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baltic management review

Volume 3
Number 1
December 2008

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Baltic Management Review

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Publisher

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CIP-Title

Patrick Moore
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Baltic Management Review

ISSN

1865-8679

Organisatinoal instruction

Dr. Rudi Wendorf

Editing

Olaf Ehrhardt, Patrick Moore, Katharina Ploch

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Procurement

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Production

Schmidt design, Fachhochschule Stralsund

Verkaufspreis

12,00 Euro

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Receivable Financing for mid-caps with PORTFOLIO SPORT

Jürgen Timm*

and

Alexandra Münster**

- structured purchase of receivables transactions -
in cooperation with:

NORD/LB

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Place, Date: Hannover, 2009-03-19

Receivable Financing

for mid-caps with Portfolio Sport

- structured purchase of receivables transactions -

in cooperation with:

Jürgen Timm – Senior Project Manager
Alexandra Münster – Junior Project Manager

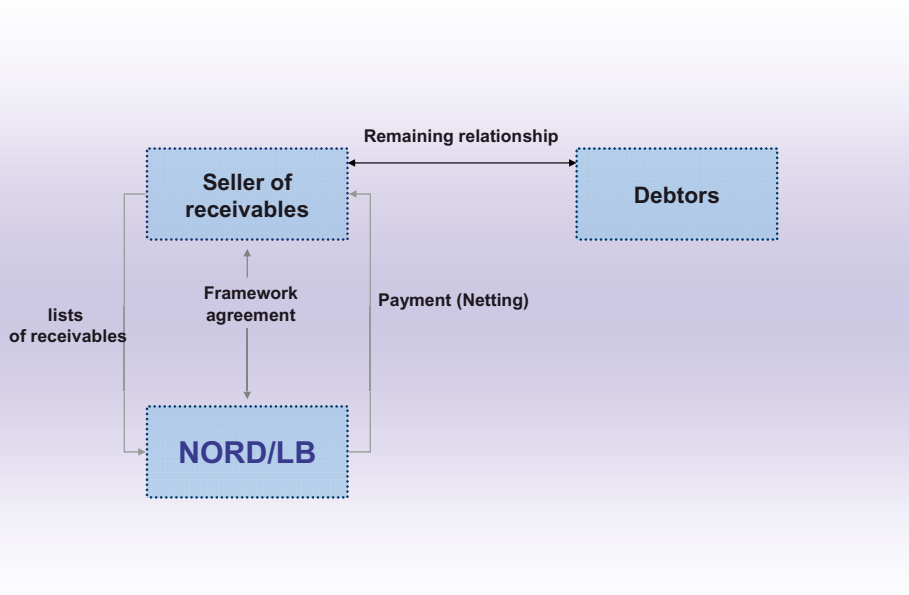
1. Introduction

The framework requirements for corporate banking were radically modified in recent years. Especially German mid-caps[1] are affected by the significant structural transformation in the credit services sector. Up to now the classical secured bank loan was the traditional core banking product for mid-caps. But since bank lending policies noticeably changed towards risk adjusted pricing due to new banking regulation as for example Basel II, first an increasing orientation towards the capital market is recorded, and second mid-caps are focussing on how to reduce financing cost in order to benefit from the new banking regulation. Therefore, new forms of financing are discussed[2]. Alongside with already established alternative financing instruments, like Factoring or Leasing, a multitude of new financing forms is flooding the capital market.

Advantaged by Basel II and the therewith connected necessity of balance sheet optimisation, corporate customers demand increasingly for new forms of financing. These changing framework requirements lead to increasing efforts to explore alternative financial solutions for mid-cap financing, which can lead to more flexibility in company financing. NORD/LB responded to these changes immediately and designed a modular, stream-lined and efficient product PORTFOLIO SPORT, namely the structured purchase of receivables transactions, a novel model of receivable financing for mid-caps. PORTFOLIO SPORT combines essential elements of traditional Factoring and Asset Backed Securitisation and features a high degree of flexibility[3].

2. PORTFOLIO SPORT Structure

A company (seller of receivables/client) sells a pool of adequate receivables especially trade receivables, which are generated out of normal business activities, on a revolving basis to the bank. An PORTFOLIO SPORT transaction is considered to be a non-recourse sale of receivables with balance sheet effect, namely true sale[4]. The following figure will present the main structure of PORTFOLIO SPORT:
The bank pays the purchase price (receivables nominal amount less a discount to be understood as an interest component) for the receivables immediately to the seller, normally within three business days[5]. NORD/LB is the new legal and beneficial owner of the receivables and expects the nominal receivables amount to be paid back after settlement by the



1 The term mid-cap is confined here to enterprises with an annual turnover of minimum EUR 25 million up to EUR 500 million.
2 cp. Ahrweiler, Sonja; Börner, Christoph, 2003; p.5
3 cp. NORD/LB Corporate Finance / Financial Solutions
4 cp. Mevissen, Dorothea, 2005; p. 23
5 cp. Lüpken, Silke, 2003; p. 83

debtor. PORTFOLIO SPORT is considered to be a non-notification transaction where the debtors are not informed about the assignment of receivables, thus a silent cession[6].

Similar to a non-recourse Factoring or Forfeiting, the bank assumes the financing function (immediate payment of receivables amount) and the del credere function[7]. In PORTFOLIO SPORT transactions however, the bank does not assess the credit risk of each of the debtors, but the risk of default or probability of default within a granular portfolio of debtors (where a single debtor may have not more than a defined percentage rate (limit) of the total receivables portfolio), historic default rates of the seller and a security deposit (first loss reserve) that is used first in case of bad debt losses, are considered instead[8].
However the servicing function or debtor management is assigned to the seller of receivables. The seller has the obligation to discretionarily manage the receivables, to operate the dunning system and the debt collection. The bank has to be continuously informed about the amount and the specification of outstanding debts in an appropriate manner. Furthermore the client is obliged to deposit and store all data and documents concerning the receivables and to release such information on first request. If receivables have to be judicially asserted, the seller will take on this function on behalf of the bank, after disclosure of cession[9].
Through the financing function, which is one of the decisive factors for choosing this financing instrument, the liquidity in the receivables tied-up capital is generated already before the maturity date. The total receivables lead directly after their origination to the accrual of liquid funds within the agreed net loan proceeds[10].

2.1 Financing process

Within PORTFOLIO SPORT the financing process starts with a feasibility audit, by analysing the receivables portfolio and the receivable management as well as the business activity and credit worthiness of the seller. Thereby the bank uses information based upon bank internal analysing tools[11]. Often the bank already knows the customer for years due to a relationship in the past. The duration of this first audit can take up two weeks to one month. With the negotiation of terms and conditions the feasibility audit is completed. The agreed terms and conditions are transferred to the in-house documentation of NORD/LB. The contract entitles the seller to sell all eligible receivables to NORD/LB while the bank is obliged to purchase all eligible receivables. Along with the disposal of receivables, the seller assigns and transfers all receivables, which are subject of the agreement together with all interest, penalties, damages, securities, indemnities and any other supplemental payment obligations payable by the debtors and all rights, remedies and privileges available to collect and to enforce the rights of the seller to receive payment for the receivables during the term of contract validity.
To minimise time and expense for bank and seller, it is agreed upon a settlement day usually on a monthly basis. The seller of receivables keeps incoming payments before the settlement day with a trust deed for the bank till the next settlement day.
Individual purchase agreements will be concluded for each sale of receivables. The seller then forwards a legally binding signed offer and a detailed record of all receivables three business days before a designated calendar date of each month. The offer is accepted when the individual purchase agreement is signed by the bank and remitted to the seller. Within three business days the purchase price (less discount) has to be provided by the bank in a NORD/LB settlement account.

The party that accounts for a difference of the paid receivables from the previous period compared to the new amount of receivables purchased, has the obligation to balance this difference to the other party on the first day of the respective period (value date) by setting-off the nominal amounts.
The seller has the obligation, during the existence of the business relationship, to immediately inform the bank about any legal and/or economical changes that have sustainable impact on its financial or earnings circumstances. Throughout the entire term the NORD/LB continuously checks on the business relationship and the credit worthiness of the seller[12].

2.2 Balance Sheet treatment

One of the main goals of the alternative financing instruments PORTFOLIO SPORT as well as Factoring and ABS transactions may be the reduction of the sellers balance sheet by the disposed receivables[13]. To charge off the disposed receivables, the transfer of the economic title onto the purchaser is essential. The legal assignment of receivables through cession is normally out of question within PORTFOLIO SPORT. In order that the economic title passes over to the purchaser, it

6 cp. Bette, Klaus, 2001; p. 59
7 cp. Lüpken, Silke, 2003; p. 84
8 NORD/LB Corporate Finance / Financial Solutions
9 cp. Schwarz, Werner, 2002; p. 41 et seq.
10 cp. Lüpken, Silke, 2003; p. 84
11 cp. Bette, Klaus, 2002: p. 376
12 NORD/LB Corporate Finance / Financial Solutions
13 cp. Engel-Ciric, Dejan; Schuler, Christoph, 2/2005; p.19

is necessary that the seller bears no credit risk out of the disposed receivables at all and these risks are completely transferred to the bank[14].

Since 2005, capital market oriented companies have to prepare their balance sheet according to IFRS standards. However, these companies do often still have to report according to the provisions of local law, as the distribution of profits and the taxation is still conducted according to commercial law in the respective country[15].

Within the IFRS[16] regulations, PORTFOLIO SPORT is to be evaluated according to single financial regulations. Single financial regulations tend to economic title and apply to basic, not with ABS transaction interrelated forms of Factoring. ABS transactions are additionally tested on a consolidated financial basis (e.g. if the originator is able to avoid a consolidation of the SPV (Special Purpose Vehicle) usually used in an ABS transaction). The charge-off of claims/receivables on a single financial statement level, highly relevant for the alternative financial instrument PORTFOLIO SPORT, proceeds as follows:

International Accounting Standard (IAS) 39 evaluates the charge-off of receivables within a multi-level procedure, where different concepts and criteria form the basis for a detailed analysis. Thus, receivables have to be charged-off according to IAS 39.18, if the legal rights for preservation of cash flow of the receivables (repayment of debt) are transferred to the purchaser[17]. IAS applies upon who is exposed mainly to risks and chances of the transaction. The transfer of economic title is given when all rights of receivables are assigned, the chances and risks are predominantly transferred and the seller has no authority to dispose of the receivables anymore. Different factors have to be observed for the evaluation of risks, namely the risk of default, interest rate risk, the risk of late payment as well as the possibility of an advanced payment[18].

The right of receipt can either directly or indirectly devolve. A direct cession of the right of receipt requires an appearance of the purchaser against the debtor. As PORTFOLIO SPORT is based on a silent cession, the liability to forward the inflow of liquid funds out of the receivables is required according to IAS 39.18(b). The debtor continues to pay to the original creditor (the seller of receivables); such transactions are known as pass through arrangements. IAS 39.19 makes restrictive demands on the pass through arrangements within the framework of a silent cession. An assignment is only to be assumed if the seller is obligated to transfer incoming payments on sold receivables (and only those), without material delay. Especially revolving purchases of receivables are therewith problematic. The day of settlement within PORTFOLIO SPORT takes place on a monthly basis. This contradicts with the requirement of forwarding incoming payments without material delay. Within a revolving purchase, such as in an PORTFOLIO SPORT structure, no immediate forwarding of incoming amounts to the purchaser takes place. Based on the context of IAS 7.7 however, a medium delay of payment of 45 days can not be detrimental for the compliance with the requirement. Consequently the legal and economic rights of the receivables are considered to be assigned and a charge-off of the receivables of the sellers' balance sheet can take place[19]. Furthermore, NORD/LB secures its right to disclose the transaction to the receivables debtor. Hence, one can say that in case of a downgrading of the credit worthiness of the seller, the bank may disclose the assignment of receivables to the debtors and thereafter obtain direct payment by the debtors without involving the seller. From a legal point of view, this equals in a situation of a "transfer without material delay".

More problematic under IFRS is the guarantee given by the seller to the bank with regards to the attributes of the sold receivables. Whereas it is not seen as harmful for an off-balance sheet treatment, when the seller gives standard representations and warranties with regard to the legal existence and the receivables being free of any third party rights, it may be problematic with regards to off-setting of payments by the debtor, or reduction in amounts paid for reason such as minor performance by the seller.

Another aspects that can be harmful for an off-balance sheet treatment are repayment obligations of the seller being in breach of contract. At the end, the auditors of the seller have to confirm, that most of the risks with regard to the receivables are transferred to the purchasing bank (or not), and therefore decides whether the receivables sold would remove from the balance sheet, or not[20].

14 cp. IDW Prüfungsstandards, 2002

15 cp. KPMG Deutsche Treuhand Gesellschaft (Ed.), 2006; p. 10

16 In the following also referred to as International Accounting Standards (IAS); In 2003 the International Accounting Standards Board renamed the IAS to IFRS, used as a generic term nowadays. The term IAS is however still common in practical life and therefore both terms are used interchangeable; cp. IFRS Portal: http://www.ifrsportal.com/Grundlagen/Was_sind_IFRS_IAS/Was_sind_IFRS_IAS_01.htm; 07.25.2007

17 cp. Engel-Ciric, Dejan; Schuler, Christoph, 2005; p. 19 et sqq.

18 cp. True Sale International (Ed.), 2006; p. 4 et seq.

19 cp. Engel-Ciric, Dejan; Schuler, Christoph, 2005; p. 19 et sqq.

20 cp. NORD/LB Corporate Finance / Financial Solutions

2.3 Risks assumed by the bank

The bank assumes the risk that the debtors are unable to pay, i.e. the risk of bad debt losses or del credere risk. The risk of the debtor's default is assumed by the bank only for receivables that remain within the specified limit to secure a granular structure of the receivables portfolio. The customers of the seller become the bank's debtors indeed, but not the contracting partners of the bank. The debtors are therefore not committed to provide information to the bank, what is hardly possible anyway within a silent cession. If the debtors are furthermore not subject to publication requirements, the bank is very limited in its possibilities to get an idea of the creditworthiness of the debtors[21].

Within a risk analysis the NORD/LB determines the expected loss of the receivables portfolio. Here the bank reverts on a structural element to minimise risk from ABS transaction, the first loss piece/reserve. Within an ABS transaction the first loss piece is the highest-risk tranche and often held by the seller of assets/receivables, meaning that portfolio losses will be first offset against the seller's own investment so that it is the seller's interest to keep such portfolio losses as small as possible[22]. There is no usage of tranches however in an PORTFOLIO SPORT structure, but the first loss reserve as a risk minimisation tool is taken on by maintenance of a reserve account held with the purchasing bank. Arising losses are first charged to that seller's account, and in a second step – if losses are higher than the reserve account balance – to the bank.

The loss reserve is determined by the historic rates of default of the portfolio as well as the individual limit for each debtor: A high degree of granularity and minor historic loss rates lead to a relatively small loss reserve, and vice versa. The loss reserve is deposited by the seller of receivables on a NORD/LB account and pledged to the bank. The bank is entitled to use the credit balance on this account for the compensation of possible losses of receivables. The maximum compensation per calendar year amounts to the agreed loss reserve. If the account is debited with losses, the seller of receivables is responsible for replenishment of the account in the next year. If the balance on the loss reserve account is insufficient for the coverage of losses, the NORD/LB has to compensate the remaining losses for own expenses.

Through the assignment of the risks to the bank, the seller of receivables is independent from the payment history of his customers. High losses on receivables and value adjustments can be reduced or even avoided[23].

21 cp. Schwarz, Werner, 2002; p. 82

22 cp. BayernLB, 2006; p. 6

23 cp. Wieland, Claus, 2003; p. 222

2.4 Risks remaining with the seller

The framework agreement of PORTFOLIO SPORT provides for several liabilities of the seller for the legal validity and the existence of the sold receivables. The seller is liable to the bank that the receivables correspond to the criteria stipulated in the agreement during the entire financing maturity. Furthermore the seller is liable for the free assignability and the legal existence of the sold receivables. The liability on the seller's part moreover comprises other transferred titles and ancillary rights (for example insurance payments due to a loss of the delivered goods constituting the receivables, credit insurances, or similar claims) and the appointed securities with regard to the receivables as well as for the rights and claims transferred therewith free of any third-party rights or counterclaims or any other rights by the debtors.

In case the debtors should assert any claims, for example impairment, set-off or notice of defects that reduce the sold receivables partly or in full, the seller has to inform the NORD/LB and it has to reimburse the difference to the full amount at first demand (or at the next settlement date). In case the receivables are (or become) non-existing, the bank would reassign the receivables as if they would exist, against payment of the original nominal amount by the seller. In addition to that, the seller is liable, irrespective of the party of default, that the sold receivables and any other assigned rights and claims as well as possible securities remain within the bank according to the framework agreement. The liability of the seller is independent from the circumstance that the NORD/LB knew or should have known possible defects of title at the time of purchase.

According to the framework agreement, the seller has to assure that the assignment of receivables and any other possible rights and claims is not restricted through any other agreements with customers. Furthermore, the seller has to represent and warrant that it has not and will not dispose of the receivables and refrains from any other actions that endangers the receivables sold, for example not to consent to any extension of payment terms without asking for the prior consent of the NORD/LB[24] .

2.5 Receivable eligibility criteria

Especially for mid-caps the possibility to use classical ABS programs is very limited. The complexity, time and expense and especially the cost as well as the non-existence of sufficient high and granular receivables portfolios create disadvantages and make the offered programs unprofitable to smaller

24 cp. NORD/LB Corporate Finance / Financial Solutions

companies. Different than in ABS related programs or ABS securitisation programs for mid-caps PORTFOLIO SPORT is a very streamlined financing product. There is no securitisation of receivables with PORTFOLIO SPORT so there is no need of a securitisation platform. Furthermore, external rating agencies that account for a high proportion of cost in ABS securitisation programs do not have to be involved. As the receivables will not be securitised and placed in the capital market there is no need of an external rating. Nevertheless, the company whishing to sell the receivables as well as the receivables itselves have to fulfil certain requirements. Moreover, structuring and financing cost emerge also when using PORTFOLIO SPORT, but are far lower.

The seller has to be the legal and beneficial owner of the receivables, i.e. the receivables have to be originated effective in law first, and the seller has not disposed of the receivables otherwise for example as loan colleteral. The legal existence of receivables is usually given when the services are successfully performed by the company. It has to be secured furthermore that the receivables are existing independent from the economic development of the company, especially concerning insolvency. The maximum maturity of the receivables may not exceed 90 days; otherwise § 18 of the German Banking Act (KWG) becomes applicable which cannot be fulfilled within PORTFOLIO SPORT transactions for two reasons: first, financial information on all debtors is often not available to the bank, and second, it would be economically ineffective to analyse all the debtors.

The receivables have to be associated originally with the delivery of goods or the rendering of services, and shall not be already due or overdue, or subject to any allowances or impairments. It is further amplified in the framework agreement for an PORTFOLIO SPORT transaction that the seller has to certify that it is not aware of any circumstances that could result in a non-duly payment of the receivables.

Since PORTFOLIO SPORT is a transaction involving a high number of debtors, it is clearly pointed out that the receivables of a single debtor shall not exceed a percentage share of the overall receivables pool earlier referred to as limit. The average receivables limit for each debtor may vary according to its credit worthiness if known to the bank, otherwise no debtor shall have a receivables maximum volume of for example more than three percent of the overall volume. Debtors with traceable first-grade credit worthiness (e.g. with a good internal or external rating) however can have special higher limits within the receivables portfolio. The others are considered from a portfolio perspective[25].

25 cp. NORD/LB Corporate Finance / Financial Solutions

The volume of receivables and the annual turnover of the company should not fall below a specific minimum value due to efficiency reasons[26]. The NORD/LB determines a minimum receivables volume requirement of EUR 3 mn for a transaction. Furthermore the bank pays attention to an adequate diversification of the receivables. In the ideal case the seller disposes of a portfolio with receivables of at least 200-300 debtors located in different geographical areas[27]. Often this cannot be achieved by a number of mid-caps in which case an additional credit insurance can be negotiated; or the loss reserve can be adjusted to a higher amount, whereby admittedly the financial cost increase, or off-balance sheet treatment may be endangered[28].

