Conceptualising Insurance:
risk management under conditions of solvency

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1. Introduction

Risk management is most often called for when political conflicts about the handling of infrequent, high-impact events are at stake. Quite contrary to this tendency, in the financial sector, risk management focuses on frequently occurring events with relatively low monetary impacts. One of the critical institutions for this routine form of risk management is insurance. Although an important institution, insurance is, however, insufficiently researched and largely overlooked in the social sciences. It has even been considered, "a virtually unknown industry," (Meier, 1988: xv). In social science literature, insurance is not unknown as far as risk spreading, contracts, or risk assessment are concerned; they are analysed in great detail. It is a conceptual void that does not allow for systematically bringing together industrial processes, organisational and regulatory features and risk management. In other words, although many aspects of insurance are analysed from political, regulatory, decision-making and economic perspectives, these findings cannot be brought together to paint a comprehensive picture of insurance. Hence, for a better understanding of insurance and its specific forms of risk management, a comprehensive framework needs to be developed.

The outline of a conceptual framework sets out from the prevailing formula, claiming that instrumental risk equals insurance. By introducing a more sophisticated, constructivist notion of risk into the formula, a feasible starting point for conceptual re-orientation is identified and this can be expected to improve our understanding of insurance substantially. This paper will delineate a preliminary sociological concept of insurance, focusing on risk management under conditions of profitability.

2. Risk and Insurance

One of the widely shared assumptions about insurance is that it revolves around an instrumental notion of risk; risk being considered a neologism of insurance (for

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1 I would like to thank Bridget Hutter, Michael Power, Andy Gouldson and Henry Rothstein for their helpful comments on successive drafts of this paper. The work is part of a research project on "Learning from Successful Risk Management. The case of property insurance in Italy and the UK" carried out at the ESRC Centre for Analysis of Risk and Regulation. The support of Aon is gratefully acknowledged.

example, Ewald, 1991: 198). Probability and the size of impact constitute a technical notion of risk and risk management is mainly concerned with assessing these probabilities and impacts (for an overview see Gratt, 1987). External interests of, for example, economic or political instances, set thresholds for the validity of related risk calculations.[2] The selection of the risk clusters cannot, therefore, be explained by risk assessment alone; external (political, cultural or economic) factors also have to be accounted for. Thus, if risks do not exist, as such, but are intentionally chosen, we can go one step further and assume them to be *socially constructed*.[3] To account for such a constructivist perspective, risk needs to be distinguished from an antonym such as 'safety', and from 'uncertainty' or 'danger'. Mary Douglas and Aaron Wildavsky (1982), Adalbert Evers and Helga Nowotny (1987) and Niklas Luhmann (1991) introduced *danger* as an antonym of risk. They suggest that those powerless to exert any influence are (often unintentionally) influenced by the effects of a decision, and are thus exposed to 'danger', whereas the same events can merely be considered as 'risks' to those able to influence and make the decisions. Risk management is, then, concerned with the control of unintended or negative effects of decisions. Management does not try to suppress risk as in the *safety* / *risk* distinction[4], but rather tries to contain the accountability for unwanted effects, now, and in all possible futures (compare to March and Shapira, 1987). Risk management may still comprise the accurate, complex analysis of quantifiable risks, as well as the selection of risks, their categorisation and contractual adaptations. But the fundamental risk-strategy changes. Containing risks does not mean that successful risk management would reduce them, just that the unwanted effects are handled according to organisational or political factors, including future claims of accountability also. Thus, the main problem is less the accuracy of risk assessments, but more the identification of numerous, unexpected effects of risks; in the past, now and in the future. The main strategy is no longer to avoid risks. Contrary to the widespread understanding of risk as cost or hazard, not taking risks implies accepting uncontrollable dangers over which no influence can be executed. Hence, risk is the safer (but still risky) choice.

While the common-sense view on risk suggests minimising risks, here, other strategies are hypothesised to structure risk management in a more promising way. Risk adverse strategies are replaced by a *danger–adverse* attitude. Consequently, risk-prone, or indeed risk-maximising behaviour, is considered the most promising strategy (Baecker, 1991). Insurance is one economic and organisational context

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2 In the political debate, the application of risk is mainly reserved to events with a low probability (i.e. below one in a million) and a large impact. In the context of insurance, the focus is rather on a set of events that can be characterised by (relatively) high probability and a low to medium impact.

3 It is claimed that risks do not exist, as such, but are risks only insofar as they are perceived as such (for example, Bechmann, 1993; Bonß, 1991; Bonß, Hohlfeld and Kollek, 1993; Luhmann, 1991; Rayner, 1984; Wildavsky and Drake, 1990; Wynne, 1982, 1987); some scholars even claim that virtually every event may become a 'risk' (see, for example, Douglas and Wildavsky, 1982).

