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The Implications of Solvency II for U.S. Insurance Regulation

Therese M. Vaughan

Abstract: Much work has been done in recent years on the subject of insurance regulation and capital requirements, and the process of regulatory reform will continue. It behooves insurance supervisors to take a step back, revisit the underlying assumptions that have driven supervisory reform in the various sectors, and assess what implications, if any, their conclusions have for future work. The use of internal models to establish regulatory capital requirements cannot and should not disappear. However, they must be used appropriately, with recognition of their significant limitations. The optimal structure of insurance supervision is likely to be a combination of a rules-based and a principles-based approach. That is, internal models should be an adjunct to a rules-based capital requirement that establishes a floor for regulatory capital. Capital regulation is a necessary, but not sufficient, additional requirement for effective financial regulation. On-site examinations, offsite analysis of financial performance and trends, and frequent interaction with the regulated entity are equally important. Finally, current developments have demonstrated that market discipline cannot be relied on as a substitute for regulation and supervision. The optimal regulatory structure is one that encourages supervisors to take action when it is appropriate, and a system that incorporates duplicative regulatory oversight may advance that objective.

About the Author: **Therese M. Vaughan** is the Chief Executive Officer of the National Association of Insurance Commissioners (NAIC). As CEO, Vaughan oversees the operations of the NAIC, including offices in Kansas City, Washington, D.C. and New York City. She also serves as the Association's primary representative and chief spokesperson in Washington, D.C. Formed in 1871, the NAIC is a voluntary organization of the chief insurance regulatory officials of the 50 states, the District of Columbia and five U.S. territories. Vaughan previously served as Robb B. Kelley distinguished professor of insurance and actuarial science at Drake University. Vaughan holds a Ph.D. in managerial science and applied economics from The Wharton School at the University of Pennsylvania.

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The past decade has seen significant attention given to strengthening insurance supervisory practices around the world. New regulatory capital regimes are being or have been developed in countries as diverse as the UK, Canada, Switzerland, Australia, Peru, Thailand, Bermuda, and South Africa. One project gaining considerable attention is the ongoing effort to modernize the system of solvency regulation in the European Union, known as Solvency II. The purpose of this paper is to consider the developments in Europe and the United States with respect to insurance regulation. More specifically, how might ongoing developments in Europe inform U.S. regulation, and what should we learn from the recent financial market problems?

The discussion proceeds in four parts. First, a brief description of Solvency II is provided. Second, recent developments and ongoing work in U.S. solvency regulation are described, and key differences between the U.S. system and Solvency II are identified. Third, the paper considers lessons learned from the current financial turmoil and describes some challenges in ensuring regulatory action around troubled financial institutions. Finally, the paper describes areas for future work on solvency regulation in the United States.

Solvency II

The effort to develop a new, more risk-focused set of regulatory capital requirements in Europe has been underway since the adoption of Solvency I in 2002. Current capital requirements in Europe are based on a simple factor-based model, with the required regulatory capital requirement set as a function of premium writings and loss reserves for property/casualty insurance and the sum at risk for life insurance. Recognizing the limited risk sensitivity of this approach, particularly its failure to recognize asset risks, it became clear even during the development of Solvency I that a more comprehensive approach was necessary. After several years of work, the European Commission adopted the Solvency II Directive Proposal in July 2007 and amended the Proposal in February 2008. The European Parliament and Council will consider additional amendments and are expected to adopt the Directive in 2009, with implementation in 2012.

It is important to note that the Directive contains a structure for capital requirements, but many of the details remain to be developed.¹ The European Commission has already begun laying the groundwork to develop the detailed implementation measures for Solvency II, in cooperation

¹ What follows is a brief description of Solvency II. A more detailed understanding of the structure and current progress on Solvency II can be gained by reading the detailed information provided by both the European Commission and CEIOPS, which are available at http://ec.europa.eu/internal_market/insurance/solvency/index_en.htm#sol1 and <http://www.ceiops.eu/>, respectively. A review of the material will quickly demonstrate that the European Commission and CEIOPS have undertaken significant work to expand the details of Solvency II beyond the general structure described here. Work is ongoing.

with the Committee of European Insurance and Occupational Pension Supervisors (CEIOPS), a group representing the insurance supervisors in the EU member countries.²

The structure of Solvency II is described in the current draft directive. At a basic level, it is patterned after the three-pillar structure of Basel II:³

² Under the European Union's Lamfalussy process, the Level 1 Framework Directive sets out the key principles of the new system, and detailed implementing measures are introduced at Level 2. CEIOPS is a Level 3 Lamfalussy committee, and will give advice to the Commission on the implementing measures.

³ Solvency II has often been compared to Basel II, the regulatory capital standard for globally active banks, adopted by the Basel Committee on Banking Supervision in 2004. On the surface, they appear to be similar, because both are based on a three-pillar structure. In fact, however, there are significant differences in the details. For example:

- (1) Risks Encompassed. Pillar 1 in Basel II is focused on only three risk categories – credit risk, operational risk, and market risk in a bank's trading operations. Solvency II takes a broad, holistic approach to establishing capital requirements, broadening the market risk category to include market risk across the organization, including asset/liability mismatch. It also, of course, includes insurance risk.
- (2) Internal Models. Basel II has taken a more cautious approach to the use of internal models. Internal models are permitted for operational risk and for certain aspects of market risk (i.e., market risk related to a bank's trading book). The treatment of credit risk, however, falls short of a full internal models approach. Under the Advanced-Internal Ratings Based (A-IRB) Approach to credit risk, the bank is permitted to use internal estimates of the probability of default, loss given default, and exposure at default. Basel II specifically defines how those factors are applied to produce a capital charge, however.
- (3) Diversification. Basel II takes a more cautious approach to the rolling up of the individual risk capital requirements. Specifically, Basel II does not permit the recognition of correlation across risk categories; Solvency II does.
- (4) Treatment of Groups. While Basel II requires a banking group to calculate its capital at the group level, it does not permit a reduction for diversification of risks across the group. In contrast, the Solvency II Directive Proposal includes a diversification benefit in the calculation of the group solvency requirement. Under certain conditions, an insurance firm could elect to be supervised under a group support regime, and the individual members of the group would be permitted to hold lower levels of capital in recognition of the groupwide diversification benefit.

Pillar 1: Quantitative Requirements. Pillar 1 addresses the quantitative requirements of Solvency II, including the calculation of technical provisions (i.e., reserves), the rules relating to the calculation of the solvency capital requirements and investment management. The Pillar 1 requirements are based on an economic total balance sheet approach. Technical provisions are valued according to the International Finance Reporting Standards (IFRS) definition of fair value. That is, they must be market-consistent and based on their current exit value.⁴ Available sources of capital are identified (own funds and ancillary own funds) and categorized into three tiers, reflecting their relative desirability and the extent to which they will be recognized for supervisory purposes.⁵

Solvency II establishes two separate capital requirements – a Solvency Capital Requirement (SCR) and a Minimum Capital Requirement (MCR). A company will not be permitted to operate below the MCR.⁶ Between the SCR and the MCR, a company may be subject to supervisory action. The Solvency Capital Requirement is defined as the amount of economic capital required to be held to limit the probability of ruin to 0.5% (i.e., 99.5% Value at Risk, or VaR). It is calculated using a standard formula, full internal models, or partial internal models coupled with some parts of the standard model. According to the directive, all potential losses, including adverse revaluation of assets and liabilities, over the next 12 months are to be assessed.

