

INSURANCE AGAINST FINANCIAL CRISES?

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I. INTRODUCTION

The recent financial crisis has led to substantial government interventions in financial markets. Large financial institutions that were in danger of collapsing were generously supported by national governments because those governments determined that the failure of large banks could lead to systemic risks as a result of which the entire financial system could collapse.¹

Much debate ensued concerning the “bailing out” of financial institutions, especially since larger financial institutions seemed to particularly benefit from these government interventions. The phrase “too big to fail” may make some economic sense since the risk of systemic failure is obviously greater with larger financial institutions. However, the use of taxpayers’ money to support financial institutions has been criticized as providing perverse incentives to investors and managers of financial institutions.

Debate over government financial intervention in new crisis situations is not new. In many countries, governments also generously intervene to provide compensation to victims of a variety of natural or technological catastrophes (such as nuclear accidents).² In some cases, ex post direct compensation is paid to victims; in other cases, the government acts as reinsurer of last resort (e.g. as far as terrorism is concerned) to deal with insuring against catastrophic risks.

With the financial crisis, the amount of government subsidies has increased considerably. To some extent, the financial crisis could be considered as comparable to a natural catastrophe in the sense that a quick intervention by government was necessary. Therefore, a goal of this article is to address whether there is an integrative legal and economic framework to analyse this type of financial intervention by governments in crisis situations.

1. Martin F. Hellwig, *Systemic Risk in the Financial Sector: An Analysis of the Subprime-Mortgage Financial Crisis*, 157 DE ECONOMIST 129, 167 (2009); Alessio M. Paces, *Consequences of Uncertainty for Regulation: Law and Economics of the Financial Crisis*, 7 EUR. COMPANY AND FIN. L. REV. 479, 501 (2010).

2. For a comparative perspective, see MICHAEL FAURE & TON HARTLIEF, INSURANCE AND EXPANDING SYSTEMIC RISKS 11-12 (2003).

This paper argues that the economic approach towards compensation of victims in case of natural catastrophes can also provide an important contribution to understanding interventions of a government during the financial crisis. It is particularly striking that in the case of natural catastrophes, insurance has played an increasingly large role. We argue that insurance may provide an attractive solution to risks emerging from the financial crisis. In a recent paper, Michel-Kerjan has programmatically pointed to this idea:

[T]he matter of financing large-scale disasters has relevance for many other catastrophes: hurricanes, earthquakes, pandemics, terrorist attacks, technological accidents, and even financial crises [emphasis added]. In all of these settings, one fundamental question arises: Who will pay for the economic consequences of future catastrophes and how best to organize this payment? . . . Catastrophe economics, which seeks to shed light on these issues, is likely to become a more significant field of research in the coming years.”³

The relevance of “catastrophe economics”⁴ for the regulation of financial catastrophes has been explored even outside of academia. In a recent OECD publication, for instance, a subchapter has been titled “New insurance mechanisms inspired by arrangements for catastrophic risks?”⁵ However, the design questions of insurance against financial crises have yet to be answered in either academia or practice. Our paper is a step towards answering these questions. A lot of work remains to be done.

The remainder of this paper proceeds as follows: first, we examine the desirability of financial crisis insurance and outline the conditions under which this would be feasible. Next, we discuss limited government intervention in insurance markets during catastrophes. Third, we present the example of export insurance, another instance in which governments step in

3. Erwann O. Michel-Kerjan, *Catastrophe Economics: The National Flood Insurance Program*, JOURNAL OF ECONOMIC PERSPECTIVES, Fall 2010, at 165, 184 (2010).

4. *Id.*

5. Sebastian Schich & Byoung-Hwan Kim, *Systemic Financial Crises: How to Fund Resolution*, 2 FIN. MARKET TRENDS, no. 2, 2010, at 1, 21.

and support insurance markets. We conclude with a proposal for a structural multi-layered approach whereby insurance could play a role in case of financial crises and the role of government would be reduced to one of a re-insurer of last resort.

II.

THE PROBLEM

A. *Bail-outs are Flawed.* . .

During the financial crisis, financial institutions were 'bailed out' on a large scale by national governments via a variety of different techniques. These "bail-outs" gave rise to substantial criticism in the literature which can be summarized as follows: the injection of money into banks and other financial intermediaries took place on an ad hoc basis to avoid financial contagion and systemic risks of the financial sector.⁶ These forms of state aid not only had an ad hoc character, but were also provided in a rather random manner: some financial institutions received (through various techniques) financial support whereas others did not and went bankrupt.⁷ Larger financial institutions especially benefited from state aid. 'Too big to fail' was the concept often heard in that respect. In addition to being problematic from a distributional perspective (using taxpayers' money to support shareholders of some larger financial institutions, whereas smaller ones could go bankrupt) this ex post compensation system could also give rise to moral hazard. That is, the awareness that they were 'too big to fail' and would receive state aid in case of a financial crisis could give managers of large financial institutions the wrong incentives to invest in riskier enterprises, thus reaping potential benefits (in case the enterprise succeeds), while shifting the risks (in case of failure) to the taxpayers.⁸

6. For an overview of how *ad hoc* means were triggered to avoid contagion, see, e.g., Roger D. Congleton, *On the Political Economy of the Financial Crisis and Bailout of 2008–2009*, 140 PUB. CHOICE 287, 304-06 (2009).

7. For an overview and assessment of the different European state aid regimes which were applied in the financial crisis, see generally CTR. FOR EURO. POLICY STUDIES, CEPS TASK FORCE, BANK STATE AID IN THE FINANCIAL CRISIS – FRAGMENTATION OR LEVEL PLAYING FIELD? (Oct. 2010), available at <http://www.ceps.eu/ceps/download/3859>.

8. These problems are summarized by Ben S. Bernanke, Chairman, Fed. Reserve Bd., Address at the Council on Foreign Relations: Financial Reform to Address Systemic Risk (Mar. 10, 2009); Karl S. Okamoto, *After the*

In addition to protecting financial institutions, the bail-out system also protects depositors via the so-called deposit guarantee system (depositors' investments in saving accounts are protected until currently 100,000 €, at least in Europe). This system, intended to prevent bank runs, provides disincentives for depositors to monitor financial institutions.¹⁰

B. . . . but is Intervention Unavoidable?

Notwithstanding the criticism of bail outs, some form of government intervention in financial crises may be unavoidable. This conclusion is related to the concept of a so-called systemic risk, the possibility that one firm's failure (e.g., the case of Lehman Brothers) will result in broad damages to the economy as a whole.¹¹ Arguably, in such cases, and to some extent, government intervention may be unavoidable.¹² The question, however, arises whether government intervention should take the form of ad hoc bail-outs or whether more structural solutions would be more desirable to, inter alia, avoid random interventions. The rest of our paper questions whether the most desirable structural solution to economic catastrophe is the classic instrument of insurance.¹³

C. Why Not Insure Against Financial Crisis?

The traditional instrument to protect risk-averse individuals and enterprises against risk is insurance. Corporations use insurance on a large scale and for a variety of reasons. Indeed, risk aversion is not the main reason why publically held corpo-

Bailout: Regulating Systemic Moral Hazard, 57 UCLA L. REV. 183, 204-08 (2009).

9. Council Directive 2009/14, 2009 O.J. (L68/3) (EC).

10. See Robert J. Dijkstra & Michael G. Faure, *Compensating Victims of Bankrupted Financial Institutions: A Law and Economics Analysis*, 19 J. FIN. REG. & COMPLIANCE 156, 157-59 (2011); H. Groeneveld, *Towards a Balanced Deposit Guarantee System in Europe*, 6-7 FORUM FINANCIER 419, 420-22 (2009).

11. See Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193, 193-249 (2008); see also Iman Anabtawi & Steven L. Schwarcz, *Regulating Systemic Risk. Towards an Analytical Framework*, 86 NOTRE DAME L. REV. 1349, 1359-61 (2011).

12. See A.J. Levitine, *In Defense of Bailouts*, 99 GEO. L.J. 435, 435 (2011).

13. For an excellent overview of the working of insurance and conditions of insurability, see HANDBOOK OF INSURANCE (Georges Dionne ed., 2000).

rations seek insurance.¹⁴ Generally, stockholders can, in principle, eliminate risk through diversification. By purchasing shares of different corporations, stockholders are able to diversify risks and are not entirely exposed to one company's performance. However, insurance provides an important tool for managing corporate risk,¹⁵ as well as reducing transaction costs.¹⁶ Given the availability of insurance, then, why would it theoretically be impossible to insure against financial crises? A variety of reasons can be advanced which would make a financial crisis an uninsurable risk.

