Adapt to the Outside But Stay True to Your DNA-Report on the 5th International Conference on Credit Risk Analysis and Management

Simone Westerfeld and Beatrix Wullschleger*

For the third time we could welcome international academics and practitioners for a successful credit risk conference in Basel consisting of the streams Regulation, Credit Portfolio Models, Credit Analysis & Ratings, CDS & Bond Pricing, and Risk Analysis. Jointly organized by the University of Applied Sciences Northwestern Switzerland and the University of Basel and co-chaired by the Universities of Regensburg, Hohenheim, Oakland, Rotterdam, St. Gallen, and the University of Applied Sciences in Vorarlberg, the 5th Conference on Credit Risk Analysis and Risk Management was held on 14/15th September 2017. The bi-annual conference series is intended to establish a discussion platform on credit analysis and related topics for both academia and banking practice alike. Around 55 international academics and practitioners gathered in Basel to discuss keynotes and latest academic research.

The first keynote speakers opening the conference program on Thursday afternoon represent two of the currently most widely discussed institutions in the financial industry: Regulatory bodies and Fintech companies. Both institutions try to adapt to the outside and the changing environment while staying true to their intrinsic DNA: Jacob Bjorheim, head of asset management at BIS, focused in his speech on the reserves management of central banks and the nature of risk-free assets used as reserves from a central bank perspective. Conventional, pre-crises thinking assumes that securities held in central bank reserve portfolios should provide safe-haven in times of financial/economic stress, be highly liquid, stable and riskless as well as a reference point for the pricing of other assets. Pre-crises, these characteristics mainly applied to fixed income securities of sovereign (related) issuers with a high credit quality and short- to medium-term maturities. The historical context of long moderate economic growth, low and

* Simone Westerfeld, CFO und Mitglied der Konzernleitung der Basler Kantonalbank sowie Titularprofessorin an der Universität St.Gallen (HSG), Aeschevorstadt 41, 4002 Basel, E-Mail: simone.westerfeld@unisg.ch.

Beatrix Wullschleger, Hochschule für Wirtschaft FHNW Basel, Institut für Finanzmanagement, Peter-Merian-Strasse 86, 4002 Basel-CH, E-Mail: beatrix.wullschleger@fhnw.ch.

stable inflation, moderate to declining public debt-levels and functioning as well as reliable political institutions in combination with macroeconomic/finance models led in the past to the perception that sovereign bonds in general are free of any repayment risk. During the financial and euro sovereign debt crises, market participants started differentiating between safe and not-so-safe sovereign bonds. On the one hand, safe sovereign bonds carried market, and possibly currency risk. On the other hand, not-so-safe sovereign bonds carry, in addition to the risks of safe sovereign bonds, credit, liquidity and reputational risk. As market participants do not change their perceptions in a linear fashion, sovereign bonds changed in investors' view from "too safe" to "too risky" rather quickly. For the future, Jacob Bjorheim predicts a primacy of monetary policy (i. e. support domestic currency, provide domestic financial system with foreign currencies) over reserve management. Safe securities therefore, should be negatively correlated with the market's general risk appetite.

Christoph Hirnschall, Lead Credit Analytics at Advanon, an authorized financial intermediary in Switzerland, gave an insight into the use of novel data sources. The Fintech Start-up uses data from novel sources like social media, accounting software, online user behavior, public websites, news platforms, but also traditional data sources like financial statements, bank statements, and credit rating reports to predict short-term repayment behavior of SMEs. The main goal of Advanon is to provide liquidity to SMEs, especially to hidden champion and financially troubled firms. Based on an algorithmic approach they provide credit risk information in real time for their clients interested in financing SMEs. Thereby, new data sources combined with machine learning build the foundation of the repayment prediction of SMEs. Thus, Christoph Hirnschall emphasized the importance of an early investment in data quality, an appropriate handling of changing data over time and the necessity to take calculated risks. Finally yet importantly, advanced programs need human know how, that is strong outliers are dealt with manually, so one of the statements of the Lead Credit Analytics at Advanon.