2.6 Company requirements

The annual turnover of suitable mid-caps for PORTFOLIO SPORT should not be below EUR 25 mn, there is no upper limit defined.

The company/seller of receivables has the obligation within PORTFOLIO SPORT to act as servicer of receivables and shall collect all payments due under the receivables; therefore a good reporting system is indispensable. As already aforementioned, the base of the debtors consists to some extent of a high number of small companies. The servicing procedure and administration of all generated data requires a respective IT support. Furthermore, the seller has to administer the collection account in trust for the NORD/LB. In addition to that the seller has to indicate on its books and records that the receivables have been sold, assigned, transferred and conveyed by the seller to the bank. This requires the willingness to communicate company data and to show entrepreneurial transparency, which is sometimes limited with regard to mid-caps, especially family-owned ones. The avoidance of accountability and disclosure requirements may be an important financing goal for mid-caps.

Companies that deliver predominantly or exclusively cash down are not considered to use PORTFOLIO SPORT, as the sale of receivables with this financing instrument is analogue to ABS and Factoring only possible with receivables that comprise a term of payment. Moreover, an acceptable credit worthiness of the company is mandatory; the seller should dispose of an internal rating of at least 7[29]. In some cases,

26 cp. Mevissen, Dorothea, 2005; p. 49

27 cp. NORD/LB Corporate Finance / Financial Solutions

28 cp. Mevissen, Dorothea, 2005; p. 50

29 Please note: An internal rating of 7 of the NORD/LB rating scale is equivalent to a probability of default of 0.88%; or equivalent to an external rating of BB+ from Standard & Poor's for example; cp. NORD/LB internal rating scale

where there is an existing long-term relationship with the seller, and rating is to be expected to improve, internal rating may be range until 9, whereby further credit enhancements such as lock-box accounts or disclosed sale of receivables may be considered.[30] The company should not be in financial or economic difficulties and should not tend to use PORTFOLIO SPORT to avoid insolvency. The economic background and the integrity of corporate management are surveyed at all times. Hence transparency and willingness to communicate is demanded here once again.[31]

3 Benefits for mid-caps when using PORTFOLIO SPORT

Raising of a loan was till recently the main external financing source of mid-caps. The bank loan is however subject to sustainable changes. The realignment of the credit business of banks, accelerated through the implementation of Basel II, leads to a restrictive lending policy, a widening of credit margins and terms and conditions depending on the company's credit worthiness. Against this background, mid-caps open up increasingly for alternative and/or supplementing financing sources, to secure and diversify their financing.

Several banks react on the increasing need for capital of mid-caps by developing custom-tailored financing solutions. Especially against the background that mid-caps are considered as being the supporting pillar of German economy, programs are designed to enable this customer segment the access to alternative financing instruments to secure the satisfaction of capital requirements.[32]

The factors for mid-caps to decide in favour of the alternative financing instrument PORTFOLIO SPORT in order to achieve their financial goals are numerous. Not only the optimisation of the financing structure is in the foreground.[33] On the one hand this financing instrument is used to improve liquidity and to achieve a diversification in financing sources. Another vital aspect on the other hand is the balance sheet optimisation and crediting that can be accomplished.

The goal to reduce the balance sheets total assets was spoken of beforehand. The main purpose of each transaction is to transfer risks from one party to another. In this connection the diversification of risk transfer on the one hand and balance sheet effect on the other hand has to be considered. PORTFOLIO SPORT represents a true sale transaction meaning that the risks are legally assigned. It is however possible that there is no modification in the balance sheet structure, clearly that the receivables still remain with the seller.[34] There is a decisive factor to be considered to achieve a discharging effect, which is the loss reserve amount. It shall not exceed a specific amount that has to be evaluated by a qualified auditor. If the auditor estimates that the seller of receivables still carries most of the risk and not the bank, because the loss reserve is oversized, there may no discharging effect. However, assuming the true sale structure of an PORTFOLIO SPORT transaction and the proper amount of the loss reserve a reduction of receivables and liabilities can be realised resulting in an enhancement of the balance sheet optic.[35]

Analogue to Factoring and ABS the company appears as seller of receivables and as a seller of risk in an PORTFOLIO SPORT transaction.[36] Cash flow optimisation as well as the reduction of risk by minimising concentrations are decisive for PORTFOLIO SPORT. ABS and Factoring implicate the transfer of risk to a third party; the same applies to PORTFOLIO SPORT. Bad debt losses and losses out of a debtor's insolvency can be prevented using this financing tool. With the usage of PORTFOLIO SPORT a company's risk portfolio can be upgraded. This effect entails a better corporate rating what again can lead to a positive influence on future loan financing and financing margins.

The assurance of liquidity is an indispensable requirement for the continuity of a business and has to be prioritised compared to other financial goals.[37] Next to the immediate liquidity improvement PORTFOLIO SPORT leads to a release of capital through the downsizing of accounts receivable, equal to Factoring transactions.[38] In this context it has to be noted that PORTFOLIO SPORT provides a double liquidity effect. Firstly, the liquidity is received immediately with sale of the receivables. Secondly, liquidity is once again gained, when the debtor pays to the seller, but settlement day with the NORD/LB is several days/ weeks ahead. In this case, even though such funds are the property of the NORD/LB, they raise the working capital of the seller in the meantime.

Another important point is that the seller can rely on a specific date (settlement date agreed in the framework agreement with the bank) to receive such liquidity in comparison to the uncertain date of payment of the receivables by the debtors, as trade receivables often are paid several days (or even weeks) late.[39]

30 Equivalent to a probability of default of 1.98% or to an external rating of BB-.

31 cp. NORD/LB Corporate Finance / Financial Solutions

32 cp. Lüpken, Silke, 2003; p. 132

33 cp. Stiefl, Jürgen, 2005; p. 13

34 cp. Pfaue, Michael, 2003; p. 195

35 cp. NORD/LB Corporate Finance / Financial Solutions

36 cp. Pfaue, Michael, 2003; p. 195

37 cp. Mevissen, Dorothea, 2005; p. 62

38 cp. Krause, Anke; Köhler, Peter, 04.01.2006; p. 25

39 cp. NORD/LB Corporate Finance / Financial Solutions

Mid-caps aim more and more for a diversification of financing sources. Particular in regards of the listed changes in the banking sector, mid-caps try to minimise their dependency on only one or few banks and their respective current and future credit policy.[40] PORTFOLIO SPORT makes a positive contribution to this aspect.
Through the diminution of continuing obligations possible excise tax savings can emerge as well.[41] By reason of the combination of liquidity, cost efficiency and risk coverage, PORTFOLIO SPORT is a flexible financing instrument, which allegorises an adequate alternative for the classical types of loan financing. It is far less cost intensive and complex than ABS transactions, more structured and flexible than Factoring and therewith explicitly suited for mid-caps.[42]

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IMPROVING FIRM PERFORMANCE THROUGH VALUE-DRIVEN SUPPLY CHAIN MANAGEMENT: A CASH CONVERSION CYCLE APPROACH

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Abstract.
Since the management of supply chains is reshaping from functional silos towards external integration and coordination, it is of critical to use appropriate performance measures that help to steer supply chain performance. Management attention must focus on cross-functional and cross-organizational performance dimensions to ensure supply chain integration and coordination. The analyses presented in this article are based on data from 480 US and European retailers and technology hardware firms in the period from 2000 to 2005. Results indicate that a firm should aim to shorten cash conversion cycles (CCC) as much as possible, but at the same time must pay great attention to creating benefits for the supply chain as a whole, instead of establishing its CCC advantages at suppliers' or customers' expenses. Improving performance through value-driven supply chain management with the right CCC approach is a lever to outperform competitors.

1 Introduction

Managers nowadays face the battlefield shifts from individual firms to entire supply chains, partially due to fierce competition, globalization, complex product and service demands, ever-changing technologies, or the new Sarbanes-Oxley Act requirements. The potential benefits for extended supply chain enhancement are still widespread. Therefore, executives are seeking innovative strategies to achieve cost savings, operating efficiencies and superior customer value.

For CFOs, working capital cycles are key performance indicators. As the firm becomes more involved in global business, working capital cycles become longer and harder to manage. While shareholders are interested in competitive economic returns on their invested capital, it can be highlighted that cash and cash management are at the center of a profitable operating business. Therefore, pursuing the ability to compete more tenaciously in this new battlefield, integrating and optimizing the financial flows in the supply chain is on the board's agenda. Supply chain strategies directed towards an aggressive Working Capital Management (WCM) have proven to be a success factor for improving operational and financial performance.

Especially since the management of supply chains is reshaping from functional silos toward external integration, it is critical to use the right performance measures that can depict the true insights into supply chain performance. Hence, management attention must focus on cross-functional and cross-organizational performance dimensions to ensure supply chain integration and supply chain coordination. Firms can jointly create shareholder and customer values by information sharing, collaborative planning, coordination, and managing the flow of financial resources along the supply chain. Dell Inc. and Wal-Mart Stores Inc.'s successful stories of supply chain practices, for example, underscore their operational efficiencies as well as strong cash management which mainly derives from superb inventory management and accelerated cash conversion cycles (CCC). Dell Inc. has achieved an enormous competitive advantage by shortening its CCC from 33 days (1995) to negative 44 days (2006). Dell Inc. realizes its benefits mainly from its Build-to-Order (BTO) business model which allows collecting money from customers in advance and paying suppliers two to three months later, resulting in a negative CCC of $4.6 billion.

The goal of this article is to explore the potential of a value-driven supply chain management and to derive recommendations for managers. Our analysis and recommendations are based on data from 480 firms. We analyzed the link between CCC and several dimensions of firm performance in the period from 2000 to 2005.

The article is organized as follows: Section 2 briefly reviews the literature for relevant underpinnings and empirical investigations which attempt to explain and establish the link between CCC and supply chain performance. Section 3 describes the definition, key drivers and impacts of each CCC component. Sections 4 and 5 portray the results and shows that a significant link between CCC and financial performance is given.

2 Backgrounds

2.1 Underpinnings

The evolving field of Supply Chain Finance (SCF) deals with the flow of financial resources on an inter-organizational level, and is positioned at the intersection of supply chain management and finance. As a dynamic view of measuring the

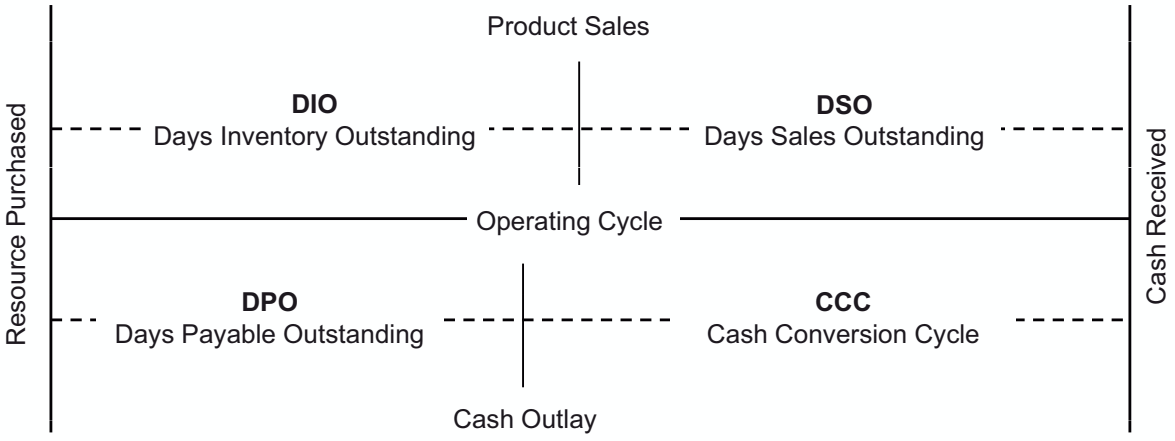
cash cycle through a firm's cash outflow to cash inflow, CCC was first introduced by Gitman (1974) and further refined by Gitman and Sachdeva (1982). Hager (1976) also presented cash management as a starting point to manage the uncertainty of operating cash cycles. The goal is to shorten the CCC as much as possible and thus to speed up the operational cash inflow and outflow.

CCC increasingly replaces Current Ratio (CR) and Quick Ratio (QR) in the evaluation of working capital performance. Especially, while CR and QR are deriving from the balance sheet at a particular point of time, these two most conventional and static measures (CR and QR) are of questionable value to assess a firm's adequate liquidity position and the efficiency of ongoing operation activities (Emery, G. W. 1984; Kamath, R. 1989; Soenen, L. A. 1993; Gallinger, G. 1997). With the dynamic nature of transformation processes within firms' operations, CCC provides more explicit implications to supplement the traditional static rations for managing a firm's working capital position (Richard, V. D. and Laughlin, E. J. 1980; Kamath, R. 1989).

An advanced model of CCC is the Weighted Cash Conversion Cycle (WCCC). Based on this concept, WCCC further scales the timing by the amount of funds committed in each stage of the cash cycle. Considering both the number of days and the amount of funds used in each segment of the cycle, WCCC is an aggregate summary measure to draw management attention on the real resource tied up at the entire working capital process (Gentry, J. A., Vaidyanathan, R. and Hei Wai, L. 1990). Although it is not easy to identify the costs of raw materials, semi-finished, and finished goods for external investors, WCCC is a prominent tool for managers to execute internal monitoring and controlling of organizational operations.

2.2 THE CASH CONVERSION CYCLE (CCC)

CCC is defined as "the interval between the time cash expenditures are made to purchase inventory for use in the production process and the time that funds are received from the sales of the finished product" (Schilling, G. 1996). This net time interval establishes "the period of time required to convert a dollar of cash disbursement back into a dollar of cash inflow from a firm's regular course of operations" (Richard, V. D. and Laughlin, E. J. 1980). While measuring the float related to the time that a firm resources are deployed in current assets offset by the float related to the time that the investment is being financed by trade credit, CCC could also be referred to be as a company's "net liquidity float" by adopting the float concept of cash management (Schilling, G. 1996).



Source: Adapted from Richard, V. D. & Laughlin, E. J. (1980)

Figure 1: The Concept of Cash Conversion Cycle

Richard and Laughlin (1980) have illustrated the relationship between CCC and the asset conversion period – the more traditional operating cycle concept. Figure 1 illustrates that operating cycle is the prime factor that drives CCC. As the operating cycle becomes longer without lengthening the Days Payable Outstanding (DPO), it leads to the financial risk of liquidity management and the need to grant additional financing requirements, resulting in uncertain CCC. On the other hand, if the firm could cut down ts operating cycle or increase its power to prolong the DPO, it could moderate the length of CCC. Here accounts payable can be viewed as a source of short-term financing to maintain a firm's liquidity position. However it also shows that any of the three CCC factors, Days Inventory Outstanding, Days Sales Outstanding and Days Payable Outstanding (DIO, DSO and DPO) influence the CCC and determine a residual cash flow financial period.

CCC is a composite tool which is measured in days. It is calculated using the number of days in which cash is invested in inventory, plus the days of uncollected accounts receivable, less the days of accounts payable to suppliers (see figure 5). A negative CCC implicates that a firm refers creating more cash on hand and harboring a safe liquidity position. In contrast, holding higher CCC means that a firm uses financing (debt or equity) as a means of progress and thus working capital is constrained to compensating for inefficiencies within its supply chain. Consequently, a firm might suffer from the financial risk of insolvency. If the firm is operating in a "zero" CCC zone, it means that the firm is in good shape without additional working capital requirements.

As CCC bridges across inbound activities with suppliers, through manufacturing operations and the outbound activities with customers, Farris and Paul (2002) also recommend CCC as an important analysis tool to measure liquidity, organizational valuation, and the management performance of processes into and out of the firm. In this context CCC is an indicator for finance managers to identify the needs to grant or refuse the loan proposal, to sustain its operations, and manage policies to repay the bill.

2.3 THE CCC FROM AN ACCOUNTING PERSPECTIVE

To explain the significance of cash flows related to liquidity, Lancaster, Stevens and Jennings (1998) extends the relationship between changes in accrual earnings and cash flow in a firm's liquidity. The study shows that CCC has the highest significant explanatory power for cash flow and working capital. Although liquidity is sensitive to either static or dynamic measures, reflecting the dynamic nature of the circulating capital makes CCC outstanding from traditional measures. It provides a valid alternative for measuring and depicting corporate liquidity.

A firm's size has direct impact on the length of CCC. Moss and Stine (1993) employed the CCC to conduct an empirical analysis for measuring corporate performance. From 1,717 observations of retail firms in the period from 1971 to 1990, the study investigated the relationship between net sales, total assets, and CCC. They showed that whether firm size is based on net sales or total assets, both is negative correlated to the length of CCC and conclude that longer CCC derives mainly from a larger inventory and/or a higher accounts receivable exposure. This evidence offers firms of all sizes a strong common interest to improve their CCC by exercising strategies focusing on inventory and accounts receivable reduction.

Moreover, different levels of liquidity can result in different impacts on the length of CCC. Eljelly (2004) further empirically examined Saudi Arabian firms in the period from 1996 to 2000 to determine the relationships between profitability, liquidity levels and CCC. The results stress that whether the liquidity parameter is measured by CR or CCC, firms with higher liquidity are expected to have lower profitability, and vise versa. Moreover, it was shown that great variation exists among different industries towards their liquidity levels. Therefore CCC is in capital intensive industries more relevant than CR with respect to measuring profitability. On the other hand, CCC is less useful in measuring a firm's liquidity within the service industry; thus it is a KPI for focal firms and industries where asset utilization plays a major role.

2.4 THE CCC FROM A SUPPLY CHAIN MANAGEMENT PERSPECTIVE

Monitoring the CCC is recommended as an instrument to optimize working capital along the supply chain by reducing the overall inventory levels, speeding the cash collection, and smoothing the payment flow (Hofmann, E. 2003; Timme, S. G. and Williams-Timme, C. 2000). Effective working capital management should be viewed as an integral corporate strategy. Shin and Soenen (1998) use the Net Trade Cycle (NTC) indicating the number of "sales days" the firm has to finance its working capital under ceteris paribus conditions. The strong negative relationship between the firm's NTC and its profitability highlights the importance of working capital management for creating shareholder value. The shorter the NTC, the higher the cash flow generated by the assets, thus the more working capital management eases the needs of external financing. These results recommend that reducing assets rather than increasing accounts payables can yield high benefits.

Deloof's (2003) research used CCC as a comprehensive measure to investigate the relationship between working capital and corporate profitability. From a sample of 1,009 large Belgian focal firms in the period from 1992 to 1996, the study points out a significant negative correlation between gross operating income and CCC. Firms with less profitability tend to pay bills later, thus increasing their accounts payable. Similar results have been obtained from studies conducted in Greece and Pakistan (Lazaridis, I. and Tryfonidis, D. 2006; Raheman, A. and Nasr, M. 2007).

Working capital management is of particular importance to small and Medium-Sized Enterprises (SMEs). In Garcia-Teruel and Maritinez-Solano's (2007) empirical research the current assets of 8,872 Spanish SMEs represent 69.48% of their total assets whereas their current liabilities represent more than 52.82% of total liabilities. This means that here current liabilities are one primary external financing source. Apart from the days of accounts payable, the study shows a significant negative correlation between SMEs' profitability (measured by Return on Assets), accounts receivables and the inventory conversion period. Likewise, Padachi (2006) investigated 58 small manufacturing firms in the period form 1998 to 2003. The study further determined that different industry sub-sectors cause various working capital needs and policies. For example, the metal industry holds the most aggressive short-term financing policy, which results in an 82% ratio of current liabilities to total assets. Those results correspond to previous studies (Jose, M. L., Lancaster, C., Stevens, J. L. 1996; Shin, H. H. and Soenen, L. A. 1998; Deloof, M. 2003) stressing that for large firms and or SMEs excellent working capital management is a powerful linkage in generating competitive profits.