A first problem that may arise is the predictability of the risk. Insurance, for localized as well as for systemic risks, is possible to the extent that risks remain predictable.¹⁷ It supposes that actuarially fair information is available (preferably via statistics) based on which the insurer can calculate the likelihood that the insured event will occur. Factual and legal uncertainties may endanger this *ex ante* predictability.¹⁸ Financial crises may be problematic in that respect for the simple reason that reliable statistics to predict such a crisis may be lacking.

A second problem relates to the fact that the insured risk has to be exogenous; that is, the insured himself must not be able to influence the risk. Endogeneity may be a serious problem to the extent that it will usually not be the financial crisis as such that will be the subject of insurance, but rather the risk that, for example, a financial institution will run into financial difficulties as a result of the crisis. The risk of endogeneity will hence pop up in cases where it is impossible to determine whether business failure (of the financial institution) occurred as a result of the crisis or rather because of other causes internal to the organization (such as risky investments or mismanagement). For that reason it was traditionally held that the

14. David Mayers & Clifford W. Smith, Jr., *On the Corporate Demand for Insurance*, 55 J. Bus. 281, 281-96 (1982).

15. See Richard MacMinn & James Garven, *On Corporate Insurance*, in *HANDBOOK OF INSURANCE* 541, 561 (Georges Dionne ed., 2000).

16. See Göran Skogh, *The Transactions Cost Theory of Insurance: Contracting Impediments and Costs*, 56 J. RISK & INS. 726, 727 (1989).

17. Faure & Hartlief, *supra* note 2, at 84-85.

18. Monti rightly points out that both factual and legal uncertainty could endanger predictability of risky events. Alberto Monti, *Environmental Risk: A Comparative Law and Economics Approach to Liability and Insurance*, 9 EUR. REV. PRIVATE L. 51, 51-79 (2001).

enterprise risk itself is in principle not insurable; this risk would not be predictable and hence an actuarially fair premium could not be calculated. The economic success of an enterprise could indeed be influenced by a lot of complex elements that may also mutually influence each other. Enterprise risks could also be related to general characteristics of business cycles, as a result of which there would not be an independent risk.¹⁹ From a societal perspective, a full insurance of the enterprise risk may also have the disadvantage that, as a result of control exercised by the insurer, potentially risky innovations would not take place.

The third reason why insuring enterprise risk is considered problematic is the well-known problem of moral hazard. Moral hazard refers to the phenomenon that behaviour of the insured corporation will change as soon as the risk is insured.²⁰ In 1963, Arrow pointed out in his well-known paper on uncertainty and the welfare economics of medical care that the demand for medical care will change under the influence of insurance.²¹ Not only will insurance increase the demand for risky activities; insurance will be particularly attractive for those who need it most.

This is closely related to the fourth problem, adverse selection. Adverse selection arises from the information asymmetry between the insurer and the enterprise.²² Adverse selection will arise if potentially responsible parties fail to disclose their true risk profile appropriately, which may impair the narrowing of risk pools. The result will be that the average premium would be relatively high for low-risk members, who would then leave the group. Thus adverse selection would emerge.²³ If in-

19. See Alfred Gossner, *Gibt es neue unversicherbare Risiken?*, Der Umgang mit den Risiken im Grenzbereich der Versicherbarkeit, Dokumentation über ein Symposium am 18-20, Oktober 2001 in Schloß Marbach, Böblingen, Karlsruhe 5-10 (2002) (written before the financial crisis). See also Walter T Karten, *How to Expand the Limits of Insurability*, 22 GENEVA PAPERS ON RISK & INS. 515, 516-19 (1997).

20. See Mark Pauly, *The Economics of Moral Hazard: Comment*, 58 AM. ECON. REV. 531, 531-45 (1968).

21. See Kenneth J. Arrow, *Uncertainty and the Welfare Economics of Medical Care*, 53 AM. ECON. REV. 941, 962 (1963).

22. See George A. Akerlof, *The Market for "Lemons": Quality, Uncertainty and the Market Mechanism*, 84 Q. J. ECON. 488, 489, 493-94 (1970).

23. Gerhard Wagner, *(Un)insurability and the Choice Between Market Insurance and Public Compensation Systems*, in SHIFTS IN COMPENSATION BETWEEN

surers are not be able to distinguish whether the enterprise risk is exogenous (for example, caused by a financial crisis) or endogenous (for example caused by mismanagement) incurable moral hazard would make the risk uninsurable.²⁴ That is, managers may blame a financial crisis for a company's problems and try to get financial help from the public while in fact management missteps caused the company's problems.²⁵

The fifth and final reason why damage resulting from a financial crisis may not be insurable is simply that the damage resulting from a financial crisis may largely outweigh the insurance capabilities of commercial insurers and even reinsurers. Hence, economic capacity may simply be lacking to cover this type of catastrophic financial risk.²⁶

After now having sketched the potential difficulties in using insurance as a mechanism to cover for damage caused by financial crisis, we will now question whether the problems identified are indeed incurable.

D. A Conditional Support

We believe that the problems identified in the previous section should by all means be taken seriously. There are, however, remedies available that render the problems curable. As a starting point, we should state that using insurance to cope with risks caused by a financial crisis may not be as odd as it perhaps seems at first blush. After all, in recent years insurance companies have become inventive in order to insure a variety of risks which are also part of enterprise risk. Moreover, in the process, insurance companies have increasingly used fi-

PRIVATE AND PUBLIC SYSTEMS 98, 99 (Willem H. Van Boom & Michael Faure eds., 2007).

24. See generally Ralph A. Winter, *Optimal Insurance under Moral Hazard*, in HANDBOOK OF INSURANCE 155-83 (Georges Dionne ed., 2000); Georges Dionne, Neil Doherty & Nathalie Fombaron, *Adverse Selection in Insurance Markets*, in HANDBOOK OF INSURANCE 185-243 (Georges Dionne ed., 2000).

25. This moral hazard problem played a major role, when the European Commission had to decide which companies should be eligible for state aid in the event of the financial crisis. For an in-depth discussion, see Michael Faure & Klaus Heine, *Can European State Aid Control Learn from the Management of Disastrous Crises?*, in INSTITUTIONELLE HINTERGRUNDE VON KRISEN 97-125 (Theresia Theurl ed., 2011),

26. For a discussion on capacity as a condition for insurability of system risks, see Faure & Hartlief, *supra* note 2, at 88-106

financial instruments to cope with particular risks. Typical in this respect is the increasing use of capital markets to cover insured risks, also referred to as securitisation or alternative risk transfer.²⁷

The use of these financial instruments and capital markets by insurance companies was praised before the financial crisis because, amongst other reasons, these alternative risk financing instruments would have more flexibility and would minimize the total risk costs.²⁸ Interestingly, empirical evidence shows that, contrary to what one might think, the financial instruments used as means of alternative risk transfer have not performed poorly during the financial crisis and hence the use of these instruments has subsequently not reduced.²⁹ This shows that increasingly financial instruments are also used as tools of insurance, as a result of which the border between insurance and financial instruments has become less clear.³⁰ In fact the question we would like to address is the reverse of using financial instruments for insurance, looking at the possibilities of using insurance for financial instruments. We believe that, notwithstanding the problems mentioned above, there are potential paths to this possibility.

Looking first at the issue of predictability: admittedly, financial crises may technically be difficult to predict. However, the recent sub-prime mortgage crisis was certainly not the first global financial crisis, and the emergence of this crisis provides additional information with which to make better esti-

27. For a discussion on securitisation and on alternative risk transfer, see Erik Banks, *ALTERNATIVE RISK TRANSFER: INTEGRATED RISK MANAGEMENT THROUGH INSURANCE, REINSURANCE AND THE CAPITAL MARKETS* 115-134 (2004); Fred Wagner, *Risk Securitisation. An Alternative Risk Transfer of Insurance Companies*, 23 GENEVA PAPERS ON RISK & INS. 574 (1998); Richard E. Smith, Emily A. Canelo & Anthony M. Di Dio, *Re-inventing Reinsurance using the Capital Markets*, 22 GENEVA PAPERS ON RISK & INS. 26, 26-37 (1997); Jürgen Zech, *Will the International Financial Markets Replace Traditional Insurance Products*, 23 GENEVA PAPERS ON RISK & INS. 490, 490-95 (1998).

