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Annual Report 2017 of the Cologne Research Centre for Reinsurance

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Foreword

The reinsurance market is currently faced with great challenges and profound changes. Even after the large NatCat claims in Q3-2017, the substantial hardening of the reinsurance market for which reinsurers had hoped failed to materialise in the year-end renewal. Interest is now focussed on the renewal of retrocession agreements as at 1st April 2018.

The Cologne Research Centre for Reinsurance analyses the latest developments in the reinsurance market and, where appropriate, monitors these through research projects. In the process, the Cologne Research Centre for Reinsurance links its research activities with practices in the reinsurance sector. Hereby, and facilitated through organisation of the annual Cologne Reinsurance Symposium and the Annual Meeting of the Sponsoring Group Reinsurance, a bi-directional transfer of knowledge between theory and practice is pursued.

The content of these two scientific events, as well as the completed research projects, are incorporated into scholarship and instruction at the Institute of Insurance Studies, rounding out practice-oriented training in the field of reinsurance.

Currently, there are seven researchers and two coordinating employees on the staff of the Cologne Research Centre for Reinsurance. Thereby, all material and personnel costs are fully financed by third-party funds provided by the Sponsoring Group Reinsurance.

We want to thank the Sponsoring Group Reinsurance, the University leadership and administration, and the employees of the Cologne Research Centre for Reinsurance for all their support for the research projects and events of the past year.

Cologne, January 2018

Prof. Stefan Materne, FCII
Director of the Cologne Research Centre for Reinsurance

Cologne Research Centre for Reinsurance

In this annual report, the Cologne Research Centre for Reinsurance documents its scientific research projects in detail, as a way of providing friends and supporters with a report on the research work carried out by the Research Centre.

The Cologne Research Centre for Reinsurance was founded in 2008. Through accreditation, in 2009 it was extended into a formal research focus.

Financing for the Cologne Research Centre for Reinsurance (personnel expenses for all employees, materials, literature, as well as travel expenses, etc.) is provided entirely through third-party made available by the Sponsoring Group Reinsurance, which currently comprises 90 participating member companies.

The Cologne Research Centre for Reinsurance is a member of the IIS (International Insurance Society) research network.

Research projects in 2017

Below is a brief listing of the main research topics for the Cologne Research Centre for Reinsurance, together with the employees responsible for them.

- **Dietmann**, Manuel: 'Effectiveness of the System of Governance in Focus'.

After years of focus on the quantitative requirements of Pillar 1, the focus of the German Federal Financial Supervisory Authority [*BaFin*] is now on those qualitative requirements of Solvency II that go hand-in-hand with the consistent establishment of an effective governance system. In its current circular (MaGo), *BaFin* discusses its (in some respects) more stringent requirements with regard to the organizational and operational structure of the insurance companies under Solvency II.

- **Hoos**, Sebastian: 'Critical Analysis of the Practical Application of the Definition of an Event'.

Sebastian Hoos examined the way in which the definition of an 'event' is applied in practice, as the topic is one of perennial critical discussion on the reinsurance market. The reason for this is that the reinsurance case in the underlying contracts is not always clearly and unambiguously defined. This can lead to problems of delimitation. As the market has often shown, the assignor and the reinsurer do not always have the same understanding of which individual claims may be aggregated on the basis of a particular event. This can lead to malfunctioning in cover and, concomitant with this, a need for coordination between the two parties. Against this background, the market-typical clauses were examined under criteria of clarity and practicability.

- **Wang**, Lihong: 'Chinese Automobile Vehicles Recall Insurance'.

The research project focusses on the developments and the challenges ahead for the Chinese Automobile Vehicles Recall Insurance. In 2016 alone, over 10 million vehicles were recalled in China, which was almost one quarter of the cars being produced or sold in China in the same year. The numbers of recall announcements and affected vehicles have been increasing rapidly year on year due to legal environment changes and stricter government oversight, as well as the transition from vehicles moving from traditional towards connected and autonomous driving. The findings will provide a deeper insight of the background and recent recall statistics.

- **Lassen**, Fabian: 'Employees in the Reinsurance Industry: A Comparison between Germany and the USA'.

The German reinsurance industry is compared with its US counterpart, primarily on the basis of the number of employees. Reinsurance premiums written in both countries are consulted in order to ascertain how

high the per-capita reinsurance premium is in the two countries. The aim is to use this information to differentiate between the two countries while highlighting special features in each. This research also investigates whether the efficiency of the two countries can be measured in this way.

- **Pütz**, Fabian: In 2017, research by Fabian Pütz focussed particularly on the project topic of 'Alternative Capital and Basic Risk in the Standard Formula of Solvency II'

  The aim of the research was to investigate the extent to which requirements under Solvency II take adequate account of actuarial basic risk and counterparty-default risk under the principle of 'substance over form'. Against this backdrop, taking cat bonds as the sample case and based on the specifics of alternative risk-transfer instruments, the requirements of Solvency II were critically analysed in terms of their economic impact.

  The research concludes that the requirements of Solvency II relative to consideration of cat bonds largely coincide with the economic mechanism involved in calculating the risk-capital requirement for counterparty-default risk. Given the typically prepaid nominal amount of the cat bond in secured collateral, the counterparty default risk is usually negligible.

  Regarding the assessment of actuarial basic risk, working from various definition approaches, it was found that the result of a fundamentally sweeping definition approach under Solvency II could be that actuarial basic risk may even need to be attributed to traditional reinsurance cover on a compensation basis, although this contradicts the prevailing market understanding. Based on the representation that even contractual elements of traditional reinsurance policies on a compensation basis (franchises, (partial) exclusions, ...) can have the same economic effect, this definition approach thus essentially protects the principle of 'substance over form'. As an analysis of the requirements of Solvency II makes apparent, however, this view is disrupted in part, potentially leading to unequal treatment of instruments with materially comparable effects.

- **Knocks**, Kai-Olaf: ‚Autonomous Driving: Evolution or Revolution of the Motor-Vehicle (Re-)Insurance Market?'.

  Motor-vehicle insurance remains the largest segment in German non-life/accidence insurance, with a volume of premiums of EUR 25.9 billion in 2016. However, an increasing number of voices in the market are predicting the imminent end of motor-vehicle insurance. Studies show that nearly 90% of all accidents are the result of human error. Autonomous driving could thus bring about a considerable reduction in the frequency of claims. The significant decline in claims payments would also lead to a collapse in premium volume for this segment. But how quickly can such a development take place? The so-called 'smartphone revolution' is often cited as an example of a rapid,

disruptive market development brought on by technological progress. But is this development actually transferable to the market for motor-vehicle insurance? That the period of transformation in the motor-vehicle market will be considerably longer is suggested when one considers new technologies and their spread in vehicle stock. Taking the evolution of ESP as an example, it turns out that the current inventory penetration of 70% has been some 20 years in coming. There are currently around 45 million cars in Germany, while the number of new vehicles is relatively constant at around 3 million per year. These data can be used to extrapolate a possible scenario for the penetration of autonomous vehicles. The most recent current estimate by a major German car manufacturer comes from BMW and forecasts a capability for series production of self-driving vehicles by 2021. For purposes of the scenario analysis, an assumption must also be made about the share of autonomous vehicles among all new vehicles. The point of departure assumed here is 5% in 2021. This share increases on a linear basis in the years that follow, to 1/3 after five years and 2/3 after ten years. After 15 years, it is assumed that a 100% share of vehicles will be self-driving. Based on these assumptions, the share of autonomous vehicles among all vehicles can be expected to stand at approx. 20% in the year 2030. Even under an extreme scenario – with every new vehicle sold self-driving from 2021 – it would take until 2035 to penetrate the entire stock of motor vehicles. These assumptions about average claim and frequency of claims would thus lead to a reduction of approx. 10% in the claims requirement for motor-vehicle liability insurance by 2025. What this scenario fails to consider, however, are the effects of additional new risks. Above all, cyber risk will also inevitably be introduced as a result of increasing networking of vehicles in the motor-vehicle sector. It also remains to be seen how the autonomous vehicles will interact with what in some cases are irrational-behaving, non-autonomous vehicles still on the road. In the area of hull insurance, the continuing increase in the burden of natural hazards will negatively impact claims requirements. Finally, and particularly from the perspective of reinsurers, the falling premium volume will lead to increasing volatility.

The mobility approach of our society is certain to change in the coming years. Where the motor-vehicle (re)insurance market is concerned, though, the development we can expect to see will be more evolutionary than revolutionary.

- **Böggemann**, Jan: 'Optimising the Approach of an Industrial Insurance Company for the Purchase of Optional Reinsurance'

Mr Böggemann sheds light on the industrial insurance market, which is doing business in a hotly contested competitive environment in an increasingly globalised world. Because this development leads to increasing levels of liability risks and insured amounts, industrial insurers must increasingly rely on optional reinsurance. The processes involved in optional purchases of reinsurance are tested for efficiency to generate a competitive advantage. This is how efficiency gains can be passed along to the policyholder in the form of reduced premiums. Another advantage can result in accelerated tendering and underwriting decisions. In this context, there is also an examination of the

basic decision of whether optional reinsurance protection is optimally – as was the case thus far – organised by the assignor's underwriter, or whether this is passed over to the responsibility of the passive reinsurance department.

- **Joniec**, Robert: 'Actuarial Swap'.

Research on the actuarial swap is based on observations that point to structural inefficiencies in the market for the transfer of actuarial risk. The actuarial swap was developed as a financial contract that can replicate the cash flows and associated risk transfer of traditional quota share reinsurance. This has been demonstrated in principle, as well as numerically with the aid of a Monte Carlo simulation. A product landscape that has been extended in this way promises to improve competition between alternative and traditional risk transfer. The real potential, however, seems to be determined largely by exogenous factors – regulatory acceptance along with market cycles in insurance and capital markets. The mode of action of these factors was also described, permitting a multidisciplinary analysis of the market. Within this analysis, the focus was placed on the practicability of the actuarial swap. Results of research activities permit an interpretation of individual insurance policies as investment products and lead to further basic questions.

- **Koch**, Wolfgang: 'Public-Private Partnership: Support of Emerging and Developing Countries'.

