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# THE SCOURGE

of demand surge

The Aon Re Scholarship topic was: "Experience across the world indicates that post-event inflation, or demand surge, can be a significant part of the total cost of major disasters. Discuss how the insurance system can help society balance the needs of rapid rebuilding, cost control and the allocation of dollars in the period after an event. (You) may wish to compare and contrast how this problem has been handled throughout the world in recent disasters".



## FEATURE



**BY AON RE  
SCHOLARSHIP  
WINNER, DAVID CHAN.**

David is Regional Operations Manager with Guild Insurance Limited based in Melbourne.

### aon re scholarship

DAVID CHAN'S WINNING SUBMISSION FOR THE AON RE SCHOLARSHIP GAVE THE JUDGES CONSIDERABLE REASON TO BE IMPRESSED. HIS ESSAY, "THE SCOURGE OF DEMAND SURGE", EARNED HIM THE PRIZE OF A TRIP TO LONDON TO ATTEND THE AON RE GLOBAL REINSURANCE SEMINAR TO NETWORK WITH INSURANCE PROFESSIONALS FROM AROUND THE WORLD.



Climate change, catastrophes and the frequency, severity and footprint of recent disasters have impacted the consciousness of the wider community in Australia and throughout the world. As the growth and spread of communities continue unabated in locations susceptible to natural disasters and catastrophes such as hurricanes around the world, the insurance industry needs to be prepared for the reality that catastrophes and their impact on the insured and non-insured communities will become more common.

Disasters are measured by the level of impact of natural or man-made hazards on human society and the environment. According to Walker (2005) in relation to human societies the scale of disasters is measured

“Today, in many parts of the world, it is the insurance industry that forms the foundation of economic recovery following a catastrophic event or disaster.”

by the cumulative effect of death, injuries, financial loss and disruption of normal life. Insurance can play a role in reducing the impact of each of these. Insurance can not reduce the level of death, injuries and financial loss, but it provides readily available cash to cope with these at a time of extreme stress, and by just doing this can significantly improve the recovery phase of disasters and thereby reduce disruption of normal life. (Walker, 2005).

Today, in many parts of the world, it is the insurance industry that forms the foundation of economic recovery following a catastrophic event or disaster. While insurance companies are familiar with meeting the regular claims demand placed on them, experience across the world indicates that post-event inflation, or demand surge, can be a significant part of the total cost of major disasters and adds to the volatility that is the scourge of the insurance industry.

#### Demand surge

Demand surge refers to incremental losses that result from an increase in replacement costs attributable to shortages in building materials and service providers. For example, when a major hurricane strikes and many of the city's building roofs need replacement or repair, roofers increase their prices and suppliers run low on materials. The increased demand drives up replacement costs, and therefore increases the losses estimated by the model (NAPCO LLC, 2006).

Demand surge occurs when the need for disaster relief and recovery supplies increases dramatically due to shortages and increased demand, forcing the cost of these goods upward as people rebuild. (Briggs, 2006). Grenier (2006) states that it is a complex phenomenon, difficult to quantify and model, as it depends on micro- and macro-economical aspects, but also behavioural, environmental and political drivers. It is probably becoming an increasingly important component of the overall loss as the economy tends to operate in a particularly tense demand and supply environment (Grenier, H, 2006).

Grenier further highlights that following a catastrophe or disaster, insurance dollars will pour into the region, but rebuilding will be limited by material and worker shortages, leading to rising wages and material prices. Construction materials and costs (e.g. steel, lumber, cement, building materials) are usually the most visibly affected by demand surge. However, energy prices (oil and gas) may also rise, as they did following Hurricane Katrina in the USA in 2005, which led to a flow-on effect with the manufacture of construction materials. Industry surveys, professional sources and CAT models vendors' communications indicate that in 2004 and 2005, demand surge was a very significant, non-linear component of the overall reported loss (Grenier, 2006).

