ARTICLE

UPDATED HURRICANE MODELS: A NEW OPPORTUNITY TO INSURE AGAINST CLIMATE CHANGE

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"The [insurance] industry has always felt that the past is the key to the future. . . . With the many changes in society and the potential changes in climate, this will no longer hold true."[1]

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[1] Mark Baker, *Natural Hazards and the Canadian Insurance Industry*, INST. FOR CATASTROPHIC LOSS REDUC. RESEARCH PAPER SERIES NO. 25, at 20 (Dec. 2002) *available at* http://www.iclr.org/pdf/mark%20baker%20paper.pdf (last accessed Nov. 21, 2007).

This article suggests that insurers will more accurately predict their losses if state insurance regulators step up to the challenge of understanding and scrutinizing the hurricane models used by the insurance industry to assess climate change's economic implications. The article briefly discusses how states are empowered to regulate the insurance industry and to influence its rate setting approaches. The article then discusses the major approaches to rate setting and highlights the inaccuracy that is characteristic of traditional approaches. It also explains that the primary obstacle to increased use of modeling in the rate setting process is state insurance regulators who, concerned for consumer protection, fear insurers will use the proprietary nature of the models to hide charging unjustifiably high premiums for insurance. Next, the article shows, through a case study of Massachusetts, how this fear can be addressed. Further, proactive measures can encourage more widespread understanding and use of the models to contribute to a more financially stable insurance industry that can withstand climate change and enable homeowners to make better long-term decisions about where they want to live and how to construct their homes.

I. INTRODUCTION

Climate change is upon us. The Supreme Court, the Catholic Pope, and even U.S. President George W. Bush recognize it.[2] A politician has presented

[2] *See* Massachusetts v. Env't Prot. Agency, 127 S. Ct. 1438, 1462 (2007) (holding that the Environmental Protection Agency may regulate the emission of greenhouse gases because they are air pollutants); John Vidal & Tom Kington, *Protect God's creation: Vatican Issues New Green Message for World's Catholics*, GUARDIAN (Apr. 27, 2007), *available at* http://www.guardian.co.uk/international/story/0,,2066671,00.html ("The Vatican yesterday added its voice to a rising chorus of warnings from churches around the world that climate change and abuse of the environment is against God's will, and that the one billion-strong Catholic church must become far greener."); Press Release, The White

an Academy Award winning documentary about it,[3] and the communal urban-living experience of millions of Americans may now include a daily walk past the street corner where young, green-minded folk stand armed with clipboards, inviting passersby to sign a save-the-earth petition. So, it should come as no surprise that the world's largest industry—the insurance industry—has taken notice of climate change. The industry has recently become poised to embrace a new approach to rate setting that, for the first time, takes climate change into account. This approach projects hurricane losses with catastrophic (CAT) models that evaluate *ongoing* climatic cycles for short time frames that are typically five years long.[4] Through increased use of this model, insurers can more accurately assess their risks, including risks associated with global warming, and consumers can make better long-term decisions about where they want to live and how they want to construct their homes because the price of insurance will reflect the risks of global warming.

Despite the benefits of forward-looking models, state insurance regulators may prevent insurers from fully using them in the rate setting process, and prefer for insurers to use the traditional approach of basing rates on historical losses—an approach that is notoriously inaccurate. The principle reason regulators hesitate to use the new models is that they fear unjustifiably high insurance rates. Insurance regulators are reluctant to trust an insurer's insistence that higher rates are necessary to cover a model's loss predictions unless the regulators have an opportunity to inspect the models. Models, however, contain significant proprietary information, which makes insurers disinclined to make their models publicly available.

With global warming expected to escalate the devastating effects of hurricanes in the future, the extent to which insurers may use models to predict their losses more accurately will become increasingly important. To illustrate how one state has grappled with this issue, this paper analyzes the June 30, 2006 Decision and Order on Massachusetts Property Insurance Underwriting Association Rate Filings R2005-14 ("Massachusetts Decision"). In this decision, the Massachusetts Insurance Commissioner authorized a residual market insurer, an insurance provider for homeowners who cannot obtain insurance in the voluntary market, to use the latest models then available in the rate setting process, on the theory that Massachusetts' public records laws and the insurers' need for reinsurance would provide the public with adequate

House, President Bush Discusses United States International Development Agenda (May 31, 2007), *available at* http://www.whitehouse.gov/news/releases/2007/05/20070531-9.html ("In recent years, science has deepened our understanding of climate change and opened new possibilities for confronting it. The United States takes this issue seriously.").

[3] The Winners, BOSTON GLOBE (Feb. 26, 2007) at E4 (stating that *An Inconvenient Truth* received two Academy Awards). *An Inconvenient Truth* is a documentary film about climate change presented by former U.S. Vice President Al Gore.

[4] *U.S. and Caribbean Hurricane Activity Rates: The New RMS Medium-Term Perspective & Implications for Industry Loss* (2006) at 1, *available at* http://www.rms.com/Publications/60HUActivityRates_whitepaper.pdf.

protection against possible insurer abuses.[5] Just as significant was the Commissioner's relieving the insurer from a statutory cap on rate increases to allow the insurer to adopt more accurate price structures.[6] Although this decision involved long-term average climatology models, as forward-looking models had not yet become available, the issues addressed in this decision also apply to forward-looking models. This case study serves as an example for progress in using forward-looking hurricane models.

Inspired by the Massachusetts model, this paper argues that several changes are necessary to promote a robust property casualty insurance industry that can withstand future hurricanes like Hurricane Katrina. First, the regulators should find mechanisms to scrutinize the forward-looking models to ensure that insurers will not use the models to raise rates unjustifiably. Once such mechanisms are in place, regulators should then approve industry usage of the forward-looking models in the rate setting process, thereby enabling insurers to adopt more accurate price structures.

Section II provides an overview of domestic insurance regulation. Section III outlines the principal approaches to setting insurance rates. Section IV explores the Massachusetts decision. Section V extracts and analyzes the lessons learned from the Massachusetts experience. Finally, Section VI briefly concludes that forward-looking modeling could help guard the insurance industry against the next Katrina.

II. INSURANCE IN A NUTSHELL

With annual revenues exceeding three trillion dollars, the insurance industry comprises the world's largest industry.[7] A basic understanding of the industry is necessary for fully grasping how hurricanes have troubled it. This section provides an overview of the industry's history and then examines how the present regulatory structure empowers states to help promote a robust insurance industry.

A. History

"[T]he business of insurance is easily the largest U.S. industry to elude . . . [federal] regulation."[8] A trek through the history of U.S. insurance regulation

[5] Mass. Prop. Ins. Underwriting Ass'n Rate Filings, No. R2005-14, at 21 (Mass. Div. Ins. June 30, 2006) (decision and order), *available at* http://www.mass.gov/Eoca/docs//doi/Legal_Hearings/R2005-14.pdf.

[6] *Id.* at 18.

[7] CTR. FOR HEALTH AND THE GLOBAL ENV'T, HARV. MED. SCH., CLIMATE CHANGE FUTURES: HEALTH, ECOLOGICAL, AND ECONOMIC DIMENSIONS 92 (Paul R. Epstein & Evan Mills eds., Ctr. for Health and the Global Env't, Harv. Med. Sch.) (2005), *available at* http://chge.med.harvard.edu/programs/ccf/documents/ccf_report_oct_06.pdf. [hereinafter "CLIMATE CHANGE FUTURES"].

[8] Roger C. Henderson & Robert H. Jerry, II, INSURANCE LAW: CASES AND MATERIALS 171 (Mathew Bender & Co., 3d ed. 2001).

reveals that state regulatory dominance developed in response to public distrust of insurers. Nonetheless, a recent shift towards more federal regulation has occurred.[9]

1. State Regulation

States hold the power to fortify the insurance industry against devastating hurricanes, because they dominate regulation of the industry. This dominance has its roots in the foundations of America. In the early colonial years, British underwriters generally handled domestic risk.[10] Then, in the later colonial years, an American insurance industry emerged in port cities, such as Philadelphia and New York.[11] State legislatures began granting the new insurance companies specialized corporate charters to operate in each of their states.[12] By placing restrictions in the charters, the state legislatures effectively regulated the companies. States later replaced the charter system with a general incorporation legislation and legislation governing the establishment of insurance companies.[13] These statutes required insurers to make periodic reports to a state official, avoid certain investments, and maintain certain levels of capitalization and reserves.[14]

The resulting patchwork system of state regulation placed a heavy burden on insurers.[15] In an attempt to eliminate the burden, in the 1860s, insurers urged Congress to adopt national standards that would make insurers federal institutions like banks.[16] Before Congress addressed the issue, however, insurers sought relief in the U.S. Supreme Court in 1869.[17] In *Paul v. Virginia*, insurers argued that the federal commerce power allowed federal regulation of insurers and that this power resided exclusively with the federal government.[18] The Court rejected both arguments and held that the power to regulate insurers resided exclusively with the states.[19]

Paul inspired the establishment of the National Association of Insurance

[9] This paper describes the status quo balance between state and federal regulation of the insurance industry, but does not attempt to provide a normative analysis. For an interesting normative analysis see INS. INFO. INST. MEDIA, *Issue Update: Optional Federal Charter*, http://www.iii.org/media/hottopics/insurance/opt/ (last visited Dec. 15 2006).