4 Risk is established as an unwanted negative event when it is distinguished from *safety,* representing the positive side of events (see, for example, Kaufmann, 1970). Avoiding risk should provide safety. If it is accepted that all events and decisions have the potential to fail, then safety stands for political expectations of a risk-free world that does not exist. Realising this shortcoming, the distinction has been modified and the discussion has shifted towards a *relative* safety or risk. Questions such as, 'How safe is safe enough?' try to qualify the acceptable level of safety/risk (see, for example, Rayner and Cantor, 1987).

specialising in assessing, selecting and optimising risks and, in turn, avoiding dangers. Insurance is interpreted as a more general "scheme of rationality, a way of breaking down, rearranging [and] ordering certain elements of reality," (Ewald, 1991: 199). Introducing the distinction of *risk* and *danger*, Françoise Ewald's statement can be developed towards the hypothesis that insurance no longer passively administers risk but instead generates risks as economic opportunities at a market of risks.

This paper develops a model of insurance reflecting this self-generative aspect. This conceptual development is carried out under one specific constraint: not all forms of insurance are considered, but insurance refers to *economic actors* as a key partition of the financial sector.[5] Economic criteria such as *profitability* and *solvency*, therefore, play a central role for the understanding of insurance. The management and selection of risks is shaped and guided by the economic survival of insurance.

3. The Insurance System

In pre-modern times, local groups or families provided insurance-like protection. A major change took place in the 14th century when three main features of modern insurance emerged: individualisation, economisation and externalisation. Individualisation points to the substitution of personal relationship (family, kinship) as the main criterion for protection by impersonal, rational criteria. The insurance-population is then no longer bound by kinship and geography, but decided upon according to (emerging) economic standards and responsibility of free, rational individuals. Economisation highlights the focus on economic activities. Insurance opens new economic potentials as it frees the single entrepreneur from the family background. Ewald celebrates this new freedom as a crucial contribution to modernity:

> Insurance accompanies the liberalisation of humankind, liberating men from a network of economic and moral dependencies. These networks chained the potentials to act long enough (...). Thanks to the development of insurance and its technology one of the great moral experiences of modernity was made possible.
>
> (in Krohn and Krücken, 1993: 17, my translation, MH).

However, economisation also means that compensation is only made to enable the re-entry into the market, i.e. every damage is translated into monetary units.[6] The last point refers to externalisation. Initially, the contractual solution is applied in the limited context of trade, where 'risk contracts' organise the handling of goods during transportation by allocating some responsibility with the transport firm. This *mutual*

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5 Other approaches could be suggested and it would be possible to consider insurance as a decision problem in the context of *moral hazard*. (For example, see Laffont, 1995; Banerjee and Besley, 1990; Shavell, 1979; Stiglitz, 1983; Heimer, 1985). A regulatory perspective could focus on the rules of the game, but would probably neglect the impact of the actors, i.e. insurance firms. The traditional neo-classical perspective focuses on the practical problems of solvency. Each approach is sensible if problems of contractual issues, capital conditions or regulatory regimes are discussed. Many of the findings generated by these approaches can be found in the model developed here.

6 This feature also rules social insurance, such as unemployment or health care, where a minimal standard of living or treatment is paid for, without liability for the sufficiency or for the completeness of compensation.

liability improved risk management as ship owners acted as if they owned the transported goods, i.e. carefully and responsibly. The behavioural change was positive, but the scarce resources of the contract-holders constrained coverage in the case of accidents to mutual ruin. The essential step in the evolution of insurance was, therefore, to externalise the risks to a third party, i.e. to an insurance company. The main advantage of this step was to spread the risk across larger populations and so overcome the resource limitations of the mutual liability structure. In addition, the evaluation of risk by a third actor leads to higher sophistication and greater independency.

Individualisation, economisation and externalisation mark the main steps of the historical emergence of modern insurance. Once at this level of differentiation, the workings of a fully developed insurance becomes a central issue. Being an economic enterprise, two questions guide our reflections: (i) under which conditions is insurance profitable and when is it able to differentiate its services, and (ii) how is the insurance industry able to couple its solvency to the management of hazards and the re-establishment of solvency of the policyholders? Before embarking on this task, two preliminary considerations have to be outlined: the distinction between external and internal risks and the effect of money as the only means of compensation.

3.1. External and Internal Risks

Literature on insurance economics differentiates the notion of risk into a list of numerous risky aspects, each of which has to be assessed and managed (for example, see overview in Swiss Re, 1999). Instead of increasing the complexity further by introducing supplementary types of risks, which have to be analysed in their own right and in their potential interrelatedness, we simplify the complexity by distinguishing only between the risks that are insured (external risks) and internal risks that emerge alongside the insurance activity.

