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Repo-style transactions and capital adequacy requirements

Collateral, capital adequacy requirements, and supervisory policies

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Abstract

When focusing on banks' repo businesses, it appears that the regulatory approach has gradually developed around two main themes: the role of collateral in repo-style transactions and the supervisory attention given to different risk categories. The regulatory treatment of collateral has recently entered a new phase, in the form of the revision of the Basel Accord. A wider range of collateral will be allowed by the new Accord and banks will be able to choose between a comprehensive and a simple approach for the treatment of collateral. The revision of the Basel Accord is expected to improve further the regulatory treatment of collateral and the risks associated with repo-style transactions.

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Introduction

In this article we will investigate the current and future capital adequacy regimes for banks as they relate to repo-style transactions.^{1,2} One of the main reasons for writing this article is the revision of the Basel Capital Accord. On 16 January of this year the Basel Committee on Banking Supervision issued a second set of Consultative Documents arising from the development of a revised Capital Accord.³ This so-called Consultative Paper presents the revised capital adequacy requirements, now termed Pillar 1, as well as a new supervisory review framework (Pillar 2) and new disclosure requirements (Pillar 3). The Paper has been issued, with comments being required by 31 May 2001 and is particularly interesting in that the Committee proposes the application of a more consistent and economic approach to risk mitigation techniques such as the use of collateral. As is well known, commercial banks are subject to capital adequacy requirements, since their activities involve different kinds of risks for which capital can provide a financial buffer. This article will examine capital adequacy regimes particularly with regard to collateral as a credit risk mitigating factor in repo-style transactions.⁴

Firstly, in section 1 we will deal with the risk profile of repos and securities lending activities. The second section will examine what capital adequacy regulations apply on the international, European and Dutch levels respectively. We will then come to the main body of the article in the third section when we discuss the capital adequacy regime in relation to collateralised repo-style transactions. We will examine the distinction between the banking book and the trading book and subsequently the different current and future regimes applicable to collateral in these books. Since supervisory policies go further than mere capital adequacy requirements, section 4 will briefly discuss some other supervisory issues arising in repos and securities lending activities. Attention will be given to both the present supervision as practised by De Nederlandsche Bank (DNB), the Dutch banking supervisor, as well as to the relevance of the future second and third Pillars in the new Basel Capital Accord.

¹ In this article, 'repo' is used to refer to repurchase and reverse repurchase transactions or agreements, 'securities lending' to securities lending and securities borrowing, whereas 'repo-style' refers to both repos and securities lending.

² See for a general outline of the topic Steiner (1997, p.182-187); for the UK market more specifically, Corrigan (1999, p.165-172); and in relation to the regime in Belgium, Koker (1995, section 9).

³ The first Consultative Paper was issued in June 1999 for comments by the 31st of March 2000.

⁴ Even though the capital adequacy regime in relation to netting is also very important for repo-style transactions, we will focus on the regime insofar as it applies to collateral only.

1. Risk profile of repos and securities lending

Repo transactions can be defined as transactions in which party 'A' sells certain securities to party 'B' for an amount of cash (the purchase price), while at the same time committing itself to buy back equivalent securities at a future date for a fixed amount of money (the re-purchase price) which is higher than the original purchase price. In economic terms, this basically comes down to 'A' borrowing money from 'B' against a certain amount of collateral where the difference between the re-purchase and purchase price reflects an implied interest rate. From the viewpoint of party 'A' (the seller), this transaction is considered a repo, whereas party 'B' (the buyer) is said to have entered into a reverse repo. Commercial banks often act as buyers and thus engage in reverse repo transactions.⁵ Their counterparties consist mostly of central banks, government agencies, insurance companies, pension funds, investment banks and hedge funds. In a securities lending transaction a lender transfers securities to a borrower who is in need of such securities. The borrower transfers cash or securities to the lender as collateral. At the end of a transaction the lender gets back securities equivalent to the ones it originally transferred to the borrower and in addition receives a fee, while the borrower receives equivalent collateral. In order to be able to judge what would be an adequate amount of regulatory capital for such repo-style transactions, one should ask oneself what the risk profile in terms of unexpected loss of repo and securities lending transactions actually is. A number of important risk categories can then be distinguished, the most important of these being counterparty risk, market risk and operational risk. Note that a lot of different risk types are mentioned in the legal documentation and literature, each sometimes comprising different risk elements. For example, market and credit risks are to a large extent interconnected in case of repo-style transactions.

When a bank enters into a repo contract, the main risk is related to its contractual partner or counterparty in that the latter may not perform as earlier agreed, for example because of an insolvency. Such risk has to a large extent been mitigated when using the Global Master Repurchase Agreement (GMRA) and the Global Master Securities Lending Agreement (GMSLA) because at the outset of a transaction there will always be a counter-flow of cash or securities to match the flow of securities purchased or loaned. This counter-flow is usually called collateral.⁶ However, even when both flows completely off-set each other at the beginning of the transaction, there may be changes in the market prices of the collateral during the transaction period. The bank may, for instance, notice that the securities it received

⁵ Although many banks also use repos, in the remainder of this article we will focus notably on the role of banks in reverse repo transactions.

⁶ Please refer to section 3 for a discussion of the exact meaning of the concept of 'collateral'.

from a counterparty decrease in value. In that event, the amount of money the bank has 'lent' to its counterparty is no longer completely covered by securities, thereby effectively creating a credit exposure. Alternatively, when the prices of the securities transferred in a repo transaction increase, it is the seller who will have a credit exposure to the buyer. After all, if the buyer is unable for some reason to deliver the agreed securities (at the fixed re-purchase price, which is below the current market price), the seller will not be able to realise a profit from any price increase of the relevant securities.

In both cases, counterparty risk manifests itself in the form of credit risk. The likelihood that such credit risks will emerge during the transaction period is dependent on the risks associated with price or interest rate developments in the financial markets (volatility or market risk). Changing prices of securities that are the subject of a repo-style transaction will result in an exposure of one of the parties to the other. Two reasons for price fluctuations can usually be distinguished. The first relates to the issuer of the individual securities involved (specific risk). For example, listed stocks of a particular company can decrease in value if the company does not perform well. The second reason for price fluctuations is more general and relates to market-wide price moves, for example because of changes in monetary conditions (general risk). Volatility risk has been taken into account both at the outset and in the course of a transaction in the GMRA and the GMSLA standard documentation. Initial margin requirements (or 'haircuts') at the outset of a transaction ensure that market prices of collateral securities are adjusted. Take the example of a repo transaction in which the seller provides securities with a market value of 100.5 euro as collateral for a cash flow from buyer to seller with a value of 100 euro. Such a mechanism will be to the advantage of the buyer, who will now less likely be confronted with a net credit exposure due to decreasing collateral values. On the other hand, the seller runs a (small) risk from the outset of the transaction equal to the amount of the haircut. However, even when initial margin is provided for, changing market prices may lead to a credit exposure for one of the parties during the transaction period. Therefore, the GMRA and the GMSLA set out margin maintenance techniques, which can be applied to further limit exposures which arise during the transaction period.

In addition to volatility risk and credit/counterparty risk, several other risk categories contribute to the risk structure of repo-style transactions. Firstly, liquidity risk arises when a party which wants to liquidate collateral finds too low a volume of trades in the relevant securities, i.e. the market is illiquid. In that case, liquidation may prove to be very expensive as it turns out to be impossible or very hard to sell the collateral in the market. Additionally, operational risk includes all risks arising from the internal organisation of a bank and from

operational issues in general. If a trader in a bank makes a mistake, or if a bank's system fails to indicate that margin payments are due but have not yet been made by the counterparty, these are operational risks. Moreover, when it emerges that a vital provision of an agreement is unenforceable, this is an example of legal risk: a specific form of operational risk. Finally, clearing and settlement risk is the risk that the clearing and settlement of flows of cash and securities, often performed by third parties, is not properly executed.⁷

2. Current and future regulatory framework in a nutshell

Although capital adequacy regulations have been set out at international, European and national levels, the Basel framework is probably the most widely known. In July 1988, the Basel Committee on Banking Supervision issued the Accord on '*International Convergence of Capital Measurement and Capital Standards*' (Basel I). Basel I was amended several times. One of the most important amendments was the Amendment to the Capital Accord to incorporate market risks (Market Risk Amendment or MRA) in January 1996.⁸ The Basel Capital Accord is not binding as such; its main influence stems from the fact that European and national regulations are expected to be in line with it. The contents of the European directives relating to credit institutions regarding capital adequacy are thus to a large extent in line with Basel I and these directives have in turn been implemented in national regulations.⁹ There are two sets of European directives which are particularly important for the determination of capital adequacy requirements. The first comprises those directives relating to the taking up and pursuit of the business of credit institutions.¹⁰ These directives lay down the general regulatory framework for credit institutions. A more specialised approach is set out in a second set of directives on capital adequacy, setting out the framework for, generally speaking, investment firms and the trading book activities of credit institutions.¹¹ In the Dutch

⁷ Cash flows between banks will usually be settled by a central bank, whereas securities flows are often settled by a central securities depository.

