

Systemic Risk Factors in the Insurance Industry and Methods for Risk Assessment

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Introduction

The insurance industry is faced with many different kinds of risks: insurance-specific risks on one hand, and investment risks on the other. As the systemic importance of the insurance industry has augmented in the last few years and increased attention has been focused on such risks as a result, the question arises what consequences these risks have for the insurance industry in particular, and for the financial markets in general.

In principle, regularly analyzing and assessing these insurance-specific risk factors is the task of the insurance supervision responsible for tracking the business practices of insurance companies. Nevertheless, the clustering of insurance-specific risks poses a potential danger to the entire industry and, as a consequence, to financial stability. Furthermore, when insurance companies transfer risks via the capital markets, the insurance industry becomes increasingly interconnected with the banking sector. In the following report we will focus in particular on systemic¹) risk factors relevant to this system. Here, we have chosen a classification method similar to that used in the banking sector, as most of the risks that the banks are subject to, such as market risk, liquidity risk or operational risk, also arise in the insurance industry. However, it must be pointed out that these individual risks have a significance for and impact on the insurance industry that is very different from that in the banking sector. Furthermore, there are risks, such as underwriting risk, which are intrinsic to insurance companies' business, and therefore only apply to the insurance industry. However, it is not possible to concentrate on just a few factors, as systemic relevance most

often results from the interplay of several risk factors. In addition, since September 11 it has become obvious that there can be no certainty about the probability and scope of events of loss, nor can their impact be limited to just a few companies or just one risk factor.

This is confirmed by the literature (Cummins et al., 1995; The Actuarial Profession, 2002) dealing with insolvency risk in the insurance industry. Since the 1980s, large numbers of insolvencies have occurred in the insurance sector at irregular intervals, most recently in the past two years. Although each of these periods were preceded by similar market developments, in particular a hardening of the market, it is not possible to confidently pinpoint the causes for the waves of insolvencies. It is more likely the interplay of several factors that is responsible for the collapse of these companies. Most frequently, insufficient reserves, rapid growth, overstated assets, fraud and catastrophic losses have been identified as the contributing factors.

Thus under specific economic conditions (such as fluctuations on the capital markets, large numbers of – major – incidents, weak economic activity and the like) is in place, no one individual risk factor can be singled out as posing a danger to the system, while at the same time excluding the potential for danger inherent in other factors. In order to avoid going beyond the scope of this paper, we will concentrate, however, on three key risk factors: underwriting risk, market risk and credit risk. We will subsequently provide an overview of the most common methods for risk assessment and illustrate the most important alternative risk transfer tools.

¹ The definition of "systemic risk" provided by E. Philip Davis is used; compare OeNB (2001).

Risk Factors in the Insurance Industry

In principle, the risk factors in the insurance industry can be divided into three groups: underwriting risk, investment risk and nontechnical risk. Underwriting risk focuses on the nature of the insurance risk that the insurance company is assuming by selling insurance contracts. This includes, for example, risks associated with calculating premiums, calculating contingent commissions and operating expenses. All of the risks that arise in conjunction with the company's asset management come under the heading of investment risk; this includes obsolescence risk, interest rate risk or valuation risk. While underwriting risks are liability-side risks, investment risk occurs on the asset side of the balance sheet. All those risks that cannot be assigned to the two above-mentioned categories are grouped under the heading of nontechnical risks, which include sales risk, country risk, legal risk or management risk.

This kind of assignment of risk factors to these three main groups is the classification method most frequently found in the literature. In addition to the International Association of Insurance Supervisors (IAIS), the Austrian Financial Market Authority – and in a slightly broader form – the German Accounting Standards Committee also classify risk factors for the insurance sector in this way. As a contribution to the Solvency II discussion, the International Association of Actuaries (IAA) has drawn up a classification method for the most relevant risks an insurance company faces that is similar to the risk classification method that banks employ. What is interesting about this type of structuring method is that most of the risks that

banks are subject to also arise in the insurance business. Using this method to classify risks makes identifying risk “hotspots” in the financial system simpler in light of the increased interconnection of the banking sector with the insurance industry which has come about as the result of the creation of financial conglomerates and bancasurances. Still, it must not be forgotten that the significance of individual risks for – and their impact on – the insurance industry certainly differs from that for the banking sector. In addition, some risks, such as underwriting risk, focus on the nature of the insurance business and are thus applicable only to the insurance sector.

