WORKING PAPER

Determinants of Structured Finance Issuance – A Cross-Country Comparison

by

Sebastian A. Schuetz

University of Lüneburg
Working Paper Series in Economics

No. 197

February 2011

www.leuphana.de/institute/ivwl/publikationen/working-papers.html

ISSN 1860 - 5508

Determinants of Structured Finance Issuance – A Cross-Country Comparison

Sebastian A. Schuetz*

This version: February 2011

Especially structured finance instruments were blamed as main reason for the financial crisis 2007, but the understanding for the motivation to originate securitization products is less discovered. Therefor this paper tries to identify main balance sheet characteristics of structured finance originators. We investigate balance sheet figures for the 250 largest banks in each Europe, Germany and USA between 1994-2009. We identified different main reasons for the banks in each region to securitize that are in line with observable behavior of market participants. US banks use securitization mainly as credit risk transfer instrument and to increase performance, while European originators focus on regulatory capital arbitrage and performance improvement. For German banks securitization seems to be an appropriate funding tool. The proposed regulatory securitization changes like in Basel III are evaluated in this context, but will hit the banks not as hard as expected.

Key words: regulatory arbitrage, securitization, subprime crisis, ABS, credit risk transfer, Basel III, liquidity.

JEL-Code: G01, G21, G24, G28

*Lüneburg-Wolfsburg chamber of industry and commerce, Am Sande 1, 21335 Lüneburg, Germany, email: Schuetz@lueneburg.ihk.de, phone: +49 4131 742-176, fax: + 49 4131 742-345

Contents

Abbreviations

ABS – Asset Backed Securities

MBS – Mortgage Backed Securities

CDO – Collateralized Debt Obligation

CMBS – Commercial Mortgage Backed Securities

CRA – Credit Rating Agency

ROA – Return on Assets

ROE – Return on Equity

US-TALF – US Term-Asset Backed Securities Loan Facility

Figures and Tables

1 Introduction

In Schuetz (2010) the US structured finance issuance is analyzed. There are clear differences in the issuance of different structured finance instruments. For example the US ABS issuance has normal growth rates for nearly all instruments but home equity loan ABS. With a growth of more than 650% in six years the home equity loan ABS issuance shows that one through moral hazard behavior supported instrument could build up disreputability for a whole class of structured finance instruments. That lead to market illiquidity and therewith to book losses of even faultless securitization tranches. Similar stories could also be found for MBS and CDOs. The European structured finance market which was as illiquid as the other worldwide securitization markets, demonstrates that the facts offer other insights than the market and the international policy “tell”. Securitization is much better than its reputation. There are lots of structured finance tranches that perform well, with no downgrades, no defaults and stable outlook from credit rating agencies that were and are valuated from market participants far under the fundamental value. The A2A tranche of the Rural Hipotecario VIII transaction e.g. had losses due to market fluctuations of more than 30 percent. Even if the value is recovering it is far from its nominal value.

These book losses through depreciation cause pressure on the balance sheets of worldwide ABS investors. As shown in Schuetz (2010) the performance depends on the quality of the underlying assets. There was a high probability that book losses, that are not based on defaults or the quality of the underlying, would recover in the next economic boom period. So the sales that realized the defaults were not necessary and are mostly based on market risks and not on credit risks. Most structured finance products are protected with different instruments like excess spreads or reserve accounts that shield the tranches from losses. Nearly all investment grade tranches of European securitization instruments had no realized defaults. The Volkswagen Bank “Driver” transactions show that the defaulted loans in the underlying portfolio are in the range of 0.2% and 2.23% and hit just the

overcollateralization. Nevertheless, many investors were under pressure and sold the ABS tranches for a fraction amount of its fundamental value. Calculations of the DZ Bank show that the cumulative default rate of European ABS tranches since the beginning of the subprime crisis is 0.86%. Customer-related ABS show a lower default rate with 0.1%. Structured finance instruments with riskier underlyings like CMBS or CDOs are on a higher level with 2.7% respectively 2.5%. But the performance is much better than the performance of corporate bonds! Anyhow, it is understandable that worldwide administrations call for a more restrictive regulation of the financial system, especially for securitization in consideration of the massive bailouts. But new regulatory approaches like the collection of loan level data, which are considered as solution for lacks in regulatory frameworks, will not prevent any crisis in the future. Loan level data and quantitative tools were available for the US ABS market before the subprime crisis and did not prevent it. These tools and data did not substitute common sense. Most of the new regulations proposed in Basel III are laid down principles of the behavior of a careful and honorable merchant.

The losses are due to incentive compatibility problems that could not easily be prevented by regulators or investors. Even if there were markets which showed moral hazard behavior of originators, like in the USA with the “originate-to-distribute model, no investors were forced to buy these products. The high demand of these structured finance instruments could be due to wrong pricing evaluations (no risk adequate spread) or to a principal-agent-problem on the investor side. By the evidence of the European market we can state that this moral hazard behavior is an exception for European originators. According to that we develop a model that is independent from incentive compatibility and explain securitization as a result of a refinancing optimization, which is supported by empirical studies and market surveys. To provide evidence for the model and to gain insights if the assumed motivations for securitization are correct, we analyze the balance sheets of securitizing banks between 1994 and 2009 to validate the assumptions.

The paper is structured as follows: Section 2 provide an overview of the existing literature. In Section 3 the methodology and the indicators of the

empirical analysis are explained. Section 4 presents the microeconomic approach for securitization as the result of a banks refinancing optimization. In Section 5 the results obtained from the empirical balance sheet analysis are discussed. Section 6 summarizes the paper.

2 Literature

In a world of perfect capital markets, repackaging of loans like in structured finance instruments would be irrelevant. Because this is at odds with the unprecedented growth in the securitization market, DeMarzo (2003) developed a rational equilibrium model that is consistent with a lot of stylized facts about structured finance. The paper focused on the impact of asymmetric information and extended the security design model of DeMarzo and Duffie (1999) and the signaling model of Leland and Pyle (1977). Bernardo and Cornell (1992) analyzed a MBS auction and showed that even if all investors are highly sophisticated market participants, the winning bid exceeded the median bid by over 17% on average. DeMarzo (2005) traced this back to the fact that major investment banks have a superior ability to value the cash flows of underlying assets of structured finance instruments, while the cash flow monitoring is not seen as a major problem for all market participants. This could be one explanation why not risk adequate spreads were accepted that did not cover the defaults with the cash flows associated risks during the subprime crisis. New due diligence directives for investors proposed in Basel III try to prevent this in the future. DeMarzo (2005) showed that pooling helps to reduce the adverse selection problem and is in line with a number of papers that explored the benefits of pooling and tranching. But also other benefits could be reached with structured finance instruments.