⁸ This was again modified in September 1997. Other amendments include the amendment in respect of the inclusion of general provision/general loan-loss reserves in capital (November 1991) and the amendments of July 1994 and April 1998.

⁹ The national regimes of the member states of the European Union should be in line with the minimum requirements of the European directives, but may be more stringent. Of course, member states will always take into account the possibly adverse effects of a more stringent national interpretation of European directives on the level playing field of the national banking system.

¹⁰ Directive 2000/12/EC relating to the taking up and pursuit of the business of credit institutions, as amended by Directive 2000/28/EC (in the context of this article, the 2000/28/EC amending Directive is not relevant). The 2000/12/EC Directive will hereafter be referred to as the '2000 Directive'.

¹¹ Directives 93/6/EEC, 98/31/EC and 98/33/EC on the capital adequacy of investment firms and credit institutions. Directive 93/6/EEC is usually referred to as 'CAD I', while Directive 98/31/EC is abbreviated to 'CAD II'. Hereafter, 'CAD' will be used to refer to the three Capital Adequacy Directives collectively.

context, the Basel documents and the European directives have led to the framework set out in section 20 of the Act on the Supervision of the Credit System (1992)¹² which is the basis for solvency supervision by De Nederlandsche Bank¹³ and, most importantly, in the Credit Supervision Manual (the 'Manual') issued by De Nederlandsche Bank. The Manual is the implementation of section 20 of the Act on Supervision of the Credit System and contains the detailed capital adequacy regulations for the Dutch credit market.

In the next few years, the above-mentioned regulatory framework will undergo an extensive revision, starting with a fundamental reform of the Basel Capital Accord. The main goal of this revision is to better align regulatory and economic capital by making the capital adequacy regulations more risk sensitive. On 16 January 2001 the Basel Committee on Banking Supervision presented the second set of Consultative Documents on the reform of the Basel Accord ('Basel II'). In addition, the European Commission launched a second round of consultations on a new capital adequacy framework for banks and investment firms.¹⁴ The specific consequences of this revision of the regulations for repo-style transactions will be considered further below.

3. The role of collateral in repo-style transactions

Introduction

This section first discusses the general distinctions between the banking book and the trading book and then explains the different regimes applicable to balance sheet and off-balance sheet items. Then we will discuss the actual banking and trading book regimes as laid down in Basel I, the European directives and in the Dutch capital adequacy regulations. In particular we will discuss to what extent the use of collateral affects capital adequacy requirements. Finally, we will examine the proposed regime of Basel II as it relates to the role of collateral in repo-style transactions.

First of all, however, we should clarify what collateral actually is and to what extent we are justified in speaking of collateral in relation to repo-style transactions. Whereas in a repo transaction the cash flow is the principal flow, in securities lending the need for securities is the reason the transaction is entered into and the securities flow from lender to borrower is therefore the principal flow. The collateral flow can now be defined as the flow of securities

¹² Wet toezicht kredietwezen, abbreviated to Wtk.

¹³ The Dutch central bank and banking supervisor.

¹⁴ We will not examine the Commission's proposals in any further detail.

and/or cash in the opposite direction to this principal flow. However, the word ‘collateral’ does not fully do justice to the two-sided nature of repo-style transactions, as it has a ‘security interest related’ meaning in an English law context. From an economic point of view, the collateral flow does indeed have such a security function. Indeed, the fact that the collateral is used for recourse in the case of default, that income payments are usually payable to the transferor of the collateral and that the transferor will often also have the power to determine how voting rights are executed, illustrates this security function of collateral. It should also be noted that the fact that securities and cash do not disappear from the balance sheets of the transferring entities is in keeping with this (see also section 3.2). On the other hand, the GMRA 2000 and GMSLA both envisage ‘outright transfer’ of securities.¹⁵ The standard agreements thus do not emphasise the security function of the collateral, but rather the fact that outright transfer is required. Compare this with section 2.3 of the GMSLA, which contains a provision stating that ‘collateral’ is market terminology, but that parties do intend that there should be an outright transfer. The ‘collateral’ terminology does not reflect the fact that in the majority of cases the collateral is used to enter into subsequent trades. In addition, the transferee of the collateral only has an obligation to transfer equivalent (and not exactly the same) securities at the end of the transaction. In this case the security function is no longer present and full ownership is the preferred route. It is for this reason that the use of collateral and pledge oriented terminology in, for instance, the Basel Accords and the European directives could be challenged. Nevertheless, as Basel I and II and the European directives use collateral terminology and as it is also used in the GMSLA (not in the GMRA 2000), we will follow this market practice in this article, noting, however, that it should be interpreted as implying outright transfer.

3.1 Distinguishing between the banking book and the trading book

In the second half of the 1990s, it was felt that investment firms should be subject to some kind of regulation. To a certain extent investment firms and banks operate in the same market and run the same risks. In order to guarantee fair competition and a ‘level playing field’ for investment firms on the one hand and credit institutions on the other, the concept of the trading book was introduced in the solvency regulations. Those credit institutions engaging in trading activities and thus operating in the same market as investment firms would

¹⁵ The most wide spread standard agreement for the documentation of repo transactions is the Global Master Repurchase Agreement (GMRA), which is published by The Bond Market Association (TBMA) and the International Securities Market Association (ISMA). As regards securities lending, the Global Master Securities Lending Agreement (GMSLA), issued by the International Securities Lenders Association (ISLA), is expected to become the leading standard agreement. In this article, we refer to the 2000 versions of both the GMRA and the GMSLA.

thenceforth also be subject to the same rules as investment firms as far as their trading activities were concerned. When discussing repo-style transactions it is, therefore, useful to make a distinction between the banking and the trading book. Repo-style transactions must be registered in one of these books, depending on the context in which they are used. Consequently, different capital adequacy rules may apply to them as well.

In general terms, the difference between the banking and the trading book can be explained as follows. Trading activities are usually carried out by trading desks and are typically focused on short-term opportunities to make money on the basis of price-movements in the financial markets. In contrast, banking book activities focus on longer-term, more traditional banking activities, notably providing credit and financial services more generally. A more precise definition of trading book activities is given in the capital adequacy documentation (banking book activities can be defined as all other activities). The Market Risk Amendment to the Basel Capital Accord defines the trading book as *'the bank's proprietary positions in financial instruments which are intentionally held for short-term resale and/or which are taken on by the bank with the intention of benefiting in the short-term from actual and/or expected differences between their buying and selling prices, or from other price or interest-rate variations and positions in financial instruments arising from matched principal brokering and market making, or positions taken in order to hedge other elements of the trading book'*.¹⁶

Generally, it can be said that the positions registered in the trading book are subject to market risk regulations, whereas all other positions of a bank are registered in the general banking book and are subject to credit risk regulations.¹⁷ The Basel Accords apply to a bank's entire business, thereby including both the banking and the trading book. Whereas originally Basel I provided rules only for credit risk, the 1996 Market Risk Amendment¹⁸ ensured that market risks were covered as well. The specific provisions relating to the trading book will be incorporated into Basel II.¹⁹ On a European level, the 2000 Directive sets out the rules for credit risk, while trading book positions and market risk are dealt with in the CAD. As a result of the implementation of Basel I and the directives, on a national level the distinction between the trading and banking book is also of importance and may result in a different treatment of repos and securities lending transactions for capital adequacy purposes.