In the following overview of the key risk factors facing the insurance industry, we will focus primarily on systemic risks, in other words those factors which – if clustered – pose a potential threat to financial markets, or those which arise when the risk management instruments used create a close link between the insurance industry and the banking sector, involving a potential threat to stability. The following classification was selected:

- underwriting risk
- market risk
- credit risk
- liquidity risk
- operational risk
- other risks

Underwriting Risks

To a large extent these risks stem from the fundamental business of the insurance industry, namely selling insurance policies. The risks emanate from the dangers to which the object of the insurance contract is exposed; these are the risks which an insurance contract is supposed to cover. In the non-life insurance segment, these risks include natural and man-made

disasters and third-party liability risks. Earthquakes, flooding, hurricanes, volcano eruptions and the like are considered natural disasters. Man-made catastrophes include, for instance, terrorist attacks, fires or airplane crashes. In comparison, the life insurance segment is confronted with a lower underwriting risk, as death rates remain relatively stable. Using historical data, corresponding death rate tables are drawn up to calculate risk; future developments, such as advances in the field of medicine, are also taken into account. However, as these tables are models based only on forecasts, they do contain a degree of uncertainty. For instance, epidemics, natural disasters or terrorist attacks can have a marked impact on the death rate.

Similar to the life insurance segment, data that is as comprehensive as possible on historical events is also compiled for non-life insurance classes to establish a relationship between where these natural disasters occurred, when and how frequently they occurred and what scope the disaster had. In so doing, the potential danger can be generally assessed. In the past few years, despite annual fluctuations, incidents caused by natural disasters have risen sharply overall. However, it cannot be unambiguously proven whether the number of natural disasters has in fact risen in the last few years. Rather, a rise in population density, an upsurge in insurance concentration in danger zones, as well as the fact that some modern materials and technology are increasingly susceptible to damage are likely to be responsible for the growing occurrence of incidents.

In addition to the risk that arises from the sale of insurance policies, operational processes associated with

carrying out insurance business activities, such as calculating premiums, developing products or selling the products (sales risk) are also subject to risks.

In order to manage the above-mentioned risks, insurance companies are increasingly relying on so-called *alternative risk transfer* (ART) instruments in addition to traditional instruments, such as increases in premiums or reinsurance. These instruments offer direct risk transfer via the financial markets as an alternative method of providing risk coverage capacity. More and more frequently, insurance companies have been using catastrophe bonds (CAT bonds) in particular to insure against the increased risks in the non-life classes. By issuing such bonds, the insurance companies transfer a portion of the risk of a natural disaster occurring to the bond subscriber. The amount of the interest payment and/or the repayment of the capital investment are dependent on whether the disasters as defined in the bond terms actually occur. If this is indeed the case, the investor's claim is limited to a payment of interest or – depending on the terms of the bond – to a portion of the invested capital. An interest claim higher than that of a normal bond compensates the investor for the increased risk. In so doing, the bond issuer (the insurance company) transfers the risk directly to the investor. With a CAT bond the investor speculates in turn that a natural disaster will not occur or will only cause minimal damage. The transactions are frequently carried out via financing companies created especially for this purpose, so-called *special purpose vehicles* (SPVs) that function as a reinsurer for the company transferring the risk and as the issuer of the bond at the same.

The advantage of this kind of risk transfer is that there is no danger of a lack of coverage due to the contracting party's potential inability to pay, unlike traditional direct insurers and reinsurers. In the event of a loss, the necessary capital is available in any case, as it has already been provided ahead of time.

Market Risk

As we have seen in the last few years, market risk has become one of the greatest risks the insurance industry faces, and hence one of the most relevant for the stability of financial markets. Market risk is defined here as potential losses owing to detrimental changes in market prices and/or other financial variables influenced by prices. This includes share prices, interest rates, asset prices or exchange rates. In other words, market risk makes up a key share of investment risk.

