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**The Impact of the Financial Crisis of 2008
on Corporate Trade Finance**

THESIS PAPER

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1. INTRODUCTION

For more than 10 years I was a manager in corporate trade finance for a globally active production company. In that time there was growing interest in finding common understanding between credit managers, what determines the credit limits, when firms deliver on open account and therefore on own risk to trade partners. Later in the manuscript I named this the micro-level. Furthermore, my time in corporate trade finance included the financial crisis of 2007. As I began to realize the rapidly changing conditions for corporate trade finance and the far-reaching repercussions of the crisis for cross-border economic activity, my interest in trade credit risk grew.

The additional focus concerned the political discussions about making the banks more secure against insolvency and what that means for bank products in trade finance as well as for corporate trade finance. The situation at that time was that after a sharp and sudden collapse in international trade in the last quarter of 2008, world trade flows declined by about 12% in 2009, according to the WTO. This exceeded the estimated loss of 5.4% in world GDP during the same period. This development was based on the fact that, globally, banks sharply reduced their credit capacity to the corporate sector, as they were very pessimistic in their credit evaluation about the future and themselves had liquidity problems. Globally, this reduced the possibilities of financing operations and growth in the real economy. With these factors in mind, the following hypotheses were developed.

H1: Corporate trade credit limits have a specific relationship to financial data and ratios.

H2: During a financial crisis, companies focus more strongly on a reduced working capital in order to improve liquidity.

H3: The portfolio approach enables corporates to receive better results in trade credit management that are comparable to individual credit decisions.

H4: The new banking regulations, Basel III, might strengthen shadow banking for corporate trade finance.

2. MODEL AND METHODS

The study is based on the literature assessment route for corporate trade credit. Furthermore, this study analyses the characteristics of the 2008–9 worldwide financial crisis in general and the near collapse of global trade in particular. Earlier papers see that companies that had ample and easy access to credit facilities had limited use for trade credits (Emery 1984, Meltzer 1960, Schwartz 1974). Several studies track their research. This is evident from Petersen and Rajan's (1997) findings, which indicate that more firms prefer trade credit in the absence of bank credit. Additionally, Nilsen (2002) and Baum, Caglayan, and Ozkan (2003) lay importance on restrictive financial measures besides macroeconomic uncertainty in the trade credit provided by companies. Further, Nilsen gained practical confirmation that smaller companies have limited access to loans from banks during restrictive monetary periods, forcing them to opt for more corporate trade credit.

Delannay and Weill (2004) confirm that a firm's trade credit provides an alternative route to bank credit in uncertain credit risk situations like transitional economies. During periods of financial crisis, production companies suffer in trade, as the availability of credit is reduced in the trade financial instruments provided by credit insurers and banks (Iacovone & Zavacka, 2009). Bastos and Pindado (2013) also investigated the use of corporate trade credit in emerging markets during periods of financial distress. According to the authors' calculations, a higher ratio of days-sales-outstanding increases the possibility of insolvency and is therefore a strong reason for using firms' trade credit in periods of financial crisis.

Chor and Manova (2011) analysed international trade during the period of financial turmoil. Their results show that in countries where the management of interest is strict, there was a lower reduction in trade volume relative to countries with a Keynesian interest policy. This insight might have led to a lower interest rate regime in many central banks' policies during the financial crisis and is in place even today. According to Eck, Engemann and Schnitzer (2012), trade credits do have a favourable impact on companies' importing and exporting activities. Moreover, trade credit offered by the product producer to his

distributors helps finance their inventory till the goods are sold and money is paid (Klapper *et al.* 2010).

The research instrument adopted for researching H1 was open-ended questions in step one. In step 2 it was data collection of existing samples and close-ended questions. In the research for H2 and H4 the questionnaire had mainly close-ended questions, supplemented by a few open-ended ones. These assisted in the gathering of the information needed for the study.

