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No. 2002/13

**Collateralised Loan Obligations (CLOs) -
A Primer**

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Collateralised Loan Obligations (CLOs) - A Primer

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Abstract:

The following descriptive paper surveys the various types of loan securitisation and provides a working definition of so-called collateralised loan obligations (CLOs). Free of the common rhetoric and slogans, which sometimes substitute for understanding of the complex nature of structured finance, this paper describes the theoretical foundations of this specialised form of loan securitisation. Not only the distinctive properties of CLOs, but also the information economics inherent in the transfer of credit risk will be considered, so that we can equally privilege the critical aspects of security design in the structuring of CLO transactions.

JEL Classification: D81, G15, G21, M20

Keywords: Loan securitisation, structured finance, CLO, ABS

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1 INTRODUCTION

In the lexicon of previous decades financial intermediation occurred when banks and non-bank financial institutions, such as insurance companies, accepted funds from depositors or other investors and channelled these funds at some margin to businesses and households by means of lending. Originators of loans used to hold such loans on the books until these asset claims matured, rolled over or terminated once debtors went insolvent. The corresponding credit risk was the prime focus of banks and non-banks, which applied forecasting models to estimate the probability of incurring bad debt, whereas interest rate risk could be managed by ensuring that the contractual interest rate on the loan varied with the cost of funds.

Over the last two decades, however, non-bank financial service providers, such as investment banks, captive finance companies and insurance firms have posed a formidable challenge as contenders in the intermediation process, employing the same technological advances as banks. Since the 1980s important technological changes have been taking place in the “old-fashioned” business of financial intermediation. Chief among the innovations introduced at major banks has been the securitisation of balance-sheet assets, i.e. the mechanism by which individual, illiquid financial assets are converted into tradable capital market instruments (The Bond Market Association, 2001). In such transactions a portfolio of assets is transferred from the balance sheet of the originator to a special purpose vehicle (SPV)¹, which refinances itself by issuing securities on this reference portfolio to capital markets at a margin (Burghardt, 2001)². Typically institutional investors are the prime investor group for such transactions.

The move of corporate finance towards such capital market-based investment funding is reducible to various causes.³ First, recent financial crises have led to a general shortage of investment funds and heightened competition for low-risk borrowers. Second, the deregulation and liberalisation of international financial markets as well as technological advances have elevated market efficiency to a level amenable to two strands of asset

¹ The Basle Committee on Banking Supervision (2002) uses the term “special purpose entity (SPE)” to define the functions of a SPV, which is a corporation, trust, or other entity organised for a specific purpose, the activities of which are limited to those appropriate to accomplish the purpose of the SPE, and the structure of which is intended to isolate the SPE from the credit risk of an originator or seller of credit exposures. SPEs are commonly used as financing vehicles in which credit exposures are sold to a trust or similar entity in exchange for cash or other assets funded by debt issued by the trust.

² See also Turwitt (1999).

³ See also Kück (1998).

securitisation. On the one hand, the issuing of debt securities by banks and non-bank financial institutions as well as corporations has posed a formidable challenge to traditional channels of asset funding through bank-based external finance and deposit business. On the other hand, securitisation of balance-sheet assets has also drawn in banks and financial service companies alike as rising sophistication in credit risk management have facilitated continuous innovation in structured finance products and derivative instruments (Eichholz, 2000).

Since financial markets have displayed a remarkable shift towards the substitution of securitisation of bank assets for traditional loan finance, the issue of debt securities, collateralised by an underlying portfolio, as a form of structured finance holds the prospect of completely transforming the traditional paradigm of intermediation. In securitisation asset risk is transferred to capital market investors in return for cash flows generated from an asset portfolio (*reference portfolio*), whose repayment risk is sliced into tranches, with the most junior tranche (*first loss position*) bearing any initial losses. This possibility of selling securities as structured claims in the form of tranches has been key to the popularity of asset securitisation. If tranches are subordinated, any losses in excess of the lower tranche are absorbed by the subsequent tranche and so on, leaving the most senior tranches only with a remote probability of being touched by defaults in the underlying asset pool (The Economist, 2002). For the securitisation process allows issuers to lower their cost of investment funding by segregating assets in terms of risk, securitisation is understood as an important risk reduction tool in the spirit of Skarabot (2002) as well as Rosenthal and Ocampo (1988).⁴ The Bond Market Association (2001) considers securitisation “an increasingly important and widely-used method of business financing throughout the world, [given that its] continued growth and expansion ... [generates] significant benefits and efficiencies for issuers, investors, securities dealers, sovereign governments and the general public.” Both mounting competitive pressure over client deposits and a notorious squeeze on interest spreads have led banks to the employ securitisation as a vehicle for balance sheet management. Frequently, this involves more complicated financial structures of packaging the risk of bank assets. The complexity of these structures is rooted in regulatory requirements for insulating investors against a multiplicity of impending risks arising from credit default (*credit risk*), an adverse movement of market prices (*market risk*) and the inability of the issuer of the security to honour scheduled payment obligations to investors (*liquidity risk*) in the wake of a securitisation transaction. By

⁴ See also Leland (1998) and Frankel (1991).

convention, these risks are managed by the originating institution on an institutional basis with the backing of the institution's equity base. However, as financial institutions have faced additional complexity in securitised asset pools with few uniform characteristics, maintaining investor confidence is rendered difficult in the quest for external funds, as banks operations need to cater to various stakeholder interests in financial intermediation at the same time. Doing so will become imperative if banks can use securitisation as a prime asset funding tool to reduce both risk and regulatory capital requirements.

Generally, mortgages and receivables are the most common asset classes issuers transfer to special purpose vehicles (which issue securities to refinance the purchase). Although securitisation has been traditionally used by commercial banks to finance these simple, self-liquidating assets such as mortgages, bank loans and consumer loan receivables, it is now also used for infrastructure and project finance. Besides securitising a wide variety of bank loans, including short-term commercial loans, trade and credit card receivables, auto loans, first and second mortgages, commercial mortgages and lease receivables, banks have also turned to small business loans and middle-market commercial loans as suitable for securitisable reference portfolios. The evolution of securitisation has produced two prime asset classes that serve as underlying collateral. Apart from structured leasing and project finance, alternative means of external investment finance⁵ vie for the attention of firms, whose credit standing influences their mode of funding, such as small and medium-sized companies (SMEs)⁶. Whereas the securitisation of corporate and sovereign loans, auto loans, credit card receivables, project finance or individualised lending agreements and alike (Investment Dealer's Digest, 1997; Standard & Poor's, 1996) are categorised as asset-backed securities (which is also the generic term for securitised assets irrespective of their type), private and commercial mortgages are called mortgage-backed securities (MBS)⁷.

⁵ Similarly mezzanine capital, equity finance and corporate bonds are other popular means of external finance with comparable structural properties.

⁶ See also Müller-Stewens et al. (1996).

⁷ See also Zoller (2001).

1.1 Definition of asset-backed securities

Over the last 20 years the market for asset-backed securities has been growing steadily, swelled by many new heterogeneous issuers.⁸ An ABS transaction is a structure finance product, where receivables from a designated asset portfolio are securitised in order to create balance sheet liquidity (Bayerische Landesbank, 2000). In contrast to the U.S., where the market for ABS has been an established method of structured finance had a longstanding tradition since the first half of the 1980s⁹ (Klotter, 2000), European ABS only began to display dynamic growth since the mid-1990s, even though *Pfandbrief* structures¹⁰ (mortgage-backed securities) by German issuers have been an established method of securitising a homogenous reference portfolio for more than two centuries.¹¹ Especially since 1995 securitisation has seen dramatic changes as a technique of asset funding asset-backed securitisation (ABS) has been used by many in the financial service sector as well as corporations to achieve a more efficient use of capital and return on equity (Bär, 1997; Laternser, 1997). At the end of 2000 the ABS market had grown six times its size in 1997 (Walter, 2000), which reflected the growing wish of issuers to parcel assets into portfolios to structure stratified debt claims issued to capital market investors.

The strong increase in issuance and trading of ABS are often attributed to three causes, i.e. issuer's desire to manage risk beyond what would be possible through portfolio diversification, balance sheet restructuring (i.e. to shore up the quality of the balance sheet) and regulatory capital relief, particularly against the backdrop of weak equity markets and stronger performance of fixed income markets (Burghardt, 2001).¹² By the end of 2001 bank-sponsored loan securitisation alone involved over U.S.-\$200 billion in outstanding securities worldwide,¹³ whose volume accounts for roughly 20 percent of the aggregate credit activities of their sponsors.

⁸ This observation relates to a greater range of geographical and industrial diversity.

⁹ the first asset-backed securitisation issue in its modern form was completed by Sperry Corporation, which issued computer lease backed notes in 1985 (Kendall, 1996).

¹⁰ See also Böhringer, Lotz, Solbach and Wentzler (2001).

¹¹ the first *Pfandbrief* instrument was created by the executive order of Frederick the Great of Prussia in 1769 (Skarabot, 2002; Anonymous, 1999).

¹² See also Fabozzi (1997).

¹³ See also Deutsche Bank Global Markets Research (2001).

As ABS transactions help issuers to improve their returns through off-balance-sheet financing and longer-term securities (Bhattacharya and Fabozzi, 2001; Fabozzi, 1996), this type of securitisation has been and continues to be a popular funding source for many financial institutions and corporations. ABS is particularly appealing to firms who have failed to receive an investment-grade rating or no rating at all, as a securitisation of future cash flows is covered by various structural provisions for the issuer to receive an investment-grade rating on the transaction. Securitisation enables issuers with a sufficiently high level of balance-sheet assets to transfer future cash flows generated from operations to a special purpose vehicle (SPV), which refinances this acquisition of assets by means of issuing debt securities to capital market investors (Andersen Consulting, 2001).¹⁴

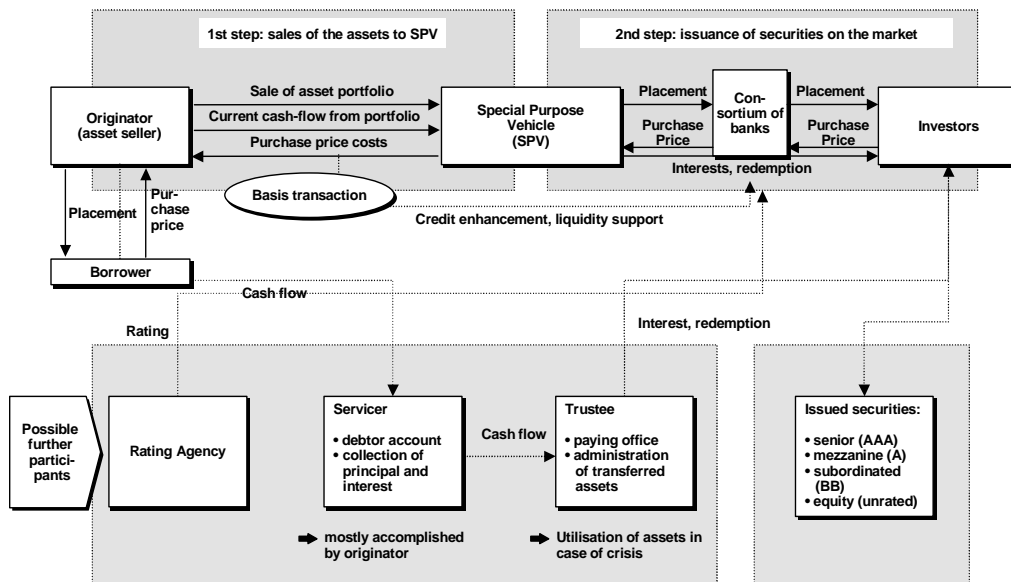


Fig. 1. Structure of an ABS transaction

Under an ABS transaction selected receivables (assets) are packaged together into a pool and sold by the originator to a special purpose vehicle (SPV). The SPV refinances the pool by issuing tradable commercial paper secured by the assets (Bayerische Landesbank, 2000). An ABS structure allocates proceeds generated from an underlying collateral of receivables (asset claims) to a prioritised collection of securities issued to capital market investors in the form of

¹⁴ A number of sectors of the economy, such as the automobile, real estate, and credit card lending industries that require large amounts of medium- to long-term capital owe their development to the growth of the asset-backed securities market. The average maturity of their loan portfolios closely match the average investment horizon of

so-called *tranches*. This allocation of proceeds from a reference portfolio also extends to the distribution of losses, which the issuer of a securitisation may incur until the transaction reaches the designated maturity date. Individual security mechanisms, so-called liquidity and/or credit support, offer protection against bad debt loss. Asset-backed securities with first class ratings are particularly marketable.

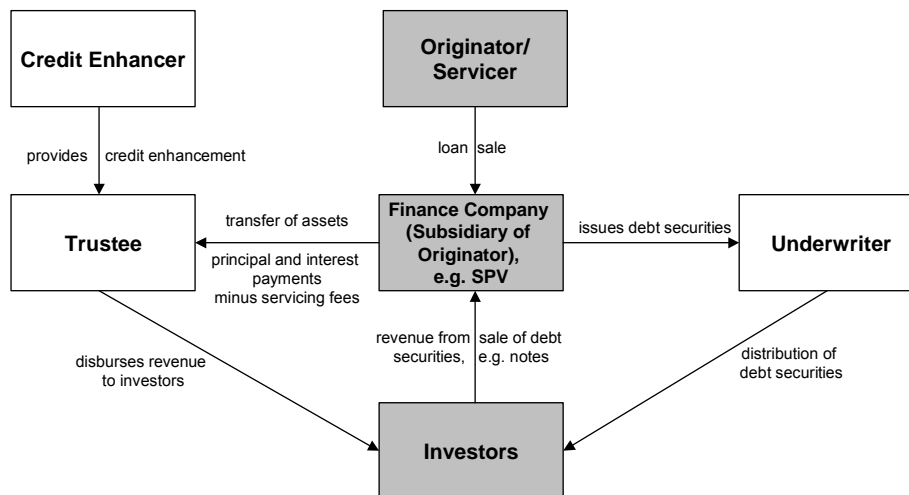


Fig. 2. *Simplified structure of asset-backed securitisation (ABS)*

Asset-backed securities (ABS) are usually backed by a portfolio of a large number of homogenous receivables. ABS is a modern form of corporate financing and can be considered a substitute for classical credit. Financial institutions resort to ABS primarily as a funding tool to increase the issuer's liquidity position and to support a broadening of lending business without increasing the capital base. Besides being a source of more competitive total weighted funding costs, ABS is not only used as a funding instrument, but also corporates and banks, the two most important types of ABS issuers, often manage their balance sheets and diversify their assets by repackaging the cash flows of their asset portfolios (Schwacz, 1997).

such structured finance transactions such that issuers can afford to dispense with compensatory provisions for interest rate mismatches, etc.

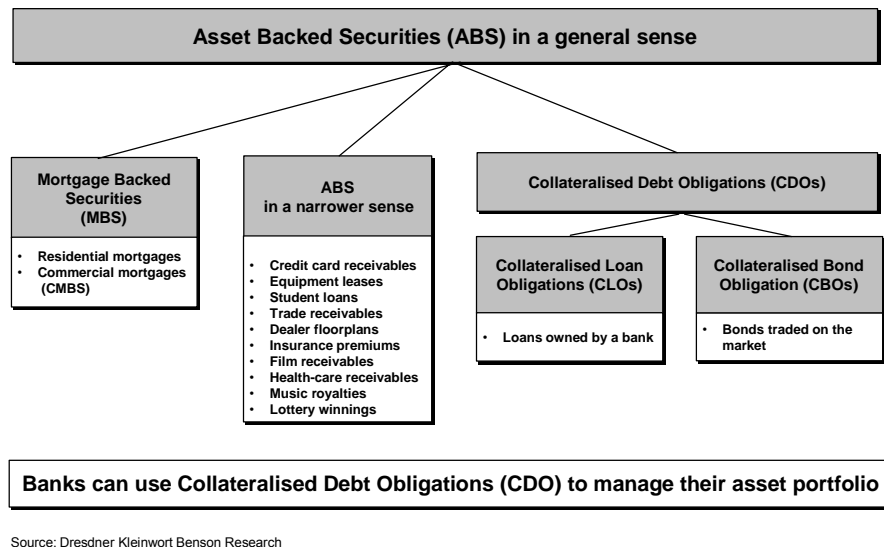


Fig. 3. *Classification of asset-backed securitisation (ABS)*

1.2 Definition of collateralised debt obligations (CDOs)

As a result of recent favourable regulatory changes, structured finance has evolved into a viable and rapidly advancing sector especially in Europe. One type of asset-backed security especially has put securitisation on the agenda of banks and other financial service providers across the world –collateralised debt obligation (CDO). In a collateralised debt obligation (CDO) structure (Fabozzi and Goodman, 2001), the issuer repackages (corporate or sovereign) debt securities or bank loans into a reference portfolio (the *collateral*), whose proceeds are subsequently sold to investors in the form of debt securities with various levels of senior claim on this collateral. The issued securities are structured in so-called *senioritised* credit tranches, which denote a particular class of debt security investor may acquire when they invest in a CDO transaction. The *tranching* can be done by means of various structural provisions governing the participation of investors in the proceeds and losses stemming from the collateral. Subparticipation is one of the most convenient vehicles for attaching different levels of seniority to categories of issued securities, so that losses are allocated to the lowest subordinated tranches before the mezzanine and the senior tranches are considered. This process of filling up the tranches with periodic losses bottom-up results in a *cascading effect*, which conversely applies in the distribution of payments from collateral by the issuer. Both

interest and losses are allotted according to investor seniority. Thus, the prioritisation of claims and losses from the reference portfolio guarantee that senior tranches carry a high investment-grade rating (triple-A or double-A rating), provided sufficient volume of junior tranches have been issued to shield more senior tranches from credit losses.¹⁵

A broad categorisation of CDOs has been proposed by Herrmann and Tierney (1999) as well as by Duffie and Gârleanu (2001). The classification of CDOs depends on possible variability in the valuation of the collateral ex post the issuance of securities. In *market value* CDOs (see Fig. 4 below) the allocation of payments to the various tranches depends on the marked-to-market returns on the reference portfolio underlying the transaction. Hence, the performance of this type of CDOs is strongly influenced by the trading acumen of asset managers, who are required to maintain an *equity cushion* between the market value of the reference portfolio (“the collateral”) and the face amount of the outstanding debt securities backed by the underlying collateral. Once the reference portfolio falls in value below an agreed trigger point, asset managers are obliged to pay down any liabilities by means of an early settlement of collateral assets. Asset managers have considerable discretion in actively trading the collateral both to take advantage of relative value opportunities and to realise capital gains in reaction to an evolving credit outlook of the collateral portfolio. This trading-based early amortisation feature of market value CDOs represents a form of essential credit enhancement, i.e. the discretion of active trading does mitigate possible default risk borne by investors. The market value form of CDOs is generally applied in cases of a distressed reference portfolio (collateral) of bonds or loans such that the credit and trading expertise of the originator of these assets might provide grounds for arbitrage gains (see *arbitrage CDOs* below) from the differences in prices between the distressed assets on the bank books and their aggregate valuation when bundled in a reference portfolio underlying the securitisation.

As opposed to market value CDOs, *cash flow CDOs* (see Fig. 4 below) represent a more common form of structured finance in this area, where the value of issued debt securities (various prioritised tranches) and their settlement are contingent on collateral distress only, i.e. expected and unexpected losses from the reference portfolio. By definition, proceeds generated from the reference portfolio are sufficient to service liabilities, i.e. debt securities backed by the assets, over the life of the transaction. These payment liabilities to investors are

¹⁵ This aspect warrants particular attention in determining the state-contingent pay-offs of investors in an

exposed to default risk resulting not only from the amount and timing of default but also from the degree of prepayments or early amortisation of assets in the underlying reference portfolio, which impose uncertainty on expected investor returns (Paul, 1994). Fluctuations in the market value of the collateral pool do not affect the valuation of the transaction and the payment mechanism as the collateral assets of cash flow CDOs tend to be relatively static (Fabozzi and Goodman, 2001), i.e. assets are acquired or held and issuers have little discretion in trading these assets. Cash flow CDOs are usually repaid by way of bullet payments (see Appendix II – ABS payment structures), which require a reinvestment period for cash collected from the underlying reference portfolio. Moreover, as commercial bank loans are not regularly repaid, e.g. mortgage loans or auto loans, there is no question of regular retirement of CDOs like pass-throughs in the mortgage market. Since most CDOs are cash flow deals, analysis of the CDO market will concentrate on these such that the trading behaviour (as it would apply in *arbitrage CDOs*) can be ignored.

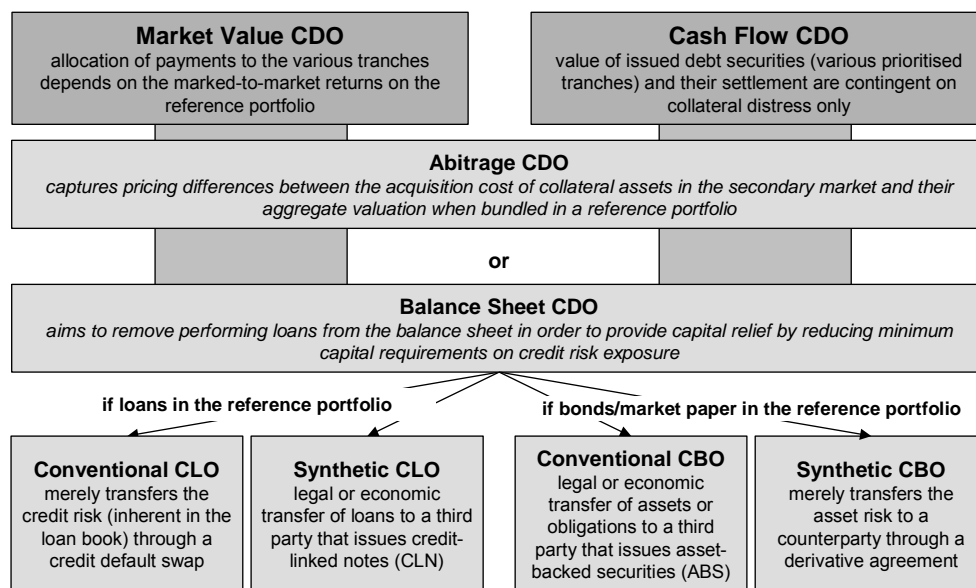


Fig. 4. *Classification of collateralised debt obligations according to the types of securitisation*

2 ASSET-BACKED SECURITISATION – MOTIVATION AND ADVANTAGES OF COLLATERALISED DEBT OBLIGATIONS (CDOs)

The development of CDOs is closely associated with imperfections in capital markets, the management of credit risk exposure, the acquisition of an alternative method of asset funding and the illiquidity of asset claims held by banks due to an inherent absence of transparency. While securitisation is not an omnipotent antidote to remedy all these shortcomings and frictions in capital markets, it serves as a flexible vehicle to mitigate the efficiency reducing effect of these factors through a creative application of structured finance, via a reduction in regulatory capital or an improvement of asset liquidity. Otherwise, the presence of perfect information would render obsolete the benefits gained from CDOs as the administrative cost of structuring and marketing such a securitisation transaction would have no counterbalancing benefit.

These benefits from the securitisation of bonds and bank loans have resulted in different forms of CDO structures that aim at eradicating allocational inefficiencies emanating from certain properties of bonds and bank loans. An *arbitrage* CDO (see Fig. 4 above) is a popular form of securitisation structure undertaken by investment banks to capture pricing differences between the acquisition cost of collateral assets in the secondary market and their aggregate valuation when bundled in a reference portfolio underlying the sale of the associated CDO structure. An *arbitrage* CDO will be undertaken once netting this marginal pricing difference by management fees yields profit. This arbitrage incentive applies to debt securities whose securitisation has either a cash flow or market-value structure. While an arbitrage CDO suggests mispricing in imperfect capital markets, a *balance sheet* CDO (see Fig. 4 above) specifically aims to remove performing loans from the balance sheet in order to provide capital relief by reducing minimum capital requirements on credit risk exposure through a subsequent securitisation. Duffie and Gârleanu (2001) point out that such securitisation might also increase the valuation of the assets through a possible increase of liquidity. If the collateral portfolio of this asset-backed securitisation is made up of corporate and/or sovereign loans, such a *balance sheet* CDO is called a collateralised loan obligation (CLO), i.e. the securitisation of corporate and sovereign loans (Eck, 1998; Kohler, 1998).

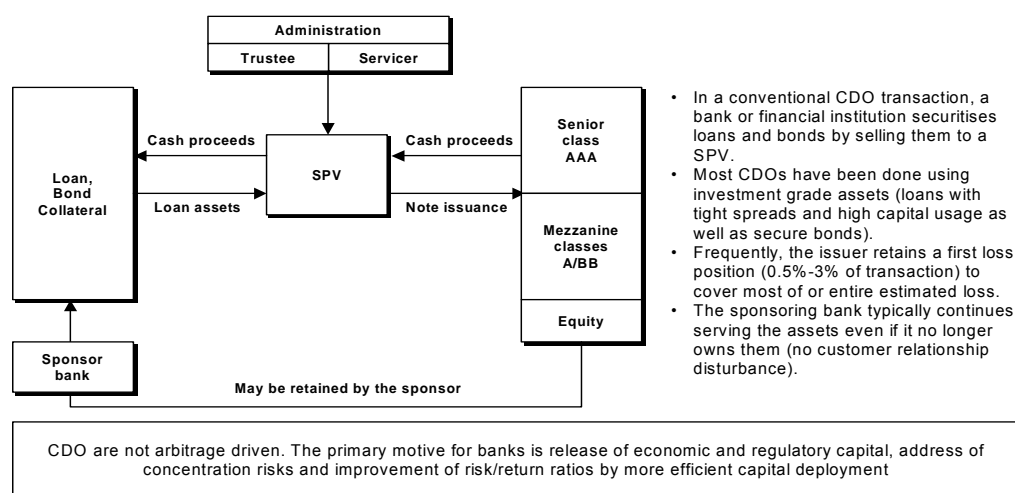


Fig. 4. *Classification of a (conventional) collateralised debt obligation (CDO)*

Issuers administer most CLO transactions in order to release risk-based capital and improve regulatory capital ratios rather than to make most efficient use of their capital. Such restructuring frequently allows the issuer to adjust the composition of the loan book, for example the granularity of debtors and credit risk concentrations. Unfortunately, large credit portfolios with a substantial degree of illiquidity defy an outright loan sale as banks are sure to incur substantial cost in negotiating technical details of internal credit risk assessments, barring any irritation in the client relationship due to changes in loan servicing.

CLO transactions are a subset of CDOs since the issuer combines a selection of loans of similar characteristics to create credit-enhanced claims against the cash flow proceeds originating from this loan portfolio, which are sold as securities to investors. Since investors in a CLO transaction acquire a claim on the cash flow generated from a collateral pool, a loan securitisation provides a contractual repartition of the interest (transmission mechanism) generated from underlying loans, i.e. interest income and repayments of principal are allocated to prioritised tranches of securities. Credit losses from possible loan default are first assigned to the most junior claimants of the collateral portfolio before senior claimants are affected. Both interest and losses are allotted according to investor seniority. This allows banks to securitise a significant portion of their loan books to capital market investors who do not participate directly in the primary lending markets due either to contractual restrictions (e.g.

investment funds, pension funds and other institutional investors), statutory covenants (e.g. insurance companies) or market barriers to entry (e.g. private investors).