28. Jürgen Zech, *Rethinking Risk Management: The Combination of Financial and Industrial Risk*, 26 GENEVA PAPERS ON RISK & INS. 71, 71-75 (2001).

29. Véronique Bruggeman, *Capital Market Instruments for Natural Catastrophe and Terrorism Risks: A Bright Future?*, 40(2) ENVTL. L. REP. NEWS & ANALYSIS 10136, 10136-53 (2010).

30. For example, many structured finance instruments can be modeled as economic catastrophe bonds. See Joshua D. Coval, Jakub W. Jurek & Erik Stafford, *Economic Catastrophe Bonds*, 99 AM. ECON. REV. 628, 635 (2009).

mates of the likelihood of future financial crises. Moreover, the literature has equally indicated that a lack of reliable statistics does not necessarily make a risk uninsurable. Kunreuther, Hogarth and Mezaros³¹ have argued that insurers can respond to this so-called 'insurer ambiguity' by charging a risk premium to account for the uncertainty following from the 'hard-to-predict' nature of an event. Problems may only occur when enterprises do not recognize the uncertainties based upon which insurers charge high additional risk premiums, and are thus unwilling to pay these premiums. Lack of information on the side of the insured may result in an unwillingness to pay. The willingness to purchase insurance may again increase if there is more information on the risks or if the potential insurance buyers become better aware of the risk.³² In that respect, the recent financial crisis only adds to the insurability of the risk by providing more actuarial information to both insurers and potential insured.

The second problem posed – the exogenous character of the risk – is the most difficult issue we need to address. That problem, however, is actually strongly related to the third problem of information asymmetry and the resulting moral hazard problem. From the literature, various tools are known to remedy the moral hazard problem.³³ If moral hazard can be adequately controlled, the insured in fact behaves as if no insurance were available. The crucial question is, hence, (noted also by von der Schulenburg³⁴), whether more information can be made available to adequately control the moral hazard problem. Time and technology to accurately assess risks are crucial in that respect. As far as financial crises are concerned, the key issue will be for insurers to intervene only when damage resulting from business failure was effectively caused by the financial crisis and not by causes which lay in the behaviour of the insured and hence could have been prevented

31. Howard Kunreuther, Robin Hogarth & Jacqueline Meszaros, *Insurer Ambiguity and Market Failure*, 7 J. RISK & UNCERTAINTY 71, 71-87 (1993).

32. Faure & Hartlief, *supra* note 2, at 86-87.

33. See Steven Shavell, *On Moral Hazard and Insurance*, 93 Q. J. ECON. 541, 541-62 (1979).

34. Alfred Gossner, *Gibt es neue unversicherbare Risiken?*, in *Der Umgang mit den Risiken im Grenzbereich der Versicherbarkeit* 5, 9-10 (2002) (comment of Matthias von der Schulenburg during discussion at symposium held at Schloß Marbach, Öhningen on October 18-20, 2001).

(e.g., mismanagement). To the extent insurers invest in risk classification and risk management, they will also be able to obtain information on whether the business failure resulted from an insured risk (financial crisis) or from an endogenous factor.³⁵

To be clear: we do not suggest making the enterprise risk as such insurable, but merely the damage resulting from a business failure following a financial crisis. Increasingly, however, the literature also considers the enterprise risk as such insurable.³⁶ Moreover, some insurance companies provide insurance against bankruptcy resulting from sudden economic changes. The website of Cadia Insurance is interesting in that respect.³⁷ The company claims to offer enterprises insurance against bankruptcy in case of “sudden economic changes.” For a premium of \$ 30,000, an amount of \$ 1,000,000 may be insured. Of course, the website mentions that the company makes the insurance “available only to companies after providing a comprehensive and transparent financial statement” and that losses “that are the result of poor management” are excluded. As a payout requirement, the website mentions: “In the case of a client filing a claim for insurance against bankruptcy we will demand an official decision issued by a court, various documents which show how the company was managed and the reason for the bankruptcy.” Without judging the effectiveness of this business model, it at least shows that the enterprise risk is no longer considered uninsurable and that insurance companies will take adequate measures to deal with problems of endogeneity and moral hazard in case of insurance against bankruptcy.

Nonetheless, the capacity issue remains a major hurdle in a proposal for the insurance of systemic risks. Although techniques such as pooling, co-insurance and reinsurance undoubtedly have increased the capacity of the traditional insurance market,³⁸ the traditional problem with the insurance of

35. For the importance of risk differentiation and classification, see Keith J. Crocker & Arthur Snow, *The Theory of Risk Classification*, in *HANDBOOK OF INSURANCE* 245-76 (Georges Dionne ed., 2000).

36. See, e.g., Gossner, *supra* note 19, at 7-8.

37. *Insurance Against Bankruptcy*, CADIAINSURANCE.COM, <http://www.cadiainsurance.com/insurance-products/financial-products/insurance-against-bankruptcy>.

38. See Faure & Hartlief, *supra* note 2, at 88-90.

risks of a catastrophic nature (such as a financial crisis) is that traditional insurance markets may lack the capacity to deal with those catastrophic risks.³⁹ Perhaps, however, government could step in as a lender or reinsurer of last resort to support the functioning of insurance markets where they would otherwise (due to capacity problems) fail. We now turn to two cases in which government plays such a role: insurance of catastrophes and export insurance.

III.

INSURANCE FOR CATASTROPHES

A. *Theory*

Many law and economics scholars favour insurance solutions for catastrophic risks, especially when compared to the alternative of government-provided compensation. For example Epstein qualifies government intervention as a "catastrophic response to catastrophic risk," meaning that it will dilute the incentives to develop insurance solutions.⁴⁰ Furthermore, Priest⁴¹ and Kaplow⁴² have pointed at the advantages of insurance in dealing with catastrophic risk: insurance better enables an adequate risk differentiation and risk spreading and if insurance markets are competitive, insurers can be assumed to be better able to deal with classic insurance problems, such as moral hazard and adverse selection. A similar point has been made by Kunreuther, who, since 1968, has argued in favour of insurance solutions for disasters.⁴³

The argument in favour of government intervention is that without government support insurance coverage for disasters would simply not have developed.⁴⁴ Indeed, if government

39. See Kenneth A. Froot & Paul G.J O'Connel, *The Pricing of U.S. Catastrophe Insurance*, in *THE FINANCING OF CATASTROPHE RISK* 195, 195-227 (Kenneth A. Froot ed., 1999).

40. See Richard A. Epstein, *Catastrophic Responses to Catastrophic Risks*, 12 J. RISK & UNCERTAINTY 287, 287-308 (1996).

41. See George L. Priest, *The Government, the Market, and the Problem of Catastrophic Loss*, 12 J. RISK & UNCERTAINTY 219, 219-237 (1996).

42. See Louis Kaplow, *Incentives and Government Relief for Risk*, 4 J. RISK & UNCERTAINTY 167, 167-175 (1991).

43. See Howard Kunreuther, *The Case for Comprehensive Disaster Insurance*, 11 J. L. & ECON. 133, 161-63 (1968).

44. See Howard Kunreuther, *Mitigating Disaster Losses Through Insurance*, 12 J. RISK & UNCERTAINTY 171, 180-83 (1996); Scott E. Harrington, *Rethinking*

intervention were absent, the regular (re)insurance market would not be in a position to cover the catastrophic risks caused by natural disasters given the hard-to-predict nature of natural disasters and the potentially catastrophic losses that may emerge once a disaster occurs. The losses may well go beyond the capacity of the ordinary (re)insurance market as a result of which they would not be willing to cover those risks, resulting in uninsurability.

Reinsurance by the State can then be considered as an adequate method to resolve the uninsurability problem. A condition is of course that the government charges an actuarially fair premium for its intervention.⁴⁵ This type of government intervention has, moreover, the advantage that ex post relief sponsored by the public purse can be avoided. Where the government acts as reinsurer, this at least has the advantage that a premium can be paid by those who actually cause or run the risk. It can thus facilitate market solutions, provide incentives for prevention to potential victims and avoid a negative redistribution from taxpayers to victims. Thus a State intervention as reinsurer may avoid the “catastrophic responses to catastrophic risks.”⁴⁶

Recently, Kunreuther and Michel-Kerjan also argued in favor of this type of government provided reinsurance. They argue that one advantage is that the government has the capacity to diversify the risks over the entire population and to spread past losses to future generations, thus creating a form of cross-time diversification which the private market could not achieve.⁴⁷ They furthermore argue that, especially as far as terrorism is concerned, government participation in insurance

Disaster Policy, 23 REG. – THE CATO REV. OF BUS. & GOV'T 40, 40-46 (2000); Reimund Schwarze & Gert G. Wagner, *In the Aftermath of Dresden. New Directions in German Flood Insurance*, 29 GENEVA PAPERS ON RISK & INS. 154, 154-68 (2004).