¹⁶ The definition of trading book in the CAD (CAD I, article 2 (6) as amended by CAD II, article 1 under 1) is far more elaborate, but consistent with this definition. See note 3 of the Market Risk Amendment. This is also true of the definition in section 4002-01/02 of the Manual.

¹⁷ Note that foreign exchange and commodities positions are subject to the market risk provisions if they are registered in the trading book and in the banking book. See Market Risk Amendment, p.1.

¹⁸ Modified in September 1997.

The distinction between the banking and the trading book is important in the Netherlands in the context of sections 4011–02.3.1 sub 10 and 4011-03.2.4 sub 5 of the Manual.²⁰ These sections broaden the range of risk-mitigating collateral for repo-style transactions registered in the trading book. More specifically, it is stated that readily marketable securities registered on recognised exchanges (other than those already accepted as risk-mitigating collateral) will be accepted. This extra category of collateral is therefore not appropriate for transactions registered in the banking book. As different regimes therefore apply to trading and banking book, it is important for both banks and supervisors to determine what transactions form part of the trading book. The trading book regime accepts a wider range of collateral and will therefore in some cases be more attractive to banks. In practice, banks themselves determine what activities are registered in the trading book or in the banking book. However, both a bank’s external accountants and its supervisory authority will seek to ensure that no unjustified switching takes place between books.

3.2 Balance sheet and off-balance sheet items

Capital adequacy regulations usually make a distinction between the treatment of balance sheet items and off-balance sheet items. Therefore, it is important to know whether the flows of cash, securities and collateral in repo and securities lending transactions are presented on or off-balance sheet. While reverse repos and securities borrowing are presented on the balance sheet, repos and securities lending are off-balance sheet positions. Both Basel I²¹ and the 2000 Directive²² make a distinction between balance and off-balance sheet items. There are also provisions in the trading book regulations to guarantee that off-balance sheet items in repo-style transactions are taken into account for capital adequacy purposes.²³ As for the Dutch market, section 4011-02.3.1 subsection 10 of the Manual lays down the status of reverse repos and securities borrowing (balance sheet items) and section 4011-03.2.4 subsection 5 sets out

¹⁹ See The New Basel Capital Accord, sections 566-585.

²⁰ In Belgium and the United Kingdom, for example, different regimes also apply to repo-style transactions in the banking and the trading book. See De Koker (1995) for Belgium and Corrigan et al. (1999) for the United Kingdom.

²¹ Basel I, Annex 2 refers to balance sheet items. Basel I, Annex 3 contains a provision about the conversion factors relevant to off-balance sheet (reverse) repos and asset sales with recourse (see the section on ‘Instruments’ under 4). It seems logical to assume that securities lending is a form of asset sales with recourse.

²² See article 42 subsections 2 and 3. The term for balance sheet items used in the 2000 Directive is ‘asset items’.

²³ See footnote 9 of the MRA and Annex I, under 10 of CAD I (as completed with Annex VII of CAD II, under 12 for commodities transactions), which provide that the seller or lender of securities (or commodities) should take the securities transferred into account when calculating its capital adequacy charge.

the capital adequacy regime in relation to repos and securities lending (off-balance sheet items).^{24,25}

Below, we will set out what happens on the balance sheets of two banks entering into a (reverse) repo transaction. Bank A is the seller (entering into a repo) and Bank B is the buyer (entering into a reverse repo). Parties have agreed on a repo with a value of 50 units, with a rate of interest equivalent to an amount of 2 units to be paid by Bank A at the end of the transaction. We distinguish three stages of the transaction (t). At t = 0, the repo has not been carried out yet. At t = 1, cash and securities have been transferred. Finally, at t = 2, the transaction is closed or reversed, cash (including interest) has been paid and equivalent securities have been transferred. For the sake of simplicity, we will ignore margin payments in the form of cash or securities arising at the outset or during the transaction. The three moments can be represented as follows on the banks' balance sheets:²⁶

t = 0

| | Bank A (repo / seller) | | Bank B (reverse repo / buyer) | |
|---------------------------|-------------------------------|------------|--------------------------------------|------------|
| balance sheet: | A | L | A | L |
| | cash 20 | equity 120 | cash 100 | equity 100 |
| | sec. 100 | | | |
| off-balance sheet: | | --- | | --- |

t = 1

| | Bank A (repo / seller) | | Bank B (reverse repo / buyer) | |
|---------------------------|-------------------------------|------------|--------------------------------------|------------|
| balance sheet: | A | L | A | L |
| | cash 70 | equity 120 | cash 50 | equity 100 |
| | sec. 100 | debt 50 | claim 50 | |
| off-balance sheet: | sec. 50 transferred to Bank B | | sec. 50 received from Bank A | |

²⁴ The provisions of the Manual apply to both the banking and the trading book (except for the provision broadening the range of eligible collateral in case of the trading book).

²⁵ We will focus on the banking book regime in the rest of this section.

²⁶ The balance sheet positions are basically the same in a securities lending transaction. The only difference is that interest is now paid by bank B (being the securities borrower) to bank A (the securities lender), which will result in different cash positions at t = 2.

t = 2

| | Bank A (repo / seller) | | Bank B (reverse repo / buyer) | |
|---------------------------|-------------------------------|------------|--------------------------------------|------------|
| balance sheet: | A | L | A | L |
| | cash 18 | equity 118 | cash 102 | equity 102 |
| | sec. 100 | | | |
| off-balance sheet: | --- | | --- | |

These simplified balance sheets make clear why a distinction is drawn between balance and off-balance sheet items in the different capital adequacy regulations. For Bank A, its basic risk (in the form of the securities transferred) exists off-balance sheet, whereas Bank B's cash exposure is included on the balance sheet. So what are the current capital adequacy regimes for on and off-balance sheet items? The risk connected to repo-style balance sheet items is based on the total value of a particular exposure as well as the presence of collateral flows mitigating the risk of the exposure. The collateralised part of a transaction is multiplied by the risk weight factor appropriate to *the collateral* (substitution approach²⁷) and then by the capital adequacy target ratio of 8%. The uncollateralised exposure is multiplied by the risk weight factor for *the counterparty* and then by the ratio of 8%. The capital adequacy requirements for the collateralised and uncollateralised parts of the transactions are then added together and the resulting figure is the total capital adequacy charge for the transaction.

The risk weight factors associated with the collateral received (for the collateralised part of the transaction) and the counterparty (for the uncollateralised part) are also applied to off-balance sheet items. The 8% capital ratio is used here, too. There is an extra element, however, that must be taken into account. Off-balance sheet items are always subject to an initial so-called credit conversion factor, reflecting the risk associated with that particular category of off-balance sheet items.²⁸ This credit conversion factor is applied before application of the risk weight factors associated with the collateral and the 8% capital ratio. The Manual provides for a risk conversion factor of 1 (full risk) in relation to repos and

²⁷ Where one would normally apply the risk weight factor of the counterparty, this is now *substituted* by the risk weight factor of the collateral. See also below.

²⁸ Off-balance sheet items are not credits as such, but do in many cases contain elements of counterparty risk. The conversion factor is meant to 'translate' the off-balance sheet items into fictitious balance sheet items. For example, a credit guarantee issued by a bank will be registered off-balance sheet. The credit guarantee is not credit as such, but is only a right to make use of the credit facility in the future. It is clear, however, that there is a certain (potential) risk connected with this credit guarantee. This is reflected in the credit conversion factor.

securities lending.²⁹ A credit conversion factor of 100% is envisaged in the Basel II Accord which, of course, effectively also produces a factor of 1.0.³⁰ The effect of applying a conversion factor of 100% is that reverse repos (balance sheet) and repos (off-balance sheet) are treated equally for capital adequacy purposes. Of course, the same is true for securities lending (off-balance sheet) and borrowing (balance sheet). Such an approach reflects the reality that both parties in a repo-style transaction have potentially a full exposure to one another. Therefore, both the buyer and the seller (in case of a repo transaction) or the lender and the borrower (in case of securities lending) may be subject to capital adequacy requirements. Since the conversion factor for off-balance sheet items is 1 for repos and securities lending transactions and since the same collateral and counterparty risk weight factors are applicable to balance sheet and off-balance sheet items, the capital adequacy regimes for repos and reverse repos are in effect the same.

