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# Commercial Wind Insurance in the Gulf States

## Developments Since Hurricane Katrina and Challenges Moving Forward

Lloyd Dixon, James W. Macdonald, and Julie Zissimopoulos<sup>1,2</sup>

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Following the devastating hurricane seasons of 2004 and 2005, indications of dramatic changes in the market for commercial property insurance began to appear in the Gulf States.<sup>3</sup> Reports arose of skyrocketing insurance prices and difficulties finding adequate coverage for commercial property in areas subject to damage from windstorms. These changes in the cost and availability of commercial property insurance did not receive the same widespread attention that policymakers and the media gave to disruptions in the residential property insurance market. Nevertheless, they had and continue to have crucial ramifications for the region's economic recovery and ongoing economic vitality.

With the 2007 hurricane season here, it is essential to assess how the insurance system for commercial wind risk performed in the wake of the recent hurricanes, and to determine what, if any, changes are warranted in government programs and regulations related to insuring wind risk. This paper helps meet these needs by first providing an overview of the 2005 hurricane season's impact on the commercial insurance market in the Gulf States and the outlook for the future. It also proposes three basic goals for a wind risk insurance system and examines some of the challenges in achieving these goals. Finally, it identi-

fies areas in which further research and analysis would inform the debate on what changes in government programs and policies are desirable.

### Conditions in Commercial Insurance Markets Since 2005

In assessing the commercial insurance market in the Gulf States, we addressed several key questions:

- What happened to the price and availability of commercial insurance after the 2005 hurricane season?
- Where were changes in market conditions the most pronounced?
- What precipitated the changes in market conditions?
- What were the economic impacts of higher insurance prices and reduced availability?
- How long will the market changes last?

Our findings are based on publicly available reports and on 69 interviews with various stakeholders: commercial policyholders, insurance agents and brokers, insurers and reinsurers, commercial lenders, firms that model wind and other losses for the insurance industry, and firms that provide credit ratings for insurers and other firms.<sup>4</sup> The policyholders we interviewed tended to be owners of shopping malls, shopping centers, and commercial office buildings, and a large proportion of the properties were in the Gulf States, particularly Florida. The firms interviewed tended to be large in size, although some small and medium-sized firms are also represented in the sample. Initial interviews were conducted in late August and early September 2006, and we followed up outstanding issues with some interviewees in subsequent months, the last interviews being completed in April 2007. The interviews were confidential, and nearly all of them were by phone.

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<sup>3</sup> The Gulf States are Florida, Alabama, Mississippi, Louisiana, and Texas.

<sup>4</sup> The number of interviews breaks down by stakeholder group as follows: 24 commercial policyholders, 16 insurance agents and brokers, 13 insurers, five reinsurers, seven commercial lenders, three modeling firms, and one rating agency.

## What Happened to the Price and Availability of Commercial Insurance After the 2005 Hurricane Season?

During the first three quarters of 2006, the cost of insurance for commercial property increased dramatically, and coverage became less available in areas most exposed to substantial wind risk.<sup>5</sup> The Council of Insurance Agents and Brokers (CIAB) reported far higher premium increases for commercial property insurance in the Southeast than in other areas of the country in both the second and the third quarter of 2006 (CIAB, 2006a, 2006b). Aon, a large insurance broker, found that among its clients in the real estate industry with catastrophic risk exposure,<sup>6</sup> premiums increased 80 percent on average from August 2005 to July 2006. Moreover, while coverage limits for overall policies rose slightly, coverage limits for losses caused by wind fell by approximately 30 percent on average from August 2005 to July 2006 (Mortgage Bankers Association, 2006, p. 23).<sup>7</sup>

The situation appeared to stabilize in the last quarter of 2006. Based on evidence that prices for coverage in coastal areas had leveled off in the fourth quarter, CIAB concluded that although insurance coverage for coastal properties was expensive and still hard to find, the worst price increases and capacity shortages might be over (CIAB, 2007a). Coverage for coastal areas remained expensive and hard to find during the first quarter of 2007, but CIAB saw the situation as being no worse than that of the preceding quarter (CIAB, 2007b).

In the hardest-hit areas, availability of insurance was at least as great a problem as price. A mid-2006 survey of buyers of commercial insurance in Florida received 1,914 responses, mostly from smaller, regional firms (Florida Office of Insurance Regulation, 2006).<sup>8</sup> The survey painted a stark picture:

- 17 percent reported that they were unable to find insurance at any price.
- 39 percent reported that they could only find insurance at prices they considered “unreasonable.”
- 25 percent reported inadequate policy limits or increases in their deductibles.
- 19 percent reported that they were able to obtain coverage at “reasonable” prices.

An especially notable finding of the survey was that 29 percent of the 529 businesses providing information on premium changes reported increases of over 200 percent, and another 9 percent reported increases of between 101 and 200 percent.<sup>9</sup>

The experiences of those we interviewed were consistent with the findings discussed above. A substantial proportion of interviewees reported premiums up by 100 percent or more following the 2005 hurricane season, and many had their coverage limits decline by over 33 percent.<sup>10</sup> Increases in the deductible from 2 percent of the policy limit to 5 percent of the policy limit were also frequently reported, and some policies included “named-storm” deductibles ranging from 10 to 15 percent of insured property value. These increased deductibles and reduced policy limits mean that many firms are bearing more of the risk than they did previously and thus are less protected against the next big windstorm.

Follow-up interviews in April 2007 suggested that prices in the first quarter of 2007 for firms with operations concentrated in hurricane-exposed areas remained flat or showed a modest increase from the very high levels of 2006. The interviews also suggested, however, that for large, national companies able to combine the risk of their coastal properties with the risk of properties in other geographic areas, prices were declining.

