparties, for instance branches established in the euro area of institutions incorporated outside the EEA. The same is true for publicly-owned credit institutions<sup>15</sup> which are subject to supervision of a comparable standard. Since taking over responsibility for directly or indirectly supervising banks within the Single Supervisory Mechanism (SSM), the ECB has established rules and processes to ensure that the monetary policy and supervision functions are separated in pursuit of their respective objectives, while allowing the ECB to reap benefits from their interactions (see Box 2 below).

The Eurosystem can suspend a counterparty's access on the grounds of prudence.

The Eurosystem can take a number of discretionary measures on the grounds of prudence to ensure that its counterparties are financially sound; such measures typically address counterparty credit and default risk.<sup>16</sup> Specifically, the Eurosystem may suspend, limit or even exclude an individual counterparty's access to credit operations. Measures carried out on the grounds of prudence are taken in a proportionate and non-discriminatory manner. Such measures are based on a detailed assessment of the counterparty's financial soundness, which takes into account all relevant information.

## Box 2

### The separation of the monetary policy and supervisory functions

The ECB is required to ensure separation between its monetary policy and supervisory functions so that each can pursue its independent objectives.

The SSM Regulation<sup>17</sup> provides the framework for the separation of the monetary policy and supervisory functions, establishes the Single Supervisory Mechanism (SSM), which is composed of the ECB and the national component authorities (NCAs) and confers on the ECB responsibility for the supervision of banks in the euro area. The SSM Regulation stipulates that the ECB is to carry out its supervisory tasks without prejudice to and separately from its tasks relating to monetary policy and any other tasks. The ECB's supervisory tasks should neither interfere with, nor be determined by, its tasks relating to monetary policy.

In keeping with the SSM Regulation, the Decision of the ECB on the implementation of the separation between the monetary policy and supervision functions of the ECB<sup>18</sup> lays down the framework for separating its monetary policy and supervisory functions in order to avoid any conflicts of interest. More than that, the Decision stipulates that the ECB's supervisory tasks and – within the monetary policy function – the ongoing monitoring of the financial soundness and solvency of the Eurosystem's monetary policy counterparties should not distort the respective other function. At the same time, the Decision acknowledges that the effective separation between the monetary policy and supervisory functions should not prevent the reaping, wherever possible and

<sup>15</sup> This applies to publicly-owned credit institutions within the meaning of Article 123(2) of the Treaty on the Functioning of the European Union.

<sup>16</sup> The Eurosystem may also take discretionary measures if there is an event of default of a counterparty.

<sup>17</sup> See Regulation (EU) No 1024/2013.

<sup>18</sup> Decision of the ECB (ECB/2014/39).

desirable, of all the benefits to be expected as a result of combining these two policy functions in one institution.

Effective separation of monetary policy and supervision still allows the benefits of combining the two functions in one institution, on a need-to-know basis, to be reaped.

The SSM Regulation and the ECB's Decision on separation imply that the financial soundness assessment of the ECB's counterparties for monetary policy operations must be conducted autonomously by the ECB's monetary policy function. At the same time, upon approval by the Executive Board of the ECB, and subject to the proviso that both the monetary policy and the supervisory functions are each exercised in accordance with their independent objectives, the two policy functions may exchange confidential information and assessments or policy recommendations upon request. This exchange, however, must take place on a strict need-to-know basis. Confidential information containing assessments or policy recommendations can only be exchanged if authorised by the Executive Board. However, in emergency situations<sup>19</sup> confidential information may be exchanged between the monetary policy and supervisory functions where it is relevant for each function's tasks regarding the emergency at hand.

Any analysis of the confidential information received has to be conducted autonomously by the receiving policy function in accordance with its objective. This autonomous analysis also forms the basis for any subsequent decisions.

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## 2.3 Collateral eligibility requirements

The Eurosystem accepts a wide range of collateral, on account of the size of its credit operations and the heterogeneity of its counterparties.

The Eurosystem mitigates the credit risk incurred when lending to its bank counterparties primarily through its collateral requirements. The Eurosystem has always accepted a wide range of collateral for its credit operations for historical and structural reasons,<sup>20</sup> in particular to ensure sufficient collateral availability for a wide range of counterparties with different business models and operating in different markets. This implies in turn that, in order to preserve a level playing field, the selection of acceptable collateral assets must be objective, transparent and rule-based.

Requirements for collateral aim to mitigate credit, legal and operational risks.

Eligibility requirements are primarily aimed at mitigating credit, legal and operational risks. By defining a minimum level of credit quality market risks are also indirectly tackled because less risky assets tend to have less price volatility; however, most of the market risks are not addressed via eligibility requirements but rather through valuation haircuts, as discussed in Section 2.5.

This section first discusses the general elements of the eligibility requirements for marketable and then non-marketable assets under both the general and the temporary collateral framework for the implementation of Eurosystem monetary policy. Since credit quality requirements are such an important element of the eligibility framework, they are discussed separately. The Eurosystem credit

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<sup>19</sup> For a definition see Article 114 of the Directive of the European Parliament and of the Council on access to the activity of credit institutions and investment firms.

<sup>20</sup> See, for example, Chapter 9 in Bindseil et al. (2009).



assessment framework (ECAAF) lays out the Eurosystem's minimum credit quality requirements and explains how the Eurosystem ensures compliance with these minimum credit quality requirements.

More details on the evolution of the collateral and risk control framework since 2007 are included in Box 2.

Since 2007, with the introduction of the “single list” of collateral assets, the eligibility criteria have been harmonised across the euro area and the set of eligible marketable assets which is published and updated daily on the ECB's website may be used as collateral by any counterparty and with any euro area NCB. This single list, also known as the general collateral framework, is common to all jurisdictions and tied to loss sharing arrangements within the Eurosystem's central banks, i.e. any loss realised in the liquidation of a single list collateral asset after a counterparty defaults is, in principle, shared according to the ECB capital key. The collateral eligibility requirements of the Eurosystem, set out in an ECB Guideline,<sup>21</sup> differentiate between asset types according to their specific nature and their associated risks. The most fundamental differences arise between marketable and non-marketable assets, but there are further requirements for certain sub-categories, such as asset-backed securities (ABSs), as outlined below.

As further described in Box 3, the Eurosystem has expanded the acceptance of collateral assets against the background of the financial crisis by introducing a temporary collateral framework, the bulk of which, in terms of usage, consists of additional credit claims (ACCs). Such assets do not belong to the single list and they are also subject to a separate ECB Guideline.<sup>22</sup> Therefore, the specification of the temporary framework can be adapted to local needs, provided certain agreed minimum risk management requirements are fulfilled.

Eligibility requirements can be seen as the efficient outcome of a cost-benefit analysis based on the characteristics of the different asset types, which evolve over time.

Taken together, eligibility requirements can be seen as the efficient outcome of a cost-benefit analysis based on the characteristics of the different asset types, in particular legal certainty, credit quality and availability of credit assessments, liquidity and complexity of pricing, handling costs, available amounts and prospective use.<sup>23</sup> While the resulting eligibility rules apply on a general asset-type level, the Eurosystem reserves the right to reject, limit the use of or apply additional risk control measures for specific assets on the grounds of prudence, both in general and for individual counterparties.

The costs and benefits of using different asset types change over time with economic and market developments. For example, over the recent crisis period, the Eurosystem has faced a shift in the composition of the provided collateral towards assets whose financial risks are more closely correlated with the Eurosystem's counterparties' defaults (“wrong-way risk”). This is true in particular for covered bonds that are “own used” by the issuer, ABSs retained by the originator of the underlying assets, own-used government-guaranteed bank bonds and, to some extent, credit claims (see Figure 2). Box 3 reviews the evolution of the collateral

<sup>21</sup> See Part Four of Guideline ECB/2014/60.

<sup>22</sup> 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).

<sup>23</sup> See Chapter 7 in Bindseil et al. (2009).

policy during the financial crisis, focusing on the main measures introduced and their background.

## Eligibility requirements for marketable assets

Eligible marketable assets are euro-denominated non-subordinated (“senior”) debt instruments issued in the EEA, traded on a regulated market (or in a non-regulated market deemed comparable in terms of safety, transparency and accessibility) and settled in an approved securities settlement system. They must be issued by a public or private sector entity (including international or supranational institutions) from the EEA or a non-EEA G10 country or, if a guarantee is relevant for compliance with credit quality requirements, guaranteed by a public or private sector entity within the EEA (see Table 2 for a more detailed summary).

A focus on simple and transparent debt instruments

Subject to these conditions and to the fulfilment of credit risk requirements, the types of issuers and marketable debt instruments which are deemed acceptable range from public sector entities' bills and bonds to ABSs, covered bonds and senior unsecured corporate bonds (both financial and non-financial).<sup>24</sup>

The Eurosystem aims to restrict the extent of collateral accepted to simple and transparent debt instruments and does not accept complex structures, such as complex coupons<sup>25</sup>, or double-layer structures in ABSs or covered bonds (see also Box 3).

Rules on the use of collateral limit or ban the existence of close links between the collateral and the counterparty using it.

For certain assets, the eligibility rules are complemented by restrictions on their use. These restrictions are needed to prevent a counterparty from using an asset as collateral when its value would likely decrease dramatically precisely in the event of a default of the counterparty. These restrictions apply to all assets issued by financial institutions or closely linked entities, such as unsecured bonds and covered bonds. In the former case, no unsecured bond issued by an entity closely linked to the counterparty may be used at all. In contrast, covered bonds issued and retained by the counterparty itself or by a closely linked entity may be used as collateral, subject to an additional valuation markdown, if they satisfy the requirements laid down in the Capital Requirements Regulation or have comparable legal safeguards.

The Eurosystem's collateral rules also deal extensively with close links embedded in the structure of ABSs. There are limitations or additional requirements imposed for ABS in which the counterparty performs the roles of servicer, swap provider or other roles, each of which are relevant for the operational or credit risk of the structure.

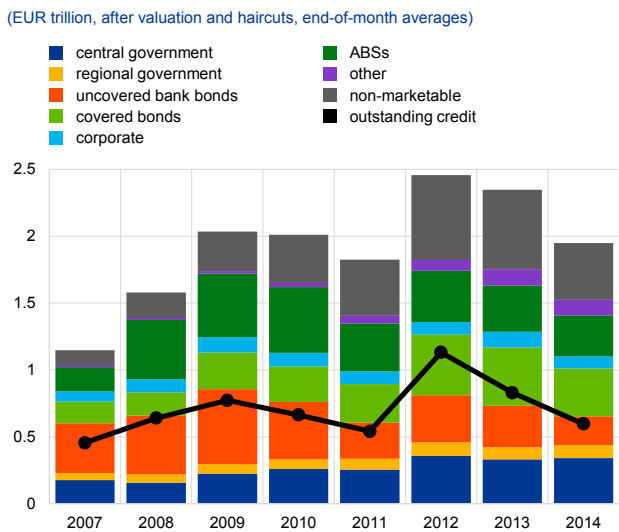
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<sup>24</sup> Furthermore, the Eurosystem accepts marketable assets issued by itself, i.e. ECB debt certificates, as collateral without further risk control measures, as such debt certificates could obviously be immediately liquidated in the event of a counterparty default without any financial risk for the Eurosystem. So far the Eurosystem has never issued ECB debt certificates.

<sup>25</sup> Complex coupon structures are, for example, floating interest rates not linked to a single euro money market rate index, any kind of ratchet and range accrual coupons or instruments with options to change the coupon type. The details are specified in Article 63 of Guideline ECB/2014/60.