The first academic session covered predominantly regulation-related topics and featured three contributions. In her paper "Central Counterparty Capitalization and Misaligned Incentives" *Wenqian Huang* (Vrije Universiteit Amsterdam) investigates incentives and optimal regulation of a profit driven central counterparty (CCP) with limited liability. Starting point of this research is the introduction of central clearing for OTC derivatives to enhance financial stability after the global financial crises. Central counterparties are positioned between buyers and sellers, providing protection against counterparty risk. Nowadays CCPs play a crucial role for the financial markets, wherefore their insolvency could be a harmful event for the financial system, so the paper. The regulation of CCPs has a high rank on regulation agenda. Especially due to the fact, that many CCPs are profit-driven public companies (i. e. CME in USA, Eu-

rex in Europe). Due to their profit driven character, the question remains if CCPs are properly incentivized for their systemic role to manage risk, i. e. if the capitalization of CCPs is healthy enough. The author therefore investigates the incentives as well as the capitalization of CCPs. Using a static partial equilibrium model the paper finds among other things that a benevolent CCP, one that maximizes total welfare surplus, favors high capital when capital costs are low. On the other hand a profit-driven CCPs, one that maximizes own value and has limited liability, chooses minimum capital if no capital requirements are given. As the paper shows, this leads to insolvency problems: If a CCP exposes less of her own capital to potential default, it has an incentive to lower risk management standard in order to attract a higher trading volume. As the traders are aware of the potential insolvency they become reluctant to trade, which requires CCPs to lower the collateral requirements even further, to increase trading volume. In addition, the paper finds that an optimal capital requirement for a profit-driven CCP depends on the profitability of volume-based fees charged by the CCP. A high fee level tempts a profit-driven CCP to increase trading volume, wherefore the CCP will opt for a relatively low collateral level. Hence, an optimal capital requirement would retain market discipline and would not try to absorb all default losses through the capital requirements of the CCPs, so the conclusion of the paper.

Jonathan Acosta Smith (Bank of England)*, Michael Grill* and *Jan Hannes Lang* (both form European Central Bank) analyze in their paper "The Leverage ratio, risk-taking and Bank Stability" potential impacts on banks of the introduction of the Basel II Leverage Ratio (LR). Additionally to the existing risk-based capital framework, a non-risk based leverage ratio was introduced under the new Basel II capital framework. To ensure a stable financial system as well as economy, excessive leverage in the banking sector which could lead to an destabilizing deleveraging process should be restricted. The leverage ratio attracted some criticism mainly based on the fact that the LR is only binding for those banks with a large share of low risk-weighted assets in their balance sheets. In consequence, the move away from a solely risk-based capital requirement could incentivize these banks to increase their risk-taking. Therefore, the authors try to answer the open questions concerning the trade-off between risk-taking and higher loss-absorption associated with a leverage ratio. First, they build a simple theoretical model, which finds, that the introduction of an LR always incentivizes banks to modestly increase risk-taking if equity is sufficiently costly. An explanation for this result delivers the non-risk based nature of the LR, which reduces the marginal cost of risk-taking as there is no penalty of having to hold more capital for riskier assets than for less risky assets. However, this increase in risk-taking is limited because banks which take too much additional risk move back into the risk-based capital framework. In addition, the negative impact of increased risk-taking should be outweighed by the positive impact of an in-

creased loss-absorbing capacity due to larger capital reserves. Therefore, the second step of their paper includes a test of the risk-taking and capital positions of banks with low leverage ratios after the announcement of the LR as well as an estimation of the joint effects of the leverage ratio and risk-taking on bank distress probabilities. Finally, a combination of these two empirical results should provide an answer if the LR is beneficial for bank stability, that is, show if an increase loss-absorbing capacity can offset the negative impact of the estimated increase in risk-taking. The paper presents empirical evidence supporting both hypotheses. An introduction of an LR alongside the risk-based capital framework is positive so the conclusion of the authors. The two measures reinforce each other making sure banks do not operate with excessive leverage and simultaneously have sufficient incentives to keep risk-taking in check.