In the traditional view, insurance focuses on *external* risks. The economic survival of insurance firms depends critically on its ability to accurately assess the relevant features of external risk, such as car accidents, floods or health problems. Focusing on external risk, however, is not satisfactory. When actors act in a lax manner (moral hazard), the economic success of insurance depends on the profitable management of *internal risks*, i.e. the customer-firm relationship. Stiglitz (1983) suggests that contracts could mitigate, or sometimes even resolve, the information asymmetry between insurance firms and the insured, pointing to the *negotiated nature* of external risks: insurance firms do not have to accept risks, as such, but in contractual relationships they are able to choose risks and shape the conditions under which they can be insured. Here, *internal risks* start to dominate the picture of insurance. The economic survival of insurance restricts the generation of risk mainly to profitable ones, i.e. insurance attempts to capture all risks within certain efficiency and solvency limits. Still, these internal risks are dependent on external risks. Risk management of insurance can, therefore, neither exclusively be concerned with external risks, for example, earthquakes, car accidents or floods, nor with the internal risks of solvency (e.g. operational risks). Rather, it is concerned with the relationship of these two types of risk under conditions of economic profitability (and sometimes political regulation).

3.2. Compensation by Money

To analyse insurance from an economic perspective can also be justified by the central role of money in insurance. Monetary compensation is to be blamed for the historical success of insurance. There are two sides of this coin however: economic integration and the tendency to monetarise non-economic relations. They are referred to as the *symbolic* and *diabolic* side of money (for example, Luhmann, 1988). Monetary compensation is a serious simplification and is often criticised, especially when even threats to limbs or life are evaluated in monetary terms (Mishan, 1971). The monetary compensation is necessarily simple and incomplete, but in its oversimplification, it provides considerable advantages for (economic) actors. The *diabolic* side points to the fact that money may neutralise or even dominate the primary logic of the field in which it is applied. It reduces the effect of compassion, justice or truth to payment, and so strengthens the economic dimension of communication in non-economic sub-systems of society. The other, the *symbolic* side of money emphasises the enormous capacity of money to speed up and differentiate the economic system. Money is the most flexible medium that – from an insurance perspective – allows re-entry to the economic sphere both quickly and quasi-frictionlessly. It enables economic integration. As far as insurance is concerned, the symbolic side of money is related to the re-integration by monetary contributions, the diabolic side refers to the situations where money drives individual action and the limitations of compensation. This is not the place to elaborate on the features of a symbolically-generalised medium of communication, but just to stress that the use of money restricts the areas where insurance can be applied. Within these limitations however, money differentiates and develops the possible areas of application.

Following the flows of money from, to and within the insurance sector, is considered to provide a crucial insight into the dynamics and structural aspects of insurance, thereby attributing to money a central function in the understanding of insurance. Money is the communication medium which permits the internalisation of external risk into the insurance system and links it to the internal risk management. The main features of the flow of money are sketched in the next section.

3.3. Two Conjunct Insurance Models

Insurance is part of the financial sector in any developed economy. Insurance firms not only pool resources in order to compensate losses, they also establish a complex flow of money; the control upon which the profitability of insurance depends (the solvency cycle).

At first glance, two streams of the solvency cycle can be distinguished, the stream of *premiums* and the stream of *compensation*. Paying premiums to insurance companies entitles the insured to receive money in the case of pre-defined events. Insurance companies collect and pool the money from the insured to re-distribute it under specific conditions and together, the money and the conditions for the collection and distribution, are established in a contract (policy).[7] These contracts define the general

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7 Several of the contractual conditions, and also issues of solvency, levels of capitalisation etc. are dealt with in national or supranational regulations. This aspect is not dealt with here.

framework for these streams. One important aspect of an insurance contract concerns the price, which reflects the features of a specific risk[8], but is also composed of the costs of administration and certain levels of profits. These aspects play a minor role for this model. Taking a simple flow model, risk management has to be focused on external risks, which have to be assessed accurately to determine the size of the insurance pool and the costs of policies. Internal risks are related to the size and administration of the pool (*managerial* and *operational risks*) but may be considered (more or less) negligible in a competitive situation. In Table 1, the main elements of this basic model of insurance are summarised.

