

Wagner, Charlotte

Working Paper

From boom to bust: how different has microfinance been from traditional banking?

Frankfurt School - Working Paper Series, No. 156

Provided in Cooperation with:

Frankfurt School of Finance and Management

Suggested Citation: Wagner, Charlotte (2010) : From boom to bust: how different has microfinance been from traditional banking?, Frankfurt School - Working Paper Series, No. 156, Frankfurt School of Finance & Management, Frankfurt a. M.

This Version is available at:

<https://hdl.handle.net/10419/43712>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Frankfurt School – Working Paper Series

No. 156

**From Boom to Bust: How different
has microfinance been from tradi-
tional banking?**

by Charlotte Wagner



**Frankfurt School of
Finance & Management**
Bankakademie | HfB

Sonnemannstr. 9–11 60314 Frankfurt am Main, Germany

Phone: +49 (0) 69 154 008 0 Fax: +49 (0) 69 154 008 728

Internet: www.frankfurt-school.de

Abstract

This paper presents an in-depth analysis of developments in the microfinance sector before and after the Lehman Brothers collapse in 2008 by comparing them with developments in traditional banking sectors of emerging market economies and developing countries. The findings indicate that microfinance has been part of the same credit boom observed in the traditional banking sector. Moreover, as in the traditional banking sector, the boom was fostered by substantial inflows of foreign capital. This raises the question whether the crisis resilience the microfinance sector has shown in the past remains a characterizing feature of microfinance or whether the same risk factors associated with excessive credit growth lead – as in the traditional banking sector – to greater vulnerability.

The findings indicate that microfinance markets with strong capital inflows, high credit growth rates and rapidly increasing competition experienced a substantial decrease in credit growth and deterioration of portfolio quality in the post-Lehman period. This is in line with the evidence found for the traditional banking sector in emerging markets and developing countries. The paper concludes that by becoming part of the global financial system, microfinance has lost one of the characteristics which distinguish it from traditional banking, namely its higher resilience towards crises in domestic and global financial markets.

Keywords: Microfinance, crisis resilience, credit boom, financial crisis

JEL classification: E44, G01, G21

ISSN: 14369753

Contact:

Charlotte Wagner
Research Associate
Centre for Development Finance
Frankfurt School of Finance & Management
Sonnemannstrasse 9-11
60314 Frankfurt am Main / Germany

Tel.: +49 (0) 69 / 154008 – 797
email: c.wagner@frankfurt-school.de

I would like to thank Adalbert Winkler who provided me with very valuable and constructive guidance. I also want to thank the participants of the 2010 Development Finance Conference in Stellenbosch / South Africa for helpful comments and suggestions on this paper as well as Yujie Wang for excellent research assistance.

Content

1	INTRODUCTION	4
2	THE PERFORMANCE OF MICROLOAN PORTFOLIOS IN TIMES OF FINANCIAL CRISES – A REVIEW OF THE LITERATURE	4
2.1	Microfinance, traditional banking and financial turbulences – evidence from previous crises in emerging markets	4
2.2	Crisis-mitigating characteristics of microfinance institutions and borrowers	5
3	THE 2000s – HOW MICROFINANCE BECAME PART OF THE GLOBAL CREDIT CYCLE	6
3.1	On the move – microfinance at the beginning of the 21st century	6
3.2	Credit growth in the pre- and post-Lehman period	7
3.3	Development of capital inflows from 2005 to 2009	11
3.4	The new boom – bust relationship in microfinance	12
4	DIFFERENT TARGET GROUPS, SAME RISKS - DOES THE MICROFINANCE SECTOR FACE SIMILAR STABILITY CHALLENGES AS THE TRADITIONAL BANKING SECTOR?	14
5	CONCLUSION	18
	REFERENCES	19

1 INTRODUCTION

Microfinance is banking for the poor. Mission, target group, and the applied credit technologies are features clearly distinguishing microfinance from the traditional banking sector. Moreover, the industry seemed to be less exposed to financial turmoil. Evidence from financial crises episodes in Asia and Latin America in the 1990s suggests that loan portfolio growth and quality of microfinance institutions were substantially less affected by financial turmoil than portfolio growth and quality in the traditional banking sector.

This paper presents an in-depth analysis of developments in the microfinance sector before and after the Lehman collapse by comparing them with developments in traditional banking sectors of developing countries (DCs) and emerging markets economies (EMEs). The findings suggest that in the pre-crisis years microfinance was characterized by features similar to those prevailing in traditional banking. Most importantly, the microfinance sector joined the overall credit boom in several EMEs and DCs. Like in the traditional banking sector, this boom was fostered by substantial capital inflows. Credit booms funded by strong capital inflows are good predictors of financial turmoil. This raises the question whether the crisis resilience observed in previous years has remained a characterizing feature of the microfinance industry in the global financial crisis.

Our findings indicate that the current financial crisis has had a substantial impact on the microfinance sector. In particular, microfinance markets with strong capital inflows, high credit growth rates and rising levels of competition in the pre-crisis period have been affected. Moreover, like in the traditional banking sector, credit growth has dropped significantly and portfolio quality has deteriorated markedly in the post-*Lehman* period. Thus, while microfinance and traditional banking still exhibit structural differences, the evidence suggests that they exhibit increasingly stronger conjunctural similarities.

The paper is structured as follows. Section two reviews the literature on the performance of the microfinance sector in previous DC and EME financial crises. Section three presents basic data on capital flows and credit growth in the microfinance and the traditional banking sector before and after the *Lehman* collapse. Section four analyzes the impact of rapid credit growth on financial stability in both sectors and section five provides a summary and conclusion.

2 THE PERFORMANCE OF MICROLOAN PORTFOLIOS IN TIMES OF FINANCIAL CRISES – A REVIEW OF THE LITERATURE

2.1 Microfinance, traditional banking and financial turbulences – evidence from previous crises in emerging markets

Microfinance has earned the reputation of being fairly immune to financial crises on the basis of case study results and cross-country evidence. Examining the correlation of microfinance and traditional banking with international and domestic market performance measures, the latter find that the microfinance sector shows almost no correlation with developments in global capital markets whereas the traditional banking sector does (Krauss and Walter, 2008). This suggests that microfinance is more insulated from the macroeconomic and financial environment than traditional banking. Analyses by

Ahlin and Lin (2006) and Gonzalez (2007) also indicate that fluctuations in domestic GDP have only a limited impact on the quality of microloan portfolios.

Turning to the evidence from selected case studies, McGuire and Conroy (1998) analyze the performance of the microfinance sector in Indonesia during the East Asian crisis. They find that during the crisis the strategic business unit (SBU) “microbanking” of Bank Rakyat Indonesia (BRI)¹ recorded only a slight increase of non-performing loans (NPL), expressed as a share of total loans, while the NPL ratio of other SBUs rose substantially. Moreover, Patten, Rosengard and Johnston (2001) report that the loan portfolio of BRI’s microbanking unit did not fall during the crisis and that growth resumed as early as 1999, with the portfolio increasing around 34 percent in 2000.

The Latin American experience also points to smoother credit growth and higher portfolio quality in the microfinance sector compared to the traditional banking sector in crises times. For example in the Ecuadorian banking crisis of 1999, Banco Solidario, a bank providing microenterprise loans and traditional loans, recorded a stable portfolio quality combined with a substantial increase in net profits on its microenterprise loans (Arora and Harper 2005). In Bolivia, the 1999 financial crisis led to a substantial decline in traditional bank portfolios which lasted until 2003. By contrast, compared to the traditional bank portfolio the aggregate microfinance portfolio growth rates in Bolivia decreased in 1999 and 2000 but recovered quickly from the crisis and recorded a positive growth rate again in 2001. Portfolio quality of MFIs deteriorated as well but showed much earlier signs of improvement than portfolio quality of traditional banks (Benoit-Calderón, 2006; Marcony and Mosley, 2005).

Overall the evidence suggests that while not being immune to episodes of financial turmoil the microfinance industry has performed significantly better in terms of loan portfolio growth and loan portfolio quality than the traditional banking sector.

2.2 Crisis-mitigating characteristics of microfinance institutions and borrowers

Several features of microfinance suggest that its superior performance in times of crises compared to that of traditional banks might reflect structural characteristics of the industry.

Lending technology

Microfinance makes use of different lending technologies than the traditional banking sector, namely the group lending and the unconventional individual lending technology (Armendáriz and Murdoch, 2005). A common characteristic of these technologies is that they are rather conservative. For example, the unconventional individual lending technology assesses the client’s debt capacity on the basis of the current cash flow only, i.e. it neglects any potential revenues the client might have from the “project” being financed. Moreover, it includes a socio-economic analysis of the household exploiting the insight that “troubled homes often become troubled borrowers” (Churchill, 1999). Finally, the credit process is loan officer centric, making close ties to and knowledge of borrowers and local markets. The group lending technology relies on the screening, monitoring and repayment incentives of the joint liability group members when taking a loan (Lehner, 2009).

¹ BRI is one of the three state-owned commercial banks in Indonesia with four strategic business units. Besides the business unit- Microbanking there are also the Retail Banking-, Corporate- and Treasury and Investment business units (Patten and Rosengard and Johnston, 2001).

Ownership

Microfinance institutions, including those operating in the form of non-bank financial institutions and banks with a for-profit objective, have, in general, owners and shareholders with a more “long term strategic interest and are less driven by market forces,” (Krauss and Walter, 2006: 18). This suggests that MFIs are less likely to engage in risky activities due to short-term profit maximization.

The loan product

Microfinance is short-term lending with weekly or monthly installments. This allows for a timely control of the portfolio’s quality and for substantial flexibility to adjust lending conditions in times of crisis. Moreover, maturity transformation, a key source of financial instability in traditional banking (Diamond and Dybvig, 1983), basically does not exist or – due to long-term funds provided by donors and international financial institutions – has the opposite sign compared to traditional banking: long-term funds are transformed into short-term loans. Finally, the large number and small size of microloans leads to a high degree of granularity and diversification in the MFIs portfolios (Krauss and Walter, 2008), supporting their stability in crises times.

The clients

Microbusinesses have a loan demand that is mainly related to financing of working capital. Investments in fixed assets such as machinery or real estate are rare as activities do not rely on a substantial capital input (Karland and Murdoch, 2010). This has the advantage that MFI clients have a high degree of flexibility to divert their activities when business slows down. Finally, microfinance clients are usually active in the local trade or service sector. These sectors are less exposed to fluctuations in the global or national economy compared to industry and export oriented companies. As a result, the revenues of microfinance clients are more robust to fluctuations in the economic cycle.

Financial market environment

The main alternative available to microclients’ for obtaining a loan is the informal financial sector, which is characterized by high interest rates and a lower degree of reliability compared to MFIs. As a consequence, micro-entrepreneurs have a strong incentive to serve and repay their loans in order to sustain a good relationship with the MFI and and so to obtain future loans (Patten, Rosengard and Johnston, 2001; Chen, Rasmussen and Reille, 2010). Thus, even in a financial crisis, clients will do their utmost to avoid arrears, stabilizing MFI performance indicators.