45. Michael G. Faure, *Financial Compensation for Victims of Catastrophes: A Law and Economics Perspective*, 29 LAW & POL'Y 339, 358 (2007).

46. Epstein, *supra* note 40; see also Howard Kunreuther & Mark Pauly, *Rules Rather than Discretion: Lessons from Hurricane Katrina*, 33 J. RISK & UNCERTAINTY 101, 112-13 (2006) (arguing that this government's role in assisting the supply side allows avoidance of the inefficiencies and inequities associated with disaster assistance).

47. Howard Kunreuther & Erwann Michel-Kerjan, *Challenges for Terrorism Risk Insurance in the United States*, 18 J. ECON. PERSP. 201, 210 (2004) (citations omitted).

programs is crucial since the risk of terrorist attacks is partly in the government's control and the government can have more information on ongoing terrorist groups' activities through intelligence services.⁴⁸

B. *Examples*

There are many examples of government intervening in the financing of catastrophe risks, whereby the government acts as reinsurer of last resort. A well-known example in the field of natural catastrophes (so-called "natcats") is provided by the case of France. France introduced mandatory insurance against natural disasters; reinsurance is provided through the Caisse Centrale de Réassurance (CCR). This CCR provides reinsurance via the State and even provides for unlimited coverage (in reinsurance) for natural disasters.⁴⁹ The French State provides an unlimited guarantee to the CCR, something that could never be provided by an ordinary insurer.⁵⁰ Many other examples of the government acting as reinsurer of catastrophe risks exist.⁵¹

An interesting case is that in many countries after 9/11 the government will intervene in to reinsure the terrorism risk. For example, in 2003, Dutch insurers and the country's government set up a reinsurer of last resort, named the Dutch Terrorism Risk Reinsurance Company – "NHT" – to cover terrorism risks in the Netherlands. This reinsurance pool, which has a capacity of 1 billion Euros per calendar year, is funded by Dutch insurers, the government and reinsurers. It was foreseen that the first 400 million Euros will be reinsured by the participating primary insurers (even in case a particular insurer does not need to collect revenues from the NHT), while losses in excess of 400 million Euros in the annual aggregate will be protected under a reinsurance market excess-of-loss

48. Howard Kunreuther & Erwann Michel-Kerjan, *Insurability of (Mega-) Terrorism Risk: Challenges and Perspectives*, in *TERRORISM RISK INSURANCE IN OECD COUNTRIES* 107, 121-23 (2005).

49. See generally CCR, *The Natural Disaster Compensation Scheme in France*, <http://www.ccr.fr/index.do?aid=2094981368466376959> (select available link for PDF) (last visited Nov. 16, 2011).

50. Veronique Bruggeman, Michael G. Faure & Karine Fiore, *The Government as Reinsurer of Catastrophe Risks?*, 35 *GENEVA PAPERS ON RISK & INS.* 369, 381 (2010).

51. See *id.* at 376-85.

program valued at 300 million Euros, with any additional shortfall taken up by the Dutch government, acting as a reinsurer of last resort, up to another 300 million Euros. The government asks for a premium for its reinsurance capacity which is chosen in such a way that it will price itself out of the market at the time insurability of the terrorism risk is restored. As a result, since January 1, 2006, the Dutch government only needs to guarantee 50 million Euros and the NHT covers more than 950 million Euros.⁵²

C. Lessons

Of course it is not difficult to find differences between natural disasters or terrorism on the one hand and the financial crisis on the other. For example the absolute economic impact of the financial crisis can be huge because of the worldwide interrelatedness of banks, issuers of securities and industry. Natural and technological disasters may inflict widespread damages, but the disasters are usually limited to a certain population and predicting the budget for compensating victims may be possible. The predictability of the total amount of the loss in case of financial disasters may be less certain.

A second difference is that the causes of natural disasters or terrorism can usually be easily defined. In a financial crisis, on the other hand, it is not so easy to determine whether the economic failure of a firm traces back to the financial crisis or was induced by general mismanagement. Thus the endogeneity of the risk may be a much more serious problem in case of a financial crisis.

Nonetheless, there are possibly a few lessons to be learned from the recent tendency in the literature and policy developments in the field of catastrophes.

First, in the field of catastrophes many scholars have pointed at the risk of the so-called 'charity hazard', suggesting that an ex post payment by government to victims of (natural) catastrophes may create a moral hazard problem on the side of the victims.⁵³ The same problem also arises in case of bail-outs after a financial crisis. Hence in both cases there may be

52. Parliamentary Proceedings of the Second Chamber of Representatives 206-2007, 31 031 IXB, No.1, at p. 37 (Neth.).

53. See, e.g., Mark J. Browne & Robert E. Hoyt, *The Demand for Flood Insurance: Empirical Evidence*, 20 J. RISK & UNCERTAINTY 291, 291-306 (2000); Paul

reasons to avoid, in the words of Epstein “catastrophic responses to catastrophic risk.”⁵⁴

Second, in the case of natural catastrophes it has been pointed out that a structural solution may be warranted to avoid randomness and ad hoc-ism.

Third, the case of catastrophes shows that a multi-layered approach could be followed whereby the advantages of insurance -with the possibilities of risk differentiation - are used to the full extent, thus providing incentives to the prevention of risks, and whereby government only intervenes as reinsurer or lender (of last resort) to provide capacity where commercial (re)insurance markets would fail.⁵⁵

Fourth, making compensation for victims of catastrophes the joint responsibility of insurers and government may provide for an optimal combination of incentives for all parties involved: insurers, specialised in risk differentiation, can maintain preventive measures through risk classification and monitoring. The State, being exposed to the residual risk, will also have useful incentives; for example, in the case of natural catastrophes, it will want to take preventive measures to avoid the catastrophe in the first place. An economies of scope argument may also be valid here: government may be better placed than other actors to prevent terrorists attacks or to build dikes to prevent flooding. These arguments apply to a large extent *mutatis mutandem* to the case of financial crisis-risks as well.

IV.

EXPORT INSURANCE

A. *Theory*

It could still be argued that the risks associated with terrorism or natural catastrophe differ from those associated with financial risk to an important degree. However, a structure similar to that of catastrophe insurance also exists in another area, export guarantees. The theoretical starting point for export guarantees is a book by the Rotterdam Nobel Prize Winner Jan Tinbergen, who as early as 1962 observed that political

A. Rashky & Hannelore Weck-Hanneman, *Charity Hazard – A Real Hazard to Natural Disaster Insurance?*, 7 ENVTL. HAZARDS 321, 321-29 (2007).

54. Epstein, *supra* note 40.

55. See Schwarze & Wagner, *supra* note 44.

factors could determine to an important extent the volume of trade between countries, given the potential of political instability.⁵⁶ According to this theory, the export market may be incomplete as a result of asymmetric information, in which case government intervention might be useful to improve efficiency.⁵⁷ The risk for an exporting party is that the importer may become insolvent and hence default on the export contract. In addition to this commercial risk, actions by the importer's host government may cause non-payment on the export contract: this is the so-called political risk. There are several reasons why no perfect insurance for this political risk can be obtained:

1. High correlations of risks in an export credit portfolio;
2. Strong time-varying risk exposures and
3. Potentially higher recovery rates of claims stemming from political risks by export credit agencies.⁵⁸

The third argument is particularly interesting: the government would be better able to bundle all claims and can use diplomatic means to recover the due obligations. Other studies also hold that from the perspective of recovering efficiency losses the use of an export credit programme is justifiable. Shifting the risk to government also reduces the costs of collecting information about credit standing of importing markets.⁵⁹

B. Example

Under the export guarantee model, the government provides export credit guarantees to market participants. In Germany, for example, the system is run via Euler Hermes Kreditversicherungs AG and PriceWaterhouseCooper. The

56. JAN TINBERGEN, *SHAPING THE WORLD ECONOMY: SUGGESTIONS FOR AN INTERNATIONAL ECONOMIC POLICY* 265 (1962), available at <http://repub.eur.nl/res/pub/16826/>.