**Impacts Amplified for Smaller Firms.** It was widely believed by those interviewed that compared with large firms, smaller firms faced more severe price increases and had more difficulty finding coverage following the 2005 hurricane season.<sup>11</sup> The experience of one owner of commercial property with small business tenants in Florida’s Dade and Broward counties provides an example of the difficult situation facing smaller businesses. In 2005, the owner bought \$38 million in property coverage for \$250,000. In 2006, after his insurer refused to renew his policy, he was able to buy only \$5 million in coverage, at a cost of \$940,000. In other words, he paid almost four

<sup>9</sup> Commercial insurance premiums are typically regulated in the *admitted* insurance market (that is, the market comprising insurers licensed to do business in the state and subject to regulation of prices and policy language). Thus, some reported rate increases may have been approved by regulators. However, rate regulations in the admitted markets typically do not apply to large policyholders, and insurers can also sell insurance in the so-called excess and surplus market, where rates are not regulated.

<sup>10</sup> Policy limits prior to Hurricane Katrina varied widely among the policyholders interviewed, from less than \$10 million up to several hundred million dollars.

<sup>11</sup> Smaller firms are defined as firms with less than \$50 million in total insured value. Total insured value refers to the value of the assets included in the insurance agreement. Note, however, that an insurance policy will only pay out to the policy limit, which may be much less than the total insured value. (For statistics showing the relationship between total insured value and the policy limit, see Wharton Risk Management and Decision Processes Center, 2005, p. 171).

<sup>5</sup> Commercial insurance policies in the Gulf States typically cover wind risk, but losses caused by wind can be excluded from policies or can be subject to a lower limit on payments (known as a *sublimit for wind risk*) than are losses caused by other perils.

<sup>6</sup> Hurricanes are not the only catastrophic risks included in catastrophic risk exposure. Others include earthquake, tornado, and flood.

<sup>7</sup> Limits for earthquake coverage in California also declined by over 20 percent during this period.

<sup>8</sup> Almost 80 percent of the firms responding reported having fewer than 51 employees, and 71 percent reported that they did business solely in Florida.

**In the hardest-hit areas, availability of insurance was at least as great a problem as price.**

times as much for one-eighth the coverage. A number of other small commercial policyholders we interviewed reported price increases of similar magnitude.

Findings from other studies also support the observation that smaller firms were more heavily affected by the tightened insurance market. A report by the Mortgage Bankers Association (2006, p. 41) noted that the borrowers having problems finding insurance tended to be those with single loans or with small portfolios concentrated in hurricane-prone areas.

Smaller firms will likely be more adversely affected than large firms by a tightening insurance market for a number of reasons. Smaller firms are usually less geographically diverse than large firms, so insurance underwriters find them less attractive when they are in high-risk areas. Smaller firms are also likely to be in a weaker bargaining position with insurance companies: They are less likely to have the financial resources and expertise needed to create captive insurance companies as an alternative to traditional insurance in the face of high prices and limited supply.<sup>12</sup> They also usually lack ready access to wind-loss models, which can be an effective tool in negotiating insurance terms; and they may lack the financial leverage with their commercial lenders that would enable them to negotiate insurance coverage requirements lower than their outstanding loan balance.

**Impacts Varied by Type of Structure.** The interviews provided evidence that changes in insurance price and availability varied not only by the size of the firm, but also by the type of structure being insured. For example, some interviewees reported that premiums increased more rapidly for light-metal and light wood-frame buildings built before 1995 than for other types of structures. One interviewee reported that he was unable to buy insurance at any price for a small light-metal commercial building located over 15 miles from the Tampa coast, when in 2005 he had paid only a \$5,000 premium.

While our interviews suggested that insurers are increasingly incorporating building type and loss-mitigation improvements into pricing decisions, the transition is gradual. The quality of data on construction type is an ongoing problem. Both the insurers and the insureds we spoke with thought that the uneven quality of data on building type and replacement value added to the uncertainty of wind risk and put upward pressure on prices.

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<sup>12</sup> A *captive insurance company* is generally defined as an insurance company mainly intended to provide insurance or reinsurance to meet the needs of its parent company (in which case it is a *single parent captive*) or its members/owners (in which case it is a *group captive* or an *association captive*). Many states, including Vermont and South Carolina, are active domiciles for this form of insurance company.

**Less Insurance Bought Through Traditional Channels.** The experiences of those interviewed suggest that policyholders are increasingly buying coverage outside the traditional admitted (licensed) insurance market, and that more firms are buying coverage in the surplus lines market.<sup>13</sup> According to insurance brokers and commercial risk managers we interviewed, most large companies either were already using an insurance captive or were considering starting one by fall of 2006. In addition, smaller firms were frequently buying coverage in the residual market, which normally provides insurance limits of not more than \$1 million.<sup>14,15</sup> These smaller firms thus bought some coverage in the residual market, but then had to go to the excess market if they desired additional coverage, at rates typically higher than those in the admitted market.

**Assessment.** According to our interviews and our review of available studies, much has changed in how insurance is used to manage wind risk in the Gulf States. The tightly regulated, admitted commercial insurers have dramatically reduced their exposure in coastal areas, causing a shift of hurricane risk to state residual market entities and the largely unregulated, surplus lines carriers. Coverage limits have fallen while deductibles have increased, shifting risk back to policyholders. In addition, the increased use of state residual markets has shifted risk to taxpayers and policyholders in areas that are at lower risk of wind-related losses.<sup>16</sup>

### Where Were Changes in Market Conditions the Most Pronounced?

Not surprisingly, changes in the cost and availability of commercial wind insurance were geographically

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<sup>13</sup> Prices and policy language are typically regulated in the admitted market, at least for smaller policyholders. In addition, policyholders who purchase insurance in admitted markets are protected against insurer insolvency. The surplus lines market does not offer price and insurance-form protections; however, it may offer more flexibility in insurance policy terms, and coverage in this market may be more readily available.