[10] Henderson & Jerry, *supra* note 8, at 172.

[11] *Id.*

[12] Robert H. Jerry, II, UNDERSTANDING INSURANCE LAW 55 (Mathew Bender & Co., 2d ed. 1996).

[13] *Id.*

[14] *Id.*

[15] *Id.*

[16] Henderson & Jerry, *supra* note 8, at 172.

[17] *Id.*

[18] *Id.*

[19] *Id.*

Commissioners (NAIC) in 1871.[20] The NAIC is an association composed of the chief regulators in the insurance industry.[21] It provides some uniformity to insurance regulation by promulgating model laws and regulations, studying problems of insurance regulation, gathering and distributing information on regulatory matters, and maintaining financial data for the purpose of detecting insurer insolvency at an early stage.[22] As discussed *infra*, the NAIC continues to be highly influential in the industry today.

Despite the NAIC's efforts to add some degree of uniformity to insurance regulation, state regulation increased. By 1900, most states had licensing procedure for insurers.[23] The public, however, considered these procedures inadequate and became enraged by widespread insurer abuses, particularly in the life insurance industry.[24] For instance, officials at insurance companies demanded excessively large commissions for agents, made false representations about future dividends, wasted company assets on lobbying activities, and generally used their positions for personal gain.[25] In 1906, New York took action.[26] It enacted a law that (1) required insurers to provide detailed year-end reporting, (2) ordered the allocation of policy dividends to insureds, (3) limited the amount of new policies insurers could write annually, and (4) strictly regulated agent commissions.[27] This statute widely influenced other states. By 1930, the insurance divisions in most state governments were in charge of preserving insurer solvency.[28] They also had authority to collect information from insurers, including information about reserve levels, valuation of assets, and investments.[29] In addition, regulators had some authority over policy forms and unfair trade practices.[30]

By 1944, states regulated the insurance industry in almost all areas except ratemaking.[31] Ironically, despite its previous preference for federal regulation, the insurance industry had come to relish the generally lax state regulation. The Attorney General of Missouri, however, was frustrated by the ineffectiveness of state regulation. He indicted 198 stock fire insurance companies in six states for violating the Sherman Act by agreeing to fix rates and boycotting non-members.[32] In *United States v. South-Eastern*

[20] *Id.* at 178.

[21] Jerry, *supra* note 12, at 127.

[22] *Id.*

[23] Henderson & Jerry, *supra* note 8, at 173.

[24] Jerry, *supra* note 12, at 74.

[25] Henderson & Jerry, *supra* note 8, at 173.

[26] *See id.*

[27] Henderson & Jerry, *supra* note 8, at 173.

[28] *Id.*

[29] *Id.*

[30] *Id.*

[31] *Id.*

[32] *Id.*

Underwriters Ass'n the Supreme Court responded by removing the constitutional impediment to federal regulation of the insurance industry.[33] This decision alarmed the insurance industry, which feared that federal regulators might apply federal antitrust laws in a manner that would prohibit pooling actuarial data—a practice central to the ratemaking process.

The NAIC responded to the insurance industry's concerns by proposing legislation, which Congress enacted as the McCarran-Ferguson Act.[34] This Act gives the states supremacy for regulation of the "business of insurance" to the extent states chose to regulate it.[35] The Supreme Court acknowledged the McCarran-Ferguson Act's sweeping impact on insurance regulation: "Congress' purpose was broadly to give support to the existing and future state systems for regulating and taxing the business of insurance . . . [and] was evidently to throw the whole weight of its power behind the state systems."[36]

The McCarran-Ferguson Act motivated the NAIC to develop model rate regulations and unfair trade practices statutes that the industry supported. These models proved highly influential, and by 1950, all states had adopted some form of rate regulation.[37] Then, in the mid-1950s, the Federal Trade Commission initiated inquiries into insurer abuses in advertising accident and health insurance.[38] Fearing further federal intervention, all of the states enacted unfair trade practices statutes by 1963.[39] The cycle repeated itself in the 1960s and 1970s. For example, the public cried out against insurer abuses in the automobile insurance industry; the federal government threatened intervention, and the states quickly responded by enacting no-fault automobile statutes, thereby increasing state dominance of insurance industry regulation.[40]

Because state regulatory dominance over the insurance industry developed to promote a stable insurance industry and prevent insurers from abusing the public, states are empowered to gird the insurance industry against the next Katrina, so long as their action does not allow insurers to engage in unscrupulous practices.

2. Shift Towards Federal Regulation

Despite the crucial role states play in preparing the insurance industry for the next Katrina, the federal government's role may soon increase. In recent decades, insurers and some consumer advocates have more successfully rallied to shift the balance towards more federal regulation. These groups see the current structure of state regulation as overly complex, anticompetitive and

[33] *Id.*

[34] *Id.*

[35] *Id.*

[36] Prudential Ins. Co. v. Benjamin, 328 U.S. 408, 429-30 (1946[0]).

[37] Henderson & Jerry, *supra* note 8, at 175.

[38] *Id.*

[39] *Id.*

[40] *Id.*

unduly burdensome with respect to costs of compliance and delays in launching new products, such as modeling.[41] Other consumer advocates, however, suspect that the current push for federal regulation arose because insurers now perceive federal regulators to be more lax than state regulators.[42]

The enactment of the Gramm-Leach-Bliley Act (the "GLB Act") in 1999 was a noteworthy step towards federal regulation of the insurance industry. The GLB Act lowers the barriers between the banking and insurance industries by allowing "financial holding companies" to own both banks and insurance companies.[43] Because banks are regulated primarily at the federal level, the GLB Act forces federal and state regulators to cooperate. For example, under the GLB Act, if the majority of states failed to enact uniform insurance agent licensing laws or reciprocity measures by 2002, a private national licensing organization would have been created.[44] However, because enough states enacted such laws the licensing the organization was never created.

Reformers have introduced legislation for a dual (federal and state) chartering system similar to the banking industry's dual regulatory system.[45] This system would allow companies to choose between the state system and a national regulatory structure. It would eliminate the need to comply with different regulations for each of the fifty states and the District of Columbia. Alternatively, some reformers prefer to modernize the state system. One proposal for modernization, the State Modernization and Regulatory Transparency (SMART) Act, would construct a framework for a national

[41] INS. INFO. INST. MEDIA, *supra* note 9.

[42] *State of Insurance Regulation: Hearing Before the S. Comm. on Commerce, Science & Transp*. 108th Cong. 2 (2003) (statement of J. Robert Hunter, Tex. Ins. Comm'r), *available at* http://commerce.senate.gov/pdf/hunter102203.doc.

[43] Henderson & Jerry, *supra* note 8, at 176. *See also* STAFF OF FLA. H. R. COMM. ON INS, LICENSURE OF INS. PRODUCERS: THE GRAMM-LEACH-BLILEY ACT, THE NAIC PRODUCER LICENSING MODEL ACT, AND FLORIDA LAW 1-3 (Fla. 2001), *available at* http://www.flsenate.gov/data/publications/2001/house/reports/insurance/glb_plma.pdf.

[44] STAFF OF FLA. H. R. COMM. ON INS., *supra* note 43, at 1.

[45] INS. INFO. INST. MEDIA, *supra* note 9. In furtherance of a dual chartering system, in April 2006, Republican Senator John Sununu (N.H.) and Democratic Senator Tim Johnson (S.D.) introduced legislation (S. 2509) that would create an optional federal charter for insurers. In September 2006, House Representative Ed Royce (R-Cal.) introduced a companion Bill, The National Insurance Act. The legislation would create a national insurer license, allowing insurers to do business in any state without the need for additional state licenses. Insurers would be able to set rates without seeking review from or filing by a federal regulator. States in which federally licensed companies operate would not oversee the rates. National insurers, however, would still be subject to regulation by the Treasury Department's National Insurance Commission. The legislation would also allow a state-licensed agent or broker to sell the products of any insurer operating within the state where the agent or broker holds a license without further authorization. *Id.* Also in furtherance of a dual chartering system, in July 2006, the House Subcommittee on Capital Markets, Insurance and Government-Sponsored Enterprises of H.R. 5637 approved a bill that would apply a single-state regulation and uniform standards to reinsurance and surplus lines. *Id.*

system of state-based regulation.[46] The SMART Act offers uniform standards in such areas as market conduct, licensing, the filing of new products, and reinsurance.

If the federal government truly steps up to the challenge of regulating the insurance industry, it must encourage a robust natural disaster insurance market. By adopting forward-looking modeling as its rate setting approach and by allowing insurers to adopt more accurate price structures, the federal government will best effectuate a robust natural disaster insurance market.

B. Regulatory Mechanisms

Increased desfires for federal regulation of the insurance industry must not overlook the fact that states currently possess the regulatory mechanisms necessary to buttress the insurance industry against catastrophic hurricanes.