57. Christoph Moser, Thorsten Nestmann & Michael Wedow, *Political Risk and Export Promotion: Evidence from Germany* (Deutsche Bank Research, Working Paper Series, Research Notes No. 23, 2006).

58. *Id.* at 4.

59. See PAUL RIENSTRA-MUNNICH, CALUM G. TURVEY & WON W. KOO, *A THEORETICAL ANALYSIS OF ECONOMIC IMPACTS OF EXPORT CREDIT INSURANCE AND GUARANTEES* (Am. Agric. Econ. Ass'n, Annual Meeting 2006).

public export guarantees are integrated into the accounts of the government. Premiums and fees are transferred to the federal budget and indemnification of claims is paid out of federal funds.⁶⁰ Euler Hermes is only paid a fee for handling the export scheme. The statute determines a maximum exposure limit. The credit insurance provided by Euler Hermes does not provide full coverage for the commercial risk (that is, the risk that a private importer will become insolvent), but mainly insure the political risks that have been specifically defined.⁶¹ The risk premiums charged by Euler Hermes are based on country ratings. The goal of export insurance and the support by government is to promote exports. The reimbursement clearly indicates a subsidy component, which is deemed justified to deal with the political risks which would otherwise hamper German exports.⁶² Almost all countries have such forms of export credit insurances, which include an element of subsidy on foreign exports.⁶³

C. Lesson

Of course, to some extent, these subsidies and government intervention may create market distortions. Moreover, questions could also arise concerning the compatibility of the subsidies with the regulations of the World Trade Organisation. More interesting for the scope of our paper, however, is that export insurances are clearly seen as a sort of subsidy to overcome financial crises in importing (often developing) countries by providing liquidity for exported goods.⁶⁴ The argument is that the State is considered to be a better insurer to cover these political risks and to have better capacities to monitor the payback possibilities of faulty credits.⁶⁵ Moreover, the German credit insurance agency, Euler Hermes, apparently

60. Moser, Nestmann & Wedow, *supra* note 57, at 6.

61. See *Covered Risks*, EXPORT CREDIT GUARANTEES OF THE FEDERAL REPUBLIC OF GERMANY, http://www.agaportal.de/en/aga/grundzuege/gedeckte_risiken.html

62. Moser, Nestmann & Wedow, *supra* note 57, at 7.

63. Rienstra-Munnica, Turvey & Koo, *supra* note 59.

64. Hideki Funatsu, *Export Credit Insurance*, 53 J. RISK & INS. 679, 679-92 (1986).

65. However, there is of course always the risk that the State will use the official export insurance as a tool of strategic export promotion (e.g. through reduced premiums) in which case the export insurance may

carefully distinguishes between commercial risks and political risks. This shows that it should be possible to distinguish also between business failure due to commercial risks (e.g. mismanagement) or due to a financial crisis.

V.

PROPOSAL

A. *A Structural Approach*

The approach in the previous sections shows that using insurance to cover risks posed by a financial crisis may be difficult, but not impossible, provided certain conditions are met; that is, the possibility that the insurer is only able to cover the exogenous risk and the ability to control moral hazard and adverse selection adequately via risk differentiation. This obviously assumes adequate information on the side of insurers. The major remaining problem, the lack of capacity as a result of large financial losses, could be covered by ex post government intervention. However, the type of government intervention we propose is in important ways different than the intervention of government via ex post “bailouts” of large financial intermediaries of the sort seen in the recent financial crisis of 2008.

First, we would suggest dealing ex ante with the possibility of losses due to a financial crisis in a structural way rather than via ad hoc and ex post mechanisms. This aims, via insurance, at implementing market solutions for compensating victims of financial crises. Hence, compensation will no longer be ad hoc but structural.

Second, government intervention should be, as in the case of terrorism or natcats, limited to situations where private insurance markets fail due to lack of capacity. Hence, government intervention will be limited and compensation will be partly paid by private insurance companies. The result will be that market incentives to assess and monitor the hidden characteristics and hidden behaviour of potential beneficiaries remain intact. While in the case of a full ex post bail-out the state has to make a full investigation into all details, such as whether a financial intermediary qualifies for a subsidy, the structural

amount to state aid. Gerda Dewit, *Intervention in Risky Export Markets: Insurance, Strategic Action or Aid?*, 17 EUR. J. POL. ECON. 575, 575-92 (2001).

involvement of insurance companies will have the effect that information concerning the financial status of financial intermediaries will be collected largely *ex ante*. In addition, competition between private insurance companies will provide high-powered incentives to price risks adequately (static efficiency) as well as to engage in innovative activities to make better risk assessments (dynamic efficiency).

An apparent advantage of this structural approach is its pre-emptive effect on financial crises. Since insurance companies will have to permanently monitor insured companies, in order to make adequate risk assessments and to adapt insurance premiums, there will be a constant flow of information regarding a company's financial status, business model and management capacity. Currently the 'due diligence' of companies takes place almost exclusively in the event of mergers or initial public offerings⁶⁶ and it is even questionable whether regular audits by accounting firms make a proper assessment of a company's financial status;⁶⁷ the engagement of insurance companies would be an additional safeguard for providing proper information on a company's financial status. Such permanently generated and disseminated information would help to stabilize the financial system by making the market participants' investment decisions more informed. In the following paragraphs the pre-emptive effect of the suggested structural approach will become more clear by discussing the approach's details.

Moreover, our proposal also has the advantage of being more distributionally fair than the current system of "bail outs" which takes place in a random, *ad hoc* manner and has negative effects on incentives to prevent crises. Moreover, under

66. Heinrich Pack, *Due Diligence*, in *HANDBOOK OF MERGERS AND ACQUISITIONS* 153, 153-83 (Gerhard Picot ed., 2002).

67. For example, the case of *Parmalat* clearly points to the ambiguous role of accounting firms. *Parmalat* claims that its accounting firms were actively involved in obscuring the true financial status of *Parmalat* which subsequently led to *Parmalat's* bankruptcy. *Parmalat Capital Fin. Ltd. v. Bank of Am. Corp.*, 412 F. App'x 325 (2d Cir. 2011). More recently, the New York attorney general Andrew Cuomo sued Ernst & Young, charging the accounting firm of helping Lehman Brothers, its client, to "engage in a massive accounting fraud" by misleading investors about the investment bank's financial status. Notice of Removal, *People v. Ernst & Young*, 2011 WL 162264 (S.D.N.Y. 2011) (No. 11 CIV 0384).

the current system, the shareholders of financial institutions receive additional protection, and, without paying for them, reap the benefits if there are profits. Under our system, financial institutions (and thus their shareholders) would pay via insurance premiums for the protection awarded to them.

B. *A Multi-Layered Approach*

From the discussion of financial compensation for victims of catastrophes in Section 3, we can see that a multi-layered approach can be introduced whereby a first layer of losses is typically absorbed by the victims themselves. The second layer of losses is covered by private insurance companies and reinsurance. The third layer of losses is covered by the public budget whereby the government becomes a reinsurer of last resort. The model, we propose, also has sufficient capacity to be applied to the large potential losses caused by a financial crisis.

While it is not likely that the economic risks of a financial crisis can be fully insured by private insurers, because insurers are highly intertwined with financial markets and because of the sheer amount of funds that are needed, the introduction of private insurance can reduce the risk that the public provides subsidies to firms that would be in trouble even without financial crisis. More technically phrased, a multi-layered insurance program can serve as a screening device that reduces the likelihood of granting non-eligible subsidies granted when a public agency has to decide on a huge amount of applications for subsidies in a short time.

The first layer of a multi-layered insurance program is typically the requirement that the insurance holder himself bears a part of the costs.⁶⁸ This is an incentive for firms not to engage in moral hazard, and it may also help to overcome adverse selection. For example, the requirement to hold enough equity to compensate temporary losses may be understood as an obligation for firms to self-insure a part of the losses in the event of a financial crisis. In addition, a firm may freely adopt codes of corporate governance in order to signal to insurers that the firm strives for proper management. This kind of self-selection may lead to a reduction of premiums for insurance

68. Kunreuther & Michel-Kerjan, *supra* note 48.

and may also be a convincing argument for the public to speedily grant aid in the event of a financial crisis.