3 THE 2000s – HOW MICROFINANCE BECAME PART OF THE GLOBAL CREDIT CYCLE

3.1 On the move – microfinance at the beginning of the 21st century

Modern microfinance emerged in the 1970s pioneered by – among others – the Grameen and SEWA banks in Asia and partners of ACCION in Latin America (Helms, 2007). In more than thirty years it gained a reputation for being one of the most effective instruments in fighting poverty. Moreover, low

default rates and an increasing number of sustainable MFIs, showing a positive return to equity, demonstrate that banking with the poor can be a successful business. Finally, most studies suggest that despite strong growth in the past, demand for microfinance services continues to exceed supply by a large amount. Estimates indicate that in many DCs and EMEs 40 to 80 percent of the population lack access to formal financial sector services (Cull et al., 2008; DiLeo and FitzHerbert, 2007).

The combination of social and economic benefits and the large unmet demand for microfinance attracted new investors and encouraged substantial commercial involvement in the industry. As a result, sources and volumes of funds available to MFIs have increased substantially. While in the past MFIs had to rely almost exclusively on socially-oriented non-profit donors and international financial institutions, it has recently been able to tap broader sources of funds, including funds provided by Microfinance Investment Vehicles (MIVs) completely funded by private investors, mainly from mature economies. In addition, the transformation of many NGOs into microfinance banks has led to a strong increase in client deposits and refinancing lines extended under market conditions. Access to global financial markets, local deposits and domestic credit lines has fundamentally changed the funding situation of the microfinance sector (Krauss and Walter, 2007; DiLeo and FitzHerbert, 2007) allowing for strong loan portfolio growth in many countries. Similar developments have been taking place in the traditional banking sectors of many EMEs and DCs (Deutsche Bundesbank, 2008). Trends changed only in the aftermath of the Lehman collapse, when credit growth rates and capital inflows slowed substantially in both sectors.

3.2 Credit growth in the pre- and post-Lehman period

The years preceding the global financial crisis were characterized by strong credit growth in the microfinance and banking sectors in many EMEs and DCs.

From 2004 to 2007, average annual credit growth was 36 percent in the microfinance sector and 27 percent in the traditional banking sector in 47 EMEs and DCs. Moreover, the pattern of growth was similar, as in both sectors growth peaked in 2007 after a slight decline in 2005 (Figure 1).²

² The analysis is based on data from The MiX database and the IMF's International Financial Statistics (IFS), line 22d. The microfinance data of 813 MFI have been aggregated at country level. MFIs with missing values in the period 2003 to 2007 are excluded from the sample, except for MFIs which were founded during that period. The sample only includes countries with more than 4 MFIs reporting to The MiX in each observed year. Our analysis is based on 47 EMEs and DCs from 2003 to 2007. As data for 2008 and 2009 is still limited, the number of countries in our sample varies in these two years. For the traditional banking sector we convert annual data on country level from national currency into US Dollar (see Appendix).

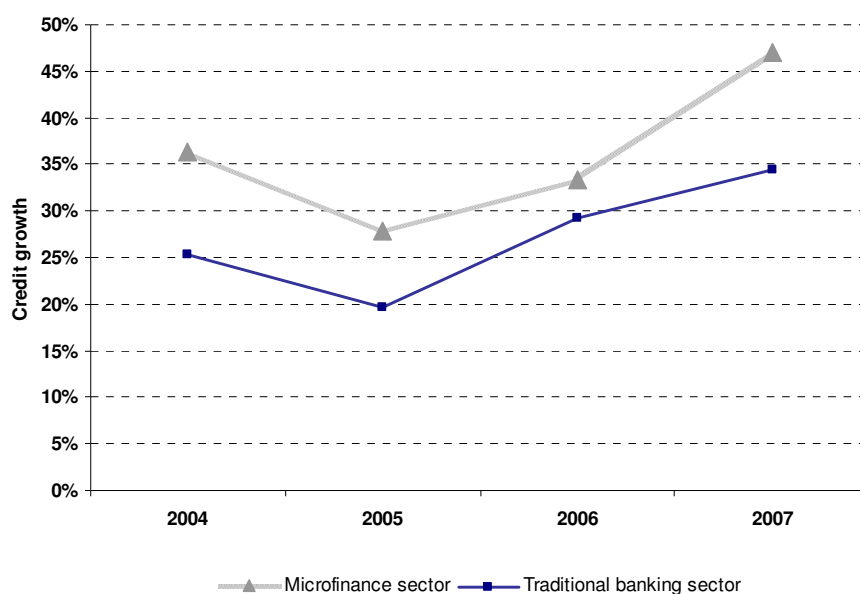


Figure 1: Credit growth in the microfinance and traditional banking sector in 47 EMEs and DCs

Source: *The MiX and IMF – own compilation*

Taking a regional perspective, MENA (Middle East and North Africa)³ and Eastern Europe and Central Asia (ECA) record the highest credit growth rates followed by Africa, Latin America and the Caribbean (LAC) and South Asia.

Similar evidence can be found on the level of individual countries: In 23 out of 47 countries the correlation coefficient for credit growth in the microfinance and the traditional banking sectors exceeds 0.6 for the years 2004 – 2007 (Figure 3). Thus, lending by MFIs advanced in line with lending in the traditional banking sector. In only eight countries was the correlation coefficient negative, indicating that the MFI and traditional banking sector exhibited opposing trends of growth.

Correlation-coefficient	> 0.9	0.6 ≥ 0.9	0.3 ≥ 0.59	0 ≥ 0.29	> 0
	Costa Rica	Philippines	Kazakhstan	Senegal	Albania
	Bosnia-Herzegovina	Nigeria	Colombia	Egypt	Ethiopia
	Vietnam	Madagascar	Bolivia	Dom. Rep.	Nicaragua
	Paraguay	Kyrgyzstan	Bulgaria	Azerbaijan	Macedonia
	Tajikistan	Kenya	Morocco	Guatemala	El Salvador
	Haiti	Uganda	Romania	Mali	Sri Lanka

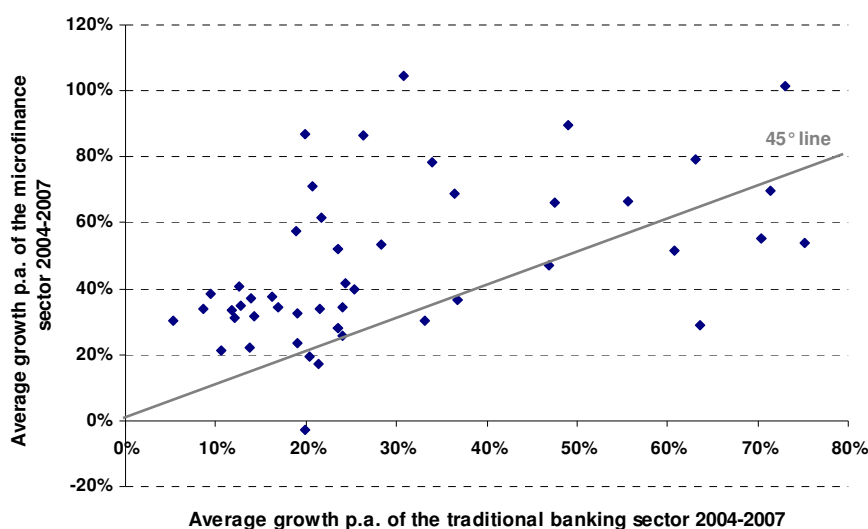
³ However, it has to be stressed that the MENA region in our sample contains merely three countries (Morocco, Egypt, Jordan).

Cambodia	Nepal	Pakistan	Georgia	Mexico
Armenia	Peru	Jordan		Ghana
Cameroon	India	Benin		
Bangladesh	Mozambique			
Indonesia	Honduras			
	Tanzania			

Figure 3: Correlation coefficient of credit growth in the microfinance and the traditional banking sector in selected countries, 2004 – 2007

Source: *The MiX and IMF – own compilation*

In most countries, credit growth in the microfinance sector was higher than in the traditional banking sector (Figure 4). While microfinance growth rates above 30 percent p.a. were recorded in 38 countries, there were only 16 traditional banking sectors with growth rates above 30 percent, most of them in ECA. Also in the microfinance sector growth was particularly strong in ECA, reflecting the fact that many ECA microfinance sectors are comparatively young. The average age of all MFIs in the ECA region was about seven years in 2007. By contrast, the average age of MFIs in East Asia and Pacific was 16 and in LAC 15 years. However, there are countries with mature microfinance markets, like Peru or Vietnam, that have been recording high growth rates as well.



Correlation Coefficient = .495

$p < .01$

$N = 47$

Figure 4: Credit growth 2004-2007⁴: Microfinance and traditional banking sector in 47 developing- and emerging countries

Source: *The MiX and IMF – own compilation*

⁴ Microfinance sector: geometrical mean of growth rates from 2004 to 2007 for each country with at least four reporting MFIs. Traditional banking sector: geometrical mean of the country growth rates from 2004 to 2007.

MFI have different legal forms and can operate as banks, credit unions/cooperatives, non-bank financial institutions, NGOs and rural banks. Banks are by far the largest institutions while rural banks are very small (Figure 5). Despite these significant differences, they recorded similar growth rates in the pre-crisis years. This suggests that credit growth in the microfinance sector was a phenomenon characterizing all institutions regardless of their institutional form.

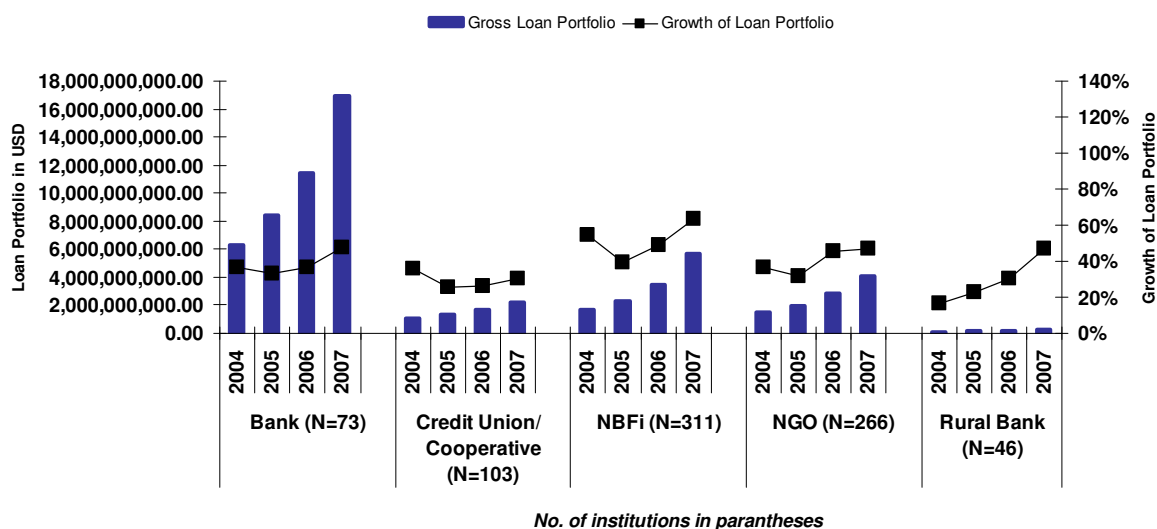


Figure 5: Credit growth in the microfinance sector – an institutional perspective

Source: The MiX – own compilation

In 2008 and 2009 credit growth slowed substantially in the microfinance and the traditional banking sectors of EMEs and DCs (Figure 6). Compared to 2007, the drop amounted to 23 percentage points in the microfinance sector and to 29 percentage points in the traditional banking sector in 2008. Evidence suggests that the slowdown was most severe in ECA, again in both the microfinance and traditional banking sector. By contrast, the South Asia region experienced modest credit contraction in both sectors.