3.3 The banking book regime

Introduction

In principle, the starting point for the banking book is that the risk related to an exposure must be measured by looking at the relevant counterparty. However, the counterparty as a means of 'risk indicator' is replaced with the issuer of the collateral assets in case of collateralised transactions such as repos. This is called the 'substitution approach', i.e. the risk weight factor used to determine the risk profile of an exposure does not depend on the counterparty but on the issuer of the collateral.³¹ The issuer is assumed to represent the quality of the collateral which may ultimately be needed for recourse.³² Where highly trustworthy issuers are involved, such as OECD central governments, the risk weight factor may even be zero. Although only the collateralised part of a transaction will be subject to collateral risk weight factors, any uncollateralised part of a transaction will be assessed in accordance with the normal regime and therefore be weighted according to the risk profile category of the counterparty.³³ Additionally, as was explained in section 3.2 above, off-balance sheet items relating to repo-style transactions are subject to an additional conversion factor of 1 (which has no economic effect). After applying the collateral and counterparty weight factors as described above, the resulting risk position is multiplied by the 8% target ratio. An example may clarify this. Suppose that a cash flow of 100 euro is collateralised by a flow of securities

²⁹ See section 4011-03.2.4, heading.

³⁰ See The New Basel Capital Accord, p.12 (Part 2, II, A, 1, (xi), nr.44).

³¹ See Standardised Approach to Credit Risk, nr. 108.

³² Cf. on the crucial importance of the stability of collateral values: Basel I, section 39.

³³ See for example Basel I, section 39, last sentence and Annex 2, footnote 4; 2000 Directive, article 43 subsection 5; Manual, section 4011-02.3, second paragraph.

issued by a multilateral development bank, also worth 100 euro. In that case, the applicable risk weight factor set out in Basel I will be 20% for the whole of the transaction. The resulting exposure is thus $20\% \times 100 = 20$. This figure is then multiplied by the 8% target ratio and therefore results in a capital adequacy requirement of $20 \times 8\% = 1.6$.³⁴

Eligible collateral and risk weight factors³⁵

Collateral plays an important role in the substitution approach since it becomes the basis for judging the risk profile of collateralised repo-style transactions. We will now examine the different types of collateral which are eligible for risk mitigation and the risk weight factors applied if such collateral is used. In the course of this discussion, and in particular when considering the table set out in the Annex to this article, it will become apparent that Basel I uses the most rigid approach to collateral, whereas the 2000 Directive and the Manual are somewhat more flexible. The following types of risk mitigating collateral can currently be identified: cash; ‘OECD’/‘Zone A’ central government securities; securities issued by regional governments and local authorities; and multilateral development bank securities. We will comment on each category in turn.

Cash

It is noteworthy that the definition of ‘cash’ is different for each document.³⁶ Basel I states that cash includes (subject to discretionary national variation) gold bullion held in a bank’s own vaults or on an allocated basis to the extent that it is backed by bullion liabilities. The 2000 Directive is rather more flexible and dictates a 0% weighting for cash in hand and equivalent items, while recognising (subject to supervisory approval) collateral in the form of cash deposits, certificates of deposit or similar instruments. The Manual is drafted in accordance with the Directive and recognises both cash and cash equivalents and certificates of deposits or comparable paper issued by the institution receiving the collateral.

‘OECD’ / ‘Zone A’ central government securities

³⁷

Basel I recognises only the use of securities issued by central governments of ‘OECD’ countries³⁸ as risk-mitigating collateral, basically because these countries are considered to be

³⁴ Note that the quality of collateral is reflected in the risk weight factor in Basel I and the 2000 Directive, whereas in the Manual the weight factor for collateralised transactions is always 0%. The quality of collateral is reflected in the Manual by means of so-called ‘supervisory haircuts’ which reduce the market value of collateral for the purpose of risk mitigation. Also note that under the regimes of Basel I and the 2000 Directive over-collateralisation is not taken into account, while under the regime of the Manual, being based on supervisory haircuts, it is.

³⁵ See Basel I, section 39 and Annex 2; 2000 Directive, articles 40-47; Manual, section 4001.

³⁶ See Basel I, Annex 2, 0%, (a); 2000 Directive, article 43, 1, (a), subsections (1) and (7); Manual, sections 4011-02.3.1 under 1 and 10 and 4011-03.2.4 under 5.

of high credit standing. The rationale behind the ‘OECD’ approach in Basel I is the same as that behind the ‘Zone A’³⁹ approach in the 2000 Directive. Even though Basel I allows for a 0% risk weighting for collateral in the form of OECD securities, several countries indicated during the Basel I negotiations that they did not intend to apply the 0% risk weighting, but a 10% or 20% risk weighting instead in order to take investment risk into account.⁴⁰ This is also why the Manual applies not a 0%, but a 10% or 2.5% supervisory haircut (the 2.5% haircut applies only in case of daily calls of variation margin)⁴¹ and thus has a stricter regime than demanded under Basel I. The regime in the Manual is also stricter than that of the 2000 Directive, which allows for a 0% risk weighting in line with the Basel Accord.⁴² Also note that, unlike the 2000 Directive and the Manual, which do recognise central bank securities, Basel I does not consider central bank securities.

*Securities issued by regional governments and local authorities*⁴³

With respect to securities issued by regional governments and local authorities the approach differs as well. Basel I does not recognise such securities and the Manual does not mention them as risk mitigating receivables in repo and securities lending transactions. On the European level, however, the basic rule for claims collateralised by securities issued by regional governments and local authorities of the Member States is set out in article 44 of the 2000 Directive. If the risk profile of regional governments or local authorities is essentially the same as that of the central government, a 0% risk weighting will apply. This will, for example, be the case when regional governments and local authorities have revenue-raising

³⁷ See Basel I, Annex 2, 0%, (d); 2000 Directive article 43, 1, (a), subsection (7); Manual, sections 4011-02.3.1 under 1 and 10 and 4011-03.2.4 under 5.

³⁸ In Basel I, ‘OECD countries’ are defined as all countries which are full members of the Organisation for Economic Co-operation and Development (OECD) or countries which have concluded special lending arrangements with the International Monetary Fund (IMF) associated with the Fund’s General Arrangements to Borrow. A country which has rescheduled its sovereign debt within the previous five years is excluded by the Amendment to Basel I of July 1994. See Basel I, sections 33-37 for a more extensive treatment of the reasons why the OECD-approach has been adopted.

³⁹ ‘Zone A’ countries are all Member States of the European Union and all other countries which are full members of the OECD together with those countries which have concluded special lending arrangements with the IMF associated with the Fund’s General Arrangements to Borrow. Countries rescheduling their external sovereign debt are, however, excluded for a period of five years. See 2000 Directive, article 1 (16).

⁴⁰ See Basel I, Annex 2, footnote 3. Investment risk usually refers to the risk that received collateral cannot be reinvested profitably or can only be reinvested by taking on additional counterparty risks.

⁴¹ The provisions on variation margin have been introduced in the Manual in July 2000. See (the short reference in) Staatscourant 25 July 2000, nr.141, p.70.

⁴² In practice, the regime in the Manual leads to the following result. If under a repo Bank A provides € 100 to Bank B, while Bank B provides Dutch government bonds with a value of € 100 to Bank A, € 90 (or € 97.5 in case of daily margin calls) provided by Bank A will be subject to mitigated capital adequacy requirements, whereas € 10 (or € 2.5 in the case of daily margin calls) will be subject to full capital requirements.