The project topic dealt with the question of whether climate insurance in the form of sovereign cat pools and cat bonds provide suitable financial protection against natural disasters in emerging and developing countries. The cooperation that this requires between states and private companies – (re)insurance companies in this case – is generally referred to as a 'public-private partnership'. This elaboration is based on sources and expert interviews by Munich Re (2017) and on sources from Liebwein (2009). First, the extent of natural disasters in emerging and developing countries was presented in comparison to developed countries. The extent of the damage, and the large insurance gap versus industrialised countries, made it clear that financial hedging by means of climate insurance can be a suitable approach. Sovereign cat pools and cat bonds in particular offer many advantages over downstream ex-post financing; among other things, this privileges ex ante measures to avert or mitigate losses. Furthermore, in the event of a claim, quick financing is ensured by a parametric index as a trigger. In the course of the elaboration, it turned out that climate insurance solutions largely limit adverse selection and moral hazard. Risks such as the basic risk must not go overlooked in this context, however. After weighing up the opportunities and risks involved, it can be stated that public-private partnerships can cushion economic shocks through quick payments, thus creating resilience in emerging and developing countries. The latest testimony to a functioning sovereign cat pool is CCRIF in the Caribbean. The first, rapid pay-outs in the form of aid to the Caribbean states were introduced through this pool in the wake of 'Harvey', 'Irma' and 'Maria', in September 2017.

- **Materne**, Stefan: 'Protectionism through Regulation'.

Prof. Materne generalises the project, begun in 2016, concerning the changed registration of third-country reinsurers in Germany to address the question of whether there is a trend discernible worldwide towards – presumably unintentional – protectionism through regulatory change. Another example of this change can be seen in the newly implemented regulatory system, C-ROSS, in China, with the implicit consequence of geographically fragmenting risk capital once more, following a countervailing trend in recent years.

The planned publications on the individual research themes, as well as the research projects planned for 2018, are listed in the final section of this Report.

New external referee for the Cologne Research Centre for Reinsurance

At the end of last year, **Ingo Wichelhaus** (Executive Board, BVZL International) became an external referee for all publications – in addition to providing internal quality assurance. With his expertise gained from many years in the reinsurance industry, he is a great asset to our team.

Administration of the Cologne Research Centre for Reinsurance

Ms **Brigitte Schumann-Kemp** coordinates and monitors the process of scientific activities at the Cologne Research Centre for Reinsurance. In cooperation with Ms Schumann-Kemp, Ms **Vanessa Pollari** (B.A.) organises the administration and coordination of the Research Centre. Ms **Laura Rengard** works in a supporting capacity as a student assistant.

V. Pollari

B. Schumann-Kemp

L. Rengard

Publications, lectures, interviews and events in 2017

Publications

The Cologne Research Centre for Reinsurance issued the following publications during the period under report:

Materne, Stefan (ed.): Proceedings des Researcher' Corner zur 10. Jahrestagung des Förderkreises Rückversicherung am 7. Juli [Proceedings of the Researchers' Corner at the 10th Annual Meeting of the Sponsoring Group Reinsurance on 7th July], Publikationen der Kölner Forschungsstelle Rückversicherung, Band 5/2017 (Forthcoming).

Materne, Stefan (ed.): Jahresbericht 2017 der Kölner Forschungsstelle Rückversicherung [Annual Report 2016 of the Cologne Research Centre for Reinsurance]. Cologne: Cologne University of Applied Sciences. Publikationen der Kölner Forschungsstelle Rückversicherung, Band 1/2018 (Forthcoming).

Materne, Stefan / **Seemayer**, Thomas: Rückversicherung [Reinsurance], in: Halm/Engelbrecht/Krahe (eds.): Handbuch des Fachanwalts Versicherungsrecht [Specialist Attorney's Manual on Insurance Law], 6th edition, Cologne (Forthcoming).

Pütz, Fabian / **Materne**, Stefan: Alternative Capital und Basisrisiko in der Standardformel (non-life) von Solvency II [Alternative Capital and Basic Risk in the Standard Formula (Non-Life) of Solvency II], Cologne University of Applied Sciences. Publikationen der Kölner Forschungsstelle Rückversicherung, Band 4/2017. Also forthcoming in Forschung am **ivw**Köln, Band 8/2017.

Materne, Stefan: Die US-Schäden testen die ILS-Investoren. [US Claims Are Testing ILS Investors.] Interview in Versicherungswirtschaft heute, 04.12.2017, http://versicherungswirtschaftheute. de/maerkte-vertrieb/chinas-ruckversicherer-leiden-unter-regulierung.

Wang, Lihong: Dragon with Endurance – How China's Economic Slowdown Impacts the Insurance Industry, Versicherungswirtschaft (VW) 12/2017, S. 48-50.

Materne, Stefan: Chinas Rückversicherungsmarkt stagniert aufgrund zunehmender Regulierung. [China's Reinsurance Market Is Stagnating Due to Increasing Regulation.]. Interview in Versicherungswirtschaft (VW) 12/2017, S. 49.

Pütz, Fabian / **Wichelhaus**, Ingo / **Materne**, Stefan: Konzeption eines proportionalen Solvency Bonds zur Reduktion des vorzuhaltenden Risikokapitals für das Prämien- und Reserverisiko unter Solvency II [Conceptual Design of a Proportional Solvency Bond for Reduction of the Risk Capital Required for the Premium and Reserve Risk Under Solvency II], Zeitschrift für Versicherungswesen (ZfV) 21/2017, S. 660-662.

Schumann-Kemp, Brigitte: Report, 14th Cologne Reinsurance Symposium: Rückversicherung 2017 – Protektionismus durch Regulierung? [Reinsurance 2017: Protectionism Through Regulation?] Cologne University of Applied Sciences. Publikationen der Kölner Forschungsstelle Rückversicherung, Band 3/2017.

Kaiser, Lucas: Bedeutung von Ratings für Rückversicherungsunternehmen [The Importance of Ratings for Reinsurance Companies], Cologne University of Applied Sciences. Publikationen der Kölner Forschungsstelle Rückversicherung, Band 2/2017.

Materne, Stefan (ed.): Jahresbericht 2016 der Kölner Forschungsstelle Rückversicherung [Annual Report 2016 of the Cologne Research Centre for Reinsurance]. Cologne University of Applied Sciences. Publikationen der Kölner Forschungsstelle Rückversicherung, Band 1/2017.

Materne, Stefan (ed.): Forschungsbericht 2016 des Forschungsschwerpunkts Rückversicherung [Research Report 2016 of the Research Focus on Reinsurance]. In: Forschungsbericht für das Jahr 2016 [Research Report for the Year 2016], Forschung am **ivw**Köln, Band 1/2017.

Hoos, Sebastian: Die (Rück-)Versicherung von Flüchtlingsunterkünften unter dem Blickwinkel der Terrorismusregelungen in der deutschen Sachversicherung [(Re-)Insurance of Refugee Accommodations from the Perspective of Anti-Terrorism Regulations in German Property Insurance], Zeitschrift für Versicherungswesen (ZfV) 01/2017, S. 25-27.

Lectures

The following lectures were given by members of the Research Centre during the reporting period:

Lassen, Fabian: Local weather-related events. Eurapco Meeting, on 10th October 2017 in Bern.

Pütz, Fabian: Alternative Capital und Basisrisiko in der Standardformel (non-life) von Solvency II [Alternative Capital and Basic Risk in the Standard Formula (Non-Life) of Solvency II]. 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Dietmann, Manuel: SFCR: Erkenntnisse zur erstmaligen Veröffentlichung [SFCR: Findings for Initial Publication]. 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Böggemann, Jan: Optimierung des Einkaufs fakultativer Rückversicherung eines Industrieversicherers. [Optimizing the Purchase of Optional Reinsurance by an Industrial Insurer.] 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Joniec, Robert: Actuarial Swap. 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Kaiser, Lucas: Auswirkung verschiedener Determinanten auf das Rating von Rückversicherungsunternehmen. [The Impact of Different Determinants on the Rating of Reinsurance

Companies.] 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Wang, Lihong: Chinese Automobile Vehicle Recall Insurance. 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Hoos, Sebastian: Kritische Analyse der Praxisanwendung der Ereignisdefinition [Critical Analysis of the Practical Application of the Definition of an Event] 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Lassen, Fabian: Beschäftigte in der Rückversicherungsindustrie – Deutschland und USA. [Employees in the Reinsurance Industry: Germany and the USA.] 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Knocks, Kai-Olaf: Autonomes Fahren – Evolution oder Revolution? [Autonomous Driving: Evolution or Revolution?] 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Koch, Wolfgang: Public Private Partnership in Schwellen- und Entwicklungsländern (Posterbeitrag). [Public-Private Partnership in Emerging and Developing Countries (Poster Contribution).] 10th Annual Meeting of the Sponsoring Group Reinsurance, 7th July 2017, in Niederkassel, Uckendorf.

Materne, Stefan: Rückversicherung 2017 – Protektionismus durch Regulierung? [Reinsurance 2017: Protectionism through Regulation?] 14th Cologne Reinsurance Symposium, 23rd May 2017 in Cologne.

Materne, Stefan: 'Die geänderten Zulassungsbedingungen für Drittstaaten-Rückversicherer in Deutschland, Fachtagung des Deutschen Anwaltvereins „Die Assekuranz im Wandel – Aktuelle Entwicklungen im europäischen und internationalen Versicherungsrecht' ['The Changed Conditions of Admission for Third-Country reinsurers in Germany', Symposium of the German Bar Association: 'The Insurance Industry in Transition: Current Developments in European and International Insurance Law'], Obernai near Strasbourg, 11th February 2017.

Interviews

Members of the Research Focus also conducted the following interviews:

Materne, Stefan: Interview with Lorenz Kielwein on the mathematical systems-theory approach to teamwork in companies. 10th Annual Meeting of the Sponsoring Group Reinsurance, Niederkassel, Uckendorf, 7th July 2017.

Materne, Stefan: Interview with Frank Baumann on his experience in reinsurance purchasing. 10th Annual Meeting of the Sponsoring Group Reinsurance, Niederkassel, Uckendorf, 7th July 2017.

Materne, Stefan: Interview with Prof. Dr. Roland Berger on the economic and financial situation in the Federal Republic of Germany. Guy Carpenter Reinsurance Workshop, Königswinter/Bonn, 20th September 2017.

Planned research projects and events in 2018

Planned research projects:

Work on and publication of the following research projects are expected in 2018:

- **Dietmann**, Manuel: 'Implementation Status of MaGo in the Insurance Sector'.