The assets side of an insurance company's balance sheet consists primarily of financial investments in the form of bonds, shares, loans and real estate – all subject to market risk. Often occurring in complex constellations, unexpected changes in share prices, exchange rates and interest rates can, for that reason, have a massive impact on the company. As when and/or how much income is generated from premiums often does not coincide with when and/or how much the insurance company must disburse on the basis of insurance contracts, the funds are invested in such a manner that the insurance company will have sufficient funds available when needed. If unexpected developments in the financial markets prevent an insurance company from drawing on enough liquid assets from its invest-

ments, it will encounter difficulties, as it cannot meet its obligations. Such unexpected developments are, for example, fluctuations of interest rates or stock prices. Thus market risk encompasses the interest rate fluctuation risk, risks stemming from shares and other equity investments, as well as currency risk and country risk.¹⁾ For example, currency risk can emerge when the insurer invests in other currencies than those in which the liabilities are denominated. Should it be necessary to dissolve the capital investments at unfavorable exchange rates, the company is forced to take a loss. Country risk stems from herding behavior typical of institutional investors, who often concentrate investments in one geographic region or in one economic sector. Should the expected yields fail to materialize, the company could suffer considerable losses, depending on how much it has invested.

In addition to observing a number of legal and regulatory provisions aimed at minimizing risks stemming from capital investments, insurance companies also apply *asset liability management* methods (ALM). ALM basically means managing assets and liabilities in a coordinated manner, in other words balancing the capital investment portfolio (assets) against the liabilities that arise from the products the insurance company sells. The objective of ALM is to completely avoid risks by pursuing the appropriate investment strategies. ALM was originally developed to bring rising interest rate risk, which had cropped up when interest rates became noticeably more volatile in the 1970s, under control. In this new and uncertain environment, several insurance compa-

1 Country risk is more broadly defined for insurance companies than it usually is for the banking sector.

nies were no longer able to manage their interest rate risk and were forced to file for bankruptcy. As techniques for managing interest rate risk were developed further, risk models were expanded to non-interest rate risks. Consequently, ALM became an important management tool for product-specific risks, as well as for general entrepreneurial risks. Value at risk (VaR) models are used in addition to ALM; these models were introduced for the first time in the banking sector in the mid-1990s and serve to manage short-term market risk for portfolios.

Credit Risk

Credit risk basically means the risk that a counterparty cannot meet its liabilities. Even if a counterparty does manage to meet its liabilities, the value of a given item may decline if its rating is downgraded. Consequently, the insurance company will be subject to credit risk whenever changes in the economic policy framework entail adverse changes in the creditworthiness of invested assets. Mortgages as well are subject to credit risk, which must be adequately assessed by means of internal ratings.

When managing credit risk, insurance companies must primarily look to avoid concentration risk (e.g. concentration of investments in a particular investment category, low degree of portfolio diversification) and strive to achieve as much diversification in their investments as possible.

However, reinsurance companies represent the most significant component of credit risk, in particular when it becomes impossible for them to meet their liabilities vis-à-vis direct insurers, as they themselves are faced with financial difficulties. Worldwide there are some 200 professional rein-

surance companies in the sector, in addition to the numerous direct insurance companies who also act as reinsurers. A reinsurer is the insurer for the insurance company. Direct insurance companies shift risks to reinsurance companies as the risks either exceed their capacities or because they are unwilling to assume the risks alone for other reasons. The transfer of the direct insurer's risk also means a greater potential threat to the reinsurer, in particular as reinsurers primarily insure disaster risks and other large risks. Thus reinsurer's job is to provide its clients with the desired coverage while structuring its own reinsurance portfolio in a way that will allow it to achieve an actuarial balance – and to make a profit. The reinsurer achieves a balance in the risks it assumes by diversifying its activities internationally in several insurance segments and by reinsuring itself in turn against risks that exceed its own capacities.

So-called finite risk reinsurance concepts are increasingly being used to supplement traditional reinsurance methods. Finite risk solutions shift the focus away from traditional risk transfers to risk financing; to a large degree the insured party actually finances the risk itself. This is mainly done by spreading the risk out over time. Over the course of several years, the direct insurer pays a fixed amount into a fund. The amount paid into the fund is calculated to cover the entire insured sum on the basis of the life of the policy. The policyholder is entitled to the insured sum in the entire amount from the first day of the life of the policy to insure against certain risks. This method helps to cushion insurance cycles. The nature of finite risk lies therefore in the limited risk transfer to the reinsurer, the

contract duration over several years and the explicit calculation of future capital investment gains when setting prices.