Different supply chain models are another parameter that influences CCC. It is not unusual to see a well performing operational strategy towards order fulfillment lead time, on-time delivery or product defect rate which achieves the same level of financial performance. Although it is a common practice to measure the operational performance by mainly using those indicators, they can only provide a single dimension of the operational performance. However, they are unable to estimate the holistic supply chain performance. Özbayrak and Akgün (2006) analyzed firms' data using two common planning and controlling strategies, push and pull. They concluded that just-in-time-based pull systems have shorter CCC than push systems', because a pull strategy is more efficient, and converts raw materials into finished goods faster. That ultimately means that the buffer capacity for inventories and SEMI-FINISHED has a substantial effect on both operational and financial performance metrics. Consequently, understanding the impacts from both supply chain strategies, decision and policy makers can further improve the CCC to drive supply chain performance.

Implementing the right supply chain framework and controlling the right drivers are keys to managing a value-driven supply chain, thus enhancing shareholder value. Losbichler and Rothboeck (2005) conducted a study of 6,925 European companies in the period from 1995 to 2004 to examine the CCC performance of European companies. They determined that the average CCC of European firms could not be shortened drastically in that period. Even so original equipment manufacturers (OEM) could significantly improve their CCC, it has to be mentioned that their CCC optimization was achieved on their suppliers' expenses. These results lead to the question of whether such supply chain management measures interfere or even impede collaborative supply chain management and show that there is still a need to improve collaborative supply chain management.

Besides internal policies, external factors such as bargaining power, market penetration and competition should not be ignored as a key element having an impact on CCC. Banomyong (2005) used shrimp export supply chains to calculate their CCC levels, where the scope of the supply chain beginsrom Thai shrimp suppliers, through Thai exporter and US importers ending at US customers. The study shows interesting results with respect to all interactions among involved entities within the supply chain. Best performers were the US importers, mainly focal firms that master the supply chain activities, resulting in a negative CCC of 50 days. This highlights the firms' competitive competence in cash flow management. In addition these findings support Losbichler and Rothboeck's (2005) findings that collaborative supply chain management would be the key to being the "best-in-class" from a long term perspective.

3 WORKING CAPITAL MANAGEMENT AND ITS IMPACT ON SUPPLY CHAIN PERFORMANCE

3.1 WORKING CAPITAL MANAGEMENT

In general, the term "working capital" is defined as the company's investment in current assets including cash, marketable securities, accounts receivable, inventories, accrued wages and taxes and in current liabilities (Brealey, R. A., Myers, S. C., and Allen, F. 2006). However, for the purpose of working capital management, a more descriptive term is net working capital, which refers to the difference between the current assets of a business and its current liabilities. The wor-

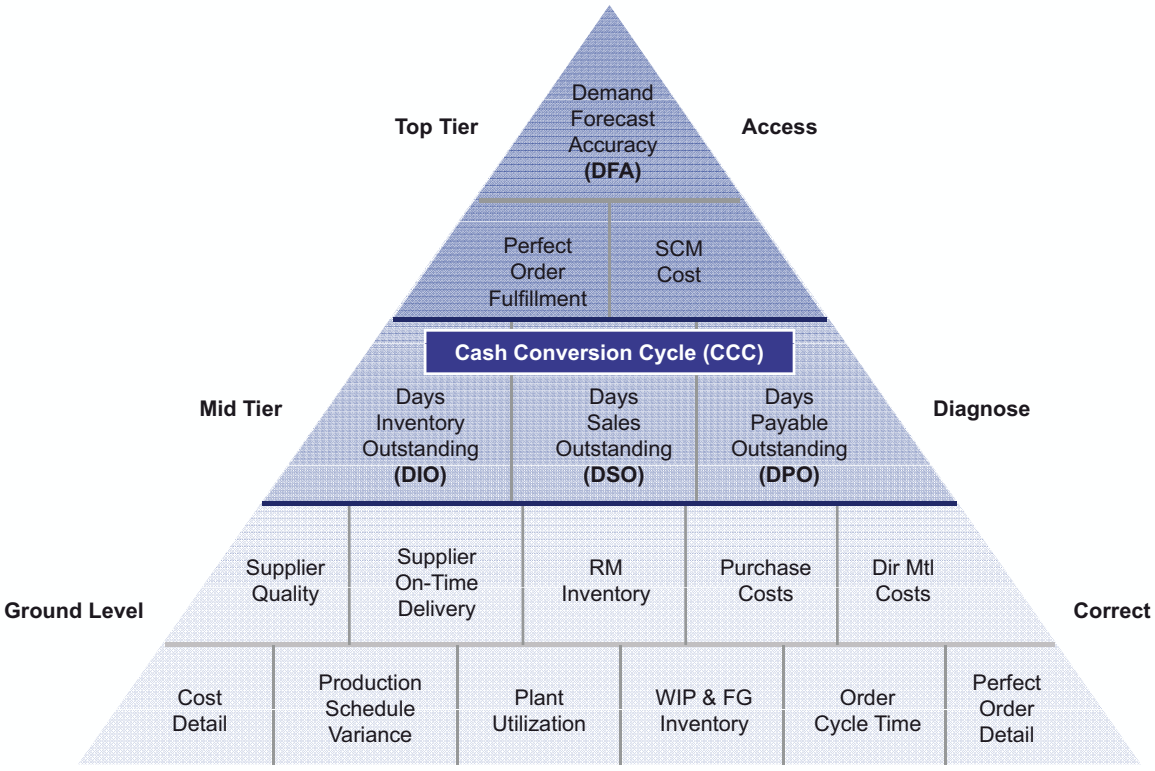
king capital determines a firm to meet its short-term financial requirements on the basis of day-to-day operations.

"Efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and avoid excessive investment in these assets on the other hand" (Eljelly, A. M. A. 2004). Working capital management synchronizes two objectives: profitability and liquidity. Although investment in business activities might increase sales performance, it may also adversely degrade profitability when carrying costs is higher than benefits of "tied up" working capital in inventory or account receivables. As CCC indicates among others the health of a company's supply chain and overall competitiveness, it is essential for managers to understand how each component of CCC is affected.

3.2 THE CCC'S ROLE IN SUPPLY CHAIN METRICS

World-class measurement is not necessarily about how much a firm measures its operations, but it is about how well the firm measures it. On the one hand, firms are striving in demand-driven supply networks – "a system of technologies and processes that sense and respond to real-time demand signals across network of customers, suppliers, and employees" (Hofman, D. 2004). On the other hand, firms are also facing challenges of choosing the right supply chain measurements, often paired with too many metrics or endless debates over metric definitions. Therefore, supply chain leaders should have the ability to measure and to act on the results respectively (Hofman, D 2006).

It is important to clearly understand the interdependencies among numerous metrics. AMR research has developed the "Hierarchy of Supply Chain Metrics" (Figure 2) to structure



Source: Adapted from AMR Benchmark Analytix (Hofman, D. 2004)

Figure 2: The Hierarchy of Supply Chain Metrics

supply chain metrics and to facilitate systematic and efficient supply chain performance management. The three-tiered framework allows managers to take a progressive view while executing measurement metrics.

The top tier helps an executive to access the overall health and high-level tradeoffs of the supply chain with three key metrics: Demand Forecast Accuracy (DFA), perfect-order fulfillment and supply chain total costs. The middle tier uses a composite cash-flow metric, CCC, which provides an initial diagnostic tool for managers to control the balance between the time it pays suppliers and the time it gets money from customers. Nevertheless, since CCC also consists of components such as inventory and Cost of Goods Sold (COGS), it is able to reveal the potentially underlying problems. Therefore, the ground level dives into more detailed metrics to cover the root causes of high inventory, high operational costs or poor customer responsiveness (Hofman, D. 2004).

3.3 SUPPLY CHAIN MEASURES FOR BETTER CCC

From empirical investigations we know that CCC has a strong impact on firm performance. Furthermore, CCC is directly related to supply chain performance. With the CCC firms can steer operational and tactical supply chain decisions. For example, CCC can indicate whether the inventory contributes to high costs and/or a low perfect order fulfillment, which helps managers to execute further analysis to discover the causes of high inventories what can be a result of excess in raw materials, semi-finished, or finished goods.

Figure 3: Operational Levers' Impact on the Cash Conversion Cycle areas: inventory, accounts receivable, accounts paya-

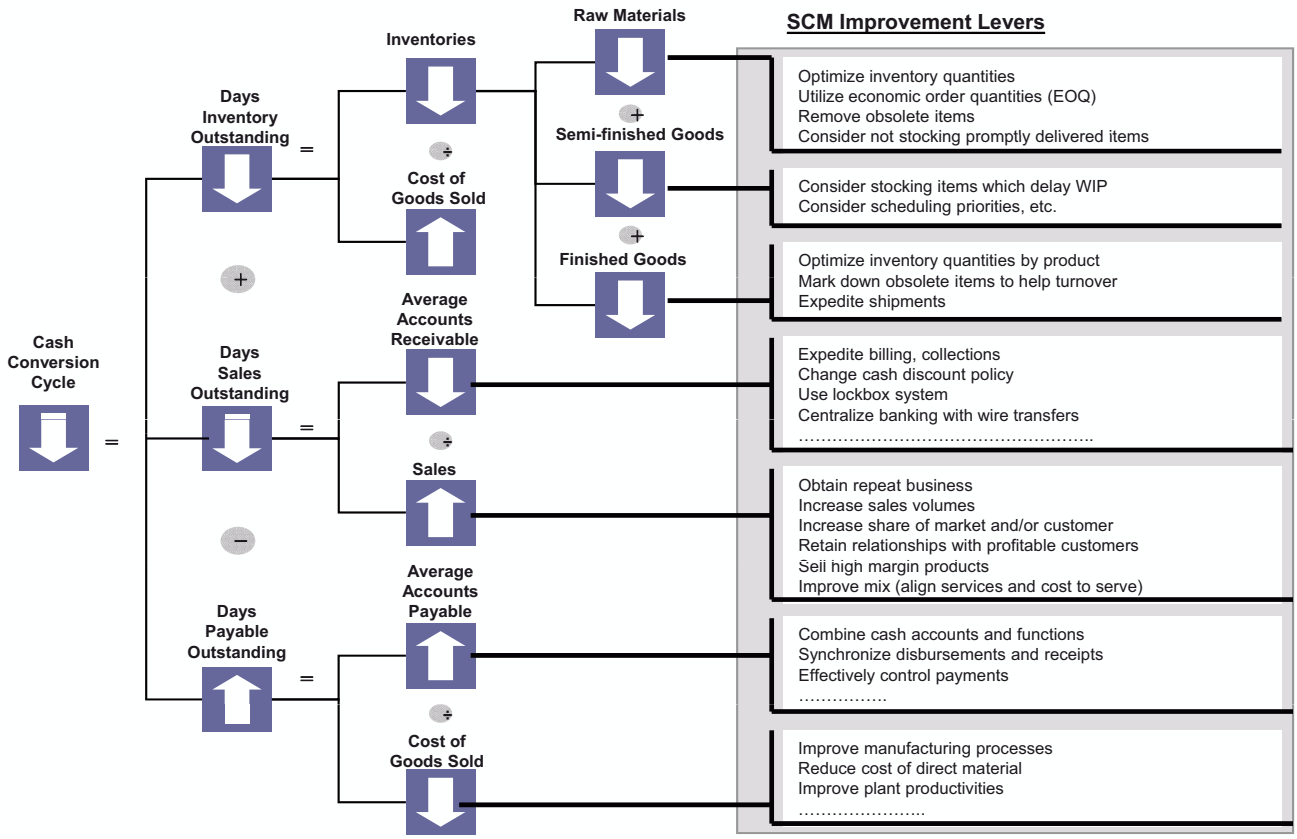


Figure 3: Operational Levers' Impact on the Cash Conversion Cycle

Days Inventory Outstanding (DIO). DIO represents the frequency of a firm in converting its cumulative stock into product sales. Inventory management involves often a trade-off between advantages of holding larger inventories and the costs of storage (Brealey, R. A., Myers, S. C., and Allen, F. 2006). For business operations, firms need to reserve a certain amount of inventory for the use of production and to satisfy market demand, but inventories can be expensive and tie-up a lot of working capital. Although typically senior supply chain managers tend to identify inventory turnover as an indicator to measure supply chain performance (Lapide, L. 1998), it does not hedge key differences in production costs or uncertainties within the supply chain (Lambert, D. M. and Pohlen, T. L. 2001). As efficient inventory management is a barometer of operational performance, inventory reduction is a common challenge faced by supply chain executives. The cash invested in inventory consisting of raw materials, semi-finished and finished goods is only cashed back when those items are sold. Furthermore, adopting purchasing, manufacturing, and distribution strategies at the same time increases the complexity to reach the "optimum inventory level" – the total amount of inventory that must be loaded into a process to support the production of one unit per day. As long as a firm holds the inventory, it holds cash captive. The magnitude of financial needs to support manufacturing operations is often underestimated (Farris II, M. T. and Hutchison, P. D. 2002).
MARKS & SPENCER's 2004 and 2005 financial statements for example show inventories of €580,767 (2004) and €495,695 (2005) and COGS of €8,803,882 (2005). From these figures, the length of DIO is computed as follows:

DIO: Average Inventories / COGS x 360 days =
[(€580,767 + €495,695) / 2] / €8,803,882 x 360 days
= 22 days

If MARKS & SPENCER were able to collaborate better with its suppliers and thus reduce its inventory level by just one day, it would free up cash of:

(€580,767 + €495,695) / 2 / 22 = €24,465

DIO can be improved by implementing operational management programs such as Just-in-Time (JIT) purchasing and delivery, Vender Managed Inventory (VMI), and Continuous Replenishment Programs (CRPs) or Manufacturing Resource Planning (MRP). Farris and Hutchison's (2002) further recommend integrating the demand forecasting accuracy and operation cycle efficiency to increase inventory turnovers, to lower inventory levels, to minimize stock outs, and to enhance supply chain efficiency, thus, in turn, to improve the efficiency of working capital (Ellram, L. M. and Liu, Baohong 2002).
The length of a firm's DIO is a function of how efficient the firm's supply chain streams are, and how well the production is synchronized with customer demand. The ultimate goal of efficient inventory management is to tie a firm's inventory closer to the actual sales, thus it is necessary to carry out techniques according to breakdown inventory sections. Nevertheless, cross-organizational collaborative planning, synchronizing supply/demand planning, and cross-docking of materials at warehouse locations create mutual benefits among supply chain entities and subsequently improve DIO.

Days Sales Outstanding (DSO). It is common that companies frequently sell goods to customers without being paid immediately and it may be weeks or even months before payment is received from these goods sold on credit. These unpaid bills, trade credits compose the bulk of accounts receivable. The remainder is made up of consumer credit which are bills awaiting payment (Brealey, R. A.; Myers, S. C., and Allen, F. 2006). The accounts receivable turnover ratio is an indicator of the frequency with which a firm's average receivables investment is converted into cash (Richard, V. D. and Laughlin, E. J. 1980). While accounts receivable represents a delay of cash inflow, this gap must be financed by the firm itself.
A number of factors can affect DSO, such as terms of sale, customer's promise to pay, business agreements or contracts, economic parameters, operational policies or collection policies. Any changes of those factors have a direct impact on the balance of the average outstanding accounts receivable to a firm's annual sales. Consequently, extending more liberal payment terms to customers increases current investments in accounts receivable, and thus creates a weaker liquidity position. DSO represents opportunity costs tied up in working capital that firms otherwise might invest in other alternative areas (Gentry, J. A., Vaidyanathan, R., and Hei Wai, L. 1990). Hence, expediting accounts receivable collections is another leverage point to improve a firm's CCC.
Taking for example again MARKS & SPENCER, which has accounts receivable of €1,189,697 (2004) and €105,939 (2005) on sales of €11,250,984 (2005), DSO is computed as follows:

DSO: Average Accounts Receivable / Sales x 360 days
[(€1,189,697 + €105,939) / 2] / €11,250,984 x 360 days = 21 days

If MARKS & SPENCER were able to accelerate the collection of accounts receivable from its customers to reduce its DSO by one day, it would create an additional positive cash flow of:

(€1,189,697 + €105,939) / 2 / 21 = €30,848

Firms should try to decrease their accounts receivable. To remove potential liquidity problems, quicker methods which

boost the cash-income eliminate risks and improve DSO. Typically, it is common to offer a cash discount for prompt settlement to increase the cash-in process. However, firms must consider the economic impacts of this decision carefully. Stewart (1995) also points out firms with low DSO tend to follow up quickly on delinquent accounts. Subsequently, implementations of electronic collection system (E-Payment) would be a good activator to shorten the invoicing process and thus make it possible to cash-in faster and to decrease accounts receivable.

Another approach, especially in the United States, to minimize the opportunity costs of uncollected funds is "Lockbox management". Since business enhancements bring a number of wide-spread customers, efficient accounts receivable collection is another important aspect for cash management. Lockbox management places "lockboxes" or cash collateral accounts in strategic geographical locations, and instructs customers to send payments to the appropriate lockbox. Thus, the authorized bank will process the checks into the firms' account in order to facilitate the collection of customer remittances. Therefore the company can facilitate its receipt of cash, making those funds available more quickly to support its daily operations (Batlin, C. A. and Hinko, S. 1972).

Furthermore it is worth to mentioning that not all sales should be traded in credit. For example, while facing a variety of irregular or delinquent customers one's could require Cash-on-Delivery (COD) payment. If a firm is supplying highly customized products, it makes sense to ask for Cash-before-Delivery (CBD) or to ask for progress payments while the work is carried out. Small firms may be able to obtain some economies of scale by farming out part of the job to a factor finance service provider (Brealey, R. A., Myers, S. C., and Allen, F. 2006).

Days Payable Outstanding (DPO). Accounts payable refers to the claims of trade creditors for unpaid bills of resources, raw materials, semi-finished or finished goods. Cash-flow forecasting assumes that all unpaid bills are paid on time, although in reality the payment could be delayed to some extent. With regard to CCC, DPO is defined as the average time over which a firm defers payment for the liability incurred to support its operating activities.

DPO is considered as a major factor to moderate CCC. Increasing accounts payable indicates that the firm accumulates larger spontaneous working capital financing, and thus enhances the ability to stabilize its liquidity position. On the contrary, declining accounts payable implies that the firm foregoes the flexibility to use the "interest-free" financing in more profitable areas. If the company is benefiting from trade credit for getting "interest-free" financing from its suppliers for a certain time period, it is possible to improve the CCC by stretching the average accounts payable associated with inventory. Therefore, lengthening DPO creates shorter CCC for the firm. However, delayed payment (also known as stretching accounts payable), can be an expensive source due to the loss of capturing losing discount incentives for prompt payment.

Following our example, MARKS & SPENCER's accounts payable were €306,727 million (2004) and €284,985 (2005) on COGS of €8,803,882. Hence DPO can be calculated as follows:

DPO: Average Accounts Payable / COGS x 360 days
[(€306,727 + €284,985) / 2] / €8,803,882 x 360 days
= 12 days

If MARKS & SPENCER could negotiate with its suppliers to extend payment terms by one day, it could free up cash of €24,655 on hand:

(€306,727 + €284,985) / 2 / 12 = €24,655

However, a firm should be cautious to focus on increasing the size of accounts payable without harming its credit rating. Accounts payable is a component used as a short-term financing source. Although accounts payable does not consume corporate resources, there is a potential trade-off between the deferred period and available early payment discount offers. Therefore, a method to shorten the CCC is to make partial rather than full payments to its suppliers. Likewise, a firm can also take the early payment discounts to reduce final payment amount. The goal of the concept mentioned above is to control and limit disbursement of cash until the last possible moment (Farris II, M. T. and Hutchison, P. D. 2002).