In their paper "The Real Effects of Bank Distress: Evidence from Bank Bailouts in Germany" *Johannes Bersch* (Centre for European Economic Research), *Hans Degryse* (KU Leuven and CEPR), *Thomas Kick* and *Ingrid Stein* (both Deutsche Bundesbank) address the question of potential impact of bank distress on their customer's perceived probability of default. As for many topics of this conference, the starting point of this paper is the financial crises 2008, which highlighted that banks are vital roots of shocks for the real economy. The paper therefore investigates the impact of bank distress on a firm's probability of distress, as perceived by an independent credit rating agency. The authors especially focus on the question whether there are different effects of bank distress depending on the default probability of a firm and/or the relationship orientation of a bank. Finally, they examine whether there is a difference in the impact depending on the nature of the bank distress event (i.e. idiosyncratic or in time of a systemic banking crisis). The empirical analysis of bank bailouts in Germany (2000–2013) leads to the conclusion that bank distress followed by a bailout increases the probability of default and lowers the maximum loan recommendations. Nevertheless, the authors find different results for relationship and transaction banks: While relationship banks decrease the probability of default for high-risk firms and increase the default probability for low risk firms, transaction banks lead to a higher probability of default for firms with above median riskiness. The final finding of the paper suggests that bank-induced risk effects are more pronounced in times of systemic crises – in this data set the financial crises 2008/2009 – where also the probability of default for high-risk firms of relationship banks increases.

In the second stream three presenting authors spoke about the newest research results in the world of "Models". *Hans-Peter Burghof* and *Marlis Schairer* (both from University of Hohenheim) explore in their paper "Loan Performance of Contractual Savings for Housing" the German housing loan system which is partially based on a system of contractual savings for housings (CSH), the "Bausparsystem". Mainly, they analyze if the mandatory saving period as a pre-

condition for loan approval has a positive impact on the creditworthiness of the pool of borrowers. The main finding of the paper is that contractual saving for housing can support a decline in the problem of asymmetric information and therefore in credit risk for loans given to private households. The authors attribute the low default rates to information collected during the saving period and therefore, in accordance with relationship lending theory, to the longer prior relationship.

The paper "Ambiguity, Volatility, and Credit Risk" written by *Patrick Augustin* (McGill University) and *Yehuda Izahkian* (Baruch College) focuses on the implications of ambiguity, the uncertainty about the probabilities of future outcomes of financial investments. Ambiguity comes in addition to risk, the uncertainty about the realization of future states. While risk has been studied thoroughly, the effect of ambiguity on asset prices has been little explored. With an empirical investigation of the impact of ambiguity on the pricing of credit default swaps the authors try to close this gap. They apply a stylized model with heterogeneous investors to the credit default swaps (CDS) market. Due to the fact, that CDS payoffs are linked to the likelihood of a firm-specific credit event, i. e. default, the CDS market is optimal for testing the effect of ambiguity in combination with risk on prices of financial insurance products. The paper yields the following main results: The impact of ambiguity and risk on CDS spreads is diametrically opposed and the economic impact of both measures is equally important. The finding, that ambiguity, in contrast to risk, has a negative impact on spreads, leads the authors to the conclusion, that the marginal investor is a net buyer of credit protection.

In his paper "Recovery News" *Claus Schmitt* (Erasmus University, Rotterdam School of Management) investigates whether information in credit ratings is valuable for investors. It is uncontested that credit ratings influence the financing costs of firms. However, on the one hand there is no final empirical conclusion about the impact of credit ratings on security prices. More precisely, no final answer has been found whether credit rating agencies provide investors with private credit risk information about firms that is disclosed to the agencies during the rating process. On the other hand, the fact that credit ratings influence the costs of holding a security for regulated investors (i. e. banks, insurance companies) is not empirically proven. A new rating type of Standard & Poor's, reflecting expected recovery outcomes is used to isolate the impact of the information component in credit ratings on security prices as they do not cause a change in debt ratings and therefore do not imply changes in regulatory costs. The author's first finding is that bondholders welcome higher expected recovery rates of bonds, i. e. that yield spreads decrease in the aftermath of a positive news release about futures recovery prospects. Second, the paper concludes that, contrary to the first finding, stock returns decrease and implied volatilities increase after positive news about expected recovery expectations.