At the second layer private insurers offer risk-adjusted insurance contracts to firms which will cover the risk of becoming illiquid and which will guarantee the maintenance of a firm's operations. Although in the case of a severe financial crisis this private part of the financial safety net will often not be sufficient to rescue all firms, it will nevertheless contribute to financial stability. However, the most significant aspect of the second layer is that insurers will undertake investigations (e.g. due diligence and stress tests) in order to calculate the risk-adjusted premiums for firms. Through such investigations, information about a firm's economic performance and financial stability will be uncovered. This information is of great importance when a public agency has to decide quickly whether a subsidy is applicable. While in non-crisis times a public agency may have enough time and resources to undertake its own *ex post* investigations into whether a firm is eligible for benefit, in times of a financial crisis the administering agency will be overburdened by applications for financial help and can refer to the information provided by insurance companies.

Again, there is a parallel to the insurance of natural catastrophes. For example, the National Flood Insurance Program (NFIP) was introduced in the US in 1968, and it was responsible for developing flood maps and gathering all the information which is needed to calculate risk-adjusted insurance premiums. Through that process, certain high-risk areas were detected, which have a flooding risk of one percent per year. Furthermore, the Community Rating System, which constantly monitors the efforts of communities to reduce the flooding risk, was installed. Those efforts to reduce the flooding risk result in lower insurance premiums.⁶⁹

In our system, the second layer would consist of an intervention of private insurers. However, in practice, several alternatives have developed to deal with catastrophic risk as alternatives to insurance. One obvious example is the use of the financial market for catastrophes in so-called "catastrophe bonds." Although it may seem a strange option to use financial instruments to deal with risks posed by financial institutions,

69. Michel-Kerjan, *supra* note 3, at 167.

this option should not be ruled out. For example, catastrophe bonds as a means of re-insurance have the advantage that third parties - private financial investors - cover a part of the risk, while taxpayers would otherwise have to step in. It is also possible that governments will issue catastrophe bonds directly, in order to avoid using taxpayer's money in case of a catastrophe. For example, Mexico did so in collaboration with the World Bank in 2006 and 2009 in form of a three-year maturity bond that covers hurricanes and earthquakes. It has been proposed to transfer this concept to the US National Flood Insurance Program as well.⁷⁰

Such a strategy is sensible: it has, after all, been shown that modern financial instruments covering catastrophic risks have done relatively well throughout the financial crises.⁷¹ Another alternative that has been developed in the market, specifically for oil pollution risks⁷² is the development of a risk-sharing agreement. Through these agreements, risks are distributed among operators exposed to a similar risk. As in the case of insurance, the agencies protect risk averse individuals against risk. The risks are, however, shared amongst similarly situated organizations rather than shifted to a third party. To the extent that financial institutions would be able to develop such a risk distribution agreement amongst themselves (for example via a pool of financial institutions), this may well be a viable alternative to provide compensation in our system's second layer as well. The preference for a risk distribution agreement rather than third-party insurance is related to the operational costs of both systems and the ability of either insurers or financial institutions to adequately monitor risks. In principle, financial institutions themselves may be better able to exercise mutual monitoring. However, through pressure exercised by larger institutions, mutual monitoring may be suboptimal and an objective risk assessment and monitoring via insurers may be preferable.

At the third layer, the public steps in as a "re-insurer of last resort" and may grant subsidies. While at the second layer private insurance companies can only diversify risk horizon-

70. *Id.*

71. J. David Cummins & Philippe Trainar, *Securitization, Insurance, and Reinsurance*, 76 J. RISK & INSURANCE 463, 485 (2009).

72. Through so-called Protection and Indemnity (P&I) clubs.

tally between firms actually part of a risk pool, the government can diversify the third-layer risks over the entire population of firms and spread past losses to future taxpayers, creating cross-time diversification of risk that private insurance markets cannot achieve.⁷³ Again, because of the information generated by the due diligence of private insurance firms in the second layer and the signals that are freely given by firms in the first layer, public agencies will be able to make timely decisions on subsidies with a considerably reduced failure rate.

C. *Specific Aspects*

Thus far, we have pointed out the potential of insurance as a mechanism for dealing with financial crises via a multi-layered approach, utilizing the example of the role of government in the case of financial compensation for victims of other catastrophes. However, several practical details crucial to the effectiveness of the system remain to be explained. First, we must identify whom this multi-layered framework should be provided for as a protection against financial crises. Theoretically, the system could be applicable both to financial intermediaries as well as companies in the "real economy." However, the "bail-outs" to which we are attempting to present an alternative were most notably provided to financial intermediaries. Therefore, for the sake of simplicity, and although it could be applicable to the real economy as well, we first explore the possibilities of our model for financial institutions.

A second issue is how one can determine whether losses are indeed caused by a financial crisis. This problem is not new. It also appears, for example, in the insurance of natural catastrophes in France, where specific insurance coverage is only provided when damage is caused by a natural catastrophe. Likewise, in our case, it will have to be determined whether a financial problem can be classified as a financial crisis, as a result of which the proposed system will be triggered. In the literature, those decisions are associated with "sorting costs" and can as such be overcome as well.⁷⁴ The example of France shows that the government will make an administrative

73. Kunreuther & Michel-Kerjan, *supra* note 48.

74. See generally Saul Levmore & Kyle D. Logue, *Insuring against Terrorism – and Crime*, 102 MICH. L. REV. 268, 315 (2003) (noting that providing gov-

decision declaring a particular event a natural catastrophe.⁷⁵ A similar system could thus be used in our model as well to deal with the sorting costs: the government could declare a particular stressful financial situation “a financial crisis” as a result of which the multi-layered approach will be triggered. An advantage of the proposed approach is that the government can also refer to the specific information that insurers have already collected. However, the official declaration of financial crisis will of course not mean that all damages claimed by the insured companies will necessarily be paid by the system. It will obviously still have to be determined whether the business failure and resulting problems of the financial intermediaries were truly caused by the financial crisis and not by endogenous factors (such as mismanagement).

Third, we referred to government intervention as a reinsurer of last resort to grant financial aid. This assumes that the intervention of government in the third layer would amount to a subsidy. That should of course not necessarily be the case. It has been argued that an efficient reinsurance by the government would suppose that risk based premiums should be charged in order to provide incentives to invest in cost-effective loss prevention measures.⁷⁶ State provided reinsurance should thus in principle use risk-based premiums that reflect actual risk to the extent possible.⁷⁷ Nevertheless, the intervention of government as reinsurer has been criticised because it would amount to a subsidy.⁷⁸ However, government reinsur-

ernment sponsored terrorism insurance creates the need to sort between crimes committed by terrorists and those not).

75. Olivier Moreteau, *Policing the Compensation of Victims of Catastrophes: Combining Solidarity and Self-responsibility*, in 22 TORT AND INSURANCE LAW: *Shifts in Compensation between Private and Public Systems* 199, 213 (Willem H. van Boom & Michael G. Faure, eds., 2007); Michel Cannarsa, Fabien Lafay & Olivier Moreteau, *France*, in 14 TORT AND INSURANCE LAW: *Financial Compensation for Victims of Catastrophes. A Comparative Legal Approach* 81, 83 (Michael G. Faure & T. Hartlief, eds., 2006).

76. See Anne Gron & Alan O. Sykes, *A Role for Government?*, 25 REGULATION 44, 49 (2002).

77. Bruggeman, Faure & Fiore, *supra* note 50, at 377-378.

78. See Levmore & Logue, *supra* note 73, at 304 (explaining that other rationales are available for criticizing reinsurer-of-last-resort subsidies, including the point that for the scheme’s to have its desired effect will only be seen “it must involve a substantial subsidy.”).

ance need not be provided gratis.⁷⁹ To the extent feasible the government should charge a price for the reinsurance it provides. To the extent possible the subsidy character of government intervention is therefore reduced.

A complicated fourth issue is whether a multi-layered coverage system for financial crises should be mandatory. Here the parallel with natural catastrophes may not be obvious. In the case of natural catastrophes the system is often mandatory (e.g., in France and Belgium) and the suggestions to institute comprehensive natural disaster insurance, repeatedly made by Kunreuther,⁸⁰ also seem to be based on a mandatory system of insurance.⁸¹ The arguments supporting compulsory insurance for natural disasters are that potential victims largely underestimate risks. Behavioural experiments also show that individuals do not take insurance against low-probability, high-loss events, even if it that increases their utility.⁸² Behavioural problems like bounded rationality cause individuals to take an 'it will not happen to me' attitude and hence not to purchase insurance coverage.⁸³ However, these behavioural arguments that support mandatory insurance in the case of "natcats" may not apply in the case of financial intermediaries who seek coverage against risks caused by financial crises. Therefore, as a starting point, the system should be voluntary. The advantage is that a separating equilibrium is thus created to distinguish between the good and the bad risks. In order to preserve the credibility of the system, those who would not seek insurance coverage (presumably the bad risks) would then also not be bailed out.