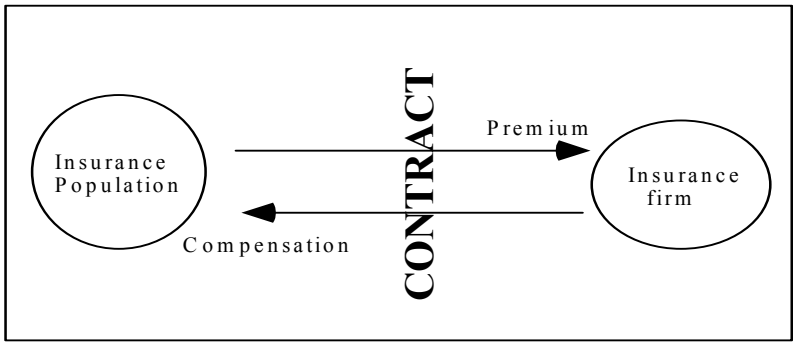

Table 1: A basic concept of insurance

Insurance can be seen as a *delayed exchange process* between firms and customers. The main features of risk management concern the completeness of all calculated risk aspects and, of course, the accuracy of all calculations. It may be assumed that any risk management that fulfils these two criteria must be successful. The success of insurance is described only incompletely, however, by the conditions of this exchange process. The process is characterised by a *time gap* between premiums and compensation, that can be utilised to increase the efficiency of insurance coverage. In the basic model, the quality of the insurance coverage depends mainly on the size (and quality) of the insurance population. Improving the range of risk spreading improves the efficiency of insurance, hence it would have positive effects on the insurance coverage, and also on the solvency of both the firms and the customers. This type of improvement requires the basic model to be expanded, by focusing on the *delay* between collecting premiums and compensation payments. Additional efficiency increases take place when the time gap is utilised to generate economic benefits elsewhere. The pooled resources are invested in banks, property or stock markets, or with other insurance and reinsurance companies. The most important activity of risk spreading among insurance and other financial companies takes place here and optimises insurance efficiency. A second major activity of insurance also unfolds; one which is concerned with managing internal financial risks and investments.

To qualify the main strategies we can distinguish between normal investments and (re)insurance. The accumulation of new capital by investments in banks or stock markets, is one important strategy used by insurance firms to spread risks and

8 Insurance companies have the right to exchange their statistics on accidents in order to allow for an adequate calculation of risks, and hence premiums. Risk spreading across a larger group makes risk bearable, which would otherwise overstrain individual possibilities.

improve their solvency. Moreover, it leaves the firms with the risk of investments. Another equally important strategy, is to use the premiums to insure the risk portfolio with other insurance firms. In other words, to improve insurance coverage, the risk claims are sold to other insurance and reinsurance companies. If risk spreading is the core activity of insurance already in the basic model of insurance (for example, Abraham, 1986), in an advanced model of insurance risks are not only distributed across all persons potentially exposed to risk, but also across a market-based network of financial companies, insurance and reinsurance firms. Large parts of the premiums are pooled and invested to insure the insurance company against the risk of insolvency. For this activity, the management of internal risks is crucial. However, reinsurance is but only one aspect. The control given to other insurance companies in evaluating risks may be seen as a central mechanism of mutual, sectoral control of risk management. But for the firms, a yet clearer indicator of success has emerged: good risks can be traded, while bad risks remain with the company.

The basic model of insurance has to be upgraded to integrate the internal, risky management of pooled resources. In such an advanced model, internal risks start to play a crucial role. The number and size of internal risks observed rises correspondingly with their overall significance. The management of external risks has still to be seen as primary source of capital accumulation, but the substantial gains on this capital are often made on financial market rather than by good, competitive service at the proper insurance level. The advanced model of insurance highlights, therefore, the relevance of the financial sector and related risks for insurance activities (see Table 2).

