UNITED STATES DEPARTMENT OF THE TREASURY
ADVISORY COMMITTEE ON RISK SHARING MECHANISMS
SUMMARY OF PUBLIC MEETING

June 9, 2017

The Advisory Committee on Risk Sharing Mechanisms was convened at 10:06 a.m. on June 9, 2017, in the Cash Room at the U.S. Department of the Treasury, 1500 Pennsylvania Avenue NW, Washington, D.C., with Wendy Peters, Chair, presiding.

In accordance with the provisions of the Federal Advisory Committee Act, the meeting was open to the public.

Committee Members Present:

WENDY PETERS, Executive Vice President, Financial Solutions – Terrorism and Political Violence, Willis Towers Watson, *Chair*
JONATHAN CLARK, Managing Director, Guy Carpenter & Company LLC
KEAN DRISCOLL, Vice President and CEO, Validus Reinsurance, Ltd.
GREGORY HENDRICK, President, P&C Insurance and Reinsurance, XL Catlin
EDWARD RYAN, Senior Managing Director, Aon Benfield
MICHAEL SAPNAR, President & CEO, Transatlantic Holdings, Inc.
JOHN SEO*, Managing Principal, Fermat Capital Management LLC (represented by proxy Adam Schwartz)
KEITH WOLFE, President US P&C – Regional & National, Swiss Re

*Represented by proxy

Also Present:

STEVEN SEITZ, Deputy Director, Federal Insurance Office, U.S. Department of the Treasury
LINDSEY BALDWIN, Designated Federal Officer, Senior Policy Analyst, Federal Insurance Office, U.S. Department of the Treasury
RICHARD IFFT, Senior Regulatory Insurance Policy Analyst, Federal Insurance Office, U.S. Department of the Treasury
JULIAN ENOIZI, CEO, Pool Re
ROY WRIGHT, Deputy Associate Administrator for Insurance and Mitigation, Federal Emergency Management Agency
HOWARD KUNREUTHER, Professor, Wharton School at the University of Pennsylvania and Co-Director of the Wharton Risk Management and Decision Processes Center

Introduction

Deputy Director Seitz welcomed all attendees to the meeting, and stated the meeting would focus on best practices and lessons learned from alternative risk-sharing mechanisms employed in other countries or other catastrophic loss exposures. He thanked the Committee and presenters for attending and noted that John Seo was unable to attend the meeting, but Adam Schwartz of Fermat Capital was attending as his proxy. He also announced that Brian Secrett from Lloyd's joined the Committee but was unable to attend the meeting.

Chairwoman Peters stated that the Committee would hear three presenters, followed by a short update from Richard Ifft of the Federal Insurance Office regarding the recently completed Terrorism Risk Insurance Program (TRIP) data call.

Mr. Sapnar, the Subcommittee chair, stated that the presenters were selected to provide a broad representation of the types of risk programs that are in existence. He added that rather than having an individual Q&A session after each presenter, the Committee would instead hold a panel discussion to facilitate additional commentary and interaction among the presenters.

Presentation by Pool Re[1]

Mr. Sapnar introduced Julian Enoizi, CEO of Pool Re, a government-backed terrorism reinsurer operating as a public-private partnership in the United Kingdom. Pool Re currently writes over $2 trillion of exposure in commercial property terrorism risk, and has paid over $600 million in claims. Mr. Enoizi has served as the CEO of Pool Re since 2013. He started his career as a lawyer practicing in London, Milan, and Brussels, and has held prominent positions with insurers AIG, Chubb, and Argo. Prior to joining Pool Re, Mr. Enoizi served as CEO for a private equity startup at Lloyds'. Mr. Enoizi has spoken at conferences worldwide, and sits on the advisory board of the OECD International Network on the Management of Catastrophes. Mr. Enoizi and Pool Re were also instrumental in the creation of the International Forum of Terrorism Risk Insurance Pools, which is comprised of 14 nations. Mr. Sapnar stated that Mr. Enoizi would be speaking about Pool Re's operations and other terrorism risk frameworks around the world.