ASIC (2007) notes that disasters can cause huge and unpredictable increases in rebuilding costs. After Cyclone Tracey in Darwin, building costs increased by 75 per cent; after the Newcastle earthquake, building costs increased by 35 per cent; and after the ACT bushfires in 2003, building costs increased by fifty per cent between November 2002 and January 2003. Preliminary reports following Cyclone Larry in Queensland indicated that there was a significant increase in local buildings costs after the disaster; with insurers estimating building costs increasing by at least fifty per cent immediately after the disaster (ASIC, 2007).

Prindle and Smith (2005) highlight that similarly, the 2004 hurricane season in the United States saw a high level of demand surge when Florida and other southeastern states



experienced four hurricanes within 37 days. The storms resulted in over two million claims, nearly three times the volume from Hurricane Andrew in 1992. Many of the damaged Florida homes in 2004 were of comparable construction and in need of similar repairs (such as roofing), leading to a surge in demand for materials and labour. As of May 2005, costs remained twenty to forty per cent above average (Prindle and Smith, 2005).

Insurance Program, but including estimates for demand surge). Katrina will displace Hurricane Andrew as the costliest hurricane and is likely to eclipse the September 11 terrorist attacks as the single most expensive insured occurrence in the United States. Hurricane Katrina is estimated to have destroyed over 250,000 properties; an order of magnitude larger than the 28,000 destroyed by Hurricane Andrew (RMS, 2005 and Towers and Perrin, 2005).

skilled construction labor in the Gulf Coast region more than a year after Hurricane Katrina, which ultimately raises the cost of rebuilding. Recent research by Risk Management Solutions (RMS) into the 1906 San Francisco Earthquake – an event with many parallels to Hurricane Katrina – found rampant demand surge as the city struggled to rebuild (Bradford, 2006).

In the final report of the Operating Recovery Taskforce, Severe Tropical Cyclone Larry (Cosgrove, 2007) it was noted that Cyclone Larry, which tore through North Queensland on 20 March 2006, destroyed or damaged 19,000 properties, resulting in 27,000 claims at an insured loss exceeding \$369 million, with a total economic loss bill of \$1.5 billion. With local builders being “booked up for the next two years”, the cost of enticing builders from interstate and accommodating them locally for the necessary months of work led to price rises. Nevertheless, the Final Report indicated that while some price rises did occur the number of tradespeople and prices remained in fair equilibrium. Much credit for that was due to the insurers who had the bulk of the trade workforce in their employ (Cosgrove, 2007).

ASIC found that many homes destroyed by Cyclone Larry had been built before building codes had been revised to ensure buildings were better equipped to withstand tropical cyclones. Insurers indicated that complying with these codes might have added \$15,000 to \$25,000 to rebuilding costs – which owners may not have taken into account when estimating their home insurance levels.

“Demand surge is a function of the size of the catastrophe: the larger the disaster and damage to property, the greater the magnitude of demand surge.”

**AIR AND PCS ESTIMATED LOSSES FOR HURRICANE KATRINA (USD BILLION)**

	<b>AIR</b> (without demand surge)	<b>AIR</b> (with demand surge)	<b>PCS</b>
LOUISIANA	16.0	20.8	22.6
MISSISSIPPI	8.3	10.8	9.8
ALABAMA	1.2	1.6	1.3
FLORIDA	0.6	0.7	0.5
OTHER	0.1	0.1	0.1
<b>TOTAL</b>	<b>26.1</b>	<b>34.0</b>	<b>34.4</b>

Source: AIR Worldwide Corp., 2005

AIR<sup>1</sup> recommended that clients apply a thirty per cent demand surge factor to modelled losses following Hurricane Katrina. The table above shows how the AIR early loss estimates by state for the final Hurricane Katrina scenario compare with PCS<sup>2</sup> early estimates. This highlights the impact of demand surge as a major factor in estimating losses following disasters.

Later estimates of the insurance loss of Hurricane Katrina were between US\$40 and US\$55 billion, (excluding losses under the US National Flood

Demand surge is a function of the size of the catastrophe: the larger the disaster and damage to property, the greater the magnitude of demand surge. For example, a windstorm causing \$5 billion in property damage may also bring a five per cent demand surge in construction costs, while a \$40 billion loss might result in reconstruction costs increases of more than twenty per cent (Lancaster, 2006).

