The collateral framework of the Eurosystem

The collateral framework of the Eurosystem is based on a number of guiding principles stemming from the Treaty establishing the European Community (the "Treaty"), as well as from operational guidelines developed in the course of the preparatory work for Stage Three of Economic and Monetary Union (EMU). The collateral framework was developed in such a way as not to depart substantially from established market practices. Due regard was given to the existing differences in central bank practices and financial structures across EU Member States. A two-tier system appeared to best serve the needs of ensuring harmonised procedures and avoiding discrimination on the one hand, and of favouring continuity on the other. This article describes how the collateral framework was designed and implemented. It then analyses aggregated data relating to the total amount of eligible collateral and its use in the Eurosystem's credit operations. Finally, it reviews how in Europe, as well as in the United States and Japan, rapid changes occurring in financial markets resulting, inter alia, from the introduction of the euro may have an impact on the collateral policies of the respective central banks.

1 Guiding principles and main features of the collateral framework

The leading principles that guided the development of the collateral framework are to be found in the Treaty and the Statute of the European System of Central Banks and of the European Central Bank (the "Statute"). In accordance with Article 18.1 of the Statute, lending is "based on adequate collateral". The main aim of this provision is to protect the Eurosystem from incurring losses in the conduct of credit operations, thus preserving the financial soundness of its operations and, ultimately, its credibility and independence, as well as its ability to pursue the objectives set out in the Treaty. Pursuant to this principle, all Eurosystem liquidity-providing operations are collateralised by underlying assets provided by counterparties.

Another principle is that of free competition and efficient allocation of resources. This principle is derived from the Treaty (Article 105), which states that the Eurosystem "[…] shall act in accordance with the principle of an open-market economy with free competition, favouring an efficient allocation of resources". The observance of this principle means, inter alia, that a level playing-field and equal treatment of issuers and of counterparties have to be ensured. This implies that every eligible asset should potentially be available for use by any counterparty, regardless of its location in the euro area. To achieve this, it was necessary to implement satisfactory procedures for the cross-border use of collateral.

Furthermore, the collateral policy also had to take note of Article 102 (ex Article 104a) of the Treaty, which allows no privileged access by public institutions to financial institutions. Accordingly, no discrimination is possible between public and private assets.

In addition to the Treaty provisions, a set of principles guiding the design of the operational framework was adopted during preparatory work for Monetary Union. Among these principles, operational efficiency and continuity were particularly important in the formulation of the Eurosystem's collateral policy.

Operational efficiency implies that the monetary policy instruments and procedures (of which the collateral framework is a part) should allow the Eurosystem to perform its tasks efficiently, in particular as concerns the implementation of monetary policy and the smooth functioning of payment systems. In practice, the requirement of operational efficiency has different consequences. First, sufficient collateral with adequate risk characteristics should be available to Eurosystem counterparties, for monetary policy purposes as well as for intraday credit operations. This also implies that counterparties should be able to access sufficient eligible assets effectively, either on a domestic or a cross-border basis. Second, in view of the time constraints involved in credit operations and of considerations

related to operational costs, the range of eligible assets should ensure their smooth and efficient handling by the Eurosystem as well as by counterparties and securities settlement systems (SSSs), in both a national and a cross-border context.

Continuity with practices and instruments prevailing in Stage Two of EMU was seen as an important principle to facilitate the transition to Stage Three and a smooth introduction of the euro. This also helped avoid the time-consuming and costly development of new infrastructure and practices by the Eurosystem and the banking sector.

Main features of the collateral framework

To take into account all the above-mentioned considerations, a distinction has been made between two tiers of assets:

a) tier one consists of marketable debt instruments, fulfilling uniform, euro area-wide eligibility criteria specified by the ECB and relating to the type and place of establishment of the issuer, location, settlement procedures and credit standard; and

b) tier two consists of additional assets, either marketable (debt instruments and equities) or non-marketable (bank loans, trade bills and mortgage-backed promissory notes), which are deemed of particular importance for certain national financial markets and banking systems and for which specific eligibility criteria are established by the respective national central banks (NCBs), subject to the approval of the ECB, provided they respect the minimum eligibility criteria established by the ECB.

No distinction is made between the two tiers with regard to the quality of the assets and their eligibility for the various types of credit operations (except that tier two assets are normally not used by the Eurosystem in outright transactions). The main features of the two tiers are summarised in Table 1.

Table 1

Eligible assets for Eurosystem credit operations

Criteria	Tier one	Tier two
Type of asset	• ECB debt certificates (at present not issued) • Other marketable debt instruments	• Marketable debt instruments • Non-marketable debt instruments • Equities traded on a regulated market
Settlement procedures	• Instruments must be centrally deposited in book-entry form with NCBs or an SSS fulfilling the ECB's minimum standards	• Assets must be easily accessible to the NCB that has included them in its tier two list
Type of issuer	• Eurosystem • Public sector • Private sector • International and supranational institutions	• Public sector • Private sector
Credit standard	• The issuer (guarantor) must be deemed financially sound by the ECB	• The issuer/debtor (guarantor) must be deemed financially sound by the NCB that has included the asset in its tier two list
Place of establishment of the issuer (or guarantor)	• European Economic Area (EEA) [1)]	• Euro area
Location of asset	• Euro area	• Euro area
Currency	• Euro	• Euro
Memorandum item: **Cross-border use**	• Yes	• Yes

Adapted from: "The single monetary policy in Stage Three: General documentation on Eurosystem monetary policy instruments and procedures" published by the ECB in November 2000.