Liquidity Risk

Closely related to market risk, liquidity risk is the risk of not being able to meet payment liabilities when due. The liquidity of an investment is defined by how quickly and to what extent it can be converted into cash. The ability to convert the investment into cash is, however, dependent on several factors which influence the scope of the liquidity risk. In addition to general market conditions which necessitate the dissolution of an investment under unfavorable conditions, an unexpected demand for liquidity may be triggered by a credit rating downgrade, negative publicity (whether justified or not) or reports of problems of other companies in the same or similar lines of business. Furthermore, company-specific characteristics can influence liquidity risk, for instance, if few contract holders control large sums of money, if the insurance company's size limits its access to capital markets, or if insufficient precautions were made for short-term borrowing (e.g. a credit line that is too restrictive).

In order to manage liquidity risk, insurers pursue various hedging strategies in addition to the already above-mentioned ALM.

Operational Risk and Other Risks

Operational risk indicates the potential for losses as a result of inadequate behavior or failure on the part of employees, management, internal processes or systems, technologies or external events. To manage this kind of risk, insurance companies use standard risk models that draw on historical data.

All risks that cannot be grouped into the above-mentioned categories come under the heading of "other risks." These include, for instance, legal and regulatory risks that result from changes in the legal framework or the regulatory environment, as well as political risks. As insurance companies have hardly any influence on these kinds of risks, it is very difficult to bring them under control. Protection against these risks is mainly limited to keeping a close watch on the environment in which insurers operate, as well as lobbying.

Risk Assessment Methods

In keeping with insurance companies' core competence, model-based approaches to risk assessment were developed early on for underwriting risk. As a case in point, the field of actuarial mathematics was established at universities at the beginning of the 20th century. However, the stochastic principles of this field of mathematics, which has since come into its own, are also of fundamental importance for many of the risks that arise in capital investment. Accordingly, certain methods of underwriting risk assessment have a counterpart in investment risk assessment. An example is the collective risk model, which is based on the one hand on modeling the frequency and the coincidence of events of loss, and on the other hand on modeling the amount of losses resulting from these events. Similarly, the modeling of credit risk in capital investment relies on the statistical description of the number of credit events (bankruptcies or rating downgrades) and the amount of loss should a credit event occur.

At least two risk components can be pinpointed when modeling underwriting risks: process risk and uncer-

tainty risk. Uncertainty risk occurs when the stochastic model of the process that generates losses is flawed or inadequate. For instance, a specific stochastic model may not be correctly specified in order to reflect the probability distribution of the amount of damage. Another example of uncertainty risk is the incorrect estimation of parameters. However, even if the underlying probability model is entirely known – in other words when uncertainty risk is precluded – any actually observed loss still is the outcome of a random process. Therefore extreme losses – although not likely – are still possible. Process risk is defined as possibly not having enough coverage in the form of incoming premiums or built-up reserves should extreme events occur (e.g. clustering of damage, particularly large-scale damage).

The collective risk model mentioned above is a concrete method for assessing underwriting risk. With this model, the probability distributions of the frequencies and amounts of individual damages observed within a particular insurance segment are calibrated in a first step. These two distributions are then used to determine the distribution of total damage within the segment. The losses within the segment result from the difference between the total damage and the premiums available to cover the damage. The distribution of total damage can be used to determine the probability with which a particular loss amount will be exceeded. Vice-versa, by applying the total damage distribution for a given probability it is possible to determine the amount of loss which is exceeded only with that probability. Losses as-

certained in this manner constitute the segment's "underwriting" value-at-risk (VaR).

The use of VaR as a risk management tool for the trading book has been well established in the banking sector for several years. Transposing the VaR concept to capital investments made by insurance companies seems at first glance to be an obvious move; however, it is subject to limitations. The reason for this lies mainly in the differing objectives of holding specific positions. In the case of banks' trading books, the goal is to post profits by exploiting relatively short-term price changes. For that reason the focus is on short holding periods (two weeks are typical) which replicate the maximum period of time positions must be held before they can be closed. The focus is on market value losses within this holding period. In the case of capital investments made by insurance companies, funds are invested in securities with the goal of drawing an income which will cover payment liabilities arising from insurance contracts. Therefore, the focus is on longer holding periods, whereby income effects take precedence over market value effects. This implies that insurance companies use ALM methods as the primary tool to manage their investment risk. In any case, circumspection is in order when adapting VaR models developed for the banking sector to the needs of the insurance industry.