As mentioned before the securitization market developed in an unprecedented manner. Nevertheless the growth of structured finance issuance showed also enormous differences in growth between asset classes, underlyings and originating country. Cardone-Riportella et al. (2009) noted that specific characteristics of financial entities that acted as originators in the securitization market are not clear. With an analysis of the balance sheets of securitizing banks, indications for the motivation to originate securitizations could be found. There are four motivations of securitization

noted in the literature that we also find in the BearingPoint securitization survey (2009). Recent empirical studies like Agostino and Mazzuca (2008) argued that securitization is used as funding tool. This goal could be mainly achieved via true sale transactions that transfer the credit risk and remove the assets from the banks´ balance sheet. Gorton and Pennacchi (1995) mentioned that with true sale transactions also balance sheet policy is possible e.g. to improve ratios. Minton, Sanders and Strahan (2004) and Bannier and Hänsel (2008) came to the result that structured finance transactions are mainly used as risk-transfer instrument of illiquid and risky assets. Uzun and Webb (2007) and Ambrose, Lacour-Little and Sanders (2005) mentioned among others that securitization is used as arbitrage-tool of regulatory capital and to reduce the banks´ capital requirements. Even if there were greater possibilities of regulatory arbitrage under the Basel I framework, there were still possibilities under Basel II. It became more difficult to verify regulatory capital arbitrage as the main motivation, but it should not be neglected because this goal is achievable both with true sale and synthetic structures. Although there are high fixed costs related with securitization that lead to a high share of relatively large banks that act as originators, it is possible to improve performance with securitization (Agostino and Mazzuca (2008)).

The following empirical study will extend the literature about securitization for ABS and MBS transactions for the 250 largest banks in Germany, Europe and USA with an analysis of the various factors guiding the banks in their decision to securitize. We expect specific bank characteristics, measured in balance sheet ratios, which give an indication which motivation of securitization is dominant and which business model (e.g. “originate-to-distribute”) could be derived from the empirical findings.

3 Methodology

The objective of this study is to determine the differences between what factors have been decisive in the development of the European, German and US securitization market in the period between 1994-2009. According to the motivations mentioned in the former noted literature, different balance sheet

ratios have been chosen to determine characteristics of the financial entities. Each year the banks were separated between securitizing (minimum one transaction) and non-securitizing institutions.

Generally we divide the more than 80 comprised variables into five main categories: liquidity, risk, regulatory capital, performance and general characteristics. According to different accounting standards and reporting frequencies not all comprised variables are reported here. But the results shown represent the dominant trend in the data.

For **liquidity** the following variables are considered as proxies:

- Interbank ratio: This is the ratio between lent and borrowed money between banks. The higher the ratio, the more liquid is the bank.
- Liquid assets/deposits and short term funding: The higher the ratio, the lower is the risk for a bank run.
- Liquid assets/short term liabilities: The higher the ratio the greater the possibility to fulfill the short term liabilities.
- Receivables/deposits: This ratio shows how much receivables are per deposit. The higher the ratio, the more illiquid is the bank.
- Receivables/total assets: The higher the ratio, the less liquid the bank will be because more money is lent to third parties.

From a theoretical point of view banks with a shortfall in liquidity should have a higher probability to securitize. As noted in Cardone-Riportella (2009) this lack of liquidity would motivate the banks to seek new sources of financing in the securitization market.

For **credit risk** the following variables are considered as proxies:

- Credit risk provision/net interest income: The higher the ratio, the less is the portfolio quality. Also it is a risk/performance ratio.

- Credit risk provision/impaired loans: This ratio indicates how much credit risk provision is needed for doubtful loans. The higher the ratio the poorer the quality of the loan portfolio will be.

- Impaired loans/receivables: This is a measure of the share of less qualitative receivables. The lower the ratio, the better the portfolio quality.

- Equity/receivables: This ratio indicates the protection of receivables measured in units of equity.

- Subordinated liabilities/equity: This ratio offers an impression about the risk of subordinated liabilities.

With these variables we get an impression of the risk profile of the comprised financial entities. If the banks have a high risk concentration, the theory showed securitization as a credit risk transfer instrument.

For **regulatory capital arbitrage** the following variables are considered as proxies:

- Tier 1 ratio: This is the Basel II capital adequacy ratio. The lower the ratio, the less new business is possible. Also a lower capital protection is given.

- Total capital ratio: This is Tier 1 capital + Tier 2 capital divided by total average assets.

- Equity/total assets: This ratio measures the protection of the total assets against losses. The higher the figure the more protection there is.

- Equity/liabilities: Measures the proportion between equity and liabilities.

A bank has a higher incentive to securitize assets if its regulatory capital is low. With an efficient risk transfer the financial entity could set regulatory capital free.

For **performance increase** the following variables are considered as proxies:

- Net interest margin: This is a ratio that measures the difference between the banks´ interest income and the amount of interest paid, relative to their assets. The higher the ratio, the more profitable is the financial institution.
- Cost income ratio: It measures the ratio between operating expenses and operating income. The lower the ratio, the better.
- Annual net profit/equity: Measures the annual profit per unit equity.
- Return on average equity (ROE): The amount of net income returned as a percentage of shareholders equity.
- Return on average assets (ROA): This ratio shows how efficient the total assets are generating profits.

The former literature showed inconsistent results regarding the influence and expected sign of performance on securitization issuance. Bannier and Hänsel (2008) mentioned that the need to improve the bank´s performance could be one reason for securitization.

The proxies “Total assets” and “Fixed assets” serve as indicators for general characteristics and will not be explained separately. Due to the high fix costs of securitization a positive sign is expected.

4 Microeconomics of securitization

Before we start with the algebra, we explain shortly the motivation for the refinancing cost minimization. As shown before the models of Gorton and Pennacchi (1995) and De Marzo (2003) are mainly based on incentive compatibility.

This is a question of optimal contract design to prevent moral hazard behavior. The idea why securitization was developed was the transformation of illiquid into liquid assets. Thereby different goals could be achieved that are still valid today after the subprime crisis. Securitization could be one

instrument to provide liquidity in the refinancing mix of a bank. Illiquid assets like credits or receivables could be transformed into transferable assets. With this transformation the bank could also do better risk management. With synthetic structures a simple risk mitigation is possible with securitized loans still on the own balance sheet. Independently if the bank act as originator or investor with trading of securitization a better maturity matching of the portfolio is possible. But also true sales are possible that affect the use of regulatory capital and the control of balance sheet ratios. Two advantages could also be accessible for a bank: the rating of the securitization tranches is independent of the originator and could lead to a higher rating of the underlyings so that a cheaper treasury channel is possible in liquid markets. Also, especially after the sovereign bond crisis in Europe, the tranches are bankruptcy-proof of the originator. In distressed times the securitization positions could serve as collateral at central banks to get repos like US-TALF. This is supported by the Bearingpoint survey. Figure 1 shows the reasons for origination of securitization after the subprime crisis.