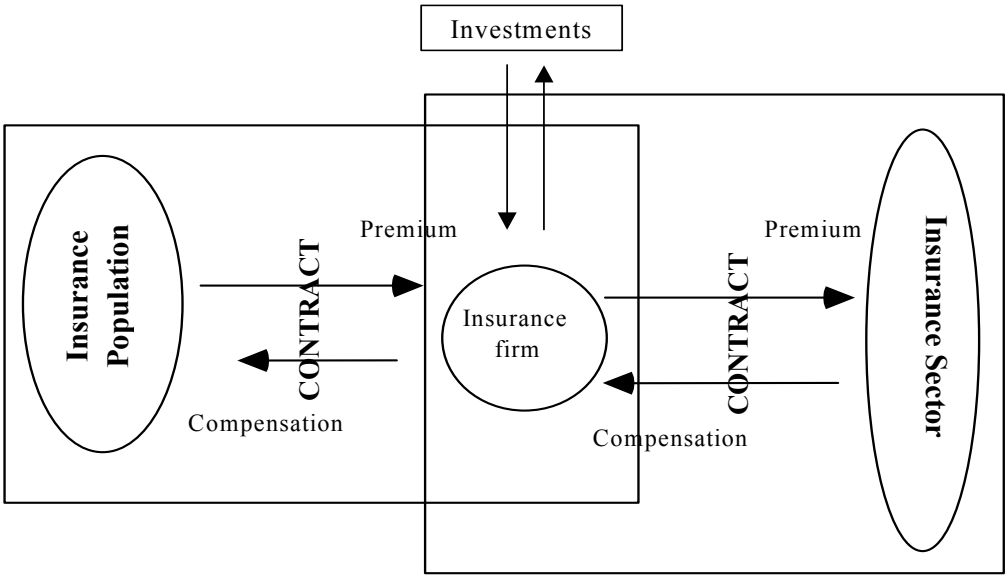

Table 2: An advanced model of risk management

Internal risks tend to dominate the advanced view on insurance. Investment risks, risks of buying bad risks from other firms, or risks of extraordinary events, all alter the structure of the entire insurance sector, influencing insurance decisions, both in

how to invest the temporarily 'free' resources and also in which risks to insure.[9] The impression, however, that internal risks govern insurance activities alone is misleading. The strong bias on internal risks does not let external risks vanish into the air. They still trigger the capital flow towards the insurance firms and create the economic basis of this sector.

The management of external and internal risks is interdependent. The question of how those two types of risks are linked and managed by insurance firms should be central to scholarly attention for further research. Apart from emphasising that investment opportunities decide upon which risks are insured, this model stresses the decisive role insurance firms play in the 'synchronisation' of risk management.

3.4. The Risk Management of Insurance

In order for insurance companies to synchronise external and internal risks, they need to be matched in their effects, reflecting upon market conditions such as public and political expectations. The main part of this synchronisation is to select feasible risks and attribute economically-adequate monetary expressions to them. Risks are transformed into monetary expressions to be managed by the procedures of the financial sector. In that way, risk is coupled to the *solvency cycle*, which is complemented by a *risk cycle* that marks the manipulations and transformations of risk in the insurance risk management. It provides a first, basic understanding of this complex process of synchronisation; a description which again takes an internal insurance perspective.

The risk cycle describes the movements and transformations of risks as they are defined and traded in the insurance system. Even if risks are seen as events that can be attributed probabilities, impacts, market interest and public attention, in the insurance system they exist only as a monetary expression, marking business opportunities and related risks. Once the risk is represented internally, the insurance system can trade and manage risks as complementary to the solvency cycle, i.e. in exchange for money, thus a market for internal risks is established. Having accumulated a stock of risks, insurance firms set up the basis for their economic activities. With respect to solvency, good and bad risks can be distinguished and the quality of these risks becomes visible when insurance companies sell them to other insurance and reinsurance firms, and sometimes the state. In this way, they are able to increase their solvency, improve their efficiency and perfect their external risk management; features already discussed above. Risk trading also has a signalling effect for the insurance market.

- The trading of risks implies appreciation for the risks by market competitors. Thus, trading risks also implies an indirect trade of risk management strategies and tools. The internal market can be seen as one important instance of control and reflection about risk selection.

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9 The discussion about new insurance instruments illustrates this point. They are supposed to overcome the limitation of traditional instruments to attract sufficient capital by linking insurance to the stock market. The related discussion of new risks that could be insured after the successful introduction of these new instruments and the new focus on financial risks, indicate the strong financial, solvency bias that structures insurance (Punter, 2000).

- The efficiency increase leads to less stringent economic safeguards as external risks are spread more evenly across a maximal insurance population. As a result of competition, the need for efficiency increases focus on the aggregated, rather than on the real insurance population. Exaggerating, one could suggest that premiums no longer reflect the costs of the insured accident or disaster, but instead reflect the investment options for pooled premiums at the stock markets.

- The attention shifts towards the internal risk management, in particular to managerial and financial risks. Buying good risks increases solvency, whereas accumulating too many bad risks puts the economic survival of the firm in danger. There is hardly any difference between risks for insurance and risks for banks when these internal risks are dealt with.[10]

The risk cycle emphasises that external, real risks have less influence on insurance decisions. The entire system is geared towards market signals forming internal risks that, in some cases, might be quite distinct from the signals of external risk management. Thus, the surprise for insurance companies when new external risks emerge (recently: terrorism, higher frequency of natural disasters) and challenge the conditions of internal risk management, is larger than expected (Huber, 2002).

3.5. Signalling the Risks of Risk Management

To synchronise risks is a complex and delicate process of balancing external expectations and internal options. Both, the modelling of external events as well as of internal financial risk management, are highly developed and continuously improved upon (see, for example, Swiss Re, 1999). However, the problem of matching the management of external and internal risks transgresses traditional issues of accuracy and raises strategic management issues. The main point here is that insurance is not able to perceive all relevant aspects in its environment, but has to rely on a myopic world-view. Synchronising risks is, then, a form of risk management that relies on signals and indicators that substitute the "real world" and easily might prove to be insufficient or misguiding. Developing adequate signals and preparing actors to interpret them adequately, hence, structures the entire risk management procedure.