This is cemented by Bradford (2006) who noted that in the United States, there was a reported shortage of



**DAVID CHAN**  
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**"You're talking about an industry that positively impacts the community in so many ways."**

Two weeks of learning about reinsurance concepts at the Aon Re Global Clients Seminar in the UK in September 2007 has kindled an even greater interest in the industry for Aon Re Scholarship winner David Chan. "I learned a lot about reinsurance – the program was comprehensive and covered concepts and topics that I found very interesting.

It was also a fantastic opportunity to network with the 25 delegates from all over the world, including the Czech Republic, Mexico, Venezuela, Kenya, Egypt, Qatar, India, Hong Kong, Japan, Korea, South Africa, Finland, New Zealand, Germany and St Lucia. We all got along very well and will continue to keep in touch.

"As reinsurance is a global industry, the principles and practices of reinsurance are the same but with local nuances and it was great to talk with the other delegates and learn how they do business as well," David said.

A Regional Operations Manager with Guild Insurance Limited, based in Melbourne, David is responsible for sales and operations at Guild Insurance's regions in Queensland, Victoria and South Australia with seven direct reports and up to fifty team members in these regions. He's very conscious of the value of the Aon Re Scholarship: "I'd

like to thank Aon Re, and acknowledge Paul Oliver, Aon's training consultant in the UK who organised the seminar and of course, Stephen Warwick, CEO of Aon Re in Australia and Joan Fitzpatrick, ANZIIF CEO, for giving me this wonderful opportunity," he said. David also wanted to acknowledge the support and encouragement of David Brown, General Manager of Guild Insurance and Brian Bengier, Managing Director of the Guild Group, adding that learning is one of Guild's core values.

David, who is 34, is convinced that the insurance industry is a good one to be in. "It's a fantastic industry! You're talking about an industry that positively impacts the community in so many ways. For example, we help the community get back on its feet after a disaster – we're one of the first on the ground so to speak. There are so many positive things we do for the community and I believe it's very important to encourage young people to come into the industry."

And the future? "I want to stay in the insurance industry. The Guild Group has a great culture and values and is focused on delivering exceptional customer service. I'm very happy here and look forward to the future. In fact, part of being prepared for the future is to constantly develop ourselves – and that's where ANZIIF plays a tremendous role in professional development," he added.

### **The impact of demand surge on the insurance industry**

Demand surge adds to volatility, especially if it is not modelled properly or taken into account when underwriting risk. Insurers have to battle with the uncertainty of demand surge on claims costs following disasters.

It also affects insurability. Following Hurricane Katrina in the USA, some insurers adjusted their programs by increasing their deductibles, raising rates and restricting their underwriting to write lower limits or only ex-wind policies. Others opted not to renew a few large accounts to remain within their allotted surplus capacity and keep the remainder of their policies in force. In their efforts to stay within their reinsurance boundaries, insurers may have been reluctant to reinstate certain policies that have been cancelled.

A report by Towers Perrin noted that as these insurers reviewed their loss estimates and the amounts of surplus they needed to have in place following Hurricane Katrina, some of these insurers were re-evaluated by A M Best and Standard & Poor's. A M Best placed 22 companies and Standard & Poor's placed eight companies under review on credit watch with negative implications while others had their ratings downgraded. Some companies reacted by raising additional capital and had their ratings affirmed and removed from credit watch (Towers Perrin, 2005).

The major rating agencies reevaluated the way they treat natural catastrophe risk in their capital adequacy models for both insurers and reinsurers. All rating agencies are asking companies to include amounts for demand surge and storm surge in their loss estimates. Some are also asking for the inclusion of losses from correlated lines such as workers compensation and auto in their loss estimates. More importantly, the rating agencies are expecting the catastrophe loss estimates to be based on models using the shorter-term view of higher hurricane frequency and severity. Standard and Poor's now include a specific catastrophe charge in both insurers' and reinsurers' target capital where in the past, only reinsurers received a specific catastrophe charge<sup>3</sup> (Fleckenstein, 2006). Insurers who

do not manage their exposure to catastrophic losses may face rating downgrades, which in turn affects their costs of raising capital and, if the downgrades are severe enough, their ability to attract new business (Insurance Information Institute, 2007). In the longer term, this may have the effect of encouraging stability and strengthening the insurance industry.