1) The requirement that the issuing entity be established in the EEA does not apply to international and supranational institutions.

Box 1

The risk control measures of the Eurosystem

All collateral is subject to specific measures aiming to protect the Eurosystem against the risk of financial loss in the event that underlying assets have to be realised owing to the default of a counterparty. In order to cover *credit risk*, the assets put forward as collateral must meet high credit standards. Among other criteria, available credit ratings by market agencies, as well as certain institutional criteria ensuring a particularly high level of protection of the asset holder, are taken into account. To cover *market risk* (arising from the fact that the value of collateral can change during the life of the credit operation), some measures have been defined on the basis of market practices. These consist of:

- *initial margins:* these correspond to a certain percentage of the amount of liquidity provided, i.e. 1% for intraday and overnight transactions and 2% for transactions with a maturity of more than one business day;

- specific *valuation haircuts:* these are differentiated according to residual maturity and coupon structure and, for tier two assets, the liquidity characteristics of the assets; and

- *margin calls:* these are aimed at ensuring over time that the valuation of the underlying asset matches the amount of liquidity provided plus the value of the initial margin.

In addition, the Eurosystem may apply limits to its exposure, require additional guarantees, or exclude certain assets from use in its credit operations. For tier two assets, risk control measures complementing the initial margins are proposed by those NCBs that have included such assets in their lists. These assets need to be approved by the ECB. The Eurosystem seeks to ensure consistency in the application of the risk control measures for tier two assets across the euro area.[1]

A review of the risk control measures took place in 2000. This review, which did not result in changes in policy vis-à-vis eligible assets, aimed to make the large range of existing haircuts for tier two assets more homogeneous. The review also aimed to facilitate the necessary checking procedures by the Eurosystem and to enhance the transparency of the risk control framework. Furthermore, it introduced a consistent methodology to measure *liquidity risk* (arising from the differing liquidity of the assets and the time needed to liquidate them). Four groups of instruments with relatively homogeneous liquidity characteristics were identified within tier two, and consistent valuation haircuts were applied to them:

a) *equities;*

b) *marketable debt instruments with limited liquidity:* the majority of the tier two assets fall into this category; although there may be some differences in the degree of liquidity, the assets in this category are broadly similar in that they have a small secondary market, prices may not be quoted daily and normal-sized trades can generate price effects;

c) *debt instruments with restricted liquidity and special features:* these are assets which, while enjoying some aspects of marketability, require extra time to be liquidated in the market; this is the case for assets which are generally non-marketable but have special features that introduce some marketability, including market auction procedures (if there is a need to liquidate the assets) and a daily price valuation; and

d) *non-marketable debt instruments:* these instruments are in practice non-marketable and therefore have little or no liquidity.

1 *A detailed description of the risk control measures can be found in "The single monetary policy in Stage Three: General documentation on Eurosystem monetary policy instruments and procedures" published by the ECB in November 2000.*

With a view to promoting simplicity and an efficient use of eligible assets, it was decided that the eligibility criteria would be the same for both payment system and monetary policy operations.[1] This was expected to simplify operational procedures for counterparties, the Eurosystem and SSSs, in particular if intraday credit needed to be extended overnight.

All eligible assets are subject to specific risk control measures (see Box 1).

To promote the further integration of EU financial markets and the principle of equal treatment of counterparties, a mechanism named the correspondent central banking model (CCBM) was launched at the start of Stage Three to enable cross-border use of collateral in the settlement of all types of operations in which the Eurosystem provides liquidity. The CCBM can, in principle, be used for all eligible assets, as specific solutions are foreseen for non-marketable assets or tier two assets with restricted liquidity and special features that cannot be transferred through an SSS.

The CCBM was implemented as an interim mechanism, since it was expected that the market would implement alternative solutions among SSSs. The market is indeed achieving some progress in this respect. One of these solutions is the establishment of "links" between SSSs, approved by the ECB, to allow the smooth and efficient cross-border transfer of collateral, by mobilising securities between systems through a book-entry process. However, at present, the CCBM remains the preferred channel for cross-border securities settlement, covering more than 80% of the volume of assets used on a cross-border basis in the credit operations of the Eurosystem. It should be noted that the CCBM can only be used to collateralise credit operations of the European System of Central Banks (ESCB). Other arrangements provided by the market have to be used for cross-border transactions that do not involve the ESCB. Currently, such alternative arrangements exist only for assets transferable by book entry.

In order to identify the assets potentially eligible as collateral, the Eurosystem has established a specific procedure. According to this procedure, the NCBs are responsible for submitting information to the ECB on assets listed in their respective national markets. Procedures for managing and publishing the complete list of assets eligible for credit operations are centralised at the ECB, where an eligible assets database is maintained. The collateral management procedures foresee that data be collected with a weekly frequency and be made accessible to all interested parties. In the light of the high update frequency and the potentially very high number of recipients of the list, it was decided that the most efficient method to ensure wide circulation would be to publish the list on the internet. The list of eligible assets is accessible to the public on the ECB's website (www.ecb.int). The solution to publish the list of eligible assets on the internet was innovative at the time it was conceived, and it has withstood the test of time and proved to be efficient. Preparations are under way to improve the efficiency of the update procedure and increase the update frequency.