<sup>14</sup> The residual market traditionally has made coverage available to high-risk applicants who would otherwise be uninsurable or face prohibitively high premiums. Some insurers interviewed for this study, however, see a trend in which residual markets, such as the one in Florida, are competing directly with the private sector. Operating losses in residual markets are typically shared among insurers according to each one's market share in the state's non-residual market.

<sup>15</sup> There are some notable exceptions to the \$1 million limitation. In Texas, for example, the Wind Pool is authorized to offer limits of up to \$3 million to meet the increased needs of the coastal market. And Florida Citizens plans to offer, starting September 1, 2007, a new commercial non-residential multi-peril policy with a higher policy limit (which had not been released at the time of this writing) (Citizens Property Insurance Corporation, 2007).

<sup>16</sup> Florida, for example, allocated \$715 million in sales tax revenue to cover part of the \$0.5 billion deficit incurred by Citizens in 2004 and the \$1.8 billion deficit incurred in 2005 (Wharton Risk Management and Decision Processes Center, 2007, p. 41). Residual markets also have the potential to shift risk across lines of insurance. For example, most Citizens policies are in personal lines, but assessments to cover deficits apply to both commercial and personal insurance lines.

specific. Based on our interviews and our review of industry and media reports, the areas most affected by increased prices and reduced availability were Galveston and Harris counties in Texas, all parishes south of I10 and I12 in Louisiana, all six coastal counties in Mississippi, counties within 25 miles of the coast in Alabama, and the entire state of Florida.<sup>17</sup> With some exceptions (such as Atlantic City, New Jersey) our interviews indicated that firms on the Atlantic coast north of Florida primarily experienced increased prices for wind insurance but not limited coverage availability in 2006.

By mid-2006, two very different commercial property insurance markets were emerging. CIAB surveys show that while the price of commercial insurance rose substantially along the Gulf Coast (and in most or all of Florida), premiums went unchanged or declined in areas outside the Gulf States. Indeed, as property insurance became more expensive and less available in hurricane-exposed areas, the Midwest and other areas perceived as less exposed to natural catastrophes commonly saw prices decrease by 25 percent or more (CIAB, 2006b, 2007a, 2007b).<sup>18</sup> And premiums went down in the inland portions of at least some of the Gulf States (excluding Florida), as well.

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### What Precipitated the Changes in Market Conditions?

The increased prices for and reduced availability of insurance stem from factors on both the demand and the supply side of the market.

**Demand.** Over the last three decades, demand for insurance has been fueled by the tremendous growth in population and property values along the Gulf and Atlantic coasts. For example, Florida's population doubled in size from 1970 to 2001, with most of the growth concentrated in coastal areas (Newman, 2005, pp. 3–4). According to one catastrophe-modeling firm, insured residential and commercial property values in coastal counties totaled almost \$2 trillion in Florida, \$700 billion in Texas, and \$200 billion in Louisiana in 2004, and insured losses from a Category 5 hurricane hitting the Miami and Fort Lauderdale areas could exceed \$120 billion

(AIR Worldwide Corporation, 2006). To put these numbers in perspective, consider that the capital base supporting the entire U.S. property/casualty industry—both commercial and residential—is about \$490 billion (Hartwig, 2007). Multiple major hurricanes striking major population areas in a single year could conceivably deplete half of this surplus, which is needed to support not just hurricane risk, but other catastrophic and non-catastrophic risks as well. The recent hurricane activity and perhaps concern about global warming have also likely increased the perception of risk by businesses in the Gulf States, increasing the demand for insurance and creating upward pressure on prices.

**Supply.** Even though increased demand may have contributed to disruptions in the coastal wind insurance market, supply-side developments were the main driver.<sup>19</sup> First and foremost, the historically unprecedented, record-setting seven hurricanes in 2004 and 2005 substantially altered insurance underwriters' perception of the frequency of major hurricanes. Insurers rely heavily on three major modeling firms to forecast losses and set rates for wind risk, and following the 2005 hurricane season, all three of these firms revised their models in various ways that led to higher predicted losses and thus the need to charge higher premiums.

In April 2006, Risk Management Solutions (2006) increased the expected frequency of Category 3, 4, and 5 hurricanes making landfall in the Gulf, Florida, and the Southeast by 50 percent compared with a pre-2004 historical baseline. Data on losses during the 2004 hurricane season led the modeling firms to increase their estimates of both the amount of structural damage that occurs when a hurricane does hit and the costs of repairing that damage (Muir-Wood, 2006).<sup>20</sup> It is important to note here not only that all three major modeling firms increased their estimates, but that their increases varied substantially: AIR Worldwide and EQECAT's estimates rose by much smaller percentages than did those of Risk Management Solutions (Kunreuther and Michel-Kerjan, 2007, p. 30). These

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<sup>17</sup> Underwriting strategies vary across insurers, so there were differences across insurers in where the most substantial changes in price and availability occurred.

<sup>18</sup> Although the subject of earthquake insurance availability and affordability was outside the scope of this paper, several interviewees and market reports noted considerable instability in the California earthquake market in mid-2006, supporting the belief of many that underwriters repositioned their exposures not just away from wind risk, but more generally away from all natural-catastrophe risks.

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<sup>19</sup> Standard economic theory of competitive markets predicts that in a constant cost industry, increased demand will prompt increases in supply that will return prices to initial levels. Thus, it is expected that long-run changes in price should be driven by cost factors underlying the supply side of the market, not by changes in demand.