  Manuel Dietmann analyses implementation of the circular on Minimum Requirements under Supervisory Law on the System of Governance of Insurance Undertakings (MaG0) in German insurance practice. Summarised in a circular, the interpretation of the requirements for the business organisation of insurance compiles the supervisory authority's expectations for organisational and operational structure under Solvency II principles. An integral part of this analysis involves the regular internal review of the business organisation.

- **Hoos**, Sebastian: 'Examination of the material damage requirement under fire reinsurance cover'.

  Fire insurance is a non-life insurance that extends to financial compensation for destroyed, damaged or lost mobile or immobile property (material damage) of the insured. In a broader sense, fire insurance also covers lost income resulting from material damage. In addition to material damage and lost income, certain costs that are associated with the material damage and lost income and also entail a financial loss by the insured party (consequential pecuniary loss) may also be covered. In principle, financial losses without triggering insured material damage are not covered in the German market under conventional fire reinsurance policies. Within the scope of his project work, Sebastian Hoos analyses whether and, in the event, which original coverage extensions (may) lead to a possible opening in the compulsory reinsurance policies for lost income losses without preceding material damage.

- **Joniec**, Robert: How do reinsurance markets value risk management services provided by reinsurers?

  The study compares traditional and alternative risk transfer contracts and their components. It permits ascertainment of the value that reinsurance markets assign to risk management components. Further, it contributes to the fundamental question of whether risk management is able to genuinely add value.

- **Koch**, Wolfgang: 'Price Development in Reinsurance after Natural Disasters'.

  Historically, and nearly without exception, the costliest insurance claims in the world are natural disasters, such as Hurricane Katrina or Sandy. The impact of these natural disasters on reinsurance and the retrocession market has been major and reflected in corresponding price mark-ups.

Hurricanes Harvey and Irma are currently causing billions in market damage in the US and the Caribbean (approx. USD 131 billion). According to initial industry estimates, the loss events may stabilise reinsurance prices. To date, low interest rates and competing products (e.g. hedge funds), among other things, the situation is dominated by price erosion, which can thus be compensated. This applies in particular to the prices of buildings and vehicles. Based on an empirical study of natural disasters and their impact on reinsurance pricing, price developments in the reinsurance industry should be better assessed as a result of 'Harvey', 'Maria' and 'Irma'.

- **Wang**, Lihong: 'Data Analysis of the Chinese Automobile Vehicles Recall Insurance'.

  The research project will focus on the data analysis of the developments and challenges ahead for the Chinese Automobile Vehicles Recall Insurance. It continues the 2017 project where the focus lay on the regulations of the Chinese Automobile Vehicles Recall Insurance.

  In 2016 alone, over 10 million vehicles were recalled in China, which was almost one quarter of the cars being produced or sold in China in the same year. The numbers of recall announcements and affected vehicles have been increasing rapidly year on year due to legal environment changes and stricter government oversight, as well as the transition from vehicles moving from traditional towards connected and autonomous driving. The findings will provide a deeper insight of the background and recent recall statistics.

- **Lassen**, Fabian: 'Reducing the Volatility of the Net Result of a Primary Insurer for Better Earnings Planning by Means of an Insurance Pool or an Actuarial Swap'

  The significance of local natural disasters has increased in recent years. For insurers, the potential large loss and the potential extent involved represent a good market opportunity, but they are also associated with great risks. The volatile nature of natural disasters in particular makes it difficult for insurers to plan earnings. Assignors typically protect themselves against these volatile risks with great loss potential through the purchase of reinsurance. By implementing an insurance pool between two or more European primary insurers or using an actuarial swap, the primary insurers' net earnings could be stabilised, and this would permit better planning of the primary insurers' earnings.

- **Pütz**, Fabian: Research topic: 'Reinsurance Aspects of Automated/Autonomous driving'.

  As part of his Ph.D. programme at the University of Limerick and Cologne University of Applied Sciences, in October 2016 Fabian Pütz began investigating the effects of (networked) automated motor vehicles on the insurance industry. As part of his work at the Research Centre for Reinsurance, he is specifically examining the reinsurance-side implications of advancing networking and automation of motor vehicles.

  Technological progress, along with any associated changes in the legal allocation of liability, potentially lead to a profound shift in the risk landscape with which vehicles

are associated. In particular, an expected decline in the frequency of traffic accidents will lead to declining premium volumes in motor-vehicle insurance. At the same time, technical advances also have an impact on the likelihood of occurrence and the extent of the damage covered under motor-vehicle policies. Coupled with emerging risks (e.g. cyber-attacks on networked automated vehicles), this leads to a change in the characteristics of inherent claims patterns, which in turn implies a need to adapt the risk-management instruments selected through reinsurance.

The work also examines how automated vehicles potentially affect other lines of business, such as product-liability and product-recall insurance cover for car manufacturers and suppliers, and the necessary reinsurance instruments.

- **Knocks**, Kai-Olaf: 'Liability issues of drones'.

  With the Drone Ordinance that was enacted in the spring – with some provisions taking effect on 1st October 2017 – interesting developments have occurred. In addition, more and more primary insurers are offering liability and own-damage products to cover drones, the cover provisions of which I would like to examine and compare in greater detail. Even if major losses have failed to materialise thus far, in my opinion this matter remains very topical and relevant from a reinsurance point of view.

- **Materne**, Stefan: 'Impact of NatCat Losses in Q3 on the Reinsurance and the Retrocession Market in Particular'.

  Prof. Materne explores the effects of loss-intensive events or calendar years – capital events in particular – on subsequent renewals in reinsurance and retrocession markets. Sample data are provided by the third quarter of 2017, with the events 'HIM' (= Harvey, Irma, Maria), two earthquakes in Mexico and the California wildfires. The aim is to distinguish between the direct and indirect impacts. Indirect impacts would be those resulting, for instance, from a hardening in retromarkets, and consequently for reinsurance markets as well, particularly for reinsurers with a substantial reliance on retrocapacity. In addition, the behaviour of traditional risk carriers will be compared with that of risk carriers with risk capacity driven by the capital market.

Planned scientific events

In 2018, the Cologne Research Centre for Reinsurance will again host the 15th Cologne Reinsurance Symposium and the 11th Annual Meeting of the Sponsoring Group Reinsurance:

- **15th Cologne Reinsurance Symposium**

The Cologne Research Centre for Reinsurance is organising the 15th Cologne Reinsurance Symposium on 5th June 2018 in the auditorium of the Cologne University of Applied Sciences.

- **2018 Annual Meeting of the Sponsoring Group Reinsurance**

The 11th Annual Meeting of the Sponsoring Group Reinsurance will be hosted by the Cologne Research Centre for Reinsurance on 13th July 2018.

14th Cologne Reinsurance Symposium

23rd May 2017 marked what is already the 14th Cologne Reinsurance Symposium of the Cologne Research Centre for Reinsurance of the Cologne University of Applied Sciences. The symposium topic was 'Rückversicherung 2017 – Protektionismus durch Regulierung?' ['Reinsurance 2017: Protectionism Through Regulation?']. In addition to discussions of regulation, some 550 participants at the symposium also observed interviews on alternative capital and on mergers & acquisitions and had the opportunity to share in a lively discussion on the challenges that face the reinsurance industry.

(Prof. Stefan Materne)

Professor Stefan Materne, holder of the Chair for Reinsurance, opened the event with a report on the activities of the Institute for Insurance Studies, as well as the work of the various research centres located there. He addressed current research topics of the academic staff, particularly at the Research Centre for Reinsurance, and briefly presented their research findings. Specifically, he presented the Researchers' Corner with the four poster entries for the previous year's 9th Annual Meeting of the Sponsoring Group Reinsurance.

(Auditorium)

Following his introductory remarks, he introduced the topic of the first interview on 'alternative capital'. Materne paid particular emphasis to the legal risk of such transactions: to date, around half of the (few) damage events are being, or have been, argued before courts of law.

(from left to right: Dr. Marc Surminski, Dr. Marcel Grandi)

This theme was then taken up by Dr. Marc Surminski (Zeitschrift für Versicherungswesen, an insurance trade journal) in the first interview with Dr. Marcel Grandi (Director, Credit Suisse ILS). The latter, however, considered the outcome of proceedings to date to be positive for the market. In Grandi's view, an increase in interest rates will not suffice to diminish the significance of alternative capital. Because interest rates usually entail a variable portion in addition to a fixed portion for the assumption of risk, investors, too, stand to profit from rising interest rates. According to Grandi, however, a major US hurricane event could indeed lead to rethinking on the part of investors. The reason for this would be the still-high share of this risk in the overall securitisation volume in conjunction with the risk of total loss. In response to Surminski's question about the future development of the market, Grandi could also imagine risk cover that extends beyond classic cover for natural disasters. From the investors' standpoint, he sees worldwide demand for life insurance risks, but long-tail risks such as liability or motor vehicle liability cover, or even operational risk, are conceivable as well.

For the first round of discussion, Materne offered highlights on the current situation concerning approvals of third-country reinsurers in Germany. He saw a possible consequence in a greater tendency to create risk carriers in Switzerland than in the states of the EU. China, too, treats local and offshore reinsurers differently – the need for capital deposits by primary insurers is significantly lower for reinsurers with registered offices in China.

(from left to right: Dr. Frank Grund, Prof. Dr. Karel van Hulle, Prof. Stefan Materne, Ulrich Wallin)

This issue was explored in greater depth during the panel discussion that followed. Ulrich Wallin (Chairman of the Executive Board, Hannover Re) acknowledged that there are similar rules in place in countries such as India, Indonesia and Australia, but that this conflicts with the reinsurance notion of worldwide diversification. The supervisory authority in Bermuda placed its focus on Europe at an early stage and is justifiably considered equivalent, according to Prof. Dr. Karel von Hulle (Board of Directors, Bermuda Monetary Authority [BMA]). This

is not the case for special-purpose vehicles and captives, but that is not something these business forms seek, either. In addition, the focus was particularly upon the 'covered agreement' as a solution approach between the EU and the United States. Pending its formal entry into force, the German supervisory authority assumes the validity of the convention, according to Dr. Frank Grund (Chief Executive Director of Insurance and Pension Funds Supervision, German Federal Financial Supervisory Authority [BaFin]). There is a certain risk, however, that it will not be ratified, in which case there would be reinsurance agreements in place between German assignors and non-approved US reinsurers. In light of this, the overseer recommends resorting to correspondence insurance in cases such as these.