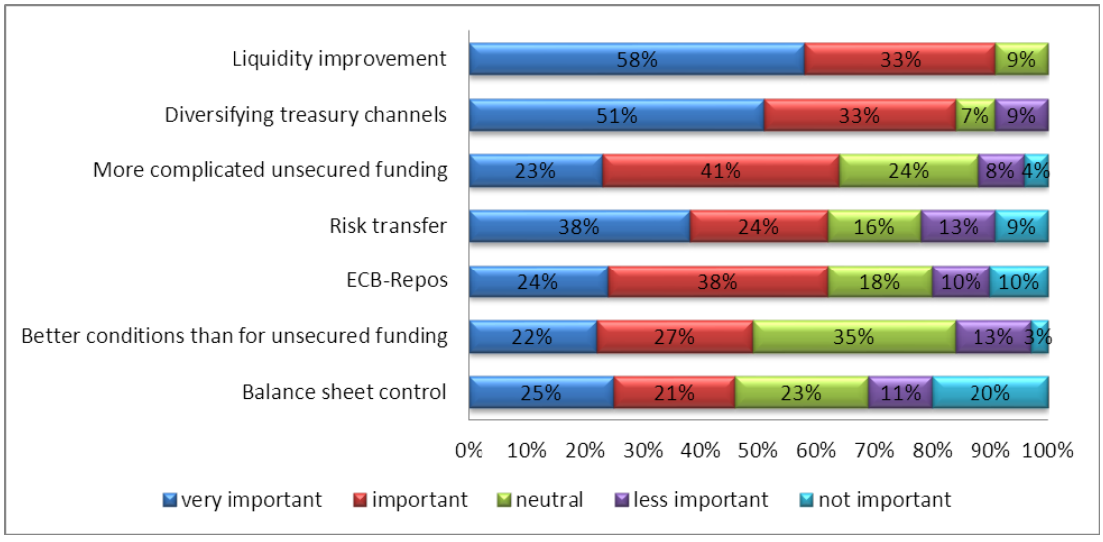


Figure 1 on the basis of Bearingpoint (2009)

Empirical studies like Agostino and Mazzuca (2008) and Martin-Oliver and Saurina (2007) showed that the only motivation found to be a determining factor in securitization is another funding channel. According to that the securitization problem is from an optimization point of a view a refinancing cost minimization problem.

Complementary to the former mentioned approaches we want to model the securitization motivation as a cost minimizing problem of different funding alternatives.

The vector **x** denotes the different funding alternatives like e.g. equity, bonds, unsecured bonds and securitization[1]. The according refinancing cost vector of **x** is **w.**

As output f(**x**)=y we define bank business like loan provision. y is not explicitly modeled because this should be a general approach independently of specific technology assumptions.

The cost-minimizing way to produce a given level of e.g loans is

$$\min_x \boldsymbol{wx} \text{ such that } f(\mathbf{x})=y$$

The according Lagrangian is

$$\Gamma(\lambda,\boldsymbol{x}) = \boldsymbol{wx} - \lambda(f(\boldsymbol{x}) - y)$$

The first-order conditions for an interior solution **x***are

$$w_i - \lambda \frac{\partial f(x^*)}{\partial x_i} = 0 \text{ for } i = 1, \ldots, n$$

$$f(\mathbf{x^*})=y$$

With a little algebra we can estimate the economic and technical rate of substitution.

$$\frac{w_i}{w_j} = \frac{\frac{\partial f(\boldsymbol{x}^*)}{\partial x_i}}{\frac{\partial f(\boldsymbol{x}^*)}{\partial x_j}} \quad i,j = 1, \ldots, n$$

[1] This is a general refinancing approach because it includes transactions that just set regulatory capital free (e.g. synthetic structures) or liquidity and regulatory capital transactions (true sale).

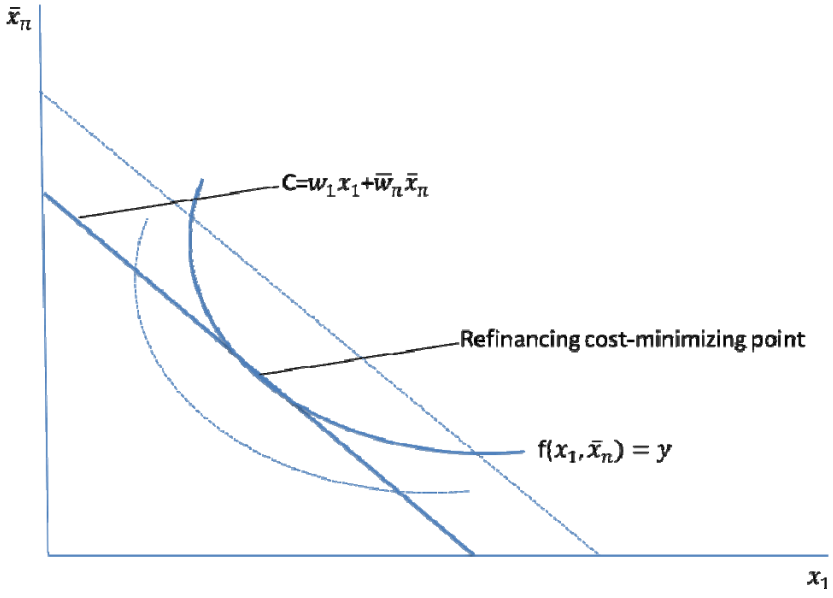


Figure 1

According to that standard microeconomic result the optimal share of securitization as funding instrument could be estimated. The treasury markets are highly competitive and therewith the spread differences between refinancing alternatives are small. Because securitization has relatively high fixed costs, this could be one reason why only large banks securitize assets and could reach in total lower average refinancing costs. According to the conditional factor demand functions that could be derived from this result, the share of securitization would decrease if the price rises.

Nevertheless could the advantage in refinancing costs vanish, if prices rise but the same securitization volume is issued. The reason for this behavior could be a risk-averse intension to maintain the ability to use a broader refinancing mix. The higher costs compared to banks that change their refinancing composition, could easily be derived from the assumptions of the cost function.

We assume that w1 is the gross[2] cost parameter for securitization. In the approach two types of banks are active: securitizing and not securitizing. For the reason of simplicity both types of banks have the same refinancing costs. Only the securitization costs could change. If w1 is lower than the average

[2] That means including the relative share of transaction costs, consulting, cra etc.

refinancing costs, the cost of the securitizing bank is lower than of the non-securitizing bank: $c^{sec}(\mathbf{w},y) < c^{nonsec}(\mathbf{w},y)$. The market changes and $w_1 > \overline{w}$. The non-securitizing banks will not change its refinancing mix because in our model all other prices are fixed. The securitizing bank would change its refinancing mix and would not issue securitizations any more. If the management has a preference for a broad liquidity mix, the securitization issuance could not be changed. The reason is that investors demand a certain period of continuing issuances as an indicator of quality.