1. Structure of State Regulation

Each state is structurally empowered to prepare its insurers for the next Katrina-like hurricane. All state legislatures charge an office, generally the "Department of Insurance," with administering the state's regulatory laws.[47] An official, generally the "Insurance Commissioner," heads the office.[48] In two thirds of the states, the department is a separate regulatory entity, rather than part of another state department.[49] In most states, the Governor appoints the Commissioner.[50] In about half of the remaining states, another governmental entity appoints the Commissioner.[51] In the other quarter of states, the public elects the Commissioner.[52]

The Insurance Commissioner has broad authority to promote the public welfare by administering and applying state statutes. Specifically, the four main purposes that Insurance Commissioners seek to further are to: 1) protect the solvency of insurers; 2) guarantee the availability of coverage to the public; 3) ensure that consumers are charged fair and reasonable prices for insurance products, and 4) prevent unfair practices and overreaching by insurers.[53] As discussed below, these purposes are best served by modernizing the rate setting process.

2. Solvency Regulation

When insurers are ill-prepared for hurricanes, they risk becoming insolvent.

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[46] *Id.*

[47] Jerry, *supra* note 12, at 98.

[48] *Id*.

[49] *Id*.

[50] *Id*.

[51] *Id*.

[52] *Id*.

[53] Henderson, *supra* note 8, at 178-79.

Hurricane Andrew "wiped out every dollar of profit State Farm ever made from the beginning of the company in one day."[54] Given the effect of the hurricane on one of the nation's premier insurance companies, it is no surprise that numerous insurers became insolvent.

Traditionally, if an insurer became insolvent, its customers suffered a partial or total default on their policies.[55] Fortunately, in the 1960s, several mechanisms arose to regulate and mitigate the effects of insurer insolvency. First, based on model statutes proposed by the NAIC, states created guarantee associations.[56] A guarantee association is a group of insurers that satisfies the obligations of insolvent insurers and thereby protects insurance customers from financially unstable insurers.[57] Second, the NAIC developed a centralized database, an early warning system, and a working group to help identify troubled insurance companies.[58] Third, states began requiring that regulators only to issue licenses to insurers found to be financially stable.[59] Statutes now prescribe the kinds of investments insurers may make, regulate the methods of valuing an insurer's assets, and require insurers to hold enough reserves to meet policy obligations.[60] As one of the primary purposes for regulating the insurance industry is to gird insurers against insolvency, states have a duty to prepare insurers for catastrophic hurricanes.

3. Coverage Regulation

While Insurance Commissioners regulate insurer solvency to protect consumers from the after-effects of events like hurricanes, they also regulate coverage to ensure that consumers own adequate insurance when events like hurricanes occur. Specifically, the Commissioners may increase the amount of coverage that insureds are required to have, specify the content of insurance policies, and prescribe rules for access to insurance.[61]For example, "residual market" plans require government-backed residual market insurers, more popularly known as "insurers of last resort," to sell insurance to consumers who cannot obtain insurance in the voluntary market.[62] If a residual market

[54] Brief of Mass. Prop. Ins. Underwriting Ass'n In Support of a Gen. Rate Revision to be Effective on and After Dec. 31, 2005, at 12, *In re* Application of the Mass. Prop. Ins. Underwriting Ass'n for Approval of a Gen. Rate Revision to be Effective on and After Dec. 31, 2005, No. R2005-14 (Mass. Div. Ins. 2005),(citing Transcript of State Rating Bureau's Mark Brannon at 1276/5-13 (Brannon)) [hereinafter, Brief of MPIUA]..

[55] Harold C. Krogh, *Insurer Post-Insolvency Guaranty Funds*, 39 J. Risk & Ins., 432, n. 3 (1972).

[56] Henderson & Jerry, *supra* note 8, at 179.

[57] *Id.*

[58] *Id.*

[59] *Id*. at 180.

[60] *Id.*

[61] *Id*. at 93.

[62] *Id*. at 182.

insurer charges rates that are too low to support its operation, the state typically assesses voluntary insurers to make up the difference.[63] These additional costs are then passed on to all of the voluntary insurers' policyholders in the form of higher premiums.[64]

The existence and growing dependence on residual market flood insurance by coastal property homeowners highlights the tension between society's desire to cover all homeowners and the insurance industry's need to charge actuarially sound rates.[65] On the one hand, if left to their own devices, insurers might cover only low-risk homeowners who can afford to pay high premiums and moreover, might simultaneously pad their own pockets by charging *more* than necessary to cover the risks presented by the low-risk homeowners. Insurers' historical abuse of the public, discussed previously in Section II, supports this premise.

On the other hand, to be viable, insurers must charge the highest risk homeowners the highest premiums for insurance. This actuarial principle suggests homeowners living near the coast should pay the most for flood insurance. Coastal dwellers, however, often find that they can purchase residual market insurance at prices below market rates, as other consumers effectively subsidize their premiums.[66] After Hurricane Katrina, many individuals living in inland areas began to grumble about paying higher premiums so that wealthy homeowners could keep their ocean views.[67]

States regulate insurance through residual market plans to ensure that all homeowners, regardless of where they live, can buy insurance coverage for floods.[68] The challenge to regulators is to find the right balance between encouraging coastal homeowners to buy insurance from voluntary insurers so other homeowners are not subsidizing them, and protecting coastal homeowners from unscrupulously over-inflated premiums. By allowing voluntary and residual market insurers to adopt more accurate price structures, state insurance regulators can find this balance.

4. Rate Regulation

In addition to regulating insurance coverage, states regulate insurance rates. Under the most common and most burdensome "prior approval" approach, insurers file proposed rates with the state's insurance department and must wait

[63] INS. INFO. INST. MEDIA, *Issues Update: Residual Markets* (Aug. 2007), http://www.iii.org/media/hottopics/insurance/residual/.

[64] *Id.;* Brief of MPIUA, *supra* note 55, at 28.

[65] Henderson & Jerry, *supra* note 8, at 182-183.

[66] *See e.g.*, Brief of MPIUA, *supra* note 55, at 16.

[67] Telephone Interview with Tim Wagner, Nebraska Insurance Commissioner and Director of the National Association of Insurance Commissioners Task Force on Climate Change (Oct. 19, 2005).

[68] *See* Henderson & Jerry, *supra* note 8, at 182.

a specified period of time before the rates become effective.[69] During this period, the state may disprove the rates.[70] Insurers frequently undergo time and resource intensive rate hearings before they may use any of their proposed rates. As a result, this approach provides the insurers with little incentive to use the most cutting edge technology to calculate more accurate price structures.

In contrast to the prior approval approach, some states use less onerous approaches. Under the "file-and-use" approach, the insurer uses the filed rate unless, and until, the insurance department takes steps to disapprove the rate within a specified time.[71] The "flex rating" approach is a hybrid of the "prior approval" and "file-and-use" approaches.[72] Here, insurers file and then use their rates, provided their rates are within a specified range. All rate changes outside the range must receive the department's prior approval.[73]

Finally, under the most lenient "open competition" approach, market forces set the rates, although the insurance department may intercede when appropriate.[74] Those who favor this approach reason that when insurers have the flexibility to set their own rates, their rates most accurately reflect risks, and thus insurers are less vulnerable to losses such as hurricanes. Although the open competition approach is clearly the minority approach in the United States, it has achieved significant popularity abroad.[75] For example, in the United Kingdom, the insurance industry freely sets its own rates as long as insurers are financially sound and do not violate antitrust laws.[76] Competition and the fear of bad publicity allegedly prevent the insurance industry from abusing the public.

The rate regulation approaches are not equally beneficial to society. Although insurers might prefer the least burdensome "open competition" approach,[77] the American public recognizes some regulation is necessary to effectuate social goals and prevent insurer abuses. Unfortunately, the most common prior-approval approach is overly onerous for insurers and also typically provides them with little incentive to adopt cutting edge technology, like forward-looking modeling. The best regulatory approaches are those that enable regulators to scrutinize rate filings without overly burdening insurers: the intermediate file-and-use and flex-rating approaches.

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[69] Jerry, *supra* note 12, at 87.

[70] *Id.*

[71] *Id*. at 87, 88.

[72] *Id.*

[73] *Id.*

[74] *See id.* at 87-88.

[75] *Id.*

[76] *Id.*

[77] *See id.* at 87-88.

III. RATE SETTING APPROACHES

Perhaps the single most potent way that rate regulation can contribute to a robust insurance industry is through rate setting. Rate setting approaches drastically affect the ability of the insurers to survive catastrophic hurricanes.

A. Traditional Approach

1. Overview

The "traditional approach" to rate setting leaves the insurance industry ill-equipped to handle catastrophic hurricanes. Under the traditional approach, regulators use historical data to evaluate the reasonableness of rates.[78] More specifically, the regulators determine what they consider to be reasonable rates for a given exposure by averaging annual statewide loss data over approximately twenty to thirty years.[79] Although the traditional approach may involve proprietary information, insurance regulators enjoy a sense of comfort and familiarity with the techniques under this approach and are reluctant to change.[80]

2. Problems

Due to its notorious inability to accurately predict hurricane losses, the traditional approach to rate setting is dangerously out of date and exposes insurers to unnecessary risks.[81] This became clear in August 1992 when Hurricane Andrew huffed and puffed and blew the U.S. property casualty insurance industry down, inflicting more than $15 billion in insurance losses.[82] Too late to protect themselves, insurers realized the traditional approach did not accurately predict losses:[83]

> [I]n 1992 the [Florida] Insurance Service Office calculated a catastrophe provision for Florida Homeowners which would have generated approximately $80 million in Florida catastrophe premium for the entire insurance industry annually. At that rate, it would have taken over 100 years to fund Andrew,

[78] AM. ACAD. OF ACTUARIES, PUBLIC POLICY MONOGRAPH: INSURANCE INDUSTRY CATASTROPHE MANAGEMENT PRACTICES 1 (June 2001), *available at* http://www.actuary.org/pdf/casualty/catmonograph_june01.pdf.