1 *The only exception is that, in addition to the list of eligible assets published on its website, the ECB may authorise NCBs to grant intraday credit for payment system purposes against certain types of debt instruments which are considered eligible for intraday credit by non-participating EU central banks (so-called "out collateral"). Such out collateral has to be: 1) located in EEA countries outside the euro area; 2) issued by entities established in EEA countries outside the euro area; and 3) denominated in EEA currencies (or other widely traded currencies). Within the euro area, the use of these debt instruments is limited to intraday credit operations, and they may not be used on a cross-border basis. To date, certain Danish, Swedish and UK assets have been made eligible as out collateral.*

2 Availability and use of collateral

Eligible collateral

The collateral eligible for Eurosystem credit operations encompasses a very broad spectrum of high-quality assets denominated in euro, issued (or guaranteed) by entities established in the EEA for tier one assets, or in the euro area for tier two assets. A substantial part of tier one (which comprises debt instruments only) is made up of general government bonds, i.e. assets issued by central, regional and local governments. Securities issued by central governments typically have a high outstanding amount, large issue size and turnover and low trading spreads. They are quantitatively the most abundant source of eligible collateral in almost all euro area countries. Regional and local government securities in the different countries display differing degrees of liquidity, but are in general less liquid than central government bonds. Other types of assets included in tier one are securities issued by international and supranational institutions.

In tier one, private sector securities include asset-backed bonds, uncovered credit institution bonds and bonds issued by corporates. A substantial share of asset-backed bonds is made up of Pfandbrief-type securities backed by residential mortgages or by public sector debt. These, unlike other asset-backed securities, are issued directly by specialised credit institutions rather than through special purpose vehicles.[2] Historically originating in German and Austrian markets, assets similar to "Pfandbriefe" have also been introduced or have experienced growth in issuance in recent years in other euro area countries (for example, "Obligations Foncières" in France and "Cédulas Hipotecarias" in Spain).

Outstanding amounts of uncovered credit institution bonds are large in some countries, but turnover is generally low compared with government bonds or certain Pfandbrief-type products (such as the so-called "Jumbo" issues). For corporate bonds, the issue size is normally smaller than for other types of issuers in many euro area countries and the available data show that turnover is substantially lower than for government bonds. Lastly, tier one also includes negligible amounts of debt certificates issued by some NCBs prior to Stage Three, which are gradually maturing. The ECB has so far not issued any debt certificates.

Most NCBs have proposed assets for inclusion in tier two. The assets range from credit institution bonds to corporate commercial paper, medium-term notes,

2 *A special purpose vehicle is a legal entity set up to acquire and hold certain assets on its balance sheet and to issue securities backed by those assets, to be sold to third parties.*

Table 2

Main categories of eligible assets for Eurosystem credit operations

Type of asset	Tier one (EEA)	Tier two (euro area)
Marketable	• ECB debt certificates (at present not issued) • Debt issued by foreign and supranational institutions • Central, regional and local government securities • Uncovered credit institution bonds • Pfandbrief-type securities • Corporate bonds	• Central, regional and local government securities • Credit institution bonds • Corporate bonds • Certificates of deposit • Medium-term notes • Commercial paper • Equities • Marketable private claims
Non-marketable	None	• Bank loans • Mortgage-backed promissory notes • Trade bills

regional government bonds and equities. Except for this last category, the liquidity and market depth of tier two assets are generally lower compared with tier one collateral. Many of these assets are not listed or traded on a regulated market, but are traded over the counter. In Spain, the Netherlands and Portugal, tier two also includes the most liquid shares of non-financial companies listed on the national stock exchanges.

Some NCBs have also included non-marketable debt instruments in tier two, including bank loans, trade bills and mortgage-backed promissory notes. The total amount of eligible non-marketable assets is not available. However, the amount of non-marketable assets actually used by counterparties is available and is generally low (see the next section on "Use of collateral").

The total amount of marketable assets eligible as collateral for Eurosystem credit operations increased from approximately €5.6 trillion to €6.3 trillion (i.e. by about 13%) between January 1999 and December 2000. A very large proportion of marketable eligible assets (almost 94% as at December 2000) was composed of tier one assets, while the remaining 6% was marketable tier two assets. This proportion did not change significantly over the period under review, even though, in the last quarter of 2000, a reduction in the share of tier two assets was experienced owing to a decrease in the number of eligible equities and a fall in their market value.

As the figures above indicate, a large amount of securities is potentially available to counterparties for Eurosystem credit operations. However, the actual amount of assets held by credit institutions is but a minor part of the total eligible assets, since assets are also held by other economic agents. According to a rough estimate by the Eurosystem in mid-2000, about one-third (i.e. around €2 trillion) of all eligible collateral was held by credit institutions in the euro area, with the situation in individual countries deviating, sometimes substantially, from the average. In addition, only part of the collateral held by counterparties can be readily used for ESCB credit operations, as the rest is needed by them for trading and client relationships, including proprietary trading, arbitraging, securities lending operations and participation in repo markets. The actual amount of collateral held by counterparties is a function of the banks' balance sheet structures, which, in turn, is connected to the financial structure of the individual euro area countries.

The differences in available collateral between counterparties also reflect differences in the level of development reached by financial markets in the individual euro area countries, such as the degree of development of private securities markets and of the legal frameworks for securitisation. The initial differences in availability appear to be diminishing, partly thanks to the significant growth in the cross-border use of collateral and partly to increased issuance in the euro area market, spurred by the introduction of the euro.