In conventional loan securitisation, a sponsoring bank or another type of issuer forms a special purpose, bankruptcy-remote¹⁶ vehicle (SPV), commonly referred to as a securitisation conduit. This conduit purchases loans from the sponsor of the transaction or from others, or might even originate the loans directly, and funds these loan purchases, or originations, by issuing various classes (tranches) of asset-backed securities with different levels of seniority and asset rating as a structured claim on the underlying loan pool. Most of conduit's debt securities are issued to public investors, who are contractually bound to demand senior securities of highly rated investment grade. Consequently, the transformation process of loan securitisation via CLO effects a redistribution of credit risk such that the structured claim on a non-investment grade collateral pool could be enhanced to an investment-grade product.

While precise motivations for the completion of CLO transactions vary, the securitisation of loans allows for greater flexibility of originators in managing their portfolio and in slimming their minimum capital requirement on the loan book. Active credit portfolio management is frequently cited in this context as sponsors of CLOs adopt a comprehensive lending process that culminates in securitisation as an expedient means of refinancing (see Fig. 5 below). Hence, banks are able to improve risk-adjusted efficiency after removing risky assets off-balance from the loan book by redeploying freed-up resources in higher-yielding and/or more diversified investments.

¹⁶ The SPV is bankruptcy remote, as all the total amount of outstanding debt securities is collateralised by third-party guarantees as well as government debt or other highly rated debt securities acquired by the SPV upon receipt of proceeds from securitisation.

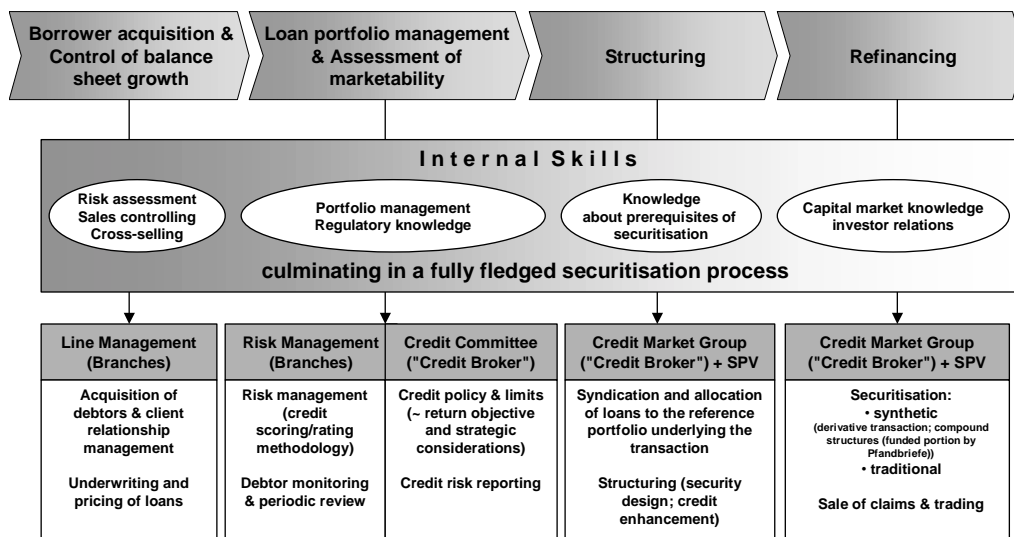


Fig. 5. Organisational structures of active loan portfolio management

2.1 General benefits from asset securitisation

Issuers reap significant advantages that emerge from securitising assets. From an economic standpoint, securitisation was principally motivated by the ability of financial institutions and corporates to convert illiquid assets into tradable debt securities, which primarily served as an arbitrage tool, flaunting the gap between internal default provisions and external risk assessment methods of stringent regulatory requirements by offering “regulatory overcharged” asset holdings/exposures to capital market investors.

Hence, securitisation goes a long way in advancing the following objectives:

- (i) curtail balance sheet growth and ease the regulatory capital charge (by moving assets off their books) and/or
- (ii) reduce economic cost of capital as a proportion of asset exposure (by lower bad debt provisions through risk transfer).

Most commonly, a balanced mix of both objectives and further operational and strategic considerations determine the type of securitisation – traditional or synthetic – in the way financial institutions envisage securitisation as a method to shed excessive asset exposures.

Many issuers move assets off their balance sheet, using special purpose vehicles known as conduits, in the wake of traditional, true-sale transactions in order to exploit anomalies in the regulatory system governing securitisation. Nonetheless, also the mere transfer of asset risk through derivative transactions (synthetic transactions) can establish an asset-backed security that qualifies for a top rating and enables the issuing party to raise funds at a very attractive rate, while freeing up capital and retaining customer relationships and servicing revenues.

2.2 Regulatory capital relief

In order to obtain capital relief and gain liquidity by exploiting regulatory capital arbitrage opportunities, CLOs have evolved into an important balance sheet management tool. Thus, the argumentation about the meaning of securitisation extends to balance sheet issues. The use of CLO transactions is endorsed by regulatory incentives as the securitisation of loans caters to the bank's interests in resolving long-standing problems of avoiding "intermediation taxes", such as reserve requirements. Excessive capital requirements are contrary to bankers' interests as they drain resources from the loan book. Securitisation bears the possibility to moderate the adverse effects of imperfections in capital markets on the loan book of banks. That is, loan securitisation exposes those provisions mandated by financial regulators, which result in regulatory constraints beyond what should be deemed economically sensible based on individualised risk assessment.

2.3 Refinancing and private economic rents

Banks are adept at originating credit exposures due to their long experience of assessing credit risk and strong client relationships.¹⁷ The benefits from such relationships do not as much result from economic rents in revolving loan commitments as they rather allow improved debtor screening, which leads to higher margins from loan origination.¹⁸ As banks are required to maintain regulatory capital against credit losses of their loan books, additional loans on their balance sheet would, however, result in diminishing marginal benefit. Hence, the sale of a

¹⁷ These relationships might yield informational rents as shown by Elsas and Krahnen (1998) and Elsas (2001) in the context of German banking.

¹⁸ Unfortunately, the ease of lending coupled with ready and cheap access to liquidity results in a recipe for disaster as banks achieve suboptimal outcomes from holding loans in the long-term.

portion of the loan portfolio allows banks to lower their regulatory capital requirements. Consequently, issuing banks can use their capital base more efficiently to support credit business, as attractive lending opportunities can be addressed without incurring balance sheet growth. From a broader economic and systemic perspective, loan securitisation does not only contribute to the sustainability of client relationships, but it also leads to an increased availability of credit finance at lower cost in the primary lending markets. According to the *European Securitisation Forum* (The Bond Market Association, 2001) efficient securitisation markets help to reduce disparities in availability and cost of loan finance, as the credit extension function of individual banks is conditioned on the pricing and valuation discipline of broader capital market systems. Consequently, financial institutions that engage in securitisation arguably promote the efficient allocation of capital and allay exposure to credit risk, whilst mitigating systemic risk throughout the financial system as a whole.

The economic feasibility of securitisation as vehicle of capital market efficiency is explained by the incentives of issuers to expand the scope of activity without diminishing returns. On the one hand, with controlled balance sheet growth of the loan book freeing up credit lines, banks can broaden their services by stirring their increased activity from traditional bank lending towards fee-based services. Improvements in long-term profitability might ensue without reliance on the generation of profits from regulatory arbitrage. On the other hand, their imbeddedness in broader capital market systems allows borrowers to profit directly from increased supply and lower cost of funds. However, both banks and borrowers will only profit from the micro- and macro-economic benefits associated with loan securitisation unless regulators avoid imposing capital adequacy requirements that curtail the beneficial application of securitisation techniques to fund their lending operations efficiently.

2.4 Regulatory arbitrage

The current regulatory regime of the Basle Accord imposes the same risk-based capital charge on differently rated loans. Such a broad treatment of credit risk has led to a problematic outcome. Under the current regulatory framework the prime objective is to shed high quality but low yielding loan claims (for whom opportunity cost of regulatory capital is higher than with higher yielding assets) in order to reduce the banks capital requirements. Since it is less efficient for banks to retain highly rated loans on the loan book due to their tight spreads

relative to the regulatory capital charge (unlike high-risk loans with a margin closer to the same capital charge), most balance sheet CLO transactions are collateralised by investment grade loans in the reference portfolio.¹⁹ The result would appear to be a continuous drain of high-quality loans from the loan book, which increases the probability of bank insolvency.

The new proposals for the revision of the Basle Accord remedy this shortcoming through the implementation of discriminatory risk-weightings across rating categories. Under these approaches risk weights will be more closely related to loan grades in the loan book. If the broad-brushed regulatory treatment of loans disappears, banks will increasingly resort to non-investment loan assets to support their CLO transaction and by doing so, they will put a premium on an adequate allocation of as credit cover (such as credit enhancement) for first losses arising from the transaction. Consequently, the incentive to securitise non-investment grade loans adds topical significance to the issue of credit enhancement²⁰, as the differences between collateral (reference portfolio) quality and desired structured rating is expected to widen in the future. The Basle Committee on Banking Supervision (2002) defines credit enhancement as a contractual arrangement in which the bank retains or assumes a securitisation exposure and, in substance, provides some degree of added protection to other parties to the transaction. Credit enhancements may take various forms [...].”

However, the example of credit enhancement as credit risk coverage illustrates that loan securitisation does not cast banks free from what is generally considered their traditional function in financial intermediation, namely to measure, assume and manage credit risk. Even though the improvement of internal credit risk management is a frequently cited advantage of CLOs, by common consent, securitisation can potentially carry as much or more credit risk exposure as traditional lending, if banks pursue the mitigation of loan portfolio risk in an unbalanced and single-sided fashion without consideration of concentrated credit risk and systemic risk of asset correlation. For all practical purposes, perennial credit risk does not suggest that the administration of a securitisation transaction does not qualify as a remedy for

¹⁹ As the degree of collateral retention in the form of credit enhancement is determined by the difference of the pool quality and the desired rating of the securitisation transaction, most balance sheet CLOs have been collateralised by investment grade loans.

²⁰ Depending upon the nature of a transaction and its underlying asset class, the asset pool may need to be supported by one or more types of credit and/or liquidity support (“credit enhancement” and “liquidity enhancement”) in order to attain the desired credit risk profile for the debt securities being issued. Such enhancements are commonly derived from internal sources, i.e. they may be generated from the assets themselves, or are supplied by a third party.

issuers caught in the throes of mounting pressure over diminishing asset returns or the growing plight of excessive regulatory burdens, i.e. it does not serve to resolve systemic issues of credit risk management or inefficiencies in loan origination and financial intermediation *per se*. To the contrary, it rather *rewards* the general capacity of superior credit risk management as an amplifier of efficient financial intermediation.

2.5 Interest risk and liquidity management

Notwithstanding the prohibitive consequences of ill-guided regulatory efforts and inhibiting effect of insufficient internal credit risk management, CLO transactions also offer the possibility of balance sheet restructuring for purposes of an improved management of interest rate risk. As banks decompose the loan function in the course of securitisation, interest rate sensitivity of the loan book is reduced in its wake, as the restructuring of credit exposure entails improved resilience to financial distress from unanticipated interest rate changes. Given that the securitisation of loans alters the composition of the loan book, lower provisions for regulatory capital to cover expected default losses from the reduced book balance permit the fundamental value of the loan portfolio to appreciate. As restructuring engenders a significant reduction of large exposures to credit default risk or sectoral concentrations, improved financial ratios are not only confined to the issuer perspective. As investor in securitisation transactions, banks are able to augment their portfolios with different asset types from diverse geographical areas (Basle Committee, 2001).

Finally, loan securitisation can also serve as a means of injecting liquidity in loan books of banks. Despite the advantages associated with a growing sophistication in lending business, since 1980 declining margins have found banks militating towards fee-based services in approaching capital markets by offering derivatives and advisory services as well as traditional banking products, such as loans, credit facilities and trade finance.²¹ Banks quickly realised that there is much to be gained by acting as intermediaries between corporate clients and capital market investors in expanding capital markets fuelled by the growth of institutionally managed funds.

²¹ See also Anonymous (1998), "CLOs: every bank must have one" International Structured Finance, September.

3 THE INFORMATION ECONOMICS OF SECURITISATION

The mechanics of bank-based loan securitisation lend themselves to models of information economics, as the sale of selected asset claims by issuers raises issues involving concepts of asymmetric information and decision-making under uncertainty. As much as the non-diversifiable idiosyncratic risk inflicts some degree of illiquidity on the reference portfolio of bank loans, the fundamental motivation of loan securitisation substantiates this notion. At bottom, the conduct of CLOs garners issuers with a range of options in improving the credit quality of their loans by means of incorporating structural and credit enhancement, such that investment grade debt securities can be issued to capital markets.

However, private information about the credit quality of loans restricts the scale of securitisation in view of the way information asymmetries adversely impact on the marketability of bank loans. Illiquidity fuels the most intuitive, though paradox, objection to an efficient securitisation of loans, notwithstanding the fact that the complete absence of asymmetries would render the securitisation of illiquid assets unprofitable, as it scuppers efforts to diversify bad risk across a selected asset pool. Loans are non-standardised, *non-commoditised* claims due to intransparent nature of the lender-borrower relationship.

For illiquidity trims the market value of asset claims, the securitisation structure of a CLO could mute such adverse effect on the value of the reference portfolio. By extension, the securitisation increases the average value of the reference portfolio to a selling price beyond what would be deemed necessary to at least offset the management cost associated with a securitisation. Hence, the detrimental effect of illiquid assets on the bank balance sheet can be extenuated by virtue of securitisation structures. However, their efficiency-improving effect is conditioned on the “capitalisation” of the financial system of the respective jurisdiction, which arguably signals the importance of market transparency of borrower fundamentals in external finance (e.g. relationship lending, etc.). In general terms, the economic effects induced by *information asymmetries and illiquidity of the securitised collateral portfolio will inevitably determine the security design of the CLO transaction*. Generally speaking, market implications of private information, i.e. adverse selection and moral hazard, as well as trading costs, are the sources of illiquidity, which impose limits to the degree of securitisation of loans.

3.1 Adverse selection

Since the presence of asymmetric information qualifies as an element of uncertainty, investors assume the existence of adverse selection to occur in the spirit of the *lemons market* à la Akerlof (1970).²² Such beliefs are compounded in their effect on asset pricing of securitisation transactions by the attendant degree of private information associated with loans, amid the apprehensive stance of banks towards disclosing their credit risk assessment methodology applied in assessing the creditworthiness of debtors.

Given some uncertainty about the true value of the credit quality of the underlying reference pool of loans, rational investors anticipate being misled by issuers of a securitisation transaction, who are sure to be in a better position to judge the true credit quality of the reference portfolio as underlying collateral. Consequently, investors will merely offer a price (average market price) that is on average below the true market price of the reference portfolio under symmetric information. Thus, the estimated value of such private information imposes a *lemons premium* on the issuer, who could either retain the reference portfolio of loans or sell it by means of securitisation. Even though issuers seek to counteract this effect by bundling assets and then further tranching these bundles before they are sold in capital markets as debt securities, the degree of private information is sanctioned by investors. Conversely, the *ability of the issuer to establish maximum transparency about asset quality bears out the discount investors would command as compensation* in return for uncertainty about the true value of the reference portfolio.

CLO transactions cannot exhaustively guard investors against the danger of adverse selection arising from the illiquidity of bank loans. In cognisance of the agency cost of adverse selection issuers of CLOs could suppress the pecuniary charge associated with the *lemons premium* by soliciting a higher valuation of the reference portfolio. They retain a claim in the performance of the collateral as a sign of asset quality. Since adverse selection can only arise in relation to the downside risk of default risk, the tranching and the allocative mechanism of losses in the structure of a CLO transaction bears critical importance, as they signal the absorption of loan default risk within the transaction. Generally, issuers would opt for a combination of both (i) the concentration of credit risk of the underlying reference portfolio in a *structural* enhancement (see Fig. 6) and (ii) the tranching of the debt securities issued to investors. In the context of subparticipation, the so-called *loss cascading* mechanism ensures that small junior

tranches find most of the default risk allotted to them, leaving hardly any credit risk to large senior tranches, which could be sold to investors without suffering from price discounting due to adverse selection.

In order to achieve high ratings for the senior securities, the conduit must commit to obtaining *credit enhancements*, which insulate senior securities from the risk of fluctuating payment patterns and excessive default on the underlying loan pool. Credit enhancement is defined as a contractual provision (such as asset retention) to reduce default loss from the reference portfolio eventually borne by the investor. For instance, the sponsoring bank of the CLO transaction would retain the most junior tranche, which attracts the highest *lemons premium* from adverse selection, as *first loss position* (credit enhancement), and possibly accepts further stakes in subsequent tranches of higher seniority (*second loss position*). In return for providing the credit enhancements, on the one hand, as well as the loan origination and servicing functions, on the other hand, the sponsor of the transaction appropriates whatever return is to be had from the securitisation net prior claims by issued debt securities. That is, the *gain from securitisation lies in the residual spread between the yield from underlying loans and the interest and non-interest costs of the conduit, net of any losses on pool assets covered by credit enhancements*.

Due to the inherently illiquid nature of the loan pool and the high risk associated with the most junior tranche as the *first-loss piece* (“equity note”), the marketability of such *unrated* credit enhancements is limited (Herrmann and Tierney 1999). However, so-called interest participation has allowed issuers to possibly trade credit enhancements. The mechanism of interest subparticipation has been devised by issuers to reduce the illiquidity of the first loss piece of securitisation transactions in order to ameliorate the marketability of the credit enhancement held as an equity tranche by the sponsor of the transaction. Payments out of available interest generated from the overall reference portfolio are partially used to offset first losses of noteholders of the first loss position. By doing so, the principal amount of the outstanding first loss piece is reduced through the amount of interest subparticipation, in an amount equal to the allocated realised losses. Even though the claim of first loss noteholders to the interest subparticipation is an unsecured claim against the issuer, the economic rationale behind this concept is regulatory capital relief, as no capital has to be held against interest income under the current regulatory standards. Since the first loss piece achieves the rating of

²² See also Calvo (1998) for a detailed discussion of the “lemons problem” in the context of financial contagion.

the issuer, the placement of credit enhancement under interest subparticipation is cost efficient. However, the capital efficiency derived from such an arrangement is associated with substantial institutional risk in view of potential future changes in the regulatory framework, which has hitherto not given clear guidance on the capital treatment of the concept of interest subparticipation in the provision of credit enhancement. The new proposal for a revision of the Basel Accord indicates the possibility that the first loss position will most likely be subjected to a full deduction from capital in this thinly regulated area of structured finance. Given present regulatory uncertainty as to the future capital treatment of structural provisions, such credit enhancement and the interest subparticipation, it is worthwhile incorporating a regulatory call of the first loss piece, which allows for the possible restructuring and subsequent sale of the most junior tranche to capital market investors.

Nonetheless, retention of credit enhancement – as a sign of willingness to shoulder significant credit risk – does not only allow the sponsor to allay adverse effects of private information associated with asset illiquidity. By the same token, credit enhancement also furnishes investors with additional comfort that the issuing bank has proper incentives to maintain effective loan servicing.

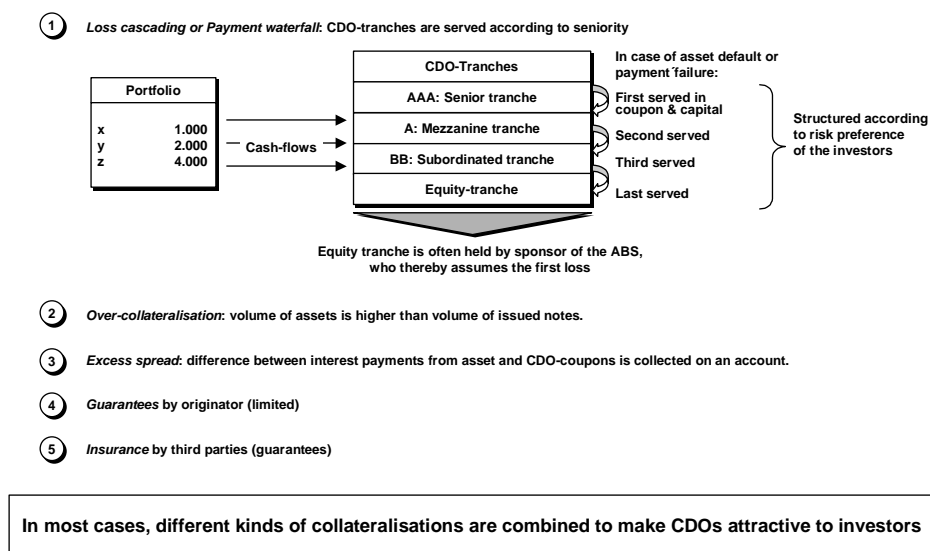


Fig. 6. *Classification of structural enhancement – various forms of structural enhancement*

Although the asset-backed (ABS) market has increasingly resorted to new structural features, such as aforementioned credit derivatives and sub-ordination for the longest time (List,

2001)²³, a great number of transactions still rely on *third-party support* in providing the payment of debt (see Fig. 6 above). This obligation might be a letter of credit (LOC), a standby bond purchase agreement, an irrevocably revolving credit agreement, a well-kept agreement or a guarantee (Deutsche Bank Global Markets, 2001). In the European context, typically insurance companies, swap providers or liquidity providers are the sort of agents that tend to commit themselves to *third-party obligations* as credit enhancements. By definition, credit and structural support in the form of (bond) insurance or guarantees, represent one of the key features in the security design, which distinguish asset-backed debt securities from unsecured or plain vanilla bonds.

Nonetheless, since credit enhancement remains to be an issue of great uncertainty, traditional devices of credit support, such as letters of credit and cash collateral, have recently been substituted for *subordination* with the well-known issuers only. Despite the growing attention devoted to subordination, many smaller issuers used to be confined to monoline policy in the form of the aforementioned insolvency insurance. The beauty of *hard insurance*, though admittedly more costly to the issuer, feeds on the capacity to reduce possible downward risk emanating from the deterioration of the loan pool or servicer quality (third party effect). Recently, even non-investment grade issuers have begun to rely on *subordination as a means of substantiating credit enhancements*, in order to acquire the right to be reimbursed for credit losses in excess of the first loss position (credit enhancement). The *broader application of soft insurance* in asset securitisation confirms a growing preference for subordinating investors' claims on the reference portfolio over third party support mechanisms and establishes an alternative route towards credit support of securitisation transactions. However, the attractiveness of subordination has major implications on the assessment of the implied credit risk in a structured finance transaction in way that reconciles discrepancies between internal credit ratings and external ratings of the loan pool underlying a securitisation transaction. Thus, with issuers militating towards *soft* forms of credit support, *structured ratings are expected to display higher degrees of volatility in the future*.

²³ See also Müller-Stewens et al. (2000c).

In summary, the following types of internal/external credit and liquidity support are possible in a security design of securitisation transactions to protect investors from a deterioration of the reference portfolio underlying the securitisation transaction (see Fig. 6).²⁴

Internal credit/liquidity support:

- senior/subordinated structure and over-collateralisation,
- reserve fund,
- yield spread (excess servicing),
- turboing, and
- commingling.

External credit/liquidity support:

- third-party and parental guarantee,
- bond insurance,
- letters of credit (LOC),
- bank facility,
- cash collateral account (CCA), and
- collateral invested amount (CIA).

A *senior/subordinated structure*, a popular type of internal credit support, represents an over-collateralisation²⁵ of the transaction – funded by the proceeds received from subordinated tranches of issued debt securities – which covers all estimated credit losses incurred by the reference loan pool. As defaults drain the value of the reference portfolio the loss burden is not equally shared amongst tranches. Instead, the subordination scheme allocates some interest proceeds – which would otherwise be distributed to subordinated debt if no distinction were made between tranches in terms of seniority – to be earmarked as payments to senior debt. This payment settlement process to senior and subordinated noteholders as well as third parties requires that any payment to subordinated noteholders is made only unless such disbursement reduces any funds contractually assigned to other creditors, whose credit support the issuer relies upon, to the extent that non-payment of these funds to creditors would jeopardise the issuer's solvency. This provision serves to prevent that payment

²⁴ See also Giddy (2002).

²⁵ i.e. the face amount of the financial asset pool is larger than the security it backs.

to senior investors are prejudiced by any payments made to the subordinated investors. A subordination of payment claims as means of coverage for both credit losses and liquidity shortfalls tends to be *more costly than the acquisition of liquidity protection* from a third party, as subordinated debtholders must be offered a higher interest rate in return for greater exposure to credit risk. Any potential rights of the subordinated noteholders to the underlying asset pool and its attendant revenues – before and after any default of issued debt securities (notes) occurs – further guide the compensation for this excess risk. As opposed to transaction structures that feature credit support from a creditworthy third party a *senior/subordinated structure is less susceptible to a rating downgrade*.

In practice, subordination is characterised by a loss cascading mechanism that involves a senior (or “A”) class of securities and one or more subordinated (B, C, etc.) classes that function as the protective layers for the “A tranche”. If a loan in the pool defaults, any loss thus incurred is absorbed by the subordinated securities. The “A tranche” is unaffected unless losses exceed the amount of the subordinated tranches. The senior securities are the portion of the ABS issue that is typically rated “triple-A”, while the lower-quality (but presumably higher-yielding) subordinated classes receive a lower rating or are not rated.

The use of a *reserve fund* is a popular alternative to a bank facility in senior/subordinated structures in order to finance timely payments on outstanding debt of the securitisation transaction. A reserve fund, a separate fund created by the issuer, guarantees such credit support as it reimburses the trust for losses up to the amount of the reserve (Giddy, 2002). It is often used in combination with other types of enhancement. This form of credit support draws its prime benefit from the permanent coverage of asset losses, as it is required to be sufficiently liquid (held on the issuer’s bank account) to ensure its availability whenever necessary. Moreover, issuers forgo the cost of maintaining a bank facility and incurring interest on any drafts made. Nonetheless, notwithstanding these inherent benefits, the cost associated with its funding, such as bond proceeds or a loan whose accrued interest must be repaid with surplus funds held by the issuer, have to taken into account in benchmarking the reserve fund mechanism with a bank facility. Since the issuer cannot release the surplus unless the reserve fund is sustained at its contractually required size, the risk of a rating downgrade of an issue is mitigated.

The *excess spread*²⁶ from the difference between the cash proceeds generated from the debt issuance on the underlying assets and the repayments on the issuer's assets can also be employed as credit coverage and liquidity support.²⁷ In other words, excess spread represents the net amount of interest payments from the underlying assets after bondholders and expenses have been paid. Most commonly, monthly excess spread is used to cover current-period losses and may be paid into a reserve fund to boost credit enhancement (Giddy, 2002). In the case of so-called *turboing* excess servicing is applied to outstanding tranches as principal. Any excess spread must cover financial shortfall arising from the combination of credit loss, in the worst-case scenario of both prepayments and termination rates on asset claims, and maximum payments to debtholders. Additionally, taxation of any excess spread further reduces the amount available to the issuer. Nonetheless, in some cases a portion of the excess spread might be *trapped*, i.e. it is stricter from being released by the issuer, as it stands to be available for future needs.