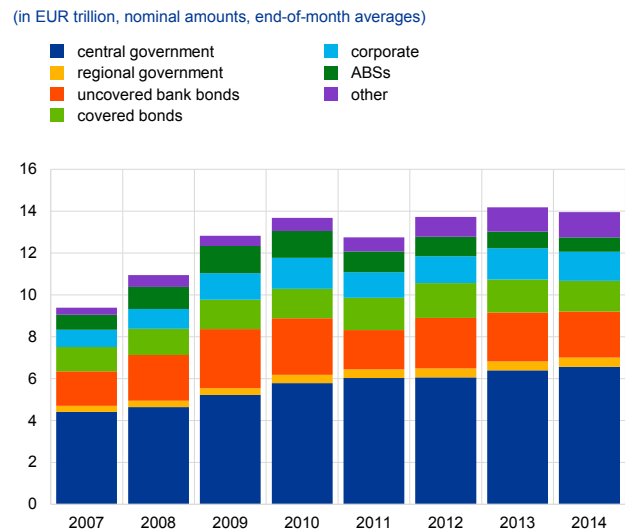
In total around 37,000 marketable assets<sup>26</sup> with a nominal value of around EUR 14.0 trillion of marketable collateral were eligible in 2014, which was up from around 25,000 assets with a nominal value of EUR 9.5 trillion in 2007 (see Figure 3). This growth of about 50% is mainly explained by the increased issuance of debt securities by central governments, banks and non-financial corporates, and partially linked to the widening of eligible collateral during the financial crisis.

**Figure 2**  
Use of collateral by asset type and outstanding credit



Source: ECB

**Figure 3**  
Marketable assets eligible as Eurosystem collateral



Source: ECB

Non-marketable credit claims are accepted, supporting SMEs in particular.

### Eligibility requirements for non-marketable assets

Eligible non-marketable assets encompass mainly credit claims, which include bank loans (including shares of syndicated loans), certain leasing and factoring credit claims, and drawn credit lines.<sup>27</sup> On the one hand, such assets are less standardised almost by definition, as less information about them is publicly available and as they are less easy to sell on the market in the event that the collateral needs to be liquidated. On the other hand, their eligibility as collateral supports the monetary transmission to real economy sectors that do not issue debt instruments traded on regulated markets, in particular small and medium-sized enterprises (SMEs). Therefore, credit claims have always been eligible assets, but with more stringent legal and operational requirements than marketable assets.<sup>28</sup> These requirements must ensure that the credit claim can be swiftly realised in the event of a

<sup>26</sup> The complete list of marketable assets is available at <https://www.ecb.europa.eu/paym/coll/assets/html/index.en.html> and is updated on a daily basis.

<sup>27</sup> The Eurosystem accepts also retail mortgage-backed debt instruments and fixed-term deposits as non-marketable assets eligible for collateral purposes. These assets are quantitatively significantly less relevant than credit claims.

<sup>28</sup> See Tamura and Tabakis (2013) for a comparison of eligibility requirements for credit claims applied by the Eurosystem and the Bank of Japan and background information on their acceptance of credit claim collateral in recent years.

counterparty default. For example, only debtors and guarantors established in the euro area are accepted, with limits on the number of applicable laws and other legal provisions. NCBs may apply minimum size thresholds, essentially to ensure operational efficiency. Given the limited publicly available information about credit claims, it is not possible to precisely quantify the amount of unencumbered eligible credit claims that the Eurosystem's counterparties could potentially use as collateral.

## Eurosystem credit assessment framework to ensure high credit standards

Minimum credit quality requirements are a key element of the eligibility criteria, in particular from a risk management perspective. The Eurosystem has defined procedures, rules and techniques in the Eurosystem credit assessment framework (ECAAF) to ensure that it only accepts assets with high credit standards as collateral. Since the Eurosystem accepts a very broad range of marketable and non-marketable assets as collateral, it has to rely on various sources of credit assessment information.

The ECAAF currently takes into account information derived from more than 50 credit assessment systems belonging to four types.

- Four credit rating agencies, known as external credit assessment institutions (ECAIs)
- Eight in-house credit assessment systems (ICASs) used by the NCBs
- Around 40 counterparties' internal ratings-based (IRB) systems
- Two rating tools (RTs) provided by third parties

ECAIs are mainly used for assessing marketable collateral, whereas ICASs, IRB systems and RTs are mainly used for non-marketable collateral. The Eurosystem is working towards enhancing its internal credit assessment capabilities and has increased the number of ICASs by 60% in recent years.

An important contribution of the ECAAF is bringing together the information provided by this significant number of credit assessment systems in a harmonised way. The ECAAF makes the credit ratings from all ECAAF-accepted credit assessment systems comparable by mapping each of their rating grades to the appropriate credit quality step (CQS) within the Eurosystem's harmonised rating scale (see Table 1). The Eurosystem's performance monitoring procedure explained below ensures that the information from different sources is indeed comparable.

The ECAAF uses credit quality information from more than 50 different systems.

The ECAAF makes credit ratings comparable.

**Table 1**  
The Eurosystem's harmonised rating scale for ECAIs

ECAI credit assessment		Credit quality step		
		1	2	3
Long-term	DBRS	AAA/AAH/AA/AAL	AH/A/AL	BBBH/BBB/BBBL
	Fitch Ratings	AAA/AA+/AA/AA-	A+/A/A-	BBB+/BBB/BBB-
	Moody's	Aaa/Aa1/Aa2/Aa3	A1/A2/A3	Baa1/Baa2/Baa3
	Standard & Poor's	AAA/AA+/AA/AA-	A+/A/A-	BBB+/BBB/BBB-
Short-term	DBRS		R-1H, R-1M	R-1L, R-2H, R-2M, R-2L
	Fitch Ratings		F1+, F1	F2
	Moody's		P-1	P-2
	Standard & Poor's		A-1+, A-1	A-2

The ECAF determines the eligibility of and haircuts on all assets...

...without mechanistic reliance on credit ratings.

Risk protection and level playing field resulting from extensive due diligence before the acceptance of a new system ...

Harmonised credit quality information about collateral assets fosters the Eurosystem's financial risk mitigation in at least two ways. First, credit quality step 3 of this scale<sup>29</sup> is the minimum credit quality requirement for the eligibility of all assets in the general framework, with additional requirements for ABSs (see Box 3 for the historical evolution of the minimum credit quality requirements). Second, the Eurosystem applies greater valuation haircuts to assets of lower credit quality, aiming at risk equivalence across all eligible assets. The Eurosystem is able to complement the information from the different credit assessment systems with information on institutional criteria and other features relevant for the credit quality of the debt instrument. For example, for some specific countries which participated in an EU/IMF economic and financial adjustment programme, the Governing Council decided to temporarily suspend the application of the minimum credit rating requirement for marketable debt instruments issued or guaranteed by the domestic government (see Box 3 for the historical details).

In view of the importance of credit quality information for eligibility and haircuts, the Eurosystem conducts extensive due diligence on all the credit assessment systems it uses. This due diligence begins with a number of regulatory, operational and information requirements for the acceptance of credit assessment systems in the ECAF. These aim to protect the Eurosystem from financial risks and to create a level playing field among the different systems that provide credit assessment information to the Eurosystem, while taking particular account of the respective regulatory situations. For example, to be considered for ECAF purposes, it is a necessary but not sufficient condition that ECAIs are supervised by the European Securities and Markets Authority (ESMA). IRB systems have to be authorised for capital requirements purposes by the relevant banking supervisor. The ECB's Governing Council approves all ECAIs, ICASs and RTs as eligible for ECAF purposes on the basis of an assessment endorsed by the Risk Management Committee, against specific acceptance criteria.<sup>30</sup> Overall, the requirements for external rating providers

<sup>29</sup> Credit quality step 3 is considered equivalent to a probability of default of between 0.10% and 0.40% over a one-year horizon.

<sup>30</sup> The general acceptance criteria for ECAIs and RTs are included in Guideline ECB/2014/60. More detailed acceptance criteria for RTs are published on the ECB's website (<https://www.ecb.europa.eu/pub/pdf/other/acceptancecriteriaratingtools201505.en.pdf>).

are designed to ascertain sufficient coverage, market testing and an adequate performance track record of their ratings.

... and on an ongoing basis using quantitative and qualitative information.

In addition to the acceptance criteria, the Eurosystem conducts due diligence on all credit assessment systems accepted in the ECAF. The key tool for regular ECAF due diligence is known as the “ECAF performance monitoring process”.<sup>31</sup> It consists of:

- (i) a quantitative statistical component, to check whether the mapping of the ratings of each credit assessment system to the Eurosystem’s harmonised rating scale is still appropriate;
- (ii) a qualitative component, which looks at credit assessment processes and methodologies, as well as taking into account supervisory information.

No mechanistic reliance on any credit assessment system.

The ECAF provides the Eurosystem with a set of tools to prevent mechanistic reliance on any system and to address any issues that may have been identified for the same system. The first element of this set of tools is a more intensive monitoring process in cooperation with the provider of the credit assessment system, including an investigation to determine whether and how the performance issues are being addressed. In addition, the ECB’s Governing Council can: (i) remap a system’s rating grades onto the Eurosystem’s harmonised rating scale; (ii) define specific eligibility requirements related to credit assessment systems; (iii) apply discretionary measures; and (iv) exclude or temporarily suspend a credit assessment system. Furthermore, regular surveillance reports published by the relevant ECAs are required for ABSs to be eligible as collateral. Additionally, as already mentioned, the Governing Council may decide to suspend (subject to specific conditions) the credit quality threshold for debt instruments issued by certain euro area governments.

Ongoing work to further reduce reliance on credit rating agencies.

Additional work to improve on the due diligence conducted on the ECAs’ ratings, rating processes and methodologies, particularly in the areas of sovereign ratings and structured finance, is continuing. This enhancement of due diligence is a step towards further reducing the Eurosystem’s reliance on credit rating agencies, in line with various initiatives by international public authorities that aim to reduce reliance on credit rating agencies in legal, regulatory and other public frameworks.<sup>32</sup> At the same time, conducting due diligence on an ongoing basis and before the acceptance of a new system is a resource-intensive process which, before the Eurosystem can use any credit assessment system’s ratings, requires sufficient coverage in terms of the volume and scope of ratings in order to justify the business case for expanding the list of accepted systems.

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<sup>31</sup> As part of the harmonised criteria for temporarily eligible additional credit claims (see Box 3 for further details), the requirements for reporting and monitoring under the ECAF are applied to all credit assessment systems used to assess the credit quality of credit claims accepted under the national frameworks for such additional credit claims.

<sup>32</sup> See, for example, the road map for reducing reliance on credit rating agencies’ ratings, as published by the G20’s Financial Stability Board, together with the provisions of Regulation (EU) No 462/2013 of the European Parliament and of the Council on credit rating agencies (known as the CRA III Regulation), which aim to reduce over-reliance on credit rating agencies’ ratings, in particular by reducing sole or mechanistic reliance on such ratings.