The standard formula is a linear, factor-based approach, intended to be a conservative approximation of the 99.5% VaR objective specified in Solvency II. While the specific structure of the Standard Formula has not yet been finalized and the factors are not yet calibrated, the components are likely to include the following:⁷

1. Market risk (including interest rate, equity, property, spread, concentration, and currency risk);
2. Counterparty default risk related to risk mitigation devices (e.g., reinsurance) and receivables from intermediaries;
3. Life risk (mortality, longevity, lapse, disability, expense, revision, and catastrophe risk);
4. Non life risk (premium and reserve, catastrophe);
5. Health insurance risk (short-term health insurance, long-term health insurance, and workers compensation);
6. Operational risk; and

⁴ Under International Financial Reporting Standards, the current exit value reflects the amount an insurance or reinsurance undertaking would expect to have to pay today if it immediately transferred its contractual rights and obligations to another undertaking. The International Accounting Standards Board (IASB) is considering whether to move from an exit value approach to a fulfillment value approach for valuing insurance contract liabilities.

⁵ Factors considered include subordination, loss-absorbency, permanence, perpetuity and absence of servicing costs. With respect to the Solvency Capital Requirement, the proportion of Tier 1 in the eligible own funds should reach at least a third, and the proportion of Tier 3 should be no higher than a third. With respect to the Minimum Capital Requirement, ancillary own fund items are not eligible, and the proportion of eligible Tier 2 items should be limited to half.

⁶ As with U.S. risk-based capital (RBC), there is a limited amount of time before final action.

⁷ These factors were the ones tested in the spring 2008 Quantitative Impact Survey (QIS 4). See CEIOPS (2008).

7. An adjustment for deferred taxes.

The various elements are combined, using correlation assumptions across the risks. Risk mitigation is intended to be recognized, but it is not yet clear what risk mitigation techniques will be allowed and how the reduction will apply in practice.⁸

Solvency II permits insurers to use internal models to determine their SCR (and perhaps their MCR, although the methodology for calculating the MCR has not yet been determined). Indeed, Solvency II encourages firms to use internal models, under the premise that it will result in a better alignment between firm risk and capital requirements and a stronger risk management culture in the firm. In general, firms that use internal models are expected to see a reduction in their required capital when compared to the standard formula.⁹ An insurer must obtain the supervisor's permission to use internal models. To be permitted to use an internal model, the insurer must demonstrate to the supervisor that it meets a use test, statistical quality standards, calibration standards, validation standards, and documentation standards. The internal models focus of Solvency II's regulatory capital requirements, and the assumption this will result in better alignment between firm risk and capital, permeates much of what has been written about Solvency II.

Finally, Pillar 1 deals with investment risk. Noting that the combination of IFRS-consistent valuation of assets and Solvency II capital requirements should account for all quantifiable risks, and that a prudent person standard will apply for insurer investments, Solvency II proposes to eliminate quantitative investment limits and asset eligibility criteria. It reserves the right to reintroduce investment restrictions if new risks emerge that are not accounted for.

To summarize, the underlying themes of Pillar 1 include greater recognition of risks across the balance sheet, including both asset and liability risks (in contrast to the current simplistic, factor-based approach that ignores asset risk), a focus on market-consistent valuation of assets and liabilities, a VaR-based framework, promoting the use of internal models by insurers in order to establish regulatory capital requirements (including an expected capital reduction if an insurer uses internal models), two levels of intervention -- the SCR and the MCR, and the removal of current rules-based restrictions on insurer investments.

Pillar 2: Supervisory Review. The focus of Pillar 2 is to provide supervisors with the means of identifying firms that have a higher risk profile, and the ability to intervene. Under the Supervisory Review Process (SRP), the supervisory authorities review and evaluate the

⁸ See the Report on the 4th Quantitative Impact Study of Solvency II (QIS 4), CEIOPS (2008).

⁹ According to the 4th Quantitative Impact Study of Solvency II (QIS 4), solvency capital requirements under an internal models approach tended to be lower than that produced by the standard formula, with about half of the firms experiencing a decrease of at least 20 percent.

strategies, processes and reporting procedures established by insurers and reinsurers to comply with Solvency II, as well as the firm's risks and its ability to assess those risks. In short, Pillar 2 is focused on the qualitative aspects of supervision, including the adequacy of a company's internal controls, risk management processes, and corporate governance. If supervisors are dissatisfied with a company's assessment of the risk-based capital, they will have the power to impose higher capital requirements.

Pillar 2 includes a requirement that firms conduct their *Own Risk and Solvency Assessment* or ORSA, an internal assessment of their overall solvency needs given their specific risk profiles. The ORSA is intended to have two objectives. First, it should be a tool for the firm's own decision making. Second, it is a tool for supervisors to better understand the risk profile of the firm.

Pillar 3: Supervisory Reporting and Public Disclosure. Finally, Pillar 3 is focused on increasing the transparency of an insurer's risks and capital positions. Economists have long focused on the importance of market discipline in constraining excessive risk taking by a financial institution (although questions have been raised recently about its effectiveness). The purpose of Pillar 3 is to provide the market with sufficient information to enable it to properly exercise its disciplinary function. Firms are required to annually disclose information on their solvency and financial condition. It is worth noting, however, that the requirement to hold additional capital as a result of regulatory action may not have to be disclosed.

Group Supervision. The Solvency II Directive Proposal makes significant changes in the way insurance groups are supervised. Under current EU rules, group supervision is supplementary to solo supervision (i.e., separate supervision of each entity within the group by its home state supervisor). Solvency II introduces a new system for supervising groups, with the objective of "streamlining the supervision of (re)insurance groups in the EU." A group supervisor, with concrete coordination and decision powers, will be appointed for each group. The group supervisor is given primary responsibility for all key aspects of group supervision (group solvency, intragroup transactions, risk concentration, risk management and internal control). This responsibility must be exercised in cooperation and consultation with local supervisors, with coordination and information sharing arrangements established between all supervisors involved. The Solvency II Directive Proposal also includes a diversification benefit in the calculation of the group solvency requirement, although this continues to be subject to internal debate. Under certain conditions, an insurance firm could elect to be supervised under a group support regime, and the individual members of the group would be permitted to hold lower levels of capital in recognition of the groupwide diversification benefit.

Developments in Financial Regulation in the U.S.

The NAIC's risk-based capital regime began in the early 1990s as an early warning system for U.S. insurance regulators. It is structured as an extensive factor-based approach that applies to

risks on both the asset and liability sides of a conservative solvency-focused balance sheet.¹⁰ Separate formulae were developed for life insurers, property-casualty insurers, and health insurers. For life insurers, the factors are intended to capture risks related to assets, asset/liability mismatch, underwriting (or insurance), credit risk, and some aspects of business risk. The property-casualty formula includes factors intended to address asset risk, underwriting and reserving risk, credit risk, and some aspects of business risk. The specific factors have evolved over time. The risk-based capital (RBC) formulas apply a fairly simplistic covariance calculation to the multiple risk areas (essentially assuming a covariance of either 0 or 1).