In cases where collections of interest and principal on assets are pooled in a general account of the servicer and commingled with its other funds (especially in cases of mortgage-backed securities)²⁸ before these payments are passed on to the issuer of the securitisation transaction (*commingling*), the risk of the servicer to retain such payments in cases of insolvency or bankruptcy poses a persistent contingency on appropriate credit coverage. Based on the legal opinion from the issuer's counsel as to whether the loss of funds would be temporary (liquidity stress) or permanent (credit loss), the availability of sufficient funds to cover credit losses has to be guaranteed. In the move to evade negative implications of commingling as regards credit coverage, any payments received from assets should be redirected to the issuer, such as the SPV. Hence, the amount of funds likely to be drawn into any bankruptcy or insolvency resolution process is minimised.

In addition to internal credit and liquidity supports, also external credit enhancement from a third party represents an alternative means of shielding investors from expected credit loss.

²⁶ The Basle Committee on Banking Supervision (2002) defines excess spread as "gross finance charge collections and other fee income received by the trust or special purpose entity (SPE) minus certificate interest, servicing fees, charge-offs, and other senior trust or SPE expenses. Finance charges may include market interchange fees."

²⁷ A specialised form of excess spread is the so-called *yield spread*, which comprises the difference between the coupon on the underlying assets and the security coupon. As a first defence against losses, excess servicing complements the yield spread, which may be applied to outstanding classes as principal (Giddy, 2002).

²⁸ See also Fabozzi (2000 and 1998), Fabozzi and Jacob (1998), Fabozzi, Ramsey and Marz (2000) as well as Fabozzi and Yuen (1998).

Under a *third-party or parental guarantee* an external party (such as an insurance company, parent company of the servicer/issuer of the transaction, etc.) enters into a contractual commitment to reimburse the issuer for losses up to a predetermined notational amount. Such a guarantee agreement could also be extended to include the obligations of advancing principal and interest to investors in a trustee-like fashion (see Fig. 8) and/or buy back defaulted loans (Giddy, 2002; The Bond Market Association, 1998).

Bond insurance (through surety bonds) can serve as a vehicle of specialised third-party credit/liquidity support. It is provided by a rated *monoline insurance companies* (generated triple-A rated), which guarantees full payment of principal and interest to noteholders of the transaction, as it reimburses the issuer of the transaction for any losses incurred. Even though issuers are able to achieve an “AAA” rating for “insured” tranches, bond insurance is a credit enhancement much less prevalent as a means of credit support in securitisation transactions than subordination due to higher cost. The higher expense associated with this form of credit coverage stems not only from the cost of insurance but also from the requirement of the underlying reference portfolio to be drawn on a loan pool of a sufficient *investment-grade rating* level. In most cases the insurer provides guarantees only to securities already of at least investment-grade quality (that is, BBB/Baa or equivalent). Hence, the insurance-based credit/liquidity support disciplines issuers to carefully balance both the level of credit enhancement needed for a desired structured rating of a designated reference portfolio and their financial capacity to provide such enhancement if they so desire. So monoline insurance tends to require one or more levels of credit enhancement that will cover losses before the insurance policy (Giddy, 2002). Rating agencies quantify the risk posed to the bond insurer by determining the capital charge on the exposure of the reference pool. Only sufficient financial capacity to meet the financial exposure (claims paying ability) merits continuation of the bond insurer’s (i.e. no rating downgrade due to the prospect of failure to maintain the claim-paying ability), whilst the “insured” receivables of a securitisation transaction bought by investors are rated equal to the rating-assessed claims-paying ability of the insurance company (typically triple-A), because the insurance company guarantees the timely payment of principle and interest on the outstanding securities of the transaction.

Letters of credit (LOCs) are the surety bond-equivalent in regards to non-insurance financial institutions are guarantors, where typically banks promise to cover any amount of losses up to

the level of credit enhancement needed for a given portfolio quality of the underlying reference pool of assets.

Third-party guarantees, bond insurance and letters of credit as forms of external credit enhancement expose the security level rating of securitisation transactions to the claims paying ability of the institutions providing enhancement as we need to think of these provisions as pledges of cash in keeping with some guarantor obligations, devoid of actual cash transfer or other payments. Hence, the character of such external credit enhancements does not betray any hint of downgrade risk independent of the actual time-varying loan performance of the underlying reference portfolio.

A *bank facility* represents another possibility of external liquidity support for a securitisation transaction, as the issuer can draw and redraw on the facility as and when needed, with repayment of drawn amounts being made when sufficient funds are held by the issuer of the transaction. Continuity of a *standing bank facility* is only guaranteed if the rights of the facility provider to termination are limited to cases of issuer's bankruptcy, whereby the lender is prohibited from petitioning the issuer into bankruptcy given that any utilisation of the facility does not constitute an act of insolvency. However, under the provisions of a bank facility the issuer ought to be entitled to terminate the facility agreement if the lender's rating is downgraded or, if specially agreed, has been downgraded such that future drawing rights can no longer be guaranteed.

This impediment to third-party risk is obviated by a *cash collateral account* (CCA). In this case, the issuer borrows the required amount of first loss provision (credit enhancement) from a commercial bank only to purchase a corresponding amount of highest-rated short-term (one-month) commercial paper. Unlike in the case of third-party guarantees, CCA represents an actual deposit of cash rather than a pledge of cash only, and, thus, the downgrade risk of the securitisation transaction remains unaffected by a rating change of CCA providers.

Finally, the *collateral investment amount* (CIA) concludes this diverse group of possible forms of credit and liquidity support. The CIA, akin to a subordinated tranche of a transaction, is either purchased on a negotiated basis by a single third-party credit enhancer or securitised as a private placement and sold to several investors. By common consent the attendant benefits of

the CIA lies in asset retention as a form of partaking in portfolio performance (without downgrade risk of guarantor uncertainty) through first loss provision as credit enhancement.

Since *credit ratings* in securitisation transactions reflect the likelihood of full and timely payment of principal and interest to debt holders and expenses of other third parties, rating agencies need to examine whether investors are sufficiently shielded from losses of the underlying reference portfolio and cash flow interruptions or outright defaults caused by delinquencies, defaults and any insolvency of the loan servicer. Mind you that the support of a transaction critically depends on the availability, preference, advantages, and costs to the issuer, as well as on the sophistication of the market. Assignment of a certain *structured rating* to a tranche primarily hinges on whether the rating agency confidently deems the issuer sufficiently fit to ensure full and timely debt service at a level commensurate to the respective default expectations on the debt (see Fig. 7 below). Depending on the quality of any credit support provided by the issuer and the sponsor respectively, external structured ratings are assigned to the various tranches of the transaction.

INFORMATION ABOUT THE ISSUER	INFORMATION ABOUT THE REFERENCE PORTFOLIO ("THE COLLATERAL")
<p>Operational data of the issuer, including financial development, organizational structure, recent development</p> <p>Market competition and market share</p> <p>Credit and termination policy</p> <ul style="list-style-type: none"> • Overview of departments and business practices • Experience of employees • Insolvency procedures, depreciation <p>Portfolio management</p> <p>Realisation of assets/claims (billing)</p> <p>Illustration of the life-cycle of bank assets/claims (including IT systems and infrastructure)</p> <p>Depreciation policy</p> <p>Overview of dilutions including description of the causes for dilution</p> <p>Cash management</p> <p>Concentration of the portfolio (granularity) and management of clusters</p>	<p>Historical information of collateral performance on a monthly basis (time horizon 3 years)</p> <p>Asset/Claim stock, expected/scheduled payments, actual payments, prepayments, default rate, recovery rates/loss given default, new acquisitions/claims</p> <p>Delinquencies, maturity and termination rates</p> <p>Dilutions (reduction of return)</p> <p>Structure of the collateral portfolio</p> <ul style="list-style-type: none"> • Distribution of nominal balances/claims, maturity and weighted maturity, type of claim, regional/industry concentration, sales of debtor • Breakdown of major debtors and their proportional share in the portfolio

Fig. 7. *Data requirements by rating agencies for loan securitisation*

Although the retention of some assets reduces the collateral base of the transaction, the efficiency increase through a *mitigated adverse selection premium* more than compensates for the

opportunity cost of partial non-securitisation *ex ceteris paribus*.²⁹ The retention of a first loss piece as credit enhancement in the loan securitisation, however, poses regulatory problems. The concentration of risk in the lowest tranche of the transaction is a *pro forma* provision for estimated (scheduled) loan default, whose deviation from expectations is *not covered* in the transaction structure on economic and regulatory grounds. In spite of the deduction of the *first loss position* from the issuer's capital base, as required by the Capital Adequacy framework of the Basle Accord, the effects excess default still pose a liability on such conventional regulatory provisions.

The introduction of increased transparency qualifies as another way of dodging the consequences of adverse selection, if issuers impart more detailed information about collateral quality of the underlying loan pool on investors and supporting agents in the security design of securitisation transactions. At some threshold level of available information in the bid for fair asset pricing of the loan pool, however, the effect of marginal disclosure of information would be strictly negative, as the *insurance effect* of asymmetric information markets is gradually eroded. The securitisation market would be prone to collapsing. Issuers with high quality reference portfolios could forgo any bundling and structuring of loan claims and sell loans directly to the market through straightforward *loan sale* or completely *retain their reference portfolio on the loan book*. Increased transparency in the valuation of the collateral quality also connotes the transition from the *conventional* type of securitisation to a *synthetic* structure, which is only hypothetically backed by the assets in reference portfolio. We distinguish between *traditional* and *synthetic* transactions.

3.1.1 Traditional securitisation

Traditional securitisation involves the “legal or economic transfer of assets or obligations to a third party that issues asset-backed securities (ABS) [, which] are claims against specific asset pools” (Basle Committee, 2001).³⁰ In its second working paper on the treatment of asset-backed securities the Basle Committee on Banking Supervision (2002) defines traditional securitisation as a structured finance transaction that “involves the (economic transfer of assets and other exposures through pooling and repackaging by a special purpose entity (SPE)

²⁹ See also DeMarzo (1999), DeMarzo and Duffie (1999), and Duffie and Gârleanu (2001) for an overview of models supporting the incentive of asset retention in the securitisation process.

³⁰ See also Ohl (1994).

into securities[, which] can be sold to investors. This may be accomplished by legally isolating the underlying exposures from the originating bank through subparticipation.”

The conventional type of loan securitisation is always predicated on a *clean break* between the bank originating the assets and the securitisation transaction itself, i.e. it epitomises the legal and economic separation of the seller from the securitised assets via a *true sale* (*novation, assignment, declaration of trust or subparticipation*). Granting regulatory capital relief through the transfer of assets off the balance sheet in standard transactions represents the most fundamental regulatory issue for the originating bank of a securitisation transaction. According to the revised proposal of the Basle Committee (2001) regulatory capital relief by means of removing assets from the balance sheet for purposes of determining minimum capital requirements takes effect once the following minimum conditions are satisfied³¹:

- (i) the transferred assets have been legally isolated from the transferor; that is, the assets are put beyond the reach of the transferor and its creditors, even in bankruptcy or receivership. This must be supported by a legal opinion,
- (ii) the transferee is a qualifying special-purpose vehicle (SPV) and the holders of the beneficial interests in that entity have the right to pledge or exchange those interests, and
- (iii) the transferor does not maintain effective or indirect control over the transferred assets.

These conditions are essentially the equivalent to the provisions in IAS 39/FASB 140/FASB 125, and therefore, there is no new restriction or qualifying condition being put up by the regulators. Unless the three previously listed conditions are met, the Basle Committee proposes to retain the respective assets on the books of the originating bank for regulatory accounting purposes (RAP), even if the assets are removed from the books in compliance with GAAP.

³¹ See also Findeisen and Ross (1999).

3.1.2 Synthetic securitisation

In the wake managing regulatory and risk capital banks and financial services companies increasingly turn to what is frequently termed the newest wrinkle of securitisation and structured finance – the *synthetic* security (Meissmer, 2000). An increasing number of structured finance transactions are such compound products, which amalgamate properties of both asset-backed securitisation and credit derivatives³² in one coherent structure. According to the Basle Committee on Banking Supervision (2002) synthetic securitisation “generally involves the transfer of credit risk through the use of funded (e.g. credit-linked notes) or unfunded (e.g. credit default swaps) credit derivatives or guarantees that serve to hedge the credit risk to which the originator is exposed.”

In defection from conventional forms of selling claims on a reference pool of assets, *synthetics effectively sidestep the legal quagmires*, mainly because most or all of the assets are never sold to capital market investors. Under this scheme of loan securitisation the originating bank merely transfers the inherent credit risk of the loan book by means of a credit default swap, in which the counterparty agrees upon specific contractual covenants to cover a predetermined amount of losses in the loan pool. A significant portion of the global \$300 billion business of risk transfer comes from collateralised debt obligations (CDOs), whose prime sub-categories are forms of synthetic and traditional CLO structures (The Economist, 2002a). Apart from this credit derivative, also credit-linked notes, credit spread options and total return swaps are further financial instruments, which allow issuers to shift isolated credit risk to guarantors, thereby making the risks marketable while leaving the original lender-borrower relationship untouched (Burghardt, 2001), as the reference asset is the loan pool retained by the bank. In case a sale does not come about, many of the bankruptcy and other securities laws become moot.

As the credit risk of the loans is transferred to a *special purpose vehicle* (SPV) and from there on to the investors, the originating bank (the *sponsor* of the transaction) achieves regulatory capital relief through a transfer of credit risk the underlying loan portfolio, which would otherwise qualify for a minimum capital requirement to cover credit risk exposure. The SPV as *securitisation conduit* does *not* purchase the reference portfolio of securitised bank assets and,

hence, forgoes financial outlay in raising funds for financing what is considered to fall outside the definition of an off-balance sheet transfer of assets. Usually a synthetic transaction is complemented by a third-party credit default swap agreement, which protects the sponsor against asset default of the reference portfolio *in nature much akin to an insurance contract with exogenised damage claims*. In synthetic structures credit derivatives, e.g. credit-linked notes (CLNs), credit spread options, credit default swaps and total return swaps, are used as vehicles to shift isolated credit risk to guarantors, thereby making credit risk marketable, while the original credit relationship between creditor and debtor remains unchanged (Burghardt 2001). Since bank assets are retained on the balance sheet, a synthetic CLO transaction does not constitute a *credit de-linkage* between the servicer of the loan pool and the issuer of the tranches offered to investors. At the same time, the credit default swap removes large portions of credit risk from the balance sheet of the sponsor and mitigates the minimum capital requirements for credit risk cover, albeit the issuer sells credit-linked notes in the capital market. So synthetification is a more fine-tuned approach, which only addresses the regulatory sensitive element of the loan book, namely credit risk.

Generally, synthetic securitisation amounts to *on-balance sheet credit hedging* by means of a transmission mechanism of payment claims on a portfolio of *assets that defy conventional forms of securitisation*. Among the reasons certainly are restrictive provisions that prevent transfer or assignment, i.e. the sale of loans to an issuer, the SPV, might compromise client relationships or restrictive contractual covenants on the transfer of the underlying loans. Concerns surrounding the retention of client relationships associated with certain bank loans lead issuers to include those assets in the reference pool of synthetic transactions, whose off-balance sheet treatment would impede the generation of future business. If credit-linked notes are issued the legal integrity of *perfected security interest* in the reference portfolio underlying these debt securities does *not only* give rise to the *benefit of regulatory capital relief*, as investors assume a synthetic and prioritised share in default loss. The *synthetification* of structured claims for CLOs also wins out over conventional, true sale securitisation transactions (traditional CLOs) in terms of *efficiency gains from the legal and economic treatment of the reference portfolio*. Possible heterogeneity of loan characteristics, which would otherwise entail legal obstacles, complicates the legal definition of a *true sale* and its effective completion. In synthetic transactions,

³² See also Rixen (2001).

however, the absence of an outright transfer of legal title to the loan pool purports to a reduction of structural risk and administrative cost of CLOs.

For loss of loan transfer to a bankruptcy-remote special purpose vehicle (SPV) the legal issues associated with the notification of obligors and the perfection of legal transfer are evaded altogether in establishing both *bankruptcy remoteness* (perfected security interest) and *true sale* properties, essential to conventional transactions. The ability of the sponsor to retain legal title in the framework of a synthetic securitisation particularly lends itself to loans that have been originated in different jurisdictions. Consequently, issuers avoid the cost of complex transfer arrangements of loans that do not lend themselves to a straightforward sale. As collateral assets of synthetic transactions are *frequently unfunded*, the popularity of synthetic structures as a carrier of regulatory capital mitigation is largely due to the favourable funding properties of large banks, who typically have access to on-balance sheet funds at competitive spreads especially in the area of mortgage-based financing and *Pfandbrief* issues.

Consequently, the synthetication of structured claims *squares with both regulatory arbitrage and improved risk-adjusted returns*, as the diversification effect of risk transfer by means of credit derivatives requires enhanced internal pricing methods of expected default loss (Rösch, 2001). Even if proposed regulatory changes to the standard credit risk weightings for bank loans (as *foundation balance sheet restructuring effect of securitisation*) renders the regulatory arbitrage aspect of securitisation obsolete, it constitutes no rebuttal to the benefits associated with loan securitisation *per se*, as efforts of boosting the economic rents from loan origination are not scuppered.

3.1.3 Distinguishing conventional and synthetic CLOs

Although both types of securitisation pursue broadly similar economic objectives in terms of balance sheet restructuring and increasing efficiency of banking operations, significantly *different exposures to explicit and implicit risks* warrant a careful distinction as to their effects on the structural make-up of the securitisation process and security design of CLOs.

The Basle Committee on Banking Supervision (2001 and 2002) addresses this aspect in the tentative regulatory treatment stipulated in *Basle Consultative Paper on Securitisation* (see section

9),³³ which discusses the two broad types of securitisation structures separately in two sections of its new proposal for revision and augmentation of the Basle Accord of 1988, and the *Second Working Paper on the Treatment of Asset-Backed Securitisation*. The schematic illustration of the contractual and financial relationships involved in the completion of a CLO transaction (see for instance Figs. 8 and 9 below) highlights the properties of loan securitisation, on the one hand, and aids understanding of the distinct features of conventional and synthetic transactions, on the other hand.

In a *conventional* balance sheet CLO, the sponsor of the transaction is in charge of *packaging* (selection and structuring) the asset claims to be transferred to a bankruptcy-remote special purpose vehicle (SPV), which issues securities on the underlying reference portfolio of loans (“the collateral”). The securities are structured in credit tranches, where a prioritisation of claims and loss cascading guarantee that senior tranches carry a high investment-grade rating (triple-A or double-A rating), provided sufficient collateral quality and the sufficient availability of mezzanine and junior tranches in the CLO structure. These tranches are needed to shield more senior tranches from credit losses. The process of asset transfer to a SPV in a balance sheet CLO involves significant administrative effort in a loan-by-loan review to ensure compliance of each collateral asset with the stipulated eligibility criteria of the respective securitisation structure. Also the existence of contractual restrictions and special covenants prohibiting the transfer of ownership of the loan must be examined, whilst the continued servicing of the transferred assets by the sponsor of a balance sheet CLO does not attract major legal and administrative enquiry and verification. The latter feature of traditional loan securitisation is advantageous to both the sponsor, who receives earning fee income, and the creditor, as the client relationship is not compromised.

³³ Appendix I includes a summary of the most important regulatory changes with respect to asset-backed securitisation in the proposal of the Basle Committee (2001) for a revision of the 1988 Basle Accord on Banking Supervision.

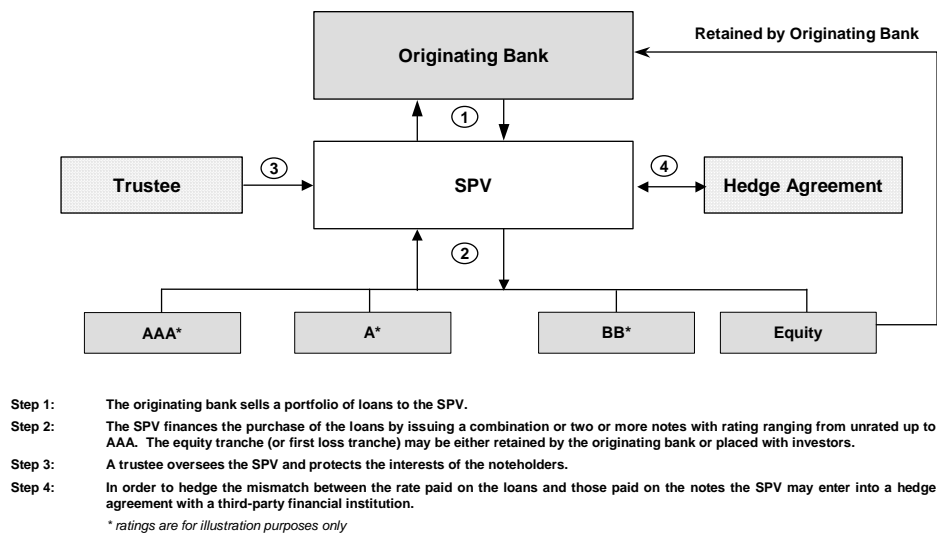


Fig. 8. *Structure of a conventional collateralised loan obligation (CLO) according to Herrmann and Tierney (1999)*

Some of the fees received by the sponsoring bank tend to be used to offset the cost of a commitment device in securitisation. As shown in theory, the originating bank (*the sponsor*) retains an equity claim as *credit enhancement*, whose nominal amount is directly deducted from its capital base for regulatory purposes. Credit enhancement represents the sponsor's willingness to mitigate the adverse selection effects of private information associated with inherent illiquidity of the reference (loan) portfolio. Investors can draw comfort from such a provision as it goes to show that the bank has installed proper incentives for effectively servicing the loan assets. Moreover, many transactions incorporate fixed-to-float interest rate swaps, which are used to hedge the interest rate risk of any fixed-rate loans such that credit risk remains the only investment risk (as described in the definition of cash flow CDOs).

Proper transmission of asset losses and the distribution of proceeds to investors by the issuer is supervised by the *trustee*, whose task is particularly sensitive in times of premature determination of the transaction through early amortisation or excessive unexpected losses in the reference portfolio of the transaction. The trustee of the transaction, acting on behalf of the SPV, must also have the ability to hold perfected security interest for each loan asset. In balance sheet CLO structures this role is critical in compliance with regulatory statutes governing the transfer of loan assets with reference to borrower confidentiality.

In contrast to conventional securitisation, synthetic securitisation represents a structured finance transaction where only credit default risk of a reference portfolio is transferred to a third party by means of credit derivatives without credit de-linkage between the servicer of the loan pool and the issuer of the tranches offered to investors in steps 2-4 as shown in Fig. 9 below. Instead of the assets being sold by the originator, credit risk is transferred through a credit default swap (Fig. 9, Step 2). Thus, any resulting capital relief for mitigated risk exposure does not stem from the actual transfer of assets but the acquisition of credit protection from counterparties by means of credit derivatives. Sellers of the credit protection receive a premium for their obligation of compensating buyers for any loss suffered on the assets underlying the credit derivative. This property of synthetic CLOs is attractive to large banks, which tend to have access to on-balance sheet assets at competitive spreads.

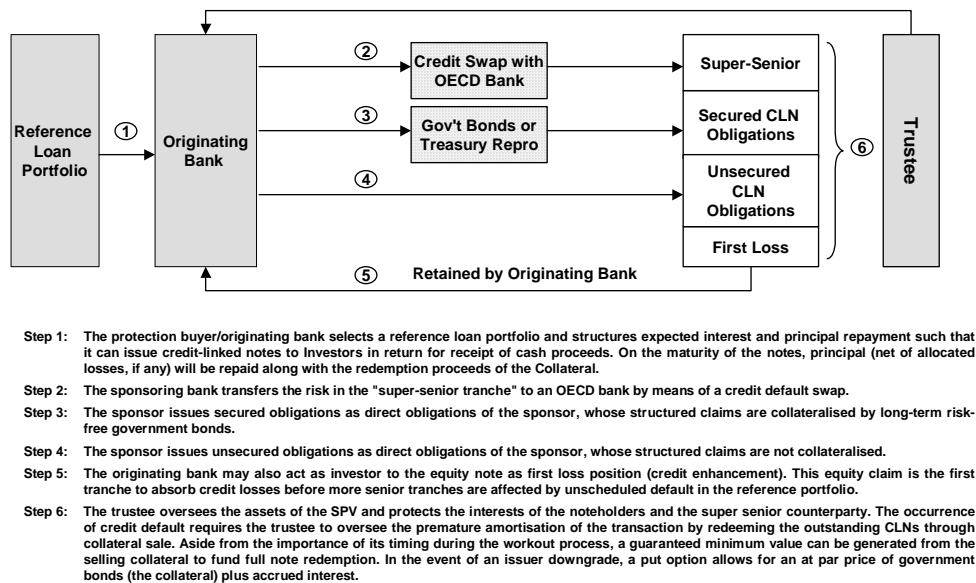


Fig. 9. Structure of a synthetic collateralised loan obligation (CLO) without the use of a special purpose vehicle (SPV)

Since a synthetic securitisation can be conducted with or without a SPV, the general description above warrants refinement as to the specific mechanism governing the completion of synthetic CLOs with SPV. The direct issuance of credit-linked notes (CLNs) by the sponsor in a synthetic CLO transaction can alternatively be augmented by an intermediating securitisation conduit, such as a special purpose vehicle (SPV). Provided that the sponsor of a

synthetic transaction incorporates a SPV as the issuer of a CLO, the latter has little or no need to raise funds, because it is not required to purchase the underlying loan pool. Similar to traditional schemes of securitisation the seller of a transaction transfers credit risk of a given asset portfolio through a specified conduit. The latter issues credit-linked notes to investors and retains the proceeds to invest in highly rated investment-grade securities as collateral for secured credit-linked notes (Fig. 9, Step 3).

The SPV gains in the reallocation of investment funds generated from buyers of debt securities, collateralised by Pfandbriefe or similarly highly rated sovereign or corporate debt securities, and finances the additional spread for CLO notes by the swap premium paid by the sponsor (excluding an administrative charge). This collateralisation of claims ensures timely repayment of principal and interest to investors. In return, the SPV assumes a proportion of underlying collateral credit risk by entering into a credit default agreement with the sponsoring bank (Fig. 9, Step 2 and 5), which remains the servicer of the underlying loan portfolio. The sponsor compensates the swap counterparty by paying a premium for the credit default swap. In the case of unexpected credit default of the underlying loan portfolio, the bank seeks recourse with the SPV as protection provider. If total accumulated losses incurred in credit events do not exceed scheduled losses of the reference portfolio, i.e. funds held by the SPV are exhausted by compensatory payments to the originating bank (protection buyer), capital market investors have a prioritised claim on both

- (i) expected returns from investments financed by the proceeds generated from the debt securities issued by the SPV as well as
- (ii) the total premium of the credit default swap paid by the sponsoring bank for credit protection, minus some administrative charge levied by the SPV.