**Table 2****Indicative overview of the Eurosystem's general eligibility criteria for collateral**

	Marketable assets	Non-marketable assets
Asset type	Debt instruments (e.g. ABSs, covered bonds, corporate bonds, uncovered bank bonds, government and agency bonds) with (a) a fixed and unconditional principal amount (except for ABSs) and (b) a coupon that cannot result in a negative cash flow and has a certain simple structure	Credit claims with (a) a fixed and unconditional principal amount and (b) an interest rate that cannot result in a negative cash flow
Accepted credit assessment systems	Moody's, Fitch, S&P and DBRS (external credit assessment institutions or ECAIs) Other credit assessment systems (national central banks' in-house credit assessment systems, rating tools, banks' internal ratings-based systems)	
Credit quality requirements	Credit quality step 3 of the Eurosystem's harmonised rating scale, equivalent to a one-year probability of default of up to 0.4% Mapping to ECAI ratings according to harmonised scale for the Eurosystem (second-best rating for ABSs, first-best rating for all other marketable assets)	
Place of issue	European Economic Area (EEA)	Not applicable
Type of issuer, debtor and guarantor	NCBs, public sector, private sector, multilateral development banks and international organisations	Public sector, NFCs, multilateral development banks and international organisations
Place of establishment of the issuer, debtor and guarantor	Issuer: EEA or (except for ABSs) non-EEA G10 countries (United States, China, Japan, Canada) Guarantor: EEA	Euro area
Currency	Euro	Euro
Minimum size	Not applicable	Minimum size of threshold at the time of submission of the credit claim: for domestic use, at the NCB's discretion, and for cross-border use, a common threshold of EUR 500,000
Governing laws	For ABSs, the acquisition of the underlying assets must be governed by the law of an EU Member State. The law governing underlying credit claims must be the law of an EEA country.	Governing law for credit claim agreement and mobilisation: law of a euro area country The total number of different laws applicable to the (a) counterparty; (b) creditor; (c) debtor; (d) guarantor (if relevant); (e) credit claim agreement; and (f) mobilisation agreement, must not exceed two.

Source: Guideline ECB/2014/60

**Box 3****Changes in the eligibility rules in the context of the crisis and its aftermath**

The Eurosystem has expanded the extent of collateral it accepts in response to the crisis. Eligibility requirements and haircuts have been adapted to keep risks in check.

As a response to the money market tensions that emerged in the course of 2007/2008, the Eurosystem's management of central bank liquidity shifted to a fixed-rate full allotment policy. The ensuing increase in the volume of collateralised lending heightened the policy

focus on collateral issues, from its availability in sufficient amounts to counterparties to its adequacy to mitigate risks. As a result, the thrust of the changes in recent years has been to expand the range of eligible assets in a context of increasing credit risk heterogeneity among euro area countries and to establish specific eligibility conditions to reject or reduce the use of assets which are complex, non-transparent and/or closely linked with the counterparty using them as collateral. This explains a number of changes related to the acceptance of new assets, which has happened at the same time as a streamlining of the range of eligible ABSs and, to a lesser extent, of covered bonds, a large proportion of which are posted by closely linked entities.

**Expansion of collateral assets**

The Eurosystem has extended the range of eligible assets, alongside other central banks, whose eligibility frameworks have become more similar in their extent to that of the Eurosystem.<sup>33</sup> This has

<sup>33</sup> See, for example, Cheun et al. (2009) and Bank for International Settlements (2013).

been done in two ways, namely by (i) extending the length of the single list, or the assets accepted under the general collateral framework, and (ii) establishing a temporary framework for the acceptance of assets in certain distressed jurisdictions, in particular. The key objective of these measures has been to maintain a functioning monetary transmission mechanism while applying the principles of protection, consistency, simplicity and transparency.

In October 2008, the credit quality threshold for assets other than ABSs was lowered to an annual probability of default of 0.40%, corresponding roughly to a credit rating of BBB-, down from an annual probability of default of 0.10% (A-). This decision, which was temporary at first, was made permanent from January 2011 (when more differentiated haircuts were introduced, see Box 5) and thus corresponds to a permanent and significant lengthening of the single list.

Government debt of crisis countries was accepted after severe downgrades. Overall, reliance on rating agencies has been reduced when justified by internal information and monitoring.

The single list has been complemented by more specific, temporary measures to reduce the reliance on external credit ratings and to diversify the sources of credit assessments as the crisis unfolded in the form of serial downgrades in some euro area countries.<sup>34</sup> The minimum rating thresholds of debt instruments rated or guaranteed by

some euro area governments have at times been suspended. These minimum threshold waivers are tied to strict conditionality in the form of compliance with the EU/IMF adjustment programmes entered into and subject to the Eurosystem's assessment of compliance with programme conditionality.

Local collateral shortages have been addressed by the introduction of a temporary framework for additional credit claims, subject to specific risk control measures.

In view of the significant amounts of unencumbered credit claims in the balance sheets of counterparties in stressed countries which did not fulfil the stringent requirements of the Eurosystem but which represented a potential source of collateral diversification, the ECB's

Governing Council also decided in December 2011 to enable NCBs to accept as collateral performing additional credit claims (ACCs) that satisfy specific eligibility criteria. This temporary solution was introduced to support bank lending and liquidity in the euro area money market. The respective national framework has to be authorised by the ECB's Governing Council and has to comply with common Eurosystem rules. The eligibility requirements for ACCs are comparable with the rules for credit claims under the general collateral framework, but less restrictive with respect to the type of debtors and the default risk. For example, ACCs can include additional types of debtors (loans to private households, mainly secured by residential property), a wider credit quality scope and non-euro denominated credit claims, depending on the specific nature of the national framework. To the extent that the wider eligibility scope would be associated with greater financial risks for the NCB, the risk is mitigated by generally greater diversification, higher haircuts and the use of further risk control measures which differentiate between individual ACCs and pools of ACCs (see Section 2.5). By mid-2015 half of the Eurosystem NCBs, namely the NCBs of Austria, Cyprus, France, Greece, Italy, Ireland, Portugal, Slovenia and Spain, had made use, to varying extents, of the option to accept ACCs. On a temporary basis, short-term debt instruments issued by non-financial corporations not traded on a regulated market can be eligible, too, provided they fulfil all other eligibility requirements for marketable assets and credit quality requirements are established in accordance with the rules for credit claims.

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<sup>34</sup> The relevant legal acts, which are not included in the general framework, are maintained in a dedicated section of the ECB's website (<http://www.ecb.europa.eu/ecb/legal/1002/1014/html/index-tabs.en.html>).



Furthermore, the Eurosystem maintains an emergency collateral framework consisting of very liquid government securities denominated in major foreign currencies that can be activated when needed. To allow for the associated exchange rate risk, these assets are subject to a valuation markdown.

Finally, in December 2011 the Eurosystem also introduced a temporary framework for the acceptance of ABSs not complying with the AAA rating at issuance requirements in place at the time. This framework is detailed below, together with the evolution of requirements for ABSs.

### **Changes to ABS requirements: towards simple and transparent structured finance collateral**

The Eurosystem has repeatedly changed its eligibility criteria for ABSs in recent years. The main guiding principles have been increasing transparency, reducing complexity and containing correlation risks in order to improve the risk protection of the Eurosystem. These measures have often had positive spillover effects to other market participants in the ABS sector.

ABS requirements have been strengthened to achieve greater transparency and simpler structures, with positive side effects for the market.

As a result of the weak rating performance and the structural downward rating migration for ABSs, in 2008 the Eurosystem raised the credit quality requirements to two AAA ratings at issuance. The rationale of this measure was to ensure that at issuance all accepted senior ABS tranches were structured to the highest standards. In the course of the crisis – and as a result of the introduction of more specific protective measures and improvements in rating methodologies – this broad measure has been phased out. Nonetheless, the rating threshold is still higher than the one for all other asset types and is based on the second-best rating to account for the higher model risks and uncertainty about the quality of ratings for structured finance (see Section 2.3 for a general discussion of credit quality requirements).

These protective measures include the requirement of a “true sale” of the cash-flow-generating assets to the securitisation special purpose vehicle, thus prohibiting synthetic ABSs, and double-layer structures (i.e. ABSs must not be backed by other ABSs). Furthermore, specific requirements apply to liquidity support in ABS and foreign exchange swap providers, which limit exposures to parties related to the counterparty.<sup>35</sup> These measures have been complemented with the ABS loan-level data initiative implemented in 2013-2014; the ABS issuers must report their data on all cash-flow-generating assets to the European Data Warehouse on a quarterly basis.<sup>36</sup> In addition, the underlying assets must consist of a homogeneous pool of loans of an accepted type.<sup>37</sup> All market participants can use the public data from the European Data Warehouse for their own valuation and risk models, either directly or indirectly via a third-party model.

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<sup>35</sup> In particular, a currency hedge may only be provided by an unrelated third party. In the case of credit support (either in the sense of liquidity facilities or as cash reserves), the providing party may be linked to the counterparty only up to certain limits on the size of the facilities/reserves with respect to the transaction size, to avoid most of the credit enhancement being in the form of cash accounts subject to “wrong-way” risk.

<sup>36</sup> See, for instance, González (2014).

<sup>37</sup> The Eurosystem accepts homogenous pools of residential mortgages, commercial real estate mortgages, loans to SMEs, auto loans, consumer finance loans, leasing receivables and credit card receivables. Mixed pools are excluded, as well as non-standard underlying assets such as public sector receivables, credit-linked notes, swaps or other derivatives that are not used for hedging purposes, etc. In the case of commercial mortgage-backed securities (CMBS), leveraged, structured and syndicated loans are also excluded.

Following these measures, the Eurosystem now accepts within its general collateral framework only the most senior tranches of ABSs with at least two “single A” ratings that are backed by a homogeneous and publicly reported pool of assets. A few additional ABS senior tranches with a lower rating (at the BBB level) are, however, accepted under the temporary framework, subject to additional criteria being fulfilled.

Most ABS issuers have quickly and comprehensively adapted their transactions to the changes in the Eurosystem’s eligibility requirements. This shows that the Eurosystem’s collateral framework may work as a catalyst for achieving simpler, more transparent and standardised financial instruments in a more harmonised European financial market. The Eurosystem’s eligibility criteria have recently been proposed as a starting point for the definition of high-quality securitisation as part of an initiative to reactivate the European ABS market and to promote financing of the real economy.<sup>38</sup>

### Covered bonds: specific haircuts for retained issuance and prohibition of double-layer structures

The rules for covered bonds have been streamlined to ban double-layer structures and account for extra risks when accepting retained covered bonds as collateral.

For covered bonds, the main risk management challenge has been their increased use as collateral by counterparties of the Eurosystem that are closely linked to the issuer. As a rule, a counterparty shall not provide as collateral any closely-linked asset, but “own-use” covered

bonds are exceptionally accepted. The safety of covered bonds for general investors arises from the double-recourse structure to both the cover pool and the issuer, which is also reflected in their credit assessments and market valuation. However, in the case of a default by a counterparty that provides a closely linked covered bond as collateral, the value of the covered bond is basically limited to the cover pool.

Hence, the possibility of own use has been permitted only for covered bonds that comply with the requirements laid down in the Capital Requirements Regulation or have comparable legal safeguards.<sup>39</sup> In addition, valuation markdowns were introduced in September 2013 for own-use covered bonds as an additional risk control measure. As is the case for ABSs, covered bonds cannot include double-layer structures, i.e. no ABS can be included in covered bond pools, although there are a few exceptions.<sup>40</sup>

### Other measures

The eligibility conditions for the general collateral framework have tightened for complex assets.

The Eurosystem has also streamlined the eligibility rules in order to exclude debt instruments with non-standard features, such as inverse floaters and bonds with complex coupons<sup>41</sup>, which are usually coupled

<sup>38</sup> See Bank of England and European Central Bank (2014).