This leads to the final conclusion, that credit rating provide valuable information for investors.

The second conference day started with the third academic stream concentrating on "Credit Analysis and Ratings". *Marc Altdörfer*, *Carlos A. de las Salas Vega* (both Ulm University), *Andre Guettler* (Ulm University and Halle Institute of Economic Research), and *Gunter Löffler* (Ulm University) analyze in the paper "European versus Anglo-Saxon Credit View: Evidence from the Eurozone Sovereign Debt Crisis" the effect of country ties of rating agencies on sovereign credit ratings. Starting point of this study is the disapproval of the three big credit rating agencies Moody's, Standard & Poors, and Fitch during the sovereign debt crises based on an Anglo-Saxon dominance in the rating market and a perceived anti-Europe bias. Using the European sovereign debt crisis as a natural laboratory, the authors find that the ratings of Fitch, the rating agency with stronger ties to Europe due to the dual headquarter (New York and London), are more favorable to Eurozone issuers during the crisis. Nevertheless, Fitch rating changings seem to be neglected by the investors. The authors find no influence on bond yield spreads, while investors react strongly and significantly to rating changings by Moody's and S&P, measured by the bond yield spreads. These results suggest that the proposed need for an independent European credit rating agency is not given as investors are more willing to follow the more conservative view of Moody's and S&P.

Lieven De Moor (Vrije Universteit Brussel), *Piet Sercu* (KU Leuven), *Luitel Prabesh* (Vrije Universteit Brussel and KU Leuven), and *Rosanne Vanpée* (KU Leuven) analyze in the paper "Subjectivity in sovereign credit ratings" the impact of the subjective component on a sovereign credit rating. The focus lies on the replicability of sovereign credit ratings as well as the size, role, and economic costs of this subjective component. The missing replicability of credit ratings lead to criticism during the financial crises and therefore to regulatory changes in the aftermath of the global financial crises with the aim of enhancing the transparency of the credit rating process. The leading credit rating agencies emphasis since 2010 their changed methods for assigning sovereign credit ratings, that is a larger focus on quantitative data and less on qualitative and judgmental inputs. With a more careful disentanglement of the objective and the subjective components of sovereign credit ratings, the authors provide additional insights into this topic. Their first finding, based on a machine-learning algorithm, is that subjective factors are relatively important in the credit rating process but have a small average economic impact. More precisely, the authors find the highest upward adjustment for countries just below investment grade (BBB), but no evidence that subjectivity results in higher borrowing costs for the respective sovereigns. Their second result is that the subjective component in sovereign credit ratings is important. In their ordered logit model, the subjective component proves to be a better predictor of sovereign default than the objective component.

In the paper "Multiple credit ratings and market heterogeneity" *Vu Tran* (Swansea University), *Rasha Alsakka*, and *Owain ap Gwilym* (both Bangor University) study the information content of rating news. By assessing a model where multiple ratings interact with market heterogeneity, they intend to contribute to the discussion about the informational value of credit rating agencies and the question of necessary regulations in the industry. According to the authors, the model shows that the information value of rating news does not lie exclusively in the first agency revealing a new information about the creditworthiness of an issuer and therefore contributing to the price discovery process. Moreover, other agency's confirmation of the new element could also play a decisive role in coordinating the heterogeneous beliefs of the investors, so the understanding of the paper. Empirical tests, based on a sample (2007–2013) of the largest three credit rating agencies sovereign ratings on all countries with a floating foreign exchange system, confirm that rating news coordinate investors' heterogeneous beliefs. Finally, the authors state that sovereign credit ratings are necessary for reducing market uncertainty and therefore should further exist because negative rating news do not increase price volatility as assumed prior to this study.