Alternative Risk Transfer Tools

In addition to traditional methods for insuring against risks, such as reinsurance, *captives*¹⁾ and *risk retention*

¹ A captive as defined in the insurance industry is an insurance or reinsurance company which is wholly owned by a company or a group of noninsurance companies.

groups¹), insurance companies are increasingly turning to alternative risk transfer tools. In light of the developments in the insurance sector in the last few years, which have been marked by a rise in risks stemming from natural disasters and capital investments, as well as the fact that insurance companies' ability to cover these risks has put the insurance market to the test, the development of new tools to manage risks in the insurance industry has taken on a special significance. What these instruments have in common is that the financial markets assume insurance-specific risks, and financial contracts function as risk management tools. These alternative risk transfer instruments (ARTs) include, in addition to the CAT bonds already mentioned above, a broad spectrum of insurance securitization products that tap financial markets as an additional source of finance. In principle these products can be divided into insurance risk bonds and insurance derivatives. The following section outlines some of these tools.

Contingent Capital

The purpose of a contingent capital solution is to secure an insurer's financial strength in the wake of a large-scale event of a loss, as at this time borrowing is in any case costly, if it is at all possible. These instruments provide the buyer with the right to issue and sell securities for a fixed period of time at a previously defined price if a predefined event (e.g. a natural disaster) occurs.

Asset-Backed Securities

Asset-backed securities (ABSs) are a tool used to securitize credit risks.

Normally a company's credit claims are grouped according to various criteria and sold to a special purpose vehicle. The financing company finances the purchase of these credit claims by issuing a bond, an ABS. The special purpose vehicle receives interest and debt payments from the purchased credit volume with which it repays the interest rate on the ABS and the entire bond when the loans become due. As the risk of default is transferred indirectly to the investor, the ABS involves a credit risk for the investor. Like fixed income securities, ABSs are usually traded on the stock market; however, the market was limited to the U.S.A. until just a few years ago. In recent times this type of securitization method has gained in importance in Europe as well, even though it still accounts for a very small share of trading.

Pure Insurance Derivatives

Pure insurance derivatives, which transfer insurance risks to or via the capital markets and, unlike insurance risk bonds, do not provide prior liquidity to safeguard maximum liability, can be designed as swaps or options. These tools therefore transfer insurance risks to capital market investors, rather than the reinsurance market, in the form of a derivative. The investors assume insurance risks by way of a capital market instrument.

By using PCS (property claims service) catastrophe call options, the insurance company can protect its liability side. Catastrophe call options are standardized contracts that provide the purchaser with a cash payment if an index measuring catastrophe losses exceeds a certain level. If

¹ Risk retention groups (RRGs) are an American phenomenon and were introduced in 1986 to provide U.S. companies with alternative access to third-party liability insurance.

the catastrophe index remains below this level for the prespecified period of time, the options expire worthless and the seller keeps the premium. If the index exceeds this level, the purchaser of the option receives a cash payment equal to the difference between the catastrophe index and the level price.

However, pure insurance derivatives harbor a counterparty risk, which manifests itself whenever the investors cannot meet the indemnification as the indemnification payments are made only after the occurrence of a given event. In the case of a insurance risk bond, on the other hand, the proceeds from the bond issue are already available in advance.

Catastrophe Swaps

Catastrophe swaps are among the most common tools used to transfer catastrophe risk, in addition to CAT bonds. Here, fixed payments made by the investor are swapped for payments whose value is dependent on the occurrence of an event of a loss. Unlike CAT bonds, catastrophe swaps do not tie up the capital in a special purpose vehicle; however, they do pose a credit risk (the default of a counterparty).