At the same time, firms need to be aware of the potential problems of forcing suppliers to finance the increased accounts payable terms with respect to production quality, inventory levels, delivery time and warehousing costs. Although certain firms can take advantage of their bargaining power to request extension in payment terms, the benefit should not be fully established at their suppliers' expenses. Since some entities in the supply chain will have to absorb these costs, the firm must execute such improvement strategies at an cross-organizational level cooperating to some extent with its suppliers.

Cost of Goods Sold (COGS) and Sales Management. The more intense the competition, the more necessary it will be for companies to reduce the COGS. World-class companies keep finding ways of cutting costs further and simultaneously improving their performance. There are three main levers to reduce COGS. The first one is to reduce complexity; second-

ly, to reduce unit costs by establishing cross-functional and cross-organizational teams; thirdly, to reduce COGS by executing the best make-or-buy strategies to increase outsourcing standardized parts. Successful Supplier Relationship Management (SRM) is crucial to reducing the product design or product-line complexity and operational inefficiency and hence cutting out COGS and reaching a shorter CCC.

As a denominator of DSO, sales management is another key driver in improving CCC. There are several components such as number of leads, conversion rate, transactions per customer, average sales value, and gross profit margin which can be improved to generate sales and profitability dramatically. Especially Customer Relationship Management (CRM) is recommended as a starting point to implement above strategies. Particularly, sales forces should be incorporated into the supply chain to provide accurate forecasts for keeping supply in line with demand. Therefore, top managers should be aware that increasing sales to create the "pull" supply chain model is as important as controlling the sales and marketing budget at the same time. Proper sales do not merely generate revenues, but contributes for sure to shorter DIO.

4 RESEARCH DESIGN AND RESULTS

4.1 SAMPLE

The data set for this study was obtained in 2007 from Thomson DataStream, a historical financial numerical database. We extracted data pertaining to 480 publicly listed companies of the following European and North American countries: Canada, France, Germany, United Kingdom, and United States. The financial data was drawn from their annual Profit & Loss reports, balance sheets and key account ratios for the five-year period from 2001 to 2005. Only firms of which complete data for each year of this period was available were finally used in the data set.

The selection of firms focuses on 284 retailers and 194 technology hardware and equipment firms. Industry classifications and the corresponding focal firms are based on the Industry Classification Benchmark (ICB) universe. Figure 4 lists the two industries, the corresponding ICB codes, and examples of firms in each segment.

Retailers Industry	Sector	Examples Firms
5300 Retail	5330 Food & Drug Retailers	Carrefour S.A., Tesco Plc., Metro Inc., Safeway Inc, Sainsbury J. Plc, Celesio AG, Kroger Co., CVS Caremark, Rite Aid Corp.
5300 Retail	5370 General Retailers	Amazon.com Inc., Bed Bath & Beyond, Best Buy Co. Inc., Blockbuster Inc., Dillard's Inc., Douglas Holding AG, EBay Inc., Gap Inc., Guess Inc., J. C. Penney Co., Kingfisher Plc, Marks & Spencer, Metro AG, Next Plc, Sears Canada Inc., Sears Holdings Corp., Tiffany & Co., Wal-Mart Stores Inc,

Tech. Hardware & Equip. Industry	ICB Codes	Examples Firms
9500 Technology	9570 Technology Hardware & Equipment	Apple Inc., Applied Innovtion, Avaya Inc., Cisco Systems Inc., Dell Inc., Ezenia ! Inc., Gateway Inc., Hewlett-Packard Co., Infineon Technologie, Intel Corp., Intelek Plc., Lexmark Int'l, Maxdata AG, Motorola Inc., Nortel Networks Corp., Nvidia Corp., Sandisk Corp., Schweizer Electronic, Texas Instruments, Xilinx Inc.

Figure 4: Classifications of Data According to ICB Codes on Thomson Datastream

4.2 CALCULATION OF CCC

From the given data set, CCC was computed using the equation adopted from Richards and Laughlin's (1980) framework.

CCC = DIO + DSO – DPO

DIO = (Average Inventories / COGS) x 360 days
DSO = (Average Accounts Receivable / Net Sales) x 360 days
DPO = (Average Accounts Payable / COGS) x 360 days

Figure 5: Equation of the Cash Conversion Cycle

In the computation, 360 days is used as a year-period. Average inventories, average accounts receivable, and average accounts payable are the sum of current year's and last year's closing balance divided by two respectively.

4.3 CCC CATEGORIES IN THE RETAILERS AND TECHNOLOGY HARDWARE INDUSTRY

Our results in the retailers' industry prove that 36% of "CCC-Improvers", firms that could improve their CCC levels between 2000 and 2005, have also better ROCE results; 27% of all 284 retailers can be defined as "CCC-Leaders" which generate the highest ROCE figures. It can be seen that CCC influences ROCE but not vice versa. Although 35% of all investigated retailers whose CCC levels declined (CCC period increased) in the observed period have also slightly increasing ROCE results. This phenomenon is at first counter-intuitive but can be explained in the way that some retailers, especially in the fashion retailers' business are focused on limited or branding products to generate high margin returns rather than gaining benefits from supply chain practice. On the other hand, there is still improvement potential for supply chain practitioners to move these firms into better performers by exercising more sophisticated CCC strategies.

In the technology hardware industry, similar results can be observed. For example, there are 31% of CCC-Decliners that performed as ROCE-Laggards and 32% of CCC-Laggards whose ROCE improved slightly. In both industries the results indicate that CCC performers have a better ROCE performance. Our sample also shows that firms which have a better "dealing power" (blue chips) achieve much better CCC results rather than new, small or so far not yet established OEMs.

4.4 CCC IMPROVEMENT BETWEEN 2001 AND 2005

An excellent CCC level is achieved if all parties involved in the value chain profit from a lower CCC level. Supply Chain Collaboration (SCC) is hence in great demand, but it is still not being implemented widely enough to create substantial improvements in CCC performance. The SCC approach is considered as an essential strategy to generate benefits throughout the whole supply chain as well as to satisfy customers' needs. It is a concrete cross-organizational cooperation of at least two involved entities who are sharing the same resources, capabilities, information, and even risk (Hofmann, E. 2005). The goal is to achieve competitive advantage of an entire supply chain to outperform other supply chains.

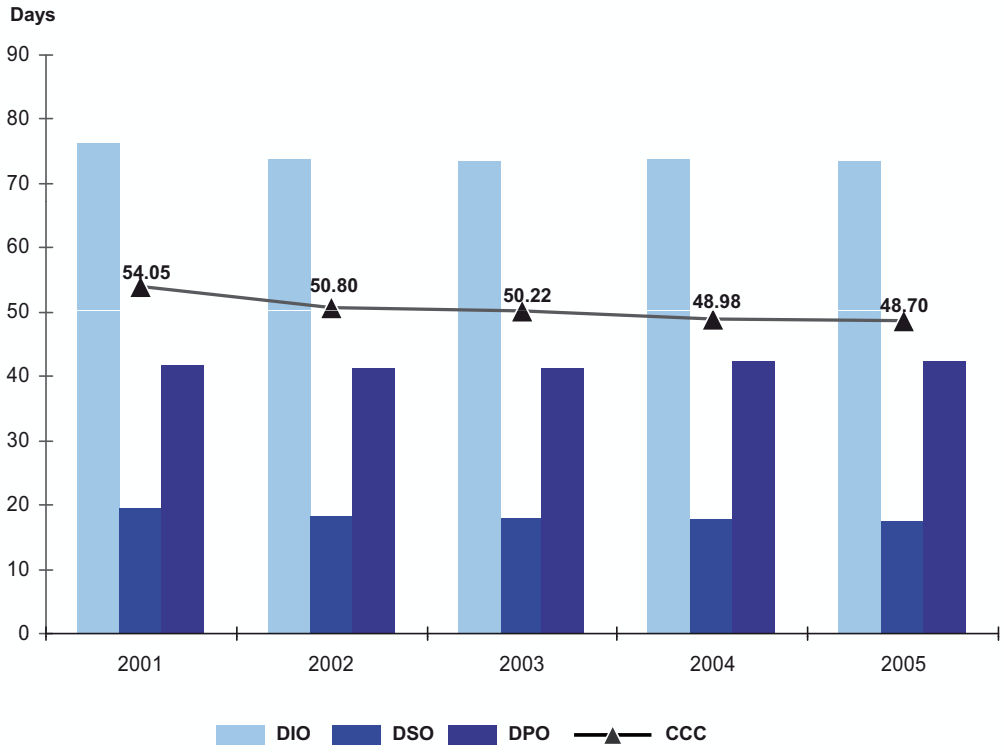


Figure 6: CCC Overall Median Performance: Retailers Industry (2001-2005)

Figure 6 shows that a gradual improvement of 9.98% among retailers. The main driver for the improvement is due to a better DIO. It clearly shows that firms already manage their inventory better than 4 years ago and that DIO has been shortened from 76.42 days in 2001 to 74.53 days in 2005. In total, the average improvement from 54.05 days in 2001 to 48.70 days in 2005 is mainly derived from organizational learning curves or industrial transportation improvements. However CCC-Leaders are merely shortening their CCC at suppliers' expenses. There is still a huge potential, especially for suppliers to focus more on a win-win situation and to convince OEMs that only a win-win situation will lead to a higher quality, service and profit level of all supply chain entities.

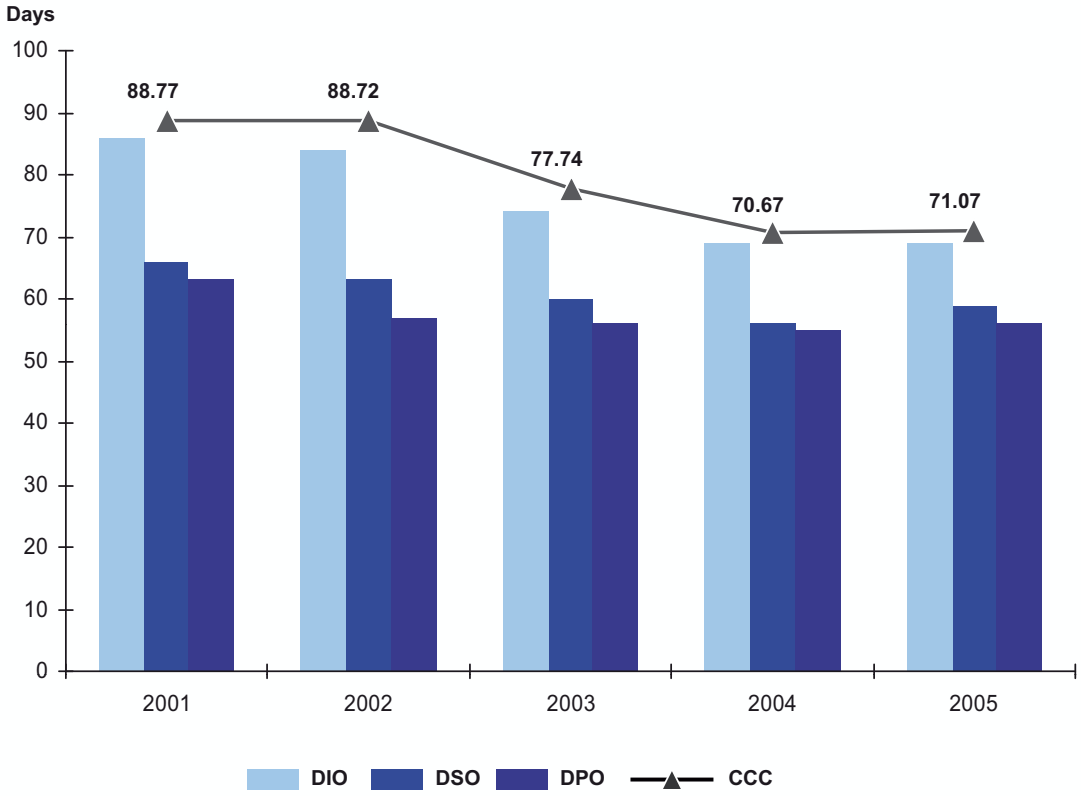


Figure 7: CCC Overall Median Performance: Technology Hardware Industry (2001-2005)

In contrast to the retailers, the technology hardware industry performed better between 2001 and 2005 (see figure 7). CCC declined from 88.77 days in 2001 to 71.07 days in 2005, which means that higher profits are generated as well as cash on hand is received quicker in 2005 than in 2001 (17.70 days). In addition, the inventory flow management is a crucial driver which is used to improve CCC performance. The DIO is substantially shortened by 15 days from 84 days in 2001 to 69 days in 2005. This result can partially explain the higher profit margins which are received in the hardware business. The pressure on hardware parts which lose daily on value pushed the supply chain management to radical innovations which resulted in lower inventory levels without losing its responsiveness.

4.5 CCC AND ITS IMPACT ON NET SALES, NET MARGIN AND ROCE

As indicated above, firms with lower CCC levels showed higher ROCE results. Figure 8 and 9 are descriptive statistics of Pearson's correlation coefficient of both industries for all variables which impact financial performance: net sales, net margin, and ROCE.

	Net Sales	EBIT	Net Margin	COGS	Total Assets	ROCE	DIO	DSO	DPO	CCC
Net Sales		0.91	0.44	0.99	0.99	0.39	-0.49	-0.59	0.40	-0.61
EBIT			0.78	0.89	0.89	0.71	-0.71	-0.85	0.52	-0.87
Net Margin				0.49	0.43	0.87	-0.82	-0.93	0.44	-0.94
COGS					0.99	0.35	-0.46	-0.56	0.39	-0.58
Total Assets						0.34	-0.42	-0.54	0.45	-0.56
ROCE							-0.68	-0.86	0.59	-0.87
DIO								0.94	0.06	0.92
DSO									-0.27	0.99
DPO										-0.32
CCC										

Figure 8: Pearson Correlation Coefficient: retailers Industry (284 retailers, 2001-2005)

	Net Sales	EBIT	Net Margin	COGS	Total Assets	ROCE	DIO	DSO	DPO	CCC
Net Sales		0.41	0.28	0.99	0.80	0.49	-0.34	-0.18	-0.04	-0.36
EBIT			0.89	0.30	0.23	0.89	-0.96	-0.94	-0.89	-0.92
Net Margin				0.19	-0.12	0.97	-0.97	-0.94	-0.74	-0.99
COGS					0.79	0.41	-0.23	-0.08	0.07	-0.27
Total Assets						0.05	-0.01	0.03	-0.09	0.03
ROCE							-0.96	-0.87	-0.63	-0.99
DIO								0.95	0.81	0.99
DSO									0.91	0.93
DPO										0.74
CCC										

Figure 9: Pearson Correlation Coefficient: Technology Hardware Industry (196 firms, 2001-2005)

For the retailers, a negative correlation between ROCE and CCC is given by - 0.87, in the hardware industry by -0.99. This strong correlation is then also seen between net margin and EBIT. The results support the impact of CCC. It is important to stress that in the technology hardware industry ROCE versus total assets (-0.12) and ROCE versus DPO (-0.74) are negatively correlated. The prerequisite is enhancing sales growth without increasing overall cost at the same time. It is interesting to note that the relationships between net sales and DPO are different in both industries. While net sales are positively correlated with DPO (0.40) in the retailers' industry, a negative correlation coefficient (-0.04) exists between sales and DPO in the technology hardware industry.

Smoothing financial flows in a supply chain is a critical activator in pursuing higher profitability. Measured by net margin, both retailers and technology hardware industries have significantly negative relationships between net margin and CCC. The result of this analysis supports Deloof's (2003) statement that firms' profitability affects their accounts payable policy. Therefore, firms should streamline the payment to suppliers by benefiting from significant discounts of prompt payment. In addition the speed of "cashing-in" plays a major role. The overall development of ROCE and CCC in both industries is highlighted in figure 10 and 11.

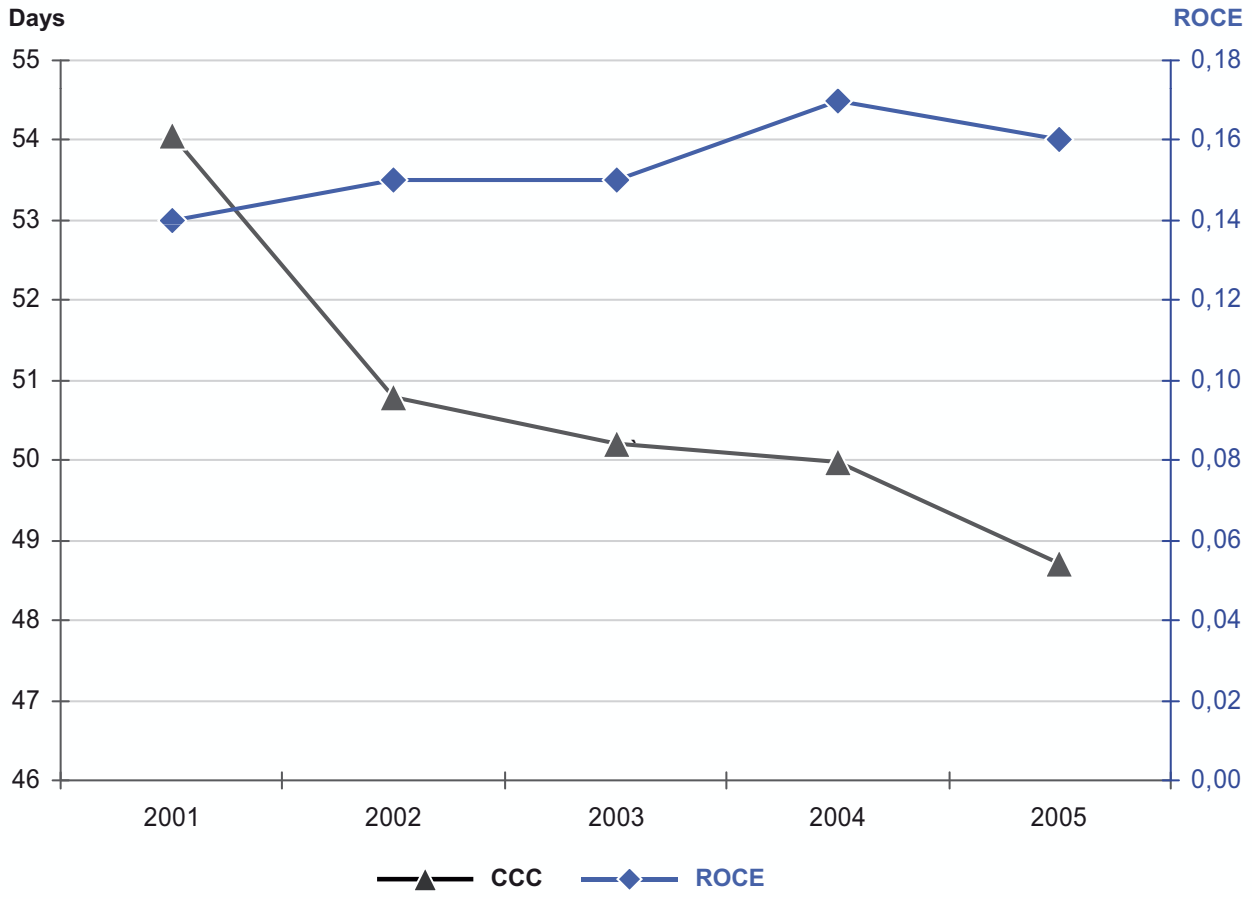


Figure 10: CCC and ROCE Overall Development in Retailers Industry (2001-2005)