[79] FLA. INS. COUNCIL, COMPUTER MODELING OF CATASTROPHIC LOSSES 1 (1998), *reprinted in* 1998 CAS Ratemaking Seminar, CAT-10: Current Issues in Florida Property Insurance, at 38 (1998) *available at* http://www.casact.org/library/ratsem98/cat-10hl.pdf.

[80] *See* Charles C. Watson, Jr. et al., *Insurance Rate Filings and Hurricane Loss Estimation Models*, J. INS. REG., Spring 2004, at 22, 22, *available at* http://hurricane.methaz.org/papers/jir22nr3.pdf#search=%22modeling%20insurance%20rate%22.

[81] *See* AM. ACAD.OF ACTUARIES, *supra* note 78, at 1.

[82] Brief of MPIUA, *supra* note 55, at 12.

[83] Watson et al., *supra* note 80, n. 3, at 5.

assuming that no other storms occurred for a century![84]

The inaccuracies of the traditional approach to rate setting stemmed from the erroneous assumptions that: (1) losses from catastrophic activity in the 1990s would approximate average losses between the 1960s and 1980s; (2) population demographics were stable, and (3) construction practices and insurance coverage were not changing significantly.[85]

Hurricane Andrew proved all of these assumptions wrong and the resulting devastation swiftly manifested itself. First, insolvency swallowed numerous insurers. In Florida alone, at least seven major insurers became insolvent. [86] Additionally, financially impaired insurers in the coastal markets responded by increasing insurance rates, by not insuring certain risks, and by buying reinsurance to cover the risks they had accepted.[87]

The prevailing actuarial literature now acknowledges that the low frequency and high potential severity of hurricanes renders the traditional approach unsuitable for the rate setting process. Leading actuarial authors Michael Walters and Francois Morin assert that "(f)or these rare event calamities (like hurricanes), reliance on actual insured experience does not allow accurate measurement of future expected loss."[88] The American Academy of Actuaries stated "the shortcomings of using historical premium and loss experience with respect to catastrophes like hurricanes are clear."[89] Finally, the Actuarial Standard of Practice 39 affirmed, "the presence or absence of catastrophes in any historical data used to form the future cost estimates can create biases that diminish the appropriateness of using that data as the basis for future cost estimates."[90]

Another significant problem with the traditional approach that only recently came to light is its failure to focus on current climate trends. Sea surface temperatures in the Gulf of Mexico and Atlantic Ocean drive hurricane activity.[91] As temperatures in these waters now exceed historical averages, the risk of more devastating and more intense hurricanes also exceed the historical

[84] FLA. INS. COUNCIL, *supra* note 79, at 1.

[85] *Id.*

[86] ISO, *The Impact of Catastrophes on Property Insurance* (Executive Summary) (Jan. 1994), http://www.iso.com/studies_analyses/docs/study006.html.

[87] *Id.;* Brief of MPIUA, *supra* note 55, at 12.

[88] *Id.* (citing "Catastrophe Ratemaking Revisited, Use of Computer Models to Estimate Loss Costs," Tr. 12, at 1696-97 and Ex. 74, at 349).

[89] Brief of State Rating Bureau, at 15, *In re* Application of the Mass. Prop. Ins. Underwriting Ass'n for Approval of Gen. Rate Revision, No. R2005-14 (Mass. Div. of Ins. 2005) (citing "Catastrophe Ratemaking Revisited, Use of Computer Models to Estimate Loss Costs," Tr. 12, at 1698-99 and Ex. 76) [hereinafter "Brief of SRB"].

[90] *Id*.

[91] *See* Richard A. Kerr, *Is Katrina a Harbinger of Still More Powerful Hurricanes?*, 309 SCIENCE 1807, Sept. 16, 2005, *available at* http://www.sciencemag.org/cgi/reprint/309/5742/1807.pdf.

average.[92] While scientists accept that numerous factors could be contributing to the higher oceanic temperatures, they attribute ten to sixty percent of the increase to climate change.[93] Therefore, knowledge about climate change is crucial to predicting hurricane risks and preparing the insurance industry for the next Katrina.

B. Long-Term Modeling Approach

1. Overview

"The shortcomings of the traditional method are clear, and catastrophe modeling has been widely adopted in making rates for hurricane. . ."[94] To combat the inaccuracies of the historical approach, after Hurricane Andrew, insurers fortified their rate setting approaches with catastrophe ("CAT") models based on long-term average climatology.[95] The models draw from expertise in the fields of meteorology, statistics, finance, computer science, and engineering.[96] Specifically, the models consider current demographic data, construction practices, insurance coverage forms, and long-term weather information, compiled by the National Hurricane Center in its HURDAT database, including hurricane frequency, windfield generation and speed, to compute expected losses from extreme hurricane events.[97] Insurers use these expected losses internally to determine their rates and reinsurance purchases, and externally to set rates, if permitted by their state regulators.[98] By the time Katrina blew through in August 2005, many of the insurers most vulnerable to hurricanes had incorporated the long-term models into their rate calculations and were much better prepared for Katrina than they had been for Andrew. As a result of various factors, including the improved accuracy of rates, the insurers were able to achieve a profitable year.[99]

[92] P. J. Webster et al., *Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment*, 309 SCIENCE 1844 Sept. 16, 2005, *available at* http://www.sciencemag.org/cgi/reprint/309/5742/1844.pdf (showing that intensity of hurricanes has increased); Kerry Emanuel, *Increasing Destructiveness of Tropical Cyclones over the Past 30 Years*, 436 NATURE 686 (Aug. 2005), (showing that destructiveness of hurricanes has increased over last thirty years).

[93] Telephone Interview with Robert Muir-Wood, Ph.D., Chief Research Officer of Risk Management Solutions and Lead Author for (4th) 2007 Intergovernmental Panel on Climate Change Assessment Report, (Oct. 26, 2006).

[94] AM. ACAD.OF ACTUARIES, *supra* note 78, at 10.

[95] CLIMATE CHANGE FUTURES, *supra* note 7, at 92.

[96] Brief of SRB, *supra* note 90, at 15 (citing Karen Clark pre-filed direct testimony, Ex. 13 at 7:137-139).

[97] Mass. Prop. Ins. Underwriting Ass'n Rate Filings, No. R2005-14, at 20 (Mass. Div. Ins. June 30, 2006) (decision and order).

[98] Watson et al., *supra* note 80, n.3, at 5.

[99] Joseph B. Treaster, *Earnings for Insurers are Soaring*, N.Y. TIMES, Oct. 14, 2006, at

2. Problems

Although models based on long-term average climatology provide greater accuracy than the traditional approach and hence greater protection against insurance industry losses in the wake of calamitous hurricanes, they have several potential problems.

First, the long term models are still inaccurate. Although the models helped prepare the insurance industry for Hurricane Katrina, the $45 billion insured losses resulting from this hurricane still appreciably exceeded expectations.[100] More recently, much public attention has focused on the fact that hurricane models overestimated the number of hurricanes expected for 2006.[101] Most seasonal forecasters attribute the overestimate to the emergence of an El Nino event through September 2006.[102] While models represent merely best educated estimates,[103] the 2006 error ties into a more significant problem afflicting the long-term model. Like the traditional approach, the long-term average climatology approach looks backwards at historical data and ignores current climate trends. Consequently, the models ignore climate change and other factors which may be causing more devastating and intense hurricanes, as well as failing to consider fully the implications of El Nino events. The long-term model's failure to account for current trends, including climate change and El Nino events leaves insurers ill-prepared for hurricanes.

In addition to the long-term model's failure to account for climatic trends, some consumer advocates fear that insurance companies could use the proprietary nature of the models to raise rates unscrupulously.[104] Insurers often input extensive proprietary data, such as claims data, into the models.[105] The closed nature of these models could potentially impede regulators' ability to determine the reasonableness of the filed rates.[106]

Several factors, however, ameliorate the proprietary concern. First,

C1, *available at* http://www.nytimes.com/2006/10/14/business/14insure.html.

[100] Evan Mills & Eugene Lecomte, *From Risk to Opportunity: How Insurers Can Proactively and Profitably Manage Climate Change*, CERES Aug. 2006 at 4, *available at* http://www.ceres.org/pub/docs/Ceres_Insurance_Climate_%20Report_082206.pdf.

[101] Neil Johnson, *Hurricane Predictions Off Track as Tranquil Season Wafts Away*, TAMPA TRIBUNE, Nov. 27, 2006, *available at* http://www.tbo.com/news/metro/MGBHKNBE0VE.html.

[102] E-mail from Robert Muir-Wood, Ph.D., Chief Research Officer of Risk Management Solutions and Lead Author for (4th) 2007 Intergovernmental Panel on Climate Change Assessment Report, to author (Dec. 15, 2006) (on file with author).

[103] Watson et al., *supra* note 80, at 43.