An interesting mix of topics and personalities characterized the second keynote session on Friday. Dimitris Petmezas, Professor of Finance at the University of Surrey kept the audience in the world of sophisticated empirical academic research. He presented a research project dealing with credit ratings and acquisitions. The paper is based in the "managing for rating hypothesis" which states that firms reduce acquisition activities as ratings improve and that this effect is especially true for firms with the highest ratings. Based on acquisition data of listed US firms rated by Standard&Poor's between 1989 and 2011, the authors find a curvilinear relation between credit ratings and acquisitiveness. That is, at low levels of credit ratings number and size of acquisitions increase as credit ratings improve, but announced returns decrease. In the meanwhile beyond the low investment grade threshold at high ratings additional rating increases reduce number of acquisitions, but improve the achieved returns. An additional finding of the paper is the fact that acquisitions have a negative impact on credit ratings for firms with high credit ratings, and on the contrary, firms with low ratings have a higher probability of rising ratings after making an acquisition. The authors therefore conclude that there is an independent effect of credit ratings on acquisition decisions and that beside financial characteristics also historical acquisition activities influence rating agencies decisions.

Luciano Donati, Senior Manager at the Thinkthank e-foresight captured the conference audience with his speech about RegTech. He defined the term RegTech as the use of new technologies for a more effective and efficient solution of regulatory and compliance problems. As many of the presented topics, RegTech has its origin also in the financial crises of 2008. Since this time an in-

creased level of financial market regulation, as well as fines and penalties for non-compliance require innovation and the application of new technologies. In Switzerland, alone 25 Regtech startups use data analysis, artificial intelligence, machine learning, and cloud applications etc. for innovative solutions to new regulations in the financial industry. Luciano Donati highlighted the benefits of RegTech as an improvement in efficiency, saving of costs, reduction of operational risks, simplification, effectiveness and speed.

In the fourth stream "Derivatives", the following works caught participants' attention. *Jongsub Lee*, *Andy Naranjo*, and *Guner Velioglu* (all three University of Florida) presented the paper "When do CDS Spreads Lead? Rating Events, Private Entities, and Firm-specific Information Flows". They analyze the role of CDS spreads in the creation of firm specific credit information around important credit events based on a broad sample of public and private US firms from 2001 to 2013. Using a panel vector autoregression model they find that CDS spreads contain unique, firm-specific credit risk information not captured by other related securities like stocks and bonds of the same firm. The paper shows that CDS lead bonds and that there is a joint contribution to price discovery of CDS and stocks. The authors conclude that CDS spreads are especially decisive for price discovery when firm credit risk matters most. An additional finding of the paper is that CDS returns predict stock returns, especially the idiosyncratic components of stock returns.

In the paper "Foreign Acquisition and Credit Risk: Evidence from the U.S. CDS Market" *Umit Yilmaz* (Swiss Finance Institute, Università della Svizzera italiana) analyzes the effect of foreign acquisitions on credit risk and stock volatility of US firms. Firms acquired by foreign investors exhibit a higher perceived credit risk in form of higher CDS premiums than firms acquired by domestic investors so the main finding of the paper. Additionally the author finds an increase in the total and the idiosyncratic risk component in the target firm's stock volatility. As an explanation for the higher firm-level risk of firms acquired by foreign investors measured by the stock return volatility, the paper mentions the larger exposure to international events as well as an informational disadvantage of foreign investors. The last point includes the fact that information flowing to foreign investors needs to overcome physical, linguistic, or cultural distances. An increase in the dispersion of the analysts' earnings forecast is also given as evidence for the higher firm-level risk of acquired firms by the author of the paper.