For the research on H1, the research aim was to determine how the credit experts of corporates currently lend money to their trading partners. This analysis included an evaluation of creditworthiness and credit limits. In the first step, group interviews and discussions with approximately 50 credit analysts were performed during 2010. All interviewees belonged to different global production firms. In this step, the data that was obtained was used to determine the criteria for the credit evaluation. In the second step, the participants (100) were either directly contacted or were asked by global credit manager FCIB, located in the US and the UK, and credit analysts anonymously provided data for the criteria that were selected in step 1. The relevant annual report year was 2009 in all cases. Data was obtained from 15 participating firms. Each participant could input the relevant data for ten firms. A total of 90 datasets were measured and evaluated to determine how corporate credit management handles trade-related credit risk in different situations and how it determines the credit limits.

For the research on H2 and H4, the author developed the 2011 questionnaire. In February 2012, several thousand company treasurers were asked for their feedback. For the contact-gathering, the author received the support of a global electronic financial newspaper (gtnews). Approximately 150 responses were received. In addition, a similar questionnaire was used to interrogate credit analysts, with the help of the FCIB in the UK. This questionnaire was submitted in November 2011 to approximately 500 corporate credit managers, most of whom worked for globally active companies. Approximately 50 responses were received. Compared to the initial research, the responses to the questionnaire were focused more in the receivables-oriented trade finance field than previously. The evaluation targets that were the focus of this study were a)

determination of whether common developments occur, and b) identifying the changes that might occur due to the financial crisis.

For the research on H3, 432 (6 years multiplied by 72) annual reports of publicly listed German firms were evaluated. This analysis was an evaluation of the finance strategy of international corporates. Therefore, the annual reports of 72 companies belonging to the German Dax or the Mdx, and thus being part of the real economy, were analysed. Banks, insurers and other financial firms were excluded from the analysis, as they do not have product deliveries and (real) trade receivables/ liabilities. Approximately 30 German listed companies belong to the Dax and exhibit the biggest market capitalization. Mdx represents a second group of listed corporates that have a smaller market capitalization. The annual reports from the years 2006 to 2011 of the selected companies were analysed. The measurements that were made included a) the operative and treasury fields, in which finance strategies are given; b) the changes that were made to the finance strategies of these companies due to the financial crisis; and c) a calculation of the non-payment costs in corporate trade finance. The analysis of the comparable rates for credit insurers provided further insights into the non-payment costs for corporates in trade finance, and a central point from which to evaluate the Basel III regulations from the perspective of corporate trade finance.

For H1 and H3 the sample volumes were critically small for a mathematical evaluation. This affected research for H1, due to difficulties in getting real data from firms, as they considered customer data to be a major part of their business success and declined to support this research. Others did not have the requested data or did not have the time to extract it from their customer relations software. Concerning research for H3, there were not many comparable firms. However, despite this, other research was successful, even with lower sample volumes – e.g. the Altman credit default prediction (1968) dealt with less than 40 companies.

3. EMPIRICAL INVESTIGATION

It is of interest to determine if there is a commonly used method by which B2B credit managers set a credit limit. Therefore, an empirical study, which was split

into two parts, was carried out. The first phase involved the identification of the criteria that are commonly considered important in the determination of a credit limit. This information was collected from approximately 25 experienced credit analysts after the financial crisis had taken place. They named a total (gross) of 30 different criteria. Many of the analysts considered not only the annual report, but also payment behaviour, a number of soft factors, and further information about the company. None of the credit analysts who participated in this study utilized all 30 criteria. Therefore, these criteria were filtered by the research participants to determine which were the most used. The second part of the research aimed to determine how selected criteria were used in the evaluation of a credit limit.

The demographic features of the participants who took part in this research have the following main specifications: The bulk of credit limit in EUR is 41.8% for limits below 500,000. Most of 'average days delinquent' is 3-19 days with 24.2%; most of 'return on sales' is for 0-1% with 47.3%. Most of the profit margin of significant trade is 0.2% with 79.1%. Likewise, most of the current ratio is for 1-2% with 39.6%.

The EDA (Exploratory Data Analysis) for all the groups was carried out individually.