[104] Brief of Att'y Gen., Mass. Prop. Ins. Underwriting Ass'n In Support of a Gen. Rate Revision to be Effective on and after Dec. 31, 2005, at 4, *In re* Application of the Mass. Prop. Ins. Underwriting Ass'n for Approval of a Gen. Rate Revision to be Effective on and after Dec. 31, 2005, No. R2005-14 (Mass. Dep't. Ins. 2005) [hereinafter "Brief of Att'y Gen."].

[105] Watson et al., *supra* note 80, at 39.

[106] *Id.* at 40.

insurers' use of reinsurance to protect their risk portfolios motivates them to keep their projected losses as accurate as possible. The higher the risks in an insurer's portfolio, the higher the price it must pay for reinsurance.[107] In addition, many states enacted Public Records Laws that govern how and when firms may withhold proprietary information from the public.[108] These laws frequently require modelers to share confidential information with members of the Insurance Commission and some consumer advocates. Florida imposes the most rigorous annual evaluation of models by experts. In recognition of this fact, several other states now begin their rate filing processes by considering whether Florida has already approved the model at issue.[109] Finally, even the traditional approach required a careful dance around proprietary information.

In addition to the proprietary concern, CAT models also contribute to over-dependence on residual market insurers. CAT modeling predicts losses for coastal properties that surpass the predictions developed under the traditional approach.[110] As a result, insurers want to buy reinsurance for these risks.[111] Unlike the heavily regulated insurance companies, however, reinsurers are essentially unregulated and do not hesitate to charge insurers premiums proportionate to the risks assumed.[112] Thus, when regulators prevent insurers from adopting accurate price structures for coastal flood insurance, insurers cannot afford to sell flood policies in coastal markets. Residual market insurers, who are the most heavily regulated, must then fill the void. Unfortunately, unless regulators allow residual market insurers to adopt accurate price structures, these insurers are vulnerable to hurricanes. This was especially true following Hurricane Katrina. Specifically, "[w]ith more claims in 2005 than in its entire 37-year history, the U.S. flood insurance program was bankrupted 10-times-over by Hurricane Katrina." [113] As explained previously in Section II, all homeowners in a state typically subsidize the residual market insurers.

The adoption of long-term average climatology modeling enables insurers to calculate more accurate price structures than previously possible under the traditional approach. Although insurers could conceivably use the proprietary nature of modeling to raise rates unscrupulously, insurers' need for reinsurance and public records laws protect the public against this possibility. In addition, while modeling may exacerbate the over-dependence of coastal dwellers on residual market insurers, regulators can easily fix this problem by allowing insurers to adopt more accurate price structures. Thus, the biggest problem

[107] *Id.* at 39.

[108] *Id.* at 42.

[109] *Id.*

[110] Brief of MPIUA, *supra* note 55, at 12.

[111] Wikipidea the Free Encyclopedia, *Reinsurance*, http://en.wikipedia.org/wiki/Reinsurance (last visited Dec. 15, 2006).

[112] Mills & Lecomte, *supra* note 100, at 4.

[113] *Id.* at 9.

with long-term average climatology models is their failure to acknowledge current climatic trends.

C. Forward-Looking Approach

1. Overview

A new technology is presently available that enables regulators to gird the insurance industry against more intense and more devastating hurricanes. A few years ago, Risk Management Solutions ("RMS"), a risk-modeling firm, realized that the historical average climatology model overlooked climatic trends, including warming ocean water.[114] As a result, in October 2005, just two months after Hurricane Katrina devastated the Gulf Coast, RMS developed a "forward-looking" CAT model, which it released in May of 2006.[115] RMS's updated CAT model replaces the previous model's long-term average perspective on hurricane activity with a five-year perspective.[116]

The "forward-looking" model provides a tool for dealing with the unpredictable, non-linear conundrum of climate change, which the previous models ignored. The model takes into account the fact that various forces, including climate change, have markedly heated oceanic temperatures above the ocean's long-term average temperature.[117] This fact is important because surface water temperatures of the Atlantic and Gulf drive hurricanes.[118] The warmer the temperature, the more intense and more devastating hurricanes one can expect.[119] The five-year perspective also enables insurers to allow for an average of one low activity El Nino year in the five-year period, like the low activity year in 2006. One principal reason RMS selected the five-year risk horizon was to accommodate this expected variability of El Nino. [120]

To date, RMS has not used the new model in a rate hearing.[121] RMS plans, however, to take the model to a hearing in Florida sometime between February

[114] RISK MGMT. SOL., U.S. AND CARIBBEAN HURRICANE ACTIVITY RATES: THE NEW RMS MEDIUM-TERM PERSPECTIVE & IMPLICATIONS FOR INDUSTRY LOSS 1 (March 2006), *available at* http://www.rms.com/Publications/60HUActivityRates_whitepaper.pdf.

[115] Beth Daley, *Homeowners May Feel Heat of Global Warming*, BOSTON GLOBE, Aug. 6, 2006, *available at* http://www.boston.com/news/local/articles/2006/08/06/homeowners_may_feel_heat_of_global_warming/.

[116] RISK MGMT. SOL., *supra* note 114, at 1.

[117] *Id.*

[118] *Id.*

[119] Emanuel, *supra* note 92; Kerr, *supra* note 91; Webster et al., *supra* note 92.

[120] E-mail from Robert Muir-Wood, Ph.D., Chief Research Officer of Risk Management Solutions and Lead Author for (4th) 2007 Intergovernmental Panel on Climate Change Assessment Report, to author (Dec. 15, 2006)(on file with author).

[121] Telephone Interview with Robert Muir-Wood, Ph.D., Chief Research Officer of Risk Management Solutions and Lead Author for (4th) 2007 Intergovernmental Panel on Climate Change Assessment Report, (Oct. 26, 2006).

and May of next year.[122] RMS is already laying the groundwork for the hearing. It has engaged in numerous discussions with Florida regulators and submitted its procedures, data, and results for publication in peer reviewed journals.[123]

2. Problems

Although the "forward-looking" approach demonstrates improved accuracy when compared to the long-term average approach, it does not solve all that ails the insurance industry. The "forward-looking" approach predicts that hurricane losses will exceed those predicted by the long-term average approach.[124] In fact, RMS says that if its model is adopted insurance loss estimates will increase by forty percent, on average, across the Gulf Coast, Florida and the Southeast, and by twenty-five to thirty percent in the Mid-Atlantic and Northeast coastal regions.[125] So long as regulators prevent insurers from adopting accurate price structures, increases in predicted losses will motivate insurers to exit the coastal market, leaving residual market insurers to fill the void. In addition, the complexity of the model invokes the proprietary argument of consumer advocates. Regulators, however, can easily reduce the proprietary concern for the same reasons they could reduce the concern with previous models: insurers' need for reinsurance and the prevalence of public record laws, among other reasons.

Forward-looking models thus enable the insurance industry to progress towards calculating more accurate price structures, because they incorporate current climatic trends, including climate change and El Nino variability, into loss predictions.[126] Unfortunately, unless regulators address the proprietary concern and allow insurers to adopt more accurate price structures, insurers will never optimally utilize the forward-looking model.

IV. THE MPIUA CONTROVERSY

To fully gird the insurance industry against the next Katrina, state regulators must grapple individually with the barriers to modeling. A case study of the June 30, 2006 Massachusetts Decision is helpful for illustrating how state regulators can successfully address these issues. Although this hearing involved only the long-term average climatology model,[127] because the insurer filed its rates before the development of the forward-looking model, the

[122] *Id.*

[123] *Id.*

[124] Environment News Service, *Insurance Risk Models Rise with Elevated Storm Frequency, Severity*, Apr. 13, 2006, http://www.ens-newswire.com/ens/apr2006/2006-04-13-05.asp.

[125] *Id.*

[126] RISK MGMT. SOL, *supra* note 114, at 1.

[127] *See* Mass. Prop. Ins. Underwriting Ass'n Rate Filings, No. R2005-14, at 20 (Mass. Div. Ins. June 30, 2006) (decision and order).

arguments made against that model are representative of those arguments that may hinder the progression towards forward-looking modeling.

A. Introduction

On June 30, 2006, the Massachusetts' Insurance Commissioner made two bold holdings concerning modeling and statutory caps in her "Decision and Order on Massachusetts Property Insurance Underwriting Association Rate Filings R2005-14."[128] First, she directly approved the request of a residual market insurer, the Massachusetts Property Insurance Underwriting Association ("MPIUA"), to use models of long-term average climatology to set its rates.[129] She justified her approval based on the explanation that both the public record laws and insurers' need for reinsurance prevent insurers from using models to raise rates unscrupulously.[130] Second, and just as significantly, the Commissioner interpreted a 2004 legislative amendment to Massachusetts' General Laws as exempting the MPIUA from a statutory cap on rate increases for predicted hurricane losses and catastrophic reinsurance costs.[131] Prior to this amendment, a statutory cap prohibited the MPIUA from increasing its rates in 2006 more than 5.9% in certain territories.[132]

Three parties submitted briefs in the proceeding: the MPIUA, the State Attorney General ("AG"), and the State Rating Bureau ("SRB").[133] The MPIUA argued that modeling was an acceptable means of setting rates[134] and that the legislature removed its statutory cap on rate increases to allow the MPIUA to adopt more accurate price structures.[135] The Attorney General ("AG"), a statutory intervenor in the proceeding and strong proponent of lowering insurance rates,[136] disagreed with both of the MPIUA's arguments, insisting that the MPIUA should base its rates on the traditional approach, not modeling, and that the legislature did not eliminate the MPIUA's statutory cap.[137] The State Rating Bureau ("SRB"), a statistical arm of the Division of Insurance and a Consumer Advocate in rate hearings in Massachusetts, agreed with the MPIUA that modeling was an acceptable method of calculating rates,[138] but stayed neutral on whether the legislature removed the MPIUA's statutory cap.[139]

[128] *See id.* at 18, 21.