The RBC implementing legislation creates four control levels which authorize four levels of regulator or company action, eventually leading to mandatory regulatory control of the company.¹¹ Under the implementing legislation, an insurer that breaches the Company Action Level must produce a plan to restore its RBC levels. This could include adding capital, purchasing reinsurance, reducing the amount of insurance it writes, or pursuing a merger or acquisition.

In the late 1990s, the NAIC began to introduce additional internal models-based components to its RBC system for life insurers. The first phase (known as C-3 Phase 1) specifically targeted interest rate risk for fixed annuities and was implemented December 31, 2000. On December 31, 2005, the NAIC implemented C-3 Phase 2, which introduced a new capital requirement for variable annuities. This was motivated in large part by the recognition that insurers were developing products with increasingly complex guarantees, and the risks embedded in these guarantees were not captured by the basic factor-based capital requirements. The extended and deep equity downturn in the early 2000s heightened the regulatory awareness of these risks, and led to the decision to superimpose an internal-models based approach on the factor-based capital requirements.¹² Work is underway to develop a new RBC requirement for life products (C-3 Phase 3).

Intricately intertwined with the introduction of models-based capital requirements for life insurers are efforts aimed at modernizing the determination of reserves (i.e., technical provisions). While the determination of loss reserves for property-casualty insurance is already

¹⁰ The RBC formula uses the data reported in the audited statutory annual statement, which utilizes conservative accounting rules adopted by the NAIC. Analysis of RBC is not complete without also evaluating the conservatism in the underlying inputs to the formula.

¹¹ The four action levels are: Company Action Level, Regulatory Action Level, Authorized Control Level, and Mandatory Control Level. In addition to the RBC calculation extensively based on factors, there are two trend tests that were introduced over the years. These trend tests place an otherwise adequately capitalized insurer into the company action level under certain circumstances. Under the life company formula, an otherwise adequately capitalized life insurer may be placed at the company action level if there has been a specified deterioration in its RBC position over the past year. Under the property-casualty formula, a combined ratio of greater than 120% could cause an otherwise adequately capitalized insurer to be subject to the company action level.

¹² C-3 Phase 1 and Phase 2 have been implemented in all states. In most states, the NAIC's risk-based capital system is specifically referenced in state law, so changes to the NAIC formula are automatically implemented in the state.

principles-based, life insurance reserves have not been. Traditionally, the U.S. insurance regulatory system has required that U.S. life insurance reserves be determined using conservative mortality and interest rate assumptions. Risks other than mortality and interest rate risk were not explicitly recognized. Over the past 30 years, however, the industry has developed new products with a variety of guarantees, and increased the portion of its business that is tied to asset accumulation, rather than traditional life insurance. The old rules failed to properly account for the risks in the new products, and the traditional rules-based approach to calculating reserves had to be modified for each new product. After attempting to modify the rules with each product evolution, the regulators concluded a more comprehensive change was needed. Principles-based reserving is the proposed solution.

A key feature of the U.S. evolution toward internal models in life insurance, in contrast to the approach in the European Union, is that it has been incremental. Internal models-based capital requirements are intended to capture risks that the factor-based capital requirements failed to capture, and the new requirements often supplement, rather than replace, existing factor-based requirements.

A second feature of the U.S. system are the significant safeguards that have been built into the introduction of internal models. A healthy skepticism of internal models by some states resulted in the NAIC's incorporating a standard scenario into its capital requirement and reserving standards for variable annuities. The standard scenario is a single scenario with specified assumptions independent of a specific company's experience. That is, while the insurer is permitted to calculate its required capital and reserves using internal models with its own inputs, it must also calculate them using a standard deterministic scenario provided by the regulators. This scenario serves as a floor for the reserves and required capital. According to the NAIC's Life and Health Actuarial Task Force, the standard scenario assumptions are not intended to produce requirements that would be adequate most of the time. Rather, they are to ensure that the requirements are not unreasonably low, particularly given the lack of experience in applying internal models in this context. Regulators see the standard scenario as providing reasonable constraints to the flexibility given to actuarial judgment when doing stochastic modeling.

A third aspect of the U.S. system that merits mention in today's environment is the element of countercyclicality built into U.S. financial reporting requirements. In the U.S., life insurance companies are required to establish an Asset Valuation Reserve (AVR), a liability that is intended to absorb market value and credit-related realized and unrealized gains and losses. Gains increase the reserve up to the maximum required reserve; realized losses decrease the reserve. The end result is that the impact of gains and losses on the surplus of the company is

dampened (at least until the reserve is completely depleted). The maximum AVR is determined by a factor-based formula, similar in nature to the Life RBC asset risk calculation.¹³

Supervisory Action. The United States system of insurance regulation is state-based. Under the U.S. system, each state has an insurance commissioner, director, or superintendent responsible for determining which insurance companies may conduct business in its state and under what rules. In addition to the risk-based capital system, U.S. regulators use a variety of solvency-focused tools that work together to form the financial regulatory system. These include on-site examinations, off-site financial analysis, required independent audits, stress testing of future cash flows by life insurers, and detailed financial reporting.

The NAIC's Hazardous Financial Condition Model Regulation, which has been adopted in substantially similar form in all states, provides the regulatory authority to address risky behaviors and characteristics exhibited by insurers. The regulation identifies a number of general factors that may indicate the need to take action, and provides the regulator with the authority to intervene in a variety of ways, including requiring the insurer to hold additional capital.

The state insurance regulators also conduct extensive off-site financial analysis and on-site financial examinations, in accordance with agreed procedures documented in NAIC Handbooks. As a requirement in 2010, U.S. regulators will utilize a revised risk-focused examination approach. This approach incorporates an enhanced risk assessment process with increased consideration of an insurer's prospective risks, risk management, and corporate governance. Among other things, it increases supervisory reliance on the work of the internal auditor and on documentation related to the U.S. Sarbanes-Oxley requirements.

The risk-focused examination is part of a broader effort adopted by the NAIC in 2004, known as the Risk-Focused Surveillance Framework. The Risk-Focused Surveillance Framework ties together four functions, most of which had been performed previously, and coordinates them in a more cohesive manner to be applied consistently by regulators. These four elements are (1) risk-focused exams, (2) off-site risk-focused financial analysis, (3) examination of internal and external changes in the organization, (4) and an annual supervisory plan for the insurer developed by the domestic regulator. An Insurer Profile Summary is used to "house" summaries of risk-focused examinations, financial analysis, internal/external changes, the Supervisory Plan and other standard information. It provides an Executive Summary of an insurer's financial condition, risk profile, regulatory actions/plans and other highlights.