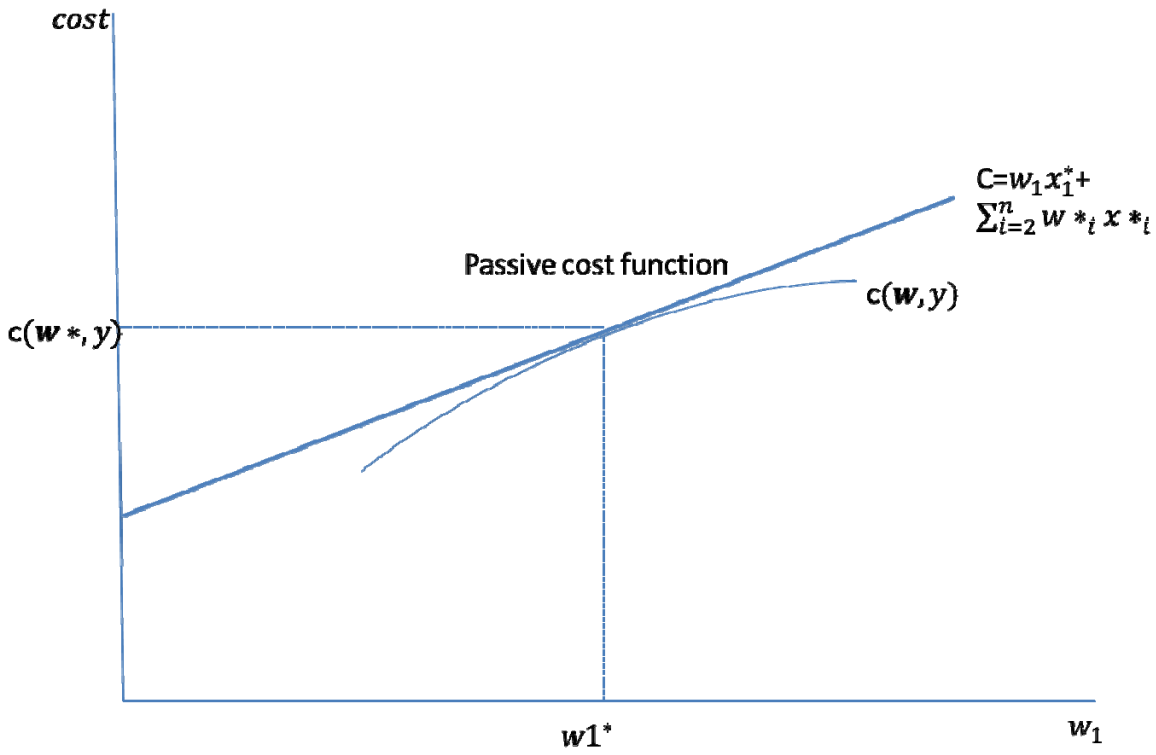
With the properties of the cost function we can derive why a mixed portfolio of treasury channels, which guarantees a higher degree of liquidity, could be not cost minimizing, if the refinancing cost of securitization is higher than its alternatives.

Of course we assume that the cost function c(**w**,y) is a continuous function of **w**. The cost function is non-decreasing in **w**, if $w' \geq w, \text{then } c(w',y) \geq c(w,y)$ and concave in **w**. c(t**w**+(1-t)**w´**,y)$\geq$ tc(**w**,y)+(1-t)c(**w´**,y) for $0 \leq t \leq 1$.

If **x*** is the refinancing cost-minimizing bundle of treasury channels at costs **w*** and the costs for securitization transactions rises from w_1^* to w_1, the securitization proportion would decline. But for investors it is an important signal of quality that there is some continuity in using treasury channels. Therefor a bank could decide to keep the securitization issuance and behave passively and continue to use **x***. The new refinancing costs will be

$$C = w_1 x_1^* + \sum_{i=2}^{n} w_i^* x_i^*$$

Because of the concavity of c(**w**,y) the cost function must lie below of the graph of the post function.



This example should clarify that securitization could be used to gain liquidity, but must not lead to averagely lower refinancing costs. Because we assumed the securitization cost parameter as gross costs, also performance increases are explainable with the model.

As a next step we want to investigate if the balance sheet analysis provides evidence for the approach.

5 Balance Sheet Analysis

The investigated sample comprises the 250 largest banks (total assets) of each Europe, Germany or USA for annual balance sheets between 1994 and 2009 of the Bankscope database. The sample includes all types of banks like savings banks, commercial banks or credit cooperatives. Just central banks and banks with abnormal ratios or outliers were eliminated from the sample. There is no limitation regarding the total assets and the minimum level of loans on each bank´s balance sheet. The reason is that also banks with relatively small levels of loans provided, could act as originator for example in multi-seller frameworks. Also, we investigated just the largest banks because of the assumed higher relevance for financial market stability.

In the first table the share of securitizing banks is reported for each investigated region. There is no detailed analysis for different bank classifications because most of the largest banks are commercial banks.

Structured finance instruments are partially standardized though customized for the individual needs of the originators. To measure the influence of structured finance instruments to financial market stability we include a broad definition of different underlyings for ABS and MBS in the sample. CDOs are excluded. The data for the individual transactions which are needed to identify originators via deal lists are collected from different sources like credit rating agencies, absnet.net, Reuters Financial Datastream, Bloomberg, True Sale International and with support from DZ Bank.

Afterwards we divide the sample of banks into a group of securitizing banks and into a group of banks that act not as originators. In a univariate framework we calculate some descriptive statistics and test for differences in means.

5.1 Empirical results

The results for **Germany** show a shortfall in liquidity. The interbank ratio is lower for securitizing banks, i.e. more dependent on liquidity from the interbank market than banks that did not securitize assets. The proxies for short term liquidity and for the protection of a bank run, liquid assets/deposits & short term funding and liquid assets/short term liabilities are both lower indicating a higher degree of illiquidity than for non-securitizing banks. The risk proxies allow the assumption that financial entities with higher risk could use securitization as a credit risk transfer instrument. German securitizing banks show indeed a clear higher value for the credit risk provision/net interest income ratio. This is not surprising because all control variables, like total assets, fixed assets or total capital are much higher for securitizing banks. Bigger banks are much likely to gain more risk than smaller banks. For these variables, positive signs are expected due to economies of scale following from the fixed costs of setting up a securitization program. The proxies for regulatory capital should capture if a bank uses securitization not only to gain liquidity but also to discharge regulatory capital for new business. The indicators, Tier 1 ratio and total capital ratio, show higher regulatory

capital for German banks and no empirical evidence for regulatory capital arbitrage. This is in line with the low volume of German true sale transactions. The indicators, net interest margin, cost income ratio, show a lower performance for securitizing banks so that the assumption of Cardone-Riportella (2009) for a performance improvement motivation for securitization could be supported. The **German** banks that securitize present, on average, lower liquidity, higher risk, higher capital ratios, lower performance, and larger size.