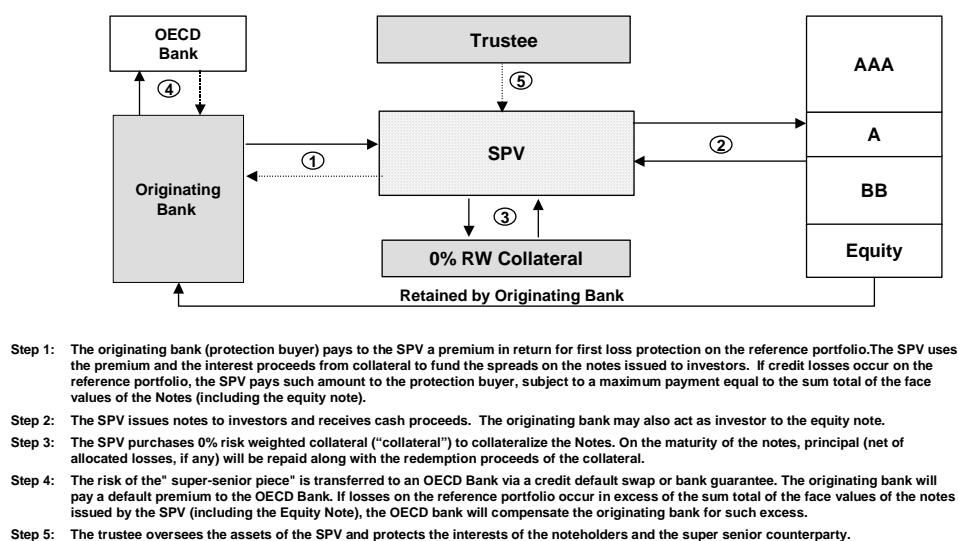


Fig. 10. *Structure of a synthetic collateralised loan obligation (CLO) with the use of a special purpose vehicle (SPV)*

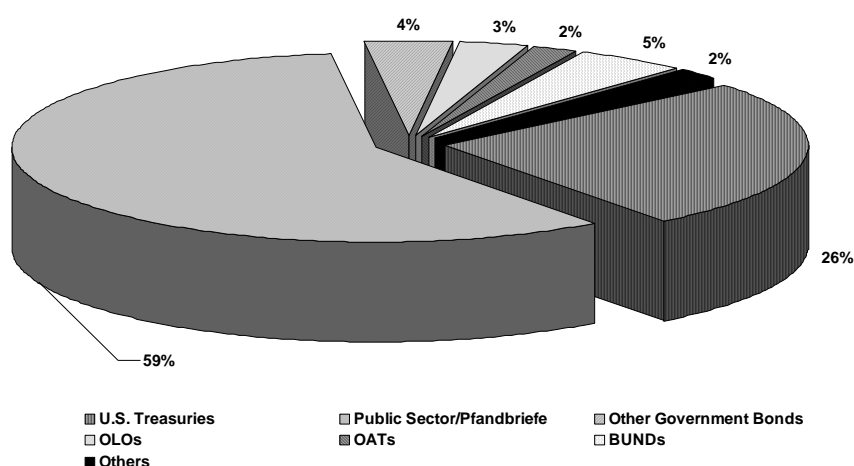
Despite of regulatory arbitrage becoming less likely in the view of an internal ratings-based approach to risk-weighted capital requirements under the revised proposal for a new capital adequacy framework, synthetic securitisation still steals a march from an economic perspective if we consider the balance sheet entries of both sponsor and originator of the securitisation transaction. The sponsoring bank substitutes the payment of a credit swap premium, the reduction of minimum capital requirements and a potential increase in risk-adjusted returns (due to greater asset base and higher diversification through re-composing the loan book) for the present level of either regulatory capital or economic capital (whichever one is higher). While the servicing function of the sponsor of the transaction remains unaffected, the generation of interest income from loans does not enter this trade-off consideration. The same applies to the cost of capital. Thus, the *key benefit from synthetic securitisation does not tally with the main argument of securitisation* - exclusive regulatory arbitrage as the only true benefit. As arbitrage fades, increased economic efficiency in reducing economic capital edges out as prime incentive.

3.1.3.1 *Structural comparison of traditional CLOs and synthetic securitisation (with SPV)*

The major differences between conventional (true sale) CLOs and synthetic CLOs can be illustrated in terms of *various stakeholder issues and the security design* of the loan securitisation

process. Whereas traditional transaction is predicated on the selection of a loan portfolio to be transferred into a special purpose vehicle, synthetic CLOs do *not* promulgate restrained balance sheet growth by means of true sales of on-balance sheet assets. However, the credit-linkage between the issuer of the transaction and issued debt securities in synthetic CLOs means that *information about the potential exposure* to credit risk of the collateral (reference pool of loans) is acutely relevant in comparing synthetic and traditional CLOs.

The accuracy in assessing information about the actual quality of the reference portfolio ultimately affects the credit rating of the issued notes, barring any mitigating effect of structural enhancements, which could absorb deteriorating collateral quality. Needless to say, due to its heightened sensitivity to collateral performance, synthetic CLOs prerequisite a greater degree of information disclosure of collateral quality (to the risk transfer counterparty) by the sponsoring bank, which is recognised by rating agencies in a more painstaking and rigorous examination of the issuer's ability to meet their obligation of promised investor returns. While the collateral pool of synthetic CLO without SPV is held by the sponsoring bank, which issues credit-linked notes (CLNs), the incorporation of a SPV results in collateralisation of issued debt securities by whatever collateral asset the issuer is willing to choose. This arrangement leaves the credit-linkage with the sponsor intact. Fig. 11 below shows the distribution of senior note collateral in European synthetic CLOs.



Source: Merrill Lynch (2000), "Cash and Synthetic European Bank CLOs", 13 November.

Fig. 11. Breakdown of senior note collateral in European synthetic CLOs

Collateralisation with government securities greatly limits the credit risk suffered by noteholders. The popular use of non-government securities (such as *Pfandbriefe*) as collateral must not be overlooked, for it might *blunt efforts to substantiate senior claims* on the securitised reference portfolio. Although the latter form of collateralisation serves the triple-A credit rating to translate into a similarly high rating of senior CLO notes (see section 4.3)³⁴ The *credit volatility* of non-government securities (which are *not* zero-risk weighted – for regulatory purposes – compared to government bonds from OECD member states) is *higher than the exposure to unexpected loss in the case of risk-free sovereign debt*. As its default probability *cannot be insulated* from the rating of the issuing entity, this exogenous collateral risk poses a significant structural challenge to synthetic CLOs. If the rating of non-sovereign security collateral fails to withstand issuer deterioration or an adverse change in the legal or regulatory framework pertinent to these instruments, the outstanding CLO notes might be subjected to a *downward rating drift*, with the sponsor's *loan portfolio remaining unchanged* in asset quality. Nonetheless, in keeping with this structural exposure to synthetic CLOs, the decrease of funds held by the originating SPV reigns supreme in assessing the credit risk of a CLO transaction.

As much as the development of collateral quality held by the SPV could fail to deflect structural exposure to the sponsor's rating, the *sponsoring bank* itself as a protection buyer can be a *source of credit risk exposure* in a synthetic CLO transaction. The credit risk exposure stemming from the defined role of the sponsoring bank might impede on the scheduled performance of synthetic transactions as to the initiation of early amortisation features (e.g. economic and structural triggers). Since a premature deposit by sponsoring bank – as the protection buyer in a credit default swap – can be contractually arranged, such that the risk of payment obligations does not add to the overall exposure of the respective synthetic CLO transaction (be it with or without a SPV) as, other functions of the sponsor might very well represent an exposure.

Whenever the collateral is credit-linked to the sponsoring bank, i.e. the synthetication forgoes the incorporation of a SPV as CLO originator, *investors are directly exposed to the insolvency of the sponsor* as a form of structural risk (Anonymous, 2001). However, not only a collateral pool (comprised of bonds) with material credit-linkage to the sponsoring bank establishes a

³⁴ Section 4.3 highlights the analytical differences between credit ratings and structured ratings.

perfected security interest that exposes investors to the sponsor's credit rating (Batchvarov, 2000, 30). In *synthetic CLOs with SPV*, even high investment-grade *non-government* bonds are sensitive to the credit performance of the sponsoring bank, despite being devoid of any credit-linkage therewith. Due to multiple reliance on the sponsor, issuers of such synthetic CLOs carefully observe this source of exposure by taking an appropriate hedging position. In the state of seller deterioration or insolvency, the cost of such a provision might eventually compromise the originator's ability to pay down outstanding notes issued on the underlying collateral, provided that the collateral has some relationship with the sponsor. If this was to occur, the apparent *credit dependence* of the issuer on the sponsoring bank could render impossible the market sale or marked-to-market payment of notes outstanding. Hence, the physical delivery of collateral in lieu of redemption is warranted.

In addition to both payment of credit protection and credit profile, the role of a *repurchase transaction* (repo)³⁵ or *hedging counterparty* represents another area of potential exposure, resulting from the role of the sponsoring bank within the CLO structure. The deterioration of the sponsor's credit quality in a marked-to-market hedging arrangement adversely affects issued CLO debt securities, unless structural provisions have been adopted, e.g. a put option on sponsor downgrade or declining collateral balance. Whereas the *rating on outstanding notes is likely to remain unaffected* (provided the collateral value remains unchanged), failure to do implement remedial action in improving the sponsor's credit standing induces an early amortisation of collateral through early liquidation.

As sponsors of *synthetic CLOs forgo transferring the loan servicing function* to another party in the bid for capital relief, the need of protecting noteholder interest by trustees appears less pressing compared to traditional loan securitisation. In a conventional transaction, the search for a proficient substitute servicer – upon the originator declaring insolvency – leads to heightened

³⁵ A repurchase transaction involves the sale of securities by an entity to a counterparty, subject to the simultaneous agreement to repurchase the sold securities at a certain later date at an agreed price. The issuer of the *repo agreement* retains the securities concerned in the balance sheet for the entire lifetime of the transaction and values them in accordance with the accounting principles for trading assets or investment securities, respectively. Any proceeds from the sale are reported in liabilities to banks or in liabilities to customers as appropriate, since the bank gains liquidity through the temporary transfer of assets. Analogously, the converse principle holds true for *reverse repo agreements*. In this case securities are purchased by an entity, subject to the obligation to sell these securities at a later date at an agreed price. As the bank forgoes liquidity due to the temporary receipt of assets, such transactions are reported in loans and advances to banks, or loans and advances to customers. Both interest expense from *repos* and interest income from *reverse repos* accrue evenly over the lifetime of the transactions (Dresdner Bank, 2000).

structural exposure. This limited role of the trustee in shielding investors from bankruptcy risk of the CLO originator does not extend to other aspects of synthetic CLOs. The continuity of loan servicing in synthetic deals does not rule out possible *incentive incompatibility between originators and investors of CLOs* in terms of

- (i) the monitoring and sale of the reference portfolio/collateral,
- (ii) the determination of amortisation triggers and their initiation threshold as well as
- (iii) the verification of credit default loss and its prioritised allocation to investors. Thus, *synthetic CLOs heavily rely on the prudential vigilance of trustees*, whose conduct in monitoring both sponsors and issuers of CLOs is vital in ascertaining their adherence to binding contractual and regulatory terms and conditions set forth in CLO transactions.

The degree of leverage in the security design denotes the *funding level*, i.e. the proportion of the reference portfolio that is not subject to the structural claim of the CLO transaction. As the sponsor relinquishes loan servicing through asset transfer (*true sale*), *traditional cash flow transactions are always fully funded*, i.e. the value of issued collateralised notes tallies with the underlying reference portfolio. Synthetic transactions hardly are. They do not even need to be necessarily partially funded; however, if they are, the presence of partial funding adds to the existent leverage of senior noteholders from the prioritisation of losses in subparticipation. Hence, any increase in the leverage entails greater relative losses (as a proportion of the reference pool) for senior tranches of the CLO transaction compared to fully funded CLO structures, provided that accumulated credit losses have depleted the first loss provision of the subordinated tranches. Although senior tranches might gain from diversification effects as their expected returns are leveraged on a larger underlying pool of loans, by the same token, they are exposed to higher potential default loss (*loss severity*) from a larger collection of loans.

The *marginal difference in senior risk* exposure between partially funded synthetic securitisation and traditional securitisation *does not extent to junior noteholders* with subordinated security interest. While partial funding structures bear more risk emerging from the sponsor's role, the credit enhancement (first loss provision) and subsequent junior tranches (the second loss

position) are no more exposed to credit risk in synthetic deals than they are in traditional CLOs.

	Traditional CLO	Synthetic CLO
Reference Pool Credit Quality	<ul style="list-style-type: none"> historical performance and diversification effects of loans credit rating of obligors and type of asset 	
	<ul style="list-style-type: none"> portfolio composition and payment rate margin on reference loans 	
Structural Considerations	<ul style="list-style-type: none"> credit enhancement (retention of first loss provision) and liquidity support (advanced payment facilities, etc.) from servicer or third parties (hedging, swap, guarantee, etc.) as cushion for potential losses (<i>including excess spread in traditional CLOs</i>) loan pool selection and replenishment criteria (eligibility & substitution criteria) verification of credit event, workout process and redemption of tranches under consideration of early amortisation triggers prioritisation of losses & proceeds under different scenarios 	
	<ul style="list-style-type: none"> legal integrity and regulatory compliance (bankruptcy remoteness of SPV) of asset transfer ("true sale") risks from commingling, set-off, interest rate, maturity mismatch, etc.) 	<ul style="list-style-type: none"> legal integrity of structured claim with/without SPV as originator ("perfection of security interest in collateral, etc.") loss determination and timing of settlement, allocation exposure from credit deterioration of sponsoring bank illiquidity and value deterioration of collateral
Originator/ Servicer Considerations	<ul style="list-style-type: none"> impact of loan servicing and reference pool characteristics on the originator: underwriting standards, effectiveness of operational routines in dealing with delinquencies, debtor relationship 	
	<ul style="list-style-type: none"> servicing competencies: administration of collections and payment remittances, policies of bad debt allowance, adherence to servicing duties and obligations (eligibility criteria) availability of substitute servicer and call provision of notes 	
Collateral Risk		<ul style="list-style-type: none"> marketability(liquidity) and scope for rating downgrade/volatility potential linkage to the sponsoring bank and market value
Sponsoring Bank Credit Risk	<ul style="list-style-type: none"> ability to perform as swap counterparty (if applicable) 	<ul style="list-style-type: none"> ability to pay credit protection premia for interest deficiency potential exposure from other roles performed in transaction (for e.g. a repo or hedge counterparty)
Capital Market Considerations	<ul style="list-style-type: none"> sensitivity of structured rating and spreads to event risk and so-called "headline risk" bond profile - pass through structure vs. bullet structure, integration of call option for premature redemption of notes secondary liquidity 	<ul style="list-style-type: none"> extent of senior note leverage in partially funded structures reliance on trustee and rating agencies in being able to safeguard investor interests (allocation of proceeds and credit losses) and credit assessment respectively

Source: Batchvarov et al. (2000), Herrmann and Tierney (1999).

Fig. 12. *Comparison of traditional/conventional and synthetic CLOs*

The above analysis cumulates in a synthesis of benchmark characteristics (see Fig. 12) pertinent to an ideal synthetic loan securitisation (in contrast to traditional securitisation), based on areas of distinctive deviation from traditional CLOs, such as the role of the sponsoring bank, the credit dependence of the collateral, the structural provisions for cash transfer as well as the interpretation of credit events and subsequent administration of transaction workout involving early amortisation triggers and the redemption of collateralised notes issued. The formulation of an optimal combination of these characteristics caters to a proper assessment of the complex security design of CLOs for structural and pricing purposes. Some of the benefits and drawbacks associated with both structures of CLOs are summarised below (see Fig. 13).

Benefits		Drawbacks	
Conventional	Synthetic	Conventional	Synthetic
<ul style="list-style-type: none"> • tried and tested structure, well familiar to both rating agencies and investors • allows for relief of both regulatory and economic capital • "True sale" transfer of assets allows for off-balance sheet accounting treatment of reference portfolio • tighter trading spreads as opposed to synthetic structures due to mature market (investors, rating agencies, etc.) 	<ul style="list-style-type: none"> • efficient transfer of isolated credit risk, esp. of non-transferable assets and less restrictive than "true sale" requirements in traditional transactions • reversibility of transfers to the reference portfolio • possibility of combining synthetic structures with other transactions to create compound structures (e.g. Pfandbrief, etc.) • allows for evolution in the loan portfolio without incurring the cost of re-structuring (as opposed to conventional deals) • structural simplicity and greater transparency of asset terms of eligibility for securitisation • shorter implementation time-table • also unfunded and/or partially funded structures are possible 	<ul style="list-style-type: none"> • high demands on reporting capability of loan portfolio information systems • eligibility of asset transfer depends on loan terms and conditions and jurisdictional constraints • in some jurisdiction the possibility of continued servicing requires the sponsor to seek permission by the issuer of the transaction • moderately longer implementation time-table than synthetic structures • higher administrative cost than synthetic structures • only funded obligations are issued 	<ul style="list-style-type: none"> • allows primarily for economic capital relief only • "leveraged" structures, as notes issued generally amount to no more than 10% of the reference portfolio • issue of defining credit event and work-out procedures in cases of default • less "informed buyers" in the market leads to historically wider spreads in comparison to traditional transactions

Fig. 13. *Benefits and drawbacks of structural alternatives between synthetic and traditional securitisation*

Given the varying approaches taken by rating agencies in deriving structured ratings, a comparative perspective on the basis of general benchmark criteria has been strongly encouraged by major CLO issuers in building investor confidence in synthetification.

In conventional cash flow CLOs the solid quality of the reference pool, structural provisions for possible credit dependence of the collateral, the various roles of the sponsoring bank, the determination of cash and asset transfer as well as the function of credit enhancements establish the prime requirements flowing into its credit assessment:

- (i) stable and projectable cash flows,
- (ii) availability of historic information about the collateral portfolio (delinquencies, terminations, defaults, dilutions, etc.),
- (iii) homogenous, broadly diversified portfolio,
- (iv) no legal obstacles in transfer of ownership (assignment, novation, subparticipation, etc.),
- (v) minimum portfolio size of € 50m (step-up possible).

A benchmark collateral portfolio of securitised loans would roughly match the following characteristics³⁶:

- *reference portfolio*: mainly loans with variable interest rate and credit derivatives
- *rating* B and better (on average BB and better)
- *average maturity*: 5-8 years
- *number of assets*: 150-500
- *portfolio diversification*: according to industry sectors and location – Moody's diversity score (30-70)
- *average loan volume*: € 600,000 - € 15m
- *AAA (tranche) enhancement*: 10% - 15%
- *bond spreads*: LIBOR +25 bps (AAA) to +250 bps (BB)
- *estimated default frequency (EDF) p.a.*: 0.05% - 0.25%

This array of properties does, however, fall short of addressing the special nature of synthetic transactions. Rating agencies and investors generally require *additional criteria* to be met for a synthetic loan securitisation to come together.

- (i) in *synthetic CLOs with SPV* the collateral of synthetic CLOs is comprised of sovereign debt securities, i.e. government bonds or capital market paper with similar credit risk weighting, whose credit volatility is lower than collateral exposure from collateralisation with non-government bonds. Independence of collateral performance from the sponsor's credit profile ensures its insulation from structural exposure that would otherwise compromise its zero-risk weighting. The secondary market for the chosen collateral (sovereign debt securities) needs to be sufficiently liquid, so that the adverse price impact of collateral sale for purposes of efficient notes redemption can be fully absorbed (without distorting market prices);
- (ii) *any structural provisions* that involve the participation of the sponsoring bank in terms of advance payment facilities/liquidity support or revolving credit agreements are *kept at a minimum* and/or are curtailed by safeguarding mechanism

³⁶ Deutsche Bank Global Markets Research, European Securitisation Group, London.

of bankruptcy remoteness, such as advance funding of protection payment obligation or letters of credit/guarantees of proficient counterparties;

- (iii) the integration of a first loss position retained by the servicer of the reference portfolio underlying a synthetic CLO serves as an incentive compatibility device in maximising recoveries of defaulted collateral. This template requires *credit enhancement in the form of an issued equity claim* on the reference portfolio, *sufficiently large* to cover almost all credit risk before senior tranches suffer from expected loss and subparticipation of interest proceeds from collateral to junior noteholders is warranted. The settlement of noteholders' claims in the case of termination ought to be conducted at the end of a *well-defined workout process*, whose duration being as it is consistent with *maximum collateral recovery* rather than a stipulated time horizon after default. By common consent, the recovery rate under enforcement or workout process is held to generate higher prices for distressed assets than soon after default;³⁷
- (iv) the *definition and validation of credit events* of the reference portfolio is vital in the estimation of expected losses and possible recovery of bad debt in synthetic CLO structures. Only an agreed threshold on portfolio losses – mapped to a certain workout process after early amortisation has been triggered – maximises investor returns in case of distressed collateral;
- (v) the degree of *leverage in the funding structure should not be in conflict with the default tolerance of assigned (senior) tranche ratings*. Since synthetic transactions are hardly fully funded, i.e. the notational value of issues notes does not square with the valuation of the underlying reference portfolio of bank loans, the *implicit marginal increase of credit risk premium* on senior tranches merits structural compensation (additional credit support, etc.); and
- (vi) the leverage of synthetic deals coupled with the retention of loan servicing by the sponsor requires the *exclusion of accrued interest on the defaulted portion of the reference portfolio* due to the synthetic interest claim of investors. In traditional CLOs the

³⁷ See Batchvarov et al. (2000), 31.

extent to which notes are redeemed is solely contingent on the recovery rate as interest payments on defaulted loans cease. In contrast, the structured claim of investors in synthetic deals allows for the allocation of losses at deal termination. In this way, the full note payment to investors is not compromised unless excessive collateral losses are charged up against proceeds from interest and principal.

3.1.3.2 Differences and similarities between ABS and CLOs

After having considered the differences between conventional and synthetic securitisation it is also worthwhile to compare asset-backed securitisation and traditional (balance sheet) CLOs (Deutsche Bank Global Markets, 2000). Generally, they display the several common structural properties. First, assets from the reference portfolio (of marketable loans in the case of CLOs) are transferred to a bankruptcy-remote, limited purpose entity (*special purpose vehicle* (SPV)), whose business function is restricted to (i) the acquisition and holding of the designated loan pool as collateral as well as (ii) the issuing of debt securities collateralised by assets in the reference portfolio. The SPV prioritises these debt claims in order of seniority by issuing different tranches of debt securities, including one or more investment grade classes and an equity tranche or *reserve fund* (cash reserve). Senior claims to the reference portfolio are largely insulated from default risk to the extent that subordinated tranches of the transaction absorb credit losses. Such junior tranches, i.e. equity claims and/or *excess cash balances*, tend to carry investment grade ratings above and beyond the rating of the underlying reference portfolio of securitised assets. The detailed configuration of issued tranches might vary with the need of the *SPV to enter into interest rate swaps* to mitigate asset mismatches of heterogeneous reference portfolios. This provision pertains to interest rate transformation from fixed rate assets to floating rate debt securities and the reconciliation of different interest indices used as base rates for the calculation of interest proceeds in the case of loans. By the same token, the SPV ensures that related administrative functions pertinent to loan servicing and asset transfer are carried out in compliance with contractual provisions. Second, in keeping with its monitoring task, the *trustee of the transactions holds the reference portfolio as collateral* on behalf of debt holders to ensure proper servicing of assets and allocates proceeds from principal and interest repayment as well as default losses to investors. Third, the servicer (and issuer if securitisation structures dispenses of a special purpose vehicle) is in charge of administering the *collection of proceeds* from obligors of the securitised reference portfolio on behalf of investors. *Proper servicing* of the

underlying asset pool also includes the preservation of estimated asset value in the event of delinquency or termination (default) through maximising asset recovery in the workout process.

However, also significant differences exist between ABS and traditional (balance sheet) CLOs. First, the *reference portfolio of ABS transactions is more homogenous* as the majority of assets is originated by a single lender as opposed to CLO transactions, whose heterogeneous asset pool comprised of non-standard items with little or no market liquidity requires a high degree of diversification by obligor and industry in order to control exposure to default risk correlation among obligors. Moreover, *prepayments and premature calls of assets* in the reference portfolio are frequently observed for CLO transactions and result in erratic portfolio amortisation, which defies traditional pool level actuarial forecasting of diversification effects in homogenous portfolios.

3.2 Moral hazard

Moral hazard is the second effect of market imperfection due to information asymmetry in the securitisation of loans. The effort level of the CLO originator might not be incentive compatible if an insufficient proportion of net gains from collateral proceeds is allocated to investors, i.e. an issuer could be tempted to retain a large share of the high-quality portion of the collateral pool and neglect the costly enforcement of contractual restrictions imposed on loan obligors of the collateral portfolio (*ex ante moral hazard* in the security design of the CLO, when the issuer anticipates the opportunity of reduced effort levels after issuance of the transaction). The predicament of the resulting moral hazard is generally resolved through the separation of proceeds and losses in the allocative mechanism of loss cascading and prioritisation of claims by means of different tranches. Since large senior tranches with a high probability of full repayment would delude any incentive of both reduced effort and the inclusion of poor asset quality in the reference portfolio, issuers securitise a large proportion of interest generating asset claims. At the same time, they substantiate the disincentive of moral hazard by retaining the most junior tranche as a commitment to bearing some credit risk.

Originators might also be tempted to select assets of the reference portfolio according to own private information, and thus, transfer a pool of securitisable loans, which is not reflective of

the general average asset quality of the loan book. Even though this so-called *cherry picking* is prohibited by national regulators that have adopted statutory objectives in supervising the securitisation process, testing the adherence to this requirement to guard against selective bias of the issuer is riddled with methodological and administrative difficulties. The incentive of cherry picking would manifest itself as *ex ante moral hazard* in matters of asset selection for CLOs, similar to the aforementioned first instance moral hazard, where the motivation of issuers could be to misrepresent the average loan book quality by including over-priced, low-quality loans in the reference portfolio. Such a conduct of securitisation would eventuate a *gradual deterioration of the residual value of the loan book*. Alternatively, cherry picking could arise as *ex post moral hazard* in terms of biased asset sorting, as maturing loans of the reference portfolio are *replenished* by the sponsor. If managers of CLO portfolios fail to successfully negotiate the structuring process, the average loan quality of the reference portfolio might deteriorate in excess of *natural* attrition due to prepayment of loans. Insufficient effort in extracting additional loans from the loan book to replace loans amortising prior to the maturity date of the CLO transaction could be the source of such a scenario.

A final source of information asymmetry and uncertainty surrounding the proper administration of the securitisation process is the impending danger of *front running* in arbitrage structures of CLOs, i.e. traders in market value portfolios prefer to trade on their own account rather than allocating the traded assets to a reference portfolio of a CLO or CDO securitisation in general. This occurs if the benefit from trading activities exceeds the gains to be generated from securitising assets based on these trading activities. Certain non incentive-compatible trading behaviour that gives rise to a situation comparable to the *principal-agent problem* in the corporate finance setting (Weiss, 1999), the illiquid nature of the collateral pool could also result in decreased valuation since heightened transaction cost attract allocational inefficiencies.

3.3 Trading cost

Depending on the composition of its loan book, the CLO originator might be faced with the prospect of *high trading cost* associated with the reference portfolio of loans, as the market for potential buyers and sellers may be small (Duffie and Gârleanu, 2001) and uncertainty about the true value of the collateral governs investors' beliefs in the face of adverse selection. The combination of higher searching cost and a limited pool of potential buyers of an illiquid

collateral pool compel originators to offer the structured asset claims to the highest bidder at relatively short notice. Moreover, illiquidity would entail a *clear shift of negotiation power from sellers to buyers* in loan securitisation markets. *Market-making investors* recognise the risk involved in future resale of securitised claims to intransparent reference portfolios and discount the current valuation in addition to the adverse selection effects. Originators of CLOs, however, are able to strengthen their negotiation position to a level akin to a market of actively traded assets.