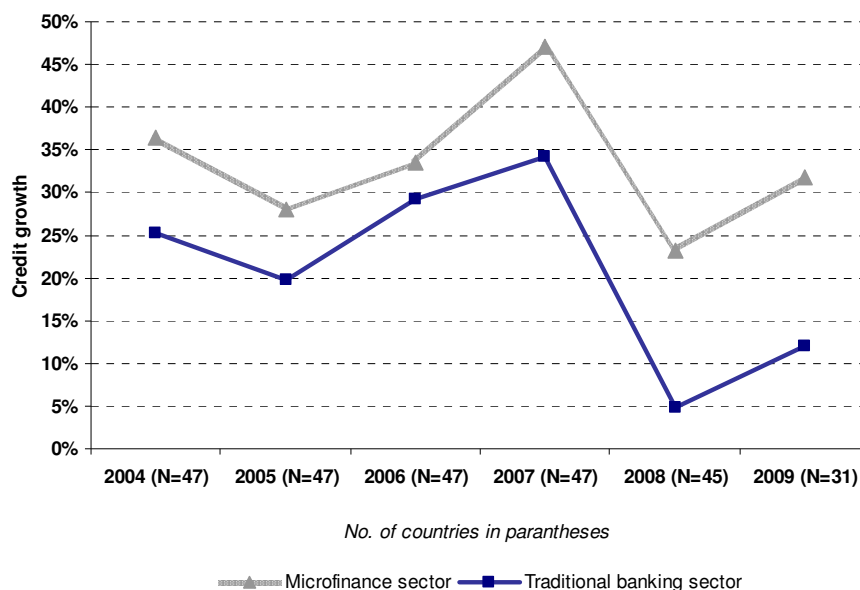


Figure 6: Credit growth in the microfinance and traditional banking sector from 2004 to 2009

Source: The MiX and IMF – own compilation

3.3 Development of capital inflows from 2005 to 2009

Before the crisis the microfinance and banking sectors in EMEs and DCs were the target of strong capital inflows (Figure 7). Both sectors gained increasing access to foreign funding at lower costs contributing to the strong growth in credit to micro enterprises and the private sector at large (Dell’Ariccia and Marquez, 2006). For the traditional banking sector the surge in foreign flows – measured by the external claims of BIS reporting banks on EME and DC banking sectors – has not been a new phenomenon. Indeed, periods of strong inflows followed by sudden stops and rapid reversals have been a key characteristic of financial integration of EMEs and DCs since the mid-1980s (Calvo and Reinhart, 1999; Milesi-Ferretti and Razin, 2000). By contrast, foreign capital became an important financing source of microfinance only in the early 2000s, when investors with commercial and social interests began channeling significant amounts of funds to MFIs via so-called microfinance investment vehicles (MIVs) (Goodman, 2006). The available evidence again suggests that patterns of capital inflows were broadly similar in the microfinance and the traditional banking sector.

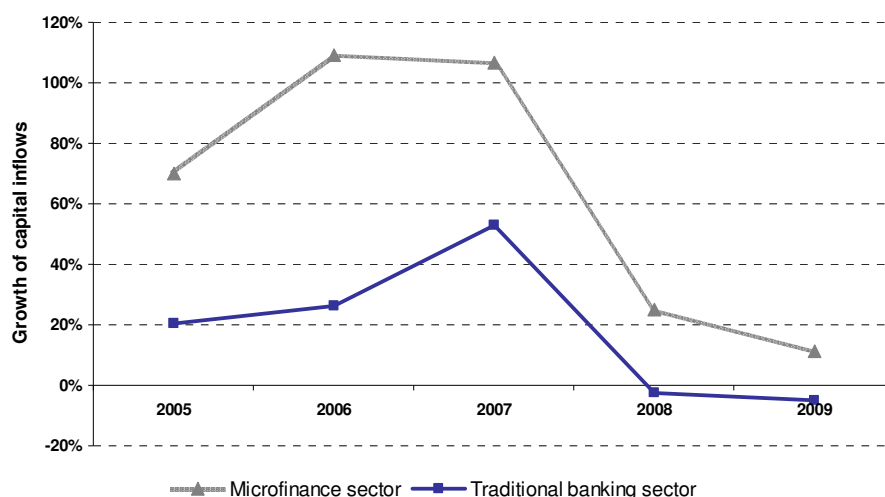


Figure 7: Growth rates of capital inflows in the microfinance sector and the traditional banking sector from 2005 to 2009

Source: Microrate, 2008; Microrate 2010 and BIS – own compilation

Rapid advances in the three years before the crisis were followed by a significant slowdown in both sectors. In the microfinance sector the growth rate of microfinance assets in MIVs experienced a large drop from 107 percent growth to 11 percent in 2009 whereas the traditional banking sector faced a sudden stop (Cali et al. 2008) of capital inflows in the post-Lehman period (Figure 7). It has to be stressed, however, that the availability and quality of data for capital flows to the microfinance sector is still limited. For example, data on the geographical distribution of foreign funding is available only for selected years.

3.4 The new boom – bust relationship in microfinance

Credit booms have been a recurrent phenomenon in traditional banking and an important predictor for future banking crises (Caprio and Klingebiel, 1996a and 1996b). Approximately three quarters of banking crises in emerging countries from 1970 to 2002 have been preceded by periods of rapid credit growth (IMF, 2004). Moreover, recent theoretical and empirical research on credit booms in the traditional banking sector suggests that the emergence of credit booms goes hand in hand with increasing capital inflows, in particular in DCs and EMEs (Mendoza and Terrones, 2008). Accordingly, credit booms end with a *hard landing* when capital flows record a sudden stop or a rapid reversal.

The correlation of capital flows and credit growth was also and has been a feature of developments in the traditional banking sector before and after the global financial crisis years. For the first time, however, similar evidence can be found for the microfinance sector. Indeed, for both sectors the correlation coefficients between credit growth and capital inflows in the period 2005 to 2009 are between 0.7 (microfinance sector) and 0.9 (traditional banking sector) (Figure 8).

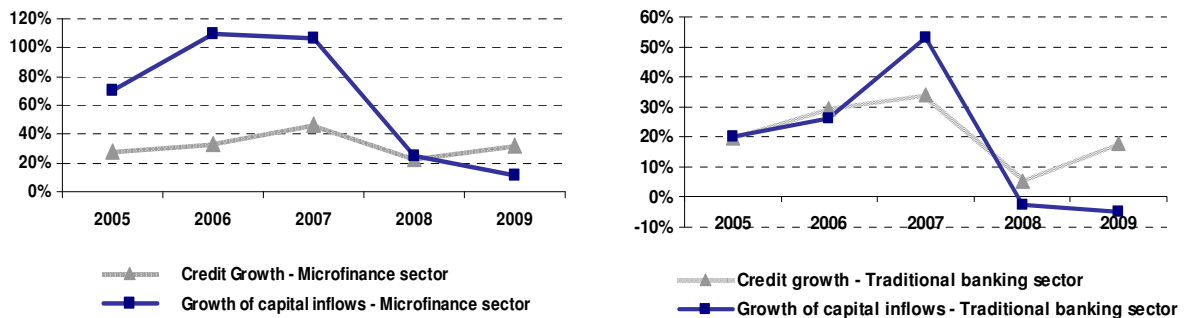
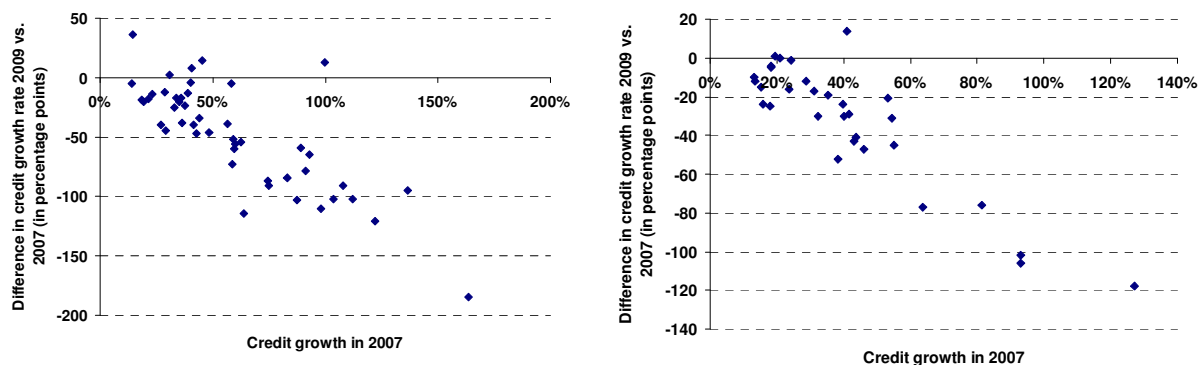


Figure 8: Development of credit growth and capital inflows in both sectors from 2005 to 2009

Source: MicroRate 2008, Microrate 2010, The MiX, IMF and BIS – own compilation

A second characteristic of boom-bust cycles in the traditional banking sector is that the magnitude of the bust is a function of the size of the pre-crisis credit boom (Tornell and Westermann, 2002). This also holds for the current crisis (Aisen and Franken, 2010; Vogel and Winkler, 2010). Interestingly, a simple correlation analysis suggests that this characteristic can also be found for the microfinance sector.



Correlation Coefficient = -.804 $p < .01$ $N = 47$

Correlation Coefficient = -.895 $p < .01$ $N = 31$

Figure 9a: Microfinance sector - Correlation between credit growth in 2007 and change of credit growth between 2007 and 2009

Figure 9b: Traditional banking sector - Correlation between credit growth in 2007 and change of credit growth between 2007 and 2009

Source: The MiX - own compilation

Source: IMF - own compilation

Higher pre-crisis growth is linked to a larger decline in lending in the post-crisis period, measured by the percentage change in credit growth between 2007 and 2009 (Figure 9a). This holds in particular for ECA countries, such as in Armenia, Bosnia and Herzegovina, Tajikistan and Azerbaijan. However, credit growth dropped substantially in Morocco, Pakistan and Kenya as well. By contrast, India, Mex-

ico and Uganda represent outliers as they continued to record high growth between 2007 and 2009 despite a boom in the pre-crisis years. Figure 9b displays an even higher significant and strong relationship between high credit growth in 2007 and a severe decrease in lending (measured by the percentage change) in 2009 in the traditional banking sector. Again, countries in ECA such as Kyrgyzstan, Kazakhstan and Bulgaria experience at most a decline in lending but also Nigeria and Ghana reports strong decreases.