In the second interview, Surminski queried Peter Gerhardt (CEO, Asia Capital Re), a proven expert in the area of mergers & acquisitions. The latter reported on the hurdles involved in the acquisition of Asia Capital Re by a Chinese consortium. In his estimation, there will be additional acquisitions with Chinese capital; because planning in this culture tends to be medium-to long-term, this could take another several years, however. He also pointed out that yield expectations can vary widely depending on the approach involved – pure financial investor versus a strategic investment.

(from left to right: Peter Gerhardt, Dr. Marc Surminski)

A second panel discussion chaired by Herbert Fromme (Süddeutsche Zeitung) addressed the future strength of the reinsurance industry. With regard to the current market situation, Dirk Spenner (Managing Director, Willis Re) saw pricing for natural catastrophe cover at a historically low level, and the claims of the reinsurers as justified in this regard. The continued good results and lack of major damage events were holding rates at this low level, however. Wallin explained the significantly higher stock market valuation of companies such as Google in comparison to (re)insurers, on the one hand, with the near-monopoly status of these business models. On the other hand, double-digit rates of growth are still possible


(from left to right: Herbert Fromme, Ulrich Wallin, Dirk Spenner, Dr. Marcel Grandi)

here – in contrast to the (re)insurance industry – and this can have a major influence on a future-oriented stock market valuation. All in all, Grandi assumed that the global need for primary insurance and reinsurance will continue to grow as a result of the host of uninsured risks. Wallin and Spenner agreed with this analysis and saw a greater need for reinsurance – in spite of increasing retention on the part of the assignors – particularly as a result of Solvency II.

(Interpreters)

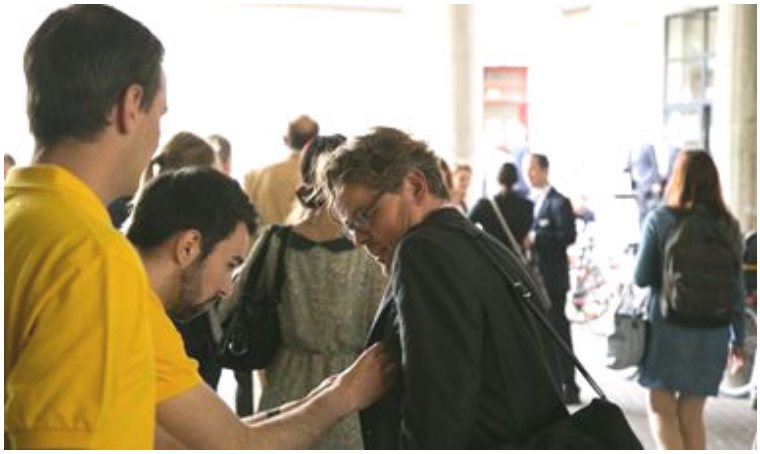
As in past years, simultaneous interpreting into English was available again this year for non-German-speaking guests.

Following the symposium, participants at the get-together used the opportunity to continue the discussions and make new contacts. Particularly the 4th and 6th-semester bachelor's students on hand completed the organisational team with great dedication and helped see to it that the event ran smoothly. They served as competent contacts for the guests throughout the symposium.

(Get-together)

Cologne Research Centre for Reinsurance
Institute of Insurance Studies
Cologne University of Applied Sciences

Impressions of the 14th Cologne Reinsurance Symposium



Handing out name tags

Roll-up banner

Information materials of the Research Centre in the auditorium foyer

Lecture by Prof. Materne

Get-together

Bachelor students in the 4th and 6th sem. concentrating in reinsurance and employees of the CRCR

10th Annual Meeting of the Sponsoring Group Reinsurance

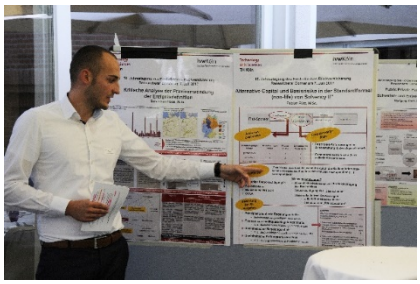
On 7th July 2017, the 10th Annual Meeting of the Sponsoring Group Reinsurance was held once again at Hotel Clostermanns Hof in Niederkassel Uckendorf.

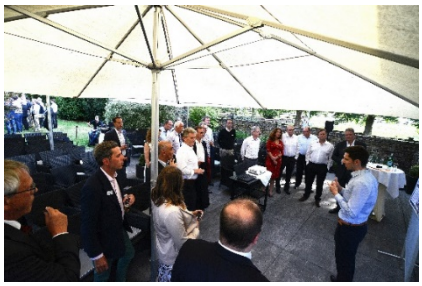
Professor Stefan Materne opened this year's annual conference before some 90 participants and announced that the companies in attendance represented around 85 percent of reinsurance premiums worldwide. He also recited the cartel agreement that prohibits price fixing, collusion concerning market behaviour, etc.

Prof. Materne then turned to a presentation of the activities of the Cologne Research Centre for Reinsurance and the Chair for Reinsurance. He reported on

- the various excursions in the previous year, to Hannover Rück, TransRe, Guy Carpenter and MSK, as well as to the Baden-Baden Reinsurance Meeting;
- he reported on the numerous research projects of the Cologne Research Centre and introduced the employees.

The agenda differed from the previous year's due to the large number of poster presentations by the research staff of the Cologne Research Centre for Reinsurance. This year, there were nine short presentations within the scope of Researchers' Corner, complementing remarks by Prof. Materne and two interviews with guests. This resulted in three sessions, each with three parallel presentations. From these, which Prof. Materne had previously announced in his own remarks, participants could choose the lecture they preferred. (The lecture topics can be found at the end of the article)





Prof. Materne thanked the companies involved in the Sponsoring Group Reinsurance for their valuable support, which had made it possible to finance the various events and the scientific work of the Research Centre throughout the year. He made special mention of the financial support of the excursions, without which some students would have been unable to participate. The Sponsoring Group Reinsurance also provided full financing for the employment of staff members and their research. This was followed by the first of the three sessions of the Researchers' Corner, with presenters **Fabian Pütz** (M.Sc.), **Manuel Dietmann** (M.Sc.) and **Jan Böggemann** (B.Sc.) at the three designated stations.

Prof. Materne then conducted the first interview of the day with Mr **Lorenz Kielwein**. Today, as an independent management consultant, Mr. Kielwein assists people and organisations with their development. He most enjoys helping teams and organisations make greater allowance for self-organisation in collaboration, thereby achieving a new quality of performance with the existing team.

SM: Lorenz, you're a mathematician, and you say you apply system theory to questions of organisation. Can you convey to us what mathematical systems theory is, in a nutshell?

Kielwein: As an overarching research discipline, system theory describes interdependencies in systems. It makes a rough distinction among three categories: Simple systems that follow a simple, linear, cause-and-effect scheme (actio = reactio principle; light switch, movement of a pendulum). Then, there are complicated systems that consist of many parts that act on each other, creating feedback effects (feedback-loop principle, machines such as a clock or helicopter, a power plant). And finally, there are complex systems, characterised by non-linear dynamics (weather, habitat, stock market, economic system, our brain).

A system's structure and mode of operation have a great impact on its mode of action. Consequently, simple and complicated systems can be broken down into their constituent parts and reassembled functionally. Their mode of operation is predictable, as in the development of an engine. Where complex systems are concerned, this situation does not

apply at all! Their behaviour can only be predicted by way of approximation; but the actual outcome can be surprisingly different.

And because you asked about the 'mathematical' dimension: mathematical formulas are used to compute systems; simple equations, linear systems of equations, and non-linear systems of equations for complex systems. Their theory is also known as 'chaos theory'.

SM: And how can this system theory be applied to teams and team-building?

Kielwein: Well, that's essentially what we do all the time, and have been for a long time! We usually apply the theory of technical control systems to the organisation and treat it as a kind of complicated machine. We believe we can plan and control its mode of operation, with each member of the organisation required to function accordingly, as a particle in its place. But social systems tend to behave more like a biological organism. Such living systems have the ability to structure themselves and create spontaneous order, repair themselves or replicate. This is done by means of self-organisation, without a controlling 'central unit'. I completely view teams as complex social systems.

SM: How should I interpret that? Can you give an example of what exactly you do?

Kielwein: First, we sit down together and look at how the team has worked thus far. Is there a team leader? How does he or she act? What do the team members do? Are there certain processes, roles, behavioural patterns, etc.? This step is only descriptive. Without any assessment involved. Everything is recorded and visualised and remains visible in the room for all to see. Then I invite the team to a 'reset'. We reimagine the best way to accomplish the team's mission. Regardless of the way it used to be. I design this process as a self-organised effort under my instructions. In doing so, everyone gets acquainted with what this effort demands of the individual, and how it feels. In the end, the outcome, which is usually unexpected, speaks for itself. Then a decision is made as to whether the team would like to head in this direction and develop its own form of collaboration.

SM: Can you identify something like the 'top killer' of teams? And how can it be addressed?

Kielwein: For truly excellent teamwork – which I have only seen as highly self-organised – the top killer is governing from the outside: a lack of trust and protection in the surrounding system. The only remedy for this is: properly docking onto the system. Empathising with the culture and winning over the person in charge, the one with the power and the budget. Engaging him or her closely from the outset, learning and developing. Over the long term, anything that exceeds what he or she is able to imagine will not be possible. This can have a variety of consequences.

SM: What does it mean if I want to apply system theory to change management in a company?

Kielwein: Mathematicians prefer to trace new problems back to solutions of an already known one. So: a company works through the division of labour and its coordination. It consists of operational organisational units and control circuits. In other words: it consists of teams of teams of teams. Got it?

SM: Quite simple! I understand. But why do so many change projects fail then?

Kielwein: Sorry. That was a bit provocative. Most of the time, of course, you cannot 'reset' a company's management body as a team in this way. In principle, though, the same rules apply: Winning over management or the department manager, assembling an initial 'design team' that is as representative as possible for the process, and working with this team as described.

Kielwein: But in response to your question: Most change projects fail because the expectations are unrealistic, I think, and because there is a latent conviction that changes can ultimately be 'pushed through'. So the failure is down to a lack of understanding of the system! If you want to introduce more agile approaches to work, you mustn't (in unconscious and often long-unnoticed ways) adhere to a mechanical notion of organisation and human beings.

SM: Have you failed in that sense yourself?