⁴³ See 2000 Directive, articles 44 and 45 subsection 1 and Manual, sections 4011-02.3.1 under 10 and 4011-03.2.4 under 5.

powers or when institutional arrangements are in place which result in a reduction in the chance of a default. If these conditions are not met, no risk mitigation will be possible and the general counterparty risk weighting will apply. However, there is one exception to this rule, which is set out in article 45 subsection 1. Even if the conditions of article 44 are not met, a 20% risk weighting is possible for securities issued by Zone A local governments and local authorities if the supervisor is comfortable with this. This section leaves some room for flexibility in respect of securities issued by local authorities and regional governments of Member States and also allows for risk mitigation for securities issued by local authorities and regional governments which, although not within the European Union, do form part of a Zone A country.

*Multilateral development bank securities*⁴⁴

Basel I recognises that securities issued by particular multilateral development banks⁴⁵ can mitigate the risk. It also allows for recognition at national level of securities issued by other multilateral development banks in which G-10 countries are shareholding members. The 2000 Directive and the Manual have taken advantage of this possibility and recognise securities issued by a number of other institutions⁴⁶ besides the multilateral banks specifically mentioned in Basel I.⁴⁷ Basel I and the 2000 Directive provide for a 20% risk weighting and the Manual sets a supervisory haircut of 10% unless daily margin calls take place, in which case 95% of the market value of securities will be taken into account (i.e. a haircut of 5%).

3.4 The trading book regime

Introduction

The approaches to repo-style transactions described in the Market Risk Amendment (MRA) and in the CAD⁴⁸ are essentially the same as far as trading book items are concerned. Whereas repo-style transactions falling under the MRA will usually be subject to the section

⁴⁴ See Basel I, Annex 2, 20%, (a), including footnote 5; 2000 Directive, articles 1 (19) and 43 (1)(b)(1); Manual, sections 4011-02.3.1 under 10 and 4011-03.2.4 under 5.

⁴⁵ I.e. the International Bank for Reconstruction and Development (IBRD), the Inter-American Development Bank (IADB), the Asian Development Bank (AsDB), the African Development Bank (AfDB) and the European Investment Bank (EIB).

⁴⁶ Notably the International Finance Corporation, the Council of Europe Resettlement Fund, the Nordic Investment Bank, the Caribbean Development Bank, the European Bank for Reconstruction and Development, the European Investment Fund and the Inter-American Investment Corporation.

⁴⁷ It should be noted that the 2000 Directive and the Manual do not mention the European Investment Bank.

⁴⁸ See for definitions of (reverse) repurchase agreements and securities lending and borrowing CAD I, article 2 subsections 17 and 18, respectively. These definitions have been amended by CAD II.

on interest rate risk⁴⁹, the CAD sets out explicit provisions for repo-style transactions regarding both position risk and settlement/counterparty risk. We note that the philosophy behind the interest rate risk (Basel) and position rate risk (CAD) provisions is basically the same, as both are intended to take price fluctuations into account. The CAD additionally sets out special provisions relating to settlement and counterparty risk in repo-style transactions⁵⁰, whereas the MRA does not contain any specific provisions on counterparty risk for such transactions. It must be presumed that the MRA leaves the issue of counterparty risk to the national regulator. The Manual deviates from this approach since it does not provide for a special trading book regime. Its regime is, apart from a single addition which will be discussed below, the same as the regime applicable to collateralised transactions in the banking book.

Standardised and internal models approaches

In 1988, Basel I set out a single standardised method for calculating credit risk which applied under all circumstances. With the introduction of the Market Risk Amendment in 1996 and CAD II in 1998, a diversified approach was adopted for calculating market risk positions. Besides the ‘standardised’ approach for calculating market risk, the MRA and CAD II also introduce the concepts of ‘internal models approach’ and ‘internal model calculation’, thereby allowing for a method of risk calculation that is based on the internal models of individual financial institutions. Notwithstanding the importance of these internal models, the discussion below will, for reasons of brevity, focus on the standardised approach.

Minimum conditions

It should be noted that both the CAD and the Manual pay particular attention to the conditions that repo-style transactions have to fulfil in order to qualify for the special capital adequacy rules that apply to trading book positions. The requirements may relate to, for example, marking-to-market techniques, re-margining, automatic set-off of obligations in the event of a default, the inter-professional character of a transaction and a prohibition of artificial transactions. We refer to the relevant provisions of the CAD and the Manual for the precise way in which these requirements must be met.⁵¹

⁴⁹ The interest rate section basically applies to positions in debt securities, since repo-style transactions are often executed with debt securities. However, if a transaction is performed with, for example, equities or commodities, the equity risk or commodity risk sections of the Market Risk Amendment will apply.

⁵⁰ See sections 4.1 and 4.2 of Annex II of CAD I as amended by CAD II to take into account commodities.

⁵¹ See CAD I, article 2(6) under (b) as amended by CAD II, article 1 under 1 and section 4002-02 under 2 of the Manual.

Interest rate and position risk

The interest rate provisions in the Market Risk Amendment and those concerning position risk in the CAD both relate to changes in the market value of securities.⁵² It should be noted that the MRA and the CAD distinguish two types of volatility risk. The first relates to movements in the price of individual securities in relation to the issuer of the securities concerned ('specific risk'), whereas the second relates to general price movements in the financial markets which also have an effect on the prices of the securities involved ('general market risk'). The specific risk approach in both MRA and CAD provides for a 0% risk charge for government paper. The risk charge applied to 'qualifying' securities, i.e. securities issued by public sector entities, multilateral development banks and certain other securities (in particular investment grade securities rated by recognised rating agencies), is dependent on their residual term to final maturity and may be 0.25%, 1%, or 1.6%. All other securities are subject to a risk charge of 8% or more if this is required taking into account the financial position of an institution. The general market risk charge is calculated on the basis of models set out in the MRA and CAD.

Counterparty risk

Next to market risk provisions, the CAD sets out express provisions regarding the calculation of counterparty risk.⁵³ Basically, in case of repo-style transactions, counterparty risk is determined by calculating the net exposure and then multiplying the outcome by the 8% capital ratio and the counterparty risk weighting factor. The same procedure is used to calculate the uncollateralised portion of exposure in the banking book. The Basel Committee also considered comparable provisions, but could not agree on a unified approach because of too divergent practices.⁵⁴

The Manual

The approach set out in the Manual regarding collateralised trading book transactions is different from that in the MRA and the CAD and is more in line with the approach to banking book items. In addition to the collateral recognised for capital adequacy purposes in banking book transactions, the Manual introduces an extra category of eligible collateral to achieve mitigation of risk.⁵⁵ These are readily marketable securities which are listed on a recognised exchange.⁵⁶ 70% of their market value is taken into account when calculating risk. For daily

⁵² See MRA, part A.1 and CAD I, Annex I as amended by CAD II.

⁵³ See CAD I, Annex II, points 4.1 and 4.2 as amended by CAD II.

⁵⁴ See the Explanatory Note to the Modification of the MRA of 19th September 1997 (referring to event and default risk).

⁵⁵ See the sections 4011-02.3.1 under 10 and 4011-03.2.4 under 5 of the Manual.

⁵⁶ The Manual further defines 'readily marketable' and 'recognised exchange'.

margin calls, 90% (in cases involving equities) or 95% (in cases involving bonds) of their value will be taken into account. Of course, the uncollateralised part of the transaction is again subject to the weighting factors of the counterparty.

3.5 Basel II

Introduction

One of the often cited disadvantages of the current Capital Accord is that it does not adequately take into account credit risk mitigation techniques such as the use of collateral. Fortunately, the Consultative Paper provides for several improvements to methods used in credit risk mitigation, which also have a special bearing on repo-style transactions. One important improvement is that use of a wider range of collateral will be allowed.

As is the case in the MRA and the CAD, which make a distinction between a standardised approach and internal models for the calculation of capital adequacy requirements in the trading book, Basel II now makes such a distinction as well for both trading and banking book. However, Basel II sets out two approaches for internal ratings: the foundation internal ratings based (IRB) approach and the advanced IRB approach. The framework for credit risk mitigation in the so-called foundation IRB approach closely follows the comprehensive standardised approach described in this article.⁵⁷ The treatment of credit risk mitigation in the advanced IRB approach is still limited to setting a number of minimum standards for application, but does not yet contain specific provisions regarding eligible collateral or method of calculation.⁵⁸ In this article we will focus on the standardised approach.⁵⁹

As is rightly mentioned in the second Consultative Paper, well-documented collateral agreements reduce the exposures of the parties involved. However, even fully collateralised positions are not without risk, as for example became clear in 1998 when the hedge fund LTCM almost collapsed.⁶⁰ This episode showed that hedge funds made extensive use of repos to finance trading positions, with (investment) banks as their most important counterparties. More importantly, it showed that the capital adequacy treatment of repo exposures should be

⁵⁷ See The New Basel Capital Accord, sections 197-221.