4 DIFFERENT TARGET GROUPS, SAME RISKS - DOES THE MICROFINANCE SECTOR FACE SIMILAR STABILITY CHALLENGES AS THE TRADITIONAL BANKING SECTOR?

Credit booms are associated with rising risks and vulnerabilities. The literature on the traditional banking sector (see e.g. Arcalean et al., 2005) suggests that these vulnerabilities are the result of a) a *deterioration of lending standards*, b) *currency mismatches, partly driven by cross-border borrowing* and c) *the fight for market shares*. This section analyzes whether those risk factors also affected the microfinance sector in the pre-crisis credit boom.

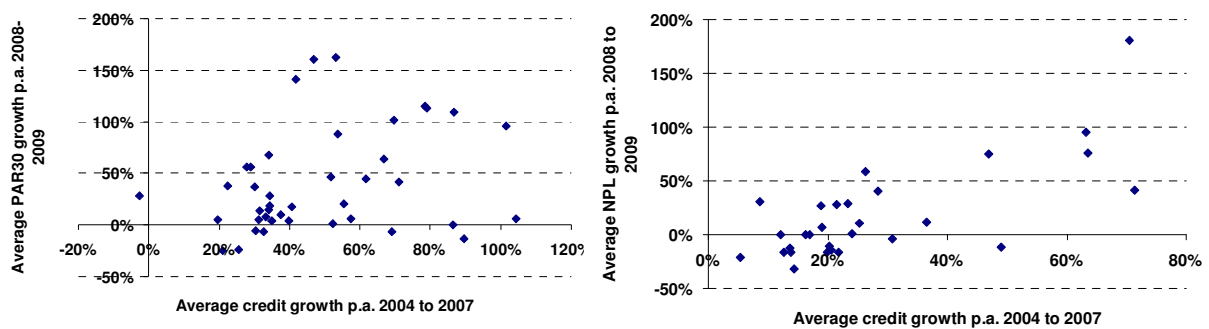
Deterioration of lending standards

Theoretical and empirical research on crises in the traditional banking sector reveals that credit booms have been associated with a decline in bank lending standards (Dell’Ariccia and Marquez, 2006; Jiminez and Saurina, 2006). Banks become less risk-averse and increasingly accept borrowers with lower credit quality. Investment projects are evaluated on the basis of more optimistic estimates of future cash flows and of inflated asset prices and collateral values (Wolfson, 2002). Furthermore, banks are confronted with strains on management and lower risk assessment capacities during the boom due to the large number of loans issued often combined with a lack of sufficiently qualified staff (Arcalean et al., 2005; Hernández and Landerretche, 1999). As long as the credit boom continues, the risks associated with these features remain largely hidden, as new loans – issued on a massive scale – do not show quality problems. Low non-performing loan ratios suggest that the boom is on a sound footing. This changes in the downturn, when new lending comes to a halt and the poor quality of loans issued in the past is revealed.

Focusing on microfinance in the pre-Lehman growth period, MFIs recorded globally low and stable arrears rates, measured as portfolio at risk above 30 days (PAR30), between two and three percent (Median) between 2005 and 2007 (The MiX, 2009), providing evidence for the sector’s ability to deliver high portfolio quality. This generated confidence and optimism among MFIs as well as investors. However, funding availability and rapid growth most likely led to a loss of risk aversion and the loosening of MFI characteristic lending standards. As long as the boom continued, the rise in credit risk was masked by the rapid portfolio growth. This changed at the end of 2008, when growth slowed and many MFIs, largely irrespective of size and type, were confronted with severe portfolio quality problems. (CGAP, 2009a). The average PAR30 of 26 EMEs and DCs in our sample rose from 3.9 percent in 2007 to around 6.7 percent in 2009. By comparison, the traditional banking sector reported an increase in the non-performing loan (NPL) ratio from 5.2 percent in 2007 to 6.3 percent in 2009, taking

the average NPL.⁵ Indeed, in most countries, the average growth rate of PAR30 from 2008 to 2009 in the microfinance sector was higher than the average NPL growth rate in the traditional banking sector. While PAR30 growth rates above 30 percent p.a. were recorded in 13 countries in the microfinance sector, there were only eight countries with a NPL growth rate higher than 30 percent p.a. in the traditional banking sector. A similar result is obtained when comparing the percentage point changes of PAR30 and NPL in the crises years from 2008 to 2009. While – on average – PAR30 in the microfinance sector rose by 1.5 percentage points, the corresponding increase in the NPL ratio was 0.9 percentage points in 26 EMEs and DCs. Moreover, the familiar cross-regional differences can be observed, with the strongest decline in portfolio quality recorded in ECA, in the microfinance as well as the traditional banking sector. By contrast, portfolio quality has largely remained at pre-crisis levels in South Asia.

The microfinance sector has never before experienced such a negative portfolio quality development, in respect to both the pace of deterioration and the geographical breadth (O’Donohoe et al., 2010). According to Chen et al. (2010), the weakening of credit discipline was most pronounced in the credit boom countries, like Bosnia or Morocco. Against this background, we examine the link between credit growth and portfolio deterioration by correlating the average credit growth rate p.a. from 2004 to 2007 with the average PAR30 growth rate p.a. from 2008 to 2009.



Correlation Coefficient = .318 $p < .05$ $N = 45$

Correlation Coefficient = .739 $p < .01$ $N = 30$

Figure 10a: Microfinance sector - Correlation between average credit growth p.a. from 2004 to 2007 and average PAR30 growth p.a. from 2008 to 2009

Figure 10b: Traditional banking sector - Correlation between average credit growth p.a. from 2004 to 2007 and average NPL growth p.a. from 2008 to 2009

Source: *The MiX* - own compilation

Source: *IMF* - own compilation

The evidence presented in Figure 10a suggests that countries with high credit growth in the pre-crisis period exhibited a stronger decline in loan portfolio quality in the aftermath of the Lehman collapse. Exceptions are limited to a few countries. One of them is India which recorded the most rapid credit growth in the pre-crisis period, but only a slight increase in PAR30 between 2008 and 2009. Overall, however, our results indicate that the microfinance sector shows the familiar boom-bust relationship

⁵ Note that the Non-Performing Loan indicator for traditional banking sector covers portfolio at risk above 90 days whereas the PAR30 refers to portfolio at risk above only 30 days. Thus, the comparison might draw a too rosy (negative) picture for traditional banks (MFIs).

observed in the traditional banking sector in previous crises as well as in the current crisis. Figure 10b displays a stronger boom-bust relationship in the traditional banking sector for the current crisis and suggests a moderate positive relationship between credit growth in the pre-crisis period and the deterioration of loan portfolio quality in the post-crisis period. Again, the region recording the highest credit growth between 2004 and 2007 and the most severe loan portfolio deterioration in 2008 and 2009 is the ECA region.

Currency mismatches

In the microfinance sector, strong capital inflows led to substantial currency mismatches as most of the inflows were denominated in foreign currency, i.e. US dollar or euro. An estimated 70 percent of cross-border borrowing in the microfinance sector was denominated in hard currency in 2008 (Reille and Foster, 2008). As a result either MFIs or final borrowers were facing substantial currency risk, depending on whether the MFI transformed foreign currency borrowing into local currency lending or passed the currency risk on to micro borrowers by lending in foreign currency. This risk materialized in the months after the Lehman collapse when currencies of many emerging markets and developing countries depreciated substantially against the US dollar (Littlefield and Kneiding, 2009). Hence, MFIs incurred large losses, as they had an estimated need for local currency hedging in the amount of approximately US\$ 1.5 billion in 2009 (Apgar and Reille, 2010). In particular, in the ECA region, i.e. the region recording the highest inflows of capital before the crisis, MFIs and their borrowers have been highly exposed to currency volatility as 84 percent of the cross-border funding by development finance institution to MFIs in ECA was denominated in hard currency (CGAP, 2009b). Again, similar evidence can be found for the traditional banking sector. While banks in most countries did not carry significant open foreign exchange positions, reflecting regulatory constraints and restrictions, they extended foreign currency loans to local borrowers without any foreign currency revenues and hedging possibilities, including households, on a large scale. This was most pronounced in Central and Eastern Europe, fueling the boom in the pre-crisis period and aggravating the bust after the Lehman collapse (Ranciere, Tornell and Vamvakidis, 2010).

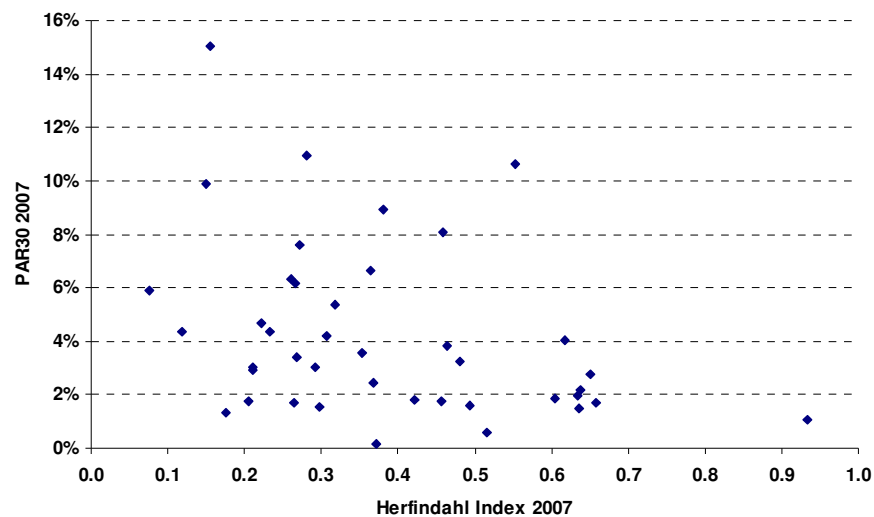
Rising competition and fight for market shares

The pre-crisis credit boom in the microfinance sector was accompanied and partly driven by a fight for market shares. Existing and newly founded MFIs became increasingly aggressive in marketing their services to the target group, also including households – via consumer and housing loans – as well as small and medium sized enterprises (Chen, Rasmussen and Reille, 2010; The MiX, 2009). Between 2004 and 2007 the number of MFIs reporting their gross loan portfolio to the MiX rose from 933 to 1331, with the strongest increase recorded in ECA, followed by MENA and LAC. This can be compared to developments in the traditional banking sector where the entry of foreign banks, for example in ECA, contributed to a higher level of competition (Arcelan et al., 2005).