In addition to the various tools and supervisory aspects of regulatory authority, it is also worth discussing the level of multistate coordination and oversight that exists in the U.S. system. Over

¹³ It is important to note that the AVR does not smooth surplus for risk-based capital purposes, however. When calculating the Total Adjusted Capital for purposes of RBC, the AVR reserve is added back to surplus. For information on the AVR, see http://www.naic.org/documents/svo_avr_imr_blue_book.pdf.

the years, the system has evolved to encompass a significant degree of interstate coordination, both bilaterally and through the National Association of Insurance Commissioners. The states maintain a uniform reporting system. Insurers file financial statements with the National Association of Insurance Commissioners, and these statements are made available to all states on centralized databases. The NAIC also provides tools for financial analysis and examination and a risk-based capital system, conducts centralized financial analysis of multistate insurers, and supports multistate peer review and other processes to increase coordination.

In the early 2000s, the NAIC developed a comprehensive guidance paper on insurance holding company oversight. In conjunction with this effort, the NAIC developed a 'lead state' framework under which a state or states were designated as 'lead' for various group solvency oversight work. A lead regulator has been appointed for all insurance groups, and the choice of lead regulator is left to the discretion of the group of domestic regulators that supervise entities in the group. The role of the lead state is to coordinate and ensure proper communication is occurring for analysis, examination and other solvency and market regulatory issues (e.g., Holding Company transactions, international coordination and communication), and at times addressing public perceptions and concerns.

Multistate processes include regular coordinated financial examinations led by an insurance group's lead state, and a peer review process to promote effective state action on domestic and nationally-significant insurers. Through its Financial Analysis Working Group, the NAIC provides a forum for nondomestic states to review and provide input into another state's actions with respect to one or more of its domestic insurers. This high level of coordination in financial analysis and examinations is one of the hallmarks of the U.S. system. It is achieved through the National Association of Insurance Commissioners, which has a staff of nearly 500 people, nearly half of which support the technology and infrastructure needed to maintain access to information and communication between the states.

Regulatory and Public Disclosure. Publicly traded insurers are governed by public reporting requirements of the SEC. Regulations require timely notification to the market of material information, comprehensive financial statements prepared on a GAAP basis, risk disclosures, and a management discussion and analysis of the company's business results.

The states maintain a uniform and detailed reporting system, with over 100 pages of reporting. The requirements are defined by the NAIC's Blanks and Annual Statement Instructions. The reporting baseline of accounting requirements are included in the NAIC's Accounting Practices and Procedures Manual. Insurers file annual and quarterly financial statements with the NAIC, and these statements are made available to all states on centralized databases. Centralized financial reporting by all multistate insurers permits states to do analyses that compare insurers to peer groups from across the country. Nondomestic states have access to financial information on companies doing business in their state, and they can use that information to make their own assessments of an insurer's claims-paying ability.

In June 2008, the NAIC announced the creation of a Solvency Modernization Initiative that would draw together the various activities underway at the NAIC, as well as examine international developments and their potential use in U.S. insurance regulation. While the U.S. annually improves its regulatory solvency system to adjust the system as needed, especially regarding the annual update to the RBC formula and factors, the initiative includes focus on five key solvency areas: capital requirements, international accounting, insurance valuation, reinsurance, and group solvency issues.

Comparing Solvency II and U.S. Financial Regulation: There are some noteworthy differences between how the system of financial regulation is evolving in the U.S. and Europe. Differences include the role of internal models and other differences.

The Role of Internal Models. Key differences between the U.S. and Europe in the use of internal models are the following:

- (1) The U.S. is introducing internal models in an incremental way and maintaining a number of controls as they are introduced. These include focusing on life insurance and annuities, applying some models to new business only, and requiring the use of deterministic scenarios to serve as floors. In contrast, Solvency II is a “big bang” approach, under which the entire framework of capital regulation will undergo change, internal models are encouraged and can be expected to result in lower capital charges, and there is no explicit floor other than the MCR.
- (2) In the European Union, it is expected that supervisors will review internal models before granting permission to use the models. Permission would be granted only if the company complies with certain standards. In the United States, regulators have largely relied upon the company’s actuaries to attest to the appropriateness of the models and its results. However, regulators have discussed the possibility of creating a centralized review office to review internal models on behalf of state insurance regulators. They are also considering the creation of a statistical agent to collect industry wide data that could be used as a benchmark for examining individual company data and model inputs.
- (3) The metrics for Solvency II and U.S. internal models are different. In Solvency II, capital requirements are targeted at a 99.5% VaR. In the United States, reserving and capital requirements using internal models are generally calibrated based on a TailVaR (TVaR) or Conditional Tail Expectation, which accounts for the magnitude of the potential loss in excess of the VaR threshold.
- (4) In the United States, a company is required to use internal models to establish its capital requirements if it engages in certain types of business. The internal models are used to address a risk that is not otherwise well-captured in the standard factor-based formula, and thus tend to increase capital requirements. In Solvency II, internal models are seen as generally superior to the standard approach because they better align the relationship between risk and capital. Accordingly, companies are encouraged, but not required, to use internal models, and the use of internal models tends to reduce overall capital required. Supervisors

can require the use of internal models if they believe the standard scenario does not adequately capture the insurer's risk profile.

Other Differences. Beyond the differences in their application of internal models, there are a number of other noteworthy differences between the U.S. system and Solvency II.

- (1) Solvency II attempts to frame its capital requirements around a consistent standard – the 99.5% VaR. This standard applies even in the construction of the standard formula, including the selection of correlation factors. While the results of the fourth Quantitative Impact Study (QIS 4) suggest the framers of Solvency II continue to have challenges designing and calibrating the formula to achieve its objective, the objective remains consistent throughout the capital regime, unlike the U.S. system. In the United States, the standard formula is not calibrated to a VaR or TVaR target, and the correlation factors are either 0 or 1.
- (2) There are some differences in the risks that are captured. Most notably, Solvency II includes catastrophe risk for both life and non-life and a charge for operational risk, neither of which are included in the U.S. RBC calculation, although the addition of an explicit charge for catastrophe risk is currently under consideration for the non-life formula. In the U.S., the RBC charges for mortgages and bonds reflect only credit default risk, and not the risk of spread widening.
- (3) In setting technical provisions or policy reserves, Solvency II favors using a “market-consistent approach” with a one-year time horizon for risk elements. The U.S. principles-based approach calculates the greatest present value of the deficit under each of the stochastic scenarios, then applies a conditional tail expectation (or Tail VaR) to determine the required reserves. As previously indicated, this is subject to a floor that is based on a deterministic scenario.
- (4) In Solvency II, Europe is relaxing its investment restrictions in favor of a prudent person approach to investment regulation. In the United States, investment regulations vary across the states. In general, states maintain a blend of rules-based and prudent person approaches to investment regulation, with most assets required to be invested in high quality instruments, but a small amount (the basket) permitted to be invested outside those restrictions (per the basket clause).
- (5) U.S. insurance regulators have nothing comparable to the Own Solvency and Risk Assessment (ORSA) report of Solvency II. While the new Risk-Focused Supervisory system is intended to increase regulatory oversight of a company's risk management, there is no explicit requirement for the company to provide the supervisor with a document that includes its internal assessment of its risks, risk management systems, and risk profile.