[129] *Id.* at 21.

[130] *Id.* at 22.

[131] *Id.* at 18.

[132] *Id.* at 6, 18.

[133] *Id.* at 1, 2.

[134] *Id.* at 19.

[135] *Id.* at 14.

[136] *Id.* at 1.

[137] *Id.* at 14, 20.

[138] Brief of SRB, *supra* note 14.

[139] Mass. Prop. Ins. Underwriting Ass'n Rate Filings, No. R2005-14, at 14 (Mass. Div.

B. Background

One must put the above decision in context to fully appreciate its significance. To do so, this paper first describes the authority of the Insurance Commissioner in the hearing. Next, the paper provides an overview of rate regulation in Massachusetts. Finally, this paper flushes out the primary concerns of the actors in the proceeding.

1. Authority of Insurance Commissioner

In the MPIUA hearing, the Commissioner's sole authority was to approve or disapprove rates.[140] She could not substitute the proffered rates with alternative methodologies or results offered by the intervenors.[141] Rather, she had the authority to advise the filing party of the provisions she would find reasonable and allow the party to submit a revised filing.[142] Massachusetts' statutes restrict the discretion of the Insurance Commissioner through two means. First, the statutes create statutory caps.[143] For example, in territories where the MPIUA holds a large share of the market ("large share territories"), a quantitative formula effectively places a 5.9% cap on the 2006 MPIUA rate increases.[144]

Second, Massachusetts' statutes prohibit rates that are "excessive, inadequate or unfairly discriminatory."[145] An insurer's rates are not "excessive" if they fall within a range of reasonableness.[146] For example, a rate requested by the MPIUA is within the range of reasonableness if it makes basic property insurance available at reasonable cost to eligible applicants in large share territories. To fulfill the adequacy requirement, an insurer's rates must produce sufficient revenue to pay losses and allow a reasonable profit.[147] This requirement enables regulators to guard against insurer insolvency. The final requirement that premium charges be nondiscriminatory for different classes of risks means that insurers must equitably adjust and proportion premiums among the classes of risk according to the losses that insurers reasonably anticipate for the risk. To illustrate, insurers may not use premiums for fire to subsidize their coverage of flood losses.

Thus, while the Insurance Commissioner in Massachusetts makes the ultimate determination regarding the acceptability of rate filings, her discretion is constrained by the State Legislature. She must approve any rates that do not exceed statutory caps and are not excessive, inadequate or unfairly

Ins. June 30, 2006) (decision and order),.

[140] *Id.* at 13.

[141] *Id.*

[142] *Id.*

[143] *See* MASS. GEN. LAWS ch. 175C, § 5(c)(2).

[144] Mass. Prop. Ins. Underwriting Ass'n Rate Filings, No. R2005-14, at 13.

[145] *Id.* at 5.

[146] *Id.* at 10.

[147] Century Cab Inc. v. Comm;r of Ins., 327 Mass. 652, 663 (1951).

discriminatory.

2. Massachusetts Rate Regulation

The MPIUA case study not only exemplifies the role insurance regulators play in rate proceedings but also illustrates how states often regulate residual market insurers differently than voluntary insurers. In Massachusetts, the Division of Insurance regulates the MPIUA much more strenuously than voluntary insurers because the voluntary market is, in theory, more competitive than the residual market.[148]

The first major disparity between regulation of the MPIUA and voluntary insurers is the approach to rate filings. Massachusetts uses the burdensome "prior approval" approach with the MPIUA.[149] Specifically, the MPIUA's residual market rates are "subject to the prior approval of the Commissioner, after proper notice and hearing, subject to the adjudicatory procedures of chapter 30A" and may not be deemed approved.[150] In contrast, Massachusetts takes the less onerous file-and-use approach with its voluntary insurers.[151] Consequently, voluntary market rates are "deemed approved" by the Commissioner if the Commissioner has not disproved them within a state period after filing.[152] Once a filing is "deemed approved," the Commissioner may revoke the approval only after conducting a hearing and making an affirmative finding that a particular filing does not comply with the law.[153]

Another important distinction between rate regulation of the MPIUA and voluntary insurers is related to the statutory cap on the MPIUA.[154] Massachusetts capped the MPIUA's rates relative to statewide voluntary market rates, rather than coastal voluntary market rates.[155] This means the MPIUA's rates for coastal properties were generally required to be lower than the coastal market rates.[156] Not surprisingly, dependence on the MPIUA developed rapidly because voluntary insurers could not compete with the MPIUA's below market premiums.[157] In fact, while the number of MPIUA policies on Cape Cod and Massachusetts' Islands increased by 237% between December 2003 and June 2005, policies in the remaining areas of the state only increased by 30%.[158] As of December 2004, the MPIUA's total number of

[148] Brief of SRB, *supra* note 90, at 5.

[149] MASS. GEN. LAWS ch. 175C, § 5 (2007).

[150] *Id.*

[151] MASS. GEN. LAWS ch. 174A, § 6(a) (2007); MASS. GEN. LAWS ch. 175A, § 6(a) (2007).

[152] *Id.*

[153] MASS. GEN. LAWS ch. 174A, § 7 (2007); MASS. GEN. LAWS ch. 175A, § 7 (2007).

[154] *See* Brief of MPIUA, *supra* note 55, at 14.

[155] *Id.*

[156] *Id.*

[157] *Id.*

[158] MASS. OFFICE OF COASTAL ZONE MGMT, COASTAL HAZARDS COMM. DRAFT

policies on Cape Cod and the Islands was 27,000.[159] To put this number in context, the ten largest voluntary insurers in the same areas wrote only 38,000 policies.[160]

In brief, Massachusetts regulates the MPIUA more stringently than voluntary insurers. As a result, the MPIUA must frequently undergo burdensome evidentiary hearings in compliance with the "prior approval" approach to rate regulation before its rates may take effect.[161] Another consequence of stricter regulation of the MPIUA is that the MPIUA cannot adopt accurate price structures for coastal property casualty insurance, so homeowners prefer the MPIUA to voluntary insurers.[162]

3. Actors

The arguments concerning rate regulation of the MPIUA are representative of future arguments for and against forward-looking modeling. To understand the arguments made by the four primary actors in the MPIUA proceeding—the MPIUA, the Insurance Commissioner, the AG, and the SRB—one must understand the parties' backgrounds.

The MPIUA, the first major party in the proceeding, was the petitioner in the hearing. As previously mentioned, the MPIUA is a residual market insurer that provides coverage to property owners who cannot obtain it in the voluntary insurance market.[163] The MPIUA had used models to develop its 2006 rates and wanted the Insurance Commissioner to approve its methodologies.[164] Based on the models, it wanted to raise its rates 12.5% for homeowner multi-peril insurance and 6.4% for dwelling fire and extended coverage.[165] Both of these rate increases exceeded the 5.9% statutory cap in certain territories. The MPIUA believed the legislature removed the statutory cap in recognition of the over-dependence on the MPIUA by coastal homeowners.[166]

Another major party in the debate was the Insurance Commissioner. Julianne Bowler received her first appointment to the Insurance

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RECOMMENDATIONS (Aug. 9, 2006), *available at* http://www.mass.gov/czm/chc/recommendations/recommendations.htm.

[159] Brief of MPIUA, *supra* note 55, at 13 (citing Tr. 869/10-18, 883/3-884/1 (Golembeski, President of MPIUA)).

[160] Brief of MPIUA, *supra* note 55, at 13.

[161] *Id.*

[162] *See id.* at 14.

[163] Hudson v. Mass. Prop. Ins. Underwriting Ass'n, 386 Mass. 450, 452-54 (1982) (reviewing the history of the MPIUA).

[164] Mass. Prop. Ins. Underwriting Ass'n Rate Filings, No. R2005-14, at 20 (Mass. Div. Ins. June 30, 2006) (decision and order).

[165] *Id.* at 1.

[166] Brief of MPIUA, *supra* note 55, at 18.

Commissioner's office in 2002.[167] Soon after, she adopted a policy to maintain a "healthy insurance industry."[168] She saw retention and attraction of insurers as one of the primary functions of an Insurance Commissioner, because the robustness of the insurance industry contributes to the long-term welfare of the insureds.[169] Bowler's concern for a robust insurance industry translated into a concern about coastal homeowners' over-dependence on the MPIUA.