Kielwein: Yes. Quite painfully, in fact. We had once organised a series of events as so-called 'workshops' designed to convey corporate strategy to some 4,000 people, and we had taken a significant step in the direction of more self-organisation. Employees from all levels were involved, and the management had approved after an acid test. But we had not adequately involved middle management. As a result, they experienced their enthusiastic employees – who were suddenly showing up with flip charts and wanted to have a say – as difficult troublemakers. The employees withdrew in frustration, if they did not quit straight away. Unfortunately, we did not have an opportunity to correct our omission.

SM: You work with a very wide range of organisations that cut across different sectors and include non-profit organisations. Have you noticed differences among the various industries in the course of your work?

Kielwein: In my experience, engineers have the least difficulty adopting this system-theoretical approach. They like it when someone underpins his or her work and suggestions with a theory. I do not tell the others about this any more than necessary; my avenue of approach is through experience. Most people have to experience it first; they cannot imagine it, and they are more concerned about losing control. Anyone who spontaneously adopts this approach, is already 'ripe' and finds something there that he or she has somehow already suspected. Proselytising doesn't work with anyone.

In the case of insurance companies – which is probably what you're getting at – I've always found that exceptional developments are possible. However, this always depends on the individual stakeholders involved, whom the company allows a great deal of room to manoeuvre. In my experience, the industry as a whole ranges between conservative and renewal-resistant. At the moment, it is trying again to jump on the bandwagon of digitalisation, which has already gathered quite a bit of momentum. To me, though, it seems the new technologies ultimately provide a foothold to a renaissance of supportive society. Unfortunately, insurance has almost degenerated to a form of account management.

Incidentally, the principle behind the notion of 'reinsuring oneself' stands in contradiction to all known natural processes. Unless reinsurance means the entire community.

SM: I'll leave that without comment. Finally, tell me, Lorenz, what actually motivates and drives you throughout the whole enterprise?

Kielwein: I find people simply fascinating, Stefan! Each individual is somehow unique, a mixture of genius and madness. With all the quirks that go with it. And I just love seeing how such a mob can get into the flow. Where everything suddenly succeeds simply and as if by itself. Where every talent is needed and is naturally brought to bear. Where everything fits together, with everyone in the right place at the right time, finding everything he or she needs. Where an opening night is a smashing success, even if the previous day's dress rehearsal ended in a fiasco.

SM: And that's what you refer to as 'flow performance'?

Kielwein: Exactly.

The interview was followed by the second session of the Researchers' Corner, with presenters **Robert Joniec** (M.Sc.), **Lucas Kaiser** (M.Sc.) and **Lihong Wang** (M.Sc., FCII).

The second interview followed, with Mr **Frank Baumann**, reinsurance manager (ret.) at Gothaer Versicherung, who discussed his decades of experience in reinsurance purchasing. Mr Baumann began with a description of the constant change in underwriting policy, offering his assessment that, when he began in the industry, the work of determining the risk exposure of the portfolios underwritten, and the pricing of loss agreements, were much more a matter of gut feeling. He went on to point out that, from a risk point of view, the processes in place today are much improved. On the other hand, there is less emphasis on the principle of 'good faith' today, but given improved risk technology, there is also less occasion to apply the principle. In response to a question by Prof. Materne, he observed that, during his time at Gothaer, he was one of the few people at the firm who occasionally also looked forward to major losses, as this would present an opportunity to demonstrate the value of the reinsurance programme he had constructed and placed.

Following the interview, Prof. Materne thanked Mr Baumann for his many years of support for the activities of the Cologne Research Centre for Reinsurance and, in particular, for the highly interesting insights into the thinking and negotiating perspectives of an assignor's reinsurance manager. It was only fitting that Mr Baumann was awarded a Lumibär for his continuous support. Mr Baumann thus became the fourth recipient of this award by the Cologne Research Centre for Reinsurance – following Messrs Zernitzky and Müller and Prof. Dr. Metzner.

This interview was followed by the third and final session of the Researchers' Corner, with **Sebastian Hoos** (M.Sc., FCII), **Fabian Lassen** (B.A.) and **Kai-Olaf Knocks** (M.A., FCII), immediately followed by a successful conclusion over dinner and a final digestif.

Researchers' Corner 2017

Once again, the Researchers' Corner was offered as an additional form of knowledge transfer. Nine of the researching members of the Research Centre presented their current developments, each in a brief lecture followed by a discussion:

Session 1

- **Fabian Pütz** (M.Sc., DEVK):
  Alternative Capital and Basic Risk in the Standard Formula (Non-Life) of Solvency II
- **Manuel Dietmann** (M.Sc., KPMG):
  SFCR: Findings for Initial Publication
- **Jan Böggemann** (B.Sc., CRCR)
  Optimizing the Purchase of Optional Reinsurance by an Industrial Insurer

Session 2

- **Robert Joniec** (M.Sc., Müller Unternehmensberatung):
  Actuarial Swap
- **Lucas Kaiser** (M.Sc., Aon Benfield):
  The Impact of Different Determinants on the Rating of Reinsurance Companies
- **Lihong Wang** (M.Sc., FCII, R+V Rück):
  Chinese Automobile Vehicle Recall Insurance

Session 3

- **Sebastian Hoos** (M.Sc., FCII, Deutsche Rück):
  Critical Analysis of the Practical Application of the Definition of an Event
- **Fabian Lassen** (B.A., CRCR):
  Employees in the Reinsurance Industry: Germany and the USA
- **Kai-Olaf Knocks** (M.A., FCII, Scor):
  Autonomous Driving: Evolution or Revolution?

In addition to the lectures, there was a poster contribution from

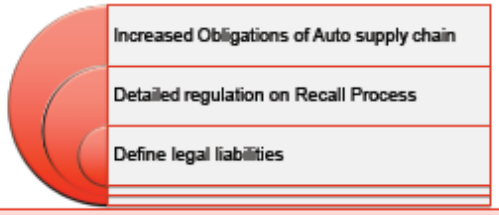
- **Wolfgang Koch** (B.A., CRCR):
  Public-Private Partnership in Emerging and Developing Countries.

Lihong Wang: 'Chinese Automobile Vehicle Recall Insurance'.

Chinese Automobile Vehicle Recall Insurance

Lihong Wang, M.Sc, FCII

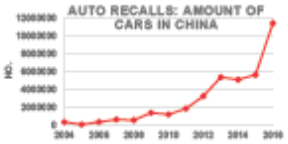
Date	Legal background
01.09.1993	Product Quality Law
01.01.1994	Law on the Protection of Consumer Rights and Interests
01.10.2004	Provisions for the Administration of Recall of Defective Auto Products
04.06.2004	Measures for the Administration of Information System on Recall of Defective Auto Products
01.07.2010	Tort Law
17.01.2013	Opinions on Several Issues Concerning the Implementation of the Regulations on the Administration of Recall of Defective Auto Products
01.01.2016	Measures for the Implementation of the Regulations on the Administration of the Recall of Defective Auto Products
01.04.2017	Measures for the Administration of Import and Export of Industrial Products

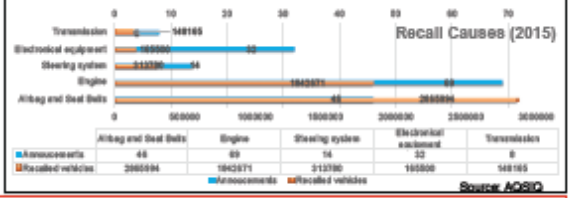


Recall Regulations

General Administration of Quality Supervision, Inspection and Quarantine of P.R. China (AQSIQ)

- AQSIQ is a ministerial administrative organ directly under the State Council of the People's Republic of China, in charge of national quality, metrology, certification and accreditation, standardization, as well as administrative law enforcement.
- Announces *recall* regulations
- Orders recall actions
- Documents recall events
- Coordinates with other ministries (e.g. Ministry of Commerce, Transport and Public Security, etc.)





Insurance

- Insurers, e.g. Allianz, ACE/Chubb, AIG, Zurich and XL Catlin, are offering this special class of business though various channels.
- However, the loss ratios vary from company to company.
- Rating models and analytical data are largely unavailable.
- Recalls are strongly influenced by political elements and media coverage.

- **Claim experience** → So far, there are few statistics on the repair costs, and insurers have lack of control over service stations.
- **Product liability** → Personal Injury Liability can be long and drawn out, due to ever-changing litigation environment and uncertainty relating to internal political power struggles and economic growth.

Chinese non-Life insurance Segment	Share in %
Property	10.2
Construction & Engineering	1.1
Motor	77.5
Liability	3.8
Others (Surety & Bonds, Marine and Aviation)	7.4

Reinsurance

Product Innovation and Risk Engineering

Huge opportunities for insurers and reinsurers

Risk categorisation is the key

Main Players: SR, MR, GenRe, TransRe, etc.