The structural design of the securitisation can be geared as to flexibly *remedy the illiquid nature of the reference portfolio of loans*. For one, issuers might consider *improving the overall average rating* of the collateral pool through structural enhancements, such as counterparty guarantees, draft facilities and monoline insurance against credit loss. Additionally, issuers of CLOs reduce the net cost of bearing illiquid collateral through a particular *subparticipation* of issued tranches. Hence, issuers include highly liquid structured claims, i.e. large, homogenous senior tranches in the structure of the CLO transaction. Latest advancements in security design of CLOs also feature the incorporation of *super-senior tranches*, secured by a credit default swap as a means of improving the marketability of issued claims.

In order to keep information imperfections from compromising the proper valuation of the reference portfolio, various structural provisions are feasible. Issuers are keen to demonstrate a sufficient degree of commitment to the future performance of the reference portfolio in order to counter adversity of discounting from non-verifiability due to existing private information. In order to allay fears of investors in being “picked off” in the acquisition of a structured claim on illiquid assets, issuers of CLO transactions retain a small but most junior tranche, which carries almost all expected first loss risk. This form of adding liquidity to the more senior tranches held by investors could prevent adverse selection through signalling of quality, as only issuers of low-risk collateral portfolios will be able to afford to cover some significant amount of credit risk given the lower probability of loan default compared to poor reference portfolios. Innes (1990) proffers a model for security design, which addresses the merits of subordination to the extent that the prioritisation of claims and the bottom-up cascading of losses produces a higher structured rating and a higher valuation of tranches compared to straight pass-through securitisation structures (see Fig. 14 below).

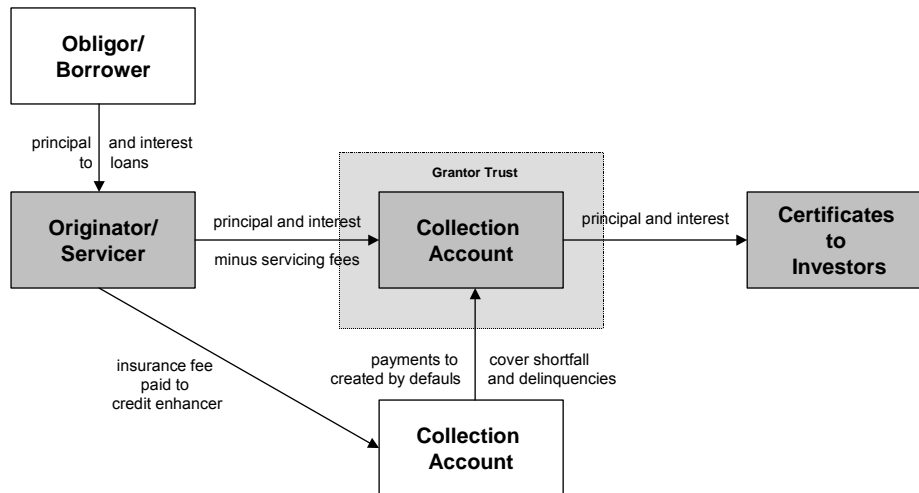


Fig. 14. *Pass-through securitisation*

However, this *retention effect of the most junior tranche* as credit enhancement only holds true unless the standard deviation of unexpected losses from expected losses increases over time, i.e. default losses in senior (investor) tranches and in the first loss piece develop in the same fashion over the lifetime of the transaction. Otherwise, the senior tranche would bear a gradually increasing, implicit share of total unscheduled losses. Hence, rational investors would command excess spreads on issued senior tranches as adverse selection and investor uncertainty reduce the valuation of the transaction.

Also the issue of *moral hazard* is addressed thereby. Managers might reduce due diligence in both asset selection for replenishment and monitoring of debtors. Just as much as the liquidity of senior tranches in the transaction assures investors of the reduced risk (of transaction cost) involved, the retention of concentrated risk in junior tranches together with the securitisation of the maximum portion of proceeds from the underlying reference portfolio mitigates such possible moral hazard of CLO managers, though agency problems of this kind cannot be entirely removed from the securitisation process. Schoring and Weinreich (1998) suggest that the principal agent problem pertinent to *arbitrage securitisation* could be resolved by means of subordinating a significant proportion of management fees to the issued tranches. The qualitative consequences of these structural features reflect how issuers negotiate the exercise of reputation building (*reputation cost*) in a market for illiquid assets such as corporate loans. As the valuation of a transaction will be significantly driven by investor confidence in fair pricing – according to the mean-variance theorem of efficient markets –

issuers need to implement a structural design that prevents them from entertaining the idea of extracting informational rents.

The information asymmetries involved in an illiquid reference portfolio of corporate loans have profound economic consequences for the administration of securitisation transactions. Generally speaking, the functional aspects of CLOs will make *credit become a commodity* that can be modelled to fit any situation of banking business as it reflects an alternative to traditional asset funding by means of deposit-taking. The importance of securitisation will almost surely grow as market participants' understanding of the process improves. Additionally, CLOs allow *banks to capitalise on their core competencies in loan origination*, i.e. screening, servicing and monitoring of debtors, whose degree of sophistication defines the margin to be generated from securitisation. In turn, rather than being event-driven in their asset allocation, banks are able to resort to a *broader portfolio of diversification practices* through securitisation without venturing beyond their traditional client bases. By way of implementing credit guarantees on specific instruments and cash flows as well as broader cross-default protection in securitisation, banks are able to better specify total or partial recovery and fine-tune their capital provisions for credit risk. As banks derive a greater measure of accuracy in actively balancing credit exposures, they are evidently *pressed to shore up their client relationships*, which might improve the debtors' ability to attract funds. More efficient asset funding also causes various formats of loan securitisation to have *far-reaching consequences for the workings of capital markets*. As the likelihood of a portfolio to cause financial strain is less likely the greater the diversification of credit risks earmarked for securitisation, banks will *require more favourable capital adequacy treatment*. Moreover, individual incentives of securitisation lead to an aggregate effect of improved market efficiency as the existence of CLOs *aids the completeness of capital markets* à la Arrow-Debreu (1954).

4 ANALYTICAL CONSEQUENCES ARISING FROM THE CHARACTERISTICS OF SECURITISATION

Despite the aforementioned benefits associated with banks engaging themselves in loan securitisation, securitisation activities warrant the application of *prudent conduct and due diligence*. Otherwise, they could increase the overall risk profile of the issuer. Even though the securitisation of loans involves the *same degree of risk exposures as bank lending business*, which stems from credit risk, interest rate risk (including risk from prepayment), concentration risk, operational risk and liquidity risk, the Basle Committee confirms the notion that unbundling

the traditional lending function into several limited roles is prone to inflict *more complex credit risk on issuers of CLOs*. With the *credit risk being shared between several stakeholders* in the securitisation process, i.e. originator, servicer, sponsor, credit enhancer, liquidity provider, underwriter trustee, investors and, as need be, credit derivative counterparty, an additional layer of administrative and processual complexity confounds the aforementioned types of risk, whose impact on the risk sensitivity of the reference portfolio might be markedly different from traditional lending. This observation especially applies to interest risk, since securitised loans are commonly regarded more sensitive to interest rate movements than unsecuritised loans, as they display a higher positive correlation between the probability of rating change to interest change. However, by way of explaining the different nature of risk in structured finance transactions, the consequences for the assessment of investors' claims on the reference portfolio of a CLO are straightforward. Whereas the quality of the reference portfolio (*credit rating*) is determined by the assumptions entering the credit risk assessment and management system of the issuer, *structured ratings* have to take into account the complex nature of CLOs and the diverse risk patterns imposed by the various agents in the securitisation process.

4.1 Credit risk – an issue of diversifiability

We first need to shed light on what actually constitutes credit risk and how the properties of credit risk warrant particular methods of mitigating its adverse effects on the bank loan book. From a management perspective, Oldfield and Santomero (1997) argue that uncertainties, i.e. risk associated with the completion of conditional counterparty promises, facing all financial institutions can be segmented into three separable types. These are:

- (i) risks that can be eliminated or avoided by simple business practices,
- (ii) risks that can be transferred to other participants, and
- (iii) risks that must be actively managed at the firm level.

Credit risk arises from non-performance by a borrower, which is caused by either an inability or an unwillingness to perform in the pre-committed contracted manner. If two parties engage in a loan contract, i.e. a contractual obligation such that funds are transferred from one party to the other for an agreed period of time in return for compensation in the form of interest, the probability of commitments to be honoured gives rise to such inherent uncertainty.

This uncertainty can affect the lender holding the loan contract, as well as other lenders to the creditor. The risk inherent in the intertemporal compensation for the periodic transfer of wealth between the provider and the recipient of capital in external finance warrants an accurate prediction as to its default probability and loss severity. Such as measurement is irrespective of the means of external finance, be it corporate bonds, bank loans or any other form of debt securities or credit obligations, such as underfunded pension provisions. Therefore, the financial condition of the borrower as well as the current value of any underlying collateral is of considerable interest to its bank. In order to prevent the assessment of financial strength as a proxy of the probability of repayment at the agreed terms and conditions set out in the loan contract from being of conjectural nature, banks employ clearly defined credit rating systems in order to quantify the capacity of lenders in generating sufficient future cash flows to meet scheduled repayments required by the lender. Credit ratings address the likelihood of full and timely payment of principal and interest to lenders and expenses of other third parties involved.

Given a portfolio of loans, the real risk from credit lenders face is the deviation of portfolio performance from its expected value. Accordingly, once standardised and made comparable, credit risk is diversifiable, but difficult to eliminate completely, as market risk and interest rate risk as systematic impediments defy diversification to the effect the financial strength of debtors and the funding sensitivity of the creditor respectively. With respect to the transferability of credits, loans cannot be distinguished along the lines of diversifiability of risk on the basis of an exclusive distinction of either *interest rate risk* exposure or *idiosyncratic credit risk* respectively. While *large part of credit risk can be diversified* through the optimisation of the “diversity score“ of loan portfolios according to portfolio theory, an *interest rate risk* portion inherent in a loan portfolio *poses a systemic risk that can only diversified to a limited extent*. Banks rather employ hedging technique to mitigate possible default losses in this respect. However, the degree of this remedial mitigation of risk impediments is bounded by the transferability of systematic risk of assets. Furthermore, the idiosyncratic nature of some portion of loan losses remains a problem for creditors in spite of the beneficial effect of diversification on total uncertainty. This is particularly true for banks that lend in local markets and ones that take on highly illiquid assets and agree to unsecured repayment schemes (e.g. non-mortgage, non-collateralised industry loans, etc.). In such cases, the credit risk is not easily transferred, and accurate estimates of loss are difficult to obtain due to the residual specific risks in the loan book.

4.2 Downgrade risk (credit quality) and claims-paying ability – fundamental components of credit and structured rating

4.2.1 Definitions

The discrepancy of credit ratings and structured ratings in loan securitisation stems from the different assumptions, which enter the estimation of credit risk associated with an outstanding payment obligation. By common consent, rating agencies distinguish two types of assessment methodologies of a debtor's credit posture, the *analysis of downgrade risk* and the *analysis of claims-paying ability*. Even though the determinants of downgrade risk and claims-paying ability are closely related, the two concepts exhibit areas of analytical distinction. For descriptive purposes we consider an abstract, albeit overly simplistic, definition of both concepts similar to Canor et al. (2000). Whereas the claims-paying ability speaks to the probability of debtor default on some obligation, the downgrade risk reflects the probability that modest changes in the financial condition of the obligor might induce a reassessment of its claims-paying ability in the future. This “benefit of doubt” in the future development of credit quality is akin to the underlying principles governing the *forward-looking rationale of conventional credit rating* which focuses primarily on the *question of whether the financial resources at the disposal of an obligor match up to the stochastic loss severity* incurred in the event of adverse shocks (determination of risk exposure), irrespective of a change in the macroeconomic environment.

Since the *claims-paying ability* is an inherent component of the assessment of downgrade risk, the same factors that help obligors to maintain solvency tends to limit their susceptibility to rating downgrade in the long run. In estimating claims-paying ability, however, the accumulation of a large number of adverse developments is assumed to be the most likely scenario to precipitate defaults. This includes the sharp deterioration of their macroeconomic environment. So the risk estimate of the *claims-paying ability describes the obligor's expected ability to sustain long-term distress*, i.e. the degree of financial strength in the wake of dramatic portfolio deterioration. Such a present reflection of a worst-case scenario comes to bear in cash flow projections and adequate provisions of risk cover in structured finance transactions. In the move likely to support *structural resilience* to portfolio credit default in stress scenarios, several factors limit downgrade risk in the long run (Canor et al., 2000):

- (i) low-risk and highly diversified reference portfolios of loan risk,
- (ii) high levels of transparency,

- (iii) limited non-financial guaranty activities,
- (iv) robust and consistent capital bases, and
- (v) prudent exposures to market risk in general and liquidity risk in particular.

The *intertwined causality of claims-paying ability and downgrade risk across time* occasions compelling plausibility for a strong credit posture of businesses. Maintaining the credit rating at a comfortable level is vital to a business franchise in order to avoid being caught off guard in times of prolonged capital shortage. For instance, only if the obligor is deemed to “stay within the fairly circumscribed financial guarantee business model” (Canor et al., 2000, 3) in the context of structured finance, the current rating level will not be subject to downgrade risk. In cases of significant capital demand in anticipation of strategic changes and significant investment, obligors will take sustained efforts to avert downgrade risk in preserving their financial capabilities.

Since the *downgrade risk indicates the risk profile of the obligor over time*, the chance of credit risk deterioration and other adverse changes in financial fundamentals might warrant a downward rating adjustment. A variety of reasons could put pressure on the rating of obligors. Alterations in the business strategy and the competitive situation could lead to damaging unexpected credit deterioration or large unexpected losses in the underlying reference portfolio. In the case of structured finance transactions, rating downgrade might also be induced a great deal by the quality of underwriting and creditor surveillance of the issuing party. Moreover, the sponsor’s long-term capital plan in funding the reference portfolio could be inconsistent with the projected payments on the individual assets included therein, given the assigned rating of both the portfolio and the guaranteeing issuer. In anticipation of weakened financial strength of obligors, *downgrade risk* focuses on the comparison of financial fundamentals (credit posture) and the probabilistic impact of adverse shocks independent of the macroeconomic environment. The significance of rating change is indistinct, however, unless one is able to identify a good leading indicator of altered downgrade risk.

Measuring the financial condition of the *obligor’s core franchise* (in the case of *credit rating*) or the *sustainability of projected cash flows* from a reference portfolio of a securitisation transaction (*structured rating*) could serve to this end. Whenever one observes a strong business model with its attendant credit strength, the obligor can be safely assumed to generally have both the incentive and the resources to remedy capital shortages arising from unexpected credit deterioration. To the contrary, a weak core business could induce obligors to consider

alternative, more profitable, though riskier, areas of operation. Such operational change might coincide with a capital structure that inhibits flexibility of raising additional funds and would force the obligor to exercise restraint in earnings dilution. The same rationale applies to structured ratings in securitisation transactions. Any so-called *unscheduled* variation (i.e. unexpected losses) in portfolio credit quality is addressed through either early amortisation or structural enhancements to avert downgrade risk, which equates to a long-term absence of claims-paying ability. However, if excessive credit deterioration renders the reference portfolio incapable of satisfying contingent claims of investors and erodes the claims-paying ability), capital needs are poised to effect increased downgrade risk.

4.2.2 The importance of downgrade risk (credit quality) and claims-paying ability in loan securitisation

The common security design in securitisation has it that the rating of the reference portfolio and its guarantor reflects investor sentiment about the likelihood of expected returns over the lifetime of the transaction. The credit risk assessment of loan securitisation generally involves developing a portfolio risk model, which describes the probability distribution of potential credit losses of the reference portfolio. In securitisation *we concentrate on the claims-paying ability of the guarantor* in judging the quality of the reference portfolio. So, a structured rating reflects a comparison of available capital resources, i.e. the value of the underlying loan pool and the liquidity provision, and the loss severity of credit deterioration in extreme distress scenarios. Given its sensitivity to systematic risk of macroeconomic change and endogenous constraints of counterparty risk in loan contracting (average portfolio credit quality and risk concentration), the *claims-paying ability is indicative of credit rating development over time*. Since the sustainability of a rating is rationed on the grounds of its resilience to stress scenarios, the issuer's reference portfolio and the security design of a securitisation transaction includes substantial credit risk provisions. So the present stability of capital resources translates into reduced downgrade risk over the lifetime of the transaction.

Despite the intertwined determinants of both downgrade risk and claims-paying ability, the fundamental determinants of credit risk in loan securitisation – credit risk concentration and average portfolio rating of the reference pool of loans – might be less relevant to the comparison of the current financial condition and projected worst-case loss severity (in testing the claims-paying ability). They appear to *have greater effect on the probability of rating deterioration implied in downgrade risk* rather than the ability of surviving financial distress. Hence, the severity

of downgrade risk to portfolio concentration corresponds to its sensitivity to macroeconomic change. The probability of an obligor to stomach a general economic downturn arguably increases in the level of diversification and the degree of portfolio quality. Although idiosyncratic risk is permanently mitigated through prudent portfolio choice, the distinction between certain portfolio risk concentrations and their attendant credit exposures is likely to be more pronounced in times of normal economic development (*anti-cyclical differentiation*). In contrast, the adverse impact of a recession would hardly discriminate against differently rated portfolios and could subject obligors to what could be considered a sweeping trend towards generally higher downgrade risk in disregard of different ratings. In absence of boom or recession, however, credit risk assessment is much more suited for a fine-tuned *differentiation between different rating grades* over long-term stability rather than short-term stress tests.

4.3 The function of structured ratings

It is worthwhile bearing mind that expectations about the support mechanism of a securitisation transaction are vital in interpreting the rationale of corporate ratings and structured product ratings respectively. Certainly, ratings for structured finance products rest to a much *higher degree on quantitative parameters* than public ratings on corporate bonds or public debt, which tend to incorporate all information about an entity that is known at present. However, in *credit ratings* the issuer quality encapsulates contingent adverse events only to the extent that they affect a revision of current rating, as determinants of corporate performance and/or the business environment will change in the future. This limited state-contingent perspective does not project probable future trends but qualifies as a measure of current creditworthiness and financial performance. In some sense corporate ratings are *upfront estimates without stochastic contemplation of future outcomes*.

This benefit of doubt is not apparent in the context of *structured product ratings*. Here, the current rating reflects the *present value of a worst-case scenario* applied to the expected future cash flow generation of the reference portfolio, based on the assumed occurrence of a predetermined trigger event. Given a certain credit risk rating at present the transaction is to survive a multiple of rating-based default loss, such as stress testing, which exposes asset performance to adverse scenarios exceeding historical norms in terms of interest rate mismatch, payment rates and recoveries. The process of determining the credit enhancement has to take into account *not only today's risk but also future risk factors* that profoundly impact the value for the transaction. Essentially, the incorporation of future unknowns elevates

structured ratings to apply stochastic prudence in estimating asset performance, given the security design of the transaction. This includes vital components of a transaction. Hence, commensurate credit enhancement in a structured finance transaction has to be inadvertently conditioned on the present projection of future outcomes, albeit the side-effect of a marked reduction of rating volatility as opposed to corporate ratings. In the event of under- or over-performance, i.e. the deviation of actual observations from expectations, a change in structured ratings ensues. Consequently, one is sure to expect *structured ratings to display lower volatility than credit ratings*.

The difference of corporate and structured ratings is also apparent with respect to the *structural properties* underlying the asset in question. Given the formal rescinding of credit-linkage, the rating of securitisation transactions aims to effectively disentangle credit and transaction/structural risk in assessing the quality of both the underlying reference portfolio and the corporate rating of the sponsoring agent/issuer. Consequently, structured ratings have to honour the distance of default between these two rating reference cases. Thus, only third-party support incorporated in the structural features of the transaction, such as the credit enhancement, should come to bear in the determination of the rating associated with structured ratings. In contrast, the *corporate ratings comprehensively assess the default risk* and propensity of adverse business development of one entity only, *irrespective of supportive mechanisms* in place, which might distort and bias the results. The estimate of financial strength frequently determined in the context of public banks does reflect this distinction most prominently.

Since any turbulence in credit markets profoundly impacts on the performance of structured finance transactions – such as collateralised loan obligations as a subset of collateralised debt obligations (CDO) – *ex ante* (i.e. presale) rating of structured assets is closely coupled with *need of proactive surveillance of future rating performance* in terms of loan quality and possible recovery rates is critical in averting consistent deterioration of the par value of the reference portfolio securing the structured transaction. Any erosion of portfolio value takes a heavy toll on the credit support mechanism especially in the case of true sales rather than synthetic on-balance sheet securitisation structures. The *loss absorbing capacity* of credit enhancement supporting debt securities issued by the sponsor or the special purpose vehicle in traditional securitisation depends on the overall performance of the reference portfolio rather than a nominal amount of third-party credit risk coverage. A persistent increase in expected loss rates of the loan pool and a steady downward rating migration signals weakening collateral performance, which

inflicts *negative bias on the credit quality of performing assets* within the reference portfolio. Eventually, this development further exacerbates the maintenance of adequate credit enhancement in order to shield the transaction against adverse collateral performance

4.4 The management of risk from the issuers perspective

As banks and non-bank financial institutions engage in ever more complicated structures of loan securitisation, the credit risk flowing from such transactions has necessitated commensurate methods of assessment and control thereof. In the light of increased sophistication in structured finance, statistical procedures, which were originally developed for traditional banking business, such as on-balance-sheet lending or *plain vanilla* transactions in debt securities, have been refined to satisfy the rising demands in credit risk management. Financial institutions address this issue by means of *comprehensive credit scoring systems*, which are based on statistical procedures that provide an estimate of default probability and loss severity for loans selected for securitisation. Although the standardising nature of credit scoring has been particularly amenable to known obligors with sufficiently high transparency, the *scoring methodology is being increasingly used for small business lending and middle-market commercial lending*

As credit scoring contributes to *consistency in credit origination and loan underwriting standards*, it has become intimately tied with loan securitisation. By the same token, a *more accurate and comparable estimation of the loss* probability distribution for a loan pool being securitised is highly desirable. The lower the variance in predictions about estimated default losses arising from a selection of loans, the lower are the efficiency losses in the external assessment of asset quality by rating agencies. Credit scoring models require historical data of credit events on a large sample of fairly homogenous loan contracts in order to derive good estimates of expected losses. The standardisation of loan agreements arguably supports the process of generating such scientifically meaningful and reliable data.

Being at the intersection of internal credit risk management and public scrutiny of asset quality in capital markets, securitisation heavily *relies on accurate estimates of loss given default* of loan reference portfolios. Needless to say, financial institutions with proper in-house credit risk management capabilities consider securitisation an attractive method of refinancing if credit scoring models can be used in the origination process of standardised loan agreements. Thus, combining credit scoring models with a standardised lending policy *reduces non-interest expenses* associated with lending from the perspective of issuers of securitisation transactions.

Increased efficiency and standardisation also has crucial implications for the *cost of securitisation contingent on the ease of external credit risk assessment* by rating agencies. For example, the amount of credit enhancement – the degree to which the issuer of a loan securitisation provides credit risk cover for first losses of the reference portfolio – is a key cost driver in such transactions. As the use of credit scoring and loan standardisation improves the statistical power of credit risk estimates, credit rating agencies are better able to determine how much credit enhancement is needed for issuers to achieve a desired rating on a given reference portfolio (with a certain average default probability). Consequently, a bank can eliminate a substantial portion of this underwriting cost in loan origination when competing for new business.

5 CREDIT ENHANCEMENT

The willingness of the sponsor to retain an equity claim on the collateral pool as credit enhancement is largely driven by the structure of the CLO transaction. The lower the asset quality of the selected reference portfolio of loans in a *true sale* transaction, the higher the *price discount*³⁸ sponsors will need to grant the issuing party (i.e. the SPV) in achieving a desired portfolio rating. Hence, high levels of first loss provision indicate a large difference between the sponsor's rating assessment of the underlying loans and the desired rating for the structured claim thereon. *This does not, however, give rise to a definite valuation of the reference (collateral) portfolio*, because a sponsor has significant leeway in deciding on the desired rating to be achieved by means of securitising a given collateral of loans. Thus, any level of first loss protection of a CLO transaction is merely the result of the *endogenous willingness of the bank to cover expected losses* of the reference portfolio. At the same time, this decision *is bounded by the conditions imposed by rating agencies* in their credit risk assessment of the reference portfolio and the structure of the transaction, for the degree of minimum credit enhancement is exactly determined by securitisation guidelines of external rating agencies.

From regulatory point of view, the credit enhancement is termed a *direct credit substitute* (CDS), which meets the classic definition of a credit derivative, as its value derives from the price movement of the underlying asset, i.e. the reference portfolio of the securitisation. Such credit derivative instruments frequently represent *concentrated risk* for providers of credit enhancements. In a bank-sponsored conduit issue, such as conventional CLOs and synthetic

³⁸ discount=book value of transferred loan volume-expected credit loss.

CLOs with SPV, the most junior tranche retained by the sponsor commonly represents the first loss credit protection for the total notational balance of the transaction. The amount of first loss provision is chosen such that it absorbs default losses up to a certain percentage. The sponsor effectively incurs all estimated credit default risk of the underlying reference portfolio of loans. As this level of credit enhancement has an extremely remote probability of being fully depleted, the *concentration of all credit risk of the loan pool onto a smaller asset base* in the form of such credit supports yields a high investment-grade rating of senior claims on the reference portfolio. Consequently, the degree of this *implicit leverage on credit risk* invalidates hitherto regulatory treatment. Given the concentration of the entire portfolio credit risk in the credit enhancement a commensurate capital charge would represent a multiple of what has previously been deemed the appropriate regulatory requirement for the total volume of securitised loans.

From the issuer's perspective, *calibrating the level of credit enhancement* is predicated on a detailed credit assessment of the reference portfolio of loans. Rating agencies ascertain the credit enhancement level for a reference portfolio based on the analysis of credit quality, expected loss and pool diversity required for senior and mezzanine classes to achieve the desired rating on the CLO structure of issued debt securities. The *credit enhancement calculation model* developed by Standard and Poor's shall serve as guideline in introducing the fundamental parameters entering calculation of the level of first loss position (generally retained by the sponsor of the securitisation transaction). The following criteria apply:

- (i) average maturity of the reference portfolio,
- (ii) historical performance,
- (iii) debtor concentration,
- (iv) record of payment delinquencies,
- (v) default rate of portfolio, and
- (vi) dilution of asset claims/receivables

These parameters are subjected to *stress scenarios*, so that the level of so-called *dilution reserve* and *default reserve* can be determined. The sum of both represents the required credit enhancement for the respective transaction. In the context of CLOs the credit enhancement signifies the *resilience of the reference portfolio to sustain an amount of scheduled losses* (determined by the desired structured rating) without compromising the continued servicing of issued debt securities. This residual credit risk underpins a lower level of *default tolerance* of structured claims on the

reference portfolio. Consequently, the amount of credit enhancement reconciles the discrepancy between the credit quality of the reference portfolio and the rating benchmark desired by the sponsor/issuer of the CLO transaction for purposes of lowering the default tolerance. The larger this difference the more funds have to be made available for sufficient credit risk cover by means of credit enhancement.