In the microfinance sector, rising levels of competition have often been accompanied by multiple borrowing, with clients taking loans from more than one MFI at the same time. This holds in particular for countries where credit bureaus are either absent or dysfunctional and credit information is not shared among MFIs. In Bosnia Herzegovina, Nicaragua, Morocco and Pakistan, recent estimates suggest that around 30 to 40 percent of microfinance clients borrowed from more than one MFI in 2009 (Chen et al., 2010; Wisniwski, 2010). As in previous episodes (Vogelgesang, 2001), the crisis reveals the overindebtedness, in particular when it is accompanied by a strong decline in economic activity. Moreover, the repayment incentive of the microfinance lending technology, where borrowers only

receive a follow-up loan if they have repaid the previous loan, is undermined when borrowers do not depend on only one MFI (McIntosh and Wydick, 2005).

In order to test the link between competition and loan portfolio quality, we examine the degree of competition measured by the Herfindahl-Hirschman-Index (HHI) in 2007, and the PAR30 in 2007. HHI can range from zero to one, ranging from a single monopolistic MFI (Index=1) to a larger number of competitive MFIs (Index=0). Therefore, a decrease in HHI shows an increase in competition.



Correlation Coefficient = -0.358

$p < .05$

$N = 41$

Figure 11: Correlation between competition and loan portfolio quality in the microfinance sector in 2007

Source: *The MiX – own compilation*

The evidence suggests a significant negative correlation between the HHI and PAR30 in 2007, indicating that the level of competition has had an influence of MFI's portfolio quality before the crisis. However, it should be noted that the correlation coefficient is low. Moreover, when looking at the correlation of competition levels or changes in competition over time and the change in the PAR30 from the pre- to the post-crisis period, the data does not reveal a strong impact of competition on loan portfolio quality in the microfinance sector.

5 CONCLUSION

During previous financial crises, microfinance proved to be more crisis-resilient than traditional banking. Since the 2000s, however, the landscape of the microfinance sector has changed. In particular, the microfinance sector has become much more integrated into the international financial system as it has been increasingly able to access foreign funding via global capital markets. These funds contributed to strong credit growth in the pre-Lehman period. As a result, the microfinance sector showed similar developments as the traditional banking sector: high credit growth financed by strong capital inflows. Thus, risks associated with credit booms in the traditional banking sector, like the erosion of lending standards, currency mismatches and a fight for market shares also evolved in the microfinance sector.

After the Lehman collapse, both sectors experienced a severe decline in capital flows, a severe contraction of credit and a noticeable deterioration of loan portfolio quality. Thus, microfinance – like traditional banking – struggled with a freezing of the global credit market right after the Lehman collapse which led to the familiar boom-bust cycle in terms of credit growth and portfolio quality. Moreover, microfinance and the traditional banking sector have been characterized by the same regional differences with regard to the size of the credit boom, the severity of the credit contraction and the decline in loan portfolio quality. In both sectors, ECA recorded the strongest credit growth in the pre-Lehman period and was affected most in the post-Lehman period in credit quantity and quality.

Overall the evidence – albeit still preliminary due to a lack of data for several countries and microfinance institutions – suggests that many microfinance sectors seem to have lost their comparative advantage to traditional banking sectors in terms of crisis resilience recorded in the 1990s. As microfinance has become part of the global credit cycle, it has enjoyed the benefits but also experienced the downside of international financial integration. Hence, the familiar risks associated with capital inflows and credit booms in the traditional banking sector materialized in the microfinance sector in the course of the current financial crisis. This does not imply that microfinance has become just another form of traditional banking. There are still many structural differences with regard to target group, mission, and credit technologies used. However, they seem to show increasing conjunctural similarities driven by global financial market trends.

REFERENCES

- Ahlin, C. and Lin, J. (2006) *Luck or Skill? MFIs Performance in Macroeconomic Context*. Working Paper No. 132. Durham: Bureau for Research and Economic Analysis of Development.
- Apgar, D. and Reille, X. (2010) *Microfinance Foreign Exchange Facilities: Performance and Prospects*. CGAP Occasional Paper No. 17 Washington DC: CGAP.
- Arcalean, C., Calvo-Gonzalez, O., Móre, C., van Rixtel, A., Winkler, A., Zumer, T. (2005) 'The Causes and Nature of the Rapid Growth of Bank Credit in the Central-Eastern and South-Eastern European Countries', in C. Enoch and Ötoker-Robe, I. (eds), *Rapid Credit Growth in Central and Eastern Europe: Endless Boom or Early Warning*. Houndmills: Palgrave Macmillan.
- Armendáriz, B. and Morduch, J. (2005) *The Economics of Microfinance*. Cambridge: The MIT Press.
- Arora, S. and Harper, M. (2005) *Small customers, big market: commercial banks in microfinance*. Warwickshire: ITDG Publication.
- Benoit-Calderón, T. (2006) 'Micro-bubble or Macro-immunity? Risk and Return in Microfinance: Lessons from Recent Crises in Latin America', in Matthäus-Maier, I. and von Pischke, J. D. (eds), *Microfinance Investment Funds, Leveraging Private Capital for economic Growth and Poverty Reduction*. Frankfurt: KfW Development Bank.
- Cali, M., I. Massa and Willem te Velde, D. (2008) *The Global Financial Crisis: financial flows to developing countries set to fall by one quarter*. Working Paper. London: Overseas Development Institute.
- Capriole, G. and D. Klingebiel (1996a) *Bank Insolvency: Bad Luck, Bad Policy, or Bad Banking?* Paper prepared for the World Bank's Annual Bank Conference on Development Economics. Washington, DC: World Bank.
- Caprio, G. and D. Klingebiel (1996b) *Bank Insolvencies – Cross Country Experience*. World Bank Policy Research Paper No. 1620. Washington, DC: World Bank.
- Calvo, G. A. and Reinhart, C. (2000) 'When Capital Inflows come to a Sudden Stop: Consequences and Policy Options', in Kenen, P. and Swoboda, A. (eds), *Reforming the International Monetary and Financial System*. Washington, DC: IMF.
- Cull, R., Demirguc-Kunt, A. and Morduch, J. (2008) *Microfinance Meets the Market*. World Bank Policy Research Working Paper No. 4630. Washington, DC: World Bank.
- Churchill, C. (1999) *Client-Focused lending: The art of individual lending*. Washington, DC: Accion international.
- CGAP (2009a) *The Impact of the Financial Crisis on Microfinance Institutions and Their Clients, results from CGAP's 2009 Opinion Survey*. Brief. Washington, DC: CGAP.
- CGAP (2009b) *2009 Financial Crisis Snapshot: Eastern Europe and Central Asia*. Brief. Washington, DC: CGAP.
- CGAP (2010) *Challenging Times: Do MIVs need a new investment strategy?* Brief. Washington, DC: CGAP.

- Chen, G, Rasmussen, S. and Reille, X. (2010) *Growth and Vulnerabilities in Microfinance*. CGAP Focus Note No. 61. Washington, DC: CGAP.
- Cull, R., Demirgüç-Kunt, A. and Morduch, J. (2007) 'Financial Performance and Outreach: A Global Analysis of Leading Microbanks', *The Economic Journal* 117 (517): F107-F133.
- Dell'Ariccia, G., and Marquez, R. (2006) 'Lending Booms and Lending Standards', *The Journal of Finance* 51 (5): 2511-546.
- Diamond, D. W. and Dybvig, P. H. (1983) 'Bank Runs, Deposit Insurance and Liquidity', *Federal Reserve Bank of Minneapolis Quarterly Review* 24 (1): 14-23.
- DiLeo, P. and FitzHerbert, D. (2007) *The Investment Opportunity in Microfinance: An overview of current trends and issues*. Working Paper. New York: Grassroote Capital Management (<http://www.microvestfund.com/news/Grassroots:%20Investment%20Opportunity%20in%20Microfinance>)
- Gonzalez, A. (2007) *Resilience of Microfinance Institutions to National Macroeconomic Events: An Econometric Analysis of MFI asset quality*. MIX Discussion Paper No. 1. Washington, DC: The MiX.
- Goodman, P. (2006) 'Microfinance Investment Funds: Objectives, Player, Potential', in Matthäus-Maier, I. and von Pischke, J. D. (eds), *Microfinance Investment Funds, Leveraging Private Capital for economic Growth and Poverty Reduction*. Frankfurt: KfW Development Bank.
- Deutsche Bundesbank (2008) *Monthly Report July 2008*, Frankfurt: Deutsche Bundesbank.
- Hernández, L. and Landerretche, O. (1999) 'Capital Inflows, Credit Booms, and Macroeconomic Vulnerability: The Cross-Country Experience', *Money Affairs* 12 (1): 1 - 69.
- IMF (2010) *The Global Financial Stability Report*, Washington DC: IMF.
- IMF (2004) *Are credit booms in emerging markets a concern?*, World Economic Outlook, Washington, DC: IMF.
- Karlan, D, and Morduch, J. (2010) 'Access to Finance', in Rodrik, D. and Rosenzweig, M. (eds), *Handbook of Development Economics*, vol. 5, Amsterdam: North-Holland.
- Krauss, N. and Walter, I. (2008) *Can Microfinance Reduce Portfolio Volatility?*, Working Paper. New York: New York University.
- Lehner, M. (2009) *Group Lending versus Individual Lending in Microfinance*. Discussion Paper No. 299. Munich: University of Munich.
- Littlefield, E. and Kneiding, C. (2009) *The Global Financial Crisis and Its Impact on Microfinance*. CGAP Focus Note 52. Washington, DC: CGAP
- Marcony, R. and Mosley, P. (2006) 'Bolivia during the global crisis 1998-2004: towards a macroeconomics of microfinance', *Journal of International Development* 18 (2): 237-261.
- McGuire, P. and J. D. Conroy (1998) *Effects on Microfinance of the 1997-1998 Asian Financial Crisis*. Paper presented at the Second Annual Seminar on New Development Finance at Goethe University Frankfurt. Brisbane: The Foundation for Development Cooperation.
- McIntosh, C. and B. Wydick (2005) 'Competition and microfinance', *Journal of Development Economics*, 79: 271-289.