<sup>20</sup> Based on a review of claims from the 2004 hurricane season, Risk Management Solutions found that commercial building vulnerabilities in their model were generally underestimated by an average of about 40 percent relative to what was actually found in the claims data (Muir-Wood, 2006). Modeling firms are now also taking into account the increase in the price of construction materials and labor caused by the "demand surge" that follows a large disaster.



variations illustrate ongoing uncertainty about the magnitude of the risk.<sup>21,22</sup>

Other factors also contributed to increased prices and reduced availability. The strengthening of capital adequacy requirements for insurers and reinsurers by such financial rating agencies as Standard and Poor's and A.M. Best is one important example. In spring of 2006, Standard and Poor's required insurers to plan for a catastrophic event projected to occur with a frequency of one in 250 years rather than the one-in-100-year frequency that had been used previously. A.M. Best (2006) introduced more rigorous "stress testing" in which the effects on an insurer's balance sheet of multiple rather than single extreme events were considered. To avoid a financial rating downgrade as a result of these changes, insurers were forced either to increase the amount of capital supporting their insurance policies or to reduce net exposure to insured losses.<sup>23</sup> The first of these two responses can translate directly into higher insurance prices; the second can translate into reduced availability of coverage in high-risk areas, which can apply upward pressure on insurance prices.

In addition, the retrocessional market (the insurance market for reinsurers) almost entirely evaporated at about the time the modeling firms released their new loss estimates and the rating agencies strengthened their capital adequacy requirements, creating a "perfect storm" for buyers of commercial wind insurance. In spring of 2006, two major providers of retrocessional insurance withdrew from the market, and the remaining players generally cut back the amount of insurance they were willing to offer per event at any price (Benfield Group, 2006, p. 3). As the July 2006 renewal period for insurance approached, the collapse of the retrocessional market (in conjunction with the strengthened capital adequacy requirements) made the upheaval in the commercial wind insurance markets as much about the availability of insurance as about its price.

Our interviews highlighted two other factors that probably made their own contributions to the rate increases and capacity shortages observed

in 2006. First, litigation and government action created "contract uncertainty" that likely discouraged the commitment of new insurance capacity in high-risk areas. The highly visible litigation over flood exclusions in standard homeowners' policies increased insurers' concerns about contract language being reinterpreted after an event.<sup>24,25</sup> It is reasonable to expect such concerns to affect the commercial as well as the residential market. Concern about contract uncertainty was magnified by such post-loss regulations as Louisiana's Emergency Rule 23, which was adopted following Hurricanes Katrina and Rita (Louisiana Department of Insurance, Office of the Commissioner, 2005). It required that once a policyholder had submitted a claim, residential and commercial insurers must continue to insure the policyholder beyond the policy's expiration date, either until the end of 2006 or until 60 days after the property was repaired, whichever occurred first.

Second, "assessment risk" has likely pushed up the price at which commercial insurers are willing to provide insurance and discouraged them from expanding the amount of coverage in place. Residual markets are now growing rapidly in Florida, Louisiana, and other hurricane-exposed areas, particularly for residential properties.<sup>26</sup> Past experience suggests that these residual pools frequently do not charge actuarially sound, risk-based rates; and residual insurers typically recover shortfalls from all insurers in the state, whether they write residential or commercial policies. This method for recovering deficits creates considerable risk for writers of both commercial and residential policies. Such assessments create another cost of doing business in a state and would likely increase the price of commercial insurance.

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**. . . litigation and government action created "contract uncertainty" that likely discouraged the commitment of new insurance capacity in high-risk areas.**

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<sup>21</sup> Uncertainty about the effects of climate change adds to the uncertainty about risk magnitude. Kunreuther and Michel-Kerjan (2007, p. 40) concluded that "[d]espite the overwhelming scientific evidence that global warming is real, there is still considerable uncertainty as to its impact on weather-related disasters such as hurricanes, typhoons, and floods."

<sup>22</sup> The insurers we interviewed observed that the wind-loss models had seriously underestimated the losses in the 2004 and 2005 hurricane seasons. These underpredictions emphasized the limitations of wind-loss models for many, calling for an extra degree of caution in setting rates. Such added caution is another source of upward pressure on prices.

<sup>23</sup> *Net exposure* refers to the risk the insurer faces for losses net of any reinsurance purchased.

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<sup>24</sup> Homeowners' policies typically cover damage caused by wind or wind-blown rain but exclude losses caused by flood. A common way to characterize the losses covered in these policies is that damage from falling water is covered but damage from rising water is not. Homeowners and businesses can purchase flood insurance from the National Flood Insurance Program, but the amount of coverage available is limited.

<sup>25</sup> Within weeks of Hurricane Katrina, Mississippi's attorney general filed suit against the state's property/casualty insurers demanding that they cover residential damage caused by flood as well as wind. A month later, in October 2005, a prominent plaintiffs' attorney filed the first of many claims on behalf of homeowners who were denied coverage for losses. These cases and others like them in the Gulf States have been working their way through the legal system and have begun to settle (see, for example, Treaster, 2005a, 2005b, 2007).

<sup>26</sup> For example, insured values for both residential and commercial coverage rose from \$183 billion to \$409 billion in Florida between 2003 and 2006, from \$14 billion to \$19 billion in Louisiana between 2004 and 2006, and from \$19 billion to \$36 billion in Texas between 2003 and 2006 (data for Florida are from Citizens Property Insurance Corporation, data for Louisiana are from Louisiana Citizens Property Insurance Corporation, and data for Texas are from the Insurance Information Institute).