Balance-sheet of a SPV in a CLO transaction (\$m)			
Assets (credits)	Liabilities (notes)	Rating	%
5,000	4,650	AAA/AA	93
-	100	A	2
-	100	BBB	2
-	150	-	3
5,000	5,000		100

The Special Purpose Vehicle has to fulfill the following conditions:

- It has to be protected from insolvency of the originator (bankruptcy remoteness)
- It usually has no recourse to the originator (non-recourse)
- It must not fall under corporate taxation, because double taxation would make transaction too expensive
- It is usually organized as a trust and is not consolidated with the originator
- Its business activities are limited to the issuance of predefined ABS
- A further going indebtedness is not possible

In an ABS structure, the risk of the securitised assets is totally separated from the originator.
For the investors, only the SPV is the liable party

(1) Equity tranche, unrated
Source: Dresdner Kleinwort Benson Research

Fig. 15. *The balance sheet of a special purpose vehicle (SPV) in collateralised loan obligations (CLOs)*

In their exposition of the function of credit enhancement, Herrmann and Tierney (1999) refer to base case 10-year cumulative default rates and base case recovery rates in an *exemplary derivation of the credit enhancement level required* by two of the three major rating agencies Moody's, Fitch IBC and Standard & Poor's. Given a diversified pool of B-rated (non-investment grade) collateral, Moody's would estimate a default rate of 31.8% and a loss rate of 22.3% of the entire portfolio respectively (assuming a conservative recovery rate of 30% of assets). In order to achieve a desired structured rating of Aa2 for this portfolio in the wake of a CLO transaction, default tolerance has to be lower. The *higher rating assumes a lower default frequency* such that a tolerance of a higher default rate must increase at the same expected loss as before

$$\text{expected loss} = \frac{\text{default frequency}}{\text{probability of default} \times \text{loss severity}}.$$

In the case of a desired investment-grade rating of Aa2 the rated class *must now survive higher default and loss rates* (39% and 55.7% respectively) of the reference portfolio, which implies a subordination of 39% of the reference portfolio value in equity tranches as credit enhancement. Fitch IBC would require a slightly lower default rate of 52.3% due for an AA-rated class based on the assumption of a based default rate of 29.9% for a B-rated collateral. As the desired rating rises, the marginal reduction of loss expectation is compensated by a commensurate degree of credit enhancement as the migration from a non-investment-grade rating to a AA-rating equates to the significant reduction in the variance of default probability. Thus, credit enhancement truly serves as a safety mechanism to protect investors in senior and mezzanine tranches of CLOs from default loss in excess of estimated losses.

6 EFFECTS OF SECURITISATION ON THE LOAN PORTFOLIO COMPOSITION (LOAN BOOK) CREDIT RISK EXPOSURE AND FUNDING OF BANKS AS WELL AS BANKING REGULATION

6.1 Regulatory change and its effects

Loan securitisation harnesses the adversity of both the current *one-size-fits-all regulatory straightjacket* and the *competition in the lending markets*, which renders the cost-effective origination of loan for the bank portfolio (especially of investment-grade credits) increasingly difficult. This predicament has prompted banks to consider balance sheet restructuring for purposes of mitigating regulatory capital as well as improving overall economic efficiency (Punjabi and Tierney, 1999).

The main channel through which banks arbitrated the regulatory provisions of the 1988 Basle Capital Accord was by securitising their better quality assets and retaining their riskier assets on their own books. Barring future modifications by the Basle Committee, the equitable treatment of risk categories under the Capital Accord of 1988 (i.e. a constant capital risk weighting, which does not distinguish between different qualities of loans) still represents a perennial source of *regulatory and institutional arbitrage*. Consequently, the market for securitised assets grew dramatically from the early 1990s onwards and attracted a large following with all major investment banks for purposes of obtaining capital relief, gaining liquidity or exploiting regulatory capital arbitrage opportunities in the securitisation of loans. Since it is less efficient for banks to retain highly rated loans due to their tight spreads relative to the regulatory capital requirement (unlike high-risk loans with an interest sufficiently high to sustain a flat capital

charge), the indiscriminate risk-weighting of loans has led a growing number of national and regional banks to concentrate on the *securitisation of investment grade* credits, whose inefficient relationship between associated regulatory capital requirements and interest yield constitutes an arbitrage opportunity. Only banks with a developed trading portfolio capability are in the position to remove credit risk of non-investment grade loans from their loan books as a result of this disparity between the regulatory regime and the economics of financial intermediation governing the benefits from loan business.

With the new proposal of the 1988 Basle Accord suggesting the implementation of discriminatory risk-weightings across rating categories, the *prospective change of the current regulatory regime will censure institutional arbitrage on regulatory capital requirements*, which has hitherto motivated asset-backed securitisation. The new proposal of the Basle Committee incorporates advances in credit risk measurement, as it allows minimum capital requirements for credit risk to be determined by an *internal ratings-based approach*. Consequently, different loan grades will attract different commensurate risk weights in the future, e.g. low credit risk of investment grade loans is transposed into a lower level of regulatory capital. If the previous broad-brushed regulatory treatment of loans rules out arbitrage opportunities of low-risk assets under the current risk-based regulatory framework, banks are very likely to dispense of investment grade loans at large in securitisation transactions.³⁹

Conversely, as a higher capital charge levied on risky assets will carry larger risk-based *capital haircuts*, the *incentive to secure non-investment grade loans* will rise. The relationship between the risk level of non-investment grade loans and the associated economic capital cost will determine the extent to which banks and other financial institutions are prepared to substitute high-risk assets (i.e. non-investment grade loans with presumably high capital haircuts) for investment grade-related credit exposures on their loan books – a reversal of the present drainage of low-risk loans off the balance sheet. Hence, loan securitisation, originally devised as remedy to inflexible regulatory capital charges, will be instrumental in the *efficient management of economic capital* for purposes adequate asset allocation. Therefore, the erosion of regulatory arbitrage by means of replacing the present regime of one-size-fits-all risk-based capital requirements is

³⁹ Punjabi and Tierney (1999) underscore this point by noting that this turn of regulatory policy was termed as the so-called “full models approach” by John Mingo of the Federal Reserve Bank of New York at a speech delivered to senior regulators of major banking supervisory authorities in London in September 1998. In conjecturing that the application of the new internal ratings based approach will require qualifying banks to extend the determination of capital cover of credit risk to market and operational risk as well such that potential insolvency can be averted with certain confidence over a specific investment horizon.

intimately related to improvements in credit risk management of banks and financial institutions.

Although the latest Basle proposal aims to moderate future regulatory incentives of banks to dispense with low-yielding assets through securitisation on an excessive scale, the market is now too large and important just to disappear. The unabated popularity of asset-backed securities raises some complex questions about how such securitisation should be treated for risk control purposes. The envisaged scrutiny of internal credit risk assessment presented in the new Basle Accord does not only *probe a comprehensive examination of the bank-based computation of capital requirements* of loan books as to the explicit treatment internal rating mechanisms. It also warrants *contemplating the development of financial intermediation* with respect to loan securitisation. This is a difficult question, especially since securitisation can be structured in a wide variety of ways, eventuating disparate risk profiles for both the originating bank and capital market investors. Unless rules on risk management, transparency and investor protection prove adequate, such form of structured finance could possibly pose a significant threat to the stability of financial markets.

While the benefits from regulatory arbitrage on investment grade loans fade in view of the new proposal to a new Basle Accord, the new reality of a more *responsive regulatory setting* does not invalidate but rather strengthen the argument of risk-adjusted *efficiency gains (of economic capital) in the process of loan securitisation*. Securitisation maintains its economic edge, as it enables banks and non-bank financial institutions to reap the rewards from *advanced approaches in controlling credit risk* and reduce inessential non-interest rate expenses.

6.2 Changes in the configuration of securitisation⁴⁰

6.2.1 Standardisation

The growing *standardisation* of loan terms and credit scoring processes does not only lead to operational efficiency and transparency of credit risk management routines but also fosters *mitigation of inherent uncertainty* in both the estimation of the cumulative distribution function of default probabilities and loss severity associated with various loan pools. Simulation models to estimate the performance of the reference portfolios of synthetic and conventional loan securitisation as well as improved analytical systems for the credit risk assessment of portfolios, such as KMV's *Portfolio Manager*, address much desired properties of credit risk

management. Higher precision in the estimation of credit risk (i.e. a declining marginal increase of total variance of estimates as expected losses rise) is tantamount to reduced credit risk exposure to unexpected loss.

Given the inherent complexity and diversity of structured transactions, Burghardt (2001) states that a case-by-case basis evaluation of structured products with a derivative element⁴¹ (such as synthetic CLOs) or pure derivative transactions is inevitably warranted from both a risk and regulatory perspective. Therefore, *greater transparency of credit risk through standardisation* bodes well with the conservative procedures of rating agencies in the determination of default probabilities and the pricing of synthetic asset-backed securities. So far, especially in cases of new types of reference portfolio assets (most prominent in synthetic CLO structures), relatively low structured ratings for mezzanine tranches (intermediate credit tranches) have resulted in spreads well above those found for comparably rated corporate bonds with arguably lower uncertainty about asset quality. The proposed regulatory framework, however, instils greater efforts in closing the information gap between issuers of CLOs and rating agencies due to a *greater degree of transparency and standardisation of credit risk* assessment by means of second-generation models of credit risk analytics.

Although credit rating agencies as the prime source of credit risk analysis for CLO transactions will not be rendered redundant, the increase in bank-based credit risk assessment is most likely to improve the efficiency of CLOs. This, in turn, allows investors to draw comfort from an increased understanding of the credit risk inherent in CLO transactions (as *informed buyers*), whose diversity and complexity tends to cause problems in analysing the risk-return relationship for lack of appropriate analytical approaches (Burghardt, 2001), which could result in incorrect classification and underestimation of risk exposure.

As opposed to the notion of portfolio diversification, which redistributes risk by pooling numerous underlying asset risk return profiles, synthetic securitisation is predicated on the exclusive transfer of credit risk without renouncing loan servicing. This form of risk redistribution is *particularly sensitive to credit risk sophistication of informed buyers*. Investors would no longer deal with structured products in an undifferentiated way, unless breaking down

⁴⁰ See also Eichholz (2000).

⁴¹ Investment management legislation in certain countries stipulates *expressis verbis* the types of derivative instruments investment funds are entitled to hold in their portfolios. The credit risk treatment of credit derivatives attracts particular attention as they do not rate a mention in the German legal catalogue for instance (Burghardt, 2001).

structured products into individual risk elements imposes disproportionate resource cost, such as time and specific asset knowledge. If increased confidence stimulates *informed* demand for structured products as the *information premium* decreases, spreads decline and synthetic CLO structures become more attractive as modes of loan securitisation.

6.2.2 The type and structural make-up of loan securitisation

In the light of the proposed revision of the Basle Accord, the increased focus of securitisation on the efficient use of economic capital in lending business is strongly intertwined with the *type of securitisation* contingent on in-house credit risk management capabilities. In order to represent credit risk more truthfully for purposes of mitigating the internal ratings based capital charge, private placements with other financial institutions would no longer warrant major involvement of rating agencies. Hence, banks might be in the position to do without rating agencies in conducting securitisation transactions to fine-tune the composition of the loan portfolio (Punjabi and Tierney 1999).

Concurrent to the adoption of the internal-ratings-based approach, rising sophistication in credit risk management also implies an *altered logic of the structural make-up of loan securitisation*. With the mechanism of removing loans from the balance sheet through true sale being doomed to obsolescence (in absence of regulatory arbitrage), the creation of perfected security interest of a synthetic claim on the underlying reference portfolio becomes the method of choice. Former disincentives of synthetic loan securitisation – inadequate credit risk assessment and information disclosure – have grown devoid of much of their economic relevance as regulatory consideration of internal credit risk assessments rewards the close alignment of economic and regulatory capital. As the legal treatment of the servicer of a loan pool no longer constitutes regulatory benefits associated with true sale, the administration of securitisation appears to be best served by the arrival of synthetic asset claims, which has stolen a march from traditional securitisation. Thus, provided that the migration towards a responsive regulatory system perpetuates the sophistication of credit risk management and rectifies arbitrage behaviour to hitherto defunct regulatory provisions, the emphasis on *economic capital as the prime incentive of synthetic securitisation is essentially a child of its own making*. The implications of regulatory change and advanced credit risk methodologies confine the optimal structure of loan securitisation to the transfer of credit risk only.

Although securitisation facilitates the cost-effective utilisation of economic capital, its *economic benefit, however, varies across banks*, depending on the varying degree of individual composition of loan portfolios and the economic objectives banks intend to achieve through securitisation. *Conventional CLOs* cater to issuers, who seek to allocate credit risk more equitably to investors, reduce the cost of capital of loan origination, and curtail balance sheet growth of the loan book. In some instances the issuer might simply not be adept in completing credit derivative transactions in compliance with commonly accepted regulatory principles and standards of credit risk control. In contrast, *synthetic CLOs* are widely revered for their capacity of efficient credit risk transfer instead of a clean break of credit-linkage through a true sale of assets. Synthetification represents a seachange in bank-based financial intermediation due to increased efficiency in economic capital, which results from converting individual, illiquid financial assets into tradable market instruments by means of combining debt securities and credit derivatives as financing conduits. Although the novel features of synthetification rebound in slightly wider spreads and marginally higher risk-based capital haircuts (Punjabi and Tierney, 1999), the relative ease of completing credit default swaps and a rapidly tapering learning curve of capital markets about synthetification permit structural flexibility of synthetic CLOs, whilst the servicing function of the reference pool of loans remains untouched.

6.2.3 Credit rationing and operational efficiency

Two consequences emanate from the prevalence of synthetic CLO security design. For one, synthetic CLOs garner issuers with a wide range of eligible assets for portfolio selection, beyond the conventional restriction to illiquid and fairly standardised loans in traditional securitisation. As much as the expansion of securitisable asset properties signals the perennial dynamics in structured finance, it coincides with an activist sprawl of standardisation in loan origination (e.g. credit scoring systems) by financial institutions. At the same time, the extended scope for asset selection in synthetification curbs fears about credit rationing of non-standardised loan contracts, while mitigating the impending cost premium of non-standardised loans. Barring new banking book regulations concerning credit derivatives, also the consideration of non-loan risk, i.e. risk exposure unrelated to the reference portfolio but associated with the collateralisation of the issued debt securities (e.g. counterparty default on a credit default swap securing the super-senior investor tranche), augments the scope of application of synthetification, with banks seeking to free up economic capital locked up in asset management provisions.

In general, the effect of securitisation per se on capital provision is straightforward. Loan securitisation espouses the basic concept of a more efficient use of economic capital (see Fig. 16) and stretches asset funding beyond what would have been attainable by means of self-funding in traditional on-balance sheet lending due to the expansion of funding sources (besides ordinary account deposits).

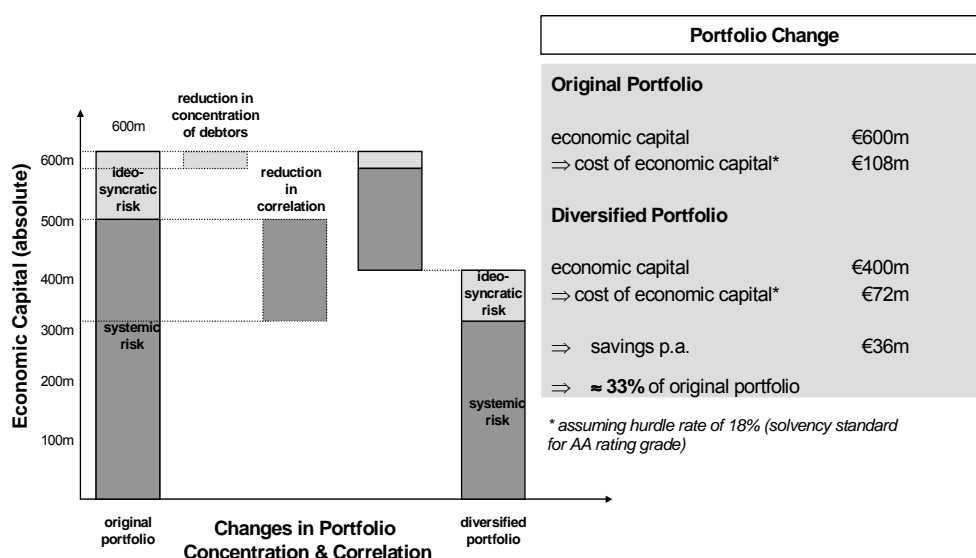


Fig. 16. *Quantification of the reduction in economic capital through portfolio optimisation.*

In keeping with the concept of risk diversification in modern portfolio theory, the ability to incorporate and sustain larger loan pools allows issuers of collateralised loan obligations (CLOs) to lower their overall credit risk (if we drop the assumption that issuers want to reduce balance sheet growth). The particular security design of CLOs allows issuers of CLOs to slice and dice the reference portfolio of loans according to estimated default by means of subordinating debt securities (various tranches with different seniority). If asset proceeds and credit defaults are prioritised according to seniority (i.e. subordination through loss cascading), securitisation achieves a close match of the term structure of each tranche with the default tolerance of each risk type of investors in debt securities. The reconciliation supply and demand of risky asset claims commits less economic capital to the loan origination process and mitigates the potential for reduced non-interest expenses, as no unexpected credit risk should go unchecked in the optimal case of optimal market equilibrium under perfect risk classification. Consequently, the cost of administering securitisation transactions should be more than offset by economic gains derived from removing credit risk off the balance sheet.

The level of trade-off (hurdle rate of securitisation) stands to be measured by the opportunity cost of interest proceeds commensurate to the asset quality of the securitised loans under information asymmetry.

6.2.4 Market mechanism and risk allocation

Optimal allocative efficiency (through regulatory arbitrage) does not necessarily equate to lower systemic credit risk. In fact, regulatory recognition of closer approximations of credit risk leaves little room for other risks impacting on banking business to be accommodated in regulatory capital requirements, such as operational risk (Goodhart, 2001). Hence, mechanisms of regulatory arbitrage for purposes of fine-tuning a previously broad-brushed determination of capital charges represent a most welcome market reaction if the means of achieving capital relief lead to an efficient allocation of capital, with risk being adequately diversified.

In the recent past, so-called monoline insurance (an insurance company set up with the sole purpose of guaranteeing selected tranches of asset-backed securities) has been a popular method of credit risk transfer for issuers in loan securitisation. Insurance companies guarantee to make good on credit loss of a pool of loans underlying a loan securitisation and, thus, free issuers from retaining minimum capital requirements for these loans. While this mechanism allows banks, for instance, to arbitrage present regulatory provisions and originate more loans, central bankers would not necessarily object to such techniques, which move risk away from banks, for which they may have to provide liquidity, as opposed to insurance companies, for which they will not (The Economist, 2002a). The original intention of risk diversification and allocative efficiency in regulatory arbitrage in credit risk transfer, however, has alerted financial watchdogs, who worry that an alignment of economic and regulatory capital through misguided credit risk transfer might lead to a build-up of risk elsewhere, or may not have been perfectly passed on to counterparties in derivative transactions (The Economist, 2002a).

Regulatory capital relief cannot sidetrack from the prospect of a dangerous reshuffling of individual credit risk exposures between financial service firms. Given that regulatory arbitrage of credit risk through third-party insurance is only acceptable if regulations imposed by national supervisors reflect different economics, i.e. any transfer of credit risk from banks to insurance firms requires the different objective and investment horizon of the counterparty to be a better match for the type of risk transferred. Rule (2001), however, states that little

knowledge of insurers about the characteristics of loans and other debt transferred, or hedged, by banks invalidates the claim of increased efficiency and diversification through risk transfer. As banks and insurers treat credit risk differently, the absence of comprehensive information about individual credit risk in the loan pool might not reduce economic and regulatory cost. Hence, the rationale of credit risk transfer both from a firm perspective as well as industry perspective would have been rendered meaningless. Consequently, judging the feasibility of risk transfer in the context of structured finance boils down to how well it produces more efficient levels of regulatory capital issuers are prepared to provide. Any transfer of credit risk should be based on enhanced credit risk management, which must not reflect institutional arbitrage but a continued effort to allocated credit risk as efficiently and equitably within and across financial institutions as possible.

As much as the credit enhancement of CLO transactions, generally a structural sine qua non, predicts the first loss provision for estimated credit events reasonably well, regulators and banks are faced with the question of how the collateralisation of senior tranches through monoline insurance should be treated in terms of minimum capital requirements to reach similar regulatory outcomes as in the case of credit enhancement. Although issuers of securitisation transactions correctly estimated future losses and provide commensurate capital cover, the edifice of asset-backed securitisation in general and CLOs in particular heavily depends on the credit rating issued by rating agencies upon assessment of extreme cases of credit events; and so does the valuation of monoline insurance, which has been created to sustain high levels of structured ratings of securitisation transactions. Considering the doubtful default protection of such insurance in severe portfolio distress, the possibility of misallocated credit risk through regulatory arbitrage subjects more and more off-balance sheet financial activity in structured finance with third-party insurance cover to comprehensive credit risk assessment by rating agencies.

The reliance on such external ratings for purposes of averting misguided allocation of credit risk to insurance companies does not only boost the governance of CLO transactions by rating agencies and their interpretation of credit risk. It might also lead issuers, regulators and investors to fall victim to collective myopia that blinds them to the actual risks of what is being packaged into the reference portfolio of CLOs and asset-backed securitisation transactions (The Economist, 2002a). Therefore, the pervasiveness of standardised rating approaches applied in structured finance could reverse efforts of efficient risk diversification

unless incentives of regulating securitisation coincide with the economic reality of the issuer's capabilities to manage credit risk – be it a bank or an insurance company.

6.2.5 Implications for bank lending

The attractiveness of securitisation, however, is not devoid of *implications for the conduct of financial intermediation and external investment funding*. As regulatory considerations recede, the premium placed on the economic rationale of securitisation occurs at a time when the *origination of loans has become a fiercely contested business*. In the quest of more efficient banking operations banks are pressed for enhanced credit risk management capabilities and allocative efficiency in loan origination. Both aspects underpin the economic rationale of securitisation under an internal ratings based regulatory framework. Given the competitive nature of capital markets, improved risk-adjusted returns are likely to translate into more favourable loan terms for bank debtors that qualify for *standardised credit assessment* and wish to partake of standard loan contracts with minimised idiosyncratic risk. The dependence of profitable asset securitisation on the acquisition of *off the shelf* loans does inevitably bias financial institutions into altering the composition of their loan book for purposes of cost efficient asset funding. The illiquid nature of customised loan contracts coupled with higher information cost, non-standardisation will carry a premium compared to standardised credits, even if the risk involved is the same. *Investment funding* such as project finance and SME finance, *is becoming less attractive to banks* and non-bank financial institutions as the information of private information in a close borrower-lender relationship or the entrenchment of individualised service defies accurate pricing in securitisation markets. In pursuit of cost efficiencies banks would for the most part be inclined to forgo customisation, as the ease of subsequent securitisation drives the acquisition of debtors, i.e. the degree of standardisation of assets determines the cost of securitisation. Hence, *non-standard loans will remain to be offered*, but only at a higher price (which might increase adverse selection and credit rationing).

What appears to be turning the principle of traditional bank-based financial intermediation upside down, is nothing else but a *re-definition and fine-tuning of the intermediation process*. Like in traditional deposit business, the terms of the lending business under securitisation is conditioned on the cost of asset funding and its attendant exposure, that is, the cost of capital sets the reference base for adequate contribution margins in asset origination. This interpretation of asset funding in securitisation preserves the *concept of financial intermediation*, with the exception that securitisation effectively *disintermediates* deposit-financed bank credit

(deposit business). Issuers of securitisation transactions subordinate investor claims by connecting investors of various risk appetites directly with debt securities structured to meet commensurate risk tolerance of investors. Asset funding through the origination of debt securities forges a new process of intermediation, with the deposit business taking a backseat. Nonetheless, loan securitisation – with banks acting as *loan brokers* capitalising on their informational rents – continues to be grounded in the idea of banks as *conduits of efficient allocation of investment funds*. Loan securitisation modifies the criteria of lending business and advances an efficient asset funding process, defined by how far the loan book can be restructured to meet the demands of issuing structured claims on an underlying loan portfolio. In other words, the diversification effect and the reduction of economic capital in securitisation is proportional to the use of *standardised* bank loans, once regulatory arbitrage has been rendered less profitable.

From a regulatory point of view, bank-based loan *securitisation might display the same characteristics of credit risk as traditional lending* depending on the payment structure and the security design of the securitisation transaction. As banks tend to retain a significant portion of credit risk in the form of credit enhancement in combination with complementary structural enhancements, CLOs pose prudential issues of credit risk management similar in scope and significance to conventional lending business. However, the elaborate security design of loan securitisation commands a regulatory treatment of credit risk of structured finance more comprehensive than what is currently considered in banking supervision of traditional lending business. Apart from issues of financial stability, improved credit risk management techniques applied by issuers of loan securitisation transactions attributes *greater significance to aspects of investor protection*. From a regulatory perspective, such structured finance investments may need extra supervision to reduce threats to the global financial system, as the inherent complexity should not blind the beholder to the fact that unregulated financial institutions pose a threat to the stability of financial markets worldwide, unless rules on risk management, transparency and investor protection prove to be adequate (Eichel, 2002).

6.2.6 Implications of the regulatory system and other general trends on bank lending - securitisation as a conduit of regulatory constraints

Future changes in the conduct of credit risk management and the lending policy of banks are *not so much driven by the requirements for securitisation* in the pursuit of lower economic and regulatory capital, *but rather by the radical change in mutually reinforcing trends challenging banks to be*

more efficient in the management of credit business. That is, securitisation epitomises *one* possible vehicle of such efficient change management.

First and foremost, the *fundamental shift in the regulatory system* governing financial intermediation is one trend that has induced a changed business paradigm. Devised as an arbitrage mechanism to exploit regulatory shortcomings, securitisation is no longer limited in application to opportunities arising from the *one-size-fits-all* treatment of credit risk in the current regulatory system, but also caters to the anticipated regulatory change as regards less standardised procedures applied in the determination of capital requirements for credit risk exposures (*Basle II*). Irrespective of the approach chosen for the calculation of capital adequacy (*Standard Approach*, *Foundation Internal-Ratings-Based Approach (Foundation IRB)*, *Advanced Internal-Ratings-Based Approach (Advanced IRB)*), the implementation of the new proposal of the Basle Accord, in one way or the other, requires a re-definition of banking operations in order to increase the liquidity of loans. *The use of securitisation and credit derivatives makes a good subtext* to this change process induced by new regulatory reform. The following the core aspects of reform in bank lending are particularly amenable to securitisation:

- (i) a consistent internal *rating and scoring model* on an individual debtor basis,
- (ii) a detailed *calculation of individual risk exposure* in order to establish a transparent creditor-debtor relationship, and
- (iii) comprehensive and *active credit portfolio management* for purposes of avoiding risk concentrations (*granularity*), which might serve as a basis for the implementation of risk control routines.

Under (ii) increased levels of sophistication in credit risk assessment allows for an accurate identification of concentrations of risk exposures as percentage of economic capital in excess of a certain absolute risk tolerance (see Fig. 17). Diversifying these risks would require a careful consideration of both concentration and correlation effects of individual exposures contingent on a given portfolio size, i.e. the exposure-weighted number of assets (Fig. 18).