As at December 2000, government and credit institution bonds constituted the bulk of tier one assets (respectively 62% and 33%). The share of corporate securities grew significantly, but from a low level (from 3% in January 1999 to 5% in December 2000). Marketable tier two assets are composed mainly of assets issued by the non-financial sector (as at December 2000, these amounted to 83%, of which equities represented 63% and corporate bonds 20%) and by the financial sector (17%) (see Charts 1 and 2).

In terms of the breakdown by *issuer,* in December 2000 government securities represented 58% of all eligible assets, down from 61% in January 1999. The reduction in the relative share of government securities (which are virtually all included in tier one) compared with securities issued by private institutions took place because of the strong growth in the amount of non-government debt and a slower increase in issuance by

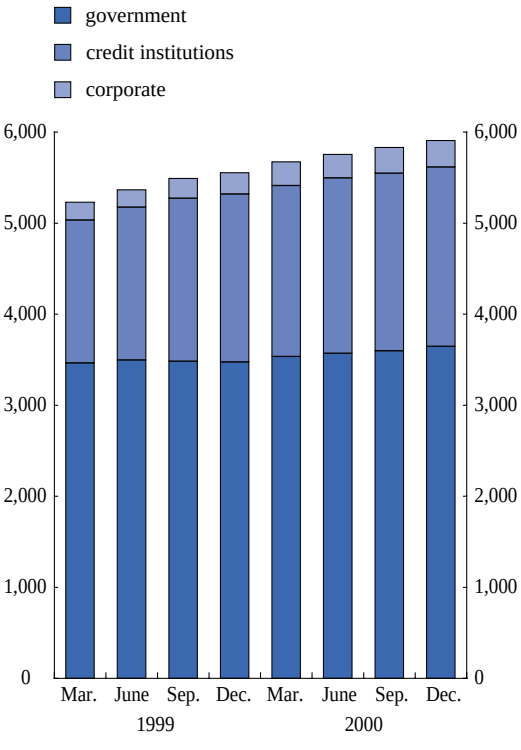
euro area governments. The share of securities issued by credit institutions rose to 32%, up from 29% in January 1999 (with only 1% of these assets being tier two).

The remaining 10% of all eligible assets were issued by non-financial corporations; their share did not change over the period, because the strong increase in the amount of eligible corporate debt instruments was offset by a decline (from 6.0% to 4.0%) in the proportion of eligible equities. The rapid growth in debt instruments issued by the corporate sector can be attributed to a number of mutually reinforcing factors: increasing financing needs of the corporate sector on account of mergers and acquisitions; improved market conditions and a wider investor base (partly owing to the introduction of the euro), which prompted direct issuance in the markets; increased competition in the European business sector, which seems to have focused attention on the financial structure of firms; and the reduced appetite of banks for direct financing as they attempt to use balance sheets more efficiently and focus more on shareholder value.

Chart 1

Tier one eligible assets for Eurosystem credit operations

(EUR billions; end-of-month data)

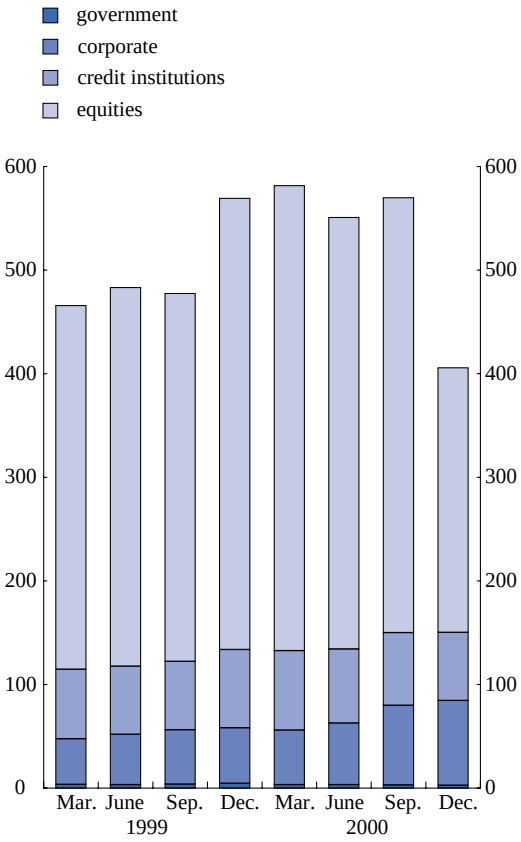


Source: ECB.

Chart 2

Marketable tier two eligible assets for Eurosystem credit operations

(EUR billions; end-of-month data)



Source: ECB.

Use of collateral

NCBs operate their systems for collateral management using either pooling or earmarking arrangements, or a combination of both. Under the *earmarking system,* each and every asset put forward (including pre-deposited assets) by a counterparty to the relevant central bank is specifically associated with a certain amount of credit obtained from the Eurosystem. In *pooling systems,* it is the pool as a whole, and not the specific assets,

that secures all of the credit extended to a counterparty.