Risk accumulation

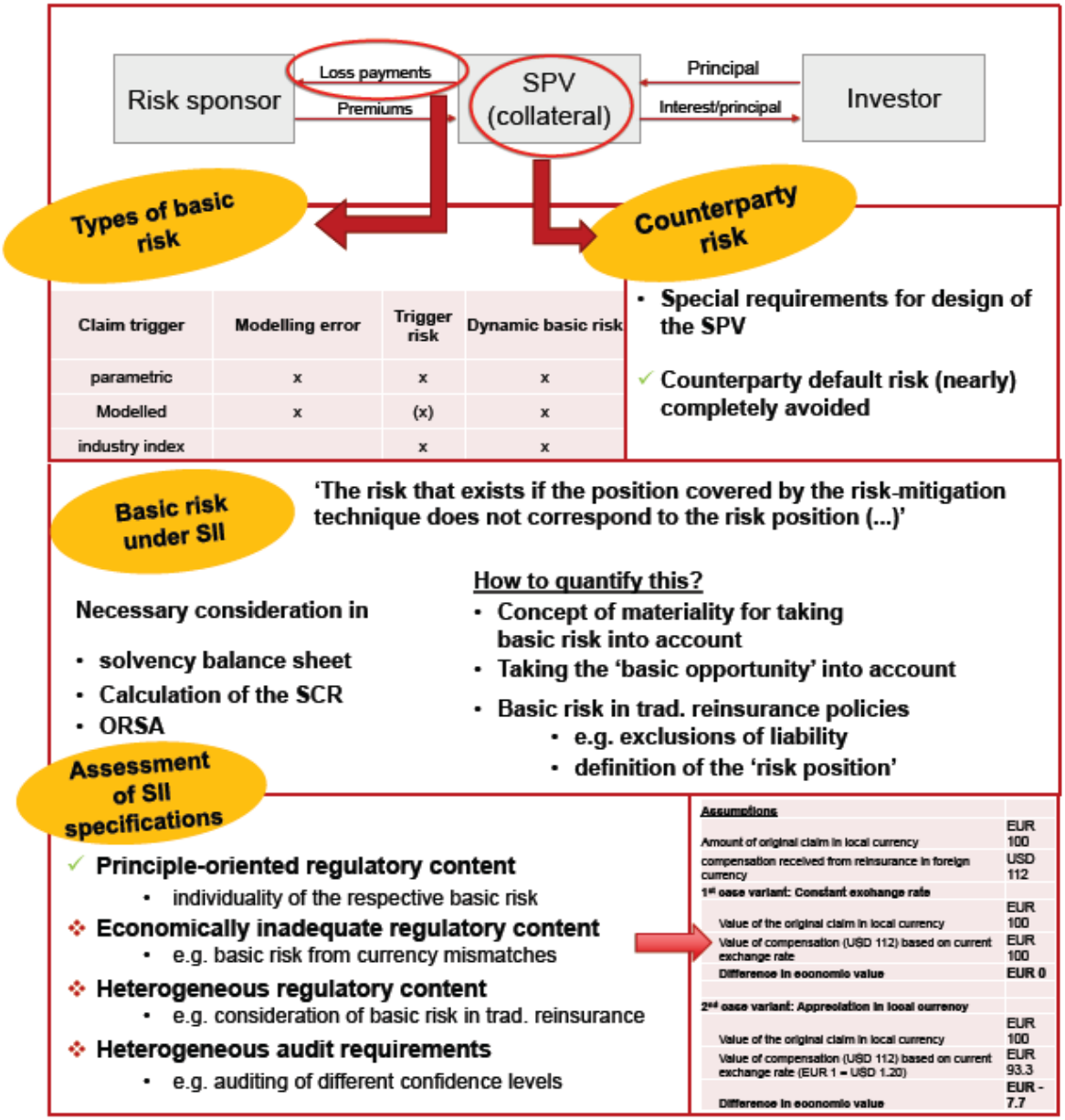
- Complex supply chain (Traceability)
- Cedant risk accumulation (Market loss)
- Worldwide exposure (Add-on effect)

(cf. also project description p. 4)

Fabian Pütz: 'Alternative Capital and Basic Risk in the Standard Formula (Non-Life) of Solvency II'.

Alternative Capital and Basic Risk in the Standard Formula (Non-Life) of Solvency II

Fabian Pütz, M.Sc.



(cf. also project description p. 5)

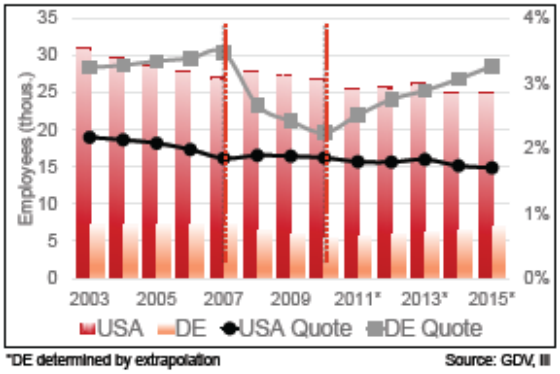
Fabian Lassen: 'Employees in the Reinsurance Industry: Germany and the USA'.

10th Annual Meeting of the Sponsoring Group Reinsurance Researchers' Corner, 7th July 2017

Employees in the Reinsurance Industry: Germany and the USA

Fabian Lassen, B.A.

Employees in the reinsurance industry



*DE determined by extrapolation

Source: GDV, III

The ratio represents the share of employees in reinsurance relative to the total number of employees in the insurance industry of the respective country.

DE (2015)	USA (2015)
Approx. 7,000	Approx. 25,000
Tendency slightly rising	Stagnant

Possible reasons for this development

- Financial crisis from 2007?
- Why DE, not USA?
- Jobs added by EVr, then job cuts?
- Jobs cut by RVr, then added?
- Additional reasons?

Number of insurance employees in Germany 2007 – 2015 (thous.)

DE	2007	2010	2015
EVr	203.1	235.4	204.2
RVr	7.3	5.4	6.9

Net reinsurance premium written per capita

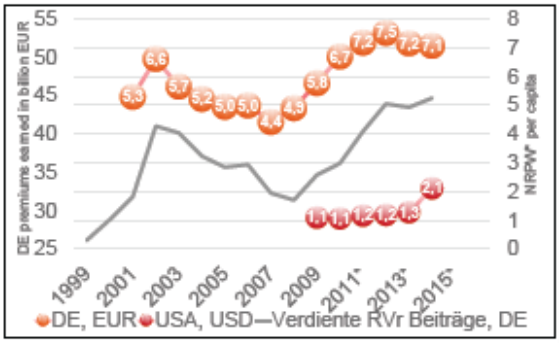
Possible reasons for the difference

- More proportional reinsurance in D Less optional reinsurance in D

Net reinsurance premium written per capita

Year	MR	SR	HR
2012	3.04	2.04	6.18
2013	3.17	2.19	6.76
2014	3.13	2.49	6.75
2015	2.59	2.48	5.54

Source: Standard & Poor's, Global Reinsurance Highlights 2013-2016



*Net Reinsurance Premium Written

Source: GDV, III

Additional ideas for the investigation

- Comparison of cost ratios
- Reinsurers with strong travel activity vs. reinsurers with numerous TGs/NLs
- Profitability of Sind RVr with only one location vs. RVr numerous locations
- Efficiency of local NLs in case of obligatory capitalisation (e.g. Germany, China, etc.)

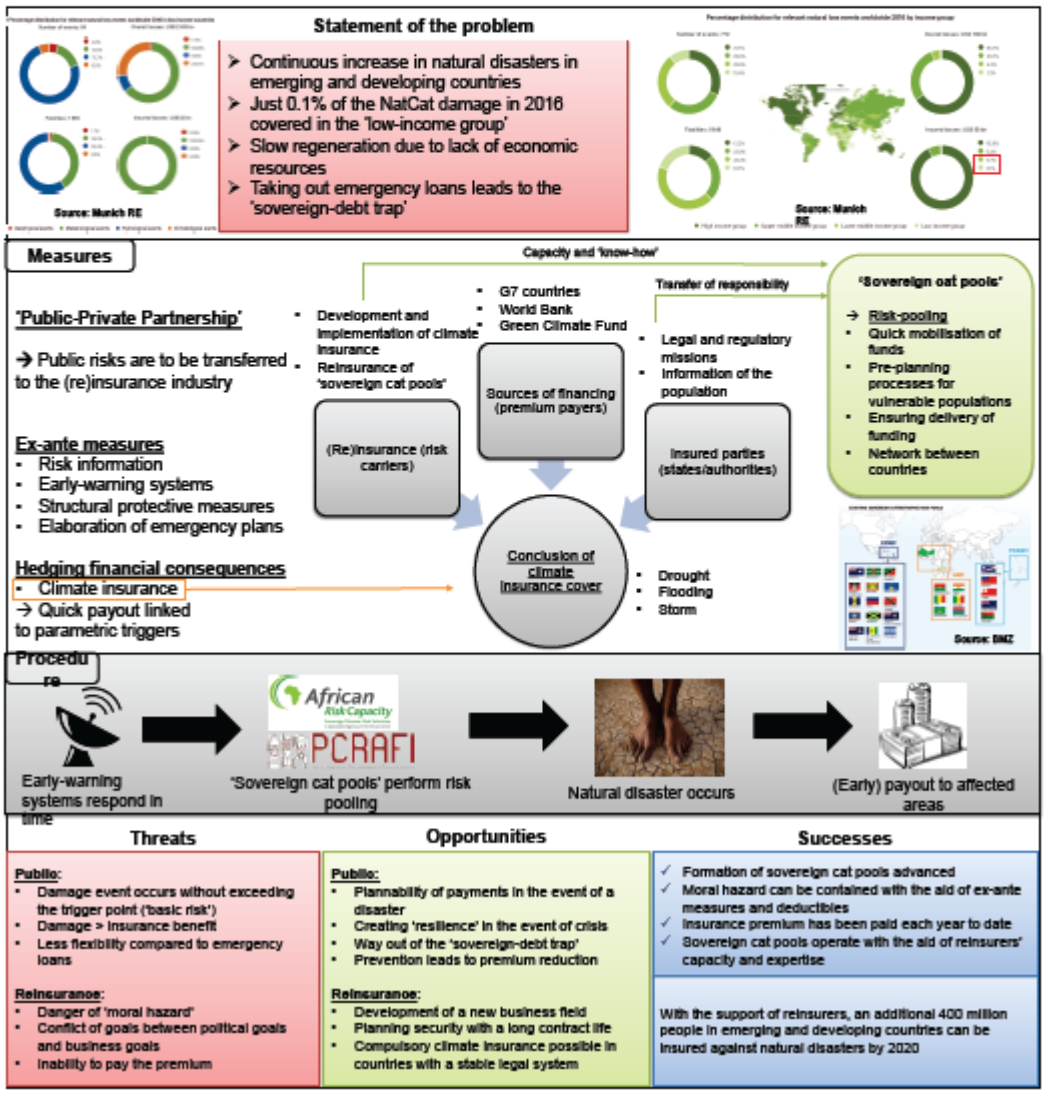
(cf. also project description p. 5)

Wolfgang Koch: 'Public-Private Partnership in Emerging and Developing Countries'.

10th Annual Meeting of the Sponsoring Group Reinsurance Researchers' Corner, 7th July 2017

Public-Private Partnership in Emerging and Developing Countries

Wolfgang Koch, B. A.



(cf. also project description p. 8)

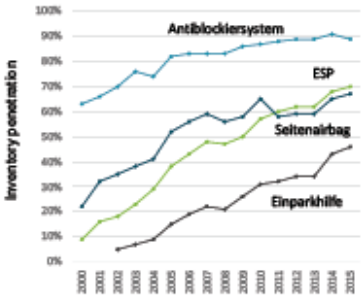
Kai-Olaf Knocks: ‘Autonomous Driving: Evolution or Revolution?’.

Autonomous Driving: Evolution or Revolution?