- Mendoza, E. and M. Terrones (2008) *An Anatomy of Credit Booms: Evidence From Macro Aggregates in Micro Data*. NBER Working Paper 14049.
- MicroRate (2008) *2007 Microfinance Investment Vehicle Survey*. Arlington: MicroRate.
- MicroRate (2010) *State of Microfinance Investment. The 2010 MIV Survey*. Arlington: MicroRate.
- Milesi-Ferreti, G. M., and Razin A. (2000) 'Current Account Reversals and Currency Crises: Empirical Regularities', in Krugman, P. (eds) *Currency Crises*. Chicago: University of Chicago Press.
- O'Donohoe et al. (2010) *All Eyes on Asset Quality: Microfinance Global Valuation Survey 2010*. CGAP Occasional Paper No. 16. Washington, DC: CGAP.
- Patten, R., Rosengard, J. and Johnston, D. (2001) 'Microfinance Success Amidst Macroeconomic Failure: The Experience of Bank Rakyat Indonesia During the East Asian Crisis', *World Development* 29 (6): 1057-69.
- Ranciere, R., Tornell, A. and Vamvakidis, A. (2010) 'Currency Mismatch, Systemic Risk and Growth in Emerging Europe', *Economic Policy* 25 (64): 597-658.
- Reille, X. and S. Foster (2008) *Foreign Capital Investment in Microfinance – Balancing Social and Financial Return*. CGAP Focus Note 44. Washington, DC: CGAP.
- The MiX (2009) *The MicroBanking Bulletin, Issue No. 18*. Washington, DC: The MiX.
- Tornell, A. and F. Westermann (2002) *Boom-Bust cycles in middle income countries: facts and explanation*. CESifo Working Paper Series 755. Munich: CESifo Group Munich.
- Vogel, U. and A. Winkler (2010) *Foreign banks and financial stability in emerging markets: evidence from the global financial crisis*. Frankfurt School Working Paper No. 149. Frankfurt: Frankfurt School of Finance and Management.
- Vogelgesang, U. (2003) 'Microfinance in Times of Crisis: The Effects of Competition, Rising Indebtedness, and Economic Crisis on Repayment Behavior', *World Development* 31 (12): 2085-2114.
- Wisniwski, S. (2010) *Overindebtedness: Evidence, Causes and Consequences*. Presentation held at the Microfinance Forum Conference in Prague.
- Wolfson, M. (2002) 'Minsky's Theory of Financial Crises in a Global Context', *Journal of Economic Issues* 36 (2): 393-399.

Appendix 1: List of variables

Name	Description	Source
<i>Credit growth – Microfinance Sector</i>	Growth rate of the total loan portfolio in our sample	The MiX: Gross loan portfolio
<i>Credit growth – Traditional banking sector</i>	Growth rate of claims on private sector (annual data), provided in national currency and divided by exchange rate against the dollar (end of period)	IFS: credit to private sector (line code 22d) and exchange rate /end of period observations (line code AE)
<i>Average credit growth 2004 to 2007 – Microfinance Sector</i>	Geometrical mean of loan portfolio growth rates from 2004 to 2007 in the microfinance sector	The MiX: Gross loan portfolio
<i>Average credit growth 2004-2007 – Traditional banking sector</i>	Geometrical mean of loan portfolio growth rates from 2004 to 2007 in the traditional banking sector	IFS: credit to private sector (line code 22d) and exchange rate /end of period observations (line code AE)
<i>Growth of capital inflows – Microfinance sector</i>	Microfinance assets in MIVs	Growth rates of 2005 compiled from MicroRate 2008, growth rates of 2006-2010 compiled from MicroRate 2010
<i>Growth of capital inflows – Traditional banking sector</i>	Difference between the external positions of reporting banks vis-à-vis all sectors and the external positions of reporting banks vis-à-vis non-bank sector = the external positions of reporting banks vis-à-vis the banking sector	BIS International locational banking statistics, Table 6A and 6B
<i>Non-performing loans (NPL)</i>	Share of loans due over 90 days to number of total loans	IMF: Financial stability report, October 2010
<i>Portfolio at risk over 30 days (PAR30)</i>	Share of loans due over 30 days to number of total loans	The MiX: Portfolio at risk over 30 days
<i>Herfindahl-Hirschmann Index (HHI)</i>	The sum of the squares of the market shares of each MFI in the respective country. Increases in the Herfindahl index generally indicate a decrease in competition and an increase of market power and vice versa	The MiX: Gross loan portfolio
<i>Difference in credit growth rates 2009 vs. 2007</i>	Difference in credit growth rate in 2009 and credit growth rate in 2007 in the respective country	The MiX: Gross loan portfolio

Appendix 2: List of sample countries by region

We subdivide our countries into regional groups according to The MiX country classification 2010. We exclude all EMES and DCs with missing values of their loan portfolio from 2003 to 2007, except of MFIs which were founded during that period. We only include countries, where at least 4 MFIs have reported to The MiX. For 2008 and 2009, number of countries declines due to limited data availability.

N = 47 (2003-2007)

N = 45 (2008)

N = 31 (2009)

	Africa	East Asia and the Pacific	Eastern Europe and Central Asia (ECA)	Latin America and The Caribbean (LAC)	Middle East and North Africa (MENA)	South Asia
1	Benin**	Cambodia*	Albania*	Bolivia*	Egypt**	Bangladesh**
2	Cameroon**	Indonesia**	Armenia*	Colombia	Jordan**	India**
3	Ethiopia*	Philippines**	Azerbaijan*	Costa Rica**	Morocco**	Nepal**
4	Ghana**	Vietnam**	Bosnia & Herzegovina**	Dominican Rep.*		Pakistan**
3	Kenya**		Bulgaria**	El Salvador*		Sri Lanka**
4	Macedonia**		Georgia**	Guatemala**		
5	Madagascar**		Kazakhstan**	Haiti*		
6	Mali**		Kyrgyzstan**	Honduras*		
7	Mozambique*		Romania*	Mexico*		
8	Nigeria**		Tajikistan	Nicaragua*		
9	Senegal**			Paraguay*		
10	Tanzania**			Peru**		
11	Uganda**					

* Country included in the 2008 sample ** Country included in the 2008 and 2009 sample

Appendix 3: Development of MIV market 2004-2009

Year	Participating MIVs at microrate survey	Microfinance assets in MIVs (in USD millions)	Microfinance asset growth (yoy)	Total MIV assets (in USD millions)	Total asset growth (in USD millions)
2004	37	415		908	
2005	41	705	69.9%	1,195	31.6%
2006	49	1,476	109.4%	1,965	64.45%
2007	69	3,053	106.8%	3,864	96.6%
2008	70	3,812	24.9%	4,931	27.6%
2009	78	4,245	11.4%	6,023	22.1%

Sources: Microrate 2008 and 2010 - own compilation

FRANKFURT SCHOOL / HFB – WORKING PAPER SERIES

No.	Author/Title	Year
155	Libman Alexander / Vinokurov, Evgeny Is it really different? Patterns of Regionalisation in the Post-Soviet Central Asia	2010
154	Libman, Alexander Subnational Resource Curse: Do Economic or Political Institutions Matter?	2010
153	Herrmann-Pillath, Carsten Meaning and Function in the Theory of Consumer Choice: Dual Selves in Evolving Networks	2010
152	Kostka, Genia / Hobbs, William Embedded Interests and the Managerial Local State: Methanol Fuel-Switching in China	2010
151.	Kostka, Genia / Hobbs, William Energy Efficiency in China: The Local Bundling of Interests and Policies	2010
150.	Umber, Marc P. / Grote, Michael H. / Frey, Rainer Europe Integrates Less Than You Think. Evidence from the Market for Corporate Control in Europe and the US	2010
149.	Vogel, Ursula / Winkler, Adalbert Foreign banks and financial stability in emerging markets: evidence from the global financial crisis	2010
148.	Libman, Alexander Words or Deeds – What Matters? Experience of Decentralization in Russian Security Agencies	2010
147.	Kostka, Genia / Zhou, Jianghua Chinese firms entering China's low-income market: Gaining competitive advantage by partnering governments	2010
146.	Herrmann-Pillath, Carsten Rethinking Evolution, Entropy and Economics: A triadic conceptual framework for the Maximum Entropy Principle as applied to the growth of knowledge	2010
145.	Heidorn, Thomas / Kahlert, Dennis Implied Correlations of iTraxx Tranches during the Financial Crisis	2010
144	Fritz-Morgenthal, Sebastian G. / Hach, Sebastian T. / Schalast, Christoph M&A im Bereich Erneuerbarer Energien	2010
143.	Birkmeyer, Jörg / Heidorn, Thomas / Rogalski, André Determinanten von Banken-Spreads während der Finanzmarktkrise	2010
142.	Bannier, Christina E. / Metz, Sabrina Are SMEs large firms en miniature? Evidence from a growth analysis	2010
141.	Heidorn, Thomas / Kaiser, Dieter G. / Voinea, André The Value-Added of Investable Hedge Fund Indices	2010
140.	Herrmann-Pillath, Carsten The Evolutionary Approach to Entropy: Reconciling Georgescu-Roegen's Natural Philosophy with the Maximum Entropy Framework	2010
139.	Heidorn, Thomas / Löw, Christian / Winker, Michael Funktionsweise und Replikationstil europäischer Exchange Traded Funds auf Aktienindizes	2010
138.	Libman, Alexander Constitutions, Regulations, and Taxes: Contradictions of Different Aspects of Decentralization	2010
137.	Herrmann-Pillath, Carsten / Libman, Alexander / Yu, Xiaofan State and market integration in China: A spatial econometrics approach to 'local protectionism'	2010
136.	Lang, Michael / Cremers, Heinz / Hentze, Rainald Ratingmodell zur Quantifizierung des Ausfallrisikos von LBO-Finanzierungen	2010
135.	Bannier, Christina / Feess, Eberhard When high-powered incentive contracts reduce performance: Choking under pressure as a screening device	2010
134.	Herrmann-Pillath, Carsten Entropy, Function and Evolution: Naturalizing Peircian Semiosis	2010
133.	Bannier, Christina E. / Behr, Patrick / Güttler, Andre Rating opaque borrowers: why are unsolicited ratings lower?	2009
132.	Herrmann-Pillath, Carsten Social Capital, Chinese Style: Individualism, Relational Collectivism and the Cultural Embeddedness of the Institutions-Performance Link	2009
131.	Schäffler, Christian / Schmaltz, Christian Market Liquidity: An Introduction for Practitioners	2009