Other results could be found for the 250 largest **European** banks. Beside of the lower interbank ratio all other liquidity indicators, liquid assets/short term liabilities, receivables/deposits and receivables/total assets show higher liquidity for European securitizing banks. This does not mean that securitization is not an important funding instrument, but maybe other objectives are more important. Also the risk proxies, credit risk provision/impaired loans, impaired loans/receivables and equity/receivables show lower risk concentration for European securitizing banks. Risk transfer and liquidity could not be marked as important securitization motive, but regulatory capital arbitrage and performance improvement. Equity/total assets, equity/liabilities, total capital ratio, and the Tier 1 ratio are all lower than for non-securitizing banks. The performance proxies, annual net profit/equity, cost-income-ratio, net interest margin, ROE and ROA are indicate less profitability for the European securitizing banks. For the sake of completeness, European banks that are participants on the securitization market are much bigger. The **European** banks that securitize present, on average, higher liquidity, lower risk, lower capital ratios, lower performance, and larger size.

For the **USA** the main motivation could be risk transfer and performance improvement. This is in line with the originate-to-distribute business model of US securitizing banks. Credit risk provision/impaired loans, impaired loans/receivables and equity/receivables as well as subordinated liabilities/equity show higher risk concentration for US securitizing banks. The lower profitability of US securitizing banks is indicated by the proxies annual net profit/equity, cost-income-ratio, net interest margin and ROA. Regulatory

capital and liquidity ratios indicate higher values for the US originators. Also, the banks are larger. The **US** banks that securitize present, on average, higher liquidity, higher risk, higher capital ratios, lower performance, and bigger size.

Concluding the question is which consequences could be drawn from the different bank business models deduced by the different indicators regarding financial market stability.

Generally, we can state that structured finance instruments have the ability to be dangerous for financial market stability like other risky securities. But this is a problem of investor mispricing and regulatory gaps, not of a moral hazard behavior of originators (at least European). With the Basel III adjustments regarding due diligence and liquidity / leverage ratios steps in the right direction were done to reduce the probability of future financial crises, doubtlessly some regulations are more politically motivated than of empirical evidence. The question is how efficient and necessary these adjustments are. If a bank has a good and responsible risk management, the danger of huge losses due to structured finance instruments or other investment activities is adjusted on the balance sheet structure. Therefor we just want to provide some tendencies that we see in the analyzed data.

5.2 Conclusion

All investigated securitizing banks are averagely larger than non-securitizing banks. Because we investigated just the largest 250 banks in each region, all of these banks affecting the stability of the worldwide financial markets. As Lehman Brothers collapsed various interbank- and other financial markets collapsed and compromised the normal bank business. Exaggerated we could state that US banks securitize assets just to transfer credit risk and to increase performance. This is in line with an “originate-to-distribute” business model that has a lot of incentive compatibility problems and is therewith dangerous for financial market stability. Especially in Germany, but generally in Europe, the “originate-to-distribute” model is not established. In Europe and Germany the self-retention of securitizations is higher and is signaling quality. In Germany the main motivation to issue structured finance instruments is to gain liquidity. The data provide evidence for our model. A

high originator reputation and high quality transactions are required to use securitization as a long-lasting funding channel. That constrains the banks to prevent moral hazard behavior. Thus the associated risk of the German securitization transactions to destabilize financial markets is low. Also European originators are dependent of high quality transactions to set regulatory capital free. This dependence guarantees European transactions with low moral hazard risk.

Closing we want to highlight again that these transaction characteristics are not preventing losses. A healthy transaction like the Rural Hipotecario VIII had book losses of more than 30 percent. The question is if the book losses are realized through depreciation or a sale of the asset. This depends on the calmness and expertise of the bank management.

6 Summary

The subprime crisis hit the financial and real economy hard with defaults due to structured finance instruments, especially MBS. But a deeper analysis provide evidence that securitization performs better than its reputation is. Many US ABS tranches perform as expected and nearly all European transactions have at least no defaults in the investment grade tranches. Beside of exogenous motivations to issue structured finance instruments, we try to find evidence for motivations that could be deduced from balance sheets like credit risk transfer or regulatory arbitrage. In section two we provided an overview of the relevant literature on securitization in this context. Most of the research is based on incentive compatibility problems regarding securitization. We see the main motivation to issue structured finance instruments in the transformation of illiquid into liquid assets. Therefore we developed a refinancing cost minimization approach. In section three we explained the methodology to measure the motivations to issue structured finance instruments with balance sheet ratio proxies. The four motivations that could be found in the literature, liquidity, risk transfer, regulatory capital arbitrage and performance improvement are measured with ratios that were also used in similar approaches in the literature. Complementary to the existing literature we added a refinancing cost

optimization approach in section four. We showed why a securitizing bank could have averagely lower refinancing costs. But also higher refinancing costs are possible, if securitization spreads are higher than the average refinancing spread and the securitization volume is not adjusted. The reason is that investors demand regular transactions as quality indication.

Section five offered the results of the analyzed data. Irrespective of the securitization motivation all analyzed banks are the largest in Germany, Europe and USA and have therewith significant influence on worldwide financial market stability. Nevertheless offer the results an insight of the risk contribution associated with structured finance orientated business models. The securitizing banks in the USA present on average credit risk transfer and performance improvement as main motivation to issue structured finance instruments. This is associated with “originate-to-distribute” models that have a lot of incentive compatibility problems and is a potential danger for financial market stability. The transformation of illiquid into liquid assets is the main motivation for the German securitizing banks. The self-retention of securitization transactions is higher for German and European securitizing banks and reduces therewith the potential for moral hazard behavior.

Bibliography

- Agostino, M. and M. Mazzuca (2008). Why do Banks Securitize: Evidence from Italy, XVI Spanish Finance Forum.
- Bannier, C.E. and D.N. Hänsel (2008). Determinants of European Banks´ Engagement in Loan Securitization, Deutsche Bundesbank, Discussion Paper, Series 2: Banking and Financial Studies, No.10.
- Bernardo, A. and B. Cornell (1997). The Valuation of Complex Derivatives by Major Investment Firms, Journal of Finance, 52, pp. 785-798.
- BearingPoint (2009). Studie “Zukunft der Verbriefung in Europa”, www.bearingpoint.de/content/industries/index_9251.htm.
- DeMarzo, P. and D. Duffie (1999). A Liquidity Based Model of Security Design, Econometrica 67, pp. 65-99.
- DeMarzo, P. (2005). The Pooling and Tranching of Securities: A Model of Informed Intermediation, The Review of Financial Studies, 18, 1, pp. 1-35.
- Gorton, G.B. and G.G. Pennacchi (1995). Banks and Loan Sales Marketing Nonmarketable Assets, Journal of Monetary Economics, 35, pp. 389-411.
- Leland, H. and D. Pyle (1977). Information asymmetries, financial structure and financial intermediaries, Journal of Finance, 32, pp. 371-387.
- Martin-Oliver, A. and J. Saurina (2007). Why Do Banks Securitize Assets?, XV Spanish Finance Forum.