<sup>39</sup> Currently only Spanish multi-cédulas and mortgage-backed promissory notes are accepted for own use, in spite of not being CRR-compliant.

<sup>40</sup> The cover pool of a covered bond may only contain an ABS if it complies with the following conditions: (i) the ABS complies with the CRR with respect to ABSs in covered bond pools, (ii) the underlying ABS asset pool was entirely originated by the issuer of the covered bond or by a closely linked entity and (iii) the ABS was solely used as a technical tool to transfer mortgages or guaranteed real estate loans from the originator into the cover pool.

<sup>41</sup> Such complex coupon structures are, for example, floating interest rates not linked to a single euro money market rate index, any kind of ratchet and range accrual coupons, or instruments with options to change the coupon type.

with lower secondary market liquidity and increased valuation uncertainty.

Furthermore, the Eurosystem has worked towards increasing the granularity and accuracy of its haircut calculation, still within a simple tabular approach. In this respect, the degree of haircut differentiation has increased over time with an additional haircut category in 2011, and the priority rules in place to ascertain which rating is applicable have been refined to make the most meaningful use of rating information across the different dimensions (asset vs issuer ratings, short vs long-term ratings) taking into account differences among asset types.

### Government-guaranteed bank bonds

Own-used government-guaranteed bank bonds, accepted as collateral at the height of the crisis, have been phased out.

Finally, during the financial crisis, various governments started guaranteeing bank bonds in order to stabilise the financial system.

While initially successful in addressing immediate financial stability risks, such guarantees reinforced the nexus between governments and their domestic banking systems. In line with the general policy to reduce the collateral exposure to assets closely linked with the issuing counterparty of the Eurosystem and to reduce concentration of exposure to sovereign guarantees, the Eurosystem decided to phase out the possibility of own use for such government-guaranteed bank bonds from 1 March 2015, with possible temporary exemptions under strict conditions.<sup>42</sup>

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## 2.4 Valuation of collateral

The Eurosystem's collateral valuation framework aims to minimise possible interferences with prices and allocations by using market prices as a starting point for valuing all eligible marketable assets. Since market valuations incorporate market expectations, including credit and liquidity premia, the Eurosystem is automatically protected against the risk of changes in the value of the collateral by marking to market and by the regular application of margin calls. If a reduction of available collateral due to market movements limits the provision of central bank liquidity to banks at a time when the preference for liquidity increases and risk premia spike, this could be seen as introducing undesirable pro-cyclicality. However, this effect is buffered by the breadth of the collateral framework, and the stance of the Eurosystem has consistently been to ensure the availability of collateral without concessions on its financial protection. Market valuation also serves to counteract the potential blurring of price differences among instruments that are placed into the same haircut category. Indeed, haircuts can hardly be fully customised for each asset (see Section 2.5 for more information on haircuts). Hence appropriate valuation is the better tool to avoid a situation in which the illiquid, risky assets become more attractive on account of their treatment as collateral by the central bank, thus potentially distorting agents' portfolio choices.

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<sup>42</sup> Individual NCBs retain the ability to reject such assets as collateral, see Article 6 of Guideline ECB/2014/31.

All eligible marketable assets are valued daily at market prices. Evaluated prices are internally derived for less liquid assets.

Non-marketable assets are accepted at face value and are subject to commensurately higher haircuts.

The Eurosystem assigns a value to each of the roughly 37,000 eligible marketable assets on a daily basis through its pricing hub. This “Common Eurosystem Pricing Hub” (CEPH) processes the input from market data vendors, selects the trustworthy information and, for those illiquid assets where no direct and reliable market quotes exist, determines a theoretical value based on proprietary methodologies aiming to ascertain their prospective market value. A 5% valuation markdown is applied to theoretically valued (i) senior unsecured bonds issued by banks and other financial institutions, (ii) covered bonds and (iii) ABSs, in order to offset any potential overvaluation caused by model errors. Valuation markdowns are also applied to non-euro-denominated assets, to cover for exchange rate risks.

In the case of non-marketable assets, mainly loans to corporates and public sector entities, the Eurosystem does not currently determine a theoretical market value. Instead, the face value is used as the reference amount to which commensurate haircuts are applied, calibrated to implicitly take into account average discounting factors and additional related market, liquidity and credit risks.

## 2.5 Haircuts and other risk control measures

The risks involved in lending to counterparties are mitigated and transformed by the secured nature of the credit operation into several types of risks (mainly market, liquidity and credit) related to the collateral asset that can only materialise in the event of a counterparty default. The bulk of these risks are in turn mitigated for eligible assets by valuation haircuts and, in certain cases, concentration limits.<sup>43</sup>

Haircuts are applied to mitigate the market, liquidity and credit risks that can hit the value of the collateral held by the Eurosystem after a counterparty default.

A haircut is the deduction of a certain percentage from the valuation of an asset for the purpose of calculating the amount of liquidity that can be backed by this asset in case of counterparty default. The national central banks of the Eurosystem operate, with a few exceptions, what is known as a collateral pooling system. In other words, all monetary policy lending to a counterparty, which may take place via different operations and terms, is backed by the same pool of collateral assets. This pool, whose assets can be replaced on an ongoing basis, is marked to market on a daily basis and margin calls may be applied if the valuation, after haircuts, falls below the borrowed amount.<sup>44</sup> Hence, the maximum liquidity ( $L_t$ ) a bank can obtain from the Eurosystem is determined by the current value of all  $k$  eligible assets (for  $i = 1, \dots, k$  at time  $t$ ) submitted as collateral ( $C_{i,t}$ ) and the related haircuts ( $h_i$ ) according to the formula  $L_t \leq \sum_i C_{i,t} \times (1-h_i)$ .

In contrast to commercial banking practice, where haircuts can be set at more stringent levels for counterparties with higher perceived credit risk, the Eurosystem, in line with its mandate to maintain a level playing field among market participants, cannot apply differentiated haircuts in its policy operations, i.e. haircuts that would

<sup>43</sup> To date, the only general limit applied on the use of collateral is the restriction that no more than 5% of the total value of the collateral pool consist of unsecured debt instruments issued by a credit institution or by any other closely linked entity, i.e. primarily uncovered bank bonds, with a few exceptions.

<sup>44</sup> A small amount of leeway, set normally at 0.5% of the liquidity provided, is used to limit the frequency of margin calls.

depend on the creditworthiness of the counterparty. Furthermore, the Eurosystem calculates the haircut on an asset-by-asset basis, not adjusting the haircuts to the diversification or concentration features of the collateral pool. Additionally, the Eurosystem retains the ability to apply additional discretionary haircuts on an asset.

Under these constraints and abstracting from collateral usage patterns and their relation to counterparty strength, the calibration of haircuts aims to ensure the equivalence of risk across different types of collateral assets. In other words, the loss in value of collateral that the Eurosystem expects to incur – with low probability – in an adverse scenario should be the same for the different assets and asset types. A choice is required here as to what the policy-maker considers an adverse but still reasonable scenario for which to cover by means of haircuts. The Eurosystem defines such a scenario as the average loss occurring within the worst percentile of the distribution. In other words, for practical calibration purposes, an adverse scenario is set to correspond to the average loss in the worst 1% of cases, i.e. to the concept of expected shortfall at a 99% (ES[99%]) confidence level.

Expected shortfall at a 99% confidence level is estimated in order to calibrate haircuts.

Haircuts need to cover various sources of risk to collateral value that could materialise between the default of a counterparty and the sale of the collateral. The bulk of such risks emanates from market risks, i.e. the risk of adverse movements in the market valuation of an asset, and from the possibility of a default on the part of the issuer of the asset. Broadly speaking and especially for relatively liquid investment grade assets, market risk represents the lion's share of the risks, because the Eurosystem will aim to liquidate collateral assets after a counterparty default within the shortest possible time frame, provided that an orderly liquidation is possible. Hence, for most eligible marketable assets, credit risk, understood as the default risk of the asset during the liquidation period after the default of the counterparty, is expected to be minor. Market and credit risks jointly form the basis of the haircut calibration, with some other adjustments made to take into account, for instance, valuation model risk or add-ons to account for the close links in retained covered bonds, the effects of which cannot be observed from price data series. The following provides an overview of their calibration, which is depicted in Figure 4.

For the fixed income assets accepted by the Eurosystem, market risk can be seen as mainly stemming from changes in (a) the base interest rate, i.e. a risk-free or quasi risk-free interest rate such as the swap rate and (b) the spread rate over the base rate, which is generally dependent on factors such as the perceived credit migration risk, secondary market liquidity and other idiosyncratic characteristics of the asset. For these two basic risk factors, an expected loss distribution and a corresponding ES[99%] can be estimated once a holding period is assumed.<sup>45</sup>

Hence, besides default risk, the basic haircut to cover for the market risk factors may be modelled as depending on three quantities, namely the volatility of the relevant base rate, the volatility of the spread and the prospective holding period, i.e. in this case the expected period required to sell the asset. These three risk factors can be

<sup>45</sup> Further risks may be relevant for certain assets, such as exchange rate risk for assets denominated in foreign currency and valuation uncertainty for theoretically valued assets. Allowances are made for these after the base haircuts for the main two risk factors are determined.

linked to the market price of standard fixed income instruments via the standard measures of “effective duration”, assuming a locally linear relationship between prices and yields.

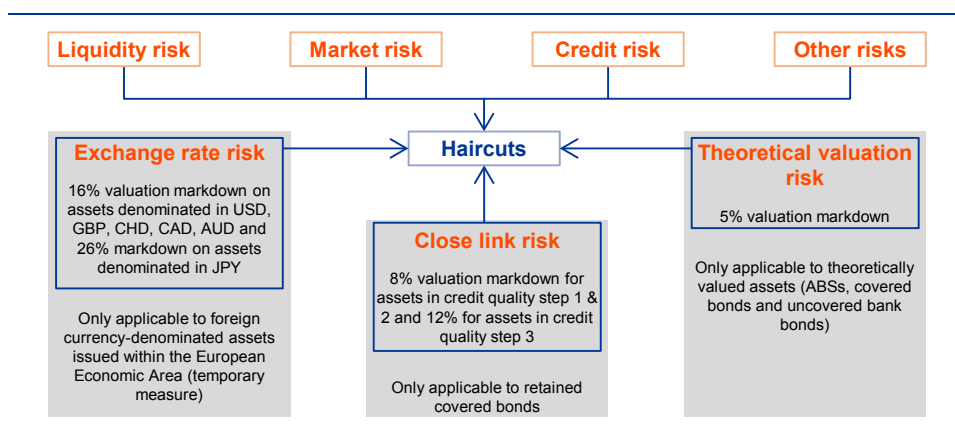
In practice, estimating the expected shortfall for each eligible asset would be cumbersome or in fact unfeasible on account of data limitations. Therefore, assets with similar characteristics need to be bundled together to estimate volatilities and distribution quantiles using quantitative techniques that are well-established in the relevant literature. In particular, the distributions of the risk factors such as interest rates, interest rate spreads and (spread) duration need to be estimated for the expected shortfall, or at least the tail of the distribution.

Assets are grouped together into buckets and long time series of price and liquidity indicators are taken into account in order to increase the stability and robustness of haircut estimates.

The Eurosystem uses a broad dataset covering a long time span, which prevents changes to the framework from being unduly pro-cyclical. In order to obtain the final base haircut, expected shortfall estimates calculated for a time unit (one day or one week) need to be adjusted for the expected asset collateral holding period. The Eurosystem estimates the latter by aggregating information on observed average bid volumes and effective usage by counterparties, as proxies of secondary market liquidity relative to the amounts provided as collateral. The daily expected shortfall estimate is then scaled under specific assumptions about the distribution.