At a conceptual level, one has to emphasise that even if it appears that insurance is mainly concerned with their internal problems, it cannot be understood as a *closed system*. One can hypothesise that the success of insurance depends on its specific form of risk-myopia that chooses to react to a very limited number of external signals only[11], otherwise, management appears to be too demanding. The myopic

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10 Distinguishing insurance activities from other financial activities is difficult. Dirk Baecker (1991) tries to distinguish banks from insurance by suggesting that while banks deal with the risk that gains cannot be realised (although economic actors count on them), insurance deals with costs that cannot be managed otherwise (Baecker, 1991: 14). This distinction holds true only for the basic insurance model where the direct contractual relationship between insured and insurance is central. In the advanced model of insurance, the main analytical attention shifts towards bank-like risk management of insurance.

11 *Autopoietic systems* (see Luhmann, 1984; Maturana, 1996; von Foerster, 1996; Maturana and Varela, 1984) describe similar qualities. This paper, therefore, builds upon some of the suggestions developed by the newer systems theory.

perspective simplifies the relationship of the insurance to its relevant (political and economic) environment. By genuinely restricting the possibility to influence the system and its performance from the outside, internal aspects tend to shape the process and the perception of environmental events. Insurance companies cannot ignore external events but depend on their ability to monitor them. *The main strategy is not to monitor external risks directly, but to monitor the risk management strategies of competitors*. This approach allows internally for more complex, and therefore, sometimes more adequate solutions when managing the remaining options. It complicates the survival of the insurance firm, however, as risks can grow as well as the danger of failure increasing. The selective perception was captured by Karl Weick (1979) with the notion of *equivalence structures*. This concept indicates that when other systems attempt to attract the attention of insurance, they are prone to develop certain linkages and to institutionalise them. It remains, however, always a result of the system-internal operations, which structural linkage is chosen to be developed. Hence, the specific openness for other systems is reflected in the organisational and sector-specific structures. A detailed analysis of the changes of organisational structures, over time, could explain the dominant strategies and expectations of insurance companies.

Another problem with co-ordinating the management of external and internal risks, is finding a temporarily feasible balance between internal needs and suppositions, on the one hand, and external expectations, on the other hand. On one side, it is necessary to be aware of all features of an external event, even those features that are not relevant in the moment of assessment, but might become relevant in the future. A detailed risk assessment of, for example, car accidents, household accidents or earthquakes is therefore inevitable and should not only be focused on past experience, but also on future expectations. However, as such, the probability and impact of, for instance, earthquakes alone, is not sufficient information for insurance. For example, it has to be calibrated by the level of property insurance in the area covered by this specific insurance. To make risk values a feasible indicator, Andreas Allmann (2001) extends the notion of technical risk (probability, impact) by adding the factor of *insured value*. This means that the risk of an earthquake depends on the frequency and the impact for a specific company engaged in the exposed area. Therefore, even if frequency and impact generate a high risk value, earthquakes tend to have a zero risk if no property is insured. For insurance companies these events are invisible when they have an insufficient market penetration. The indicator mirrors insurance strategies to optimise the solvency flow. But although the category of insured value improves and is of practical significance to risk assessment, it is still insufficient to make a final decision. It only highlights that some events should be more carefully considered than others. The conditions of insurance depend also on other aspects, such as the trading opportunities of such risk, the individual risk portfolio, or stock market developments that influence the investment strategies. Introducing insured value into the risk assessment represents, however, a first hint at understanding the selection of external risks and their management as internal risk.

This paper has illustrated some aspects of signals in risk management. However, the problems of the entire signalling system can best be seen when routines are changed and, accordingly, where the risk of failure becomes greater. Taking the example of natural hazards, we can see how substantial evaluative failures may suddenly play a

central role in risk management. The importance of natural disasters regarding insurance has changed dramatically since the beginning of the 1990s.