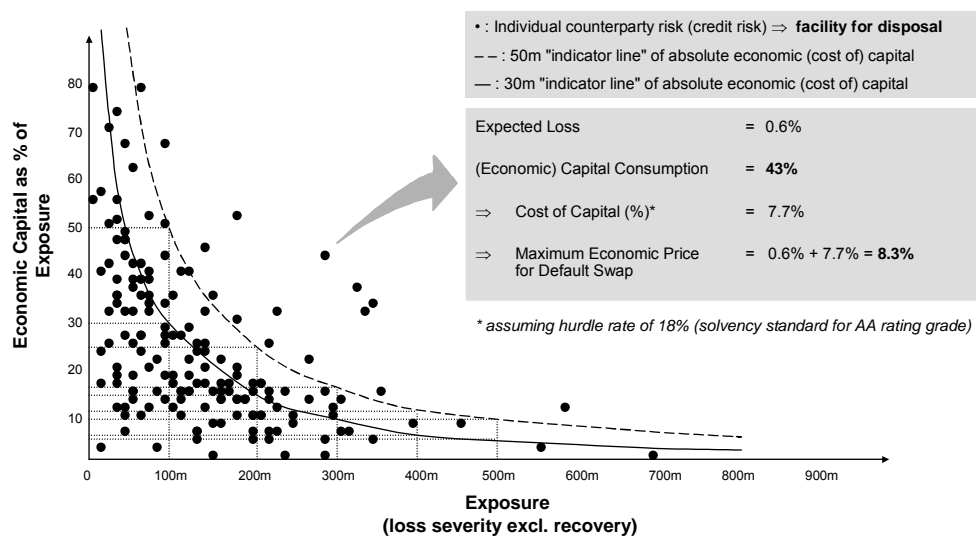


Fig. 17. *Portfolio concentration – identification of individual risk concentrations within the portfolio and acceptable price for hedging this risk.*

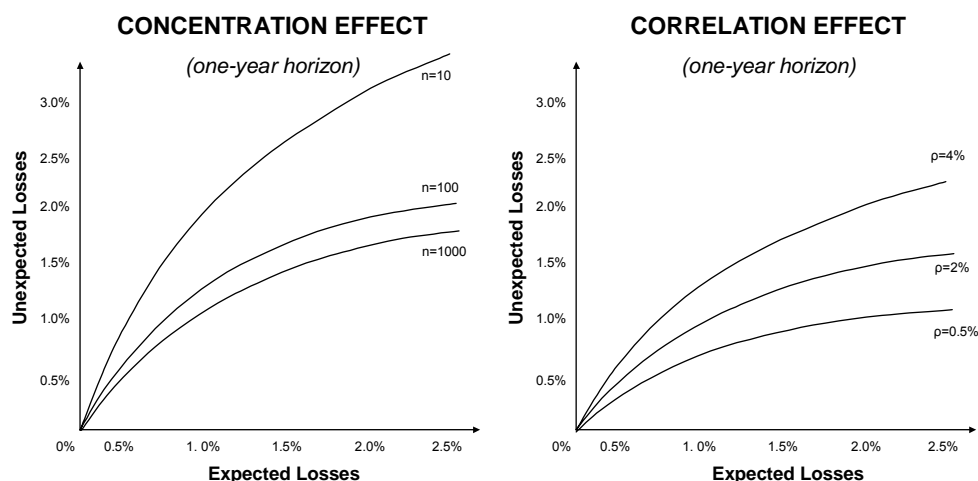


Fig. 18. *Portfolio diversification depends on the concentration and correlation of individual assets in the given portfolio.*

Fig. 19 below illustrates aspect (iii) – the relationship between securitisation as an operational response of financial institutions to turn the tide of declining yields from interest-based business, on the one hand, and regulatory reforms set forth in the new proposal of the Basle Accord and active credit portfolio management, on the other hand.

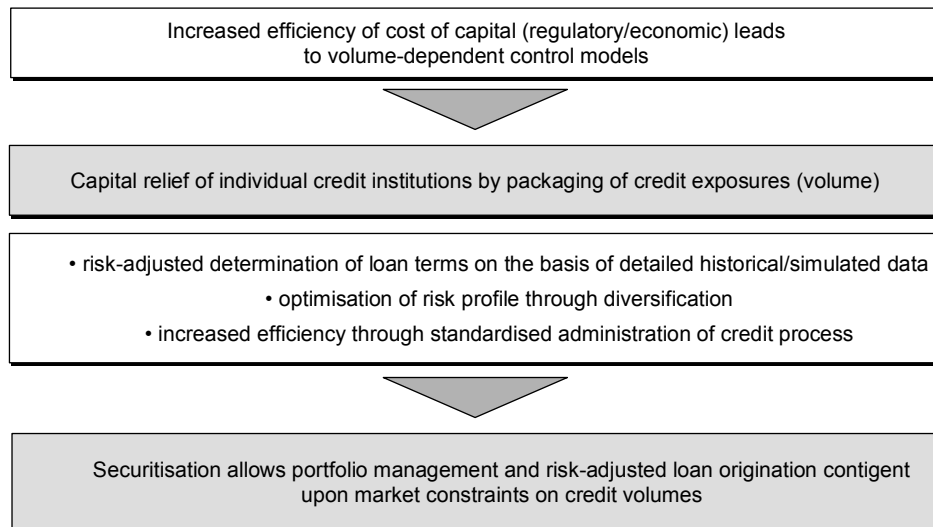


Fig. 19. *Portfolio structuring through securitisation.*

Secondly, the prospect of under-performing credit assets as well as a legacy of poor pricing and cross-selling in interest-based business, such as lending to corporates and sovereigns, has led banks to embrace *securitisation as a convenient tool to overcome regulatory and economic capital constraints*. Apart from such internal demand-driven reasons of changes in the way banks manage lending business and attendant credit risk, the pervasiveness of methodological advances in credit risk assessment (see Fig. 20 below) and sophisticated portfolio analytics have helped establish structured finance transactions as an essential refinancing tool of banks and financial service firms (Oliver, Wyman & Co., 2002).

	<i>Merton-based models</i>	<i>Econometric Models</i>	<i>Actuarial Models</i>
Risk and Correlation Parameters	<ul style="list-style-type: none"> • estimated default frequency (EDF) • asset correlations • industry/country weights • (loss severity) 	<ul style="list-style-type: none"> • estimated default frequency (EDF) • sensitivities to macroeconomic variables • (loss severity) 	<ul style="list-style-type: none"> • estimated default frequency (EDF) • default rate volatility • sector weights • (loss severity)
Basic Analytics	<ul style="list-style-type: none"> • credit event (debtor default) occurs if value of assets is less than value of liabilities • Monte Carlo simulation of correlated asset returns and default • generates loss and/or NPV distribution 	<ul style="list-style-type: none"> • default rate is regressed on macroeconomic variables and random innovations • Monte Carlo simulation of default rates • generates loss distribution 	<ul style="list-style-type: none"> • default rate is assumed to be a random variable • closed form solution for default and loss distribution • generates loss distribution
Commercial Applications	<ul style="list-style-type: none"> • JP Morgan CreditMetrics • KMV Portfolio Manager 	<ul style="list-style-type: none"> • McKinsey CreditPortfolioView • Proprietary Portfolio Models 	<ul style="list-style-type: none"> • CSFP CreditRisk+

Fig. 20. *The three basic approaches to portfolio modelling*

Consequently, the interaction of these trends emphasises the critical importance of *active credit portfolio management*, sustained by consistent high-quality credit risk analysis, as banks realign business roles and responsibilities in the lending process as illustrated in Fig. 21 below.

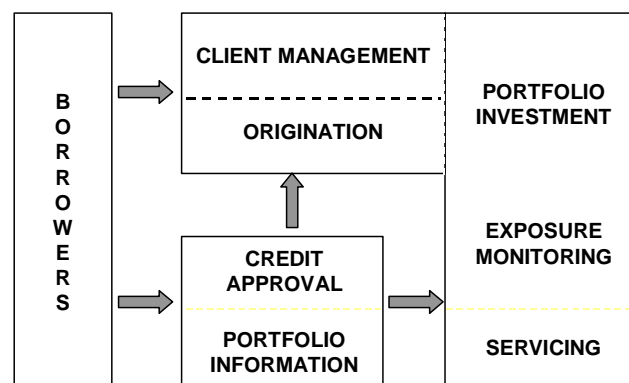


Fig. 21. *The new organisational model of bank lending (Oliver, Wyman & Co., 2002)*

The implementation of these core aspects of active credit portfolio management lead to a *radical redesign of business processes in bank lending* provided that risk control routines take into account credit volume. As the origination of loans and portfolio investment is unbundled, the *risk-oriented determination of credit conditions and increased efficiency in the lending process through*

standardised credit terms are essential components of a new organisational model of bank lending. Therefore, securitisation of loans and other bank assets would lead to a flexible structuring of the credit portfolio if market prerequisites are satisfied.

The *strategic consequences for the lending policy of banks will vary between large and small banks*. Large banks, with more sophisticated credit management systems, are better prepared for an internal-ratings based determination of minimum capital requirements, which lead to a more truthful representation of the risk-return relationship in the lending business. With loan pricing under the new regulatory framework geared to internal credit risk assessment, large banks will be ill at ease to fully transpose exposure to poorly rated loans into higher risk-adjusted spreads. The perpetuation of past standards of loan origination appears hardly feasible. Since the attractiveness of a loan is also contingent upon both the credit portfolio quality of the loan book and the corresponding routines for credit risk control, large banks are more inclined to focus on the strategic business of highly rated loans (The Boston Consulting Group, 2001). Smaller banks are faced with the need to adjust loan terms in accordance with capital requirements of the standard approach in the Basle II proposal to preserve their competitiveness; however, lower flexibility in the calculation of capital adequacy (e.g. incorporation of *loss given default* (LGD) in a *standardised* calculation of credit risk exposure, etc.) defaults smaller banks into accepting those levels of credit risk, which attract more beneficial treatment in the *standard* approach of credit risk weighting – namely poorly rated loans with high interest margins. Moreover, even if bad risks were to be weeded out, the process would not offset the cost of restructuring the credit portfolio. Although the standard approach enables smaller banks to comply with regulatory minima by adopting a risk-adjusted lending policy in line with more advanced portfolio credit risk management, low quality debtors with long maturity loans are most likely to migrate to smaller banks, creating larger credit risk exposure.⁴²

Consequently, the administration of *securitisation by financial intermediaries is the consequence of a more responsive regulatory system and new external constraints, which reward increased sophistication* of internal credit risk management – be it driven by either efficiency gains or regulatory incentives or both. Banks would focus on underwriting, product engineering, distribution and trading of structured finance products through the active use of credit derivatives in order to achieve favourable tax and regulatory treatment of their loan portfolio. Nonetheless, *securitisation is only one way* to address more sophisticated credit risk management. Besides a *securitisation model*,

⁴² Oliver, Wyman & Co. (2002), Presentation at the “Campus For Finance” conference, Otto Beisheim Graduate School of Business (WHU), Vallendar/Germany.

banks could also adopt other operational structures in anticipation of future *business end games* for financial intermediaries (see Fig. 22).

In an *investment banking model* banks would specialise in their role as intermediaries for end-investors, such as mutual funds, insurance companies and asset managers, with their core activities limited to loan underwriting, distribution and secondary trading for purposes of limited tax expense and capital cost.

"INVESTMENT BANKING MODEL "	"REINSURANCE MODEL "	"SECURITISATION MODEL "
<ul style="list-style-type: none"> • banks acting as intermediaries • activities focused on loan underwriting, distribution, secondary trading • end-investors: mutual funds, insurance companies, asset managers • favourable tax and capital treatment 	<ul style="list-style-type: none"> • parallel to P&C (property and casualty insurance) market • banks hold specific risks of individual loans • reinsure against „tall“ risks (large losses) • insurance opportunity for capital rich, globally-diversified institutions 	<ul style="list-style-type: none"> • ultimate manifestation of increasing liquidity • banks focused on underwriting, product engineering, distribution, and trading • active use of credit derivatives • favourable tax and capital treatment

Fig. 22. Models of possible “business end games” for financial intermediaries in the wake of regulatory change (Oliver, Wyman & Co., 2002)

Finally, if the internal risk management routine of a bank reaches a level of sophistication sufficiently advanced, such that a bank could profitably accept specific risks of individual loans, a *reinsurance model* becomes feasible. In this model of a *business end game* banks focus on reinsuring counterparties against large credit risk exposures – parallel to the property and casualty insurance market, likely to be limited to capital rich and globally diversified companies.

7 REFERENCES

- Akerlof, G. A. (1970), "The Market for Lemons: Quality Uncertainty and the Market Mechanism," *Quarterly Journal of Economics*, Vol. 84, 488-500.
- Albach, H. (1983), "Die Bedeutung Mittelständischer Unternehmen in der Marktwirtschaft," *Zeitschrift für Betriebswirtschaft*, Vol. 53, No. 9, 870-888.
- Altrock, F. and S. Riesio (1999), "Why Asset Backed Securities?," *Die Betriebswirtschaft*, Vol. 59, 2/1999, 279-282.
- Anonymous (2001), "Collateralised Bond Obligations (CBOs)," Atlantic Asset Management (<http://www.atlanticasset.com/services/cbo.html> (23th June 2002)).
- Anonymous (1999), "Pfandbriefe, Germany's Secret Gamblers," *Euromoney Magazine*, April.
- Anonymous (1998), "CLOs: every bank must have one" *International Structured Finance*, September.
- Anonymous (1997), "Slicing Up Bank Loans," *Investment Dealer's Digest*, 22th December.
- Anonymous (1996), "Cash Flow CBO/CLO Transaction Rating Criteria: 1996 Update," *Standard & Poor's Structured Finance*, November.
- Andersen Consulting (2001), "Rating und Basel II: Bedrohung für den Deutschen Mittelstand ?," 15. Arbeitskreis 'Finanzierung' der Schmalenbach-Gesellschaft (1992), "Asset Backed Securities – Ein neues Finanzierungsinstrument für deutsche Unternehmen?," *Zeitschrift für Betriebswirtschaftliche Forschung* Vol. 44, Issue 6, 495-530.
- Arrow, K. J. and G. Debreu (1954), "Existence of an Equilibrium for a Competitive Economy" *Econometrica*, Vol. 22, No. 3. (July), 265-90.
- Batchvarov, A., Rajendra, G., Ross, W. and X. De Pauw (2000), "Cash and Synthetic European Bank CLOs," Merrill Lynch, International Structured Finance Research, 13th November.
- Bhattacharya, S., Boot, A. and A.V. Thakor (1998), "The Economics of Bank Regulation," *Journal of Money Credit and Banking* 30(4), 745-70.
- Bhattacharya, S. and A.V. Thakor (1993), "Contemporary Banking Theory," *Journal of Financial Intermediation* 3, 2-50.
- Bank of England (1989), "Notice to Institutions Authorised Under the Banking Act 1987, Loan Transfers and Securitisation," No. BSD/1989/1.
- Bär, H. P. (1997), "Asset Securitisation: Die Verbriefung von Finanzaktiven als Innovative Finanzierungstechnik und Neue Herausforderung für Banken," *Schriftenreihe 'Bank- und finanzwirtschaftliche Forschungen'*, Vol. 262, Bern.
- Bär, H. P. (1998). *Asset Securitisation*. Bern.

- Bartelt, N. (1999), "Asset-Backed Securities: Ein Produkt für Deutsche Banken," Wiesbaden.
- Bank of England (1989), "Notice to Institutions Authorised Under the Banking Act 1987, Loan Transfers and Securitisation," No. BSD/1989/1.
- Bank for International Settlements (1998). *International Banking and Financial Market Developments*. Bank for International Settlements, February.
- Basle Committee on Banking Supervision (2002). *Second Working Paper on the Treatment of Asset Securitisation*. Bank for International Settlements, October.
- Basle Committee on Banking Supervision (2001). *Basle Consultative Paper on Securitisation*. Bank for International Settlements, January.
- Basle Committee on Banking Supervision (1999a). *Consultative Paper on a New Capital Adequacy Framework*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1999b). *Principles for the Management of Credit Risk*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1999c). *Sound Practices for Loan Accounting and Disclosure*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1999d). *Sound Practices for Banks' Interactions with Highly Leveraged Institutions*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1999e). *Credit Risk Modelling: Current Practices and Applications*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1999f). *Risk Concentration Principles*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1998). *OTC Derivatives: Settlement Procedures and Counterparty Risk Management*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1997). *Core Principles for Effective Banking Supervision*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1996a). *Amendment to the Capital Accord to Incorporate Market Risks*. Bank for International Settlements, January.
- Basle Committee on Banking Supervision (1996b). *Supervisory Framework for the Use of 'Backtesting' in Conjunction with the Internal Models Approach to Market Risk Capital Requirements*. Bank for International Settlements, January.
- Basle Committee on Banking Supervision (1995a). *The Treatment of Potential Exposure for Off-Balance Sheet Items*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1995b). *An Internal Model-Based Approach to Market Risk Capital Requirements*. Bank for International Settlements, April.
- Basle Committee on Banking Supervision (1993a). *Working Paper of the Credit Risk Measurement*

- and Management Subcommittee*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1993b). *International Convergence of Capital Measurement and Capital Standards*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1991). *Measuring and Controlling Large Credit Exposures*. Bank for International Settlements.
- Basle Committee on Banking Supervision (1988). *Capital Accord*. Bank for International Settlements, July.
- Bayerische Landesbank (2001). *Annual Report and Accounts 2000*. Munich, 130.
- Becker, G. M. (2000), "Mehr Dynamik durch Baseler Regeln," *Bank Magazin*, Vol. 50, 2/00, Wiesbaden, 30-4.
- Benston, G. L. and G. G. Kaufman (1996), "The Appropriate Role of Bank Regulation," *Economic Journal* 106, 688-97.
- Besanko, D. and G. Kanatas (1996), "The Regulation of Bank Capital: Do Capital Standards Promote Bank Safety?," *Journal of Financial Intermediation* 5, 160-83.
- Bhattacharya, A. K. and F. J. Fabozzi (1996) (eds.) *Asset-Backed Securities*. Wiley Europe.
- Bigus, J. (2000), "Finanzierung über Factoring und Finanzierung über Asset-Backed-Securities im Vergleich," *Wirtschaftswissenschaftliches Studium*, Issue 8, August, 465-67.
- Bliss, R. R. (1995): "Risk-Based Bank Capital: Issues and Solutions," *Federal Bank of Atlanta Economic Review* 80(5), 32-40.
- Blum, J. and M. Hellwig (1995), "The Macroeconomic Implications of Capital Adequacy Requirements for Banks," *European Economic Review* 39, 739-49.
- Bodi, Z., Kane, A. and A. J. Marcus (1999). *Investments*. International Edition, 4th ed., Singapore.
- Böhringer, M., Lotz, U., Solbach, C. and J. Wentzler (2001), "Conventional Versus Synthetic Securitisation – Trends in the German ABS Market," *Deloitte & Touche*, Düsseldorf, May.
- Boot, A. W. A. and S. I. Greenbaum (1993), "Bank Regulation, Reputation and Rents: Theory and Policy Implications," in *Capital Markets and Financial Intermediation*, C. Mayer and X. Vives (eds.), Cambridge University Press, Cambridge, 262-85.
- Boot, A. W. A. and A. V. Thakor (1997), "Financial System Architecture," *Review of Financial Studies* 10, 693-733.
- Bund, S. (2000a), "Asset Securitisation, Anwendbarkeit und Einsatzmöglichkeiten in deutschen Universalkreditinstituten," edited by Joh. Heinrich von Stein, Vol. 8, Hohenheim.

- Bund, S. (2000b), "Collateralised Debt Obligations: Die Formel 1 Unter den Asset-Backed Securities," *Die Bank*, Vol. 55, 3/2000, Cologne, 196-200.
- Bundesaufsichtsamt für das Kreditwesen (ed.) (1997a), "Anschieben zum Rundschreiben 4/97," (http://www.bakred.de/texte/rundsch/anrs4_97.html (10th March 2001)).
- Bundesaufsichtsamt für das Kreditwesen (ed.) (1997b), "Rundschreiben 4/97 an alle Kreditinstitute in der Bundesrepublik Deutschland: Veräußerung von Kundenforderungen im Rahmen von Asset-Backed Securities-Transaktionen durch Deutsche Kreditinstitute," 19th March, Berlin.
- Burghardt, M. (2001), "ABS: Pedigree Beasts or Trojan Horses?," *Investment Management Newsletter*, PricewaterhouseCoopers, June, 6.
- Calvo, G.A. (1998), "Contagion and Sudden Stops," United Nations Development Programme, Working Paper, 8th November (www.undp.org/rblac/documents/poverty/archit/calvo.pdf (13th April 2002)).
- Campbell, T.S. and W.A. Kracaw (1994). *Financial Institutions and Capital Markets*. Addison Wesley Longman, Inc.
- Canor, R., Dorer, J., Levenstein, L. and S. Qian (2000), "Moody's Portfolio Risk Model For Financial Guarantors," Moody's Investors Service, Global Credit Research, Special Comment, July, New York.
- Cox, J.C., J. Ingersoll, and S. Ross (1985), "A Theory of the Term Structure of Interest Rates," *Quarterly Journal of Economics*, Vol. 84, No. 3, 488-500.
- Crane, D. B., Bodie, Z. and F. Perold (1995). *The Global Financial System: A Functional Perspective*. Cambridge: Harvard Business School Publishing.
- Crocker, K. J. and A. Snow (1992), "The Efficiency Effects of Categorical Discrimination in the Insurance Industry," in: Dionne, G. and S. E. Harrington (eds.). *Foundations of Insurance Economics. Readings in Economics and Finance*. Kluwer Academic Publishers, London.
- Crouhy, M., D. Galai and R. Mark (2000), "A Comparative Analysis of Current Credit Risk Models," *Journal of Banking and Finance* 24, 59-118.
- DeMarzo, P. and D. Duffie (1999), "A Liquidity-Based Model of Security Design," *Econometrica*, Vol. 67, No. 1, 65-99.
- Deutsche Bank (ed.) (1999), "Kreditderivate: Strukturierte Produkte, Anwendungen, Marktfragen," Frankfurt/Main, 26th July.
- Deutsche Bank (ed.) (2000), "Der Arbitrage-CDO-Markt: Cashflow- und Marktwert-CDOs an der Spitze," Frankfurt/Main, 21st March.

- Deutsche Bank (ed.) (2000), "Euro ABS 2000: Relative Value und Trends bei Europäischen ABS," Frankfurt/Main, 17th January.
- Dewatripont, M. and J. Tirole (1993). *The Prudential Regulation of Banks*. Cambridge, MA, MIT Press.
- Dothan, U. and J. Williams (1980), "Banks, Bankruptcy and Public Regulation," *Journal of Banking and Finance* 4, 65-88.
- Dresdner Bank AG (2001). *Annual Report 2000*. Frankfurt/Main, 102f.
- Duffie, D. and N. Gârleanu (2001), "Risk and Valuation of Collateralised Debt Obligations," *Financial Analysts Journal*, Vol. 57, No. 1, 41-59.
- Duffie, D. and N. Gârleanu (1999), "Risk and Valuation of Collateralised Debt Obligations, Unabridged Version," Working Paper, Graduate School of Business Stanford University (<http://www.stanford.edu/~duffie/working.htm>).
- Duffie, D. and K. Singleton (1998), "Simulating Correlated Defaults," Working Paper, Graduate School of Business Stanford University (<http://www.stanford.edu/~duffie/working.htm>).
- Duffie, D. and K. Singleton (1999), "Modelling Term Structures of Defaultable Bonds," *Review of Financial Studies*, Vol. 12, No. 4 (Special), 687-720.
- Eck, T. van (1998), "Collateralised Bond Obligations, Collateralised Loan Obligations: The Markets and The Securities," *The Securitization Conduit*, Vol. 1, No. 4.
- Eichel, H. (2002), "The Dangers of Hedge Funds," *The Financial Times*, Personal Views, 7th February.
- Eichholz, R. (2000), "Neue Trends bei Strukturierten Finanzierungen," *Börsenzeitung* No. 209, 28th October, B 6.
- Eichholz, R. and M. Nelgen (1992), "Asset Backed Securities – Ein Finanzierungsinstrument auch für den Deutschen Markt ?," *Der Betrieb*, Vol. 45, Issue, 17th April, Düsseldorf/Frankfurt, 793-96.
- Elsas, R. (2001), "Why do Banks View Themselves as Relationship Lender ?," Unpublished Working Paper, Johann Wolfgang Goethe-University of Frankfurt/Main.
- Elsas, R. and J. P. Krahen (1998), "Is Relationship Lending Special ? Evidence From Credit-file Data in Germany," *Journal of Banking and Finance*, Vol. 22, No. 10-11, 1283-1316.
- Everling, O. (1999), "Wertsteigerung durch ABS," *Börsenzeitung* 19th May.
- Fabozzi, F. J. (2001) (ed.). *Investing in Asset-Backed Securities*. Wiley Europe.
- Fabozzi, F. J. (2000) (ed.). *Investing in Commercial Mortgage-Backed Securities*. Wiley Europe.
- Fabozzi, F. J. (1998) (ed.). *Trends in Commercial Mortgage-Backed Securities*. Wiley Europe.

- Fabozzi, F. J. (1997) (ed.). *Advances in Fixed Income Valuation Modelling and Risk Management*. Wiley Europe.
- Fabozzi, F. J. and L. S. Goodman (2001) (eds.). *Investing in Collateralised Debt Obligations*. Wiley Europe.
- Fabozzi, F. J. and D. P. Jacob (1998) (eds.). *The Handbook of Commercial Mortgage-Backed Securities*. 2nd edition, Wiley Europe.
- Fabozzi, F. J., Ramsey, C. and M. Marz (2000) (eds.). *The Handbook of Nonagency Mortgage-Backed Securities*. 2nd edition, Wiley Europe.
- Fabozzi, F. J. and D. Yuen (1998) (eds.). *Managing MBS Portfolios*. Wiley Europe.
- Findeisen, K.-D. and N. Ross (1999), "Wirtschaftliche Zurechnung und Anhangangabe bei Asset-Backed Securities," *Der Betrieb*, Vol. 52, Issue 21, 28th May, Düsseldorf/Frankfurt, 1077-79.
- France and Berry (1992). *Pan-European Securitisation*. London.
- Frankel, T. (1991), "Securitisation: Structured Financing, Financial Asset Pools and Asset-Backed Securities," *Journal of Financial Intermediation*, 6, 64-86.
- Freixas, X. and J. C. Rochet (1997). *Microeconomics of Banking* MIT Press, Cambridge, MA.
- Gennotte, G. and D. Pyle (1991), "Capital Controls and Bank Risk," *Journal of Banking and Finance* 15, 805-24.
- Geurts, M. (1999), "Steuerliche Aspekte bei Asset Backed Securities," *Der Betrieb*, Vol. 52., Issue 9, 5th March, Düsseldorf/Frankfurt, 451-55.
- Giddy, I. (2002), "European Securitisation – A Resource Guide," European Securitisation Forum (<http://www.stern.nyu.edu/~igiddy/ABS/resourceguide.pdf> (12th October 2002)).
- Göttgens, M. and A. Kalhoff (2000), "Risiken Effizient Steuern," *Bank Magazin*, Vol. 55, Issue 8, Wiesbaden, August, 28f.
- Goodhart, C. (2001), "Operation Risk," Special Paper 131, Financial Markets Group (FMG), London School of Economics and Political Science (LSE).
- Grill, W. and H. Perczynski (1993). *Wirtschaftslehre des Kreditwesens*. 28th revised and expanded edition, Bad Homburg von der Höhe, 28.
- Grohmann, Herbert (1999), "Kredit Direkt vom Investor," *Bank Magazin*, Vol. 49, Issue 11, Wiesbaden, 48-51.
- Gurley J. and E. Shaw (1962). *Money in a Theory of Finance* Washington D.C., Brookings.
- Herrmann, M. (2000), "ABS sind ein Attraktives Neues Anlagesegment," *Börsenzeitung* No. 190, 30th September, B 4.