The result of this process is summarised in tables of haircuts applicable to different groups of assets (see Box 4). These tables essentially correspond to the basic haircuts after consistency checks and final adjustments are applied to add the default risk – by means of an expected shortfall using a straightforward approach of multiplying default probability by expected loss – and possible outliers and the effects of noise in insufficiently populated haircut buckets are ironed out. The haircut table takes account of the main market and credit risk differences, in as few dimensions as possible. For example, the risk connected with the liquidation of a covered bond in credit quality step 3 (BBB-rated) is very different from that connected with the sale of a government bond in credit quality step 1 (AAA-rated). All other factors being equal, the relative secondary market liquidity of the two asset classes differs, as do the risk of a default of the issuer and the volatility of market prices, etc. Accordingly, the haircuts applicable to covered bonds are higher than those applicable to government bonds in order to align the residual risks inherent in the collateral upon liquidation.

**Figure 4**  
Risk components addressed by haircuts



Source: ECB

The Eurosystem regularly revises the haircut schedule applicable to collateral accepted in its monetary policy operations. Its latest general reviews took place in 2010 and 2013. Box 5 summarises their outcomes.

Since the start of the financial crisis, the Eurosystem has on several occasions calibrated and applied specific haircut schedules for certain assets accepted on a temporary basis, such as marketable debt instruments issued or guaranteed by the central governments of the Hellenic Republic and the Republic of Cyprus. These haircuts are calibrated following the principles described above and with the parameters in the calculation adapted to address market developments.

Furthermore, the introduction of a framework for the acceptance of additional credit claims as collateral was tied to the application of haircuts that would ensure risk equivalence with the general framework. Hence, a framework has been developed to set eligibility conditions for (large) pools of credit claims including retail mortgage loans and loans to SMEs in order to calculate minimum haircuts for their acceptance.<sup>46</sup> The methodology for this calibration reflects the diversification effects of the granular pools, assuming conservative estimates on correlation patterns and recoveries after default and exploiting the loan-level information available to determine prudent default probability estimates. In the same way as credit claims eligible under the general framework, additional credit claims are valued at outstanding amounts. Thus, part of the haircut allows for the discount related to the time value of the expected cash flows.

<sup>46</sup> The Eurosystem has established a benchmark haircut calculation methodology that sets a minimum applicable haircut. Each NCB may decide, if deemed necessary after taking into account the specific risk factors of each pool, to apply a higher haircut.

## Box 4

### Levels of valuation haircuts

**Table A**

Levels of valuation haircuts applied to marketable assets

Credit quality	Liquidity categories										
	Residual maturity (years)	Category I		Category II		Category III		Category IV		Category V	
		Fixed Coupon	Zero Coupon	Fixed Coupon	Zero Coupon	Fixed Coupon	Zero Coupon	Fixed Coupon	Zero Coupon	Fixed Coupon	Zero Coupon
Steps 1 and 2 (AAA to A-)	Up to 1	0.5	0.5	1.0	1.0	1.0	1.0	6.5	6.5		
	1 to 3	1.0	2.0	1.5	2.5	2.0	3.0	8.5	9.0		
	3 to 5	1.5	2.5	2.5	3.5	3.0	4.5	11.0	11.5		
	5 to 7	2.0	3.0	3.5	4.5	4.5	6.0	12.5	13.5		10.0
	7 to 10	3.0	4.0	4.5	6.5	6.0	8.0	14.0	15.5		
	> 10	5.0	7.0	8.0	10.5	9.0	13.0	17.0	22.5		
	Step 3 (BBB+ to BBB-)	Up to 1	6.0	6.0	7.0	7.0	8.0	8.0	13.0	13.0	
1 to 3		7.0	8.0	10.0	14.5	15.0	16.5	24.5	26.5		
3 to 5		9.0	10.0	15.5	20.5	22.5	25.0	32.5	36.5		
5 to 7		10.0	11.5	16.0	22.0	26.0	30.0	36.0	40.0		22.0*
7 to 10		11.5	13.0	18.5	27.5	27.0	32.5	37.0	42.5		
> 10		13.0	16.0	22.5	33.0	27.5	35.0	37.5	44.0		

\* Only eligible in the temporary framework.

**Table B**

Levels of valuation haircuts applied to credit claims with fixed interest payments

Credit quality	Residual maturity (years)	Fixed interest payment and valuation based on a theoretical price assigned by the NCB	Fixed interest payment and valuation based on the outstanding amount assigned by the NCB
Steps 1 and 2 (AAA to A-)	Up to 1	10.0	12.0
	1 to 3	12.0	16.0
	3 to 5	14.0	21.0
	5 to 7	17.0	27.0
	7 to 10	22.0	35.0
	> 10	30.0	45.0
	Step 3 (BBB+ to BBB-)	Up to 1	17.0
1 to 3		29.0	34.0
3 to 5		37.0	46.0
5 to 7		39.0	52.0
7 to 10		40.0	58.0
> 10		42.0	65.0

Notes: Individual credit claims with a variable interest rate are subject to the valuation haircut applied to the credit claims with fixed interest rate classified in the zero-to-one-year residual maturity corresponding to the same credit quality step and the same valuation methodology as applied by the NCB.



## Box 5

### Recent reviews of the risk control framework

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The latest review of the Eurosystem haircuts led, in particular, to changes in the haircut schedule that were announced on 18 June 2013 and to changes in the treatment of the retained covered bonds and asset backed securities (ABSs).

#### Changes in haircut schedule

The lowering of the credit quality threshold was complemented by higher haircuts. In the same vein, less liquid securities, with more uncertain price signals, are subject to a 5% markdown.

The Eurosystem performs a regular update of the haircut table in the form of a review of the risk control framework, which takes place every two or three years. Increasing haircut granularity was the main theme of the review conducted in 2010. The lowering of the credit rating threshold to BBB-, announced in April 2010, was accompanied by a

uniform 5% haircut add-on across the asset types made eligible as a result of the amended threshold. After a review conducted shortly after this decision, the Eurosystem replaced the uniform haircut add-on by a more graduated haircut schedule for BBB-rated assets, generally increasing this add-on haircut for assets in this credit quality step relative to the better-rated ones, except for government bonds. This graduated haircut schedule was complemented by an extension of the 5% valuation markdown hitherto applied to theoretically valued ABSs, uncovered bank bonds and covered bonds (jumbos, traditional, structured and multi-cédulas). This extension aimed to cover the risks associated with the low marketability of individual securities for which a market price was not available.

Haircuts have generally become more granular, with the aim of better matching the risk features of the different assets accepted as collateral and ensuring consistency.

The latest review, which was finalised in June 2013, entailed a recalibration of all haircuts in the general collateral framework. For most asset types, the new haircuts did not bring any significant changes, apart from slightly steeper increases with maturity. There

was a focus on cross-checking the consistency of risk measures among the different collateral assets related to private loans in banks' balance sheets, namely own-used covered bonds, ABSs and credit claims, including those accepted under the temporary ACC framework. This exercise led to the introduction of a haircut add-on for own-used covered bonds, on account of their close link, generally limited marketability and high usage rates.

#### Changes for retained covered bonds

Covered bonds that are provided as collateral by the issuer, also referred to as own-used or retained covered bonds, entail additional risk in the event of the default of the counterparty. In fact, the implicit guarantee of the issuer is lost and only the underlying cover pool offers a guarantee for the value of the asset. These aspects are not reflected by market valuation or ratings. Accordingly, following the latest review of the risk control framework, the Eurosystem announced the introduction of a valuation markdown of 8% for retained covered bonds in credit quality steps 1 and 2, and a markdown of 12% for retained covered bonds in credit quality step 3. This markdown is applied on top of the regular haircut.

## Changes for ABSs

In order to increase the transparency of the ABSs accepted as collateral for monetary policy operations, the Eurosystem has introduced the public reporting of information on a loan-by-loan basis as an eligibility requirement for ABSs backed by a homogenous set of one of seven types of cash-flow-generating assets: (i) loans to SMEs, (ii) residential mortgage-backed securities, (iii) commercial mortgage-backed securities, (iv) auto loans, (v) consumer finance loans, (vi) leasing receivables and (vii) credit card receivables. Moreover, a number of further requirements were introduced, such as the mandatory notification of planned modifications to an ABS, as well as additional close-link and servicing provisions for ABSs accepted within the scope of the temporary framework. Given that these adjustments have reduced the risks stemming from these securities, the Eurosystem relaxed the eligibility criteria for ABSs slightly, also with a view to bringing them into line with the eligibility criteria for other types of assets. In particular, it replaced the requirement of two AAA ratings for ABSs subject to loan-level reporting requirements with one of two A ratings or higher, reflecting their improved transparency and standardisation. Furthermore, the haircuts applicable to these ABSs were reduced slightly.

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## 2.6 Emergency liquidity assistance (not a monetary policy instrument)

As distinct from the Eurosystem's credit operations, national central banks can temporarily provide emergency liquidity assistance (ELA) to euro area credit institutions which are solvent but face liquidity problems. ELA is not a monetary policy instrument. It is a national task, but the ECB Governing Council can object to ELA provision, should this national task interfere with the objectives and tasks of the ESCB as set forth under Articles 2 and 3.1 of the Statute of the ESCB.<sup>47</sup> To ensure this objection can happen, ELA provision is subject to ex ante information requirements. The financial risks of ELA are similar in nature to those of the Eurosystem's credit operations, but are borne and managed by the NCBs.

Box 6 provides further information on ELA.

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<sup>47</sup> Whilst Article 2 refers to the objective of maintaining price stability, Article 3.1 lists the following four primary tasks to be carried out through the ESCB, in accordance with Article 127(2) of the Treaty on the Functioning of the European Union (TFEU): "to define and implement the monetary policy of the Union; to conduct foreign-exchange operations consistent with the provisions of Article 219 of that Treaty; to hold and manage the official foreign reserves of the Member States, to promote the smooth operations of payment systems".

## Box 6

### Emergency liquidity assistance

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#### Purpose of ELA

The objective of ELA is to support solvent credit institutions facing temporary liquidity problems. It is not a monetary policy instrument.

The objective of ELA is to support solvent credit institutions that are facing temporary liquidity problems. ELA thus addresses short-term liquidity problems and does not aim to provide solvency support. ELA takes the form of central bank money and/or any other assistance that may lead to an increase in central bank money. ELA needs to be distinguished from the Eurosystem's credit operations, which are designed to implement the monetary policy of the Eurosystem and with which ELA should not conflict.

ELA should not conflict with the objectives and tasks of the ESCB. Interference with the objectives and tasks of the ESCB could, for instance, result from the following: (i) a threat to the singleness of monetary policy, (ii) a threat to the implementation of monetary policy, for example by making the steering of short-term rates more difficult, (iii) a threat to the financial independence of the NCB, for instance if ELA was not provided against sufficient collateral to safeguard such independence, (iv) an obvious concern about a possible breach of the monetary financing prohibition, or (v) provision of ELA at overly generous conditions, which, in turn, could increase the risk of moral hazard on the side of financial institutions or responsible authorities.

#### Responsibility

ELA is a national task and national central banks bear the costs and risks. The ECB Governing Council can object to ELA if it interferes with the tasks and objectives of the ESCB.