130.	Herrmann-Pillath, Carsten Dimensionen des Wissens: Ein kognitiv-evolutionärer Ansatz auf der Grundlage von F.A. von Hayeks Theorie der „Sensory Order“	2009
129.	Hankir, Yassin / Rauch, Christian / Umber, Marc It's the Market Power, Stupid! – Stock Return Patterns in International Bank M&A	2009
128.	Herrmann-Pillath, Carsten Outline of a Darwinian Theory of Money	2009
127.	Cremers, Heinz / Walzner, Jens Modellierung des Kreditrisikos im Portfoliofall	2009
126.	Cremers, Heinz / Walzner, Jens Modellierung des Kreditrisikos im Einwertpapierfall	2009
125.	Heidorn, Thomas / Schmaltz, Christian Interne Transferpreise für Liquidität	2009
124.	Bannier, Christina E. / Hirsch, Christian The economic function of credit rating agencies - What does the watchlist tell us?	2009
123.	Herrmann-Pillath, Carsten A Neurolinguistic Approach to Performativity in Economics	2009
122.	Winkler, Adalbert / Vogel, Ursula Finanzierungsstrukturen und makroökonomische Stabilität in den Ländern Südosteuropas, der Türkei und in den GUS-Staaten	2009
121.	Heidorn, Thomas / Rupprecht, Stephan Einführung in das Kapitalstrukturmanagement bei Banken	2009
120.	Roszbach, Peter Die Rolle des Internets als Informationsbeschaffungsmedium in Banken	2009
119.	Herrmann-Pillath, Carsten Diversity Management und diversitätsbasiertes Controlling: Von der „Diversity Scorecard“ zur „Open Balanced Scorecard“	2009
118.	Hölscher, Luise / Clasen, Sven Erfolgsfaktoren von Private Equity Fonds	2009
117.	Bannier, Christina E. Is there a hold-up benefit in heterogeneous multiple bank financing?	2009
116.	Roßbach, Peter / Gießamer, Dirk Ein eLearning-System zur Unterstützung der Wissensvermittlung von Web-Entwicklern in Sicherheitsthemen	2009
115.	Herrmann-Pillath, Carsten Kulturelle Hybridisierung und Wirtschaftstransformation in China	2009
114.	Schalast, Christoph: Staatsfonds – „neue“ Akteure an den Finanzmärkten?	2009
113.	Schalast, Christoph / Alram, Johannes Konstruktion einer Anleihe mit hypothekarischer Besicherung	2009
112.	Schalast, Christoph / Bolder, Markus / Radünz, Claus / Siepmann, Stephanie / Weber, Thorsten Transaktionen und Servicing in der Finanzkrise: Berichte und Referate des Frankfurt School NPL Forums 2008	2009
111.	Werner, Karl / Moormann, Jürgen Efficiency and Profitability of European Banks – How Important Is Operational Efficiency?	2009
110.	Herrmann-Pillath, Carsten Moralische Gefühle als Grundlage einer wohlstandschaffenden Wettbewerbsordnung: Ein neuer Ansatz zur erforschung von Sozialkapital und seine Anwendung auf China	2009
109.	Heidorn, Thomas / Kaiser, Dieter G. / Roder, Christoph Empirische Analyse der Drawdowns von Dach-Hedgefonds	2009
108.	Herrmann-Pillath, Carsten Neuroeconomics, Naturalism and Language	2008
107.	Schalast, Christoph / Benita, Barten Private Equity und Familienunternehmen – eine Untersuchung unter besonderer Berücksichtigung deutscher Maschinen- und Anlagenbauunternehmen	2008
106.	Bannier, Christina E. / Grote, Michael H. Equity Gap? – Which Equity Gap? On the Financing Structure of Germany's Mittelstand	2008
105.	Herrmann-Pillath, Carsten The Naturalistic Turn in Economics: Implications for the Theory of Finance	2008
104.	Schalast, Christoph (Hrsgs.) / Schanz, Kay-Michael / Scholl, Wolfgang Aktionärsschutz in der AG falsch verstanden? Die Leica-Entscheidung des LG Frankfurt am Main	2008

103.	Bannier, Christina E./ Müsch, Stefan Die Auswirkungen der Subprime-Krise auf den deutschen LBO-Markt für Small- und MidCaps	2008
102.	Cremers, Heinz / Vetter, Michael Das IRB-Modell des Kreditrisikos im Vergleich zum Modell einer logarithmisch normalverteilten Verlustfunktion	2008
101.	Heidorn, Thomas / Pleißner, Mathias Determinanten Europäischer CMBS Spreads. Ein empirisches Modell zur Bestimmung der Risikoaufschläge von Commercial Mortgage-Backed Securities (CMBS)	2008
100.	Schalast, Christoph (Hrsg.) / Schanz, Kay-Michael Schaeffler KG/Continental AG im Lichte der CSX Corp.-Entscheidung des US District Court for the Southern District of New York	2008
99.	Hölscher, Luise / Haug, Michael / Schweinberger, Andreas Analyse von Steueramnestiedaten	2008
98.	Heimer, Thomas / Arend, Sebastian The Genesis of the Black-Scholes Option Pricing Formula	2008
97.	Heimer, Thomas / Hölscher, Luise / Werner, Matthias Ralf Access to Finance and Venture Capital for Industrial SMEs	2008
96.	Böttger, Marc / Guthoff, Anja / Heidorn, Thomas Loss Given Default Modelle zur Schätzung von Recovery Rates	2008
95.	Almer, Thomas / Heidorn, Thomas / Schmaltz, Christian The Dynamics of Short- and Long-Term CDS-spreads of Banks	2008
94.	Barthel, Erich / Wollersheim, Jutta Kulturunterschiede bei Mergers & Acquisitions: Entwicklung eines Konzeptes zur Durchführung einer Cultural Due Diligence	2008
93.	Heidorn, Thomas / Kunze, Wolfgang / Schmaltz, Christian Liquiditätsmodellierung von Kreditzusagen (Term Facilities and Revolver)	2008
92.	Burger, Andreas Produktivität und Effizienz in Banken – Terminologie, Methoden und Status quo	2008
91.	Löchel, Horst / Pecher, Florian The Strategic Value of Investments in Chinese Banks by Foreign Financial Insitutions	2008
90.	Schalast, Christoph / Morgenschweis, Bernd / Sprengetter, Hans Otto / Ockens, Klaas / Stachuletz, Rainer / Safran, Robert Der deutsche NPL Markt 2007: Aktuelle Entwicklungen, Verkauf und Bewertung – Berichte und Referate des NPL Forums 2007	2008
89.	Schalast, Christoph / Stralkowski, Ingo 10 Jahre deutsche Buyouts	2008
88.	Bannier, Christina E./ Hirsch, Christian The Economics of Rating Watchlists: Evidence from Rating Changes	2007
87.	Demidova-Menzel, Nadeshda / Heidorn, Thomas Gold in the Investment Portfolio	2007
86.	Hölscher, Luise / Rosenthal, Johannes Leistungsmessung der Internen Revision	2007
85.	Bannier, Christina / Hänsel, Dennis Determinants of banks' engagement in loan securitization	2007
84.	Bannier, Christina "Smoothing" versus "Timeliness" - Wann sind stabile Ratings optimal und welche Anforderungen sind an optimale Berichtsregeln zu stellen?	2007
83.	Bannier, Christina E. Heterogeneous Multiple Bank Financing: Does it Reduce Inefficient Credit-Renegotiation Incidences?	2007
82.	Cremers, Heinz / Löhr, Andreas Deskription und Bewertung strukturierter Produkte unter besonderer Berücksichtigung verschiedener Marktszenarien	2007
81.	Demidova-Menzel, Nadeshda / Heidorn, Thomas Commodities in Asset Management	2007
80.	Cremers, Heinz / Walzner, Jens Risikosteuerung mit Kreditderivaten unter besonderer Berücksichtigung von Credit Default Swaps	2007
79.	Cremers, Heinz / Traugher, Patrick Handlungsalternativen einer Genossenschaftsbank im Investmentprozess unter Berücksichtigung der Risikotragfähigkeit	2007
78.	Gerdemesier, Dieter / Roffia, Barbara Monetary Analysis: A VAR Perspective	2007

77.	Heidorn, Thomas / Kaiser, Dieter G. / Muschiol, Andrea Portfoliooptimierung mit Hedgefonds unter Berücksichtigung höherer Momente der Verteilung	2007
76.	Jobe, Clemens J. / Ockens, Klaas / Safran, Robert / Schalast, Christoph Work-Out und Servicing von notleidenden Krediten – Berichte und Referate des HfB-NPL Servicing Forums 2006	2006
75.	Abrar, Kamyar / Schalast, Christoph Fusionskontrolle in dynamischen Netzsektoren am Beispiel des Breitbandkabelsektors	2006
74.	Schalast, Christoph / Schanz, Kay-Michael Wertpapierprospekte: Markteinführungspublizität nach EU-Prospektverordnung und Wertpapierprospektgesetz 2005	2006
73.	Dickler, Robert A. / Schalast, Christoph Distressed Debt in Germany: What's Next? Possible Innovative Exit Strategies	2006
72.	Belke, Ansgar / Polleit, Thorsten How the ECB and the US Fed set interest rates	2006
71.	Heidorn, Thomas / Hoppe, Christian / Kaiser, Dieter G. Heterogenität von Hedgefondsindizes	2006
70.	Baumann, Stefan / Löchel, Horst The Endogeneity Approach of the Theory of Optimum Currency Areas - What does it mean for ASEAN + 3?	2006
69.	Heidorn, Thomas / Trautmann, Alexandra Niederschlagsderivate	2005
68.	Heidorn, Thomas / Hoppe, Christian / Kaiser, Dieter G. Möglichkeiten der Strukturierung von Hedgefondsportfolios	2005
67.	Belke, Ansgar / Polleit, Thorsten (How) Do Stock Market Returns React to Monetary Policy ? An ARDL Cointegration Analysis for Germany	2005
66.	Daynes, Christian / Schalast, Christoph Aktuelle Rechtsfragen des Bank- und Kapitalmarktrechts II: Distressed Debt - Investing in Deutschland	2005
65.	Gerdemeier, Dieter / Polleit, Thorsten Measures of excess liquidity	2005
64.	Becker, Gernot M. / Harding, Perham / Hölscher, Luise Financing the Embedded Value of Life Insurance Portfolios	2005
63.	Schalast, Christoph Modernisierung der Wasserwirtschaft im Spannungsfeld von Umweltschutz und Wettbewerb – Braucht Deutschland eine Rechtsgrundlage für die Vergabe von Wasserversorgungskonzessionen? –	2005
62.	Bayer, Marcus / Cremers, Heinz / Kluß, Norbert Wertsicherungsstrategien für das Asset Management	2005
61.	Löchel, Horst / Polleit, Thorsten A case for money in the ECB monetary policy strategy	2005
60.	Richard, Jörg / Schalast, Christoph / Schanz, Kay-Michael Unternehmen im Prime Standard - „Staying Public“ oder „Going Private“? - Nutzenanalyse der Börsennotiz -	2004
59.	Heun, Michael / Schlink, Torsten Early Warning Systems of Financial Crises - Implementation of a currency crisis model for Uganda	2004
58.	Heimer, Thomas / Köhler, Thomas Auswirkungen des Basel II Akkords auf österreichische KMU	2004
57.	Heidorn, Thomas / Meyer, Bernd / Pietrowiak, Alexander Performanceeffekte nach Directors Dealings in Deutschland, Italien und den Niederlanden	2004
56.	Gerdemeier, Dieter / Roffia, Barbara The Relevance of real-time data in estimating reaction functions for the euro area	2004
55.	Barthel, Erich / Gierig, Rauno / Kühn, Ilmhart-Wolfram Unterschiedliche Ansätze zur Messung des Humankapitals	2004
54.	Anders, Dietmar / Binder, Andreas / Hesdahl, Ralf / Schalast, Christoph / Thöne, Thomas Aktuelle Rechtsfragen des Bank- und Kapitalmarktrechts I : Non-Performing-Loans / Faule Kredite - Handel, Work-Out, Outsourcing und Securitisation	2004
53.	Polleit, Thorsten The Slowdown in German Bank Lending – Revisited	2004
52.	Heidorn, Thomas / Siragusano, Tindaro Die Anwendbarkeit der Behavioral Finance im Devisenmarkt	2004
51.	Schütze, Daniel / Schalast, Christoph (Hrsg.) Wider die Verschleuderung von Unternehmen durch Pfandversteigerung	2004
50.	Gerhold, Mirko / Heidorn, Thomas Investitionen und Emissionen von Convertible Bonds (Wandelanleihen)	2004