- Herrmann, M. and J. Tierney (1999), "The Market for CLOs in Germany," Deutsche Bank Asset-Backed Research, London.
- Innes, R. (1990), "Limited Liability and Incentive Contracting with Ex-Ante Choices," *Journal of Economic Theory*, Vol. 52, No.1, 45-67.
- ISDA (2000), "A New Capital Adequacy Framework: Comments on a Consultative Paper Issued by the Basle Committee on Banking Supervision in June 1999," International Swaps and Derivatives Association (ISDA).
- Johnson, H.J. (2000). *Global Financial Institutions and Markets*. Blackwell Publishers.
- Johnson, H.J. (1993). *Financial Institutions and Markets: A Global Perspective*. The McGraw-Hill Companies.
- Kahane, Y. (1977, "Capital Adequacy and the Regulation of Financial Intermediaries," *Journal of Banking and Finance* 1, 207–218.
- Keeley, M. C. and F. T. Furlong (1990), "A Re-examination of the Mean-Variance Analysis of Bank Capital Regulation," *Journal of Banking and Finance* 14, 69-84.
- Kendall, L. (1996). *A Primer on Securitisation*. MIT Press, Cambridge.
- Klotter, D. J. (2000), "Der Markt für ABS in Deutschland Wächst," *Börsenzeitung* No. 209, 28th October, B. 7.
- Kohler, K. E. (1998), "Collateralised Loan Obligations: A Powerful New Portfolio Management Tool For Banks," *The Securitization Conduit*, Vol. 1, No. 2, 6-15.
- Kück, M. (1998), "Meinungsspiegel," *Betriebswirtschaftliche Forschung und Praxis*, Vol. 50, Issue 3/98, 302f, Herne/Berlin.
- Kupiec, P. H. and J. M. O'Brien (1997), "Recent Developments in Bank Capital Regulation of Market Risks," in: Schachter, B. (ed.). *Advances in Finance Investment and Banking Derivatives, Regulation and Banking* Amsterdam, North Holland.
- Latenser, S. (1997), "Asset-backed Securities (ABS) im Portfoliomanagement," *Schriftenreihe Bank- und Finanzwirtschaftliche Forschungen*, Vol. 245, Bern.
- Leland, H. (1998), "Agency Cost, Risk Management and Capital Structure," *Journal of Finance*, 52, 1213-43.
- List, T. (2000), "Asset Backed Securities und Kreditderivate – Neue Chancen für Unternehmen und Kreditinstitut," *Bank Magazin*, Vol.50, 6/2000, Wiesbaden, 22f.
- Mayer, C. (1988), "New Issues in Corporate Finance," *European Economic Review* 32, 1167-88.
- Meissmer, V. (2001), "Synthetische ABS," *Kreditpraxis*, Vol. 26, 1/2001, Wiesbaden, 4-7.
- Merton, R.C. and Z. Bodie (1992): "On the Management of Financial Guarantees," *Financial Management*, Winter, 87-109.

- Meyer-Giesow, H. (2000), "Risiken Übernehmen," *Bank Magazin*, Vol. 50, 2/00, Wiesbaden, 38-41.
- Monfort, B. and C. Mulder (2000): "Using Credit Ratings for Capital Requirements on Lending to Emerging Market Economies: Possible Impact of a New Basle Accord," IMF Working Paper.
- Müller-Stewens, G., Roventa, P. and G. Bohnenkamp (2001a), "Eigenkapitalregeln Zeitgleich mit Basel II Umsetzen," *Börsenzeitung* No. 16, 24th January, 17.
- Müller-Stewens, G., Roventa, P. and G. Bohnenkamp (2001b), "Im Neuen Akkord Werden die Bankenrisiken Individueller Gemessen," *Börsenzeitung* No. 10, 16th January, 18.
- Müller-Stewens, G., Roventa, P. and G. Bohnenkamp (2000a), "Breaking the Deadlock," *Structured Finance International*, Issue 9, August, 13-23.
- Müller-Stewens, G., Roventa, P. and G. Bohnenkamp (2000b), "Durchbruch bei 'Basel II' mit Deutschen Impulsen," *Börsenzeitung* No. 239, 9th December, 7.
- Müller-Stewens, G., Roventa, P. and G. Bohnenkamp (2000c), "Neuer Fonds für ABS-Titel," *Frankfurter Allgemeine Zeitung* No. 288, 6th December, 33.
- Müller-Stewens, G., Roventa, P. and G. Bohnenkamp (1996). *Wachstumsfinanzierung für den Mittelstand*. 2nd edition, Stuttgart.
- Ohl, H.-P. (1994), "Asset-Backed-Securities – Ein Innovatives Instrument zur Finanzierung Deutscher Unternehmen," *Schriftenreihe für Kreditwirtschaft und Finanzierung* Vol. 17, Wiesbaden.
- Oliver, Wyman & Co. (2002), Presentation at the "Campus For Finance 2002" Conference, Otto Beisheim Graduate School of Business (WHU), Vallendar/Germany.
- Paul, S. (1994). *Bankenintermediation und Verbriefung Neue Chancen und Risiken für Kreditinstitute durch Asset-Backed Securities ?* Wiesbaden.
- Punjabi, S. and J. F. Tierney (1999), "Synthetic CLOs and their Role in Bank Balance Sheet Management," Deutsche Bank Research, Fixed Income Research, 11st March.
- Rajan, R. G. (1996): "The Entry of Commercial Banks into the Securities Business: A Selective Survey of Theories and Evidence," in: Walter, I. and A. Saunders (eds.). *Universal Banking: Financial System Design Reconsidered*, Chicago, Irwin, 282-302.
- Rixen, H.-H. (2001), "Kreditderivate Bilanzieren – Empfehlungen des Bundesverbandes Deutscher Banken," *Kreditpraxis*, Vol. 26, 1/2001, Wiesbaden, 14f.
- Rochet, J. C. (1992), "Capital Requirements and the Behaviour of Commercial Banks," *European Economic Review* 36, 1137-78.
- Rösch, D. (2001), "Transfer von Kreditrisiko," *Kreditpraxis*, Vol. 26, 1/2001, Wiesbaden, 8-13.
- Rosenthal, J. and J. Ocampo (1988). *Securitisation of Credit*. John Wiley & Sons, New York.

- Rule, D. (2001). "Risk Transfer Between Banks, Insurance Companies and Capital Markets," *Bank of England Financial Stability Review*, December.
- Santos, J. A. C. (1998a): "Commercial Banks in the Securities Business: A Review," *Journal of Financial Services Research* 14(1), 35–59.
- Schorin, C. and S. Weinreich (1998), "Collateralised Debt Obligation Handbook," Working Paper, Fixed Income Research, Morgan Stanley Dean Witter.
- Schwarcz, S. L. (1997), "Die Alchemie der Asset Securitisation," *Der Betrieb*, Vol. 50, Issue 26, 27.06.1997, Düsseldorf/Frankfurt, 1289-97.
- Shepherd-Walwyn, T. and R. Litterman (1998), "Building a Coherent Risk Measurement and Capital Optimisation Model for Financial Firms," Working Paper presented at the conference *Financial Services at the Crossroads: Capital Regulation in the 21st Century*, Federal Reserve Bank of New York.
- Skambraks, J. (ed.) (2000). *Herausforderungen für die Zukunft: Mittelstand im Umbruch*. Munich.
- Skarabot, J. (2002), "Securitisation and Special Purpose Vehicle Structures," Working Paper, Haas School of Business, University of California at Berkeley, 29th April.
(<http://faculty.hass.berkeley.edu/skarabot/unix/ch2.pdf>)
- Spence, M. (1993), "Job Market Signalling," *Quarterly Journal of Economics* 87, 534-44.
- Spence, M. (1974) *Market Signalling* Harvard University Press, Cambridge, Massachusetts.
- Stopp, A. H. (1997), "Asset-Backed Financing in Germany: Legal Concepts Affecting the Securitisation of German Receivables," *The Financier*, Vol. 4, No. 5, December, 27-32.
- Thakor, A. V. (1996a), "The Design of Financial Systems: An Overview," *Journal of Banking and Finance* 20, 917-48.
- The Bond Market Association (2001), "Transaction Reporting Standards: Analysis and Preliminary Recommendations of the European Securitisation Forum," London
(<http://www.europeansecuritisation.com>).
- The Bond Market Association (1998), "An Investor's Guide to Asset-Backed Securities – Investing for Attractive Yield and High Credit Quality," New York
(<http://www.bondmarkets.com>).
- The Boston Consulting Group (2001), Financial Services Research, Internal Report, Frankfurt am Main.
- The Economist (2002), "Bombe Surprise – Who Can Understand, Let Alone Manage, Credit Risk?," 7th February.
- Turwitt, M. (1999). *Asset-Backed Finanzierungen und Handelsbilanzielle Zuordnung* Wiesbaden.
- Yoneyama (1999), "Capital Requirements and Bank Behaviour: The Impact of the Basle Accord," Basle Committee on Banking Supervision, Working Paper No. 1.

- Wagster, J.D. (1996): "Impact of the 1988 Basle Accord on International Banks," *Journal of Finance* 51 (4), 1321–1346.
- Walter, N. (2000), "The Euro: Second to (N)one," German Issues 23, American Institute for Contemporary German Studies, The Johns Hopkins University, Washington, D.C. , 33f (<http://www.aicgs.org>).
- Weiss, W. (1999), "Asset-Backed Securities (ABS)," in: Achleitner, A.-K. and G. Thoma (eds.) *Handbuch Corporate Finance: Konzepte, Strategien und Praxiswissen für das Moderne Finanzmanagement*. Supplementary edition 4/1999, 1-35.
- White, L.H. (1999). *The Theory of Monetary Institutions*. Blackwell Publishers.
- Willburger, A. (1997), "Asset Backed Securities im Zivil- und Steuerrecht," *Steuerfragen der Wirtschaft*, Vol. 5, Cologne.
- Zoller, E. (2001), "Real Estate Structured Finance," HypoVereinsbank (HVB) Group, Munich.

8 APPENDIX I: BIS REVISED PROPOSAL ON SECURITISATION

On 16 January 2001 the Bank for International Settlements (BIS) issued a revised proposal for capital requirements in securitisation. This proposal for an adjustment of regulatory capital and supervision by financial regulators on financial institutions includes a separate 32-page chapter on the securitisation as a comprehensive effort to codify a regulatory framework for structured finance in the funding process of financial intermediaries and firms alike.

It warrants mentioning that the revised proposal does justice to the increasing popularity of *synthetic transactions* by devoting a separate section on this recent structural innovation of securitisation. The earlier proposals in June 2000 were completely silent on synthetic securitisation. Moreover, besides the critical issue of *information disclosure requirements with respect to securitisation* transactions, the revised proposal also draws an *important distinction between implicit/residual risks and explicit risks in securitisation*, the latter being separately dealt with in an additional section. In this context, implicit risk refers to residual risk that is thought of not being legally assumed by an originating or sponsoring bank; however, due to an obligatory commitment to safeguard investors' interests it might still be tacitly recognised to that extent that actions in defiance of this understanding might prejudicially affect the reputation of the bank.

The subsequent exposition outlines the most significant changes stipulated by the recently issued BIS proposal.⁴³

1. *Originating banks and true sale ("clean break"/"(credit) delinkage")*

Granting regulatory capital relief through the transfer of assets off the balance sheet in standard transactions represents the most fundamental regulatory issue for the originating bank of a securitisation transaction. In achieving recognition of a "clean break" the originating bank seeks permission to remove assets from the calculation of risk-based capital ratios. According to the revised proposal the applicability of regulatory capital relief by means of shifting assets off-balance holds once the following minimum conditions are satisfied:

⁴³ See also Basle Committee on Banking Supervision. The New Basle Accord. Consultative Document, January 2001, 87f.

- (iv) the transferred assets have been legally isolated from the transferor; that is, the assets are put beyond the reach of the transferor and its creditors, even in bankruptcy or receivership. This must be supported by a legal opinion,
- (v) the transferee is a qualifying special-purpose vehicle (SPV) and the holders of the beneficial interests in that entity have the right to pledge or exchange those interests, and
- (vi) the transferor does not maintain effective or indirect control over the transferred assets.

These conditions are essentially the same as in IAS 39/FASB 140/FASB 125, and therefore, there is no new restriction or qualifying condition being put up by the regulators. Unless the three previously listed conditions are met, the BIS proposes to retain the respective assets on the books of the originating bank for regulatory accounting purposes (RAP), even if the assets are removed from the books in compliance with GAAP.

2. *Investing Banks*

In correspondence with previous regulatory advances, the revised proposal follows suit the BIS proposal from June 2000 in proffering the adoption of ratings-based weightings. The following risk weights have been suggested:

Rating range		Risk Weighting
AAA	AA-	20%
A+	A-	50%
BBB+	BBB-	100%
BB+	BB-	150%
B+	D	full capital deduction*
unrated		full capital deduction*

*=regarded as credit enhancement

In the case of private placements of securitisation transactions, which are unrated, the BIS has adopted the “look-through” approach for senior positions, i.e. these tranches will be deemed to be a fraction of the originator’s original cash flows and, thus, will attract the equal risk

weighting as the underlying cash flows of the collateral portfolio, whereas the mezzanine classes may be accorded a 100% risk weighting. For this “look through” approach to be applicable, the following conditions need to hold:

- (i) the underlying assets are subject to proportional rights of investors, whilst the SPV must not have any liabilities unrelated to the transaction,
- (ii) the securitisation transaction perfectly matches the cash flow stream generated from the underlying asset with the cash flow requirements of the issued securities without any undue reliance on reinvestment income,
- (iii) the underlying asset must be fully performing when the securities are issued, and
- (iv) the funds that have been earmarked as pay-out to investors must not carry a material reinvestment risk unless they have been disbursed.

3. Sponsoring or managing banks

The notion of sponsoring or managing banks includes banks running securitisation programs or asset backed commercial paper conduits for their customers. These conduits tend to feature an integrated liquidity support mechanism sustained by the sponsoring banks (either programme-wide or pool-specific). According to the 1988 Basle Accord contractually fixed liquidity support on part of the sponsoring or managing bank represents a commitment to lend which is subjected to adamant risk weightings in correspondence to its maturity. While a short term agreement to lend is converted with a 0% risk weighting, any long term agreement is treated as a direct credit substitute, and, thus, attracts a 100% risk weighting.

The revised proposal bears witness to mounting concern with BIS that liquidity support to asset backed commercial paper is akin to a credit enhancement with no apparent, clear-cut practical distinction of credit support and liquidity support. Consequently, BIS has established conditionality parameters to be contemplated in drawing a line between credit support and liquidity support, such that each can be treated in their own distinctive manner:

- (i) a facility, fixed in time and duration, must be provided to the SPV, not to investors, which is subject to usual banking procedures and, at regular banking terms, subject to usual banking procedures,
- (ii) the SPV must have the option at its disposal to seek credit support from elsewhere,
- (iii) the terms of the facility must be established on grounds of a clear identification in what circumstances it might be drawn, ruling out the utilisation of the facility neither as a provider of credit support, as a source of permanent revolving funding nor as cover for sustained asset losses,
- (iv) the facility should include a contractual provision (on the basis of a reasonable asset quality test) to either prevent a drawing from being used to cover deteriorated or defaulted assets or to reduce or terminate the facility for a specified decline in asset quality, and
- (v) the payment of the fee for the facility should not be further subordinated or subject to a waiver or deferral, while the drawings under the facility should not be subordinated to the interests of the note holders.

If the above-mentioned criteria hold, the facility qualifies for a 20% conversion factor as liquidity support. Otherwise the facility will pass as a credit enhancement, which should be treated no different than an investment in a securitisation transaction with a risk weighting based on either internal or external ratings. So if we assume that a sponsoring bank provides a BIS-recognised liquidity facility for a partly-supported asset backed commercial paper conduit at the amount of €100m of which €40m have been drawn already, the committed assets for regulatory purposes will be $€40m + (€100m - €40m) * 20\% = €52m$.

4. Standard securitisation

As opposed to the June 2000 proposal issued by BIS, the recent revised proposal does not only relate essentially to banks investing in securitised investments in the context of standard securitisation transactions (i.e. where the originator transfers assets usually to an SPV), but also envisages banks entering into securitisation transactions in three ways, namely as originator, investors or sponsor/manager.

5. Revolving asset securitisation

In most revolving asset securitisation transactions, the SPV advances funds to the originating institution in the form of a revolving credit, in order to allow the originator to continue generating loans (Grill and Perczynski, 1993). However, in combination with an early amortisation trigger as a common feature in such transactions, the event of amortisation compels the SPV to use cash flows to pay down investors instead of revolving the amount back to the originator. Such amortisation could be triggered in the event of deterioration in the credit quality of the portfolio or generation of fresh accounts, security cover, etc.

Since the probability of early amortisation functions as a sort of credit enhancement on the structure of revolving asset securitisation transactions, BIS considers such a mechanism to have the fallacy of a self-fulfilling downward spiral that eventuates due risk. For one, in the case of a sudden drop in the cash flow position of the underlying collateral portfolio due to a decrease in credit quality, the originator is faced with a withdrawal of revolving credit from the SPV. Additionally, since the inherent waterfall scheme of payment allocation allows the trustees to use the cash to first pay off the investors, the originator's claim in appropriating collections in replenishing the collateral portfolio is subordinated to the payment claims of investors. Thus, the combination of both characteristics of revolving asset securitisation transactions amounts to a sort of an implicit recourse as a bad scenario is likely to stimulate an even worse outcome in cash flow allocation if early amortisation is triggered. Consequently, BIS puts forward to apply a conversion factor of 10% for the off-balance sheet piece of the collateral portfolio, which represents the investors' interest.

6. Credit enhancements

The revised proposal on securitisation requires the originating bank to deduct the amount of the first loss credit enhancement in the securitisation transaction straight from its capital stock. Thus, if a € 100m transaction is conducted and the sponsoring entity provides recourse to the extent of € 5m, this amount is the required regulatory capital requirement as it reflects the capital loss or reduction the bank faces in case of default. However, any subsequent loss protection is viewed as a direct credit substitute, provided that a sufficient and significant level of first loss protection is being provided, and, thus, the capital requirement equals the same as for the original underlying asset itself (8%). Following the aforementioned example, let's

assume a sponsoring bank provides a second loss provision to the extent of € 10m on a securitisation transaction of € 100m with a first loss protection of € 5m accepted by a third party/external credit enhancer. According to the revised BIS proposal, the bank will need to retain 8% of € 10m as minimum capital requirement, i.e. 0.8% of the total amount of collateral portfolio securitised (€ 100m).

7. Securitisation tranches

The new proposal for the revision of the Basle Accord also exhibits specifications as to the treatment of minimum capital requirements in relation to the structuring/tranching of securitisation transactions. According to the current regime an entity that provides credit support in the course of a securitisation of assets has to hold capital against any credit risk originating thereof. Such so-called credit enhancement can take the form of a first or second loss facility. Any first loss position would be directly deducted from the capital base, whilst a second loss facility entails an adjustment after it has been valued on an arm's length basis in line with normal credit approval and review processes. The latter is considered to be a credit substitute with a 100% risk weighting. On top of this approach, the New Basle Accord puts forth securitisation tranches to be risk weighted depending on the external assessment (credit rating) of default risk (see 2. Investing banks). Moreover, note that unrated securitisation tranches are deducted from the capital base, senior tranches, which are part of the unrated part of the securitisation collateral (such as in the case of private placements), may be accorded a look-through treatment, i.e. it would be assigned a risk category in correspondence with the underlying asset quality.

For the look-through approach to be applicable the principal criterion is predicated on the fact that investors and not the issuer is effectively exposed to the risk arising from the underlying asset pool. According para. 527 of the Consultative Document on the New Basle Capital Accord (2001), the following conditions have to be met: rights on the underlying assets are held either directly by investors in the asset-backed securities or on their behalf by an independent trustee (e.g. by having priority perfected security interest in the underlying assets) or by a mandated representative. In case of a direct claim, the holder of the securities has an undivided pro rata ownership interest in the underlying assets. In case of an indirect claim, all liabilities of the trust or special purpose vehicle (or conduit) that (i) issues the securities are related to the issued securities; (ii) the underlying assets must be fully performing when securities are issued; (iii) the securities are structured such that the cash flow from the

underlying assets fully meets the cash flow requirements of the securities without undue reliance on any reinvestment income; and (iv) funds earmarked for the investors but not yet disbursed do not carry a material reinvestment risk.

Even if issuers have fully complied with the conditions outlined above, mezzanine or subordinate tranches banks have invested are still assigned to the 100% risk category (for second loss facilities and other structural enhancements), albeit first loss pieces are directly deducted from capital as mentioned above. Furthermore, the composition of the senior portion of the underlying asset pool under the look-trough approach (granted by national regulators) requires a risk weighting of the unrated tranches equal to the highest risk-weighted asset that is included in the underlying asset pool. However, this method lacks clarification of how the capital charge will be determined. The two reference cases are either the external rating of the securitisation tranches themselves or the residual risk left on the balance sheet of the originating bank following the securitisation of assets. Since speculation surrounding the issue of regulatory arbitrage practices has given rise to the belief that bank banks might have an incentive to shift high quality assets from their balance sheet, the latter approach is given more credence in order to curb fears that a mechanism could be implicitly installed otherwise, which allowed banks to meet regulatory requirements on new practices even with a higher risk profile.

8. Early amortisation features

In the event of early amortisation provisions taking effect, which force an early wind-down of the securitisation programme, such as a certain economic event triggering a significant deterioration of the collateral value, the notational amount of the securitised asset pool is regarded a credit equivalent and charged with a minimum 10% conversion factor. However, this conversion factor may be increased depending on national discretion applied in the assessment of various operational requirements, e.g. provisions regarding rapid amortisation.

9. Cash advancement/liquidity facility

Moreover, the BIS has undertaken efforts to highlight the priority status of reimbursement of cash advances on part of the servicing entity in the context of liquidity or credit support granted to the SPV. Nonetheless, the revised proposal recognises the contractual provision that allows temporary advances to the SPV to ensure uninterrupted payments to investors, as

long as "the payment to any investors from the cash flows stemming from the underlying asset pool and the credit enhancement [are] subordinated to the reimbursement of the cash advance." This qualification ensures that the advances are senior claims to reimbursement, i.e. the servicer of the transaction has to retain the right to withhold a commensurate fraction of the subsequent cash collection in order to recoup previous advances made.

9 APPENDIX II: ABS PAYMENT STRUCTURES

Tranche types and maturities of ABS

We need to equally privilege different structures of asset-backed securities, i.e. the relationship of the maturity of the underlying assets, on the one hand, and method of cash flow management and the ways of scheduled repayment of principal and interest of the underlying reference portfolio to investors, on the other hand. The following section provides a basic description, and working definition of transaction payment structures.

Securities that return total principal to investors throughout the life of the security are considered *fully amortising* where the securitised portfolio generally consists of assets, such as car loans, manufactured housing contracts or other fully amortising assets. Controlling prepayment risk is the prime concern with ABS structures of this kind, although the rate of prepayment may vary considerably by the type of asset.

Securitisation of non-amortising assets in the reference portfolio, i.e. revolving debt (such as credit card receivables, trade receivables, dealer floor-plan loans and some leases), typically sports a *controlled amortisation* structure with a relatively predictable repayment schedule in the bid to curb investor fears about the inherent risk of early amortisation in this kind of ABS. In controlled amortisation an ABS tranche is paid off in equal payments over a set period of time (often one or two years). Similar to corporate bonds with a sinking fund, the principal is repaid to investors over a period of less than a year after a contractually predetermined "revolving period", when only defined interest payments occur (The Bond Market Association, 1998).

So-called "*bullet structures*" are a viable alternative to controlled amortisation structures for revolving assets. They are designed to return principal to investors in a single payment. Similar to controlled amortisation transactions, "bullet" payment structures feature two separate cash

flow management periods. During the “revolving period” principal received from the reference portfolio is retained to buy more receivables, before the principal payments build up in an escrow account during the subsequent “accumulation period” to fund a future bullet payment to investors. As much as in controlled amortisation structures “bullet maturities” suffer from early amortisation risk. We distinguish between “*soft bullet maturity*” and “*hard bullet maturity*”. The former structure is the most common bullet structure, where only part of the deal is guaranteed on the expected maturity date (unlike the “hard bullet” deal), although past evidence indicates that most such ABS return principal on this date. Nonetheless, a “soft bullet” payment includes the implicit shortfall risk during the accumulation period, so that investors may receive the remaining principal payments over an additional period (usually one to three years) after the maturity date (Fabozzi and Yuen, 1998). In contrast, investors in “hard bullet” structures can expect principal to be paid off on the scheduled maturity date. This is usually done by providing for a longer accumulation period, a third-party guarantee, or both (The Bond Market Association, 1998). The latter “bullet structure” are rare, as investors in ABS are comfortable with limited repayment risk, and, hence, less inclined to pay the safety premium (i.e. accept lower yield) associated with the guarantee of timely repayment of principal.

Sequential pay is another alternative payment structure of ABS, where the issuer allocates all available principal repayments to the tranche with the shortest maturity until it is retired before the next tranche receives any principal. The diametrically opposite structure to this maturity-induced principal allocation is so-called pro-rata pay. Here, payment is made concurrently to all tranches in accordance with their proportionate shares of principal payments during the life of the securities. According to Fabozzi and Jacob (1998) as well as Fabozzi and Yuen (1998) both sequential pay and pro-rata pay are also combined to address investor concerns about timely payment either upon credit-related events (switch from pro rata pay to sequential pay) or at a certain remaining maturity (switch from sequential pay to pro rata pay). At the same time issues with sequential pay represent a sizeable portion of the ABS market, mainly because the credit-enhancing effect of the senior/subordination structure allows the senior class of securities to be supported by one or more subordinated tranches. The degree of credit support is contingent upon the order of payment under subordination, which is determined once the junior classes of securities are issued (The Bond Market Association, 1998).

With the presence of floating-rate loans in underlying reference portfolios increasing, a growing number of issues – be they collateralised by either amortising or non-amortising assets – feature floating rather than fixed interest rates imposed on the ABS payment structure. This arrangement forestalls inevitable cash-flow mismatch between borrowers and investors if a reference portfolio of floating-rate loans, such as credit card debt indexed to the prime rate, is securitised through fixed-rate coupons on the ABS structure and vice versa. Hence, so-called “floaters” represent maturity structures of ABS with floating-rate coupons, where the rate adjusts periodically according to a designated index, usually the LIBOR rate or the U.S. Treasury Bill rate, plus a fixed margin. Alternatively, in the case of cash flow mismatch the issuing trust frequently engages in a counterparty interest rate swap or with an outside provider for a rate cap in the move to offset the basic interest rate risk to investors (Giddy, 2001).

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