Unlike the appointed Insurance Commissioner, A.G. Tom Reilly, another major party in the proceeding, acquired his position through the electoral process.[170] Interestingly, during the MPIUA proceeding, the A.G. was running for another office: Governor.[171] Reducing insurance rates was one of his main campaign platforms.[172] Consistent with his goal of reducing rates, shortly after filing his brief in the MPIUA proceeding, he stated "[w]e must do everything we can to keep costs down for homeowners."[173]

The A.G. statutorily intervened in the MPIUA hearing[174] to oppose the MPIUA's rate filing.[175] The A.G. argued that the MPIUA should use the traditional approach in setting its rates, rather than modeling.[176] The A.G. further argued that the 2004 legislative amendment did not eliminate the statutory cap on the MPIUA's rates.[177] Even if it did raise the cap, the A.G. asserted that the MPIUA's requested rate increases were inconsistent with the MPIUA's purpose of providing property insurance to homeowners at reasonable cost.[178] The A.G. proposed that the MPIUA should only raise its rates 1.2% for Cape Cod homeowners and should make hefty rate decreases in

[167] Andrew G. Simpson, Jr., *The Hidden Power Behind the Massachusetts Makeover*, INSURANCE JOURNAL, Nov. 8, 2004, *available at* http://www.insurancejournal.com/magazines/east/2004/11/08/coverstory/49214.htm.

[168] *Id.*

[169] *Id.*

[170] The Office of the Mass. Att'y Gen. Tom Reilly, *About Tom Reilly*, http://www.ago.state.ma.us/sp.cfm?pageid=873 (last visited Dec. 15, 2006).

[171] Wikipidea the Free Encyclopedia, *Massachusetts Gubernatorial Election, 2006*, http://en.wikipedia.org/wiki/Massachusetts_gubernatorial_election,_2006 (stating that Attorney General Thomas Reilly lost his campaign for Governor of Massachusetts in the primary election) (last visited Dec. 15, 2006).

[172] *See* CBS4 Website, *AG Reilly: Cut Auto Insurance Rates 18 Percent,* Sept. 29, 2005, *available at* http://cbs4boston.com/traffic/local_story_272085834.html.

[173] The Office of the Mass. Att'y Gen. Tom Reilly, *AG Reilly Calls for Lower Home Insurance Rates*, May 8, 2006, http://www.ago.state.ma.us/sp.cfm?pageid=986&id=1665 (last visited Dec. 15, 2006).

[174] MPIUA Decision and Order, No. R2005-14, at 1 (Mass. Div. Ins. June 30, 2006) [hereinafter Office of Tom Reilly, *Home Insurance Rates*].

[175] *See id.* at 13-14, 20.

[176] *Id.* at 20.

[177] *Id.* at 14.

[178] *Id.*

many urban communities.[179]

Finally, the last major party in the proceeding was the State Rating Bureau ("SRB"). As the statistical arm of the Division of Insurance,[180] the SRB serves as a consumer representative in hearings on the appropriateness of all filed insurance rates in Massachusetts.[181] Consumer advocates like the SRB tend to support defensible rate increases in order to keep rates affordable and coverage available.[182] Because modeling more accurately predicts losses than the traditional approach, the SRB supported the approval of modeling.[183] The SRB, however, disagreed with some of the MPIUA's methodologies in calculating its rates.[184] The SRB took no official position on whether the legislative amendment removed the statutory cap on the MPIUA rates.[185]

The four major participants in the MPIUA proceeding had diverging agendas. The MPIUA wanted to alleviate coastal homeowners' over-dependence upon them by adopting more accurate modeling-based price structures.[186] The appointed Insurance Commissioner's focus was on encouraging a robust insurance industry for the long-term benefit of consumers.[187] In contrast, the elected A.G. wanted to lower rates for the short-term benefit of consumers.[188] Finally, the SRB favored defensible rate increases that kept premiums affordable and available.[189]

C. Legal Issues

The arguments made by the four main participants in the MPIUA proceeding revolved around two major legal issues. First, should the Insurance Commissioner approve the use of CAT models in the rate setting process?[190] Second, did the legislature amend the Massachusetts General Laws to exempt

[179] The Office of the Mass. Att'y Gen. Tom Reilly, *AG Reilly Calls for Lower Home Insurance Rates*, May 8, 2006, http://www.ago.state.ma.us/sp.cfm?pageid=986&id=1665.

[180] Associated Press, *AG Rating Bureau Submit Steep Cuts in Auto Insurance*, BOSTON HERALD, Sept. 28, 2006, *available at* http://news.bostonherald.com/localRegional/view.bg?articleid=159702.

[181] Office of Consumer Affairs & Business Regulation Website, *State Rating Bureau*, http://www.mass.gov/?pageID=ocamodulechunk&L=4&L0=Home&L1=Government&L2=Our+Agencies+and+Divisions&L3=Division+of+Insurance&sid=Eoca&b=terminalcontent&f=doi_StateRatingBureau&csid=Eoca.

[182] Henderson & Jerry, *supra* note 8, at 178-79.

[183] MPIUA Decision and Order, No. R2005-14, at 19 (Mass. Div. Ins. June 30, 2006).

[184] *Id.*

[185] *Id.* at 14.

[186] Brief of MPIUA, *supra* note 55, at 35.

[187] Andrew G. Simpson, *supra* note 167. http://www.insurancejournal.com/magazines/east/2004/11/08/coverstory/49214.htm.

[188] Office of Tom Reilly, *Home Insurance Rates*, *supra* note 173.

[189] Henderson & Jerry, *supra* note 8, at 178-79.

[190] *Id.* at 20.

the MPIUA from a statutory cap on its rates?[191]

The MPIUA developed its rates using long-term average climatology models of two leading modeling firms, Applied Insurance Research Worldwide (AIR) and RMS, because the MPIUA recognized that use of models was widespread throughout the insurance industry.[192] The SRB assertively pointed out that modeling advanced the ability of insurers to predict their losses and prepare for catastrophes. [193] The SRB, however, criticized a few specific methodologies used to develop the MPIUA's rates. [194]

The A.G. opposed the MPIUA's request to base its proposed hurricane loss load on model results, rather than historical data. The A.G. first raised a proprietary argument, arguing that the record was insufficient to allow a reasonable analysis of the models.[195] He asserted that the testimony of the MPIUA's witnesses neither addressed how the models were developed nor provided sufficient data to test their performance.[196] In addition, he claimed that the MPIUA failed to disclose its models fully to all parties for review and evaluation, as obligated under Massachusetts law.[197] For example, he alleged that the MPIUA neither provided its models in response to discovery requests nor permitted them to be placed on the public record.[198]

The A.G. also questioned the accuracy of the models. He suspected the MPIUA used its models to raise rates excessively, so it could "create a windfall for the MPIUA and [the voluntary] insurers who run it, including those carriers who have abandoned coastal communities. . ."[199] To support this argument, he pointed to the fact that the AIR's model rates would be 400% higher than under the traditional approach, and those suggested by the RMS model would be 900% higher.[200] How could the models be accurate if they not only departed significantly from the traditional approach, but also differed by a factor of more than two?

The Commissioner swiftly addressed the A.G.'s proprietary argument.[201] She explained that throughout the proceeding, the parties protected the confidentiality of documents and exhibits by responding to certain discovery requests under the terms of a confidentiality agreement among them.[202] Under

[191] *Id.* at 13.

[192] Brief for MPIUA, *supra* note 55, at 33, 35.

[193] Brief of SRB, *supra* note 90, at 16.

[194] MPIUA Decision and Order, No. R2005-14, at 21, 24 (Mass. Div. Ins. June 30, 2006).

[195] *Id.* at 20.

[196] *Id.*

[197] *Id.*

[198] *Id.*

[199] Brief of Att'y Gen., *supra* note 104 at 3.

[200] *Id.* at 17.

[201] MPIUA Decision and Order, No. R2005-14, at n. 20 .

[202] *Id.* at 20.

Massachusetts' Public Record Laws, the holder of a trade secret (or commercial or financial information) does not need to disclose it to the public if he voluntarily provided the trade secret to a government entity "for use in developing government policy . . . upon an assurance of confidentiality" and "the information [was] not submitted by law," nor "submitted as a condition of receiving a governmental benefit."[203] In accordance with this Public Record Law, the modelers let the Insurance Commissioner and the SRB review their proprietary information, and exposed their non-proprietary methodologies to the public eye.

Commissioner Bowler next turned to the A.G.'s claim that insurers could manipulate the models.[204] She stressed that Hurricane Andrew raised insurer awareness that the traditional approach gravely underestimated insurance losses.[205] She recognized that after Andrew, using modeling to estimate hurricane losses became widespread amongst insurers in both the voluntary and residual markets, because it was more accurate than the traditional approach.[206] In particular, she noted that "insurers extensively use models to develop rate filing. . ."[207] The Insurance Commissioner then outlined how economic considerations motivate hurricane modelers to make their models as accurate as possible:

> . . . [s]ellers of reinsurance will rely on the models only if they are convinced that the models' predictions are not understated; otherwise they will not charge enough for the reinsurance. Primary insurers, the potential buyers of reinsurance, on the other hand, will use the models only if they believe that their predictions are not overstated; otherwise they will keep excessive reserves or pay too much for reinsurance. [208]

Hence, she concluded that insurers will not use their models to over-inflate rates as long as they must use the same models to buy reinsurance.[209] The Commissioner was "persuaded that it is appropriate to use mathematical models to develop rates, but that there is no single preferred approach to doing so."[210] The Commissioner approved the MPIUA's usage of modeling in the rate setting process because both herself and the SRB had scrutinized the

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[203] WILLIAM FRANCIS GALVIN, SEC'Y OF DIV. OF PUBLIC RECORDS, A GUIDE TO THE MASSACHUSETTS PUBLIC RECORD LAW 14, Sept. 2006, *available at* http://www.sec.state.ma.us/pre/prepdf/guide.pdf.