A fundamental correlation evaluation without earlier analysis is the relationship between **customers' home region and credit limit in EUR**. The details are therefore provided below:

Customers' home region	Credit limit in EUR					Total
	< 500.000	> 10m	1000000	1m-10m	500-1m	
Africa	1	0	0	0	0	1
	2.6%	0.0%	0.0%	0.0%	0.0%	1.1%
Asia	15	0	0	1	6	22
	39.5%	0.0%	0.0%	3.4%	42.9%	24.2%
EE	6	0	1	10	4	21
	15.8%	0.0%	100.0%	34.5%	28.6%	23.1%
EU	16	1	0	15	3	35
	42.1%	11.1%	0.0%	51.7%	21.4%	38.5%
America	0	8	0	3	0	11
	0.0%	88.9%	0.0%	10.3%	0.0%	12.1%
Near East	0	0	0	0	1	1
	0.0%	0.0%	0.0%	0.0%	7.1%	1.1%
Total	38	9	1	29	14	91
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

PHI-Value: 0.952, P-Value: 0.000<0.05.

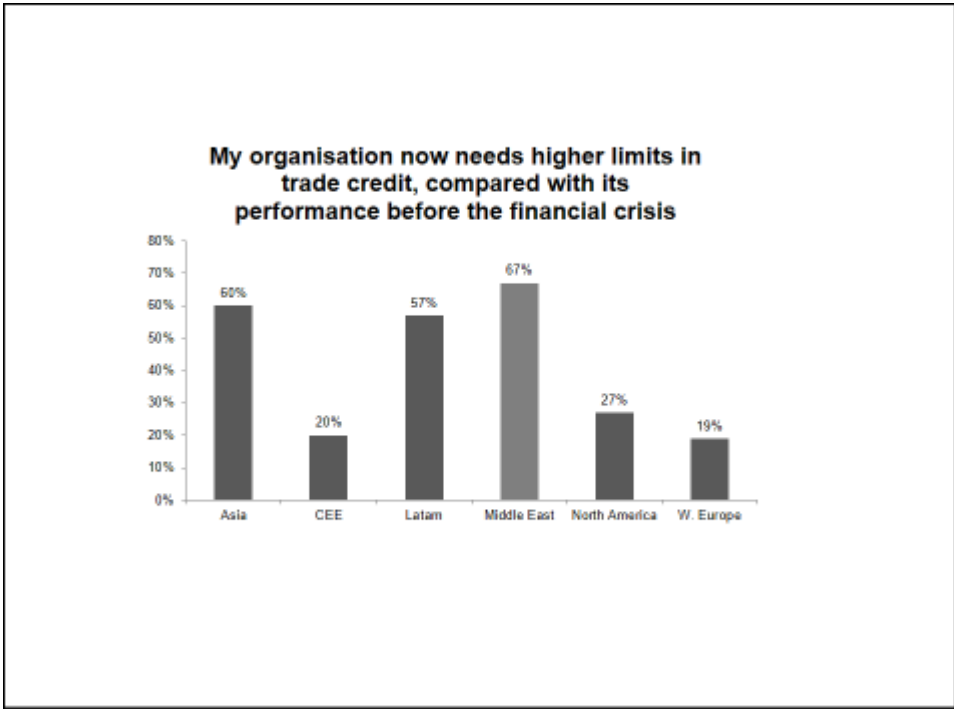
Further results: The comparison between the **'Customer's home country' and 'ADD'** (Average days delinquent) shows a Phi-value of 0.935 and p value of 0.000. The relationship between **customers' home country and years in business** show the Phi-value 0.612 and the p value 0.003. The correlation evaluation, which does not have the benefit of earlier academic analysis, investigates the relationship between **customers' home country and years as customers**. Here the Phi-value is 0.708 with a p value of 0.001. The relationship between **customers' home country and equity ratio** show a Phi-value of 0.730 and p value of 0.000. Important for the basic question of the research, the corporate trade finance situation, is the **relationship between customers' home country and current ratio**. It must be explained that a high current ratio rate is positive. A score over one is evaluated positively, as the firms can at any moment

pay their debt against supplier just by liquidating the current assets. All current ratios under 1 have a negative sign, as these firms have a trade debt that is higher than short-term assets (inventories and trade receivables). It is noted that most of the 'current ratio' participants in Eastern Europe show results of one and larger. In the EU, the peak for the 'current ratio' was from 0.5 to 2.