79. Kunreuther & Michel-Kerjan, *supra* note 47, at 211.

80. See generally Kunreuther & Pauly, *supra* note 46 (arguing an ex ante public program to ensure coverage of catastrophic losses may be more efficient than the current ex post public disaster relief program).

81. See Kunreuther, *supra* note 44, at 182-83 (arguing for comprehensive disaster insurance provided jointly by the government and private insurers).

82. See Paul Slovic, Baruch Fischhoff, Sarah Lichtenstein, Bernhard Corrigan & Barbara Combs, *Preference for Insuring against Probable Small Losses: Insurance Implications*, in *THE PERCEPTION OF RISK* 51, 70 (Paul Slovic ed., 2000) ("The experiments reported above suggest that people's natural predisposition is to protect against high-probability hazards and to ignore rare threats.").

83. See Kunreuther, *supra* note 44, at 175; Michael G. Faure & Veronique Bruggeman, *Catastrophic Risks and First-Party Insurance*, 15 CONN. INS. L.J. 1, 21-27 (2008).

The problem is, however, that the systemic nature of the risk in question was the starting point to create the system in the first place. In other words: destabilisation of one financial intermediary (like Lehman Brothers) could lead to the destabilisation of the entire economy. If the system is supposed to prevent these kinds of systemic risks, there may be an argument for making it mandatory. However, this may create the problem that there could be a pooling equilibrium in which it is no longer possible to distinguish between good and bad risks. Moreover, a system of mandatory insurance unavoidably leads to a cross-subsidisation whereby good risks finance bad risks.⁸⁴ The question therefore arises whether it is possible, even under mandatory insurance, to attain a separating equilibrium, in other words, distinguishing between good and bad risks. Again, the example of natural catastrophes may be instructive. For example, in Belgium there is mandatory insurance against flooding included in fire insurance. However, premiums are not fixed and can hence be differentiated. Thus good risks (e.g. protecting themselves with preventive measures against flooding) can, even in a mandatory insurance system, still be rewarded as a result of risk differentiation.

The problem remains, however, that insurers still need sufficient information to punish the bad risks with higher premiums and reward the good risks. If that were not the case, the risk would remain (like in the case of bail-outs today) that a financial institution has incentives to behave as a gambler (counting on being protected by the system). As a general rule, one could therefore hold that the system could be mandatory in order to prevent systemic risks, but this supposes that insurers charge risk-differentiated premiums and are able to monitor financial institutions adequately. Those may be heavy assumptions, issues which will be discussed in greater depth in the next paragraph.

D. *Further Challenges*

1. *The Implementation of a Separating Equilibrium*

As already mentioned, an important problem is the design of a mechanism which differentiates between firms that got into trouble because of the financial crisis and those firms

84. See Faure, *supra* note 45, at 349-50.

that were in trouble anyway. An informative separating equilibrium between the two groups can be attained, if firms can choose between different insurance contracts, or can decide to not insure the risk at all.⁸⁵ A firm that has not insured the risk may not qualify for receiving public aid. Alternatively, in the case that all firms must insure, a pooling equilibrium may occur, which provides no substantial information for the decision on whether a subsidy is justified or not. That is, mandatory insurance leaves no, or only little, room for self-selection of firms. Therefore, making insurance voluntary seems to be essential. However, if firms are free to take insurance or not, then they may behave strategically and take no insurance; they may speculate that in case of a financial crisis they may get financial help anyway because of the systemic risks that have to be prevented or because of politicians who want to signal activity to voters.⁸⁶ This sort of behavior has been vividly described in the natural disaster literature as 'charity hazard,' holding that individuals do not insure against natural hazards if they anticipate governmental and private aid. However, the extent to which charity hazard exists in practice is debated, since the empirical evidence in this respect provides a mixed picture.⁸⁷

There is obviously a dilemma between accurately identifying good and bad risks by a system of voluntary insurance on the one hand and preventing financial contagion and systemic risks by mandatory insurance on the other hand. However, there are screening and signaling devices at hand that may overcome the problem of a pooling equilibrium in case of a mandatory insurance.

Firms may invest voluntarily in additional signals, like adopting a prudential corporate governance code or adapt to

85. For a discussion of this kind of insurance problems, see generally Michael Rothschild & Joseph E. Stiglitz, *Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information*, 90 Q.J. ECONOMICS 630 (1976); Marie Allard, Jean-Paul Cresta & Jean Charles Rochet, *Pooling and Separating Equilibria in Insurance Markets with Adverse Selection and Distribution Costs*, 22 GENEVA PAPERS ON RISK & INS. THEORY 103 (1997).

86. Mathias Dewatripont & Paul Seabright, 'Wasteful' Public Spending and State Aid Control, 4 J. EUR. ECON. ASS'N 513, 520 (2006).

87. Browne & Hoyt, *supra* note 53, at 293; Raschky & Weck-Hannemann, *supra* note 53, at 324-25.

a particular capital structure⁸⁸ in order to become identified as a good risk. Insurance premiums may then be lowered for those firms, while firms that do not invest in those costly signals may have to pay higher premiums. As a consequence it is possible to calculate risk-adjusted premiums.

Nevertheless, it is not clear if the incentive to engage in signaling is strong enough for firms. Therefore, a pooling equilibrium might not be prevented. However, the screening activities of insurers can also contribute to attaining a separating equilibrium. At the first stage, insurers will permanently monitor financial intermediaries,⁸⁹ in order to adjust premiums. This may reveal at least some information about the insured companies, which is useful for calculating risk-adjusted premiums. The question is then whether even an incomplete screening that does not uncover all risks may be sufficient to attain a separating equilibrium. To be sure, the incompleteness of information will hinder insurance companies in their efforts to correctly calculate premiums and overcome the problem of a pooling equilibrium in case of a mandatory insurance. But even small adjustments of premiums may have a disciplinary effect on financial intermediaries and can incentivize them to engage in financial risk prevention. The means with which this “leverage-effect” can be attained is corporate governance via media, which works through public naming and shaming of weak performing companies.⁹⁰ This means that if the current insurance premiums of financial intermediaries are made public, capital markets can then evaluate this information and take it into account when the firm value is determined. In principle, the mechanism is the same as with rating agencies; though here it is not an abstract code, like AAA, which indicates a certain risk level within a pre-speci-

88. See Hayne E. Leland & David H. Pyle, *Informational Asymmetries, Financial Structure, and Financial Intermediation*, 32 J. FIN. 371, 371 (1977).

89. In this respect, export insurance is again an instructive example. Usually, the state as lender of last resort of export insurance undertakes a permanent monitoring of the importing country, thereby assessing the risk (changes) and maybe launching political initiatives to lower the involved risks. Peter Egger & Thomas Url, *Public Export Credit Guarantees and Foreign Trade Structure: Evidence from Austria*, 29 WORLD ECON. 399, 403 (2006).

90. See generally Alexander Dyck, Natalya Volchkova & Luigi Zingales, *The Corporate Governance Role of the Media: Evidence from Russia*, 63 J. FIN. 1093 (2008).

fied band-width, but rather a price signal, which mirrors the risk evaluation of a firm by an insurer. An advantage of this rating by insurers (compared to traditional rating agencies) might be that insurance companies have a strong incentive to adequately price the risk, in order to maintain their financial stability on the one hand and to make competitive offers of insurance premiums to financial intermediaries on the other. In the end, financial intermediaries may have a strong incentive to utilize reliable measures for preventing financial instability in order to lower insurance premiums as well as to signal to capital markets that they are a good risk.

In summary, attaining a separating equilibrium is by no means simple. However, it is not impossible when smart mechanism designs are considered. In addition, our proposed structural approach may also be of interest for overcoming topical problems of rating agencies, which in the recent financial crisis failed to accurately inform market participants of the inherent risks of certain financial products.