> The risk of natural disasters in the US has significantly increased in recent years, straining private insurance markets and creating troublesome problems for disaster prone areas. The threat of mega-catastrophes resulting from intense hurricanes or earthquakes striking major population centers has dramatically altered the insurance environment.
>
> (Grace, Klein and Kleindorfer, 2000: 2)

While in 1990 the maximum impact of natural hazards such as floods, earthquakes or hurricanes was estimated to be below $1 billion (Kunreuther, 1997: 7), Hurricane Andrew (1992) caused insured losses of between $14.5 to $20 billion. Still, the damaging potential of hurricanes were not fully visible in this case. It was estimated that had the hurricane taken another route, costs could have risen up to between $50 to $80 billion (Klein and Kleindorfer, 1999: 6). Due to the size of the economic impact, the financial basis of the traditional insurance system was under pressure as it was laid out for considerably smaller maximum losses (for example, Skipper and Klein, 1999).[12] The problem for insurance, therefore, was not only newly visible features of natural disasters, but also brand new financial effects. Insurance (for example in Florida) had increased the insured value and the density of insurance coverage step-by-step. At the same time, the size of premiums and the internal mechanisms for risk spreading were insufficiently prepared to match the actual risk level. Risk management had not perceived these contradicting signals in an adequate way. Changes in the market structure should have signalled that the formerly good risk had turned into a bad one. The unwanted effect of this systemic failure became, unfortunately, observable only after the hurricane occurred. The main problem, then, became to develop adequate indicators or signalling mechanisms to make the risk situation, as well as the related market conditions visible to the entire insurance sector. The market and its narrow focus on internal risks was not prepared to anticipate these outcomes. It could be concluded that the insurance system relied on wrong information, thus, the risk of insolvency has increased dramatically by the changes related to natural hazards, such as climate change.

The problem of indicators and their perception can be taken further. We can distinguish between indicators relevant for individual firms and for the sector as a whole. The industrial structure, as a whole, is less exposed by single events, but the vulnerability for a big event is often unknown since, at the level of individual firms, a domino-effect may be triggered with more serious impacts on the sector than the actual size of compensation would let us anticipate (Cummins et al, 1999). As internal risk trading tightly links all insurance firms, the effect such an event may have on single firms depends on the overall structure of the sector. The problem of risk management is, then, not so much the objective risk assessment awareness of specific financial risks, but more the issue of what combination of indicators signal relevant changes, including external risks and contextual conditions (for example, regulation). As a further consequence, the question emerges as to whether the

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12 An analogous argument was developed in the context of the nuclear issue. It was argued that the political and institutional context was developed to resolve issues of the welfare state, but could not deal with the challenges of the *risk society* efficiently (Beck, 1986; Huber, 1998).

institutional or regulatory context allows for necessary changes of the sector structures or not. The structure of the insurance system is not only influenced by the logic of insurance and of organisations, but also by constraints such as the form of regulation. In the case of Hurricane Andrew, it could be expected that rational insurance companies would have left the market in those exposed areas. However, political expectations and long-term contractual ties limit this type of rational reaction. In response to this inability to act rationally, the political setting is expected to become active and to develop a new and comprehensive regulatory framework (Grace and Klein, 1999) that re-arranges the conditions of economic success in the insurance system. These regulations, for example, oblige the insurance companies to remain in the market and provide a service in exposed areas, even at a fictional price.[13] Regulatory aspects of risk management highlight the problems of internal and external control. In the light of the above discussion, the problem for regulation is not only to establish long-term securities concerning coverage and economic investments (Meier, 1988), but also to establish an institutional setting that improves the effectiveness of signalling risks. Quite contrary to the expectations, the regulatory policies in the aftermath of Hurricane Andrew have increased the blindness of the market and the insurance firms, rather then allowing them to react to the relevant indicators of market changes (see also Huber, 2002).

3.6. The Role of Organisations

Coming back to the organisational aspects of risk management, their central role in the advanced model of insurance has to be stressed. The regulated market provides the general institutional setting within which organisations carry out the decisions about the selection of risks. Hence, the management of risks depends mainly on the organisational form of insurance, which influences the outcome considerably.

Françoise Ewald (1991) emphasises that a huge number of organisational forms shape the actual processes of insurance risk management. These forms have a direct impact on risk management as firms are not reflecting the financial risks of the insurance system as such, but more the individual possibilities of organisations to internalise/ externalise some of these generic risks. The individual organisations choose specific strategies to remain successful in the relevant market segment, which are differentiated in accordance with the organisational form.[14] For example, the differentiation between specialists and generalists is discussed in evolutionary theories of organisational change (for example, Hannan and Freeman, 1977; Nelson and Winter, 1982). Specialists are more flexible as they choose to carry out only one (or few) activities, while generalists cover a wider range of activities in a sector. Specialists can be expected to be flexible organisations with a flat internal structure, while generalists develop rather hierarchical, i.e. inflexible structures. Analysing the

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13 In the case of hurricanes, the State of Florida has decided on a moratorium on contracts, which blocks insurance companies from leaving pre-existing contracts and has fixed an upper limit for insurance premiums. The effects of the regulatory policy on the economy are considerable and require some compensation in the form of funds which help to curb the economic losses of insurance and reinsurance companies (see Klein and Kleindorfer, 1999).