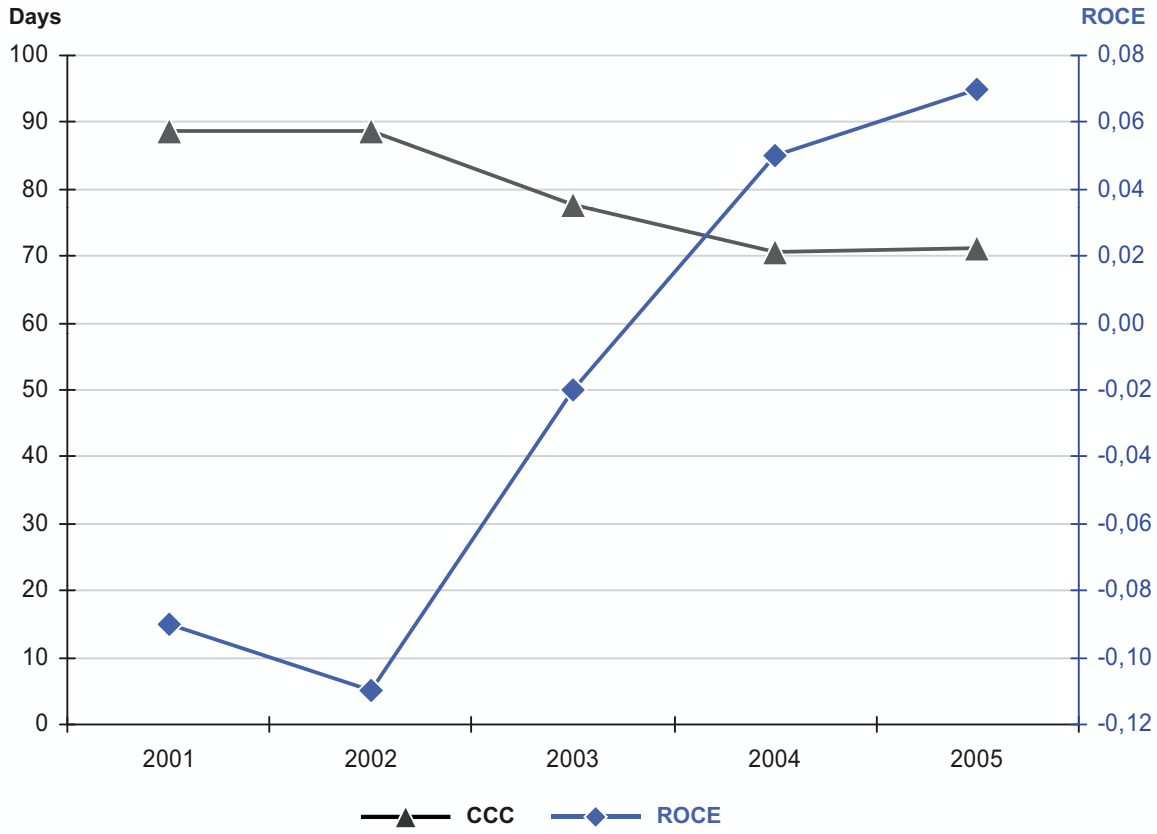


Figure 11: CCC and ROCE Overall Development in Technology Hardware Industry (2001-2005)

The curve shows negative correlations between ROCE and CCC, which strongly demonstrates that CCC is a critical element that impacts the capital utilization level and establishes the financial competitiveness. Shorter CCC boosts ROCE, which means a firm with lower inventory level, shorter accounts receivable collection time, and smoother payments terms will generate higher returns of its capital employed. The results suggest that managers can increase corporate profitability and competitiveness by understanding those relationships among net sales, net margin, ROCE, and CCC.

5 CONCLUSION

CCC is one of the key indicators to illustrate the link between supply chain and financial performance. Especially the new competition battlefield mentioned at the beginning makes it crucial. CCC can provide a quantified perspective of a broader supply chain process, because it bridges cross-functional and cross-organizational parties. Hence, the optimal result of collaborative CCC management is that all supply chain entities minimize the cost of tied-up working capital, while maximizing the shareholder value over all collaboration members.

As shown, focal firms with huge tied up capital should focus on CCC to enhance their performance. The results show that CCC has a positive impact on a firm's performance including net sales, net margin, and ROCE. Net sales, an indicator for growth capability, are correlated -0.61 in the retailers, industry and of -0.36 in the technology hardware industry. Net margin measuring profitability illustrates a significant negative relationship towards CCC; -0.94 in the retailers, industry and -0.99 in the technology hardware industry. Furthermore, ROCE representing the capital utilization is also strongly correlated with CCC performance. The correlation coefficients are -0.87 in the retailers' industry and -0.99 in the technology hardware industry.

To excel the components of CCC, which impacts the working capital performance, is a competitive advantage to execute and create enhanced economic returns for shareholders. Hofmann (2004) illustrated a collaborative cash flow management with a payment-based view to create customer value

with benefits for the whole supply chains. Sheridan (2000) also proved that highly collaborative finished goods manufacturers report shorter order-to-shipment lead times than less collaborative firms. However as we showed, top executives should be aware of capturing the real message behind various CCC levels.

The era of competition between supply chains changed the game in the way that members within a supply chain have to work together more closely. Firms should focus on shortening CCC as much as possible, but at the same time to pay much attention on creating benefits for the supply chain as a whole rather than establishing its CCC advantages on suppliers or customers' expenses. Since a firm's supply chain performance is inter-affected by all CCC factors, the overall cycle must be considered while making decisions of optimizing the CCC to achieve "the highest return 'uses' with the cheapest 'sources' until the cost equals the return, thus maximizing the company's return" (Hager, H. C. 1976). Therefore, collaborative supply chain management can be a holistic strategy to improve or to eliminate the interface disputes between its tier suppliers or customers. Firms should benchmark their CCC performance from year to year rather than focusing on a short term period. Improving the performance through value-driven supply chain management with the right CCC approach is the key to outperforming competitors.

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The Impact of IPO Costs and Private Benefits on Exit Strategies

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Zingales (1995), 426.

The Impact of IPO Costs and Private Benefits on Exit Strategies

Olaf Ehrhardt[1] and Henry Lahr[2]

1 Introduction

Although the vast majority of firms are controlled by their founding families, there is a high dynamic in the evolution of family businesses. Some theoretical models, such as Bhattacharya and Ravikumar (2005, 2001) and Burkart et al. (2003), analyse the evolution of family ownership and predict that market imperfections, agency conflicts, and private benefits influence the decision of the incumbent family owners either to bequeath the controlling stake, or to sell their business.

When a family wants to sell its firm, it has to choose between different selling techniques to maximize its total proceeds from the sale. Firstly, the family can bargain for the controlling block with a potential buyer in the imperfectly competitive market. Secondly, the family can decide to take the firm public and sell the ownership to dispersed shareholders in a fully competitive capital market. Third, the family can combine both selling techniques.

If the founding family enjoys substantially private benefits, a control transfer takes place in a two-stage process as described by the models of Zingales (1995) or Mello and Parsons (1998). Zingales (1995) recommends that "cash flow rights should be auctioned off to dispersed shareholders, private benefits of control should be bargained over in a direct negotiation." In line with the theoretical predictions of Zingales (1995), Ehrhardt and Nowak (2003) show that German families tend to either manifest controlling shareholder structures or exit the firm in selling their controlling stakes completely.

Because Zingales' (1995) model does not include the concept of transaction costs we relax this essential assumption in the process of divesting the firm. In our model we derive equilibrium conditions according to which the family owner will be indifferent with regard to going public or selling directly to a new shareholder. Due to transaction costs the fraction retained by the founding family after the initial public offering is always higher than in the basic model by Zingales (1995). In addition, we find an optimum combination of the fixed and variable costs an investment bank could charge in order to maximize its revenues from fees. This fee is the difference between the buyer's valuation of the firm and the revenue accruing to the family owner when selling directly to the buyer.

The paper proceeds as follows. Section 2 describes Zingales' (1995) basic model. In section 3 we include the concept of transaction costs in the basic Zingales (1995) model. Section 4 contains a numerical example for the presentation of the results for each model and section 5 presents a summarizing conclusion.

2 Zingales' Basic Model

Zingales' (1995) model of control sales consists of four phases (see figure 1). At time 0 the incumbent decides whether or not to go public. If she decides to go public, she determines a fraction $\varnothing$ of the company she wants to retain after the IPO. At time 1 a potential buyer, the "rival", with a different valuation steps in and his characteristics (i.e. his potential to improve or reduce the company's cash flow and his ability to extract private benefits) are revealed. At time 2 the bargaining between the incumbent and the rival takes place. If the incumbent retains a majority of votes at time 0, the rival can only prevail by negotiating with the incumbent. Bargaining power is modelled by ψ, which denotes the probability that the incumbent makes a take-it-or-leave-it offer which is accepted by the buyer. If the offer is successful, control is transferred to the rival. Otherwise, the negotiation game ends. If the incumbent does not retain a majority of votes, the buyer can attempt to obtain control by buying a majority of votes from dispersed shareholders. Zingales (1995) shows that it never pays for the incumbent to relinquish control, since she always could sell her cash flow rights to dispersed shareholders and could additionally trade her voting power for some positive value which is attached to the control right by the buyer. Since the model is a finite game, it is solved by backward induction.

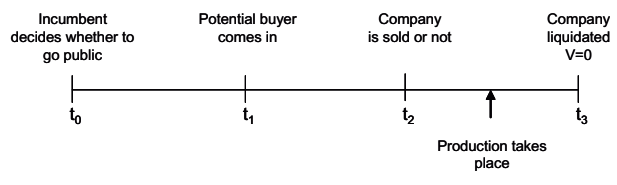

Figure 1. Sequence of events in the basic model.

Time 2

The incumbent sells his stake if the valuation of her stake in the company is less than the rival's valuation of that fraction. This condition yields a limiting value of the post-IPO share

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ϕ at which the incumbent becomes indifferent of selling the company:

$$B^i + \phi v^i \leq B^r + \phi v^r \quad (1)$$

with B^i and B^r representing the incumbent's (I) and rival's (R) private benefits, v^i and v^r representing the cash flows with the incumbent or rival managing the company and ϕ denoting the incumbent's fraction of the company before time 2. Cash flow rights are assumed to be completely separable from control rights such that ϕ denotes some fraction of the cash flow rights. Control rights are transferred en bloc in this model, for the controlling shareholder will obtain all private benefits as long as he owns a majority of control rights while the remaining shareholders after the IPO receive only their fraction of the cash flows as represented by their share ϕ.

In Zingales' (1995) model,. $\phi \geq \frac{B^r - B^i}{v^i - v^r}$

cash flows than the incumbent ($v^r > v^i$).

There is an optimum combination of fixed and variable cost an investment bank could charge in order to maximize its revenue from fees. Solving equation (12) for c_f or c_v yields possible combinations of these cost components.

$$c_f = \frac{(B^i - B^r + v^i - v^r)(v^r + v^i(\psi - 1) - (1 + c_v)v^r\psi)}{v^i - v^r} \quad (13)$$

For any fixed cost c_f the investment bank could extract the whole surplus from going public which otherwise would accrue to the incumbent. The fee charged by the investment bank is the difference between the rival's valuation of the company and the revenue accruing to the incumbent when selling directly to the rival. After substituting equation (13) into (8) the equilibrium fraction retained by the incumbent is

$$\phi = 1 - \frac{(B^i - B^r + v^i - v^r)\psi}{v^i - v^r}. \quad (14)$$

For all $B^i + v^i < B^r + v^r$ this fraction is larger than the value obtained in the basic model (equation (2)).

4 Numerical Example

To demonstrate how both models work, we construct a numerical example by using the following figures in Zingales' (1995) basic model:

$v^r = 140$	(cash flow with R managing the company)
$v^i = 100$	(cash flow with I managing the company)
$B^r = 10$	(private benefits of R)
$B^i = 40$	(private benefits of I)
ϕ = endogenous	(fraction retained by I after the IPO)
$\psi = 0.5$	(bargaining power of I)

In addition, the following transaction costs are assumed:

$c_f = 2$	(fixed cost of going public)
$c_v = 0.1$	(variable cost of going public)

4.1 Zingales' (1995) Basic Model

First, *I* decides the fraction $1-\phi$, which she is willing to sell through an initial public offering. Using equation (2) Zingales (1995) calculates a limiting value of ϕ of 0.75. This simultaneously represents the optimum, for *I* could sell up to 0.25 shares to minority shareholders (S) through an IPO. If the incumbent offers more than 0.25 of the company, minority shareholders anticipate that she will conduct a subsequent negotiated sale to *R*, since the rival's valuation will be below that of the incumbent. Consequently, *S* will pay only a price for his share in this case instead of v^i in cases where the amount of shares offered is below 0.25. If I offers less than $1-\phi$ shares, as shown in figure 3, she has to bargain over the surplus with the rival, which makes her worse off than going public with exactly $1-\phi$ (unless her bargaining power is absolute, i.e. $\psi = 1$).

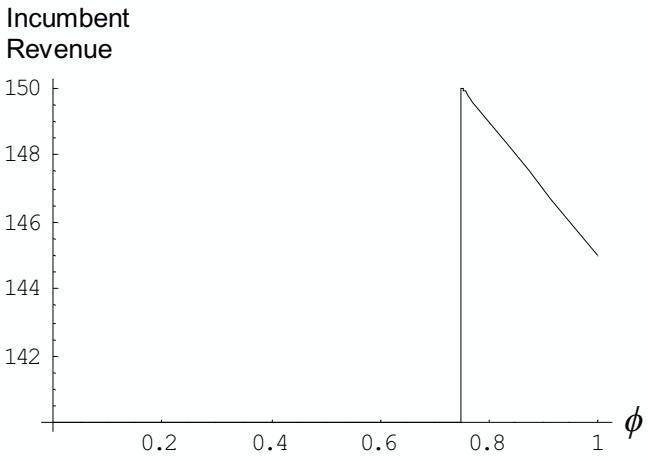

Figure 3. Incumbent's revenue in the basic model. Offering a fraction of less than 0.25 (retaining more than 0.75) reduces maximum proceeds for the incumbent, because she has to bargain over an increasing surplus with the rival.

If the incumbent did not retain $\phi = 0.75$ shares but $\phi = 0.9$ instead, for example, she would achieve a smaller total revenue: First, *I* would sell 0.1 shares to S through an IPO earning , because *S* can safely assume that *I* will sell her remaining share to *R* afterwards, since the rival's valuation is still higher than the incumbent's (10+0.9 x 140=136 vs. 40+0.9 x 100=36) thus increasing cash flow from $v^i = 100$ to $v^r = 140$. Due to their equal bargaining power, *I* and *R* would share the surplus of $(136 - 130) \cdot 0.5 = 3$ with *I* generating revenues of 14 + 130 + 3 = 147.

The maximum revenue *I* is able to achieve is 150 if she retains a stake of when selling the company through an IPO and subsequent negotiated sale, compared to 145 if she does not offer shares to minority shareholders. Bargaining

power of *I* and *R* is thus completely negligible when calculating the final allocation of revenues. With all agents having perfect information in Zingales' (1995) model it is possible for *I* to extract the buyer's whole private benefits if these are less than those of the incumbent.

4.2 Model with Transaction Costs

The optimum amount to offer publicly is calculated using equation (8) which yields $\phi = 0.852$. The relation between variable cost and ϕ is shown in figure 4.
(10+0.9 x 140=136 vs. 40+0.9 x 100=36)

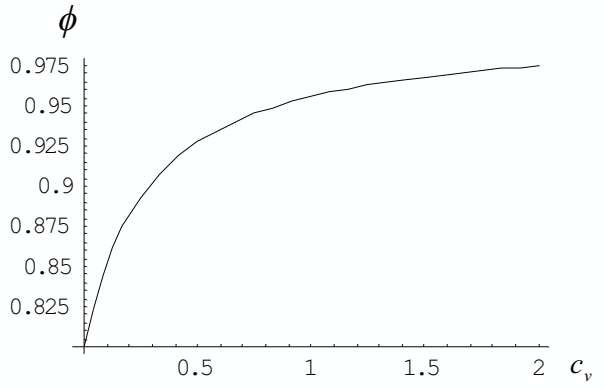

Figure 4. Fraction of the company retained by the incumbent. With fixed costs of 2, the optimum fraction retained after the IPO increases with the variable cost.

Since minority shareholders bear no costs, they are still willing to pay the rival's valuation of the cash flow of 140 for the shares offered: (1-0.852)x140=20.72 .
The total cost of an IPO is 4.072 = (1-0.852)x140x10%+2.
The incumbent internalizes all costs arising from the offering, netting revenues of 145.926 (using equation (9)). With an appropriate combination of fixed and variable costs an investment bank could extract fees up to 5 from the incumbent, which is depicted in figure 5.

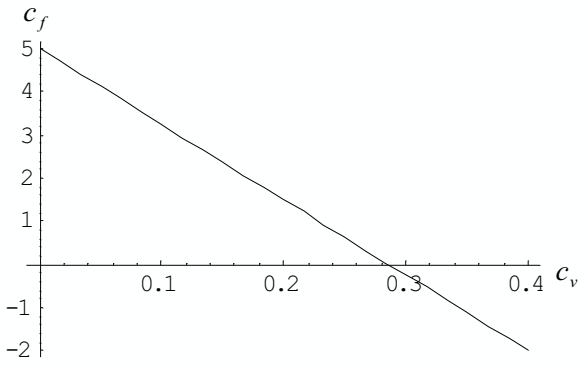

Figure 5. Combinations of fixed and variable cost. For given characteristics of buyer and seller, these combinations of fixed and variable cost charged by an investment bank extract the incumbent's entire surplus from going public.

5 Conclusion

The model developed in this paper is based on the model of Zingales (1995). We analyse how Zingales' findings change if transaction costs are introduced.
Equilibrium conditions are derived according to which the incumbent will be indifferent with regard to going public or selling directly to the buyer. Due to transaction costs the fraction retained by the incumbent after the IPO is always higher than in the basic model by Zingales (1995). There is an optimum combination of the fixed and variable costs an investment bank could charge in order to maximize its revenue from fees. In our model with complete information, an investment bank is therefore able to extract the whole difference between the buyer's valuation of the firm and the revenue accruing to the incumbent when selling directly to the buyer.
Models with more assumptions relaxed (e.g. the assumption of perfect information) should be developed in future research to get a closer understanding of the relation between private benefits, IPO costs and possible strategies to sell the company.

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Funding Management of Banks

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Funding Management of Banks

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Abstract.
Historically, banks used to have a quite small equity ratio. In order to conduct their business they have to raise debt capital from their customers or international financial markets. Hence, funding management for banks is quite a demanding challenge, because cost efficient and diversified funding is not only an advantage in a highly competititve environment, but also an insurance against insolvency. In this article we firstly ask what theory predicts about funding management. Subsequently, a set of funding instruments and strategies are discussed. The article concludes with an empirical analysis of funding policies of a sample set of banks.

1 Introduction

In this article, we discuss the "Funding Management of Banks". Funding management comprises all activities that are related to the structuring of the liability side. Bank's funding management differs from those of non-banks by the following particularities:

1. Debt Proportion

Banks are highly leveraged, i.e. debt is the main funding source.

2. Debt Determination

Depending on the business model, bank's debt are not all auto-determined, but determined by customer's preferences (deposits). The bank only manages the residual gap. In commercial banks, deposits play an important role whereas investment banks do not take deposits.

3. Debt Structure

Debt is not a single instrument but has several dimensions (maturity, seniority, collateralization, optionalities). A bank's funding manager faces a wider spectrum of instruments than a corporate funding manager. Hence, the setup of an optimal instrument mix (funding architecture) is more complexe.

4. Monitoring

Bank's funding activities are continuously monitored by rating agencies, regulators and customers. Particularly the view of institutional customers (e.g. other banks) as fund providers are crucial for the financial stability of a bank. Bank's funding manager have to respect key ratios of rating agencies and regulators (e.g. minimum capital requirements).

Banks need an active funding management: the demand for bank deposits has moved towards alternative investments (mutual funds, certificates, etc.) or directly to capital markets leading to an increased funding gap.

The more banks depend on institutional investors, the more their rating becomes important for both funding volume and funding price (credit spread). As rating agencies and regulators closely monitor banks' funding management, bank's need a funding policy that meets the expectations of these monitors. Hence, funding management is a hot topic that we would like to analyze from both a theoretical and an empirical point of view.