Outlook

Until just a few years ago, insurance companies' risk management tended to be a segment-by-segment approach. As risks have become more and more complex, affecting a number of segments at the same time, a more comprehensive approach is needed for modeling risk concepts. Furthermore, we have seen that the insurability of risks is limited by a lack of experience (as in the case of the Y2K conversion), and many risks are simply too large to be insured. In

these cases ART products help supplement capacity or shift the focus away from risk transfer to risk financing, expanding the area of application for risk management solutions. ART products have evolved successfully in the last few years not only because they can compete in price with reinsurance products, but also because they offer more liquidity and greater transparency within the sector. According to a SwissRe study (2003) the market volume of ART products in 2001 came to USD 163 billion. The present situation, marked by stiff competition, in particular in the non-life segment, is encouraging the trend toward using ART products to replace traditional insurance methods. For that reason, the reinsurer SwissRe forecasts annual volume growth of approximately 15% over the next two years.

Repercussions for Financial Stability

In the last few years, the insurance industry has gained significance for financial markets: First, the market for direct insurers and reinsurers has grown in the last twenty years as a result of the increased events of loss, especially in the non-life insurance segment; second, insurance companies have become more important on global financial markets in their role as investors and financial intermediaries. Insurance companies not only insure the financial risks of other market participants, but are also increasingly transferring their own risks via the capital markets. As a result, the boundaries between the insurance sector and the banking sector are becoming more and more blurred, in particular because of the numerous financial instruments that have been developed in recent years. Unlike in the banking

sector, very little is known about the actual scope of direct insurers' and reinsurers' financial market activities, partly because the regulatory framework is less uniform across countries (in particular for the reinsurance sector), partly because only limited experience has been gained with the financial market tools insurance companies use. For example, there is little data available on insurance companies' off-balance sheet transactions, and not enough information has been gathered on whether market and credit risk management developments can keep pace with the insurers' growing involvement in the financial markets, or whether market and credit risk management is applied adequately.

As ART instruments offer insurance companies the possibility of choosing from a broader range of risk transfer products and, in so doing, diversifying their risk portfolio, their use should principally contribute to financial market stability and improve the efficiency of international financial systems. Nevertheless, the growing use of these instruments poses a potential risk according to the available literature (e.g. IMF, 2003; Rule, 2001). First, to a certain extent these products are subject to cyclical and economic policy factors, which have an impact on the volume of ART products. For instance, when loan conditions become more restrictive, recourse to contingent capital or asset-backed securities can be expected to increase. On the other hand, accounting scandals in the United States have proved to be a considerable handicap to the market establishment of CAT bonds or other ART products transacted by special purpose vehicles. The image of special purpose vehicles, off-balance sheet financing and measures

used to smooth income have suffered from the recent financial scandals, so that traditional risk management solutions regained attractiveness.

Second, the growing importance of rating agencies also poses a potential danger. To cut costs, companies often rely on rating agencies to assess risk. It may be a rational decision to use ratings as an objective measure of credit risk in individual cases; however, as frequently documented in the literature, problems can arise if several market participants choose to rely on rating agencies as a criterion in their decision-making process, especially if they are contractually bound to ratings decisions in a similar way, setting in motion large volumes of capital – not unlike the herding phenomenon.

Third, many ART products, such as asset-backed securities or catastrophe swaps, also harbor a credit risk for investors (default of a counterparty). In this context, more information on who is buying these products and therefore assuming the risk would allow a better assessment of the extent to which the banking sector is involved.

And finally, it must be taken into account that the use of ART products reinforces the linkages between the banking sector and the insurance sector. In particular the use of derivative products aimed at transferring credit risk may be considered a potential danger. However, the lack of available data on the actual scope of transferred volume, as well as the increasing lack of transparency, virtually rule out a sound analysis of the repercussions on financial stability.

In addition to the risks that result from transferring credit risk, the growing interconnection between the banking sector and the insurance sector in the form of bancassurances and finan-

cial conglomerates also poses a risk to financial market stability according to ECB (2003). Especially in the last few years banks and insurance companies have been taking advantage of the benefits of bancassurances and have supplemented their core competences by adding profitable business segments that are no longer consistent with their original business activities. This trend is underpinned in particular by comprehensive steps toward deregulation in the global financial markets. However, while the increased cooperation between the banking sector and the insurance industry expands the possibilities for posting gains due to new business activities, according to ECB (2003) it also encompasses a risk of contagion. This risk became evident especially in the last few years, when turbulences rocked international capital markets.