Lessons Learned in the Current Financial Turmoil

Following 15 years of relative stability (marked by occasional, relatively short-term problems, such as the bursting of the technology bubble and the demise of Long Term Capital Management), the world has entered a period of deep economic turmoil. Most of the current regulatory initiatives were developed during the good years and are guided by several underlying assumptions embraced during those years of relative stability. In light of the current dislocation in global financial markets, many of these assumptions are being or should be challenged.

Much of the recent work in supervision, both in banking and in insurance, has been characterized as a movement from a rules-based approach to a principles-based approach to supervision and regulation. The argument went essentially like this: the world is getting increasingly complicated, with more complicated investment strategies, products, and new ways to manage risk. Rules-based approaches can never adequately address the differences across companies that are emerging in this new world. Furthermore, rules-based approaches focus firms on adhering to the rule, rather than on the ultimate regulatory objective. They create the problem of regulatory arbitrage, where financial institutions find ways to “game the system” and have a tendency to stifle evolution in a dynamic marketplace.

With respect to capital and financial oversight, this led to the conclusion that rules-based approaches to solvency regulation were inferior. In short, the argument was this: companies are responding to the new world of increased complexity by enhancing their risk management systems and doing a better job of assessing risk. They are developing models aimed at better measuring their capital requirements in light of their unique risk profiles. The supervisory system would benefit from leveraging the work that companies are already doing. Supervisors need to focus more on ensuring that companies have effective risk management systems in place, are identifying and controlling their risk, and hold the right amount of capital in light of those risks.¹⁴

The underlying assumptions behind the above arguments were threefold. First, they assumed that companies had an incentive to properly manage their risk. Second, they assumed that regulators could distinguish between firms that effectively managed risk and those that did not, and, moreover, that the results of internal models were an effective measure of risk differentiation. And, third, they assumed that regulators would take action when they had identified a firm that did not effectively manage its risk. All three assumptions are being questioned in light of the recent market turmoil.

Company Incentive to Manage Risk. A financial institution such as a bank or insurer is funded by a variety of sources, including shareholders, lenders, and depositors/policyholders. Of course, the interests of these different groups are not identical. An action that benefits one group (say, shareholders) may come at the expense of the other groups. In particular, if shareholders are able to increase the risk of the firm, other things equal, the shareholders will benefit at the

¹⁴ It is an argument, by the way, that the author has frequently made herself.

expense of the lenders and depositors/policyholders. This is because the downside of the increased risk is largely borne by the lenders and policyholders, without providing any additional return to them, while the upside accrues to the benefit of the shareholders. According to financial economists, however, shareholders are constrained in their ability to assume risk by the market reaction to that risk. In particular, those with which the firm does business (such as lenders and depositors/policyholders) will demand better terms in reaction to the risk. This phenomenon, which provides an incentive for the firm to maintain an appropriate risk profile, is known as market discipline.

It is well recognized that the existence of deposit insurance and guaranty funds reduces market discipline and increases risk-taking by banks and insurers. In the absence of deposit insurance/guaranty funds, depositors/policyholders have an incentive to monitor the financial solvency of the financial institutions with which they contract. With coverage from deposit insurance or guaranty funds, depositors/policyholders have a reduced incentive to purchase from financially stable institutions. The institution's owners, on the other hand, still have an incentive to engage in risky activities. This is because the gains accrue to the benefit of the owners, while the losses in the case of insolvency are borne by the guaranty fund/deposit insurance fund. Without the market discipline imposed by risk-averse customers, the risk profile of the financial institution can be expected to increase.¹⁵

Furthermore, this tendency toward increased risk-taking increases as the financial condition of the bank/insurer diminishes. That is, shareholders in a thinly capitalized institution have an even greater desire for risk-taking. Intuitively, the owners have even less to lose. There is a tendency to "go for broke" as the firm's prospects get worse, a phenomenon well understood by regulators. Thus, as the financial condition of a bank or insurance company deteriorates, excessive risk-taking increases the potential losses to deposit insurance or the guaranty fund.

¹⁵ Economists explain this phenomenon as an effort to maximize the value of the deposit insurance or guaranty fund put option, the value of the firm's claim on the deposit insurance funds if the insurer becomes insolvent. Economically, the owners of the firm have a put option on the assets of the insurer, with a strike price equal to the value of the insurer's liabilities. As with puts generally, the value of the option increases as the volatility or risk of the underlying asset increases. Thus, as the risk profile of the insurer increases, the value of the put option, and hence the value of the firm to the equity owners, increases. (For a concise explanation, see Downs and Sommer, 1999.)

The empirical evidence is consistent with the theory of reduced market discipline and increased risk-taking in the presence of insurance guaranty funds. Lee, Mayers, and Smith (1997) found that the asset risk of property-casualty insurance companies increased after the enactment of state guaranty fund laws. They concluded that guaranty funds create counterproductive investment incentives, and the effect is stronger for stock companies than for mutual companies (where ownership and policyholder interests are merged). After studying almost 250 property-casualty insurers that failed between 1986 and 1999, Grace, Klein, and Phillips (2007) find strong support for the hypothesis that more highly leveraged insurers are more costly to resolve in bankruptcy, supporting the conclusion of increased risk-taking in insurers as capital levels decrease. They also find that guaranty fund losses are higher for insurers where a greater portion of policyholders have guaranty fund coverage.

The effectiveness of market discipline itself is being questioned, as regulators and counterparties become aware of the vast amount of hidden leverage and risk that existed in our financial system.¹⁶ Some people point to the problem with management incentives, where executive compensation, because it was based on short-term performance, had a tendency to encourage risk-taking. Many scholars fear that recent government actions, which may have expanded the concept of “too big to fail” or “too interconnected to fail,” will further erode market discipline in the banking sector.¹⁷ It is worth noting, however, that banking is not insurance, and there is some evidence that market discipline may be more effective in some areas of insurance.¹⁸

Regulator Ability to Identify Risky Activities in Firms. A key consideration in the effectiveness of a supervisory system is the ability of the supervisor to detect problems. In an increasingly complex world, this is increasingly challenging. The competitive market creates powerful forces compelling insurers to innovate – in products, investments, sources of funding, corporate structures, and other ways. The ability of supervisors to keep up with the companies is constantly challenged.

Risk-based capital systems developed to serve as an early warning signal to regulators, to enable them to take action against a company that was inadequately capitalized. Of course, any system of regulatory capital is imperfect and imposes potential costs. Some of these costs relate to the costs of implementation, and other costs relate to the problem of misclassifying companies. Because a risk-based capital system is imperfect, some firms that are destined to fail will be treated as healthy (a problem known as a Type I error), while the regulator will take action against some healthy firms that are incorrectly identified as troubled (a Type II error). Both errors result in costs.¹⁹

In response to the increased complexity in insurer activities, regulators have begun to rely more on company-developed internal models to establish capital requirements.²⁰ Part of the motivation was the belief that, although using internal models would increase the costs of

¹⁶ As stated by Alan Greenspan in his October 23, 2008 testimony before the House Committee of Government Oversight and Reform: “(T)hose of us who have looked to the self-interest of lending institutions to protect shareholder’s equity (myself especially) are in a state of shocked disbelief. Such counterparty surveillance is a central pillar of our financial markets’ state of balance. If it fails, as occurred this year, market stability is undermined.” Particularly in the case of banks, risks that were thought to be removed from balance sheets, such as through the creation of structured investment vehicles (SIVs) or special purpose vehicles (SPVs), turned out to be incompletely removed, and the losses have been forced back onto the balance sheets, to the tune of billions of dollars.