Section 2 presents theories of capital structure and their empirical support. Section 3 describes the funding architecture of a sample of 16 European banks.

2 Models of Funding Architecture and their Empirical Support

As a preliminary step, we structure the topic „Funding Management" in Figure 1.

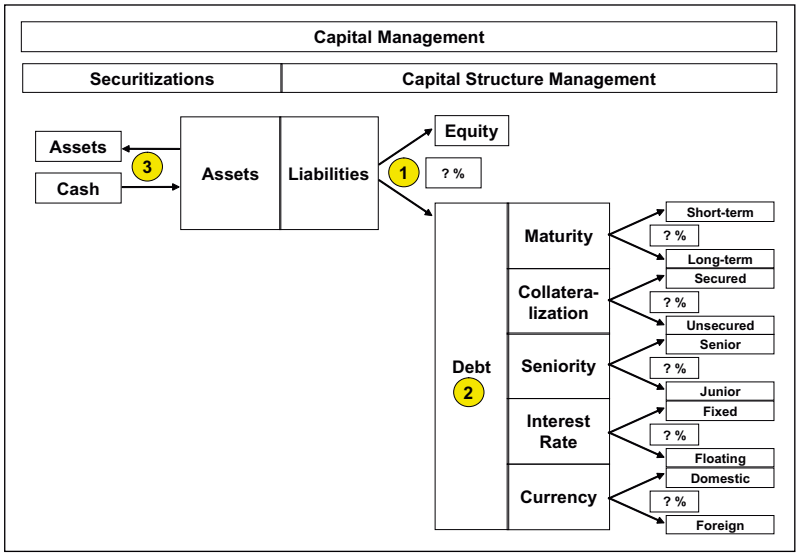

Figure 1: Classification of Capital Management

Capital Management is a generic term that comprise all capital transactions that adjust the asset or liability structure of a company. Transactions on the liability side refer to „Capital Structure Management".[1] Transactions on the asset side are majoritarily securitizations where assets (true sale) or only their (credit) risk (synthetetic sale) are sold. The objective of capital structure management is the determination of the shareholder value maximizing funding strategy.

In the academic discussion, three main research questions can be identified:

1. Optimal Debt-Equity Ratio
2. Optimal Debt Instrument
3. Securitization

The „Debt-Equity-Ratio" studies the existence and the dimension of an optimal percentage of debt relative to equity (leverage). Capital Structure Management (and our first section) starts with this question (see 2.1).

After a firm has decided for debt, the „Optimal Debt Instrument" has to be chosen. Debt is not a single instrument but has several degrees of freedom (Maturity, Collateral, Seniority, Interest Rate, Currency). In analogy to the debt-equity choice, one can ask whether there exist an optimal ratio of short /long-term, secured / unsecured, senior / junior, floating-/ fixed-rate, domestic / foreign currency debt? If there exist an optimal ratio, the question is how much it is? We address these questions in our second section (see 2.2).

Our third section (see 2.3) changes the balance sheet side and briefly discusses why „Securitization" exists. In the „Introduction" we stated the particularities of bank's' capital management.

However, bank's capital management has not played an important role in capital theory. First, it is assumed that bank's liability side is determined by deposits. Second, banks' capital structure is monitored and biased by regulatory requirements.[2] Furthermore, banks enjoy insurance schemes and their debts are usually more sophisticated than corproates debt. Therefore, there is no bank-specific capital management model.[3] As stated above, our review follow the main research points. We start with the equity-/debt-ratio.

2.1 Optimal Debt Equity Ratio

The debt-equity-ratio raises the question whether an optimal debt-equity-ratio (leverage) exists and if yes, how much it is?

1 See [Brealey and Myers, 2003, p. 465]

2 Although, Basel II does not determine the whole capital structure, but it limits the leverage, i.e. requires a minimum amount of equity.

3 An exception is the intermediation literature (see [Diamond and Rajan, 2000 or [Tyrell, 2003] for a survey).

This question is one of the most discussed questions within the field of Corporate Finance. Early evidence suggests that firms have a target debt-equity-ratio.[4] CFOs also admit that they follow target debt ratios.[5]

However, the fact that firms have target debt ratios does not automatically imply that this is optimal, i.e. shareholder-value maximizing. The optimality can only be shown by a model. Are target debt ratios optimal?

This question has not been unanimously answered. Two rival approaches have been developped: tradeoff-models derive optimal leverages whereas the 'Pecking Order'- or 'Market Timing'-models state that there is no such optimal leverage.

All models that seek to explain firm's capital structure need to face market imperfections (e.g. asymmetric information, taxes, etc.). In a world with perfect capital markets, the firm value only depends on the asset structure.[6] The liability structure does not have any impact on the firm value. Hence, capital management is irrelevant.

Models with optimal debt-equity ratios

Trade-off models trades off the (marginal) cost and benefits of debt. The classical trade off was the one between financial distress cost and taxes. Too much debt increases the default probability and therefore the expected bankruptcy cost (cost of debt). Only considering bankruptcy cost would imply an optimal funding of 0% debt. However, debt coupons are not taxed on the company level, but accounted as (interest) cost. This advantage would imply an optimal funding debt volume of 100%.[7] The optimal leverage is obtained where the marginal bankruptcy cost equal the tax advantage.[8]

[Ross, 1977] derives an optimal leverage in a setting where managers have insider information about expected future earnings ('Information Asymmetry') and where they participate

4 [Schwartz and Aronson, 1967] find that (i) there are industry-specific levrages, (ii) that individual firm leverages are clustered around the industry mean and (iii) that the industry differences remain if structural changes in the economy occur (sample of US firms from five industries covering 1923-1962). This is confirmed by [Marsh, 1982] that founds that individual debt ratios are mean-reverting. He uses a sample of 748 issues by UK quoted companies between 1959 and 1970 to calibrate its model and 110 issues from 1971-1974 to evaluate its predictive power (Out-of-Sample).

5 [Brounen et al., 2004] survey CFOs of G7-countries and report that 83,2% of their US firms, 75% of their Dutch firms, 71,2% of their German firms, 60,3 % of their UK firms and 42,6% of their French firms have target debt ratios. However, the majority follows somewhat flexible ratios.

6 See [Modigliani and Miller, 1958].

7 See [Modigliani and Miller, 1963] where only the tax advantage, but no bankruptcy cost are considered.

8 The first one that derived the trade-off in a formal framework was [James H. Scott, 1976].

in bankruptcy cost. Outside investors cannot distinguish between low-quality and prosperous firms. Hence, they would undervaluate all firms. However, a prosperous firm can repay a large amount of debt whereas a poor firm will default. By choosing a high-debt proportion, the managers can signal the high firm quality. Rational managers of poor firms do not cheat (issuing large debt), because they would like to avoid bankruptcy as they are participating in the bankruptcy cost.

Within this model framework, managers balance their marginal gain in stock price rising with the marginal (expected) cost of a default to choose the optimal debt amount.

Debt can also be used to mitigate the economic distortions resulting from information asymmetries between managers and owners[9]: managers are reluctant to pay back funds to shareholders: first, it reduces the power of managers as the resources under their control decrease. Second, manager have less reserves for future investment. However, debt forces managers to return (free) cash flow to shareholders. It reduces the fraction of cash flow that is at manager's free decision (risk).

Debt can also mitigate the conflict between share- and bondholders[10]: too much debt might demotivate shareholders to invest (inject new capital) in profitable projects (real options) as the shareholders bear the risk but the returns will primarily be used to repay creditors. This „Investment Demotivation" is called „Underinvestment Problem". Within this argument, firm value is maximized with 0% debt. By introducing debt benefits (e.g. tax shield), an optimal debt-ratio is obtained.

The debt ratio is a rather abstract variable that might be biased by accounting rules. A figure that many market players look at is the rating. A model that motivates optimal target ratings has recently been presented.[11] Finding that firms want to avoid (ensure) a downgrade (upgrade) if they are already close to an downgrade (upgrade), Kisgen's model trades off the costs (benefits) of a downgrade (upgrade).[12]

Models without optimal dept-equity ratios

Alternative approaches state that an optimal leverage does not exist. However, there are optimal funding decisions: they just do not depend on the current capital structure but on other factors. The most prominent approach is the 'Pecking Order'-model.[13] It assumes that (i) managers have insider information, that (ii) they have to decide about the funding of a new project. and (iii) that debt benefits (e.g. tax shield, disciplinating device) are of secondary order. The central assumption is that managers have insider information: they know the true firm value (existing assets) and the true project value (additional assets). Due to the insider information, external funding might not be fairly priced. Therefore, only internal funding (accumulating free cash flow across the years) is optimal. By contrast, external funding is always sub-optimal and should be avoided. If it cannot be avoided, the firm should first issue debt and only if the debt capacity is used, they should issue equity. Another model approach that refuses the existence of optimal debt ratios is based on a 'Market Timing'-argument: it postulates that managers try to time the market, i.e. that firms issue equity (decrease leverage) when prices are high and repurchase equity (increase leverage) when prices are low.[14] The resulting capital structure is the cumulative result of past decisions to time the equity market. The observed leverage is explained by relative valuation advantage of debt and equity in the past.

Other Factors that influence the capital structure

The models described above focus on different factors for the debt- /equity-choice. However, it is likely that in the real world all of these factors are simultaneously at work. Which factors are of first and which are of second order, depend on the organisational, technological and institutional setup of each firm.

The afore mentionned factors have all been situated in a formal model framework. Nevertheless, the list of factors does not pretend to be exhaustive. In fact, [Quiry et al., 2005] evoke other factors that might interfere. However, to our knowledge they have not been put into a formal framework.

The relevant factors are:[15]

- Capital Structure of Competitors
- Lifecycle of the Company
- Shareholder Preferences

Managers find it easier to communicate that they follow an industry wide target ratio instead of applying a leverage that is completely different to the (competitors') leverage. The choice of capital structure is therefore relative to the industry average, not absolute. Another determinant is the firm's situation within its lifecycle: startup companies are likley to have insufficient external ressources. On the other hand, it is difficult for them to tap debt financing as they do not have a credit history and only 'ideas to pledge' but not real assets. Startup are likely to have a low leverage. By contrast, mature

9 See [Jensen, 1986]

10 See [Myers, 1977]

11 See [Kisgen, 2006]

12 He uses rating time series about 800 firms per year covering 1986-2001, including financials.

13 See [Myers and Majluf, 1984]

14 See [Baker and Wurgler, 2002]

15 See [Quiry et al., 2005, p.723ff.]

firms with a long credit history are likely to have accumulated internal resources and real pledgable assets. They are able to fund with a low leverage. Shareholders might be reluctant to bear more risk and therefore opt for equity funding. Otherwise, they might be reluctant to dilute their stakes opting for debt issuances. We presented models that argue that optimal leverages exist (Trade Off-Theory) and others that reject the existence of optimal leverages (Market Timing, Pecking Order). We are now looking at the empirical evidence of the presented models.

Empirical Support

At the beginning of this section we reported industry-wide and mean-reverting debt ratios. This is – a priori - not an empirical support for trade-off models. Only if the observed debt-ratios are related to bankruptcy cost and taxes, this would provide empirical support for the classical trade-off model.

The empirical picture is as heterogenuous as the modelling „landscape“: as Figure 2 documents, there are studies in favour and in disfavour of trade-off models, pecking order and market-timing lists the results of empirical studies.

Empty cells indicate that this dimension has not been tested. The bold line demarcates the two methodologies that have been used: panel techniques (above) and surveying CFOs (below).

Support for the pecking order has been reported by Shyram-Sunder and Myers (1999) (strong support) and Graham and Harvey (2001) (low support). Fama and French (2002) report that the common predictions of pecking order and trade-off models have been confirmed. However, the pecking order has been contrasted by Frank and Goyal (2003), Fama and French (2002) (on the pecking order-specific predictions) and Bancel and Mittoo (2004). The trade-off theory has not been rejected by Fama and French (2002) (weak), Barclay et al. (1995) (moderate), Hovakimian (2004) (weak), Graham and Harvey (2001) (low), Bancel and Mittoo (2004) (moderate) as well as by Brounen et al. (2004) (moderate). Only Shyam-Sunder and Myers (1999) rejected the trade-off model. Support for Market-Timing has been reported by Baker and Wurgler (2002) and Hovakimian et al. (2001). The surveys all reveal that financial flexibility and the credit rating are important factors that CFO stake into account when they decide funding transactions. The importance of the credit rating is in line with

Authors	Sample	Pecking Order	Trade-Off Theory	Others
Frank and Goyal, 2003	US and Canadian firms (no financials/ utilities), 1971-1998	contrasted		
Fama and French, 2002	300 firms (no financials/ utilities), 1965-1999	Shared predictions confirmed		
		contrasted	weak	
Barclay et al., 1995	6.700 firms 1963-1993		moderate	
Hovakimian, 2004	firms 1980-1998		weak	
Shyam-Sunder, Myers, 1999	157 firms 1971-1989	strong	contrasted	
Baker, Wurgler, 2002	11.000 firms 1970-1998 (no financials)			Market Timing
Hovakimian et al., 2001	1979-1997 (no financials)			Market Timing
Graham, Harvey, 2001	392 US and Canadian CFOs 1st quarter 1999	low	low	Market-Timing Rating Fin. Flexibility
Bancel, Mittoo, 2004	87 European CFOs Winter 2001/02,	contrasted	moderate	Rating Fin. Flexibility
Brounen et. al, 2004	317 G7 CFOs 1st quarter 2003		moderate	Rating Fin. Flexibility

Figure 2: Empirical studies of capital structure models

the model of Kisgen (2006). Due to the ambiguous heterogenuous picture, recent efforts have been taken to reconcile pecking order and trade-off theory: the idea is that the tradeoff framework explains debt levels whereas the pecking order is more suitable to explain changes in capital structure.[16] [Hovakimian et al., 2002] propose a dynamic tradeoff-model. The attribute 'dynamic' contrasts the equilibrium view of the static tradeoff model. In a dynamic framework, deviations from the target debt level are induced by economic shocks. Assuming cost for the adjustment of leverage (examples of costs), permanent adjusting is not optimal anymore. However, when deviations from the optimal debt level become too large, capital decisions return the actual ratio to the target ratio. This theory explains that there are long-term optimal ratios and temporary divergences. The conclusion is that the pecking order expains short-term deviations whereas the tradeoff-model explains the long-term (equilibrium) debt ratio. However, [Strebulajev, 2007] objects that the ambigious findings of the empirical tests might be due to methodological pitfalls. He argues that cross-sectional tests are hardly suitable to study capital structure patterns if firms do not immediatley adjust their leverages (e.g. because of adjustment cost). To demonstrate his argument, he sets up a time-consistent optimal dynamic financing model and simulates leverage paths. On these sample with the known underlying model, he reperforms the empirical tests of previous papers. Inconsistently, some tests reject the underlying (true) model.
The confirmation of theories is one issue. To apply these models and help CFOs to find the optimal capital structure for their firms is another. Guidelines for practicioners have been proposed by [Opler et al., 1997] and [Heine and Harbus, 2002].

2.2 Optimal Debt Instruments

The question whether there exist an optimal debt structure and which ratios of short-/long-term, senior/ junior, secured/ unsecured, floating-/ fixed-rate and domestic/ foreign currency a funding manager should chose to maximize shareholder value have not been discussed or they are in their beginning.

This is even more true for banks: theory considers that banks have only one type of debt: deposits.[17] Questions about maturity, seniority, collateralization and so on are not necessary. There is no space for a funding manager that structures bank's debt. For non-banks, there exist some explanations about the debt structure that we explain in what follows.[18]

Maturity (short-term vs. long-term)
One approach argues that firms go for short-term debt if they expect positive prospects or if they have a bad credit rating and simply can'not tap long-term funds. Firms with middle prospects choose long-term debt.[19] This prediction has empirically been confirmed.[20] Short-term debt can also be used as disciplinating device against debt/ stakeholder conflicts as it restricts asset substituation and underinvestment. Due to its short-term horizon, it requires periodical disclosures and repayments. Hence, investors in firms with high agency costs (e.g. firms with many growth options) should head for shortterm debt.
[Jun and Jen, 2003] set up a model that derives an optimal maturity structure. They tradeoff costs and benefits of short-term debt. As benefits they identify small rates (normal interest rate curve), reducing agency costs (discipl. device) and few coventants. As cost of short term debts , they primarily identifed the refinancing risk that induces financial distress costs. The model predicts that financially strong firms hold overproportionally short term debt. On a sample of 5134 US industrial firms covering 1978-1996, they find that financially strong borrowers hold proportionally more short-term debt and that heavy short-term borrowers pay lower interest cost per dollar borrowed. An important factor of long-term maturity is the avoidance of the refinancing risk in 'bad times' according to [Graham and Harvey, 2001].

Seniority (senior vs. junior)[21]

The seniority establishes an order in the recovery process: junior (or subordinated) debtholders are paid only after senior debtholders are paid in full. Therefore, the recovery rates of subordinated debt is systematically lower than that of senior debt. Junior debtors claim a higher spread for this risk.

Collateralization (secured vs. unsecured, restrictive covenants)[22]

Collateralized debt is debt where the lender has exclusive access to a set of assets to recover its funds in case of default. Theory predicts that the lower the credit quality, the hig-

16 Quiry et al., 2005, p.723]
17 See the intermediation literature. A good survey has been presented by [Tyrell, 2003].
18 See [Brealey and Myers, 2003, p. 702ff.] or [Quiry et al., 2005, p.737ff.].
19 See [Flannery, 1986 and Kale and Noe 1990]
20 See [Mauer and Stohs, 1996] on a sample of 328 US firms (no regulated firms) across 1980-1989.
21 [Brealey and Myers, 2003, p. 705ff.]
22 [Brealey and Myers, 2003, p. 710ff.]

her the information asymmetry between borrower and lender, the higher the competition in the credit market, the more collateral is required by investors.[23] Collateral is used when the credit quality of the collateral can be easier assed than the credit quality of the borrower.

Interest Rate Scheme (floating vs. fixed-rate)

Currency

There exist models that argue why investors should require collateralization or senior debt, but we are not aware of a model that explains from a firm's perspective, which is the optimal ratio of secured/ unsecured, junior/ senior, floating- /fixed-rate and domestic/ foreign currency.

2.3 Securitization

Securitization is the pooling of illiquid assets and the issuance of claims against the asset pool with customized default features (tranches). The individual assets are still illiquid. However, as portfolio they became liquid. Which drivers does theory see behind the securitization trend? [Fabozzi, 2005] states that drivers for financial innovations are (i) transfer of price risk, (ii) transfer of credit risk and (iii) liquidity generation. He attributes the success of securitization to the fact that ABS fulfills every criterion: (i) price risk of pool of loans or receivables exposure of IR-risk can be altered, (ii) re-structuring (tranching) transfer of credit risk and (iii) liquidity: securities whose liquidity is greater than that of unsecuritized portfolio borrowing from investors that would not ordinarily want to hold portfolio of loans or receivables reduction of capital requirements for regulated financial institutions [Ambrose et al., 2005] argue that there are three main drivers for Securitization: it increases liquidity for originator, reduces the level of reulatory capital required and asymmetric information, i.e. that the riskiest loans are retained on the balance sheet. On a sample of 14285 conventional, fixed-rate mortgage loans, originated between 01/1995 and 12/1997, they find that the loans that remain on the balance sheet are riskier than the sold ones. [Cebenoyan and Strahan, 2004] document using a sample of US banks covering June 1987-1993 that actively rebalancing banks (buying and selling loans) hold lower level of capital per dollar of risky assets, hold less capital, lower level of liquid assets and display lower risk and higher profits than banks doing similar activities (but not using loan sales).