14 This paper takes up this distinction to flag up some possible lines of argumentation on the link between insurance, risk management and organisational form. Many other distinctions could be developed. The size of firms (large/small) may play a crucial role (see, for example, Diacon, 2001).

effect of organisational structures on the success of insurance firms with the help of this crude distinction of organisational forms, one may expect that, in the case of crises, specialists tend to survive, while (as a tendency) generalists will suffer severe problems. Taking into consideration the regulatory setting, however, the need to establish continuity and stability, and the ability of specialists to adapt to changes in due course, may be blocked intentionally, thus providing generalists with a clear competitive advantage through regulation. Generalists develop in pace with the insurance system as a whole. Expanding the analysis further, then, and taking all actors of the entire insurance system into consideration, i.e. regulators, experts, state authorities and the insured, the problem of organisational survival is shifted towards the problem of co-ordinating insurance activities across the network and towards the ability to successfully challenge the rules of the game.

As far as indicators for risk management are concerned, it has to be noted that insurance companies cannot control the entire insurance system, they learn from observing their competitors and their deviation from 'normal' behaviour. This type of information determines their strategies. Being myopic as well, insurance firms become very attentive to minor market changes and the success or failure of competitors when they try to improve their own risk management. General changes outside the market may well pass unobserved. If success is expected, competitors imitate the innovating company and turn innovations into a success by this imitation (see, for example, Scott and Meyer, 1994; Zucker, 1991). The myopic view marks the substitution of the real world by market structures and internal relationships. The relevant environment could be condensed in the notion of an insurance network.[15] While the insurance sector might develop certain characteristics, individual firms may systematically deviate in order to establish an economically successful niche. One question is, is a single organisation able to adapt to the changing conditions of the network when new challenges emerge? The survival of the network is at stake and the probability of survival of single organisations depends mainly on these circumstances, but also on individual skills of the organisation. And how are organisations able to imitate the success by modifying it and adopting it to new needs? The success of such change is not secured by the rationality of the process, but depends on the incorporation of such changes into the broader setting. Hence, success depends not only on the capacity of the organisation to reflect upon the changes taking place in competing companies, but also the regulatory system and the strategies of how to influence their environment. Such an inter-organisational perspective directs our attentions towards problems of how 'successful patterns' of risk management are institutionalised across organisations. It points, therefore, to the specific, competitive and co-operative dynamics of an insurance network.

Two main points of this concept can be summarised: first, the strategies of organisational survival at the insurance market depend on market conditions rather than the problems to be dealt with; and second, organisations observe the market and the competitors when decisions about risk have to be taken. An artificial, internal 'market' or 'network' substitutes the real world and any understanding of insurance is bound to explore the logic of this substitution and of market-specific forms of co-

15 The network should not be understood in terms of strict membership, but rather in terms of an arena of negotiations among independent, and highly inter-dependent, insurance companies.

operation, particularly if new, unexpected situations emerge and put the established structure under severe pressure.

4. Conclusions

The distinction between *external* and *internal* risk is central to any attempt to decipher the conditions of risk management by insurance. External risk refers to events occurring frequently and causing damage to the individual insured. Car accidents, earthquakes or the difficulties of the labour market may be taken as examples of such external, 'real' risks. Only in rare cases is the insurance company endangered by these risks in their existence. Instead, it transforms these external risks into internal risks, which relate for them - due to the monetary compensation - mainly to financial activities. Consequently, the risks distributed across groups and firms are not external risks, such as the loss of property, but 'internal' risks of solvency, for both the insurance company and the insured. Therefore, the main achievement of insurance is to transform external factual risks of life and limb into a risk of its insolvency, incorrect calculations and insufficiently wide range of risk spreading. Internal processes and conditions, for example, by observing the market rather than the external world to decide on risk management, guide this internalisation of risks. External events are not ignored but are strictly selected according to internal processes. Economic benefits are of utmost importance, even if sometimes political or social factors play a decisive role. The synchronisation of risks takes place after risks have been identified and are chosen from a quasi-infinite number of events and decisions.

Insurance is no longer the institutional form of accurate risk assessment, but sets the goals and evaluates the commercial side of the 'objective' calculus. Even if the economic survival of insurance companies is based on these calculations, we see them not as a natural consequence of external risks, but as a result of the process of internalisation. While the traditional concept argues that insurance manages external risk, here it has been claimed that these external or real risks can be neglected. Insurance perceives and manages these external risks only insofar as it can perceive them as financial opportunities, and after that, it internalises them. It is the risks related to this internalisation process which then go on to determine the risk management of insurance firms and the insurance sector, as a whole.

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