⁵⁸ See The New Basel Capital Accord, sections 364-365

⁵⁹ On the standard approach, Overview of The New Basel Capital Accord, sections 84-87; The New Basel Capital Accord, sections 44 and 61-111; The Standardised Approach to Credit Risk, sections 88-173.

⁶⁰ It appears that banks often underestimated the secondary risks associated with fully collateralised repo transactions. As it turned out, the liquidation of collateral in highly volatile and illiquid markets proved to be expensive or even impossible. Moreover, the costs associated with re-balancing portfolio positions were substantial. See also Moonen (1999).

differentiated urgently in order to reflect the volatility of the underlying securities and the frequency with which positions are marked-to-market.

The Consultative Document describes two methods for the treatment of collateral in the standardised approach for banking book exposures: a comprehensive approach and a simple approach. Banks will be required to operate under only one of the two alternatives. They may choose themselves which regime is appropriate for them, but have to be consistent.⁶¹

Minimum conditions and eligible collateral

First of all, the Consultative Document clearly states that certain minimum conditions should be met before capital relief will be applied to any form of collateral.⁶² A first group of minimum standards refers to the legal certainty of the collateral, since collateral will only effectively mitigate risk if the related legal mechanisms are robust and ensure that the lender has clear rights to the collateral. For instance, collateral arrangements must be properly documented, with clear procedures for the timely liquidation of collateral. Moreover, banks must obtain legal opinions confirming the enforceability of the collateral arrangements in all relevant jurisdictions. Secondly, the credit quality of the obligor and the value of the collateral must not have a positive correlation.⁶³ Lastly, there should be a robust risk management process in place and, importantly, banks must satisfy certain disclosure requirements set out in section B7 of The Standardised Approach to Credit Risk and in the third Pillar of the new Accord.⁶⁴

Two other important changes to the present framework of the banking book are that operational risk and volatility risk will be of increased importance under the Basel II regime. Apart from the separate capital charge for operational risk⁶⁵, this risk category is also expressly dealt with in the form of mandatory conditions for risk mitigation. For example, we mentioned above that the use of good legal documentation and qualitative systems (guaranteeing, for example, daily marking-to-market and re-margining) are expressly stated to

⁶¹ Issues relating to the trading book have also been incorporated in the New Capital Accord. We refer to the sections 566-585 of The New Basel Capital Accord but will not consider the trading book further.

⁶² Cf. section 3.4 above on the minimum conditions for application of the current trading book regime.

⁶³ If the credit quality of the counterparty and the value of collateral it transferred are closely connected, the collateral may not provide sufficient protection. For example, if seller A provides securities issued by a company in its own group, these securities may prove of little value when the group gets into financial difficulties. See The Standardised Approach to Credit Risk, point 96.

⁶⁴ These disclosure requirements include, among others, the bank's overall strategy for managing collateral, in particular the monitoring of collateral value over time. Also, quantitative information should be disclosed, such as total exposure, the amount of exposure covered by collateral and on-balance sheet netting contracts.

be minimum conditions in Basel II. In addition, estimations of the volatility of prices of securities will be more in line with reality, resulting in total capital adequacy charges which are more in line with the actual economic risk profile of individual positions.

The following instruments are eligible as collateral in both the comprehensive and the simple approach: cash on deposit with the lending bank; securities rated BB- and above issued by sovereigns and certain public sector entities; bank, securities firm and corporate securities rated BBB- and above; equities included in a main index; and finally gold. Additionally, equities which are not included in a main index but are traded on a recognised exchange are eligible for recognition in the comprehensive approach.⁶⁶ We refer to the Annex to this article for an overview of the risk weight factors.

Comprehensive approach

In the comprehensive approach, capital adequacy requirements will be applied to banks on both sides of the collateralised transaction, so that both repos and reverse repos and securities lending and borrowing will be subject to capital requirements. The requirements are calculated on the basis of haircuts (referred to as ‘H’) and a floor factor (‘w’). In general, haircuts will be applied to the market value of collateral in order to protect against price volatility. It is interesting to note that the methodology of applying such haircuts was already used in the Manual, but as yet not in the Basel Accord. However, in the new Accord, three different categories of haircuts will be distinguished: haircuts that reflect the volatility of the exposure, haircuts that reflect the volatility of the collateral received and haircuts that reflect currency volatility.⁶⁷ The last category refers to cases in which the collateral is denominated in a currency which differs from the one in which the underlying exposure is denominated (‘*currency mismatch*’). Haircuts may be calculated using a standard approach or an own estimates approach. Under the standard approach, each item of eligible collateral receives a standard haircut. This haircut ranges from zero in the case of cash to 30% in the case of non-main index equities listed on a recognised exchange. Haircuts for debt securities depend on their issue rating, their residual maturity and the type of issuer (sovereigns, banks or

⁶⁵ See Overview of the New Basel Capital Accord, sections 157-173; The New Basel Capital Accord, par. 547-565 and the supporting Consultative Document on Operational Risk.

⁶⁶ Bonds issued by banks which are not assessed by a recognised external credit assessment institution may be treated equivalently to those assessed A/BBB if they fulfil certain criteria. Certain Undertakings for Collective Investment in Transferable Securities (UCITS) and mutual funds are also eligible.

⁶⁷ Both sides of repo-style transactions will be subject to capital charges. When a bank’s exposure is secured by collateral, the value of that collateral will be reduced by the haircut appropriate to the specific collateral instrument. If a bank’s exposure takes the form of securities posted or lent, the value of the collateral received will be reduced by the haircut appropriate to the securities posted.

corporates).⁶⁸ Under the own estimates approach, supervisors may permit banks to use their own internal estimates of market price volatility and foreign exchange volatility (and thereby the applicable haircut), provided that they meet certain minimum qualitative and quantitative standards. Permission to calculate the appropriate haircuts internally will be limited to those banks which have received supervisory recognition of an internal market risk model under the 1996 Market Risk Amendment.

After the application of the appropriate haircuts, a floor factor or weight (' w ') is applied to that portion of the exposure which is actually collateralised. For collateralised transactions, w is 0.15, whereas banks will be permitted to apply a zero w in certain government securities repo-style transactions because the risk in such transactions is deemed to be zero. The effect of the floor factor is that the risk mitigating effect of collateral is somewhat modified. The reason for introducing a floor factor is to take into account the fact that collateral might turn out to be effectively worthless e.g. because it proves impossible to establish title to the collateral.⁶⁹ The floor factor thus reflects the fact that even a collateralised transaction is never without risk. Lastly, an interesting feature of the Basel II Accord is the so-called carve out from the comprehensive approach. When the conditions for applying a zero w are all met (in case of government repo-style transactions) and additionally the counterparty is a so-called 'core market participant', supervisors may choose not to apply the haircuts specified in the comprehensive approach but instead apply a zero w .⁷⁰

Simple approach

Banks may also choose to use the simple approach to the treatment of collateral as an alternative to the comprehensive approach explained above.⁷¹ No haircuts are used in this approach, which is basically targeted at banks which do not very often use collateralised transactions. However, the other side of the picture is that a more limited range of types of collateral are recognised as being risk mitigating factors. While the simple approach is easier for banks to apply, it is also less accurate and is designed in such a way that it will result in higher overall capital requirements. Applying the simple approach is possible only if there is

⁶⁸ For so-called capital market driven transactions, which include repos and reverse repos, a ten business day holding period is used as the base term for calibrating the standard collateral haircuts, provided that daily marking-to-market and re-margining is conducted. If re-margining occurs less frequently than daily, larger haircuts are required. These will be calculated using what is called a 'square root of time' formula.

⁶⁹ See The Standardised Approach to Credit Risk, in particular under 117-118 and 153-157.