Table 1: Securitization share

		1994	1995	1996	1997	1998	1999	2000	2001
USA	**Securitizing Banks**	25,00%	25,00%	27,70%	28,00%	34,00%	36,50%	40,70%	43,80%
Europe	**Securitizing Banks**	9,20%	7,30%	10,20%	11,40%	13,10%	15,70%	18,50%	20,10%
German	**Securitizing Banks**	14,30%	14,30%	14,30%	14,80%	16,60%	18,80%	23,50%	30,00%
		2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
USA	**Securitizing Banks**	43,70%	45,60%	45,90%	48,00%	48,80%	49,00%	49,00%	48,00%
Europe	**Securitizing Banks**	23,20%	26,60%	28,70%	32,00%	33,40%	35,80%	36,10%	38,00%
German	**Securitizing Banks**	34,40%	40,00%	43,40%	42,10%	44,50%	45,00%	45,90%	42,70%

Table 2: Univariate results for Germany

Germany		N	Range	5% Percentile	95%Percentile	Median	Mean	Std. Error	Std. Dev.	P-value
Securitising	total assets	480	3,13E+09	1,40E+06	6,42E+08	2,52E+07	1,49E+08	2,99E+08	8,92E+16	0,00
	interbank ratio	451	933,44	10,03	377,78	71,31	104,98	133,53	17831	0,00
	liquid assets/deposits	463	2,82	0,49	1,22	0,79	0,78	0,25	0,06	0,00
	liquid assets/short term liabilities	464	210,24	4,14	110,75	38,90	45,97	34,97	1223	0,00
	credit risk provision/net interest income	474	2,93	0,48	1,41	0,65	0,77	0,37	0,14	0,00
	fixed assets	459	9,66E+06	2,21E+03	3,58E+06	3,53E+04	6,08E+05	1,50E+06	2,24E+12	0,00
	total capital	62	3,97E+07	8,18E+05	3,69E+07	1,56E+07	1,60E+07	1,25E+07	1,56E+14	0,00
	Tier 1 ratio	142	25,80	4,70	16,16	7,25	8,80	4,86	23,59	0,00
	total capital ratio	135	24,40	8,70	20,33	11,30	12,41	4,33	18,76	0,02
	net interest margin	477	12,33	0,21	4,20	1,00	1,42	1,37	1,87	0,00
	CIR	469	481,66	30,06	98,76	65,90	65,58	30,32	919,27	0,00
Non-securiti	total assets	932	6,46E+08	4,71E+06	2,62E+08	1,48E+07	5,25E+07	9,21E+07	8,48E+15	
	interbank ratio	883	941,69	7,51	541,52	76,45	132,90	168,48	2,84E+04	
	liquid assets/deposits	905	8,96	0,33	1,21	0,61	0,71	0,47	0,22	
	liquid assets/short term liabilities	909	777,12	3,63	246,35	27,93	57,90	87,09	7585	
	credit risk provision/net interest income	927	1,01	0,21	0,99	0,41	0,51	0,28	0,08	
	fixed assets	926	6,27E+06	4167,00	1,05E+06	7,74E+04	2,34E+05	5,99E+05	3,59E+11	
	total capital	43	3,68E+07	2647,25	2,69E+07	1,65E+06	6,90E+06	9,92E+06	9,83E+13	
	Tier 1 ratio	174	21,10	4,60	13,65	6,50	7,54	3,19	10,18	
	total capital ratio	186	21,10	8,40	18,27	10,40	11,50	3,60	12,97	
	net interest margin	930	51,51	0,33	3,21	1,54	1,79	3,30	10,86	
	CIR	910	227,99	23,23	85,93	60,01	58,61	21,15	447,28	

Table 3: Univariate results for Europe

Europe		N	Range	5% Percentile	95%Percentile	Median	Mean	Std. Error	Std. Deviation	P-value
Securitising	total assets	422	3,81E+09	2,13E+07	2,24E+09	3,80E+08	6,33E+08	6,85E+08	4,70E+17	0,00
	interbank ratio	299	973,25	23,87	181,93	67,62	85,36	75,53	5705	0,00
	liquid assets/short term liabilities	420	888,89	11,18	178,66	47,87	69,73	93,30	8704	0,12
	receivables/deposits	394	97,53	4,74	84,56	48,84	47,44	24,39	595,03	0,00
	receivables/total assets	384	95,99	2,00	71,35	40,01	37,21	23,39	547,04	0,00
	credit risk provision/impaired loans	275	425,70	35,04	168,19	61,13	74,02	55,55	3086	0,00
	impaired loans/receivables	282	24,34	0,40	7,50	2,31	2,89	2,42	5,84	0,03
	equity/receivables	382	308,69	3,29	85,15	9,07	21,17	49,18	2418	0,03
	equity/total assets	422	43,66	0,98	7,56	3,26	3,73	3,41	11,63	0,00
	equity/liabilities	422	602,68	1,70	33,57	6,76	12,82	36,89	1361	0,00
	total capital ratio	223	18,30	9,20	14,19	11,00	11,30	1,86	3,46	0,00
	Tier 1 ratio	279	19,10	6,20	12,30	8,20	8,56	2,03	4,14	0,00
	annual net profit/equity	241	291,38	-26,65	16,65	6,82	1,64	24,03	577,58	0,01
	CIR	266	260,52	1,00	115,63	61,76	67,78	27,76	770,44	0,00
	net interest margin	433	8,56	-0,04	4,00	0,92	1,28	1,38	1,92	0,05
	ROE	397	676,59	-28,81	22,86	9,45	3,33	37,90	1437	0,00
	ROA	411	13,8	-0,69	1,00	0,32	0,27	0,78	0,60	0,00
Non-securiti	total assets	641	1,49E+09	2,30E+06	4,02E+08	4,49E+07	9,67E+07	1,66E+08	2,76E+16	
	interbank ratio	528	966,19	9,81	442,31	80,63	135,00	158,65	25171	
	liquid assets/short term liabilities	550	777,07	6,17	189,94	39,84	62,78	86,76	7528	
	receivables/deposits	522	111,99	18,06	100,13	63,33	61,08	24,75	612,75	
	receivables/total assets	453	99,54	0,74	88,70	49,66	43,88	27,35	748,08	
	credit risk provision/impaired loans	218	980,24	25,92	323,51	68,60	103,92	112,17	12581	
	impaired loans/receivables	237	16,16	0,12	9,45	2,86	3,33	2,87	8,22	
	equity/receivables	437	605,42	2,00	30,34	8,70	14,94	40,37	1630	
	equity/total assets	584	85,16	0,83	9,27	4,03	4,91	6,39	40,88	
	equity/liabilities	567	739,57	3,12	57,65	7,50	22,78	73,91	5462	
	total capital ratio	406	223,40	8,40	20,93	11,60	14,43	18,00	324,01	
	Tier 1 ratio	302	114,00	5,52	17,72	8,50	10,37	10,38	107,80	
	annual net profit/equity	254	180,85	-3,20	20,60	5,08	5,60	11,94	142,67	
	CIR	360	320,02	17,40	87,80	57,26	56,58	27,33	747,15	
	net interest margin	519	9,00	0,17	3,54	1,09	1,42	1,28	1,65	
	ROE	374	207,93	-2,99	27,41	9,39	10,10	13,28	176,33	
	ROA	544	10,58	-0,09	1,55	0,35	0,46	0,71	0,50	