Kai-Olaf Knocks, M.A., FCII

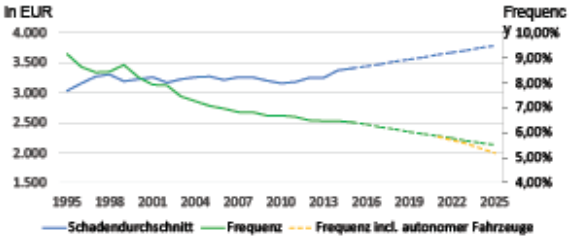
Importance of the motor-vehicle market

- Motor vehicles constitute the largest segment in German non-life/accident insurance (EUR 25.9 bn in 2016)
- considerable significance for reinsurance
- Will autonomous driving soon render motor-vehicle insurance obsolete?



Assumed impact on claims requirements:

- **Average loss** plus 1% p.a. due to
  1) increasing costs for personal injury
  2) inflation + rising material costs due to an increase in additional technology
- **Claims frequency** has been falling steadily since 1999 – autonomous driving will significantly strengthen this trend over the medium term



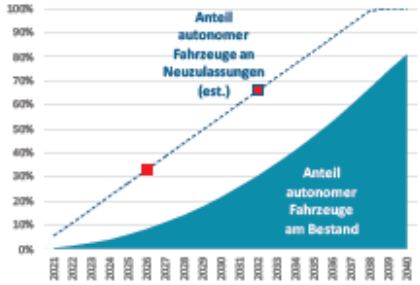
These two assumptions result in a reduction in claims requirements in KH of about 10% by the year 2025

The smartphone revolution

Is the smartphone revolution transferable to autonomous driving?

- Significantly higher acquisition costs
- Necessary infrastructure
- Legal framework conditions

- Soft facts: ‘My car is my castle’
- Constantly increasing average age of cars



Additional challenges / risks:

- cyber as a new (cumulative) risk
- autonomous vs. non-autonomous vehicles
- Interaction of KH and product liability
- Hull cover: Further increase in the encumbrance due to natural hazards
- Falling premium volume – rising volatility

(cf. also project description p. 6)

Lucas Kaiser: 'The Impact of Different Determinants on the Rating of Reinsurance Companies'.

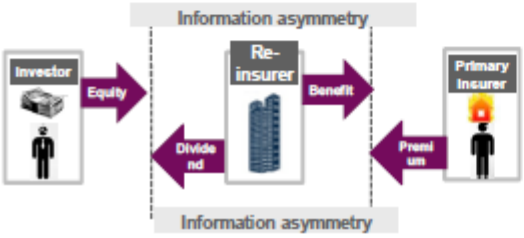
10th Annual Meeting of the Sponsoring Group Reinsurance Researchers' Corner, 7th July 2017

The Impact of Different Determinants on the Rating of Reinsurance Companies

Lucas Kaiser, M.Sc.

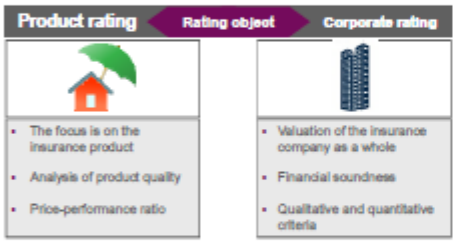
Generally, ratings reduce mutual **information asymmetries** between the contracting parties through the information provided.

The problem of information asymmetry leads to the growth of Rating agencies



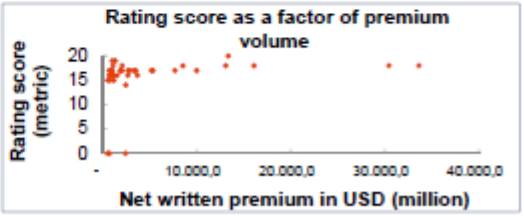
Ratings relate either to financial products (e.g. CatBonds) or entire companies.

Diffenciating into product and corporate rating



Financial-power ratings are an **important consideration** when selecting a reinsurance company. This reflects financial stability and suggests security.

It can be stated that the determinant of 'premium volume' is insufficient to justify a good rating for financial strength.



It turns out that there is no significant difference per country in terms of rating score.
This could be justified by the fact that the country rating accounts for just a part of a reinsurance company's total financial-power rating.

Further differentiation of reinsurance companies in:

- EU/EEA RV
- Equivalence RV (Bermuda, Japan and Switzerland)
- Third-country RV
  - USA (*US-EU Covered Agreement*, no equivalence of any kind)

(Mr. Kaiser offers a guest presentation of his research topic for the past year)

Robert Joniec: 'Actuarial Swap'.

10th Annual Meeting of the Sponsoring Group Reinsurance Researchers' Corner, 7th July 2017

Actuarial Swap

Robert Joniec, M.Sc., FCII

The ART market is not efficient

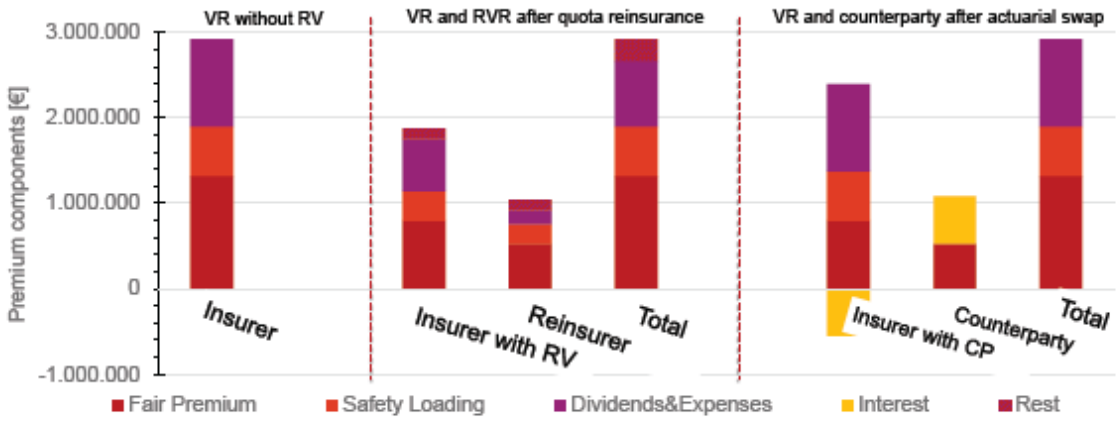
'imperfect product landscape'

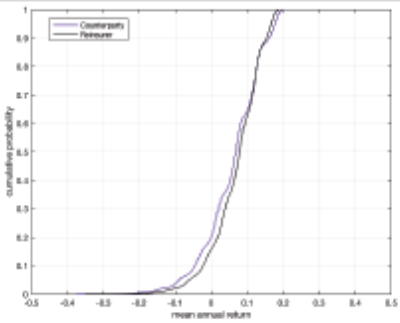
Asymmetrical information ⟷ inefficient risk

premium

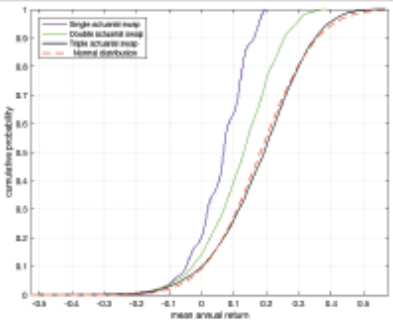
Alternative capital	
Non-proportional	Proportional
Securitization / Collateralized Re / Side Cars	Securitization / Collateralized Re / Side Cars
Insurance Derivatives	Actuarial Swap

- there is no alternative product with the same effect as a quota RV (see solvency bond prototype)
- Traditional avenues and traditional contacts dominate the overall market
- Effects on transactions costs and risk premiums





RoRAC of providers of capacity (deviation due to sliding scale commission in trad. contract)



Diversification effect of multiple actuarial swaps (i.i.d.) within an investment portfolio (RoRAC)

Challenges:

- Marketing
- Market cycle
- Business models
- Differences in theory
- Etc.

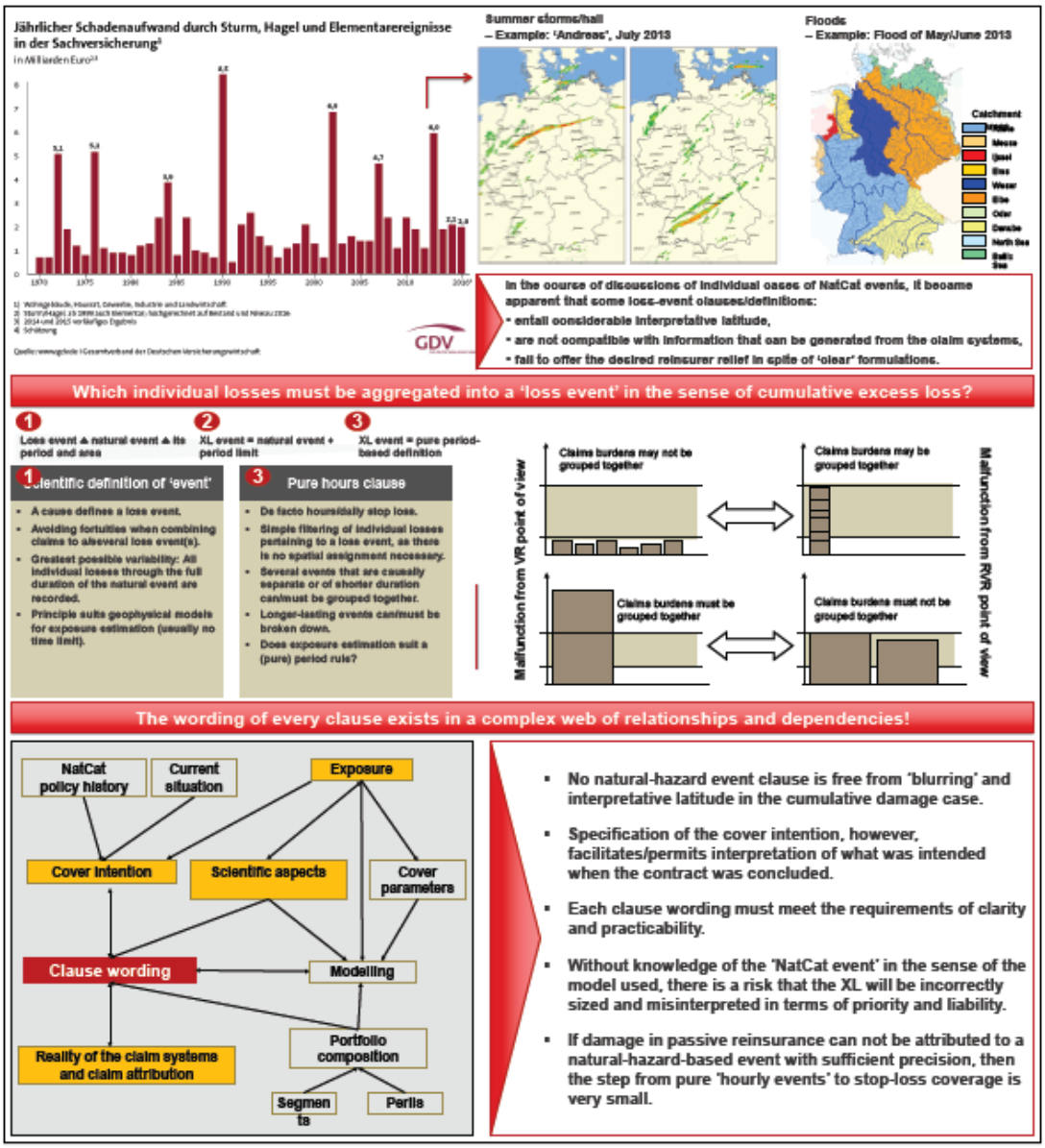
(cf. also project description p. 7)

Sebastian Hoos: 'Critical Analysis of the Practical Application of the Definition of an Event'.