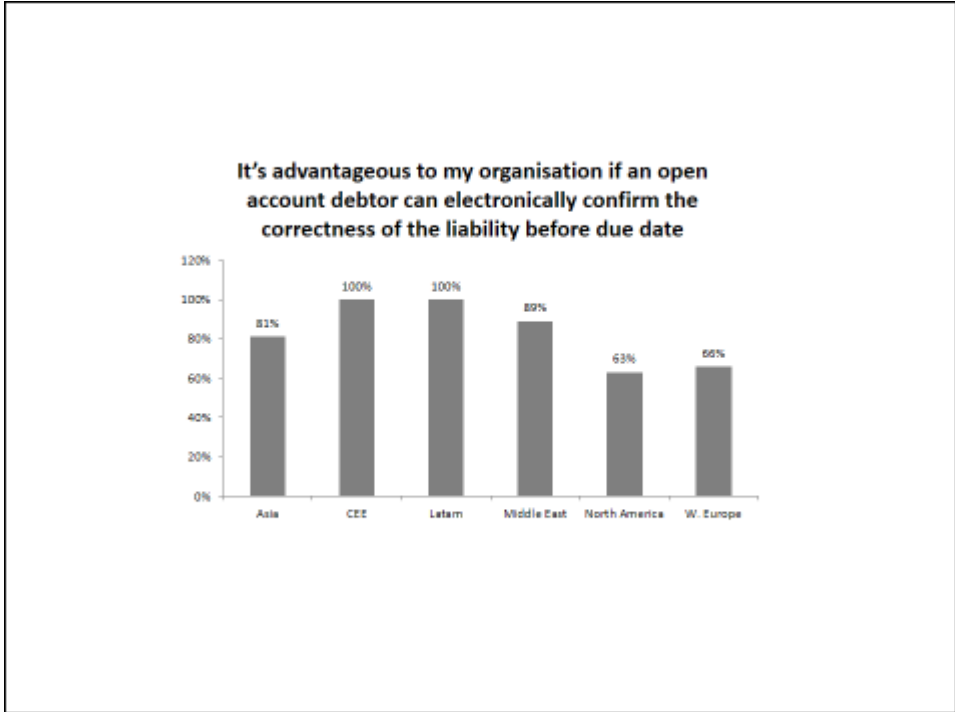
In a separate evaluation **working capital** was further evaluated to analyse its development over the **total time of the financial crisis** (2006-2011): The volume of net working capital (trade receivables, inventories, and trade payables) of the 68 German companies that were analysed had increased. The usual method to determine the volume is by using the cash conversion cycle. This cycle has increased from 48.5 days to 53.1 days. A comparison of the same period was made for the receivables subset. The average time of invoice to cash (DSO) had improved from 57.3 days to 55.4 days. This result shows that in times of crisis big firms have no problems in holding on to their working capital, while the customers, who are mostly SMEs, are forced to pay faster.

German stock-listed companies provide information about their trade credit risk. Their default ratio in 2010 was 0.19% of the trade exposure. In 2011, the ratio improved to a rate of 0.15% of the exposure. The author analysed the three biggest international credit insurer groups: Atradius, Euler Hermes and Coface. Together, the three groups had a credit exposure of €1.432 billion in 2010, with a default to exposure ratio of 0.12%. In this context, exposure referred to limits; therefore, it was assumed that the limits used were averaged by 50%, which increased the credit default ratio to 0.24%. In 2011, the data and the ratios were approximately the same as in 2010.

The additional own questionnaire from 200 firms show that almost one-third (30%) of the participating corporates expanded their business and increased their credit limits for customers during the financial crisis.



Furthermore, on average, approximately two-thirds of the participating corporates had stricter trade credit management guidelines as a result of the financial crisis of 2008.