**. . . insurers' upward revisions of hurricane frequency and of the vulnerability and repair costs associated with many types of commercial structures appear to be long-term changes that will prevent the return of market conditions seen in 2005 and earlier.**

### What Were the Economic Impacts of Higher Prices and Reduced Availability?

Higher insurance prices and reduced insurance availability can in principle have significant negative, albeit difficult-to-quantify, economic consequences. Increased prices and reduced availability can affect the viability of both new and existing ventures. New projects can be canceled or delayed because of high insurance rates or limited availability. For example, being unable to find wind insurance at an acceptable price can jeopardize project financing, since lenders usually require borrowers to carry such insurance as a condition of a loan. A substantial increase in coverage costs may force existing firms that are marginally profitable into bankruptcy, and the inability to find coverage at an acceptable price may force a borrower into technical default.<sup>27</sup> Technical default can lead to interest rate increases for the borrower, increasing the probability of insolvency.

Our discussions with various stakeholders indicated that lenders responded in various ways to tightening insurance conditions. In some cases, lenders took a hard line—for example, declaring existing loans in technical default if the insurance purchased was inadequate, or refusing to issue new loans in the absence of full insurance. In other cases, lenders demonstrated more flexibility, although mainly with existing rather than new loans. They sometimes overlooked inadequate insurance or renegotiated contract terms to allow for less insurance.<sup>28</sup>

Our discussions with policyholders provided evidence that changes in the wind insurance market had adverse effects on specific investments in the Gulf States region after Hurricane Katrina. Roughly one-quarter of the policyholders interviewed were aware of projects that had been canceled or delayed in 2006 because of high insurance prices or unavailability of insurance, and over half of the lenders interviewed were aware of such projects.

The effects of higher prices and limited insurance availability on statewide and/or regional economic activity are less clear. Tight insurance markets may redirect economic activity to areas of lower risk rather than reducing the overall level of economic activity.<sup>29</sup> Also, increases in insurance costs may be capitalized as reduced land values and do little to retard development.

<sup>27</sup> Technical default occurs when a firm violates one aspect of its debt contract (for instance, the requirement to carry insurance) while still complying with the debt service payments.

<sup>28</sup> The approach taken by lenders is in part determined by whether the loan is securitized or not. Securitized loans have very specific insurance requirements, and lenders have little leeway in adjusting terms.

<sup>29</sup> It is interesting to note that personal income in the Southeast and Southwest grew faster than in the nation as a whole from 2004 to 2006 (by 13 percent and 17 percent versus 12 percent, respectively), continuing the pattern of higher growth rates observed between 1990 and 2004 (Bureau of

### How Long Will the Market Changes Last?

As we discussed above, recent industry surveys and our interviews suggest that premiums have stabilized and in some cases even declined in areas exposed to wind risk. Market responses have dampened price increases and may exert downward pressure on future prices to some degree. Insurers made large profits in 2006 because wind premiums rose dramatically and no major wind losses or other major catastrophes occurred. These profits will attract more capital into the industry, putting downward pressure on prices. Indeed, \$27 billion of private capital flowed into the reinsurance sector between September 2005 and June 2006 through existing reinsurers, start-up reinsurers, reinsurance sidecars, and catastrophe bonds (Moody's Investors Services, 2006).<sup>30,31</sup> In addition, some of the factors responsible for the price jumps—such as contract uncertainty, assessment risk, and the collapse of the retrocessional market—may be transitory, which raises the hope that prices will decrease in the future. However, insurers' upward revisions of hurricane frequency and of the vulnerability and repair costs associated with many types of commercial structures appear to be long-term changes that will prevent the return of market conditions seen in 2005 and earlier.

### The Challenge of Wind Risk for Private Insurance Markets and Government Policy

The discussion above paints a picture of substantial disruption in the commercial insurance market in 2006 and of ongoing high prices and limited availability for commercial wind insurance in 2007. A challenge for policymakers is to determine what type of government intervention, if any, is warranted in the market for commercial property wind insurance. Various solutions are being proposed by different stakeholders. Some focus on improving the private sector's ability to provide wind coverage, others propose public-private partnerships to insure wind losses, and still others think the government should take the lead in providing wind insurance.<sup>32</sup> Any

Economic Analysis, 2007). Undoubtedly, these relatively high growth rates can be partially attributed to the post-Katrina inflow of federal aid and might have been even higher if insurance conditions had been more favorable.

<sup>30</sup> A sidecar provides reinsurance coverage to an insurer or reinsurer by issuing debt to its investors. Typically, a sidecar shares risk on only certain policies written by an insurer or reinsurer, not on the insurer's or reinsurer's entire portfolio of policies. For more discussion on sidecars, catastrophe bonds, and other alternative risk transfer instruments, see Wharton Risk Management and Decision Processes Center, 2007.

<sup>31</sup> Although this inflow is a substantial amount of money, it supports reinsurance for all types of losses, not just wind losses. Moreover, it represents only about one-half of the 2005 insurance losses.

<sup>32</sup> Proposals that emphasize the private sector include removing state regulation of insurance rates, preserving the sanctity of insurance rates, and allowing insurers to establish tax-deferred reserves for catastrophes (see,



evaluation of alternative proposals should be guided by clearly defined goals for the insurance market. We suggest three such goals:

1. Insurance premiums should create appropriate incentives to mitigate risk.
2. Decisions by businesses should factor in the cost of insurance premiums that create appropriate incentives to mitigate risk.
3. An insurance system should pay legitimate claims expeditiously and efficiently.

We next discuss each of these goals and the challenges policymakers face in crafting solutions that achieve them. We also identify further research and analysis needed to inform decisions about the types of government intervention or private-sector reforms that might be warranted.