¹⁷ See, e.g., Shadow Financial Regulatory Committee (2009).

¹⁸ Harrington (2005) agrees that insurance guarantees reduce market discipline. However, he points to other characteristics of the insurance and banking markets (buyer sophistication, firm franchise value, completeness of the protection provided by deposit insurance or guaranty funds) and concludes that market discipline in insurance is stronger than in banking. Furthermore, according to Harrington, systemic risk is lower in insurance than in banking.

¹⁹ See Cummins, Harrington, and Klein (1995) and Harrington (2005).

²⁰ For a discussion of the advantages and disadvantages of static factor-based RBC models and dynamic cash flow based (internal) models, see Eling, et al (2007).

implementation, they would reduce the costs of Type I and Type II errors. This was because (as the argument went), internal models would develop capital requirements that more closely matched the risks of the regulated entity and promote a culture of risk management at the firm. In Solvency II, firms that use internal models are expected to receive a reduction in their capital requirements relative to those that use the standard model.

Recent experience raises questions about whether the problem of Type I and Type II errors are actually reduced by using internal models for purposes of determining required regulatory capital. Model risk can be significant. Criticisms of internal models are rampant today, with critics focusing on the structure of the models (including, e.g., the frequent use of a Gaussian distribution), the inputs into the model (tending to be too optimistic, because they relied too heavily on recent good experience), the assumption that the past can fully predict the future, the failure to account for extreme changes in correlations in times of turmoil, the tendency of the firms and their models to ignore certain risks that turned out to be important in retrospect (e.g., liquidity risk). Equally important, there is increasing recognition that internal models don't necessarily solve the problem of regulatory arbitrage.²¹

In some respects, using internal models to establish regulatory capital requirements complicates the job of supervisors. Internal models rely on the use of discretion in a number of respects (which risks should be captured, what are the inputs, etc.). Supervisors must have technically competent staff to evaluate internal models and to understand the different risks faced by insurance companies. They have to understand how those risks are modeled and to make judgments as to whether they are modeled adequately. The possibility that regulators can err in these determinations – and fail to adequately constrain a company's discretion -- is one of the major drawbacks in the use of internal models.²²

It is unfortunate, but true, that regulators tend to be outgunned by the resources in the companies they regulate. The regulated firm is more likely to have the rocket scientists that live and breathe the structure of their models every day – or at least to have more of them. For the regulators, it is much

²¹ A January 4, 2009 article in the *NY Times* described the evolution of VaR from a tool used by JP Morgan to better understand its risk to a tool used by regulators for disclosure and capital. As VaR became a mandated regulatory tool, firms had an incentive to game the system. The result was a tendency to “stuff the tails” with risk from things such as options and credit default swaps. These generated small, stable returns with a very low probability of large losses. Because the probability of loss was so small, it existed out of sight of the VaR metric used by the regulators. The U.S. principles-based framework uses a CTE or TailVaR measure to account for the magnitude of the potential losses in the tail, which is clearly an improvement over a traditional VaR approach. While it solves this problem, it is not unlikely that regulatory arbitrage will manifest itself in other ways. The forces of competition are enormously powerful.

²² One of the most strident criticisms of the recent direction of supervisory modernization direction was provided by Avenish Persaud in a lecture at Gresham College in July 2005, who argued that complexity increased the problem of regulatory capture. “(R)egulatory capture is . . . much more subtle and sophisticated than in the past. It's not about bribery and corruption of officials. . . . It's about big business persuading regulators about certain principles that seem eminently reasonable, although on further examination I believe are hollow and bankrupt; principles that the regulators grab hold of and believe are right, but actually ultimately support big businesses and the regulated.”

easier to nod sagely and acquiesce when confronted by models or systems that we don't understand than to say "I haven't a clue what you are talking about: would you care to put it in plain English?" Additionally, there are many of us that have strongly believed that many of the directions towards internal models are theoretically correct, and yet we find ourselves in the position that empirical evidence actually indicates that the companies that would have been at the top of most professionals' lists of the best run, most sophisticated entities with the most cutting edge risk management two years ago nonetheless have tended to be those that are now making the headlines and requiring the largest inflows of new capital, whether private or governmental.

Having said that, it is equally true that, for some risks, there is no substitute for internal models. They help to frame the problem and permit stress testing. When used with a certain amount of healthy skepticism, they can be valuable tools to understand the implications of alternative future scenarios. But their use must be framed in the context of their limitations.

In the banking sector, it is worth noting that supervisors are considering the creation of a regulatory capital floor, such as a fixed leverage requirement. The minimum leverage ratio (tangible equity/assets) is a longstanding feature of banking regulation in the United States and was recently introduced by the Swiss banking regulators. The Basel Committee on Banking Supervision is reportedly considering introducing a leverage ratio as a component of Basel II²³

A second lesson learned is the tremendous importance of regulatory tools beyond capital requirements to supervise insurers. Valuation issues can be a challenge; assets may be overstated, liabilities may be understated, and capital may be overstated. Risk profiles of insurers will vary in ways that no system of risk-based capital can recognize. The quality of management is a key consideration, as is corporate governance. Thus, effective regulatory monitoring systems must go beyond a reliance on capital. It is important for regulators to be cognizant of red flags that demand their attention – excessive growth, excessive use of reinsurance (in insurance), investment strategies outside the norm, entry into new lines of business. History indicates these are potential indicators of future problems. These other aspects of regulatory oversight, those embodied by Pillar 2 of Solvency II and by the U.S. Hazardous Financial Condition Model Regulation and the U.S. system of risk-focused supervision, are at least as important as quantitative capital requirements.²⁴

The Effectiveness of Regulatory Action. Of course, it is not sufficient for regulators to simply identify the problems; they must then take action. The history of financial regulation is filled

²³ In the spring 2005, the Basel Committee conducted QIS 4, which revealed a surprisingly large drop at many banks in the amount of capital that the Basel formulas would require – more than 25% drop for over half of the banks surveyed. For many U.S. banks, required capital would have fallen below acceptable leverage ratios under the existing regulatory capital structure. The results of QIS, including the dispersion of results across banks and portfolios as well as the reduced levels of required capital, raised concerns about the adequacy of the models and data used. As a result, U.S. regulators decided to phase in Basel II over a three year period, while maintaining the leverage ratio as an absolute floor to capital levels.