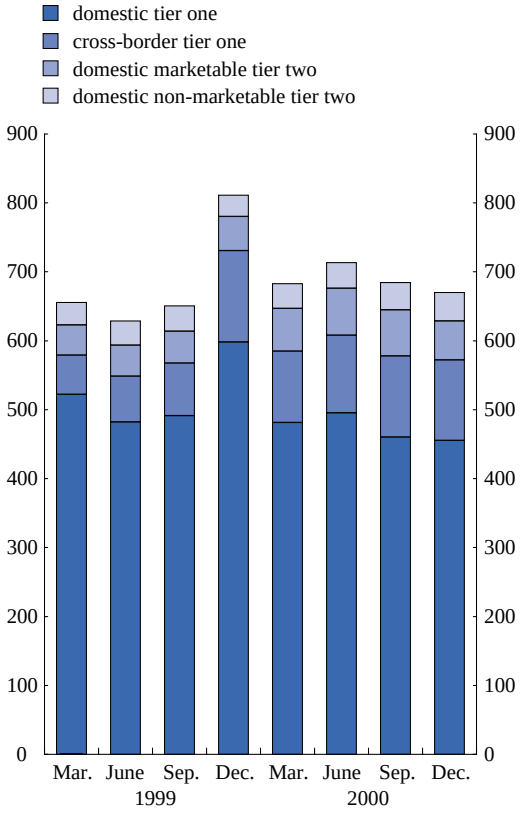
In the light of the differences between pooling and earmarking systems, it should be borne in mind that a caveat applies to the analysis of data on the use of collateral. In earmarking systems, there is a direct relationship between a credit operation and the actual assets collateralising it. By contrast, for pooling, no direct inferences about the collateral actually used by a counterparty can be made by analysing the structure of the pool; in the analysis presented in this article the assets in the pool are taken as a proxy for the collateral used by a counterparty.[3]

The average total amount of collateral *used* by counterparties to collateralise Eurosystem credit operations, taking into account both monetary policy and payment system operations, decreased slightly in 2000 compared with 1999, from €658 billion to €622 billion. This means that the amount of collateral used by counterparties was, on average, slightly more than one-tenth of the total volume of eligible assets and about one-third of the amount estimated to be held by counterparties. A peak in the total amount of collateral deposited or put forward for Eurosystem credit operations was reached in December 1999 (at €791 billion); this is explained by the build-up of assets by counterparties in anticipation of possible

Chart 3

Use of collateral in Eurosystem credit operations

(EUR billions; end-of-month data)

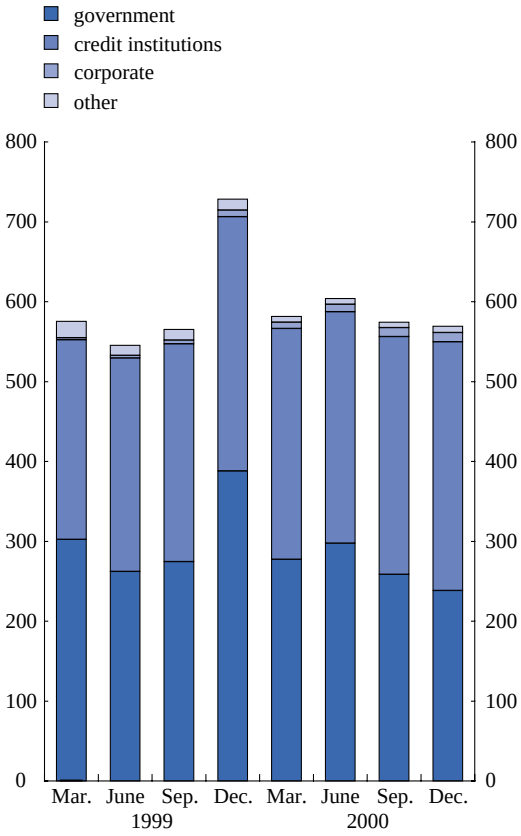


Source: ECB.

Chart 4

Use of collateral in Eurosystem credit operations: tier one

(EUR billions; end-of-month data)



Source: ECB.

3 However, it should be noted that using the pooled collateral as a proxy for the collateral used gives an upward bias to the estimate of the use of collateral, since in pooling systems more collateral is deposited than actually needed for credit operations with the Eurosystem.

problems arising from the changeover to the year 2000 and the resulting need to access central bank money. A retrenchment then took place in the initial months of 2000.

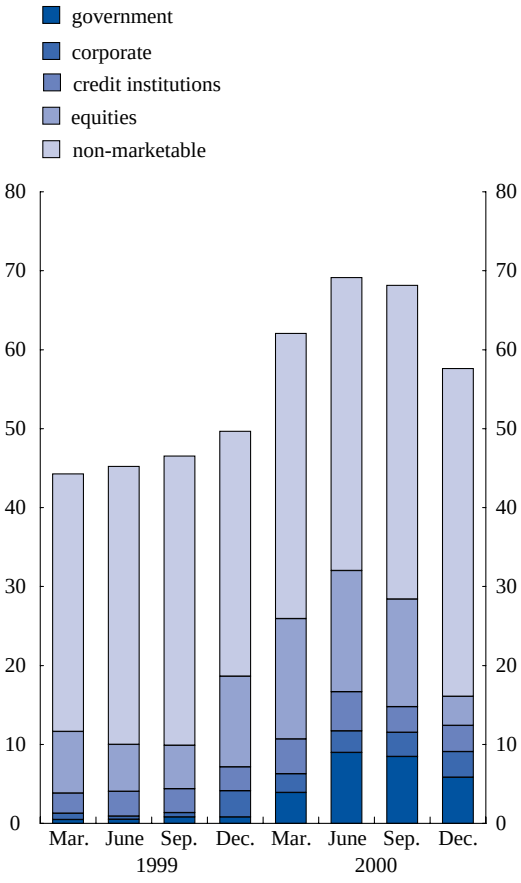
A first conclusion, reached by comparing the use of collateral with data on the outstanding amounts of eligible assets, is that proportionately more tier one than tier two assets were *used* compared with the proportions of *eligible* tier one and tier two assets in order to secure credit operations at the start of Stage Three. However, the use of tier two assets steadily increased in the following months; whereas the share of tier one assets in the total outstanding amount of eligible assets increased from 92% to 94% in the period under review, the use of tier one assets decreased gradually from 94% to 91% of all assets used in the same period. In fact, in some countries a steady trend towards an increase in the use of marketable and non-marketable tier two assets has been observed. This trend may suggest a lower opportunity cost for using these assets than for more liquid tier one assets. As a matter of fact, with the exception of equities, most marketable securities included in tier two are not actively traded on secondary markets and their liquidity is low.