Corporates would have liked to receive the “intent to pay” message electronically if they were the seller. If the corporates were the buyer, nearly half of the firms (41%) would send the “intent to pay” message if it could be sent

electronically. Furthermore, 72% of all the corporates that were surveyed wanted the “intent to pay” message electronically transferred to their ERP and receivables management software. The “intent to pay” message would also be helpful in the reduction of the trade finance costs for banks, because the buyer’s confirmation message would enable their ability to have lower credit margins. The credit analysts reported that having comprehensive knowledge of their customers’ accounts helped control the default and late-payment risks.

The research question focused on the impact that the Basel III regulation plan has on corporate trade finance. Sixty-five percent of the firms were concerned about Basel III in relation to corporate trade finance. The credit analysts had a different view: 56% of the surveyed credit analysts felt that the new global banking regulations (Basel III) require higher risk premiums, due to the financial crisis in trade finance.

4. DISCUSSION AND FINDINGS

The most commonly used factors to determine the credit limit are payment behaviour (ADD), years as customer, years in business, current ratio, return on sales, and turnover.

The credit limit has a correlation with the home region of the debtor. This result is generally not new, as the order price per invoice in high-cost countries must be above the costs in poor countries. In the poor countries buyers just cannot pay for big orders. To be fair, the results do not confirm this relation for the regions in detail. The portfolio used is too small to represent the order behaviour per country. The comparison between the ‘**Customer’s home country**’ and ‘**ADD**’ (Average days delinquent) shows a correlation between ADD and Customers’ Home Country. These results are often derived by analysis from commercial information brokers, standard corporate finance books and academic papers. The evaluation of the relationship between **customers’ home country and credit limit in EUR** shows a correlation is present between the ‘credits limit’ in EUR and ‘customers’ home country’. This result has the same explanation as for the credit limit: In the poor countries buyers just cannot pay big order.

A correlation evaluation for which there is no earlier academic analysis is the relationship between **customers' home country and years in business**. It was deduced that a correlation exists between 'years in business' and 'customers' home country'. The result is a new research finding, but is not surprising. In the regions that have had a free market economy in the long term, there are many firms that have been successful for years, while in the countries where the free market economy started less than twenty years ago, private firms are younger. The further correlation evaluation that does not have the benefit of earlier academic analysis investigates the relationship between customers' home country and years as customers. A correlation is present between 'years as customer' and 'customers' home country'. The results must be evaluated in the same way as for the question in the paragraph before: the result is a new research finding, but again is not surprising. In the regions with a long history of a free market economy, there are many long-term relations between corporates, while in the countries where the free market economy started less than twenty years ago, the successful relations between private firms can only be shorter.

The **relationship between customers' home country and equity ratio** has been analysed by market and academic researchers before. The analysed data shows strong equity ratio for Eastern Europe. The financial crisis may be the reason for this. As the banks were very reluctant to lend money to the real economy, firms needed high equity to get a) finance and b) sufficient liquidity. A correlation exists between 'Equity Ratio' and 'Customers' Home Country'.

Important for the basic question of the research, the corporate trade finance situation, is the **relationship between customers' home country and current ratio**. Corporates in Eastern Europe needed a stronger balance sheet and liquidity ratio than in normal times and normal regions to survive the financial crisis. In the EU, the central bank combats the financial crisis by pushing liquidity and cheap refinancing opportunities into the markets. Firms in Asia did not need a strong current ratio, which enables these companies to finance their expanding business in the long term. Before the crisis the American companies already had strong current ratios (and lower bank loans ratios). This did not change.

In a separate evaluation **working capital** was further evaluated to analyse its development over the **total time of the financial crisis** (2006-2011): The result

shows that in times of crisis big firms have no problems in holding on to their working capital, while the customers, who are mostly SMEs, are forced to pay faster.

German stock-listed companies have a much lower default ratio than the results reported by Boissay and Gropp (2007), who calculated a rate of 1.81%. The difference in results is probably caused by the fact that the earlier analysis used data from several thousand French firms, most of which were small firms. The three biggest international credit insurer groups confirmed the general low default rate of approximately 0.2% of the exposure for corporate trade finance. This is further confirmed by the data of the International Chamber of Commerce, the ICC, for letters of credit. The insignificant default rate of close to zero did not change even in the global economic crisis. The additional own questionnaire from 200 firms shows that corporates expanded their business and increased their credit limits for customers during the financial crisis. The firms are more risk aware and are active in credit control.