Ultimately, the availability of property insurance written "ex-wind" will increase as carriers scramble to write business that is less hazardous. Liability insurance will be the place where carriers will try and increase their writings to offset their diminished ability to write property coverage (Briggs, 2006).

Demand surge was rarely calculated into catastrophe models before 2004. After [Hurricane] Katrina, demand surge was estimated to be as much as thirty per cent and could well go higher in future storms (Cullen, 2006).

Consequently, modeling companies such as AIR have updated their hurricane models and modeling software to include enhancements that include the impact of demand surge (AIR Worldwide Corp., 2007). For example, in June 2006, RMS released a RMS RiskLink 6.0, a revised model that encompasses a new concept called "loss amplification". The new model represents a broadening of previous efforts to model additional classes of economic damage. Loss amplification looks beyond demand surge to encompass several new causes of additional loss necessary to project losses accurately under severe conditions. In addition to demand surge, they include repair delay<sup>4</sup>, claims inflation<sup>5</sup> and coverage leakage<sup>6</sup> (NAPCO, 2006).

However, models on their own are not a panacea. A model is a simplification of real life and a balance needs to be struck between complex models and practicality. Furthermore, there will always be room for differences in opinion. Therefore, models have to be combined with sound commercial judgement, to ensure they offer a powerful tool to assist insurers/reinsurers to manage portfolios of risk (Goulder and Waite, 2006).

### Impact of demand surge on the community

According to Dr George Walker (2005), the primary role of insurance in the reduction of the impact of disasters is the lessening of the human and economic impact of financial losses arising from the damage. For individuals and businesses, it does this by providing an assured source of funding to cover all or part of the financial costs of repair and reconstruction following damage, as well as other costs such as additional living expenses until homes have been repaired or reconstructed, or loss of profits due to business interruption. Because it is part of an existing system with established procedures, the processing can begin immediately with all the protocols in place, and those affected can be quickly informed of the situation (Walker, 2005).

This contrasts with other systems of funding recovery like charity or government relief, which generally require systems to be set up following the disaster, and in the case of government relief a considerable bureaucratic process to be followed applying for relief and getting any funds approved, all of which takes time and creates uncertainty at a time when those affected are seeking certainty. From an economic perspective, insurance means that funds become rapidly available for repair and reconstruction enabling the building and construction industry in particular to respond rapidly to the disaster, and in turn get money flowing through the local economy (Walker, 2005).

The New South Wales storms that hit coastal NSW, Newcastle, the Hunter Valley and surrounding districts in June 2007 are a prime example of how the Australian insurance industry plays a critical role in paying claims and contributing to the rapid rebuilding efforts of communities devastated by such disasters.

Recovery centres (one-stop-shops) were established in Wyong and Newcastle with two more established in Cessnock and Singleton. Insurers were given access to these recovery centres to interact with claimants and have a presence as required. Two

weeks after the storm, the general insurance industry had received approximately 33,000 claims with an estimated claims cost of around \$350 million (Insurance Council, 2007). The figure is estimated to rise above that, with figures of 55,000 claims at more than \$550 million in insured losses being touted by industry sources. Economic losses are expected to exceed \$1.2 billion.

To cope with the increased workload, insurers flew in claims assessors from interstate and brought resources from other states to assist in claims and recovery operations. By acting quickly and decisively, insurers helped speed up the recovery process in the local community. For example, with the help of their insurer, a number of pharmacies in Newcastle were up and running inside a week, serving the local community.