⁷⁰ See The Standardised Approach to Credit Risk, sections 160 and 161.

⁷¹ See The Standardised Approach to Credit Risk, sections 163-173.

no mismatch between the maturity of the collateral and that of the exposure.⁷² Additionally, collateral is required to be marked-to-market and revalued at least every six months. Basically, in the simple approach, that part of a claim which is collateralised by recognised collateral receives the risk weight appropriate to the collateral instrument. However, this risk weight will be subject to a floor of 20% (except under certain specified conditions). The remainder of the claim should be assigned to the risk weight appropriate to the counterparty.

4. Supervision by DNB, supervisory review and market discipline

Introduction

Although minimum capital requirements are crucial for maintaining financially healthy banks, in most cases they are not sufficient. Supervisory policies should, and indeed do, pay close attention to matters such as banks' risk management practices and the soundness of their operations and policies more generally. In this section we will first examine the present DNB supervision of banks' repo and securities lending businesses. After that, we will briefly consider two new elements of the new Capital Accord. In addition to the amendments to the minimum capital requirements in Pillar I discussed above, an important novelty of Basel II is the second Pillar, also termed supervisory review process. Moreover, the third Pillar consists of measures to improve transparency, and thereby market discipline, by requiring banks to disclose certain information.

4.1 Current DNB supervision

The policies of DNB for supervising the repo and securities lending business of banks go further than a 'mechanical' approach focused on the mere fulfilment of minimum capital requirements. Instead, the aim of DNB's (on site) supervision is to assess whether a bank's business brings with it material risks and, if so, whether such risks are adequately managed. Based on the so-called risk analysis framework, supervisors try to gain an understanding of both the risk profile and the control mechanisms of the supervised institutions. Additionally, they assess whether the credit institution concerned is able to fulfil (and actually does fulfil) DNB's monthly reporting requirements. We will examine the on site activities of DNB supervisors when assessing a bank's repo and securities lending business further below by discussing DNB's risk analysis method appropriate to the different issues related to such

⁷² See The Standardised Approach to Credit Risk, under 108 and 167 and cf. the minimum condition laid down in point 104 of the same document. If collateral securities mature before the end of a transaction this may effectively lead to an exposure for the receiver of the collateral.

activities.⁷³ When carrying out repo-style transactions, four main risk categories can be distinguished: credit risk, operational risk (including payment and settlement risk), IT risk and finally legal and integrity risk. While credit risk as it is understood in the Risk Analysis Handbook contains elements of counterparty risk and volatility risk, the categories of IT risk and legal and integrity risk as described in the Handbook are actually all forms of operational risk in the sense of section one of this article ('Risk profile of repos and securities lending'). We will now consider these main risk categories further (except for IT risk⁷⁴) and explain for each category what main issues are currently being examined by Dutch banking supervisors.⁷⁵

Of course, credit or counterparty risk is one of the most important categories in repo-style transactions. When an obligor fails to meet the terms of a contract with a bank or otherwise fails to perform as agreed, this will have immediate financial repercussions for the bank. When judging the amount of credit exposure associated with repo-style transactions, on site supervisors will first of all assess the total amount of funds invested in repos, both as cash and in the form of securities. These amounts will then be assessed in view of their relative importance, i.e. their importance when compared with, for example, the total balance sheet. Then, the quality and default probability of counterparties will be assessed. In the course of determining credit risk exposure, the nature of the securities used is also identified, particularly with regard to their market volatility. The volatility of market prices may also bring significant reinvestment risks in certain circumstances. This will be the case when cash or securities cannot be reinvested profitably due to (unexpected) price developments in the market or by taking additional credit risks. Generally, the on site supervisors will use the institutions own internal reports to determine the risk profile of the repo and securities lending portfolios. Important additional topics investigated include the existence of large exposures and the diversification of the portfolio.⁷⁶

Operational risk is a second important risk category with regard to repo-style activities. This can be defined as the current or prospective risk to earnings and capital arising from failed

⁷³ The general risk analysis method is described comprehensively in DNB's Risk Analysis Handbook, which is frequently updated. The Handbook contains practical guidelines for supervisors. Specific details concerning the risk analysis of repo-style transactions are laid down in the so-called Workprogram Securities Lending & Borrowing. Although not mentioned in the name, the Workprogram also applies to (reverse) repos.

⁷⁴ Although IT-risk is regarded as one of the risks that deserves special attention in relation to risk analysis of repo-style activities, we will not elaborate more on this risk category as the points of interest are not so much relevant to the specific nature of repo-style activities.

⁷⁵ Of course, a full discussion of the supervisory process with regard to repo-style transactions is beyond the scope of this article. Instead, an overview will be provided of the main topics covered during the assessment of the risk profile of an institution's repo-style business.

⁷⁶ In case of a diversified portfolio with all sorts of different securities the over-all risk for the owner of the securities portfolio is reduced.

transactions with customers or counterparties due to inadequate and insufficient systems and human resources. First of all, supervisors will examine the amount of (pre)transaction risk, i.e. the quality of the organisational framework set up before dealing in repo-style transactions has actually started. Examples are the policies in relation to the use of standard contracts and the risk profile of agreements with third parties for clearing and settlement, the existing processes for determining collateral values and the existing processes for hedging interest rate risks. Attention should also be given to the processing risk, which refers to how the bank records information concerning collateral values in its systems and whether such values are updated in light of margining requirements. Another point deserving attention is the question of whether the volume of a bank's repo business is in proper proportion to its current capacity, both in terms of personnel and systems. Also, whether the current staff has enough knowledge and is experienced enough to perform repo-style transactions in a prudent fashion will be investigated. Additionally, the supervisors will identify risk in relation to clearing and settlement of cash and securities flows. One important issue is whether securities transfers and cash payments are simultaneous transactions ('delivery versus payment'). Finally, the supervisors will check whether (senior) management receives regular updates of relevant information about the institution's repo-style activities.

Legal and integrity risk refers to the risk to earnings and capital arising from violations of or non-compliance with laws, rules, regulations, agreements, prescribed practices or ethical standards. Of course, one of the most important points to establish here is whether an institution bases its transactions on internationally recognised standard contracts, such as the GMRA or GMSLA. Whether master agreements include enforceable close-out netting clauses will be checked.⁷⁷

It is important to emphasise that the risk analysis framework as applied by DNB not only assesses the main *risks* in an institution, but also the quality of risk mitigating *controls* in all significant functional activities. The objective of such a control assessment is to determine the quality of the control environment with regard to repo-style transactions. Banks should, for example, ensure that they choose the right counterparties ('know your customer') and record which standard trading conditions apply to each type of counterparty. Also, there must be adequate procedures in place with regard to limit-setting, stress-testing and risk-measurement. In repo-style transactions, banks should be able to make well-founded judgements about the

⁷⁷ These clauses imply that if one party defaults, the other party is allowed to terminate and set off all remaining open transactions with the defaulting party in such a way that only one single claim on (or obligation to) the defaulting party remains.

interplay between market risk and credit/counterparty risks. Among others, the following important risk control measures can be distinguished:

Table 1 Risk categories and control measures in repo-style transactions

| Risk category | Control measure(s) |
|--------------------------------|---|
| Credit risk | Daily margining Quality requirements of collateral Counterparty diversification Evaluation of credit and credit limits |
| Operational risk ⁷⁸ | Separation of functions Automation Checking and surveillance |
| Clearing and settlement risk | Delivery versus payment Tripartite facilities ⁷⁹ |
| Legal risk | Use of standard agreements |

Source: Workprogram Securities Lending and Borrowing (DNB).