23 [Jiménez et al., 2006]

3 Funding Architecture for Banks

In the first part we briefly reviewed literature and some empirical analysis on capital structure in general and looked at today's status of discussion on optimal capital structure. In the second part we focus on the capital structure of banks – to be more precise, we look at the liabilities of a bank and analyse the funding structure. As mentioned in the first part, in the academic literature on capital structure there is hardly anything to find about banks and utilities. Given that banks have quite different business models – retail, wholesale, niche player, pure investment bank to mention just a few – we analyse whether there are major distinctions in their funding architecture. And we discuss whether similarities in funding structure exist although business models differ. We start by a brief overview of funding instruments. Then we will focus on a sample of banks from Europe and USA with different business models.

3.1 Funding Instruments

As banks generally have only a small portion of equity in their balance sheet, they are forced to raise liquidity to conduct their particular business.[24] It depends on the individual organisational set up of a bank in which department the responsibility for the acquisitions of liquidity it located. Typically, Asset Liability Management, Capital Markets, Global Markets or Treasury is in charge for funding. There are a number of ways to systematise funding instruments.[25] Banks issue different types of short and long term securities. We decided to differentiate whether a funding is secured or not. Secured or unsecured funding instruments last from money market maturities up to very long term bond maturities.[26] We call funding "secured" or "collateralised" if there is a special, well-defined collateral pool which serves as a security for the investors in case of default of the issuer. A large number of constructions exist in the international financial markets. In any case, the basic construction looks a displayed in figure 4. The issuer separates special assets into a collateral pool. The quality of the collateral pool depends on the quality of the assets in the pool. And, consequently, the asset quality has a huge influence on the rating of the collateral pool.[27] It is worthwhi-

24 To ensure sufficient liquidity and to minimise the risk of insolvency at any time is the first and major task of a bank management. See ; Obst (1921), p. 364 f, L. Mühlhaupt (1980), p. 196

25 Typically, the starting point is the systematic of balance sheet liabilities. See: Hagenmüller (1976), p. 224

26 See above Figure 1 Classification of Capital Management.

27 In international financial markets typically issuer has at least a rating from Standard & Poors, Moody's or Fitch. This is called the issuers rating. In addition to the issuers rating mostly certain programmes or issues have

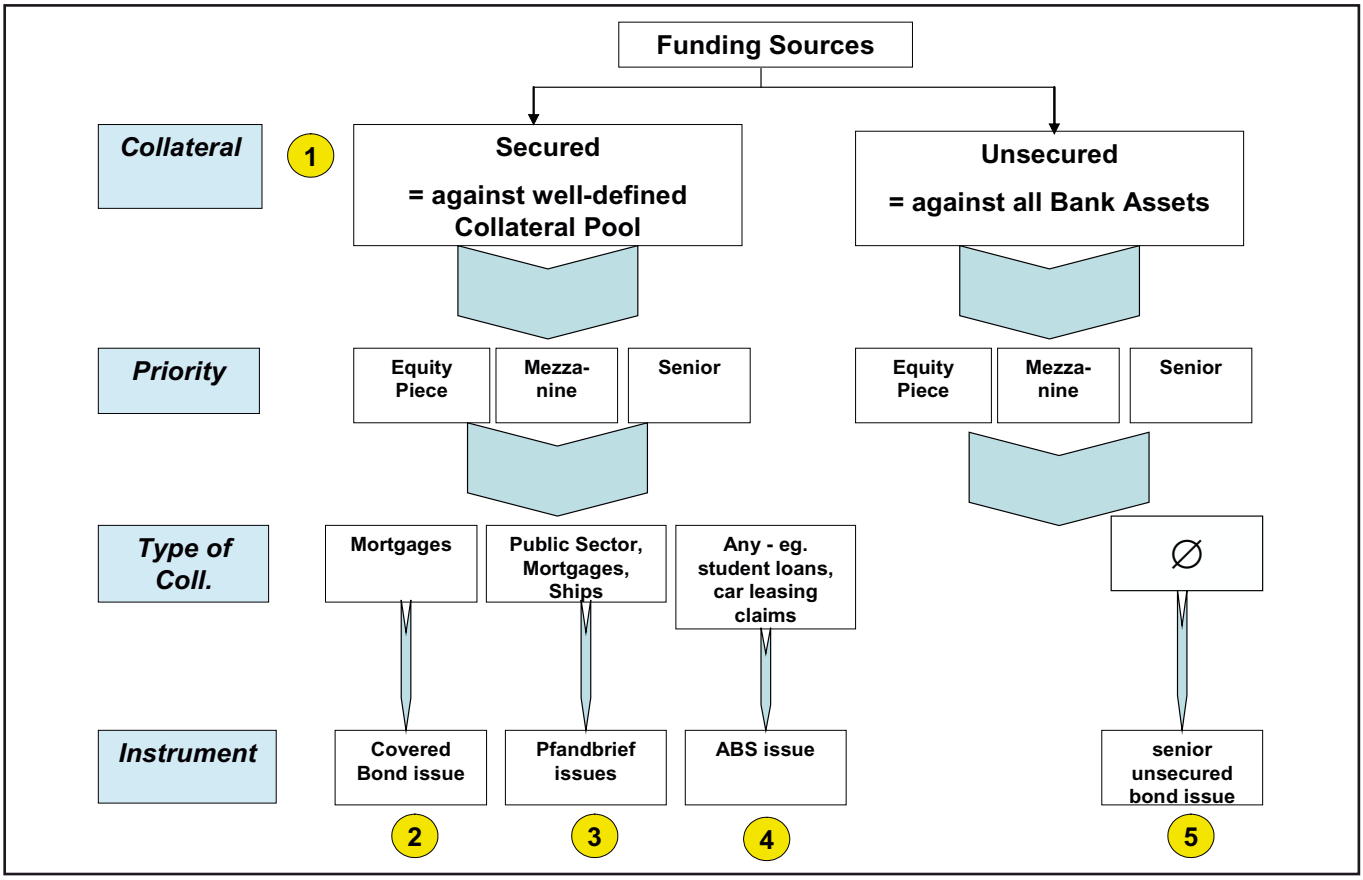

Figure 3: Funding sources

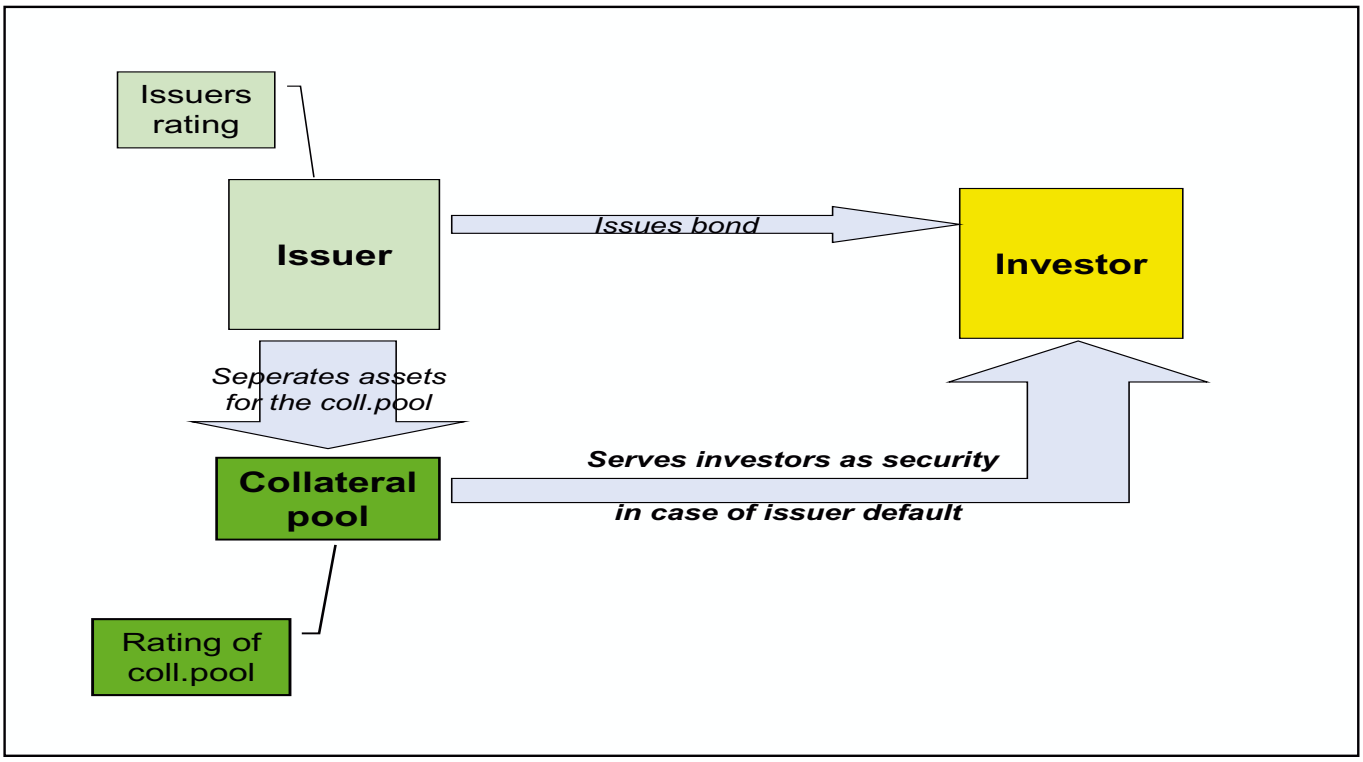

Figure 4: Principle of collateralised funding

le to have a rating on the collateral pool, because this is really a cachet. The bank now issues bonds and in case of default of the bank the collateral pool will secure any claims of the investors. It is important to find a legal construction that in case of default the fiduciary who manages the insolvency of the bank has no chance to use the collateral pool.[28] A (rated) collateralised bond is pretty much detached from the rating of the issuer and as a consequence investors have in general a much stronger position in case of issuer default. The classical example for secured funding is the issuance of so called covered bonds.[29] Today, on the basis of jumbo issues the covered bond market worldwide is some 757 bn EUROS. Typically, the cover pool consists of mortgage secured residential houses, sometimes also commercial houses. Nevertheless, it depends on the jurisdiction of the particular country, how "safe" such a cover pool is in case an issuers default. It is worthwhile mentioning that the German Pfandbrief Act is by far the strictest jurisdiction. There is a number of eligibility criteria for transferring assets to the cover pool and then issuing pfandbriefe.[30] The German Pfandbrief Act distinguishes three types of covered bonds: public sector pfandbriefe, mortgage pfandbriefe, ship pfandbriefe. All three types of pfandbriefe have a long history in Germany (and Europe as well). Public sector and mortgage pfandbriefe are well known. Ship pfandbriefe are not very well known, although they exist nearly as long as mortgage or public sector pfandbriefe.[31]

Covered bonds from other jurisdictions do not have the same status as pfandbriefe, although their construction might look similar. Depending on the particular legislation, the potential assets of the cover pool as well as the chance that the covered bonds survive an issuer default, the quality of such (structured) covered bonds might differ widely. Nevertheless, major advantages of secured funding are: (i) mostly a good cross selling product, (ii) it reduces the amount of unsecured funding at lower funding cost and (iii) at least with AAA rating offers the chance for a wide range of international investors. Disadvantages of secured funding are (i) quite a huge amount of over-collateralisation might be necessary to receive a good rating, (ii) management of prepayments of cover pool assets can be quite demanding and (iii) a good marketing story (road show) is very important to attract an international investor basis.

Other funding sources, which can be summarised as collateralised funding, are the whole area of so called "asset backed" funding: asset backed securities, mortgage backed securities, residential mortgage backed securities, asset backed commercial papers – to mention just a few. The basic construction is pretty much the same as in figure 4, but the design often varies form one transaction to the other. And, as a consequence of that, rating agencies use different rating methodologies. The cost of capital, i.e. the cost of liquidity or cost of funding using collateralised funding depends very much of the asset quality in the collateral pool. A large number of covered bonds is rated AAA, especially German pfandbriefe. ABS is typically divided in different rating classes, i.e. within one issue you have tranches form AAA to BBB or even lower (so called equite tranche). Consequently, the pricing of each tranche is different. The AAA might be closely priced to AAA rated covered bonds, where as the BBB surely will be priced closely to junk bonds.[32] Using ABS transaction for funding can be quite useful, because it diversifies a banks liability portfolio. Particularly, an ABS issuer also has the chance to acquire new investors which might have somewhat higher risk appetite. The pricing depends on the different tranches of such an ABS transaction. The better the rating of a particular tranch the lower the funding cost and vice versa. Nevertheless, ABS transactions generates a huge amount of documentary and administrative effort . It is important to notice, that an ABS transaction, i.e. the issuance of a bond (with different tranches) is not done by the bank, but a special purpose vehicle. Therefore, one sometimes speaks about "off balance" funding. The funding sources discussed so far were all on balance, or at least the starting point was the banks balance sheet. In order to diversify, some banks use off balance

an individual rating, which might differ from the issuers rating.

28 Best example is a covered bond issued under the German Pfandbrief Act. There is a clear regulation by law, that the collateral pool is in no way touched by an insolvency of the issuing bank; sec. 30 PfandBG. Covered bonds issued under other legislations typically try to implement a similar construction.

29 It should be noted, that "covered bond" is the summarising technical term. The quality of covered bonds form different countries may be quite different as well. And, Pfandbrief issues according to the German Pfandbrief Act belong to the covered bond family, but they differ in many aspects to covered bonds. See [Stünkler and Winkler, 2007].

30 Best example is a covered bond issued under the German Pfandbrief Act. There is a clear regulation by law, that the collateral pool is in no way touched by an insolvency of the issuing bank; sec. 30 PfandBG. See [Buschman and Volk, 2007].

31 This will surely change in the near future, because although there exist only a limited number of potential issuers, the volume of shipping loans in Germany is pretty high, and, hence, some issuers will use or use already ship pfandbriefe as an adquate funding source. To our knowledge, as of September 2007 only ship pfandbriefe of HSH Nordbank had AAA rating, where the others were unrated.

32 It is worthwhile noting, that in the worldwide liquidity crises starting August 2007, spreads of covered bonds and ABS widened dramatically, whereas German Pfandbriefe more or less were priced as before.

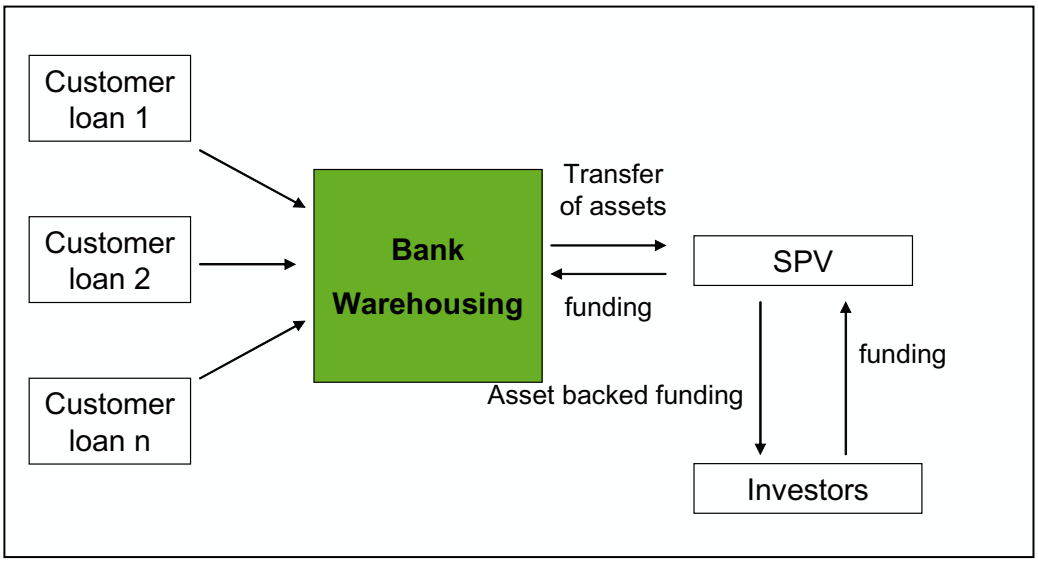

Figure 5a: Assets firstly on balance-then off balance

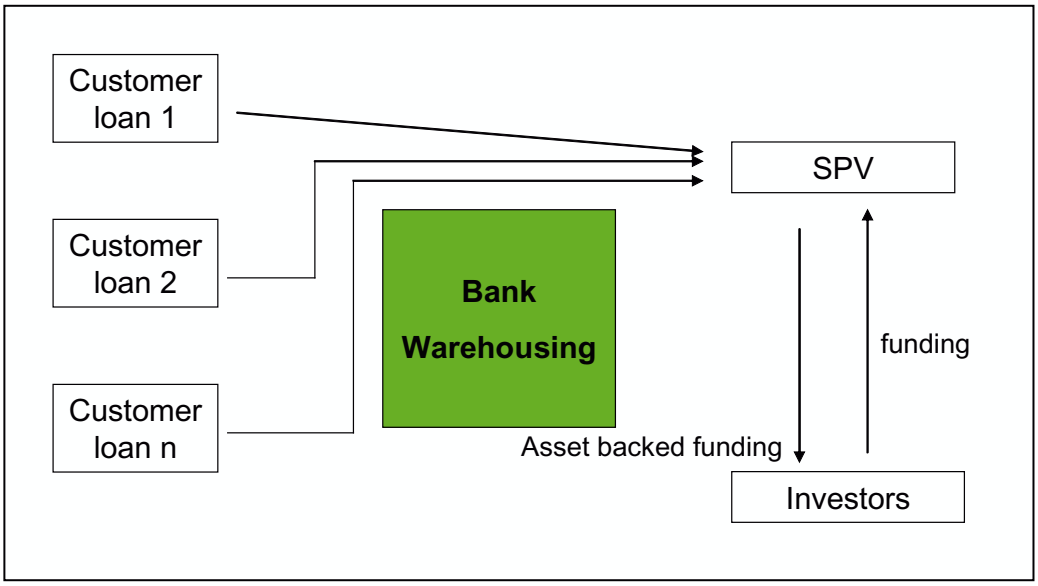

Figure 5b: Assets stay off balance right after origination

funding. Off balance funding is in certain aspects quite close to secured funding. On principle, a bank either can take assets for a limited time on balance – so called warehousing or ramp-up period – and then later "sell" or transfer these assets to a special purpose vehicle (figure 5 a) or a bank can directly buy assets into a special purpose vehicle (figure 5 b). Using ABS constructions, banks transform illiquide loan claims into a tradeable security.[33] Hence, they act as a credit broker. Briefly discussing the pros and cons of the use of off-balance funding, one can say that one of the major advantages are the more efficient use of given equity and to increase the turnover speed of the banks balance sheet.[34] An additional impact is to increase commission income and reduce dependency of interest income. At this stage it is already obvious that there is a trade off between funding and equity (risk weighted assets).[35]

Before going forward analysing a sample of banks regarding their funding instruments in use, we briefly want to touch the group of unsecured funding instruments.

We call funding "unsecured" or "un-collateralised" if all assets on balance serve as collateral for an investor. In case of default of the bank, there is no well-defined pool of assets which ser-

33 As mentioned above in 2.3, securitization is the pooling of illiquid assets and the issuance of claims against the asset pool with customized default features.

34 As equity is a scare and expensive „ressource", banks can enhance their business model increasing the turnover speed of their balance sheet, i.e. taking asset only for e.g. some month on balance and then syndicate them. Using this instrument e.g. twice a year doubles the utilisation rate of given equity.

35 To discuss and analyse this trade off and its implications in detail seems to be most interesting, but is out of scope of this paper.