A key problem with demand surge is that it exacerbates the financial loss suffered by those who are under-insured or not insured at all. According to ASIC, initial estimates by the Insurance Council were that as many as fifty per cent of houses in the areas affected by Cyclone Larry in Northern Queensland were underinsured to some extent. Most home building policies in Australia are "sum insured" policies which require the insured to nominate a specified figure on the amount to be paid out in the event of total loss. However, estimating the rebuilding costs can be a complex and difficult task. The impact of demand surges cannot be adequately reflected in policies with a fixed sum insured. The potential solution could be for insurers to offer either Total Replacement Policies<sup>7</sup> or Extended Replacement Policies<sup>8</sup>. These types of policies are common in New Zealand and the United States where they are called "guarantee replacement policies". A few Australian insurers have introduced these types of policies, which will significantly address the problem of under-insurance by providing for the full replacement cost of the home (ASIC, 2007).

A very low penetration of insurance, particularly in regard to residential buildings, exacerbates the magnitude of disasters created by major natural hazards when they occur. This was demonstrated in Taiwan following the 1999 Chi Chi earthquake where

very few homes were insured. The burden of providing funds for the reconstruction fell on the government, who responded by organising up to US\$3 billion in low interest long term loans. Fortunately, the Taiwanese government had the funds to do this (RMS, 2000 and Walker, 2005). While the economic loss of the Taiwan Chi Chi earthquake was estimated to be US\$10-US\$20 billion, insured losses were only US\$ 600 million, which mostly went to manufacturing industries for business interruption losses. Loans spread the burden over time, but not across the community. Governments may use taxes to mitigate the individual impact within




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their own borders, but the advantage of insurance is that, through reinsurance, it can spread the burden across the whole insured population worldwide (Walker, 2005).

The enormous size and frequency of recent catastrophes and the potential for more frequent disasters, including a “super catastrophe” is an issue for governments, communities and the insurance industry. This is in view of the growing discrepancy between economic and insured losses following disasters and the ongoing issue of under- and non-insurance. The graph below illustrates not only the sheer growth of economic losses following catastrophes since the early 1990s but also the divergence of the trend line between economic and insured losses. The message is clear, as human populations expand in disaster prone geographic areas, the devastating impact of catastrophes will continue to be felt economically in these communities.

### Conclusion

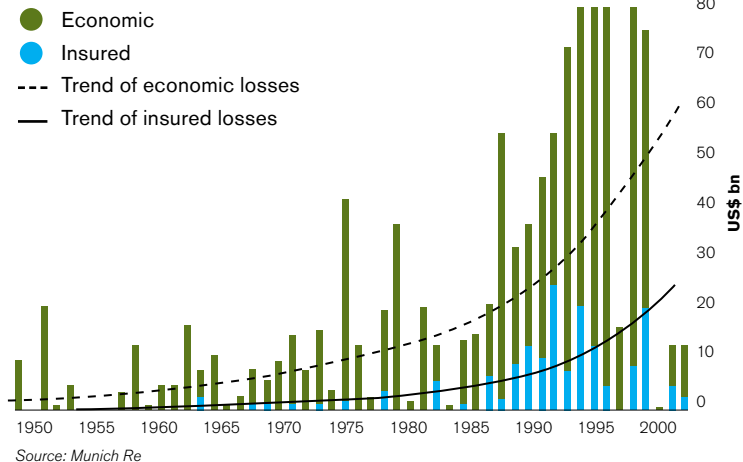
Demand surge is a significant loss driver that contributes to the overall insured loss following disasters. It is part of the vernacular of the insurance industry and increasingly at

the forefront of the debate about capital adequacy, risk mitigation and management, catastrophe modelling and the role of government and capital markets, following catastrophes.

Risk is what insurance is all about. Although wise to be wary of it, the industry could not survive without risk. Exploiting the opportunities, while managing the threats, arising from new risks has been a major factor in the survival and expansion of the insurance industry for several centuries (Walker, 2005).