Finally, the research question for Basel III regulation show the concerns about Basel III in relation to corporate trade finance.

The following are the hypotheses confirmed through this study:

H1: The corporate trade credit limit has a specific relationship to financial data and ratios

The hypothesis is confirmed by the literature of credit analysing and by the practitioners' handling. The relationship is circumscribed by narrow ranges, which helps trade buyers, bankers and new credit analysts to set credit limits.

H2: During a financial crisis, companies focus more strongly on a reduced working capital to improve liquidity

The hypothesis concerning working capital development is partially confirmed by the data. The results of the annual reports data show a strong improvement in receivables reduction, while trade liabilities, and especially inventories, were adapted here only to a higher turnover. The research gives some ideas about what could be done in the future. The author has the impression that treasurers strongly rely on bank products and are still not focused on fundamental alternatives.

H3: The portfolio approach enables corporates to receive better results in trade credit management, comparable to individual credit decisions

The hypothesis is confirmed. The portfolio approach enables companies and groups to optimize their credit management through better credit costs in relation to trade turnover. The new approach requires strict credit guidelines and procedures, better credit management knowledge and further investments in software support.

H4: The new banking regulation, Basel III, might strengthen shadow banking for corporate trade finance

The IMF economist Zamil (2010) considers Basel III an improvement as long as the banks solidly apply the assets and valuation standards and establish good risk management. In addition, this strategy requires assertive regulators. In contrast, other economists evaluate the solution as not being one of the free market; and the manuscript described earlier that the new Basel III regulations, in the actual rules, will lead to higher credit costs for banks than the price calculation for shadow banks. This can only be equalized for banks when they take additional risks in order to be competitive. Credit insurance is also affected, because the insurers received stricter guidelines that are similar to those proposed in Basel III. The low default rates in trade finance even in times of crisis justify the confirmation of the hypothesis.

5. EMPHASIS

Trade finance products have significantly different risk profiles, default rates and capital uses from other corporate finance products. Multinational corporations increasingly handle their trade finance risk globally, in a portfolio approach. They rely on their business partners, traders and producers even in developing countries with weak institutions; while smaller firms generally rely more on bank-mediated trade finance, such as letters of credit (LCs) and guarantees.

Trade finance had been run in a consistent way for over 500 years. Banks offered letters of credit and other paper-based documents. Corporates generally have very low default rates on trade finance loans. It was expected that Basel III would increase the costs of finance significantly. Although the calculation for each

bank differed, an interest increase of 0.5% seemed probable. This negatively affected the vast majority of corporates and led to an increased use of in-house trade finance, or a greater use of new market participants outside the banking regulations – so-called “shadow banks”.

New trade finance products will make trade finance stronger. Ideas are to include the buyer’s confirmation before due date to avoid late payment, and a greater use of the new electronic bank guarantee, called BPO. Finally, the findings on how to determine credit limits enable a reduction in the credit process costs as well as the defaults.

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2. Trade Finance and its coming risk under Basel 3. Enterprise Risk Management, Barcelona, February 2012.

3. TSU (Trade Services Utility) and how this new bank solution will impact on accounts receivables, FCIB. Berlin, October 2010.

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1. The Strategic Role of Treasury, The gtnews Forum and Awards for global treasury and finance, London, June 2014.

2. Finanzierungsvorteil Kreditversicherung, Kongress Länderrisiken, Coface / FAZ-Institut, Mainz – Germany. May 2014 (credit insurance and finance).

3. Corporate priorities in maintaining liquidity: How supply chain finance can help. 8th Annual Trade & Supply Chain Solutions Conference, London, June 2011.

4. The relation between cash and trade, The International Payments Summit, London, March 2011.

5. Optimizing working capital efficiency: The integration of cash and trade. Sibos – the global banking trade fair, Amsterdam, October 2010.

6. How are banks and corporates working together to ensure supply chain efficiency? 7th Annual Trade & Supply Chain Solutions Conference, Rome, May 2010.