2. *The Problem of State Intervention*

A second kind of problem that may be posed against our proposed system is concerned with the interplay between the second and the third layer of insurance. This problem occurs if the government as a "re-insurer of last resort" impinges on the insurance premiums of the second layer. For example, the government may enforce an equalization of premiums between firms or between industries, with the consequence that premiums are no longer risk-adjusted. The driving force behind this sort of state intervention may be interest groups which seek to impede competition.⁹¹ Lobbying against risk-ad-

91. For an overview of how industries capture the regulator to prevent competitive pressure, see Dennis W. Carlton & Randal C. Picker, *Antitrust and Regulation*, (Nat'l Bureau of Econ. Res., Working Paper No. 12902, 2007), available at <http://www.nber.org/papers/w12902.pdf>. With special reference to the insurance industry, see Paul L. Joskow, *Cartels, Competition and Regulation in the Property-Liability Insurance Industry*, 4 BELL J. ECON. & MGMT. SCI. 375 (1973); Lisa A. Gardner & Martin F. Grace, *X-Efficiency in the U.S. Life Insurance Industry*, 17 J. BANKING & FIN. 497 (1993); Michael G. Faure & Roger Van den Bergh, *Restrictions of Competition on Insurance Markets and the Applicability of EC Antitrust Law*, 48 KYKLOS 65 (1995). A special example of those lobbying activities (regulatory capture) was when the Clinton administration proposed in 1993 its plans for restructuring the health care in-

justed premiums may be done by insurance companies as well as by insured companies. Insurance companies may want to restrain competition between themselves, in order to set a monopoly price. This cartel is then stabilized by the state, which administers and enforces the cartel price. Insured companies may be interested in infringements of the state in order to shift a part of the burden of insurance to competitors. In addition, the equalization of premiums will result in a pooling equilibrium from which financial intermediaries that are bad risks profit.

While state intervention into the adequate calculation of insurance premiums is certainly a serious matter, it is not a special problem of our proposal. It is always tempting for firms to stabilize a cartel with the help of the state in order to overcome the inherent instability of a cartel.⁹²

However, there is another antitrust-relevant issue implied which needs attention. Insurance companies may be financially intertwined with the financial intermediaries they insure. These cross links can be abused to grant competitive advantages to financial intermediaries that are financially affiliated to the insurance company. The abusive competitive advantage thereby not only consists of relatively lower insurance premiums for the linked financial intermediaries in comparison to the non-linked ones, but a reduced premium will also signal a strong financial status for the intermediary which will allow it to raise capital at lower costs than its competitors. Therefore, antitrust policy has to be targeted on the neutrality of the insurance companies with regard to the conditions they provide to financially linked and non-linked financial intermediaries. However, those problems are not totally new to competition policy and can be solved either within the general application

dusty, including 'price controls' for health insurance premiums, see Fred S. McChesney, *Rent seeking and rent extraction*, in THE ELGAR COMPENDIUM TO PUBLIC CHOICE 379, 387 (William F. Shughart & Laura Razzolini ed., 2001).

92. See, e.g., Mordechai E. Schwarz, *If You Can't Beat Them – Join Them. A Cooperative Game. Theoretical Approach to Rent-Seeking Contests*, (Open Univ. of Israel Univ. – Research Inst. for Policy, Political Economy and Society, Working Paper No. 11, 2011) (showing that cartels are inherently unstable), available at <http://www.openu.ac.il/policy/download/maamar-3.pdf>; Jason E. Taylor & Peter G. Klein, *An Anatomy of a Cartel: The National Industrial Recovery Act of 1933 and the Compliance Crisis of 1934*, RES. IN ECON. HIST., no. 26, at 235 (2008).

of competition policy or with the help of a more specialized sector regulation. The important issue is that governments act strictly as a "re-insurer of last resort" and maintain competition on private insurance markets of the second layer.

Of course, a related issue in case of state intervention is that one can always wonder whether it is possible to metaphorically bind the hands of the state with golden handcuffs; that is, preventing them from providing "bail outs" after the introduction of the structural solution we propose here. Pressure on politicians may indeed always exist. However, we claim that this pressure will be reduced where a structural solution is already at hand. Moreover, again, the comparison with the case of the natural catastrophes is illustrative: in countries where structural solutions (mandatory insurance with state provided reinsurance) do exist (like in France) there is less of a need to call on government to provide direct compensation in case of a natural disaster. Structural solutions can thus help to prevent the tendency of politicians to provide "bail-outs" in cases of crisis.

3. *Coordination Problems of Compensation*

A third problem may be seen in the coordination of compensation by the second and third layer. The proposed model suggests that public subsidies are granted if the second layer ascertains the event of loss in case of a financial crisis and if the funds provided by the second layer are not sufficient to financially stabilize a financial intermediary.

However, there is the chance that the coordination of payments of the different layers is not as frictionless as necessary. The second layer of private insurance may pay, for instance, while the government refuses to grant aid. This case seems unproblematic as long as the compensation paid by insurance companies covers the economically necessary amount of funds to stabilize financial intermediaries. However, it becomes complicated if the government refuses to pay while the private layer is paying and the funds are not sufficient to stabilize financial intermediaries. Also, it is possible that private insurance companies refuse to pay, while the state does pay a subsidy. Then the beneficiary as well as the government may claim that the insurance companies also have to pay.

The crucial point is that private insurance companies or the state may try to shift the burden of paying compensations. Private insurance companies may try to shift the burden to the public, while the government may try to pay out generous subsidies by leveraging their own budget and involving insurance companies. Therefore, in order to prevent lengthy lawsuits and to provide timely compensations to financial intermediaries, strategic behavior has to be abandoned. That is, it is indispensable that there is a clear-cut and reliable legal framework which coordinates the decisions of the second and third layer. This legal framework must comprise two main components:

1) There has to be an automatic mechanism which is triggered in case of a financial crisis and which leads to a timely activation of private insurance and public funds. The reason for such an automatic function is that a discretionary mechanism may lead to opportunistic ex post actions of the involved parties who would try to bargain a more profitable sharing of costs, thereby delaying the timely availability of funds.

2) The final decision to declare the situation a financial crisis is certainly with the government, which is the legitimate legal representative of a jurisdiction. However, this decision has to be substantiated by a committee which is independent from any special interests. Such an independent committee might be formed of financial experts or a special independent legal body may be assigned, for example the constitutional court.⁹³

VI.

CONCLUDING REMARKS

In this paper, we have applied insights from the theory and practice of insuring technological (such as e.g. nuclear) and natural (such as e.g. flooding) disasters to the idea of in-

93. In general, the coordination problem points to the need for legal safeguards on the constitutional level which will trigger reasonable decisions on the post-constitutional level. Public choice and constitutional law and economics provide the tools for a legal mechanism design, which precludes strategic actions of the involved players. For an introduction into constitutional mechanism design see, e.g., JAMES M. BUCHANAN, *THE LIMITS OF LIBERTY: BETWEEN ANARCHY AND LEVIATHAN* 35-74 (1975); VIKTOR J. VANBERG, *RULES AND CHOICE IN ECONOMICS* 195-208 (1994).

suring the financial risk of financial intermediaries in case of a financial crisis. Although technological and natural catastrophes are certainly different from financial crises in many respects, it is striking that both events present similar obstacles that an insurance system has to overcome. This similarity implies that it is theoretically possible to insure financial intermediaries against the risk of financial crisis. More practically, it is possible to borrow "insurance technology" from the practice of insuring natural and technological disasters.

At the heart of our proposal is the idea of a multilayered approach which comprises self-insurance, private insurance and the state as re-insurer of last resort. These three layers of insurance have to be well-matched in order to overcome a pooling equilibrium, undue state intervention and coordination problems. While these are all serious problems, they are not specific to our proposal and can be tackled by employing insights from insurance theory, antitrust and public choice.

One major advantage of our proposal is that insurance companies can monitor financial institutions and hence contribute to the prevention of financial crises. Of course, the effectiveness of the system will to a large extent depend upon the ability (and willingness) of insurance companies to actively exercise this monitoring capability. Moreover, we of course do not claim that monitoring by insurers is the only remedy to prevent financial crises. Other instruments not addressed in this paper, like regulation and reform of corporate governance in banks⁹⁴ may have a far more important role to play in that respect. Our focus here was on the role that insurance could play in preventing financial crises and in intervening when crises do arise. The main thrust of our paper is that the role of insurers in that respect can be far more promising than the current practice of bailing out of financial institutions.

Notwithstanding our optimistic stance, we are aware that our proposal is only a first step on the way to an insurance approach towards the avoidance and management of financial crises.

94. See Hellwig, *supra* note 1, at 166-67.