Table 4: Univariate results for USA

US		N	Range	5% Percentile	95%Percentile	Median	Mean	Std. Error	Std. Deviation	P-value
Securitising	total assets	609	2,18E+09	4,24E+06	7,56E+08	4,10E+07	1,53E+08	2,76E+08	7,63E+16	0,00
	credit risk provision/impaired loans	496	902,70	30,26	642,34	227,60	261,28	178,73	31946	0,35
	impaired loans/receivables	526	20,80	0,08	3,62	0,59	1,19	2,15	4,62	0,00
	equity/receivables	585	990,99	9,08	75,48	14,09	26,66	63,26	4001	0,00
	subordinated liabilities/equity	310	40,81	2,43	32,94	19,30	18,55	9,62	92,52	0,00
	annual net profit/equity	585	439,11	-12,81	18,64	7,34	4,95	21,16	447,87	0,13
	CIR	602	698,98	16,29	91,41	60,37	61,86	40,57	1646	0,21
	net interest margin	608	21,76	0,56	6,96	3,52	3,51	2,15	4,61	0,02
	ROA	514	53,81	-0,87	5,05	1,77	1,63	2,99	8,95	0,43
	Tier 1 ratio	499	395,90	7,00	27,20	9,10	12,99	24,37	593,84	0,05
	liquidity ratios	602	806,58	2,29	66,98	9,21	20,06	40,47	1638	0,00
Non	total assets	1038	6,68E+08	1,50E+06	9,04E+07	1,22E+07	2,67E+07	4,62E+07	2,14E+15	
securitising	credit risk provision/impaired loans	896	950,83	36,94	691,06	201,16	257,31	197,51	39010	
	impaired loans/receivables	970	18,69	0,10	2,53	0,54	0,85	1,05	1,11	
	equity/receivables	1032	294,51	8,53	35,01	13,30	17,71	21,73	472,40	
	subordinated liabilities/equity	474	82,56	2,77	30,87	15,16	15,99	10,67	113,76	
	annual net profit/equity	1005	607,45	-8,90	18,21	8,26	6,17	20,90	436,75	
	CIR	1033	563,72	35,58	79,36	57,86	60,27	33,85	1146	
	net interest margin	1035	15,04	1,46	6,29	3,70	3,73	1,56	2,44	
	ROA	900	25,95	-0,08	3,63	1,72	1,65	1,83	3,34	
	Tier 1 ratio	930	146,91	7,00	18,10	10,10	11,15	6,25	39,02	
	liquidity ratios	1021	721,99	1,23	36,16	6,11	12,61	37,04	1372	

Working Paper Series in Economics

(recent issues)

No.196: *Joachim Fünfgelt and Günther G. Schulze*: Endogenous Environmental Policy when Pollution is Transboundary, February 2011

No.195: *Toufic M. El Masri*: Subadditivity and Contestability in the Postal Sector: Theory and Evidence, February 2011

No.194: *Joachim Wagner*: Productivity and International Firm Activities: What do we know?, January 2011

No.193: *Martin F. Quaas* and *Stefan Baumgärtner*: Optimal grazing management rules in semi-arid rangelands with uncertain rainfall, January 2011

No.192: *Institut für Volkswirtschaftslehre*: Forschungsbericht 2010, Januar 2011

No.191: *Natalia Lukomska, Martin F. Quaas and Stefan Baumgärtner*: Bush encroachment control and risk management in semi-arid rangelands, December 2010

No.190: *Nils Braakmann:* The causal relationship between education, health and health related behaviour: Evidence from a natural experiment in England, November 2010

No.189: *Dirk Oberschachtsiek and Britta Ulrich:* The link between career risk aversion and unemployment duration: Evidence of non-linear and time-depending pattern, October 2010

No.188: *Joachim Wagner:* Exports and Firm Characteristics in German Manufacturing industries, October 2010

No.187: *Joachim Wagner:* The post-entry performance of cohorts of export starters in German manufacturing industries, September 2010

No.186: *Joachim Wagner:* From estimation results to stylized facts: Twelve recommendations for empirical research in international activities of heterogenous firms, September 2010

No.185: *Franziska Dittmer and Markus Groth:* Towards an agri-environment index for biodiversity conservation payment schemes, August 2010

No.184: *Markus Groth:* Die Relevanz von Ökobilanzen für die Umweltgesetzgebung am Beispiel der Verpackungsverordnung, August 2010

No.183: *Yama Temouri, Alexander Vogel and Joachim Wagner:* Self-Selection into Export Markets by Business Services Firms – Evidence from France, Germany and the United Kingdom, August 2010

No.182: *David Powell and Joachim Wagner:* The Exporter Productivity Premium along the Productivity Distribution: First Evidence from a Quantile Regression for Fixed Effects Panel Data Models, August 2010

No.181: *Lena Koller, Claus Schnabel und Joachim Wagner:* Beschäftigungswirkungen arbeits- und sozialrechtlicher Schwellenwerte , August 2010

No.180: *Matthias Schröter, Markus Groth und Stefan Baumgärtner:* Pigous Beitrag zur Nachhaltigkeitsökonomie, Juli 2010

No.179: *Norbert Olah, Thomas Huth and Dirk Löhr:* Monetary policy with an optimal interest structure, July 2010

No.178: *Sebastian A. Schütz:* Structured Finance Influence on Financial Market Stability – Evaluation of Current Regulatory Developments, June 2010

No.177: *Franziska Boneberg:* The Economic Consequences of One-third Co-determination in German Supervisory Boards: First Evidence from the German Service Sector from a New Source of Enterprise Data, June 2010
[forthcoming in: Schmollers Jahrbuch / Journal of Applied Social Science Studies]

No.176: *Nils Braakmann:* A note on the causal link between education and health – Evidence from the German short school years, June 2010