ELA is a national task and a responsibility of the corresponding NCB. The decision to provide ELA thus lies with the NCB and the legal basis for the decision to grant ELA stems from the national law. The NCB also bears the costs and risks associated with the provision of ELA.

The Governing Council, however, can object to ELA provision if it conflicts with the objectives and tasks of the ESCB as outlined above. An objection to ELA requires a two-thirds majority in the Governing Council.

To enable the Governing Council to assess whether ELA conflicts with the objectives and tasks of the ESCB, NCBs have to follow a certain procedure. In principle, the exact procedure followed depends on the amount of ELA provided. Only ELA requests exceeding EUR 2 billion per credit institution/group are subject to the non-objection of the Governing Council. ELA requests of less than EUR 2 billion and more than EUR 0.5 billion are subject to ex ante information requirements, while for ELA requests of less than EUR 0.5 billion information may be provided ex post. In practice, however, all ELA requests are put forward to the Governing Council before the provision of ELA.

#### Information requirements

ELA is subject to minimum information requirements on the volume and duration of ELA, the beneficiaries, as well as the collateral, its valuation and the risk controls applied.

ELA is subject to minimum information reporting requirements. NCBs should thus provide to the Governing Council information such as: (i) the counterparty receiving ELA; (ii) the volume, value and maturity dates of ELA, the interest rate applied on ELA, and the currency denomination; (iii) the collateral, including its valuation, as well as the haircuts applied to the

collateral; (iv) the specific reasons for the ELA provision; (v) the prudential supervisor's assessment over the short and medium-term of the liquidity position and solvency of the credit institution – not only is a positive solvency assessment required, the criteria behind the positive solvency assessment must be given; (vi) where relevant, an assessment of cross-border issues and potential systemic implications.

The ELA framework is revised on a regular basis. The latest revisions reflect the creation of the Single Supervisory Mechanism, which has implications in terms of the responsibilities assumed by different parties regarding the solvency assessments.

## Risks of ELA

The financial risks of ELA are similar in nature to those of monetary policy credit operations, but tend to be higher. ELA risks are managed and borne by the NCBs.

While the objective and procedures of ELA are different from monetary policy credit operations, the types of risk are in principle similar. Thus, there is counterparty risk associated with the credit institution, which is mitigated by means of collateral.

As ELA is a national competence and NCBs bear the costs and risks associated with ELA, the management of the risks is also the responsibility of the NCBs, to the extent that the management of those risks does not interfere with the objectives and tasks of the ESCB. In this regard, NCBs can in principle autonomously design their own collateral framework for ELA, including the applicable risk control measures. Such a framework should, however, ensure that sufficient collateral is provided, according to the NCB's own risk assessment, to cover the risks arising from such operations to such an extent that the financial independence of the NCB is ensured. In addition, Article 59(3)(e) of the Bank Recovery and Resolution Directive<sup>48</sup> implicitly requires that ELA collateral needs to be appropriate to avoid an equity write-down and/or conversion of capital instruments in the credit institution receiving ELA. According to paragraph 62(b) of the Banking Communication,<sup>49</sup> ELA may constitute state aid if it is not "fully secured by collateral to which appropriate haircuts are applied, in function of its quality and market value".

Even after risk control measures have been applied, some residual risks remain as the credit risk, market risk and liquidation risk relating to the collateral in the event of a counterparty default cannot be fully mitigated by valuation and haircuts. In general, ELA also carries operational and legal risks. Indeed, the residual risks associated with ELA tend to be higher than those in regular monetary policy operations. Counterparties receiving ELA frequently lack collateral eligible for monetary policy operations, or there are doubts about their financial soundness such that they cannot participate in monetary policy operations.

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<sup>48</sup> Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms.

<sup>49</sup> See the Communication from the Commission on the application, from 1 August 2013, of State aid rules to support measures in favour of banks in the context of the financial crisis ('Banking Communication') OJ C 216; 30.7.2013.

## 3 The risk management framework for outright purchases

### 3.1 Asset types, their risks and achieving risk efficiency and risk equivalence

From the Eurosystem's monetary policy perspective, three main principles should guide monetary policy asset purchases; they also contribute to making such purchases proportionate to the respective objectives. First, the asset purchases should be an effective tool in helping to achieve the mandate of price stability throughout the euro area. Second, purchases should be proportionate and should minimise allocative distortions, by respecting as far as possible the singleness of monetary policy. Third, all other things being equal, purchases should minimise the Eurosystem's exposure to risk. These three principles are intimately linked to the concepts of risk efficiency and risk equivalence, as described in Box 1. In addition, asset purchases must not circumvent the rules prohibiting the monetary financing of public authorities as set out in Article 123(1) of the Treaty on the Functioning of the European Union; an adequate risk management framework facilitates compliance with the monetary financing prohibition.

Outright purchases are subject to similar types of risks as collateralised lending – in particular credit, market and liquidity risks.

While outright monetary policy purchases share many types of financial risks with collateralised lending operations, there are important differences. Both types of operations are subject to credit, market, liquidity, operational and legal risks, and the value of the assets concerned can be affected by their accounting treatment. However, while in the case of collateralised lending operations the Eurosystem is only exposed to these risks in the event of a counterparty default, in the case of outright purchases, the Eurosystem is directly exposed to them. As a result, the measurement and management of financial risks is particularly important in the case of outright purchases. It should also be noted that, while counterparty risk is of particular importance in the context of collateralised lending operations, counterparty risk can still be present in the case of assets purchased outright, as the financial risks relating to a particular security can depend on counterparties. For instance, covered bonds are secured by a double recourse, first to the issuing bank's balance sheet as a whole and second to the collateral pool of the covered bond. As a result of having recourse to the bank's balance sheet, the credit risk of a covered bond thus also depends on the riskiness of the issuing bank. While ABSs do not profit from the originator's balance sheet but depend primarily on the performance of the underlying cash-flow generating assets, the credit risk of ABSs can also be linked to the issuer special purpose vehicle's counterparties, as counterparties and third parties provide swap facilities, some forms of credit enhancement, commitments on servicing continuity, etc.

Whereas the categories of financial risks involved are to some extent similar for collateralised lending and outright purchase operations, the available risk management tools differ. Most importantly, in the case of outright purchases of

assets haircuts cannot be applied to ensure adequate risk protection and risk equivalence across the units of assets.

However, some degree of risk efficiency and equivalence can be achieved by purchasing – at market prices – a portfolio with adequately managed risks, that is, a portfolio assuming systematic risks, as these cannot be diversified and are rewarded through expected returns, but one that minimises idiosyncratic risks as far as possible. Purchasing such a portfolio at market prices also minimises potential distortions in capital markets. This notion applies both across the entire extent of assets, as well as within a specific asset class.

The definition of diversified benchmarks and the use of limits to avoid concentration in risky assets are powerful ways in which idiosyncratic risks can be diversified away. In addition, for assets not actively traded, due diligence, prudent pricing policies and transparency and market conformity requirements are necessary to minimise residual idiosyncratic risks and achieve the risk-return equivalence and efficiency goals.

## 3.2 Tools for the risk management of outright purchases

For each purchase programme, a governance framework is in place determining the eligibility and surveillance according to asset type. The complexity of such a framework will generally depend on the degree of heterogeneity of the targeted asset class. As far as possible, eligibility assessments and surveillance are rule-based.

### 3.2.1 Eligibility analysis and surveillance in relation to asset type

Outright purchases require a distinct risk management framework, involving the definition of benchmarks, eligibility criteria, credit assessments, due diligence, pricing and limits.

All outright asset purchase programmes have a governance framework for risk surveillance. The specific framework for each purchase programme takes into account the specific features of the asset types purchased. Here we focus on the outright purchase programmes which are currently active, i.e. the extended asset purchase programme (EAPP) comprising the ABS purchase programme (ABSPP),<sup>50</sup> the third covered bond purchase programme (CBPP3)<sup>51</sup> and the public sector purchase programme (PSPP).<sup>52</sup>

Some general eligibility requirements apply across all outright purchases programmes. These general requirements are complemented by specific requirements which address the particular features and risks associated with the different asset classes.

<sup>50</sup> Decision (EU) 2015/5 of the ECB of 19 November 2014 on the implementation of the asset-backed securities purchase programme (ECB/2014/45), OJ L 1, 6.1.2015, p. 4.

<sup>51</sup> Decision of the ECB of 15 October 2014 on the implementation of the third covered bond purchase programme (ECB/2014/40), OJ L 335, 22.10.2014, p. 22.

<sup>52</sup> Decision (EU) 2015/774 of the ECB of 4 March 2015 on a secondary markets public sector asset purchase programme (ECB/2015/10), OJ L 121, 14.5.2015, p. 20.

## General eligibility requirements for outright monetary policy purchases

General eligibility criteria apply across all asset classes, such as minimum credit standards and geographical requirements.

Only marketable assets which are eligible as collateral for the Eurosystem's credit operations (see Section 2.3) are eligible for outright purchases. Further to this, in general terms, to be eligible for outright purchases, assets must broadly be "euro area assets". For instance, the assets must be denominated in euro, as well as being issued and settled in the euro area. Similarly, in the case of securitised assets, the debtors underlying the respective claims must predominantly be located in the euro area as well.

The requirement for assets to be eligible as collateral implies, among other things, that assets must satisfy minimum credit quality requirements. In particular, eligible assets must at least meet the criteria for credit quality step 3 on the Eurosystem's harmonised rating scale in the form of at least one credit rating (and at least two ratings for ABSs) provided by an ECAI accepted within the ECAF.<sup>53</sup> This minimum credit quality threshold can be waived if the respective jurisdiction is subject to and in compliance with an EU/IMF financial assistance programme as decided by the Governing Council.

In addition to the general requirements, specific requirements account for the particular risks associated with each asset class.

The general eligibility requirements applying to all outright purchases are complemented by specific requirements fine-tuned to address the features and risks associated with each asset class. This is especially true for assets which become eligible for outright purchases in cases where the minimum credit quality threshold has been waived.

## Specific eligibility requirements for assets eligible following a waiver of the minimum credit quality threshold

For assets which become eligible for outright purchases by virtue of a waiver of the minimum credit quality threshold, which may occur in the case of compliance with an EU/IMF financial assistance programme, the following additional requirements that aim to somewhat reduce the gap in terms of risks per unit purchased compared to other assets also apply.

In the case of the PSPP, no purchases are allowed in the two months preceding and following each successful review of the financial assistance programme, unless exceptional circumstances justify a deviation from this rule.

In the case of the CBPP3 and the ABSPP, covered bonds and ABSs must achieve a minimum asset rating at the level of the maximum achievable rating for that asset in that country. This requirement relates to the explicit or implicit application by rating agencies of "country ceilings" to issuers of certain jurisdictions. The country rating

<sup>53</sup> For the first covered bond purchase programme eligibility was restricted to assets rated at least AA, while for the second covered bond purchase programme the credit quality requirement was relaxed to BBB-, which is the minimum credit assessment corresponding to credit quality step 3 on the Eurosystem's harmonised rating scale.

ceiling means that, irrespective of the intrinsic credit quality of the instrument (e.g. high degree of overcollateralisation/credit enhancement), the instrument will not be rated above a rating ceiling on account of a high perceived country risk that cannot be mitigated by further pledges of domestic assets. Generally a rating ceiling is distinct from but related to the sovereign rating of the country. Thus, assets which achieve the country ceiling have the best possible rating within a specific country.