[204] MPIUA Decision and Order, No. R2005-14, at 21 (Mass. Div. Ins. June 30, 2006).

[205] *Id.*

[206] *Id.*

[207] *Id.*

[208] *Id.* at 22.

[209] *See id.*

[210] *Id.* at 21.

models in accordance with the State Public Record Law, the MPIUA's use conformed with the insurance industry's frequent use of models in rate filings, and the MPIUA's need for reinsurance gave it economic incentives to make its models as accurate as possible.

The second novel legal issue the Commissioner addressed was how legislation enacted in 2004 affected a statutory cap on the MPIUA's rates. The Insurance Commissioner agreed with the MPIUA that the legislation removed the cap on the MPIUA's rates with respect to predicted hurricane losses and the cost of catastrophic reinsurance.[211] As a result of her decision, the MPIUA can now adopt more accurate price structures to gird against future hurricanes.

After approving the MPIUA's models and granting it relief from the statutory cap, the Commissioner turned to a discussion of less fundamental issues. She identified a few minor changes the MPIUA should make to its rate filing before she would approve it.[212] The MPIUA resubmitted its revised rate requests, and Commissioner Bowler approved them on August 12, 2006 to take effect on October 1, 2006.[213]

V. LESSONS LEARNED

The MPIUA hearing illustrated how one insurance commissioner addressed the primary arguments hindering the acceptance of CAT modeling. Similar arguments must be confronted to achieve the much needed modernization of the rate setting process through the adoption of "forward-looking" loss projections. Fortunately, the time is ripe for state legislatures, insurance commissioners, and the NAIC to take proactive measures to progress with forward-looking insurance models.

A. State Legislatures

State domination over the insurance industry developed so that states could protect the public from insurer abuses and encourage a robust insurance industry.[214] Because forward-looking modeling and accurate price structures are compatible with both of these aims, state legislatures should encourage their extensive use.

First, the legislatures can provide insurance regulators with the tools to address the proprietary concerns about models. Legislatures could require that insurers make their models more accessible to the public and/or state regulators. For example, in the MPIUA hearing, public records laws enabled the SRB and Insurance Commissioner to access and probe the models, including the MPIUA's proprietary information. Alternatively, the legislatures

[211] *Id.* at 13.

[212] *Id.* at 34.

[213] *Mass. FAIR Plan Rate Increases Approved to Start Oct. 1*, INSURANCE JOURNAL, EAST, Aug. 14, 2006, *available at* http://www.insurancejournal.com/news/east/2006/08/14/71415.htm.

[214] Henderson & Jerry, *supra* note 8, at 174-75.

could follow Florida's lead by creating an independent "modeling board" inside each state insurance commission to review models.

Second, the legislatures should create a more favorable environment for cutting edge technology, like the forward-looking model, by replacing the "prior approval" approach to rate regulation with the "file-and-use" approach. The most common and most burdensome "prior approval" approach stifles technological innovation, because it takes longer for insurers to win approval of rates set with a new technology than under the "file-and-use" approach. The "file-and-use" approach is less burdensome, more conducive to technological innovation while still providing regulators with the authority to closely scrutinize insurers' rates. As such the "file-and-use" approach should become the norm.

Third, state legislatures should leave adequate flexibility in statutes to ensure that insurers can adopt accurate prices necessary to maintain their stability. Some rate regulation is necessary to prevent insurers from manipulating models with the sole purpose of lining their own pockets. Inflexible limits on rate increases, however, render voluntary insurers susceptible to insolvency and create over-dependence on residual market insurers. These residual insurers are supposed to be insurers of last resort and not of first resort, which the MPIUA became for coastal dwellers in Massachusetts. Over-dependence on residual market insurers by coastal homeowners means that all homeowners must subsidize the coastal homes. Fortunately, the Massachusetts legislature took action to combat this problem by amending its statute to enable the MPIUA to adopt more accurate price structures. Massachusetts' action provides a model of leadership for the rest of the states.

Fourth, state legislatures that allow for the election of insurance commissioners should consider switching to an appointment system if their commissioners likely are not focusing on the long-term welfare of the public. Unlike elected officials, appointed officials hold enough political insulation to effectuate beneficial rate setting changes without jeopardizing their careers. By supporting a robust insurance industry, they provide long-term benefits to the consumers in the form of enhanced competition amongst insurers. Massachusetts illustrates the benefits of appointing insurance commissioners. Here, the appointed Insurance Commissioner championed a robust insurance industry by approving the use of models. In stark contrast, the elected Attorney General argued for continuance of the inaccurate, obsolete traditional approach to rate setting, chiefly because it predicted lower loss rates, and thus lower rates for consumers.

B. Insurance Commissioners

Insurance Commissioners have considerable discretion over which rates they approve, and should use this power wisely, as Commissioner Bowley did in the MPIUA hearing. First, they should realize that the vitality of the insurance industry depends on the ability of insurers to forecast their potential

losses accurately. Although forward-looking models do not purport to know exactly when the next hurricane will strike, they are actuarially sound and develop more accurate predictions of hurricane losses than previously possible. Therefore, insurance regulators who accept rates based on these models would make rate setting more robust and accurate, and thus would protect the insurance industry from insolvency when, inevitably, the next big hurricane strikes.

Second, insurance commissioners should be informed about how the models work, because regulators who understand the models can prevent insurers from manipulating their numbers. The simplest, and probably most effective, way insurance regulators can ensure adequate but not excessive rates would be to require insurers to prove that they use the same data set to support their rate filings as to buy reinsurance. As the Commissioner pointed out in the MPIUA hearing, insurers will not use their models to raise rates unscrupulously so long as they use the same models to buy reinsurance. Public records laws in most states already require insurers to reveal this information to the insurance regulators upon request.

Finally, the commissioners should realize that they have the power to rectify any deviations between expected losses and actual losses when they review the following year's rates. Insurance regulators can require that insurers lower their rates if actual hurricane losses in a given year are significantly less than predicted losses, as happened in 2006. This adjustment would conform to the legislative mandate to ensure that rates are reasonable. For example, Massachusetts requires that the Insurance Commissioner approve any rates are not excessive, inadequate or unfairly discriminatory.[215]

C. NAIC

Although Massachusetts' Insurance Commissioner was well-informed about modeling, other insurance commissioners may benefit from outside assistance. The NAIC is uniquely situated to help the state insurance regulators and legislatures apply forward-looking modeling. The NAIC has long held an influential role in the insurance industry and, if the movement towards more federal regulation takes flight, its ability to modernize the industry will only increase.

First, the NAIC can help the insurance industry prepare for the increasing devastation that global warming will bring by informing regulators about the benefits of forward-looking modeling. For example, it could create a dual program to educate insurance commissioners about the importance of forward-looking modeling and fund rate-proceeding interventions state-by-state to advocate for these models.[216] The NAIC already knows how to increase insurance regulator awareness about modeling. In fact, in January 2001, it

[215] *Id.* at 5.

[216] This idea was inspired by Ruth Bell, the Director of the International Institutional Development and Environmental Assistance program at Resources for the Future.

published the "Catastrophe Computer Modeling Handbook" to guide insurance regulators in evaluating models in the rate setting process.[217] The NAIC could educate regulators about forward-looking modeling by updating its handbook. Alternatively, the NAIC's Task Force on Climate Change could further its mission of preparing insurance regulators for climate change by incorporating forward-looking modeling into its program.

Second, the NAIC could encourage state legislatures to adopt more accurate price structures by promulgating model laws and regulations as guidance. For example, it could promulgate a model regulation that adopts the file-and-use approach to rate regulation. Alternatively, it could promulgate model regulations for public record laws that allow insurers to expose their models to the insurance commission, while safeguarding their proprietary information from competitors.

VI. CONCLUSION

As we have seen, the historical approach to rate setting is dangerously out of sync with current hurricane predictions.[218] This imperils the financial stability of the insurance industry as global warming increases the frequency and devastation of hurricanes. In accepting the long-term average climatology model, Massachusetts acknowledged that the rate setting process needs to evolve. The rest of the states should follow suit. The proprietary nature of models challenges regulators to find mechanisms to scrutinize forward-looking models to ensure that they are not used to raise rates unscrupulously. Fortunately, various mechanisms already exist to keep the insurers in check, including public record laws and the insurers' need for reinsurance.

"Forward-looking" models provide insurers with the opportunity to go one step further in developing more accurate projections of their risks. This approach enables insurers not only to brace themselves against destructive hurricanes but also against the inevitable reality of climate change. By encouraging insurers to use "forward-looking" loss projections to support their rates, state insurance regulators can prevent the next Katrina from pushing voluntary insurers into insolvency. Further, by allowing insurers to adopt more accurate rates, homeowners will internalize the costs of living along the coast, so over-dependence on government residual market insurers will decline and people will be less likely to settle in environmentally sensitive areas. Just as we carry umbrellas when we hear thunder, insurers and their regulators should prepare for climate change with the most accurate, forward-looking hurricane models.

[217] AM. ACAD.OF ACTUARIES, *supra* note 78, at 10.

[218] FLA. INS. COUNCIL, *supra* note 79, at 1.