Nevertheless, insurers do not have sole responsibility in alleviating the financial impact of disasters on communities. According to a CRO Position Paper on Climate Change and Tropical Cyclones in the North Atlantic, Caribbean and Gulf of Mexico, governments bear key responsibility for risk mitigation in society, such as avoiding development in high-risk

zones, building and maintaining flood defences, developing and enforcing construction codes or establishing emergency management organizations. Jointly with the regulatory authorities, they play a vital role in ensuring the viability of private insurance by creating appropriate legislative and regulatory frameworks. Similarly, individual or corporate insured clients need to participate in sharing the risk of financial losses. A significant retention of potential loss is a powerful incentive to prevent or mitigate losses and reduce administrative costs by absorbing small, high-frequency losses. The insurance industry can create incentives for these mitigation measures and further add value by contributing risk analysis and management expertise to help entities and regulatory authorities handle risks optimally. By absorbing financial and insurance risk, the insurance industry plays an indispensable role in today's



economic system. If this is to continue, the industry must minimise surprises (Aichinger, et. al. 2006).

It was noted in a report by Munich Re (2006) that there is a legitimate interest on the part of clients to have their losses of whatever origin indemnified, but there is also a legitimate interest on the part of insurance companies to pay only for the portion of losses for which a premium has been calculated and charged. This is a basic principle of insurance, and violating this principle ultimately renders insurance unfeasible. The only clear-cut solution is to redesign the way in which disaster losses are apportioned between the public and the private sector with the aim of avoiding unnecessary and unintentional overlaps (Munich Re Group, 2006).

The insurance industry will adapt and cope with the issues pertaining to demand surge by creating and using ever-sophisticated models, using capital markets (e.g. with catastrophe bonds) and risk mitigation options, diversifying risks globally and by working with governments. The insurance industry does and will continue to help society balance the needs of rapid rebuilding, cost control and the allocation of dollars in the period following a major disaster or catastrophic event. **II**

The full text of this presentation, as well as references, is available on the Institute's website, [www.theinstitute.com.au](http://www.theinstitute.com.au).

#### Endnotes

- <sup>i</sup> **AIR** is a risk modelling and technology firm specialising in risks associated with natural and man-made catastrophes, weather and climate. **AIR** provides analytical tools and software systems to help companies manage that risk.
- <sup>ii</sup> **ISO's Property Claim Services (PCS)** unit serves property/casualty insurers and reinsurers as a source of catastrophe loss information, providing estimates of anticipated industry-wide insured losses arising from catastrophes. **ISO** is a provider of products and services that help measure, manage, and reduce risk. ISO provides data, analytics, and decision-support solutions.
- <sup>iii</sup> The charge is an estimate of the global annual aggregate losses from natural catastrophe events at the one-in-250 year level.
- <sup>iv</sup> **Delay in Repair:** Evacuation, labor shortages and other factors can cause a delay in repairs to damaged properties. When the delay is lengthy, additional damage from mold, spoilage, contamination and moisture infiltration can occur, exacerbating the direct storm damage. Delays in repair can amplify property, contents and time element losses. (NAPCO LLC, 2006).
- <sup>v</sup> **Claims Inflation:** Claims inflation or exaggeration can occur after a severe event results in an overwhelming number of claims. The desire to help policyholders by settling claims promptly may conflict with prudent and proper claims adjusting practices. Insurers also face societal and political pressure to settle large volumes of claims quickly – and generously – to restore the community and local economy. Given these circumstances, inflated and fraudulent claims invariably slip through the cracks. (NAPCO LLC, 2006)
- <sup>vi</sup> **Coverage Leakage:** Coverage leakage occurs when policyholders report property damage in the most favourable light based on their coverage. For example, those without flood coverage or with large flood deductibles tend to portray all losses as resulting from wind damage. In situations with widespread damage, and pressed with a need to resolve claims quickly, carriers may not aggressively dispute the characterization of claims. (NAPCO LLC, 2006)
- <sup>vii</sup> **Total Replacement Policies:** The insurer agrees to pay all rebuilding costs, not just those costs up to a specified amount.
- <sup>viii</sup> **Extended Replacement Policies:** The insurer will meet potentially higher rebuilding costs higher than the nominated sum insured where the house is destroyed in a mass disaster.



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