### Premiums Should Create Appropriate Incentives to Mitigate Risk

Researchers and policy analysts typically think that a wind insurance premium should reflect the insured structure's expected loss from wind damage given that structure's construction type, location, and improvements for reducing wind losses.<sup>33</sup> Such premiums create appropriate incentives to avoid locating in risky areas and to build wind-resistant structures. When insurance premiums are lower than the expected loss, the incentive to avoid risky areas or to build wind-resistant structures is inadequate. Analogously, when insurance premiums are higher than the expected loss, development will be unnecessarily discouraged or buildings will be overengineered.<sup>34</sup> Premiums should be based on estimates that reflect loss estimates over the life of a structure or piece of infrastructure. Estimates of risk over the short term (say, five years or less) are not appropriate for longer-lived structures or infrastructure.

This prescription, in and of itself, is not controversial. But implementing it in the context of wind insurance—and for most other perils involving high-severity, low-frequency events—is problematic because of the substantial uncertainty about what the

risk is. The risk-modeling firms' different responses to the 2005 hurricane season (discussed above) and the uncertainty over how global warming will affect hurricane activity illustrate this ongoing uncertainty and underscore the difficulty of determining appropriate rates in this setting.

In the face of such uncertainty, the most straightforward approach is to set premiums to reflect best estimates of expected loss over a structure's life given construction type, location, and any wind-specific loss-mitigation improvements. Best estimates might be based on the average of predictions from the respected modeling firms. Given the substantial amount of uncertainty involved, however, it may also be desirable to add a cushion above expected loss. In particular, if from the social (as opposed to the private insurer's) perspective, the perceived cost of underestimating the risk and setting rates too low is higher than that of overestimating the risk and setting rates too high, rates above best estimate of expected loss would be warranted.

Premiums that reflect best estimate of expected loss or, perhaps, best estimate plus a cushion should thus be a primary goal. It may prove difficult, however, for either private markets or government programs to produce such an outcome.

#### Challenges Facing Private Insurance Markets.

Private insurance markets work best for high-frequency, low-severity events, when losses across policyholders are statistically independent, and when loss probability is well understood. In these cases, insurers need to hold only a small amount of equity capital per policy, and the price of a policy approaches the expected value of the loss (Cummins, 2006, pp. 342–343). Automobile insurance is an area in which private insurance markets might be expected to work well.

Infrequent, catastrophic events create challenges for private insurance markets. Losses are correlated across policyholders in the sense that an event affects a large number of policyholders simultaneously. Events are infrequent, meaning that the variance of losses around expected loss is large, and the low frequency of the events means that loss probability is difficult to estimate. These and other conditions<sup>35</sup> imply that in order to avoid insolvency, insurers may have to charge premiums that substantially exceed expected loss.<sup>36</sup> If businesses and individuals view this risk premium as too high, they will be unwilling to buy insurance, and

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for example, American Insurance Association, 2006). Proposals for public-private partnerships include a federal backstop like the current federal program for terrorism insurance or programs like the Florida Hurricane Catastrophe Fund (see, for example, Csiszar, 2006, and Litan, 2006). Models with the public sector in the lead include federal or state-run windstorm coverage funds modeled after the National Flood Insurance Program (see Dixon et al., 2006, for a description of the National Flood Insurance Program).

<sup>33</sup> As used here, *expected loss* factors include both the probability of a hurricane occurring and the loss given that a hurricane does occur.

<sup>34</sup> For discussion of the relationship between insurance and loss mitigation in a homeowner setting, see, for example, Kleindorfer and Kunreuther, 1999.

<sup>35</sup> For example, Litan (2006) emphasizes timing risk, which arises from the possibility that insurers will be forced to pay out a large amount in claims before sufficient premiums have been collected.

<sup>36</sup> For a mathematical derivation of these results, see Cummins, 2006, pp. 342–343.

insurance markets will break down. There are indications that private markets indeed require substantial risk premiums. One analyst points to evidence from the Congressional Budget Office that the risk loads in residential property insurance markets are five to seven times expected loss (Litan, 2006, p. 4). Such a markup is likely far higher than any increase warranted by the uncertainty of the underlying risk.

A second type of challenge that catastrophic events create for private insurance markets is the tendency for rates set by private markets for such events to swing dramatically even when there is no change in perceived risk. Much previous research on the response of insurance markets to large losses suggests that insurance prices rise and insurance availability falls following an event not only because of changes in risk perception, but also because of slow adjustment by insurers to the financial outlays triggered by large events (see, for example, Gron, 1994). Information asymmetries between insurers and investors are one of the factors that cause insurers to only gradually regain the capital needed to write the amount of coverage that was available prior to an event. In contrast to such a jump in rates, once sufficient time has passed since a catastrophe, short-sighted profit maximization by insurers can lead to competition among them that results in rates below expected loss. When such swings are not based on changes in the underlying risk, they send incorrect signals to businesses about the need to avoid risky areas or to invest in loss-mitigation measures. High prices and limited availability after a major storm inappropriately discourage rebuilding, and low prices during the competitive stages of the property/casualty insurance market cycle discourage investment in loss-mitigation measures. To provide businesses with the right incentives to take loss-mitigation measures and invest in hurricane-prone areas, premiums should not jump dramatically around expected loss, but, instead, should remain stable absent changes in the underlying risk.

**Challenges Facing Government Intervention in Insurance Markets.** In principle, government does not need to charge a risk premium above the price that recovers expected loss. It can increase tax revenues to cover losses after a natural catastrophe and hence need not be concerned about insolvency. Government is also not subject to the private-sector factors that produce large swings in premiums around expected loss in private insurance markets. Thus, compared with the private sector, government should be able to set insurance prices closer to expected loss for hurricanes and other catastrophic risks, and keep those prices closer to expected loss over time.