Opinion is split in the literature (IMF, 2002; Swiss Re, 2002; Lane, 2002) over the role of reinsurance companies within the context of financial stability. On one hand reinsurance companies have considerable importance, as a large portion of risk is traditionally still transferred to reinsurers. In light of the consolidation trend in the reinsurance sector in the last few years, it can be assumed that the concentration of risk is growing.

Should systemically important companies encounter financial difficulties – or even become insolvent – at the same time, a considerable credit risk for counterparties may result.

In the literature, the smooth cooperation of supervisory bodies and market discipline is presented as a counterargument, allowing us to detect warning signals early on and take appropriate action. Furthermore, it is argued, the volume of direct bank exposures granted to the insurance sector is too small to pose a potential danger. The same is true of the volume of ART products, so the argument goes, which is still estimated to be low.

In summary, it can be stated that there is limited experience thus far with newly developed financial instruments, as well as a lack of available data (for example in the OTC segment) and information on the scope, volume and nature of the insurance industry's financial market activities. Therefore, further developments need to be carefully monitored. Supervisory bodies and central banks have already taken initiatives aimed at gathering more detailed information that would allow to quantify the insurance industry's financial market activities, therefore making it easier to assess any potential risks.

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The Third Quantitative Impact Study (Basel II): An In-Depth Analysis of Regional and International Results¹⁾

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Introduction

The core element of the third quantitative impact study (QIS 3) was an analysis of the changes in risk-weighted assets (RWA) resulting from a comparison of the new approaches introduced by the Basel II framework with the current Accord. An increase in RWA is tantamount to a higher capital requirement.²⁾

The analysis focused on two key indicators: first, the relative change in RWA, which enables us to quantify the impact of the new approaches on the capital requirement in the individual exposure categories, and, second, the so-called contribution of changes in the individual exposure categories to the aggregate result. This contribution, which is calculated by multiplying the percentage share of RWA for one exposure category in total RWA by the relative change under the Basel II framework, allows us to assess the impact on the aggregate result. As an example, RWA as a percentage of loans to sovereigns increased considerably (in some cases by several hundred percent) across all aggregated reports (G-10, Europe) and the majority of the individual country reports (e.g. Germany). The relative change in RWA is thus substantial. At the same time, the absolute amount of RWA for sovereign exposures is very low (e.g. less than 1% of total RWA in the Austrian sample), and, by extension, their contribution to the aggregate result is not very high.

The following considerations have to be taken into account when analyzing and interpreting the data given below:

- The published results are not only based on actual data but also on estimates and reflect the status as at about four years prior to the entering into force of the new Accord. Moreover, neither the new framework itself nor its implementation by banks has yet been concluded. Thus, the results presented in this paper must be seen as a snapshot of current conditions. Further changes will have occurred by the time the final Accord has been published and fully implemented by banks, and these modifications may and most probably will have a substantial impact on the results published in this paper.
- The banks calculated their results on the basis of the QIS 3 Technical Guidance documentation. The modifications contained in the third consultative paper (CP3) were taken into account retroactively to the extent possible, although the CP3 does not reflect the most recent changes to the new framework. In addition, the EU draft Directive, which will have a major impact on the implementation of the new capital adequacy rules in Austria, introduces a series of important changes, as for example “permanent partial use”³⁾ with regard to bank and

1 The conclusions drawn from the QIS 3 results, which are presented in this paper, would not have been possible without the manifold contributions of the OeNB staff members involved in the preparation of the country report for Austria. In the first place I would like to thank Yi-Der Kuo and Brigit Wlaschitz for their active support. Moreover, I would like to thank the following colleagues for their valuable contributions: Nikolaus Böck, Gabriela de Raaij, Evgenia Glogova, Mario Oschischinig and Vanessa Redak.

2 The correlation $\frac{\text{tier 1} + \text{tier 2 capital}}{\text{risk-weighted assets}} = \text{capital ratio in \%} \geq 8\%$ continues to apply under the new Basel Accord.

3 Under the IRB approach, banks are given the option to continue applying the standardized approach for certain asset categories that fall below a specified materiality threshold.