4.2 New Pillars II and III

Until now, the international standardisation of supervisory practices based on the Basel framework almost exclusively paid attention to minimum capital requirements. With regard to the more general review of banks' activities, such as those performed by both on site and off site national supervisors, international co-ordination has been less far reaching.⁸⁰ However, in the new Basel Accord, the minimum capital requirements (now termed Pillar I) will be complemented by the so-called Supervisory Review Process (SRP, Pillar II). This second Pillar sets out guidelines on how banks should ensure that they have a sound process in place for assessing overall capital adequacy in relation to their risk profile. Additionally, it provides some basic principles for supervisors investigating risk profiles and risk management methods of banks. The origin of this new Pillar lies in the Basel Committee's ambition to bring capital requirements more in line with banks' actual economic risk profile. The second Pillar will thus be used to stimulate banks to be sufficiently well equipped, *ex ante*, to control and manage the risks inherent in each business in which they are involved.⁸¹ The SRP includes, among other activities, on site examinations, off site reviews and discussions with bank management. In

⁷⁸ In the workprogram operational risk is defined rather narrowly, excluding clearing and settlement risk and legal risk which are treated as separate risk categories. In the context of Basel II, operational risk is interpreted more broadly, including also legal risk and clearing and settlement risk.

⁷⁹ When using a tripartite facility, a third independent party acts as an intermediary between the lender and borrower in a repo-style transaction and manages the settlement process as well as the collateral flows.

⁸⁰ During the last five years, the Basel Committee has, however, published several papers with guidance on several important components of the supervisory review process. For an overview, please refer to page 113 of the New Basel Capital Accord.

⁸¹ Additionally, the qualitative supervisory processes was thought to be of use in creating a level playing field to deal with certain categories of 'other risks', which could not be quantified within the

the end, the SRP may result in higher minimum capital requirements for those banks that have relatively high risks and/or inadequate risk management systems. In addition to the integration of the SRP in the new Basel Accord, a third Pillar is added. This Pillar aims at improving market discipline by introducing both disclosure recommendations and disclosure requirements. These requirements are directly connected with the use of particular methods or financial instruments and can thus be thought of as preconditions for using such instruments for regulatory capital purposes.

Taking a bank's repo and securities lending business as an example, it is possible to further clarify the links between the three Pillars of the new Capital Accord. The framework for appropriate minimum capital requirements for repo-style transactions is described in Pillar I. Pillar I also expressly mentions that several conditions are attached to the use of certain methods and instruments. For repo-style transactions, these are the requirements discussed above which relate to the use of collateral as a mitigating factor in credit risk. The use of collateral to reduce risks and thereby the minimum amount of required capital is thus restricted by certain risk management and disclosure requirements and recommendations. The requirements and recommendations in the field of disclosure are described in more detail in Pillar III.⁸² Banks are, for instance, required to provide qualitative information on how they monitor collateral value over time and what internal policies are in place to access the collateral. Banks must also provide information which is more quantitative in nature. Examples are the bank's total exposures and what portion of these exposures is secured by collateral and on-balance sheet netting contracts. The chosen regulatory calculation methods must also be disclosed. In addition to these mandatory requirements, the Basel Committee recommends certain additional disclosures. Some examples are total annual amounts recovered from collateralised transactions and exposure amounts defined by the bank for internal management purposes by types of eligible collateral and by geographical grouping. Finally, as part of the supervisory review process (Pillar II), supervisors must ensure that the above conditions have been met and must monitor ongoing compliance with them. The review process is thus, *inter alia*, also used to encourage banks to meet the disclosure requirements set out in Pillar III. More generally, within the scope of the SRP, the supervisory authorities will investigate a bank's repo-style activities as part of their overall assessment of the bank's process of allocating capital, taking into account the particular characteristics of its portfolio and the related risk management structure.

framework of the first Pillar. The best example is interest rate risk, described further in the Supporting Document to the New Basel Capital Accord.

⁸² Sections 653-658 of the New Capital Accord as well as sections 229-230 of the Standardised Approach to Credit Risk deal expressly with the disclosure requirements and recommendations in the area of credit risk mitigation techniques, which are highly relevant in repo-style transactions.

Summary and conclusions

We have given a concise overview in this article of the most important regulations with regard to capital adequacy requirements in repo-style transactions. First, we argued that banks will be exposed to different risk categories when entering into such activities. The most important risk is that related to the contractual partner, although this is to a large extent avoided when sufficient collateral is posted. However, additional counterparty exposures can emerge during the transaction because of fluctuations in the value of this collateral. Also, markets may prove to be illiquid when a bank finally has to sell its collateral, making it hard to raise sufficient money from the collateral to make up for the incurred losses.

Banks are required to hold a certain amount of capital in order to be able to have a sufficient financial buffer against unexpected losses. Ideally, the amount of (regulatory) capital should be a direct function of the risk profile of a bank's activities. When focusing on banks' repo business, an activity that has vastly gained importance during recent years, it appears that the relevant regulatory approach has developed around two main themes: (1) the role of collateral in repo-style transactions and (2) the supervisory attention given to the different types of risk categories in case of a repo-style transaction. Of course, the Basel Capital Accord of 1988 was an important first regulatory milestone. However, this Accord only relates specifically to credit risk and the role played by risk mitigating factors, such as the use of collateral, is only very limited. The same is true for the European directives and national regulations derived from the (non-binding) Basel Accord. Attention was given to market risks (in the trading book) for the first time in the Market Risk Amendment to the Basel Accord and these are relevant in repo-style transactions as well. It would seem that in the Netherlands repo-style transactions in the trading book are somewhat more attractive due to the fact that readily marketable securities registered on recognised exchanges are recognised in the Manual as risk mitigating factors in the trading book (unlike in the banking book).

Regulatory treatment of collateral has recently entered a new phase, in the form of the revision of the Basel Accord. First of all, use of a wider range of collateral will be allowed and banks will be able to choose between a comprehensive and a simple approach to the treatment of collateral. Additionally, two new Pillars have been added to the Accord: the Supervisory Review Process and the requirements and recommendations for market discipline. These new Pillars ensure, for example, that banks will have to make clear statements about the methods they use in their collateral management. Recommended principles are laid down for supervisors conducting the review process. This is important, since adequate supervision should go beyond mere enforcement of minimum capital

requirements: it has to comprise an integral and risk sensitive approach to banks' activities and their control systems. In short, the revision of the Basel Accord is expected to improve the regulatory treatment of both collateral and the risks associated with repo-style transactions, thereby further aligning regulatory and economic capital which banks must hold for these activities.

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Annex

The first table in this annex shows the collateral recognised for the purpose of risk mitigation under Basel I, the 2000 Directive and the Manual. The second table shows the regime proposed by Basel II.

Collateral recognised in Basel I, 2000 Directive and Manual

| | Cash | 'OECD' / 'Zone A' central government (/central bank) securities | Securities issued by regional governments and local authorities | Multilateral development bank securities |
|----------------------------|------|---|---|--|
| Basel I | 0% | 0% | - | 20% |
| 2000 Directive | 0% | 0% | 0% / 20% | 20% |
| Manual⁸³ | 0% | 10% / 2.5% | - | 10% / 5% |

Collateral recognised in Basel II⁸⁴

| Issue rating for debt securities | Residual Maturity | Sovereigns ⁸⁵ | Banks/Corporates ⁸⁶ |
|---|---------------------|--------------------------|--------------------------------|
| AAA/AA | ≤ 1 year | 0.5% | 1% |
| | > 1 year, ≤ 5 years | 2% | 4% |
| | > 5 years | 4% | 8% |
| A/BBB | ≤ 1 year | 1% | 2% |
| | > 1 year, ≤ 5 years | 3% | 6% |
| | > 5 years | 6% | 12% |
| BB | ≤ 1 year | 20% | |
| | > 1 year, ≤ 5 years | 20% | |
| | > 5 years | 20% | |
| Main index equities | | 20% | |
| Other equities listed on a recognised exchange | | 30% | |
| Cash | | 0% | |
| Gold | | 15% | |
| Surcharge for foreign exchange risk | | 8% | |

⁸³ The percentages in the Manual represent supervisory haircuts. The Manual has a system of calculation of capital adequacy requirements that differs from those set out in Basel I and the 2000 Directive which work with a weight factor and do not know haircuts.

⁸⁴ Table from The New Basel Capital Accord (p. 20). The percentages represent the haircuts to be applied in the standardised approach (assuming daily mark-to-market and re-margining).

⁸⁵ Includes Public Sector Entities (PSEs) treated as sovereigns by the national supervisor.

⁸⁶ Includes PSEs which are **not** treated as sovereigns by the national supervisor.