Additional requirements for purchases of covered bonds under the CBPP3 that become eligible by virtue of a waiver include: (i) monthly reporting of cover pool characteristics, including loan-level data, programme structure features and issuer information; (ii) a minimum committed over-collateralisation of 25% and (iii) at least 95% of the assets denominated in euro or, alternatively, only currency hedges with counterparties rated BBB- or higher for non-euro-denominated claims included in the programme's cover pool.

The following additional requirements apply for ABSPP purchases of ABSs that become eligible by virtue of a waiver: (i) the structure of the ABS should incorporate current credit enhancements equal to a minimum of 25% of the current principal amount outstanding; (ii) investor reports should be available and the modelling of the ABS should be feasible using standard third-party ABS cash-flow modelling tools; (iii) the best available credit quality assessment of each of the following counterparties (if relevant), with the exception of the servicer, complies with at least credit quality step 3: issuer account bank, issuer account bank guarantor, any liquidity facility provider, any hedge counterparty, principal paying agent, any guaranteed investment contract provider; and (iv) a backup servicer for the ABS issue needs to have been appointed.

### Specific eligibility requirements for the CBPP3

Covered bonds issued by entities suspended from the Eurosystem's credit operations cannot be purchased for the duration of the suspension. This reflects the fact that the risks of covered bonds are closely related to the issuing entity as the covered bonds ultimately have recourse to the issuing entity's balance sheet.

### Specific eligibility requirements for the ABSPP

ABS tranches which have been retained in full by the originator or which have been fully retained by entities with which the originator has close links are only eligible for purchase under the ABSPP if an external investor without close links to the originators also purchases part of that ABS tranche. This ensures that retained ABS transactions purchased by the Eurosystem are also subject to the scrutiny of market participants who are also buying part of the ABS tranche.

ABSs with a credit quality assessed to be below credit quality step 2 have to satisfy additional requirements, which include (i) no loans backing ABSs are allowed to have been non-performing at issuance or during the life of the ABS; (ii) the ABS



must not be structured, syndicated or leveraged; and (iii) servicing continuity provisions must be in place.

## Credit risk assessment and due diligence

Credit risk assessments and due diligence are made prior to purchases and on a continuous basis.

For both covered bonds and ABSs, the Eurosystem conducts credit risk assessments and due diligence prior to purchase. All European regulated entities, such as bank, insurers and fund managers, are required by the relevant legislation (Capital Requirements Regulation, Alternative Investment Fund Managers Directive, etc.) to conduct due diligence prior to investing in an ABS. Like these private sector purchasers of ABSs, the Eurosystem applies a similar procedure to its purchases under the ABSPP, thus aiming to ensure that its purchases are made prudently. The credit risk and due diligence assessments are risk-based, with more intensified analysis of riskier assets. Given that ABSs are more bespoke, the due diligence process for each ABS transaction is a key part of the ABSPP governance framework (see Box 7). In addition to the due diligence conducted before the purchases are made, the Eurosystem carries out credit risk and due diligence procedures on the ABSs eligible for the ABSPP on an ongoing basis and monitors the implementation of the purchase programmes against the risk control framework.

### Box 7

#### Overview of the Eurosystem's due diligence for ABS purchases

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The Eurosystem's due diligence assessment for ABS purchases encompasses a number of key components including assessments of (i) the transaction structure; (ii) the quality of the portfolio; (iii) the resilience of the portfolio under stress scenarios; (iv) operational risk; (v) counterparty risk and (vi) legal risk. As far as possible, credit risk assessments and due diligence follow a rule-based approach in order to ensure consistency.

#### (i) The transaction structure

The transaction structure can vary between transactions and is therefore reviewed in each case. A key question to be answered is whether the structure has typical or uncommon features. This particularly applies to retained transactions, as they will often not have undergone third-party due diligence other than the rating agencies' review. The analysis includes (i) an assessment of the payment structure (i.e. the waterfall) both pre-enforcement and post-enforcement including the performance triggers for switching from pro-rata to sequential treatment (if applicable), (ii) the credit enhancement provided by over-collateralisation, subordination, excess spread and/or reserve fund/cash account (based on a uniform formula), (iii) other support, such as liquidity support and available guarantees, (iv) the rating triggers for counterparties, such as the swap provider, account bank and servicer (v) the presence of hedge instruments to address mismatches between the assets' and liabilities' interest rates, and finally also (vi) the inclusion of any redemption dates and step-up margin in the transaction.

**(ii) The quality of the portfolio**

The assessment of the portfolio quality provides details on the quantitative aspects relating mainly to the credit risk profile, including the types of loans, concentrations (geographical, borrower, sector), delinquencies, defaults and recoveries. A key aspect is the benchmarking of the quality of the underlying portfolio, ideally (i) against the originator's whole loan book and/or (ii) earlier transactions and (iii) against the sector's average quality (e.g. for RMBS with regard to loan-to-value, debt-to-income, self-certified borrowers, interest-only loans, arrears and losses). This is particularly crucial for new issuers. The quality of the portfolio is normally expressed in risk metric terms, such as average and/or stressed default, recovery and loss estimation.

**(iii) The resilience of the structure under stress scenarios**

The ABS is subjected to a number of stress scenarios. A key question to answer is whether the structure, including credit enhancement, is sufficient to absorb the losses from the stress scenarios, which include assumptions on default, recoveries, prepayments and interest rates. The ability of the transaction to withstand shocks, such as the failure of the swap counterparty, is also checked.

**(iv) Operational risk**

An assessment of the quality, experience and financial strength of the originator and servicer is provided. The main question to be addressed is whether there is "continuation" risk in the transaction as this is crucial for the performance of the underlying assets. In order to address this risk it is also important that there is an assessment of close links with the originator and servicer and the availability of backup servicing provisions.

**(v) Counterparty risk**

The risk associated with counterparties in the transaction is reviewed. The main questions to be answered are: (i) whether there is a concentration risk in the use of counterparties, i.e. whether they have a close link with the originator; and (ii) whether the rating triggers and remedial actions are sufficient to mitigate the counterparty risk in the transaction. This involves a comparison of the counterparty ratings with the rating triggers for remedial action to mitigate the counterparty risk in the transaction.

**(vi) Legal risk**

Particular legal risks are identified and it is established whether they are properly addressed. In this context, it is important to note that there are a number of legal risks which arise in ABS structures that cannot be avoided in most jurisdictions or can only be mitigated, such as the commingling of cash collections and set-off risk. This type of legal risk is identified as well as any structural mitigants. In addition, the voting rights are checked whether they are in line with market practice and whether they protect the rights of the purchaser of the senior tranche.

The due diligence conducted on ABSs considered for purchase in the ABS purchase programme (ABSPP) has yielded rich insights into the variety of ABS features that exist and, within this variety, the features that appear to be best practice from a risk management perspective:

- The collateral consists of a diversified pool of granular and performing assets
- The underlying exposures have been originated according to sound underwriting criteria
- The transaction structure is straightforward and robust
- The originator is in good financial health and has ideally demonstrated (or intends to have) a regular presence in the ABS markets
- Interest rate risks are mitigated and the transaction documentation clearly specifies the mitigation measures for these risks
- The transaction documentation clearly specifies the processes and responsibilities necessary to ensure that replacement of important counterparties to the transaction
- The transaction displays a high degree of transparency

Nevertheless, it is recognized that ABSs may not always contain these features, particularly for older transactions and also on account of certain national practices (which may also be enshrined in national legal frameworks). In this regard, other risk management considerations may intervene to enable the Eurosystem to still continue considering such ABSs for purchase while ensuring that the Eurosystem's balance sheet remains protected.

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## Pricing framework

The pricing framework ensures that the prices paid are market-based and transparent.

A pricing framework guides the purchases for all the outright purchase programmes. The framework takes into account available market prices, the quality of such prices and the fair values. In addition to a consideration of prices before transactions take place, in particular in markets where liquidity is impaired, the risk management area also conducts post-trade checks on the transaction prices.

The pricing framework is market-based and multi-sourced, while leaving room for expert judgement, where it is needed. The market-based element ensures that purchases are conducted in line with market prices. In addition, theoretical price checks and price sensitivity analyses with respect to key parameters are conducted, in particular for assets where market prices are of poor quality or unavailable. Thus, the pricing framework is multi-sourced in that a wide variety of price sources are used, ranging from market data vendors, dealer quotations and messages and the Eurosystem's internal pricing system.

The pricing framework is also risk-based in that the price checks become more extensive the less liquid the market and the fewer market prices there are with which to compare. In general terms, both ABSs and covered bonds which have been retained by the issuing entity or placed privately are subject to particular scrutiny. To this end, dedicated pricing teams have been established, meaning a thorough assessment of prices can be achieved.

## 3.2.2 Exposure management

For outright transactions the definition of diversified benchmarks and the use of limits to avoid concentration in risky assets are powerful ways in which some degree of risk-return efficiency and equivalence can be achieved.

### Benchmarks

The definition of broad benchmarks ensures diversification.

If the benchmark, i.e. the allocation of assets to be purchased, corresponds to the market capitalisation of the outstanding assets of the asset class targeted, then purchasing the benchmark goes some way to supporting risk efficiency and risk equivalence. Benchmarks are thus generally set to be broad, while monetary policy and risk considerations allow them to be fine-tuned. In the case of ABSs and covered bonds benchmarks are generally guided by the nominal outstanding amounts of covered bonds fulfilling the eligibility criteria and satisfying risk considerations. By contrast, in the case of government bonds the ECBs' capital key shares per NCB play a more prominent role in defining country allocations, as focusing on outstanding amounts would give a larger weight to countries with more debt outstanding, which could give rise to undesirable incentives. In addition, benchmarks may be constrained by restrictions on minimum or maximum transaction sizes, as well as restrictions on the maturity spectrum targeted.

### Limits

Issue and issuer limits are an effective tool to address residual risks.

Limits are applied for each of the purchase programmes. The definition of limits takes into account policy, operational, legal and risk management considerations. The limits are fine-tuned in accordance with the different asset classes, distinguishing public sector assets on the one hand, and private sector assets on the other.

For the PSPP, issue and issuer share limits are applied that limit risk concentration, while also ensuring that the Eurosystem does not find itself in a position where it is able to block a potential restructuring of government bonds through collective action clauses (CACs). Typically, the restructuring of a bond requires the consent of at least a third of its holders. The Eurosystem is prohibited from agreeing to the use of CACs by the monetary financing prohibition.<sup>54</sup> The issue share limit is applied for each International Securities Identification Number, consolidating holdings across all the portfolios of the Eurosystem's central banks. This issue share limit is set at 25% for the first six months of PSPP purchases and may subsequently be reviewed by the Governing Council. For securities eligible only under the waiver, a different issue

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<sup>54</sup> See the Treaty on the Functioning of the European Union, Article 123.

share limit applies. In addition, an issuer share limit of 33% across all outstanding securities is applied.<sup>55</sup>

The ABSPP and the CBPP3 also have issue limits applied in order to manage risks. However, as the monetary financing concerns present in the context of CACs and government bonds are absent in the case of ABSs and covered bonds, these issue limits are set at a higher level than for government bonds. The limits which are applied in the ABSPP and the CBPP3 are thus: (i) no more than 70% of the outstanding amount of a tranche (ABS) or issue (covered bonds) may be purchased, (ii) for ABSs and covered bonds eligible for purchase as a result of the waiver of the minimum credit quality requirement, only 30% of the outstanding amount of any tranche (ABSs) or issue (covered bonds) may be purchased in order to limit concentration in these riskier assets. In addition to the issue limit, issuer limits are also applied for the CBPP3.