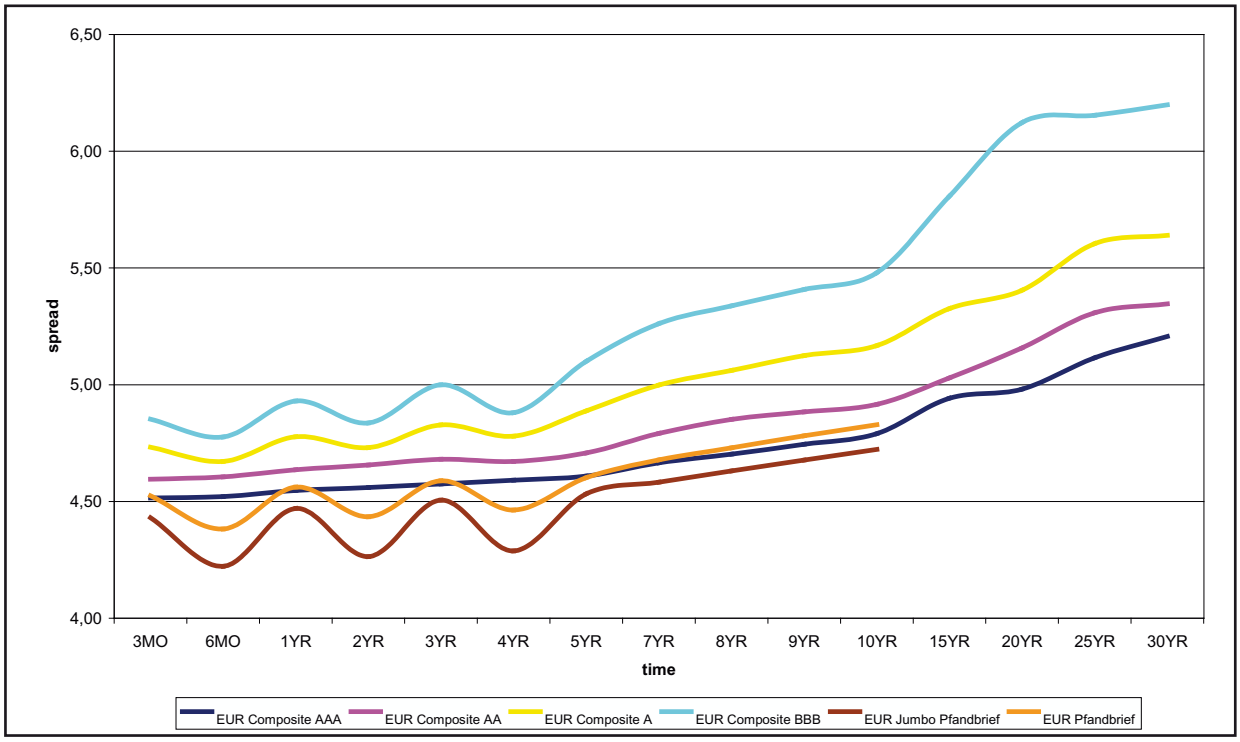

Figure 6: Influence of rating (source: Bloomberg, Sept. 2007)

ves as recovery, but just the total asset of the bank. Investors hold a "senior" position, i.e. they line up with all other credits if the bank goes bankrupt. As a consequence, unsecured funding is somewhat more expensive than collateralised funding. The price of the funding depends very much on the rating of the issuer. The better the rating the lower the price and vice versa. In figure 6 we show prices form 3 month to 30 years for pfandbriefe and indices of AAA to BBB rated unsecured bonds. Unsecured funding is a very flexible funding source, because the issuing bank is not restricted in using the liquidity inflow. Mostly, banks have well established programmes – so called debt issuing programme – under which they raise debt capital. It should be well recognised that this funding source is rather rating sensitive, meaning that if there are some rumours about an issuer in the market this touches immediately her expected future rating and within seconds the pricing of her senior unsecured bonds outstanding.

3.2 Funding Architecture

It is reasonable to assume that companies try to operate their business in an efficient and effective way.[36] Hence, they try to be most profitable. This is also true for banks. In this context is worthwhile to note that banks – due to their particular importance within our economic system – are much more regulated and supervised as other industries, e.g. car manufacturers.[37] As a consequence, they are not completely free in their decisions, but have to stick to a legal and supervisory framework. And, of course, this is also true for their funding decisions. Nevertheless, banks have to externally fund the majority of their assets. Our next step is to have a closer look at the funding architecture, i.e. mix and ratios of certain funding sources within the liability portfolio of a bank. Therefore, we have a look at a sample of banks, which differ in their regionals and business models. From figure 7 one can see that our sample includes banks that differ in many aspects. Rating e.g. differs from A3 up to Aa1, home countries are mostly European, but includes two – perhaps not to well known – US banks. Regarding the tier 1 ratios it is worthwhile noting, that they are mostly a little bit north of 8 %.[38] We have chosen this particular sample of banks exactly because of this somewhat exceptional composition. Most significant difference is the volume of total assets – ranking from 15 bn EUROS up to

36 There exist a broad discussion what the major target of a company is – profit maximising, maximising share holder value – to mention just a few. For the purpose of this paper the working assumption is, that companies simply want to make money. This assumption is quite reasonable as "profit maximisation" plays an important role in a market economy for allocating resources. See; [Gould and Ferguson, 1980, p. 211]

37 To mention only a few German regulations: Banking Act, Minimum Requirements for Riskmanagement, Solvency Act and Liquidity Act, numerous official announcements of the BaFin and ECB.

38 We discussed theoretical issues of debt equity ratios above in 2.1. With respect to banks one can use tier 1 ratio as debt equity ratio. Although, the tier 1 ratio is an important key figure, as banks are much more regulated and supervised than other types of industries, there exist certain floor ratios, arising from regulatory standards in the respective country.

Bank	MDY's Rating	Country	www	total assets in mn €	Tier 1 Ratio [%]	Total Capital Ratio [%]
Anglo Irish Bank	A	Ireland	angloirishbank.com	88.700	8,40	12,10
Banca Carige	A2	Italien	carige.it	25.300	8,40	10,70
Banco Espirito Santo	Aa3	Portugal	bes.pt	60.000	8,30	13,00
Bank of Ireland	Aa2	Irland	boi.ie	178.000	7,50	11,40
Bradford & Bringley	A1	UK	bbg.co.uk	74.000	7,60	13,20
Caixa Catalunya	A1	Spanien	caixacatalunya.es	68.000	5,80	11,30
DnB NOR	Aa1	Norwegen	dnbnor.no	169.000	6,70	10,00
Eurobank EFG	Aa3	Griechenland	eurobank.gr	54.000	8,50	10,40
Montepio	A2	Portugal	montepio.pt	15.300	7,30	10,80
NIBC	A3	Niederlande	nibc.com	32.600	12,30	13,30
Nordea	Aa1	Schweden	nordea.com	346.900	7,10	9,80
Sun Trust	Aa2	USA	suntrust.com	136.000	7,70	11,10
Washington Mutual	A2	USA	wamu.com	240.000	8,20	11,80
Yorkshire Building Society	A2	UK	ybs.co.uk	26.000	13,40	14,80

Figure 7: Sample of banks (Data as of Jul: 2007)

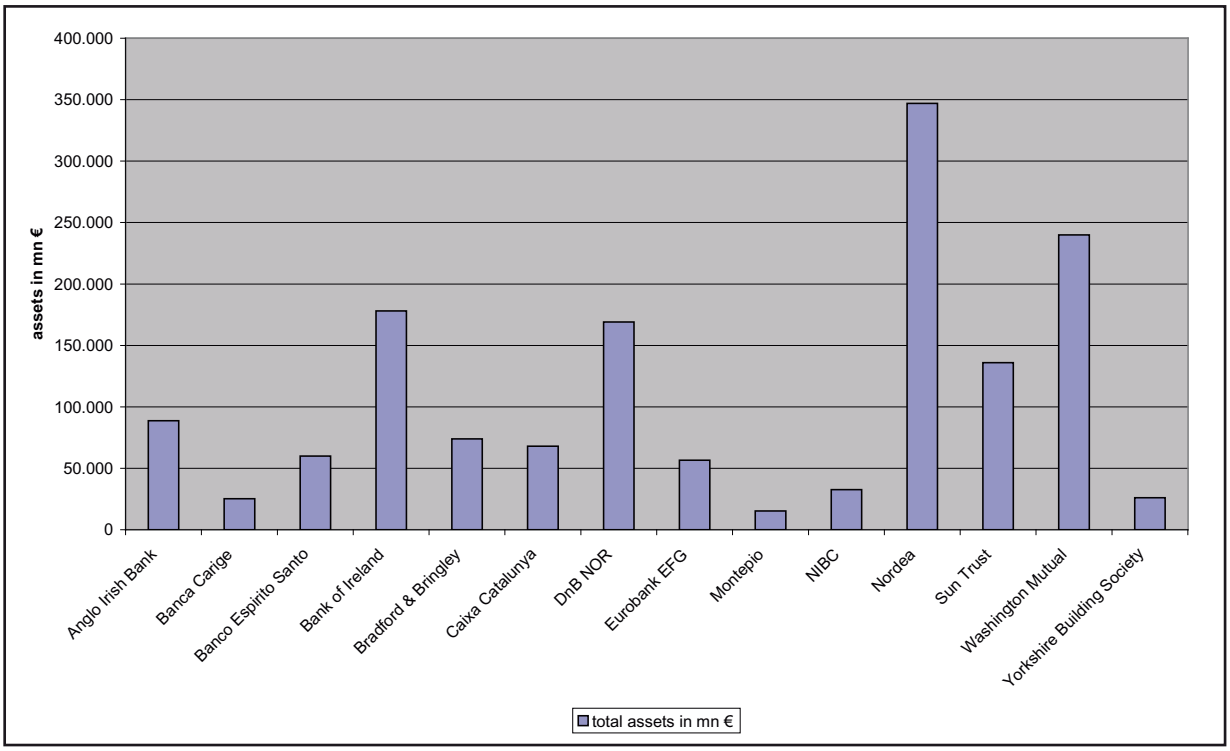

Figure 8: Sample by total assets

346 bn EUROS as, shown in figure 8. We mentioned above, that in general banks have some kind of funding mix a certain kind of capital structure, i.e. independently of their size they use more or less the same funding sources. If this hypothesis was true, we should find

i) Secured funding sources
ii) Off balance funding sources
iii) Unsecured funding sources

Firstly, we plot the mix of funding sources in absolute figures in figure 9 a. First finding, different funding sources are in use: commercial papers, interbank & repo and customer deposits are typical short term funding sources. Commercial paper programmes are often backed by assets, the same is true for repo. These are examples for short term secured funding sources. Interbank and customer deposits are usually unsecured funding sources. Senior unsecured, covered bonds, securitization as well as 'others' are long term funding sources. And it is obvious from the earlier discussion that covered bonds are collateralised. It is hard to get resilient data for securitization, but mostly there ABS transaction behind. Trying to analyse the use of these different funding sources for our sample it is worthwhile to use relative figures in order increase the comparability. For this reason, in figure 9 b we have drawn the funding mix in relative figures. As mentioned

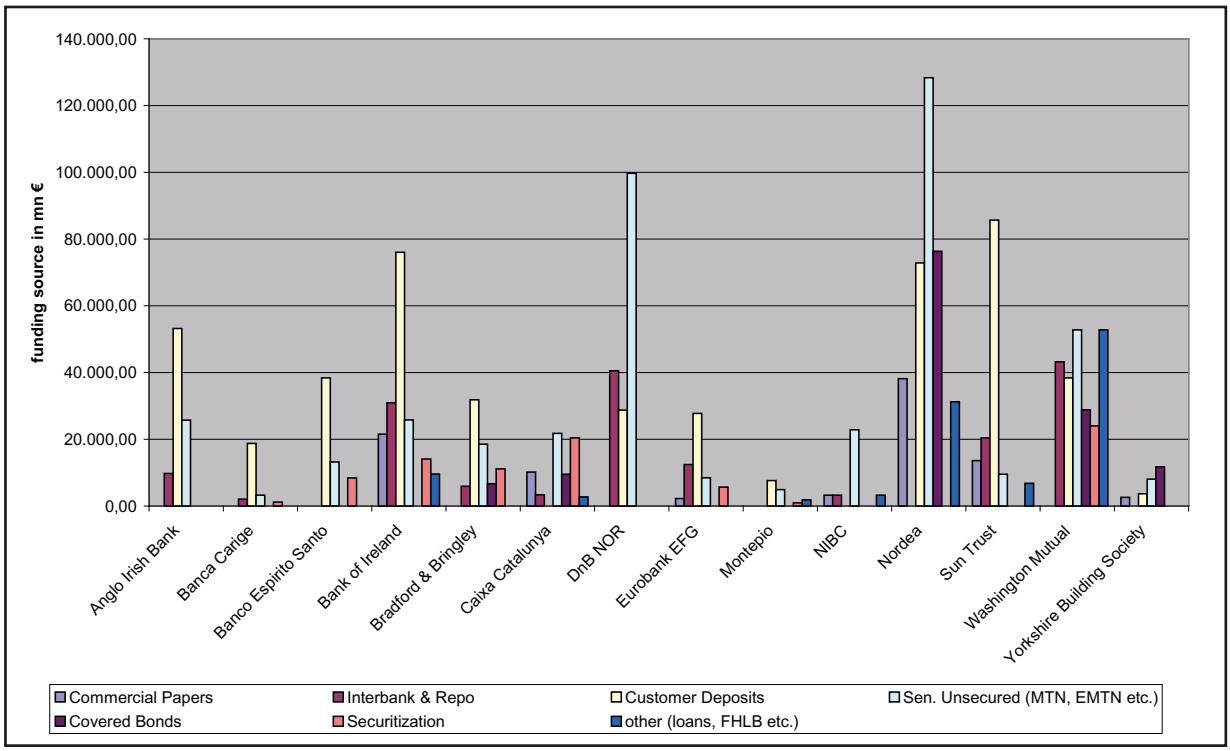

Figure 9a: Funding mix in absolute figures

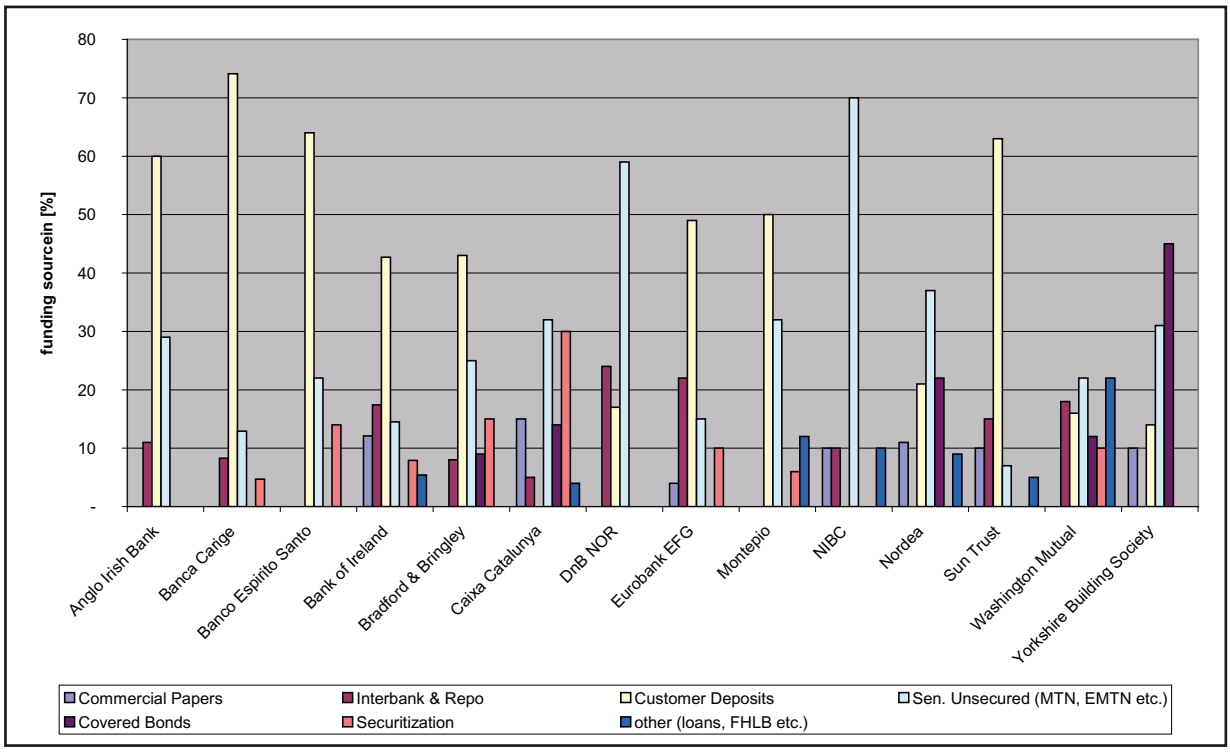

Figure 9b: Funding mix in relative figures

above, senior unsecured funding by issuing long term bonds is a rather flexible funding instrument. Hence, it is not surprising that all banks in our sample use this source, although with quite different percentages from 7 % (Sun Trust) to 70 % (NIBC).[39] Customer deposits is a short term unsecured funding source which 80 % of the banks in sample use, average utilisation ratio 43 % lasting from 14 % (YBS) to 74 % (Banca

39 Typically, wholesale driven banks depend very much on unsecured funding were as retail driven banks make much less use on unsecured funding.

Carige). Customer deposits is a funding source a bank can acquire at rather favourable cost. Banks with a (large) portion of retail business in general have huge amounts customer deposits. 67 % of our sample banks use interbank and repo business as a funding source, but the average utilisation ratio is about 14 % lasting form 5 % (Caxia Catalunya) to 24 % (DnB NOR). It is an interesting finding that the fourth important funding source of our sample is securitization: 53 % of our sample obviously at a certain time sell parts of their assets. Another interesting issue would be the average time that loans stay on the balance sheet and block equity. This figure could serve as an efficiency indicator of a bank. However, these data were not publicly available. Average utilisation ratio is 12 % lasting form just 5 % (Banca Carige) up to 30 % (Caxia Catalunya). On the fifth place we find the use of commercial papers and 'other' funding sources.[40] The average utilisation ratio here is 10 % in for both funding sources. As of December 2006 only five (33 %) of our sample banks use covered bonds. The banks using this funding source are typically very much in the real estate business; hence, they can make proper use of their mortgage backed residential loans. Yorkshire Building Society funds 45 % by issuing covered bonds. Having a closer look at all banks funding strategy for the next years, a lot of them are on their way to implement a covered bond issuing programme. The rational behind is to reduce funding cost, because – as mentioned above – if the rating of the cover pool is better than the issuers rating the funding cost issuing covered bonds are lower than issuing senior unsecured bonds. What can we learn form our findings so far? Although our sample is rather small, it is composed of quite different banks (in terms of rating, total assets, region and individual use of specific funding sources. …). In addition, portfolio theory tells us that diversification makes sense. Generally, diversification reduces risk and increases return.[41] Risk reducing in funding means to be independent of a particular funding source but use several sources, which are at best uncorrelated to one ano fundfunding at relatively low cost. Diversification in funding is a proper strategy to protect a bank against uncomfortable funding squeeze situations and it is at the end of the day the best hedge against illiquidityinsolvency. Consequently, any funding architecture, i.e. the whole set up of funding instruments should be based on the principle of diversification. The August 2007 world wide liquidity crisis starting with defaults in the US home equity loan market and resulting in a confidence crisis in the whole banking system is just another argument in favour of funding diversification. Although, during such crisis some funding sources just may dry up and there might be no chance for any funding at all, independently of the price a bank was willing to pay. But those banks with a wider funding tool box have a bigger chance to fund them at least somewhere and to conduct their business as before.

Diversification generates value also in funding. Hence, an efficient and effective funding architecture always will be based upon a wide toolbox of funding instruments. At least some of the instruments in the toolbox should be uncorrelated. Such a funding architecture contributes to the business model of any bank, is a competitive advantage and a hedge against insolvency.

40 Widely used other funding sources are e.g. open market credits, loan against borrower's note and promissory note bonds.

41 Diversification generates value. See [Markowitz, 1952] The concept of portfolio selection can be easily transferred to other questions, here the portfolio is represented by the banks total liabilities.

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