Indeed, government has intervened in a wide range of circumstances in which private insurance markets might not be expected to work well. Examples include insurance for flood (National Flood Insurance Program), earthquake (California Earthquake Authority), accidents at nuclear power plants (Price-Anderson Act), riots (Fair Access to Insurance Requirement programs), terrorism (Terrorism Risk Insurance Act), and, of course, wind (Florida's Citizens Property Insurance Corporation, for example). One must be careful, however, not to automatically assume that the private insurance market did not work well in each of these settings. The intervention may have come about because policy-makers did not like the outcomes of what was an appropriately functioning private insurance market.

While government-provided insurance and government intervention in insurance markets can in theory produce more economically efficient outcomes than private insurance markets, they can in practice produce undesirable outcomes. Government policy-makers often face strong political pressure to set premiums below expected losses or to subsidize one group of policyholders at the expense of another.<sup>37</sup> For example, there is reason to believe that the Citizens Property Insurance Corporation, which is Florida's residual wind market, is not pricing wind insurance at its full cost.<sup>38</sup> The resulting low rates tend to encourage construction in high-risk areas and reduce incentives to build wind-resistant structures, thereby increasing potential losses from future hurricanes. Government interventions in insurance markets, if poorly designed, can also reduce private insurers' willingness to provide wind insurance and thus compound the problem.

**Issues That Warrant Further Study.** This discussion suggests that one should not put blind faith in the ability of either the private sector or the government to create a well-functioning market for wind insurance. Policy attention and research have primarily focused on personal insurance lines, mainly homeowners' insurance, in individual states. Further

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<sup>37</sup> Government policymakers may depress rates either by setting rates on government-offered insurance or through regulatory approval of private-sector rates.

<sup>38</sup> As discussed above, Citizens ran a \$0.5 billion deficit in 2004 and a \$1.8 billion deficit in 2005. Taxpayers covered \$700 million of the deficit, and all policyholders in the state, whether in high-risk or low-risk areas, are to be assessed a surcharge over a ten-year period to recover most of the remaining amount. Further, in January 2007, the legislature repealed a rate increase designed to put Citizens on a sounder financial footing (Insurance Information Institute, 2007). A recent study by a leading actuarial firm found that as a consequence, a Florida hurricane that caused \$80 billion in insured losses could result in \$54 billion in post-event assessments over 30 years on auto, homeowners', and business insurance policies throughout Florida, regardless of risk or type of structure (Tillinghast Towers Perrin, 2007).

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research on the pricing behavior of private commercial insurers when they are allowed to set their own rates is warranted. The divergence of premiums from best estimates of expected loss should be examined, including variations in the divergence by policyholder size. Additionally, programs capable of dampening swings in insurance rates and availability caused by inefficiencies in capital markets—such as temporary government loan programs that provide capital to insurers after a large event—should be explored.

There are indications that some high-profile government programs are moving in troublesome directions, at least for residential insurance policies. However, further work is needed to better understand how the prices of commercial wind insurance available through state programs in the Gulf States or set by state regulation compare with best estimates of expected loss. Better information on the functioning of private markets and public programs will allow a more complete assessment of types of reform needed in government programs and types of intervention warranted in private markets.

### Business Decisions Should Reflect the Full Cost of Wind Risk

The “right” insurance premiums (that is, premiums that cover best estimates of expected loss or best estimates of expected loss plus a cushion) will do little good unless businesses consider the full cost of wind risk in deciding where to locate, what types of structures to build, and what types of loss-mitigation measures to take. Businesses may fail to consider the full cost of wind risk for two major reasons: underestimation of the risk of loss before a major hurricane arrives, and the expectation that government or other forms of assistance will follow a loss.

**Underestimation of Wind Risk.** Research has shown that when the probability of an event is below a certain level, individuals tend to ignore the risk (Wharton Risk Management and Decision Processes Center, 2007, p. 73). The result may be an unwillingness by individuals to buy insurance priced at the expected loss value.<sup>39</sup> The same individuals will also be unlikely to take into account the full cost of wind risk when deciding where to live or whether to invest in loss-mitigation measures. These research findings apply to individuals, but it is reasonable to expect that small business owners will behave similarly and thus to expect similar outcomes for small businesses. The same cannot necessarily be said of large busi-

nesses, however. They are able to hire professional risk managers and to more fully evaluate the different risks they face, which means the extent to which they will tend to underestimate risk is not clear.<sup>40</sup>

### Expectation of Assistance Following a Loss.

The expectation that government or some other entity will provide assistance after a loss may cause businesses not to factor in the full cost of wind risk when making decisions. Current government policy does not put the full burden of uninsured losses on property owners. The federal government provided massive assistance after Hurricane Katrina and the 9/11 terrorist attacks,<sup>41</sup> and some of this assistance covered uninsured business losses. For example, the Small Business Administration offers subsidized loans (to large and small firms alike) for property damage and business interruption costs not covered by insurance. Typically, government programs focus on smaller businesses, so the expectation of assistance following loss may do less to suppress a full consideration of wind risk by large businesses than by small businesses.

**Issues That Warrant Further Study.** From a policy perspective, the central issue here is the types of programs and/or regulations needed to ensure that businesses consider the full cost of hurricane risk. In the extreme, policies requiring businesses to purchase wind insurance might be justified, and there is a precedent for this type of requirement: The National Flood Insurance Program mandates that homeowners and businesses with mortgages from federally regulated lenders purchase flood insurance if their property is in an area subject to significant flood risk (that is, in the so-called Special Flood Hazard Areas).<sup>42</sup> However, before a similar requirement for commercial wind insurance is considered, more information is needed on the take-up rate of wind insurance by businesses, particularly small businesses.<sup>43</sup> Also helpful would be better information on the fraction of uninsured business loss that is compensated by government and charity programs, and the variation in

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**Research has shown that when the probability of an event is below a certain level, individuals tend to ignore the risk.**

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<sup>39</sup> Individuals are willing to pay more than expected loss for an insurance policy because they are risk averse, which is what enables a market for insurance.