10th Annual Meeting of the Sponsoring Group Reinsurance Researchers' Corner, 7th July 2017

Analysis of the status quo of the definition of 'event' under NatCat XL covers

Sebastian Hoos, M.Sc.



(cf. also project description p. 4)

Manuel Dietmann: 'SFCR: Findings for Initial Publication'.

10th Annual Meeting of the Sponsoring Group Reinsurance Researchers' Corner, 7th July 2017

SFCR: Findings for Initial Publication

Manuel Dietmann M.Sc.

Sticking points identified in the SFCR

Comprehensive consistent implementation, inter alia with regard to:
Balance – depth of detail – terminology – regulatory references

A
- Breakdown of actuarial earnings per HGB [German Commercial Code] to the Solvency II divisions
- Breakdown of investment result pursuant to HGB across Solvency II asset classes

B
- Disclosures on the assessment of the adequacy of the governance system
- Explanation of the relative importance of fixed and variable compensation components

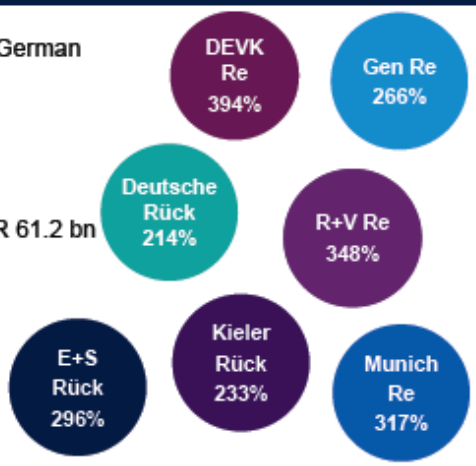
C
- Different interpretation of the reg. requirements (risk exposure vs. solvency capital requirement)
- Quantitative disclosures on risk exposure

D
- Depth of detail on the disclosures of actuarial reserves (including comprehensibility)
- Implementation of requirements for alternative valuation methods

E
- Already well prepared due to the extensive specifications of Day 1 reporting
- Initial request for internal model users to explain the differences to the standard formula

Earnings of the reinsurance industry

- Reporting obligation pursuant to SII for 30 German reinsurers
- Own funds in the amount of EUR 209.4 bn
- Solvency capital requirement (SCR) of EUR 61.2 bn
- Average SCR coverage ratio of 342%
- Surplus cover among all reinsurers
- Market risk material risk driver



(cf. also project description p. 4)

Jan Böggemann: 'Optimizing the Purchase of Optional Reinsurance by an Industrial Insurer'.

10th Annual Meeting of the Sponsoring Group Reinsurance Researchers' Corner, 7th July 2017

Optimizing the Purchase of Optional Reinsurance by an Industrial Insurer

Jan Böggemann, B. Sc.

Framework conditions

- Industrial insurance is in transition, due, among other things, to the low interest-rate environment, excess capacity and hyper-competition
- This results in rising liability risks and insured sums
- Process optimisation presents a point of departure for reducing costs, and thus for increasing competitiveness

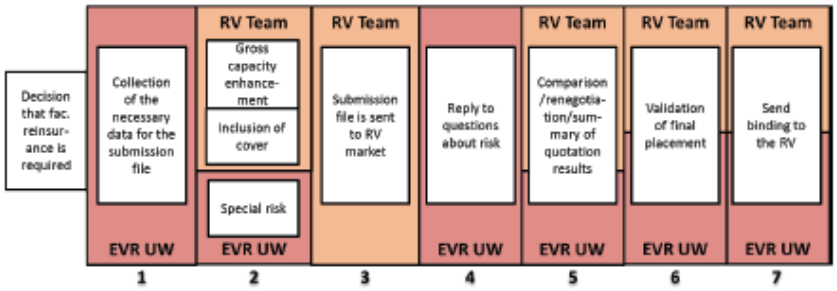
Theses

1. There is a difference between the theory and practice of purchasing optional reinsurance
2. With a clearly designed process, the industrial insurer can reduce its costs
3. On average, an industrial insurer can achieve better placement results, thanks to largely central purchasing

What needs to be kept in mind?	What can be neglected?
• Specific organisational features • Internal risk policies • Design of the treaty, special acceptance solutions possible where necessary	• There is no need to distinguish between purchases of an expansion of capacity versus purchases of an expansion of cover

Underwriter of the primary insurer vs. central reinsurance team

- **PI UW** → much better awareness of risk, although the core mission is actuarial analysis
- **RI team** → much better market overview and better process expertise



Step 1 & 4

If step 1 is met in full, queries – hence follow-up costs – are reduced

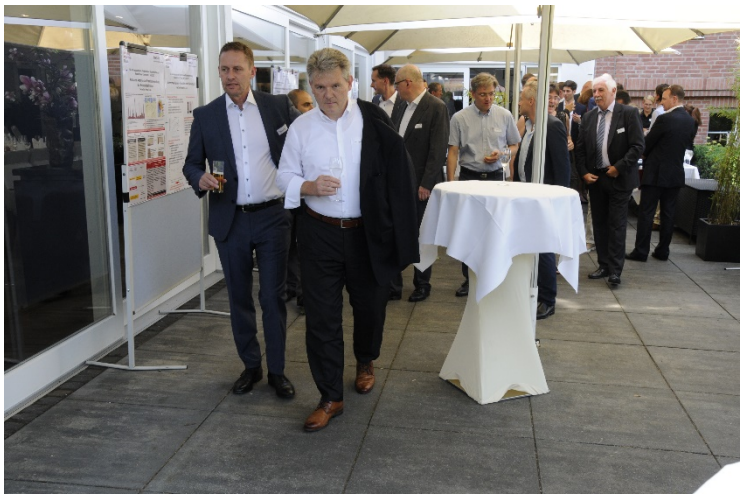
The diversification factor improves through cooperation between the compulsory and optional department

Involving all purchasing stakeholders as early in the process as possible generates synergy effects that lead to a reduction in cost

Central purchasing leads gives the primary insurer greater negotiating power, and hence better placement results

(cf. also project description p. 7)

Impressions of the 10th Annual Meeting of the Sponsoring Group Reinsurance



Excursions 2017

As every year, the Sponsoring Group Reinsurance made it possible for students with a concentration in the field of reinsurance, together with the academic staff of the Cologne Research Centre for Reinsurance, to make several excursions and participate in a variety of events in the (re)insurance market. These excursions consisted of the following events in 2017:

- Annual Meeting of DVfVW [German Association for Actuarial Science], 15th-16th March 2017 in Berlin.
- Customer event by Trans Re on 27th April 2017 in Munich.
- Excursion with Guy Carpenter on 2nd May 2017 in Cologne.
- Participation in the Expert Group for Insurance Medicine, Risk and Investigation of Claims of DVfVW [German Association for Actuarial Science] on 16th May 2017 in Cologne.
- Excursion to Meyerthole Siems Kohlruss on 8th June 2017 in Cologne.
- Colin Brett Seminar, 20th-21st June 2017 at Cologne University of Applied Sciences.
- Versicherungsmonitor Breakfast Briefing on the topic of 'Connected Insurance', 6th October 2017 in Cologne.
- Excursion to Aon Benfield, 19th-20th October 2017 in Hamburg.
- Participation in the Reinsurance Week in Baden-Baden (Guy Carpenter 2017 Reinsurance Symposium and an Eastern Europe evening by Aon Benfield, 22nd October 2017 in Baden-Baden.
- Versicherungsmonitor Breakfast Briefing on the topic of Brexit, 6th October 2017 in Cologne.

Sponsoring Group Reinsurance

The Cologne Research Centre for Reinsurance is fully financed by third-party funds provided from the Sponsoring Group Reinsurance, in which there are currently 90 companies involved. These are 60 risk carriers (with an approx. 85% market share worldwide) as well as 30 transferors and reinsurance-oriented service providers.

Sponsoring Group Reinsurance

Current as at: 31st December 2017

The Cologne Research Centre for Reinsurance ensures bidirectional knowledge transfer between theory and practice, in particular to Sponsoring Group Reinsurance. It accomplishes this, firstly, via ongoing, bilateral project cooperation and the exchange of views with the respective experts in the field; and secondly, via the two major scientific events held each year.

The Sponsoring Group Reinsurance also finances two to three Germany scholarships each year for students concentrating on the topic of reinsurance.

Publications of the Cologne Research Centre for Reinsurance

2018 – Forthcoming

Böggemann, Jan: Optimierung des Einkaufs von Rückversicherung im Industrieunternehmen

Joniec, Robert: Weather Derivative Design in Wine Production: A Preliminary Study for Mediterranean Grapes

Koch, Wolfgang: Public Private Partnership“ – Unterstützung von Schwellen- und Entwicklungsländern

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Publisher's details

This document has been issued as part of a series of publications by the Cologne Research Centre for Reinsurance. A complete overview of all previous publications can be found at the end of this publication.

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