A second conclusion is that, similar to the trend recorded for eligible assets, a change occurred in the *composition* of assets used: the proportion of central and local government bonds (of both tiers) decreased steadily (from 49% to 39%), whereas the proportion of bonds issued by credit

Chart 5

Use of collateral in Eurosystem credit operations: tier two

(EUR billions; end-of-month data)

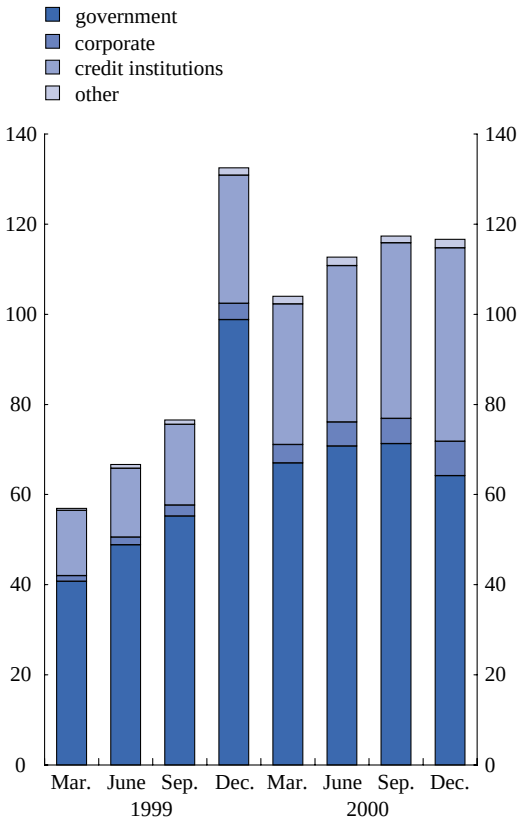


Source: ECB.

Chart 6

Use of collateral in Eurosystem credit operations: cross-border tier one

(EUR billions; end-of-month data)



Source: ECB.

institutions increased (from 42% to 50%), as did that of corporate bonds (from 2% to 3%). It is interesting to note that, in the same period, the proportion of non-marketable assets used also increased (from 4% to 7%, see Chart 3). A third conclusion is that, despite their declining share, government bonds remained the biggest category of eligible assets, while credit institution assets became the biggest category for *used* collateral in the period under review (see Charts 4 and 5).

Although in most countries predominantly domestic collateral was used for securing central bank credit, the cross-border use of collateral grew steadily over the period under review. This was particularly the case in the course of 1999: assets used on a cross-border basis represented 8% of all assets used at the start of Stage Three, but climbed rapidly to over 21% at the end of 1999. A more stable development was then observed in 2000, when cross-border use oscillated around 18%, reaching a peak of 20% in December. Nearly all collateral used on a cross-border basis is tier one, which confirms the notion that tier two assets are mainly of national importance and/or, particularly in the case of non-marketable assets, their cross-border use may be seen as operationally too complex or costly (see Chart 6).

3 Challenges ahead for the collateral frameworks of central banks

Financial markets are undergoing rapid structural change. Against this background, the European Central Bank (ECB), as well as central banks outside the euro area such as the US Federal Reserve System and the Bank of Japan, face several challenges regarding their collateral frameworks.

The composition of the available pool of collateral in fixed income markets is changing. Government bonds are becoming scarcer in most industrialised countries. This development is most pronounced in the United States. The US Government posted its first budget surplus in 1998 and surpluses have continued to grow larger since. As a result, in the United States, privately held marketable Treasury debt is shrinking fast. Public finances in the euro area have also partially improved. Against this background, the outstanding amount of marketable government securities has been stagnating or increasing only slowly. The only exception is Japan, which has posted large fiscal deficits in recent years, meaning that the Japanese government bond market is expanding rapidly.

At the same time, recent years have seen high growth in private securities markets. Corporate issuance grew rapidly in the late 1990s. Euro-denominated corporate issuance grew particularly noticeably in the months following the introduction of the euro, although starting from a very low level. Financial sector issuance broadly kept pace with corporate issuance, owing to a large extent to the expansion of the collateralised debt market.

As a consequence, especially in the United States but also in Europe, the market share of central governments in debt securities outstanding is decreasing, while that of the private sector is increasing. Even in Japan, where the share of the central government in debt securities markets rose considerably, the stock of yen-denominated private debt securities expanded, albeit moderately. These changes in the composition of the available pool of collateral will also affect the collateral policy of central banks. Central government securities will play a less predominant role in the collateral frameworks, whereas the acceptance of private issues as eligible collateral will increase.