More generally, the Eurosystem closely monitors the risks of all the programmes and the possible deviations from the benchmarks, and can at any time implement additional limits to contain them.

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<sup>55</sup> Applying an issue share limit of 25% is not sufficient to guarantee a certain issuer share as the issue limit was not applied in previous purchase programmes such as the SMP.

## 4 Risk reporting and monitoring

For risk reporting purposes, a distinction is made between the Eurosystem's internal risk reporting process and the public disclosure of risks.

### 4.1 The ECB's internal risk monitoring process

Internal risk reporting activities cover risks stemming from all monetary policy and investment operations.

The Eurosystem's credit operations carry risks, even if monetary policy counterparties are required to be financially sound and provide adequate collateral which is subject to risk-mitigating measures. These risks are residual in nature; in the unexpected event of a counterparty default, the Eurosystem is exposed to the credit, market and liquidation risks associated with the resolution of collateral assets that may not be fully covered by the applied valuation and haircuts.

In addition, the Eurosystem's central banks are exposed to financial risks arising from holdings of securities purchased for monetary policy purposes, such as those that were acquired in the past as part of the Securities Markets Programme (SMP) and the first two covered bond purchase programmes (CBPP1 and CBPP2), as well as within the currently active outright purchase programmes which are part of the extended asset purchase programme, such as the asset-backed securities purchase programme (ABSPP), the third covered bond purchase programme (CBPP3) and the public sector purchase programme (PSPP), as well as potentially through the Outright Monetary Transactions (OMT) programme.

Furthermore, financial risks result from investment portfolio holdings of foreign reserves and gold, as well as euro-denominated investment portfolios.

Last, the Eurosystem is also exposed to financial risks arising from potential mismatches between assets and liabilities.

The methodology and processes for risk reporting are defined by the Directorate Risk Management and the Eurosystem's Risk Management Committee.

The ECB's Directorate Risk Management and the Eurosystem's Risk Management Committee use a common methodology and reporting process to produce risk estimates pertaining to the Eurosystem as a whole and to each individual central bank separately. Risk estimates reflect the risks borne by each central bank related to their own non-monetary policy portfolios, ELA and the share of the monetary policy risks allocated to the bank on the basis of applicable loss-sharing arrangements. In addition, each of the Eurosystem's central banks reports internally on the risks associated with the specific exposures contained in their balance sheet, not necessarily on the basis of the same methodology and assumptions used for the common calculations, although this can serve as a benchmark.

## Risk measures

To obtain a comprehensive understanding of risks, the ECB uses two types of measures, value at risk (VaR) and expected shortfall.

The Eurosystem's common risk calculations rely on a variety of risk measures. In order to estimate such risk measures, the ECB applies in-house risk estimation techniques, designed by the Risk Management Committee and endorsed by the ECB's Governing Council, which rely on a joint market and credit risk simulation framework. The core modelling concepts, techniques and assumptions underlying the risk measures are inspired by and reflect market standards.<sup>56</sup> In order to obtain a comprehensive understanding of the potential risk events that could be observed with different frequencies and entailing different severity levels, the ECB uses two types of measures, the value at risk (VaR) and the expected shortfall,<sup>57</sup> calculated for an array of confidence levels. Furthermore, sensitivity and stress scenario analyses are used to complement statistical risk measures and gauge the model risks associated with the risk estimation.

Risk estimates for the Eurosystem's credit operations are analysed (i) on a stand-alone basis, (ii) together with other monetary policy portfolios, or (iii) in the aggregate balance sheet context (including investment portfolios).

The risk of a particular monetary policy portfolio is assessed from multiple angles and in different contexts. As an example, the risk estimates for the Eurosystem's credit operations are analysed (i) on a stand-alone basis, (ii) together with other monetary policy portfolios, or (iii) in the aggregate balance sheet context (including portfolios that are not related to monetary policy instruments).

- (i) The stand-alone risk estimates for the Eurosystem's credit operations isolate the analysis of specific risks from potential interactions with other exposures and focus on the different exposures along a number of dimensions (country, collateral type, counterparties). This enables an understanding of the impact of the applied risk control measures and an identification of potential weaknesses in the applied risk control framework.
- (ii) The analysis of the Eurosystem's credit operations in the broader context of monetary policy operations and ELA is one of the most relevant sources of information produced by the Eurosystem's risk management function for the ongoing monitoring of monetary policy implementation from a risk management perspective. By placing credit operations in the broader context, interactions across different monetary policy portfolios, such as diversification, concentration and substitution effects, can be analysed.
- (iii) The analysis of the Eurosystem's credit operations in the aggregate balance sheet context, either at the overall level of the Eurosystem or at the level of the individual NCBs, is the best way to assess the overall risk impact of the policy

<sup>56</sup> Default and rating migration probabilities are derived from default and rating transition studies published by the major rating agencies. Volatilities, correlations and, more generally, the co-movement of credit and market risk variables are modelled by means of a multi-factor copula approach, calibrated on the basis of trailing historical data.

<sup>57</sup> The value-at-risk (VaR) is defined as the maximum potential loss threshold for the portfolio of financial assets that would not be exceeded with a given probability (confidence level) over a specified risk horizon. The expected shortfall is a coherent risk measure that is more conservative than the VaR if specified over the same horizon and for the same confidence level as it measures the probability-weighted average losses that could be observed in the worst-case scenarios falling beyond the VaR threshold. Losses, in this context, are defined as the differences between the value of the Eurosystem's portfolios in balance sheet terms at the beginning of the horizon compared with simulated values at the end of the horizon.

operations on the financial strength of the central bank. This is because the risks from credit operations are combined with other balance sheet risks and compared against the financial buffers available to withstand these risks at the central bank level.

From the perspective of the risks considered, internal common risk estimates are presented for the total risk profile considering all risks and are broken down into contributions by risk type (distinguishing mainly between market and credit risks). In addition, separate pieces of analysis show each risk type on a stand-alone basis, without considering inter-risk diversification effects. Those separate pieces of analysis resort, when necessary, to specific risk modelling techniques and tools that are deemed more adequate to assess specific risks. For instance, scenario analysis can be used to assess and illustrate, taking a long-term forward-looking perspective, the interest rate risk in the Eurosystem balance-sheet arising from a mismatch between the interest income earned on the asset side and the interest expenditure on the liability side.

All these different perspectives allow decision-making bodies to gain a deep understanding of the severity and probability of possible loss events defined in different ways, and of their aggregate effect on the financial strength of each central bank within the Eurosystem and at a consolidated level.

The Eurosystem's internal risk calculations distinguish between potential accounting losses after applying directly applicable financial buffers, such as revaluation accounts, provisions and income, which mitigate losses before they are reported in the profit and loss accounts, and financial risks or potential losses defined as a decrease in the overall net equity value of the Eurosystem or of individual central banks. The distinction between these perspectives is particularly relevant in view of the accounting conventions applied by the Eurosystem's central banks, which do not allow unrealised gains and losses to be netted for different assets and treat them asymmetrically, bringing losses to the profit and loss account, while keeping unrealised gains in revaluation accounts that, in some cases (for instance in the case of gold) can be very sizeable buffers against a potential depreciation of assets in the future.

Risks are monitored both with a view to potential economic losses and accounting losses.

## 4.2 Public risk disclosures

The Eurosystem attaches the utmost importance to credibility, trust, transparency and accountability, and aims for effective communication with the public. At the same time, risk disclosures should be supportive of monetary policy communication.

The Eurosystem's mission statement specifies that, in pursuing its objectives, it attaches the utmost importance to credibility, trust, transparency and accountability, and aims for effective communication with the citizens of Europe and the media.<sup>58</sup> This strategic intent and the associated communication strategy adopted by the ECB, serves as a framework, or a set of principles, for the articulation of the ECB's public risk disclosures.

<sup>58</sup> [http://www.ecb.europa.eu/ecb/orga/escb/html/mission\\_eurosys.en.html](http://www.ecb.europa.eu/ecb/orga/escb/html/mission_eurosys.en.html).



Transparency, if articulated through a conscious and effective communication strategy, supports the credibility, integrity and effectiveness of the ECB's policies. Beyond the clearly defined accountability obligations of the central banks, transparency can therefore be understood as a means for achieving the central banks' objectives. From this perspective, disclosure policies should avoid unwarranted policy signalling arising from misunderstandings of confidential policy or public investment strategies.

Taking these principles into consideration, the Eurosystem discloses its risk management practices and exposures through a variety of channels. The most significant disclosure channel is probably the publication of the ECB's Annual Report, which includes the ECB's annual accounts and accompanying management report, and the publication of the annual reports and accounts of the NCBs. As an example, the ECB's Annual Report for 2014<sup>59</sup> described various elements of the risk management framework applied to the Eurosystem's monetary policy portfolio and other ECB portfolios. In addition, the management report contained in the ECB's annual accounts for 2014<sup>60</sup> further elaborated on the risks faced by the ECB, by providing a qualitative description of these different risks, such as market, credit, liquidity and operational risks, as well as a quantitative risk estimate of the total financial risk assumed by the ECB over a one-year horizon, expressed using the value-at-risk (VaR) measure.

While risk disclosures are not harmonised across the Eurosystem's national central banks, the risk disclosures of the ECB provide an important reference point.

The disclosure of public risks is not harmonised across the Eurosystem's central banks, as the level of disclosure is affected by the different circumstances applicable to each central bank, such as the existence of private shareholders or public guarantees, the different approaches towards building up financial buffers against financial risks, and even the different disclosure traditions and cultures across central banks. However, the public risk disclosures by the ECB can be seen as a relevant reference for the Eurosystem because the level of risk disclosures provided by the ECB is broadly in line with that of other Eurosystem central banks and other major central banks.

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<sup>59</sup> <http://www.ecb.europa.eu/pub/pdf/annrep/ar2014en.pdf>.

<sup>60</sup> [https://www.ecb.europa.eu/pub/pdf/annrep/ar2015annualaccounts\\_en.pdf](https://www.ecb.europa.eu/pub/pdf/annrep/ar2015annualaccounts_en.pdf).

## 5 Concluding remarks

This overview aims to provide clarity and transparency regarding the prudent principles, techniques and assumptions followed by the Eurosystem's risk management function in the area of monetary policy implementation. Within the Eurosystem a great deal of attention is focused on how best to assess and control the risks associated with the implementation of monetary policy operations. However, this is not the only risk factor applicable for the Eurosystem's balance sheet; other important risk factors are associated with the additional functions of a central bank, namely the risks due to the holding and investment of foreign exchange reserves and own funds. In addition, the evolution of demand for banknotes and seigniorage are inherently linked to a central bank's profitability and risks to this.<sup>61</sup> A more comprehensive and integrated presentation of risks stemming from policy considerations would need to take into account these additional risk factors.

It is the role of central bank risk managers to provide decision-makers with up-to-date and realistic assessments of the risks linked to the central bank's financial operations. The Eurosystem focuses particular attention on risk management as an integral part of its decision-making. Risk management strives to enable the achievement of policy objectives with the lowest possible risk for the Eurosystem. It strives to fulfil the highest possible organisational and governance standards for this function and applies state-of-the-art tools and techniques. The Eurosystem has been entrusted with a public mandate and it is therefore expected to follow the prudent principles of risk management in a transparent way that can be easily understood by the public.

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<sup>61</sup> See, for example, Bindseil et al. (2009).

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