The change in the impact of securitization on bank's loan supply over the business cycle is the subject of the paper "Secondary loan markets and bank loan supply" by *H. Özlem Dursun-de Neef*, and *Stefan Hirth* (both Aarhus University). By applying a simple two-period model the authors study whether the existence of a secondary loan market changes the credit supply of banks. They

assume that the liquidity in the secondary market is a good proxy for the business cycle as the buying capacity of investors depends on the economic state. Firstly, the authors proof that the existence of a secondary loan market has an impact on the loan supply of banks, and that this effect changes over time. While the loan supply increases in normal times, banks reduce their loan supply in crisis times. In addition, they identify that securitization leads to a decrease in bank capital ratios in normal times and an increase in crisis times. Finally, the paper finds a more pronounced underinvestment when the secondary loan market is illiquid and therefore, asks the regulators to be aware of the fact that an illiquid secondary loan market will lower loan supply and not increase as intended by the policy measure.

The last stream "Risk Analysis" completes the academic program with two papers aiming to break new soil in risk analysis. *André Lucas*, *Julia Schaumburg* (both VU University Amsterdam and Tinbergen Institute), and *Bernd Schwaab* (European Central Bank) focus in the paper "Bank business models at zero interest rates" on the highly heterogeneous banking data. Empirically studying 208 European banks between 2008 and 2015, the paper captures the global financial crisis (2008–2009), the euro area sovereign debt crises (2010–2012), and the persistent low-interest environment of the post-crises period (2013–2015). The applied novel dynamic statistical model reliably clusters banks into homogeneous groups and indicates different effects of the observed crisis on banks with different business models. Domestic retail lenders and mutual/cooperative-type banks were affected the least so one of the conclusions of the paper. Additionally, the authors point out several changes in banks' business models when long-term interest rates change. On average banks grow larger when long-term interest rates decrease, they built up assets in their trading portfolios to offset declines in loan demand, widen their derivative books, and sometimes increase leverage and decrease funding through customer deposits. These effects, so the conclusion of the authors, could be problematic for the financial stability.

"Feedback Between Credit and Liquidity Risk in the US Corporate Bond Market" is the title of *Rob C. Sperna Weiland's* (University of Amsterdam), *Roger J. A. Laeven's* (University of Amsterdam) and *Frank de Jong's* (Tilburg University) paper examining the dynamic interaction between credit and liquidity risk and their impact on bond prices and risk. In an empirical analysis, they evaluate a case study on Ford Motor Company, as well as US bond portfolios sorted by rating. Their introduction of a new model, in which dynamic feedback loops between liquidity and credit risk are possible, enables a decomposition of bond yield spreads into pure credit, pure liquidity, credit-induced liquidity, and liquidity-induced credit components. Due to the newly integrated dynamic feedback, the model allows a study of the causal impact of credit shocks on liquidity, and vice versa. The applied model indicates asymmetric feedback between credit and liquidity risk and finds more pronounced effects for bonds with lower

credit ratings. Additionally, the authors demonstrate that worsening liquidity conditions, mainly induced by deteriorating credit conditions, were the main cause for the widening of yield spreads during the financial crises. The Ford Case study further gives evidence for a changing yield spread decomposition over time. While the credit-induced liquidity component, especially for bonds with lower credit ratings, is about 8–17 % of total 10-year yield spread in normal times, it goes up to over 40 % of total yield spreads in turbulent periods. Finally, the authors point out the importance of their results for risk management procedures: Ignoring credit-liquidity interactions could result in a significant underestimation of risk. As a result the capital buffers, especially for bond with lower credit ratings could be too low, so the final conclusion of the paper.

The lively discussions throughout the two conference days confirmed the significance of the current research and the need for ongoing research in the area of credit analysis and risk management. Ten years have passed since the outburst of the financial crises, but the impacts of the crises and the need for adequate means against further crises are still pervasive in literature as well as in daily business. The fast-paced environment of today's global financial network and the increasing importance of digital applications challenge academics and practitioners. The current particular situation on the financial markets with ongoing low interest rates and the development of new financial products call for sophisticated but practicable models and effective regulation, alongside with well-wrought incentive schemes.

The 5th International Conference on Credit Analysis and Risk Management encouraged the exchange of knowledge and experiences among academics and practitioners and therefore contributed to the addressing of weaknesses and raising awareness for future challenges in the field of credit analysis and affiliated areas.

We are looking forward to the next Basel Workshop on Credit Risk in 2019!