49.	Chevalier, Pierre / Heidorn, Thomas / Krieger, Christian Temperaturderivate zur strategischen Absicherung von Beschaffungs- und Absatzrisiken	2003
48.	Becker, Gernot M. / Seeger, Norbert Internationale Cash Flow-Rechnungen aus Eigner- und Gläubigersicht	2003
47.	Boenkost, Wolfram / Schmidt, Wolfgang M. Notes on convexity and quanto adjustments for interest rates and related options	2003
46.	Hess, Dieter Determinants of the relative price impact of unanticipated Information in U.S. macroeconomic releases	2003
45.	Cremers, Heinz / Kluß, Norbert / König, Markus Incentive Fees. Erfolgsabhängige Vergütungsmodelle deutscher Publikumsfonds	2003
44.	Heidorn, Thomas / König, Lars Investitionen in Collateralized Debt Obligations	2003
43.	Kahlert, Holger / Seeger, Norbert Bilanzierung von Unternehmenszusammenschlüssen nach US-GAAP	2003
42.	Beiträge von Studierenden des Studiengangs BBA 012 unter Begleitung von Prof. Dr. Norbert Seeger Rechnungslegung im Umbruch - HGB-Bilanzierung im Wettbewerb mit den internationalen Standards nach IAS und US-GAAP	2003
41.	Overbeck, Ludger / Schmidt, Wolfgang Modeling Default Dependence with Threshold Models	2003
40.	Balthasar, Daniel / Cremers, Heinz / Schmidt, Michael Portfoliooptimierung mit Hedge Fonds unter besonderer Berücksichtigung der Risikokomponente	2002
39.	Heidorn, Thomas / Kantwill, Jens Eine empirische Analyse der Spreadunterschiede von Festsatzanleihen zu Floatern im Euroraum und deren Zusammenhang zum Preis eines Credit Default Swaps	2002
38.	Böttcher, Henner / Seeger, Norbert Bilanzierung von Finanzderivaten nach HGB, EstG, IAS und US-GAAP	2003
37.	Moormann, Jürgen Terminologie und Glossar der Bankinformatik	2002
36.	Heidorn, Thomas Bewertung von Kreditprodukten und Credit Default Swaps	2001
35.	Heidorn, Thomas / Weier, Sven Einführung in die fundamentale Aktienanalyse	2001
34.	Seeger, Norbert International Accounting Standards (IAS)	2001
33.	Moormann, Jürgen / Stehling, Frank Strategic Positioning of E-Commerce Business Models in the Portfolio of Corporate Banking	2001
32.	Sokolovsky, Zbynek / Strohhecker, Jürgen Fit für den Euro, Simulationsbasierte Euro-Maßnahmenplanung für Dresdner-Bank-Geschäftsstellen	2001
31.	Roßbach, Peter Behavioral Finance - Eine Alternative zur vorherrschenden Kapitalmarkttheorie?	2001
30.	Heidorn, Thomas / Jaster, Oliver / Willeitner, Ulrich Event Risk Covenants	2001
29.	Biswas, Rita / Löchel, Horst Recent Trends in U.S. and German Banking: Convergence or Divergence?	2001
28.	Eberle, Günter Georg / Löchel, Horst Die Auswirkungen des Übergangs zum Kapitaldeckungsverfahren in der Rentenversicherung auf die Kapitalmärkte	2001
27.	Heidorn, Thomas / Klein, Hans-Dieter / Siebrecht, Frank Economic Value Added zur Prognose der Performance europäischer Aktien	2000
26.	Cremers, Heinz Konvergenz der binomialen Optionspreismodelle gegen das Modell von Black/Scholes/Merton	2000
25.	Löchel, Horst Die ökonomischen Dimensionen der ‚New Economy‘	2000
24.	Frank, Axel / Moormann, Jürgen Grenzen des Outsourcing: Eine Exploration am Beispiel von Direktbanken	2000
23.	Heidorn, Thomas / Schmidt, Peter / Seiler, Stefan Neue Möglichkeiten durch die Namensaktie	2000
22.	Böger, Andreas / Heidorn, Thomas / Graf Waldstein, Philipp Hybrides Kernkapital für Kreditinstitute	2000

21.	Heidorn, Thomas Entscheidungsorientierte Mindestmargenkalkulation	2000
20.	Wolf, Birgit Die Eigenmittelkonzeption des § 10 KWG	2000
19.	Cremers, Heinz / Robé, Sophie / Thiele, Dirk Beta als Risikomaß - Eine Untersuchung am europäischen Aktienmarkt	2000
18.	Cremers, Heinz Optionspreisbestimmung	1999
17.	Cremers, Heinz Value at Risk-Konzepte für Marktrisiken	1999
16.	Chevalier, Pierre / Heidorn, Thomas / Rütze, Merle Gründung einer deutschen Strombörse für Elektrizitätsderivate	1999
15.	Deister, Daniel / Ehrlicher, Sven / Heidorn, Thomas CatBonds	1999
14.	Jochum, Eduard Hoshin Kanri / Management by Policy (MBP)	1999
13.	Heidorn, Thomas Kreditderivate	1999
12.	Heidorn, Thomas Kreditrisiko (CreditMetrics)	1999
11.	Moormann, Jürgen Terminologie und Glossar der Bankinformatik	1999
10.	Löchel, Horst The EMU and the Theory of Optimum Currency Areas	1998
09.	Löchel, Horst Die Geldpolitik im Währungsraum des Euro	1998
08.	Heidorn, Thomas / Hund, Jürgen Die Umstellung auf die Stückaktie für deutsche Aktiengesellschaften	1998
07.	Moormann, Jürgen Stand und Perspektiven der Informationsverarbeitung in Banken	1998
06.	Heidorn, Thomas / Schmidt, Wolfgang LIBOR in Arrears	1998
05.	Jahresbericht 1997	1998
04.	Ecker, Thomas / Moormann, Jürgen Die Bank als Betreiberin einer elektronischen Shopping-Mall	1997
03.	Jahresbericht 1996	1997
02.	Cremers, Heinz / Schwarz, Willi Interpolation of Discount Factors	1996
01.	Moormann, Jürgen Lean Reporting und Führungsinformationssysteme bei deutschen Finanzdienstleistern	1995

FRANKFURT SCHOOL / HFB – WORKING PAPER SERIES
CENTRE FOR PRACTICAL QUANTITATIVE FINANCE

No.	Author/Title	Year
26.	Veiga, Carlos / Wystup, Uwe Ratings of Structured Products and Issuers' Commitments	2010
25.	Beyna, Ingo / Wystup, Uwe On the Calibration of the Cheyette. Interest Rate Model	2010
24.	Scholz, Peter / Walther, Ursula Investment Certificates under German Taxation. Benefit or Burden for Structured Products' Performance	2010
23.	Esquivel, Manuel L. / Veiga, Carlos / Wystup, Uwe Unifying Exotic Option Closed Formulas	2010
22.	Packham, Natalie / Schlögl, Lutz / Schmidt, Wolfgang M. Credit gap risk in a first passage time model with jumps	2009

21.	Packham, Natalie / Schlögl, Lutz / Schmidt, Wolfgang M. Credit dynamics in a first passage time model with jumps	2009
20.	Reiswich, Dimitri / Wystup, Uwe FX Volatility Smile Construction	2009
19.	Reiswich, Dimitri / Tompkins, Robert Potential PCA Interpretation Problems for Volatility Smile Dynamics	2009
18.	Keller-Ressel, Martin / Kilin, Fiodar Forward-Start Options in the Barndorff-Nielsen-Shephard Model	2008
17.	Griebsch, Susanne / Wystup, Uwe On the Valuation of Fader and Discrete Barrier Options in Heston's Stochastic Volatility Model	2008
16.	Veiga, Carlos / Wystup, Uwe Closed Formula for Options with Discrete Dividends and its Derivatives	2008
15.	Packham, Natalie / Schmidt, Wolfgang Latin hypercube sampling with dependence and applications in finance	2008
14.	Hakala, Jürgen / Wystup, Uwe FX Basket Options	2008
13.	Weber, Andreas / Wystup, Uwe Vergleich von Anlagestrategien bei Riesterrenten ohne Berücksichtigung von Gebühren. Eine Simulationsstudie zur Verteilung der Renditen	2008
12.	Weber, Andreas / Wystup, Uwe Riesterrente im Vergleich. Eine Simulationsstudie zur Verteilung der Renditen	2008
11.	Wystup, Uwe Vanna-Volga Pricing	2008
10.	Wystup, Uwe Foreign Exchange Quanto Options	2008
09.	Wystup, Uwe Foreign Exchange Symmetries	2008
08.	Becker, Christoph / Wystup, Uwe Was kostet eine Garantie? Ein statistischer Vergleich der Rendite von langfristigen Anlagen	2008
07.	Schmidt, Wolfgang Default Swaps and Hedging Credit Baskets	2007
06.	Kilin, Fiodar Accelerating the Calibration of Stochastic Volatility Models	2007
05.	Griebsch, Susanne/ Kühn, Christoph / Wystup, Uwe Instalment Options: A Closed-Form Solution and the Limiting Case	2007
04.	Boenkost, Wolfram / Schmidt, Wolfgang M. Interest Rate Convexity and the Volatility Smile	2006
03.	Becker, Christoph/ Wystup, Uwe On the Cost of Delayed Currency Fixing Announcements	2005
02.	Boenkost, Wolfram / Schmidt, Wolfgang M. Cross currency swap valuation	2004
01.	Wallner, Christian / Wystup, Uwe Efficient Computation of Option Price Sensitivities for Options of American Style	2004

HFB – SONDERARBEITSBERICHTE DER HFB - BUSINESS SCHOOL OF FINANCE & MANAGEMENT

No.	Author/Title	Year
01.	Nicole Kahmer / Jürgen Moormann Studie zur Ausrichtung von Banken an Kundenprozessen am Beispiel des Internet (Preis: € 120,-)	2003

Printed edition: € 25.00 + € 2.50 shipping

Download:

Working Paper: http://www.frankfurt-school.de/content/de/research/publications/list_of_publication/list_of_publication
CPQF: http://www.frankfurt-school.de/content/de/cpqf/research_publications.html

Order address / contact

Frankfurt School of Finance & Management
Sonnemannstr. 9–11 ▪ D–60314 Frankfurt/M. ▪ Germany
Phone: +49 (0) 69 154 008–734 ▪ Fax: +49 (0) 69 154 008–728
eMail: e.lahdensuu@fs.de
Further information about Frankfurt School of Finance & Management
may be obtained at: <http://www.fs.de>