However, broadening the range of eligible assets implies a changing overall risk profile. Government bonds have traditionally been preferred by central banks because of their low credit risk and high liquidity, allowing relatively simple risk control measures,

concentrated mainly on market risk. By contrast, with a growing proportion of private sector paper, the assessment of credit quality becomes increasingly complex and important. Moreover, private securities may have a higher price volatility and lower liquidity, which could imply difficulties in liquidating the assets in adverse market conditions. Consequently, not only market risk but also credit risk and liquidity factors need to be taken into account in the design of protective devices such as valuation haircuts to ensure an adequate degree of financial protection for the central bank.

Against this background, central banks face a trade-off in their collateral policy. On the one hand, the range of assets which can be used as collateral should be broad enough to ensure that sufficient instruments are available to collateralise the credit operations with the central bank. On the other hand, a heterogeneous list of eligible assets may conflict with the desire for operational efficiency and simplicity. The more heterogeneous the types of assets accepted as collateral, the more complex the eligibility criteria, risk control measures, collateral evaluation methods and operational handling by the central bank, counterparties and SSSs may be. For the same reasons, it may be more difficult to keep the collateral framework transparent to counterparties.

In the context of their collateral policies, central banks place varying emphasis on operational efficiency and simplicity on the one hand, and securing the availability of sufficient collateral on the other. For the Federal Reserve System, direct Treasury obligations and securities of federal agencies have so far been used to collateralise open market operations (for a more detailed description, see Box 2). This has facilitated a smooth, safe and speedy handling of collateral by the Federal Reserve System as well as by counterparties and SSSs. For discount window borrowing, a much broader range of assets is accepted. However, borrowing under the discount window accounts for a negligible share of the overall amount of outstanding monetary policy operations.

The collateral policy of the Bank of Japan is largely determined by the need to secure the availability of sufficient collateral (see Box 2 for more details). This is due to the fact that the amount of collateral needed for monetary policy operations may be large as a result of the high volatility of autonomous factors. In addition, collateral requirements for payment system purposes are higher than in the case of the Federal Reserve System, since the Bank of Japan, like the Eurosystem, grants intraday credit only on a collateralised basis. Furthermore, the Bank of Japan has to spread its open market operations over several markets to avoid undue market effects, since its operations are larger, in particular in relation to the size of the markets, than in the United States. Therefore, a broad range of both public and private sector instruments, including relatively illiquid instruments, are eligible for market operations with the Bank of Japan, which makes the collateral framework more complex from an operational standpoint.

The collateral framework of the Eurosystem is, in practice, more homogeneous than that of the Bank of Japan, since the majority of collateral is concentrated in tier one, which comprises relatively homogeneous asset categories. Therefore, for a large part of the eligible assets, relatively simple risk control measures, evaluation methods and transfer conditions are in place.

The three central banks face different challenges regarding their collateral policy in the coming years.

The Federal Reserve System is confronted with a potential scarcity of its preferred collateral. Since 1981, it has used outright purchases of Treasury securities as a primary means of accommodating permanent increases in the demand for central bank liquidity. However, the reduced supply of marketable federal debt is likely to limit the Federal Reserve System's

Box 2

The collateral frameworks of the Federal Reserve System and the Bank of Japan

The collateral framework of the Federal Reserve System

In principle, the Federal Reserve Act allows a broad range of assets to be used in open market operations. However, currently, the Federal Open Market Committee (FOMC) authorises the Open Market Desk to transact only in Treasury and agency debt.

The volume, liquidity and transparency of the market for US Treasury securities has permitted the Federal Reserve System to use these low risk assets almost exclusively in its outright transactions and, therefore, also to maintain sufficient liquidity and minimise any impact on credit allocation within the private sector. At the end of 2000, securities held outright by the Federal Reserve System amounted to USD 533 billion.

Under repurchase agreements, both Treasury and agency debt have been eligible as collateral. Since August 1999, the FOMC has expanded temporarily the list of eligible securities to allow also agency mortgage-backed securities to be used as collateral in repurchase operations. A binding operational constraint for the Federal Reserve System is that there should be a liquid repo market for the assets eligible for its repurchase operations. The existence of such a market helps to explain why these securities have been used as collateral in repurchase operations. At the end of 2000, outstanding repurchase operations amounted to USD 43 billion.

Much broader collateral requirements apply to the discount window, operated by the 12 regional Federal Reserve Banks. Under this facility, funding is provided at below market rates to meet temporary liquidity shortages at the discretion of the respective Federal Reserve Bank. Common eligibility criteria ensure the uniformity of the collateral policy throughout the System. The range of accepted assets includes not only public debt instruments, but also private debt instruments, both marketable and non-marketable, as well as debt securities of foreign governments and international agencies, denominated also in currencies other than the US dollar. However, in practice, this facility is used only infrequently and for low amounts. At the end of 2000, the discount window loans amounted to only USD 0.1 billion.

Another key feature of the collateral framework of the Federal Reserve System is that it does not require collateral for intraday credit granted under Fedwire, the payment system operated by the Federal Reserve System. Instead, to limit recourse to intraday overdrafts, banks are charged a fee and a penalty rate is applied to end-of-day overdrafts. The Federal Reserve System's policies governing intraday overdrafts are currently undergoing a comprehensive review. It cannot be said at this point whether or not there will be changes to these policies.