²⁴ The U.S. Hazardous Financial Condition Model Regulation is an accreditation standard and has been adopted in substantially similar form in all states.

with examples of regulators that failed to act, a problem known as regulatory forbearance. In some cases, the results were disastrous for taxpayers and others.²⁵ The classic example of regulatory forbearance in the United States is the savings and loan crisis of the late 1980s.²⁶ Some have pointed to problems with regulatory forbearance as a factor in the current financial turmoil.²⁷

The prompt corrective action (PCA) rules in U.S. banking regulation were introduced as a direct result of perceived problems with regulatory forbearance following the savings and loan crisis. Under PCA, which was introduced as a part of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991, as bank capital levels decline, regulators must take certain regulatory actions and banks are subject to a series of increasingly severe restrictions. At the extreme level, a receiver or conservator must be appointed within 90 days for any bank that has a leverage ratio of less than 2%. The motivation for PCA was twofold -- first, to limit the discretion of regulators, and, second, by defining a clear set of restrictions on banks as capital levels fall, to give banks an incentive to keep capital levels above some minimum. The threat of regulatory action encourages banks to hold a level of buffer capital in excess of regulatory requirements.

²⁵ On the other hand, some scholars believe regulatory forbearance by the insurance regulators during the Great Depression helped the industry survive that period of economic turmoil. The NAIC altered asset valuation rules during the 1930s, as they had previously done during periods of market turmoil in 1907, 1914, and 1917-1921, and there is no indication of significant fallout. The NAIC history suggests that many commissioners believe their action to “shore up” insurer balance sheets during the 1930s helped insurers to survive the tremendous market dislocations of the time. Insurers that would otherwise have been forced into insolvency were able to continue operating until asset values recovered. While some insurance companies did fail during the Great Depression, policyholder losses were modest despite the absence of guarantee fund coverage (Magrath 1934).

²⁶ Between 1983 and 1990, more than 900 savings and loans were “resolved,” i.e., placed in conservatorship or merged/closed with the assistance of the Federal Savings and Loan Insurance Corporation. There was increasing concern about the financial condition of commercial banks and fear that they would suffer the same fate. The Federal Home Loan Bank Board, the regulator of the savings and loan institutions in the 1980s, responded to the savings and loan crisis by easing regulatory requirements, including minimum capital requirements and regulatory accounting rules. This permitted savings and loans to continue in business and to adopt increasingly risky business strategies in an effort to save themselves, thus increasing the ultimate losses suffered by the insurance fund. The savings and loan regulators were not the only ones subject to criticism during this time period. A 1985 staff report of the House Banking Committee criticized the OCC’s and Federal Reserve’s supervision of Continental Illinois Bank, which failed in 1984 (FDIC 1997).

²⁷ According to an article in the *Banking Times*, Lord Adair Turner (current chairman of the UK Financial Services Authority) cites regulatory forbearance as one of the reasons for the failure of Northern Rock. “According to Lord Turner, the Authority had concerns about the business models of Northern Rock and Bradford & Bingley before their collapse but would have been seen as harming the competitiveness of the City of London, had it tried to act.” The SEC has been criticized for relaxing the capital requirements for investment banks. In 2004, the SEC permitted the five largest U.S. investment banks to opt for supervision under a new Consolidated Supervised Entities (CSE) program. For these firms, the Net Capital Rule, which had governed regulatory capital requirements since 1975, was replaced by the Basel II capital requirements. The change resulted in a dramatic decrease in required capital, and concomitant increase in leverage. As is widely known, none of these entities continues to be a freestanding investment bank. In September 2008, SEC Chairman Cox announced the end of the CSE program, opining that it had been “an utter failure.” Together, these stories demonstrate that a regulatory system must be constructed with the recognition that regulators are fallible.

A specific aspect of the U.S. regulatory structure merits discussion in this context. It is well-recognized that U.S. insurance regulation is a state-based system. The nature of the state-based system is not always well understood, however. Under the state-based systems, regulators in each state are responsible for the supervision of their own market. That means that, although a company is primarily supervised by its domestic regulator, other state regulators also have an incentive to ensure the company is adequately supervised. In fact, they have the ability to constrain the operations of that company within their state if they believe it is necessary. That structure provides an important benefit, a set of checks and balances that reduces the possibility of regulatory error.²⁸ Because there are multiple eyes on a problem, it is less likely that problems will get missed. Moreover, because the behavior of a given regulator is constrained by the actions that could be taken by other states with respect to his or her domestic companies, the problem of regulatory forbearance may be reduced.

Examining data from the late 1980s, Willenborg (2000) found that the likelihood of solvency-related regulatory action against a distressed insurer was positively related to the number of states in which the insurer operates. That is, the more states in which a company is licensed, the quicker the regulator acts. According to Willenborg, this is a result of the overlapping nature of state regulation. Multiple states monitor the financial condition of a multistate insurer. Because individual states can act in response to a troubled company (e.g., by revoking the company's license to do business in the state), the domestic regulator can no longer engage in unfettered negotiation with the insurer. As a result, a domestic regulator has less discretion when responding to a distressed multistate insurer than it does in the case of a single state insurer. In a study that looked at the insolvency costs of almost 250 insurers that failed between 1986 and 1999, Grace, Klein, and Phillips (2007) found support for Willenborg's conclusion. They found that single state insurers were more costly to resolve and conclude that this could be an indication of greater regulatory forbearance in the liquidation of single state insurers.²⁹

The high degree of coordination fostered by the National Association of Insurance Commissioners supports this aspect of the state system. Through its national financial database and other multistate databases, all states are provided with financial data, analysis tools, and information on regulatory actions in the various states. Centralized financial analysis by the NAIC's Financial Analysis Division, peer review through the NAIC's Financial Analysis Working Group, multistate financial examinations, and an accreditation program that includes periodic NAIC review of a state's financial analysis and financial examination files provide

²⁸The Nobel prize-winning economist Joseph Stiglitz (2008) articulates this concept. "The problems of enforcement mean that we have to design robust regulatory systems, where gaps in enforcement are transparent. Relatively simple regulatory systems may be easier to implement and more robust. There needs to be sensitivity to the risk of regulatory capture. It may also be optimal to have duplicative regulatory systems: the costs of a mistake overwhelm the extra costs of regulation. And one must guard against regulatory competition—allowing a choice of regulators, which can lead to a race to the bottom."

²⁹ Cost was measured as the cumulative net guaranty fund assessments as a percentage of the assets of the insolvent insurer in the year prior to the first formal regulatory action.

additional checks and balances. A review of the robust mechanisms that U.S. insurance regulators have developed to coordinate and to create checks and balances could provide valuable insights to policymakers charged with developing supervisory systems that cross geographic boundaries. These include, for example, the Solvency II efforts in Europe and the development of a framework for the operations of supervisory colleges.³⁰

Implications for U.S. Insurance Regulation

Considerable work has been done in Europe to create Solvency II, the new regulatory capital system for insurance companies in the European Union. Similarly, considerable work is underway across all financial services sectors to assess the successes and failures of regulation in light of the current financial turmoil. Together, insights gained from these work streams should inform future insurance regulatory reform in the United States. Some of the following lessons learned have confirmed the wisdom of certain aspects of U.S. regulation.

Checks and Balances. Any regulatory system must contemplate the potential for regulators to make errors. Regulators may err in failing to understand the risk of a regulated entity, and they may err in failing to take appropriate action after they've identified excessive risk. A regulatory structure that includes a system of checks and balances can help control the negative effects of errors. The importance of these checks and balances increases as the costs of being wrong increase (for example, when the regulated entity is systemically important). In the current debate over regulatory reform, this particular strength of the U.S. system of insurance regulation must be remembered.