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<sup>40</sup> For a review of the diverse ways in which corporations and large businesses can manage risk, see Doherty, 2000. For a discussion of the differences in the demand for insurance of firms and individuals in the face of the risk of terrorism, see Wharton Risk Management and Decision Processes Center, 2005, p. 149.

<sup>41</sup> The U.S. government funded over \$15 billion in assistance to businesses and individuals in New York City affected by the 9/11 attacks (Dixon and Stern, 2004, p. xviii). Post-Katrina spending on reconstruction by the U.S. Department of Housing and Urban Development, the Federal Emergency Management Agency, and the U.S. Army Corps of Engineers totaled approximately \$29 billion through December 2006 (Cooper, 2007).

<sup>42</sup> However, any property that does not have a mortgage or that has a mortgage issued by a non-federally regulated lender is not required to purchase flood insurance (see Dixon et al., 2007).

<sup>43</sup> The most relevant, though difficult to measure, information here would be estimates of the take-up rate when insurance is priced at expected loss.

this fraction by firm size. Prior research can provide some insight into this issue,<sup>44</sup> but a more detailed analysis of the assistance received by businesses in the Gulf States after Hurricane Katrina is warranted.

### Legitimate Claims Should Be Paid Expeditiously and Efficiently

The 2005 hurricane season generated an estimated \$57 billion in insured losses (excluding losses paid by the federal flood insurance program), and the vast majority of claims were settled expeditiously. A survey by the Insurance Information Institute (2006) found that 95 percent of the 1.0 million homeowners' insurance claims in Louisiana and Mississippi were settled within one year of Hurricane Katrina, and that 2 percent were subject to litigation or mediation. Two percent of 1.0 million claims amounts to 20,000 claims, which will generate substantial legal and other types of transaction costs. As discussed earlier, this type of litigation creates contract uncertainty for insurers, which puts upward pressure on insurance prices and can induce insurers to withdraw from the market altogether.<sup>45</sup> Litigation also delays claims payments and consumes resources that could be put to better use.

Stakeholders interviewed for this study were not aware of significant litigation pertaining to commercial insurance policies following Hurricane Katrina, but no systematic inquiry into the scope of this type of litigation has been carried out yet. Even if the primary focus of litigation has been residential policies, however, there still may be ramifications for the commercial insurance market.

Despite all the attention that has been paid to the litigation over residential policy coverage, one of the key issues driving the litigation has not been addressed: the difficulty of determining whether damage was caused by wind or by rising water (i.e. flood). Consequently, it is reasonable to expect coverage disputes whenever an insurance policy covers loss from one of these but not the other. Strategies for reducing this type of litigation include offering insurance policies that cover damage from both wind and flood.

**Issues That Warrant Further Study.** An analysis of the post-Katrina settlement patterns for commercial insurance policies is needed to better understand the extent to which the commercial wind insurance system currently pays legitimate claims expeditiously

and efficiently. In particular, the prevalence of litigation over wind versus flood coverage in commercial insurance policies should be systematically examined. Commercial insurers' concerns about coverage litigation in personal insurance lines after Katrina should be assessed, as should the potential for such coverage litigation to lead to increases in commercial wind insurance rates. Finally, there should be an evaluation of the feasibility of providing "storm surge" protection in commercial policies to reduce both post-catastrophe litigation and the contract uncertainty that can undermine insurance markets.

### Conclusions

The debate over whether the government should intervene in the market for wind insurance has focused primarily on the residential market since the 2004 and 2005 hurricane seasons. However, as the above discussion indicates, the market for commercial property insurance in the Gulf States has experienced considerable disruption itself, disruption that has important implications for business, the economy, and taxpayers in states that face significant hurricane risk.

The 2007 Atlantic hurricane season is expected to be above normal; the prediction is for seven to ten hurricanes, three to five of which could become major hurricanes of Category 3 strength or greater (National Oceanic and Atmospheric Administration, 2007). Given the high human and economic stakes involved, it is imperative that the commercial wind insurance market be assessed to determine whether it is providing effective risk transfer and compensation instruments for the wind peril at appropriate prices, whether businesses are considering full estimates of wind risk when they make location and loss-mitigation decisions, and whether the insurance system is resolving claims expeditiously and efficiently.

We have identified several areas of research that will aid the assessment. Dialogue among the different stakeholder groups will also move the debate forward. Such dialogue is essential for identifying the problems and for identifying solutions that have few unintended consequences. A structured process for convening the different stakeholders would facilitate the needed dialogue.

The intense hurricane seasons of 2004 and 2005 undoubtedly caused significant disruptions for businesses and insurance markets. But they also provide an opportunity to better understand the strengths and weaknesses of the current system for insuring hurricane risk. This improved understanding can provide a firm basis for the development of policies to mitigate the costs and disruptions of the major hurricanes that will inevitably strike in the future. ■

<sup>44</sup> See, for example, Dixon and Stern, 2004.

<sup>45</sup> State Farm announced on February 14, 2007, that it would stop writing new insurance policies for homeowners and businesses in Mississippi. This decision followed on the heels of a \$2.7 million jury award against State Farm and State Farm's agreement to pay \$80 million to settle about 1,000 cases in Mississippi (Reuters, 2007).

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**It is reasonable to expect coverage disputes whenever an insurance policy covers loss from wind but not flood.**



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