As regards risk control measures, valuation haircuts are applied to collateral accepted under repurchase agreements, controlling mainly market risk. In the case of collateral accepted under the discount window facility, the haircut valuation also incorporates credit risk and liquidity factors, to cater for possible differences in the liquidation periods associated with each asset class.

The collateral framework of the Bank of Japan

The collateral policy of the Bank of Japan faces two constraints:

1 *The need to secure sufficient collateral.* Collateral needs for monetary policy operations can be very high in Japan owing to the high volatility of autonomous factors. In 2000, the outstanding amount of open market operations reached a peak of almost €450 billion. Collateral requirements have further increased this year owing to the introduction of a real-time gross settlement (RTGS) system for the settlement of funds transfers across current accounts held at the Bank of Japan.

2 *The need to comply with the principle of market neutrality.* The Bank of Japan conducts its open market operations directly in the market. Like the Federal Reserve System, it does not want to influence the interest rate or price conditions in the markets in which it operates. Since liquidity needs can be very large, the Bank of Japan has to spread its open market operations over a broad spectrum of markets to limit the impact on market prices and interest rates.

As a consequence, the Bank of Japan employs a large variety of open market instruments and accepts a broad range of eligible assets, differentiated according to the type of operation. To enhance efficiency in the use of collateral and transparency regarding the selection criteria, it has recently established guidelines on eligible collateral.

The main categories of assets accepted by the Bank of Japan are:
- Treasury bills/financing bills (TBs, FBs), under repurchase agreements and for outright transactions;
- Japanese government bonds (JGBs), under repurchase agreements and for outright transactions;
- commercial paper, only under repurchase agreements; and
- purchases of master bills backed by eligible assets of various types, including non-marketable commercial bills and bank loans.

These types of collateral are also eligible for intraday overdraft facilities granted by the Bank of Japan.

In the case of collateral other than public debt, the Bank of Japan assesses the credit risk. With respect to corporate debt obligations, the creditworthiness of borrowers is evaluated by the Bank's in-house assessment system, for which guidelines have also been drawn up. In addition, the Bank may make use of ratings provided by rating agencies.

In line with market practice, no haircuts are applied to repurchase transactions in TBs/FBs and commercial paper. However, all other assets accepted in repurchase transactions and backing purchases of master bills are subject to valuation haircuts, tailored to individual asset categories. They incorporate market risk and, in the case of non-government securities, also credit risk and liquidity factors.

In March 2001, the Bank of Japan introduced a lending facility under which overnight loans are extended to counterparties upon request at a rate above the target overnight rate. These loans can be backed by the same range of eligible assets as those accepted for the various open market operations.

ability to add substantially to its Treasury holdings, even on a temporary basis, if it wishes to avoid exacerbating declines in market liquidity. The Federal Reserve System recently adopted self-imposed limits on its outright holdings of individual issues, which will, sooner or later, curb its ability to expand its Treasury debt portfolio. The Federal Reserve System has therefore announced that it is reviewing its collateral policy and considering alternative asset classes and selection criteria, in particular for its repurchase transactions.

The Bank of Japan has taken into account, as illustrated above, its large collateral needs for monetary policy and payment system operations by accepting a diverse range of asset categories. However, at the same time, there is a need to continuously improve the operational efficiency and transparency of such a heterogeneous collateral framework. A major concern for the Bank of Japan is also that its operations may have an undue market impact. Furthermore, it has to manage the risks stemming from the diversified range of assets that it accepts as collateral.

The collateral framework of the Eurosystem has served well the purposes for which it was designed before the start of Stage Three, allowing an effective and safe provision of liquidity to counterparties, both for monetary policy and payment system operations. It also successfully navigated the millennium date change, as it proved broad enough to cope even with substantial temporary increases in the demand for collateral. However, it will have to adapt to the rapid developments in the euro area and, in particular, to the ever closer integration in all sectors of the financial market. Moreover, a number of specific areas have been identified where operational efficiency and transparency could be improved.

Since the overall share of instruments issued by private entities is increasing relative to government issues, risk control measures have to be further developed to take into account the different risk profile of private instruments. In this context, the Eurosystem plans to adopt a more systematic treatment of liquidity risk. Currently, only the valuation haircuts applied to tier two assets take into consideration the assumed liquidation horizon.

To reflect recent developments in financial markets, the eligibility status of some instruments has to be further clarified. Securities backed by assets other than mortgages are on the advance in Europe. However, the Eurosystem has not yet established specific eligibility standards for those instruments. It also needs to be clarified whether instruments which are guaranteed by corporates and fulfil the criterion of financial soundness should become eligible. Moreover, in view of the ongoing integration of the market infrastructure, the criterion to determine the location of an asset may have to be further refined. The eligibility of assets issued by special purpose vehicles located in offshore centres but guaranteed by an institution located in the euro area, should also be better clarified.

Furthermore, the policy on the use of credit ratings and in-house credit risk assessments needs to be continuously monitored, notably in the light of the New Basel Capital Accord on the minimum capital requirements to be met by banks to cover credit risk. The New Basel Capital Accord foresees the establishment of a list of rating agencies accepted for supervisory purposes and rules for internal credit risk assessment systems. It cannot be ruled out that these proposals may have a bearing on the Eurosystem's policies for the use of external ratings and the conduct of in-house credit risk assessments.