A Combination of Principles-Based and Rules-Based Regulation (Constrained Regulatory Discretion). Insurance supervision should reflect a careful balance of rules-based and principles-based approaches to supervision. A rules-based approach is one way to address the potential for regulatory errors, the problem of regulatory forbearance. Of course, in light of the diversity and complexity in which the particularly industry operates, regulatory discretion cannot and should not be eliminated. Recent experience leads me to the conclusion that “constrained supervisory discretion” may be the best answer, that is, supervisory discretion with limits.³¹ This might include, for example, a rules-based specification of minimum capital requirements, perhaps based on a factor-based model. Internal models will continue to serve a role, but they

³⁰The Financial Stability Forum has proposed to set up colleges of supervisors to facilitate a coordinated approach to supervising internationally active financial institutions.

³¹ For a discussion of lessons learned in the banking sector and the need for systems to constrain regulatory discretion there, see Statement of the Shadow Financial Regulatory Committee on Restructuring Financial Regulation (2009). “The failure of bank regulation tells us that regulation is no panacea. . . . The Shadow Committee recommends that countercyclical measures, such as imposing increased capital requirements when asset prices and profits are rising, be mandated by a statutory formula and not left to regulatory discretion. . . . (t)he bank regulators seriously underestimated the need for capital during the early stages of the crisis . . . This is another example of regulatory failure, and another reason why regulatory discretion must be curbed, not enhanced.”

must be used with a proper appreciation for their limitations. Companies will undoubtedly find internal models useful as they plan for the future. But for regulatory capital purposes, they are best used on a targeted basis, aimed at those risks that require the use of internal models, and used with proper safeguards.³² This fairly described the current U.S. system of capital regulation and the direction in which it is moving.

Beyond capital requirements, there may be benefit to maintaining a level of regulation around insurer activities and not relying solely on regulatory capital requirements to constrain risk-taking. This might include, for example, some limitations on permitted investments to ensure a minimum level of highly liquid assets as needed by the enterprise.

The Importance of Other Supervisory Tools. As indicated earlier, the U.S. system of regulation incorporates a number of elements to identify potentially troubled firms beyond regulatory capital requirements. On-site examinations, off-site financial analysis, and other tools provide additional checks and balances and increase the chance that regulators will identify problems that are not captured by regulatory capital rules.

Enhancements to U.S. Insurance Regulation. A review of the global developments in solvency regulation also suggests a number of improvements U.S. regulators might take from their colleagues in Europe. Many of these ideas have already been targeted for further study in the NAIC's Solvency Modernization Initiative. One item that is high on the priority list is to establish a models-based catastrophe charge for earthquake and hurricane risk. U.S. regulators have also begun to examine the structure of their RBC asset charges, specifically considering whether the charges for bonds and mortgages should be expanded beyond a focus solely on credit risk.

Many of the other ideas relate to the Solvency II approach to targeting capital requirements. For example:

- Should the NAIC expand its use of internal models beyond current efforts?
- Should the NAIC attempt to calibrate its RBC system to a particular statistical level of safety (e.g., TVaR)?
- Should the U.S. system of risk-based capital have a specific charge for operational risk?
- Should the NAIC require companies to calculate their economic capital requirements and share that with the regulator? Should a regulator require that company's target a particular level of safety at an enterprise wide level?

³² An excellent example of this approach is the Swiss Solvency Test, which combines a standard model with supplemental scenario testing targeted at particular risks. The Swiss Solvency Test is also based on a TVaR approach, similar to the direction in which the U.S. is headed. See Eling, Schmeiser, and Schmit (2007).

As mentioned earlier, the NAIC is also considering the development of tools that would assist regulators in evaluating the internal models of a company. These will become particularly important as the NAIC moves toward increased use of internal models to establish life insurance policy reserves. One proposal is to create a centralized review office that would provide a high level of expertise to the states, expertise that would be difficult to maintain at the individual state level. This could also provide a means of promoting some level of consistency in the model review process. A related proposal calls for the creation of a statistical agent to collect data from life insurers that can be used as industry wide benchmarks when regulators evaluate the model inputs used by the companies. These resources could go a long way to giving regulators additional comfort as they continue to introduce internal models incrementally into their risk-based capital system.

Finally, the U.S. regulators are considering further work related to Pillar 2 of Solvency II. These include evaluating the merits of introducing a requirement similar to the Own Risk and Solvency Assessment in the United States and increasing the focus on corporate governance.

Summary

Rob Esson, a member of the NAIC staff who is actively involved in international issues (and chairs the IAIS Insurance Contracts Subcommittee), tells the following story:

During the First World War in the summer of 1916, the Royal Navy Grand Fleet and the German High Seas Fleet met in the last major fleet action between navies before the rise of air power. In the first half hour, HMS *Indefatigable* and HMS *Queen Mary* – two of the Royal Navy’s most modern and powerful battlecruisers – blew up. Shortly thereafter, a salvo struck on or around HMS *Princess Royal*, which was obscured by spray and smoke from shell bursts. A signalman promptly leapt onto the bridge (of the flagship)... and announced "*Princess Royal's* blown up, Sir." British Admiral Sir David Beatty famously turned to his flag captain, saying "Chatfield, there seems to be something wrong with our bloody ships today." At the time of Admiral Beatty’s comment in the heat of the battle, he didn’t know the correct underlying reason,³³ he simply knew that something was very wrong.

Much work has been done in recent years on the subject of insurance regulation and capital requirements, and the process of regulatory reform will continue. But today we face a problem similar to that faced by Admiral Beatty. It is clear that something has gone wrong. Underlying assumptions that have driven supervisory reform in the various sectors are being questioned. Given recent developments, it behooves insurance supervisors to take a step back, revisit the

33 Subsequent analysis showed that the lack of a very low cost, low tech item cost the lives of some 3,000 Royal Navy seamen who died in those three ships: the answer was flash-screens to prevent ‘flash’ entering the ship’s magazines and blowing them apart.

underlying assumptions, and assess what implications, if any, their conclusions have for future work.

The use of internal models to establish regulatory capital requirements cannot and should not disappear. However, internal models must be used appropriately, with recognition of their significant limitations. The optimal structure of insurance supervision is likely to be a combination of a rules-based and a principles-based approach. That is, internal models should be an adjunct to a rules-based capital requirement that establishes a floor for regulatory capital. The current environment has also demonstrated the value of some regulatory oversight of other activities of financial institutions, including, for example, the regulation of investments. Capital regulation is a necessary, but not sufficient, requirement for effective financial regulation. Onsite examinations, offsite analysis of financial performance and trends, and frequent interaction with the regulated entity are equally important. These are long-standing features of the U.S. insurance regulatory system. Finally, current developments have demonstrated that market discipline cannot be relied on as a substitute for regulation and supervision. The optimal regulatory structure is one that encourages supervisors to take action when it is appropriate, and a system that incorporates duplicative regulatory oversight may advance that objective.

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