No.175: *Torben Zülsdorf, Ingrid Ott und Christian Papilloud:* Nanotechnologie in Deutschland – Eine Bestandsaufnahme aus Unternehmensperspektive, Juni 2010

No.174: *Nils Braakmann:* An empirical note on imitative obesity and a puzzling result, June 2010

No.173: *Anne-Kathrin Last and Heike Wetzel:* Baumol's Cost Disease, Efficiency, and Productivity in the Performing Arts: An Analysis of German Public Theaters, May 2010

No.172: *Vincenzo Verardi and Joachim Wagner:* Productivity premia for German manufacturing firms exporting to the Euro-area and beyond: First evidence from robust fixed effects estimations, May 2010

No.171: *Joachim Wagner:* Estimated capital stock values for German manufacturing enterprises covered by the cost structure surveys, May 2010
[published in: Schmollers Jahrbuch / Journal of Applied Social Science Studies 130 (2010), 3, 403-408]

No.170: *Christian Pfeifer, Simon Janssen, Philip Yang and Uschi Backes-Gellner:* Training Participation of an Aging Workforce in an Internal Labor Market, May 2010

No.169: *Stefan Baumgärtner and Martin Quaas:* Sustainability Economics – general versus specific, and conceptual versus practical, May 2010
[forthcoming in: Ecological Economics]

No.168: *Vincenzo Verardi and Joachim Wagner:* Robust Estimation of Linear Fixed Effects Panel Data Models with an Application to the Exporter Productivity Premium, April 2010

No.167: *Stephan Humpert:* Machen Kinder doch glücklich? April 2010

No.166: *Joachim Wagner:* Produktivität und Rentabilität in der niedersächsischen Industrie im Bundesvergleich. Eine Benchmarking-Studie auf der Basis vertraulicher Firmendaten aus Erhebungen der amtlichen Statistik, April 2010
[erschienen in: Statistische Monatshefte Niedersachsen, Sonderausgabe "Kooperation Wissenschaft und Statistik - 20 Jahre Nutzung von amtlichen Mikrodaten", S. 30 - 42]

No.165: *Nils Braakmann:* Neo-Nazism and discrimination against foreigners: A direct test of taste discrimination, March 2010

No.164: *Amelie Boje, Ingrid Ott and Silvia Stiller:* Metropolitan Cities under Transition: The Example of Hamburg/ Germany, February 2010

No.163: *Christian Pfeifer and Stefan Schneck:* Relative Wage Positions and Quit Behavior: New Evidence from Linked Employer-Employee-Data, February 2010

No.162: *Anja Klaubert:* "Striving for Savings" – religion and individual economic behavior, January 2010

No.161: *Nils Braakmann:* The consequences of own and spousal disability on labor market outcomes and objective well-being: Evidence from Germany, January 2010

No.160: *Norbert Olah, Thomas Huth und Dirk Löhr:* Geldpolitik mit optimaler Zinsstruktur, Januar 2010

No.159: *Markus Groth:* Zur Relevanz von Bestandseffekten und der Fundamentalen Transformation in wiederholten Biodiversitätsschutz-Ausschreibungen, Januar 2010

No.158: *Franziska Boneberg:* Die gegen das Drittelbeteiligungsgesetz verstoßende Aufsichtsratslücke existiert. Replik zu „Das Fehlen eines Aufsichtsrates muss nicht rechtswidrig sein“ von Alexander Dilger, Januar 2010
[erschienen in: Zeitschrift für Industrielle Beziehungen, 1 (2010)]

No.157: *Institut für Volkswirtschaftslehre:* Forschungsbericht 2009, Januar 2010

No.156: *Alexander Vogel, Joachim Wagner, Kerstin Brunken und Arno Brandt:* Zur Beschäftigungsentwicklung in der Region Hannover - Ein Vergleich mit 12 deutschen Verdichtungsräumen, Dezember 2009

No.155: *Nils Braakmann and Joachim Wagner:* Labor market adjustments after a great import shock: Evidence from the German clothing industry and the Multi-Fibre Arrangement, December 2009

No.154: *Joachim Wagner:* Zehn Jahre *European Data Watch*: Dokumentation von Datensätzen für die empirische Wirtschafts- und Sozialforschung und Zugangswegen zu den Daten, Dezember 2009
[erschienen in: AStA - Wirtschafts- und Sozialstatistisches Archiv 4(2010), 2, 141-149]

No.153: *Joachim Wagner:* Offshoring and work performance: Self-Selection, effects on performance, or both? December 2009
[revised version forthcoming in: Review of Word Economics]

No.152: *Christian Pfeifer:* Effective Working Hours and Wages: The Case of Downward Adjustment via Paid Absenteeism, November 2009

No.151: *Christian Pfeifer:* Adjustment of Deferred Compensation Schemes, Fairness Concerns, and Hiring of Older Workers, November 2009

No.150: *Franziska Boneberg:* Recht und Realität von Mitbestimmung im westdeutschen Dienstleistungssektor: 11 Fallstudien, November 2009

No.149: *Birgit Müller, Martin Quaas, Karin Frank and Stefan Baumgärtner:* Pitfalls and potential of institutional change: Rain-index insurance and the sustainability of rangeland management, November 2009

No.148: *Alexander Vogel, Florian Burg, Stefan Dittrich und Joachim Wagner:* Zur Dynamik der Export- und Importbeteiligung deutscher Industrieunternehmen – Empirische Befunde aus dem Umsatzsteuerpanel 2001-2006, Oktober 2009
[publiziert in: Wirtschaft und Statistik, Heft 11(2009), 1109-1116]

No.147: *Markus Groth:* Potentiale und Risiken der Nutzung von Methan aus Methanhydraten als Energieträger, Oktober 2009

No.146: *Sandra Derissen, Martin Quaas and Stefan Baumgärtner:* The relationship between resilience and sustainable development of ecological-economic systems, October 2009
[forthcoming in: Ecological Economics]

No.145: *Anne-Kathrin Last und Heike Wetzel:* Effizienzmessverfahren – Eine Einführung, September 2009

No.144: *Horst Raff and Joachim Wagner:* Intra-Industry Adjustment to Import Competition: Theory and Application to the German Clothing Industry, September 2009
[published in: The World Economy 33 (2010), 8, 1006-1022]

No.143: *Nils Braakmann:* Are there social returns to both firm-level and regional human capital? – Evidence from German social security data. September 2009

(see www.leuphana.de/institute/ivwl/publikationen/working-papers.html for a complete list)

Leuphana Universität Lüneburg
Institut für Volkswirtschaftslehre
Postfach 2440
D-21314 Lüneburg
Tel.: ++49 4131 677 2321
email: brodt@leuphana.de
www.leuphana.de/institute/ivwl/publikationen/working-papers.html