Mr. Enoizi begin by providing some background on Pool Re, which was established in 1993 due to an inability of businesses to obtain reasonable commercial property coverage for terrorist attacks. Pool Re operates at no cost to taxpayers as a private industry mutual supported by a Government guarantee, with amounts repayable to the Government in the event of use. To date, Pool Re has dealt with 13 certified claim events, the largest being the Bishopsgate Bombing in London which occurred in 1993. The payout for that event was £262 million and the same event today would cause over £1 billion in damage due to increased property density and values. Although Pool Re was originally set up with a focus on London risks, over time it has spread over the entire country. Governance of Pool Re occurs via a Board of Directors comprised principally of insurance industry representatives. It essentially operates as a private company with a public policy objective.

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[1] Mr. Enoizi's presentation is available at https://www.treasury.gov/initiatives/fio/acrsm/Documents/ACRSM_Presentation_By_Pool_Re.pdf.

Mr. Enoizi stated that Pool Re was designed to be temporary, however it would be extremely difficult to get rid of it because it covers nuclear, chemical, biological, and radiological (NBCR) risks (which are difficult for the private market to insure). Pool Re does not go through a renewal process, but it does have a review every five years. Pool Re currently has five active claim notifications arising from the events arising at Westminster on March 22, 2017 and Manchester on May 22, 2017.

Mr. Enoizi stated that the current economics of Pool Re are significantly different than they were prior to the last review, which occurred three years ago. Pool Re is now permitted to buy commercial retrocession, with the intent of bringing the private market back into writing terrorism insurance. Program changes occurred during the last review because the private market is more willing to participate than it was in 1993, the government is limited by austerity and fiscal constraints, and the terrorist threat has changed significantly.

Pool Re is a pre-funded model, and Pool Re has collected £6.25 billion in premiums to date. Pool Re calculates the premium and tells insurers what to charge; insurers then cede all risk to Pool Re (which in turn cedes a portion to the government). Mr. Enoizi stated that the member apathy this creates is one of the program weaknesses that Pool Re is seeking to address. As a result, each year Pool Re is pushing the market retention amount higher so insurers have more "skin in the game."

Mr. Enoizi stated that Pool Re was able to purchase approximately £2 billion in commercial reinsurance with an A- rating or better, based on the price it was willing to pay. Each year, Pool Re has purchased marginally more reinsurance to ensure that they are buying the maximum amount possible. Mr. Enoizi stated that he believes NBCR risk dampened their ability to obtain additional reinsurance. Pool Re is hoping to add cyber coverage in the future, however Mr. Enoizi stated that he was told that Pool Re will be unable to obtain this level of reinsurance cover. However, he did acknowledge that it was an achievement for the purchase of reinsurance to reintroduce terrorism coverage in the private market in the United Kingdom for the first time in 23 years. Pool Re is also examining the possibility of purchasing insurance-linked securities (ILS), and the British government has introduced legislation to make purchase of a terrorism catastrophic bond possible.

Pool Re's reinsurance was initially purchased for Fire & Explosion, but was then changed to "All-Risks" with two exclusions for war and cyber coverage. NBCR coverage is no longer excluded from Pool Re's reinsurance. The inclusion of NBCR increases the probable maximum loss amounts from single digit billions (for conventional losses) to tens of billions (for non-conventional losses), which Mr. Enoizi said makes it difficult to imagine eliminating Pool Re.

Mr. Enoizi said that Pool Re was a fantastic model for the 20th century; it now needs to evolve to be a fantastic model for the 21st century. He said Pool Re is aware it is a good model but it is not a perfect model, and they are trying to improve by introducing more private market capacity. This will enable Pool Re to shift from its original structure as a "first-dollar" insurer to a catastrophe reinsurer.

A 9/11-level event (somewhere in the range of £10 billion) would be required before Pool Re would need to draw from taxpayer money. Rather than collecting money, Pool Re has attempted to move into a more pro-active role in mitigating terrorism losses.

The last government review of Pool Re took 12 months and focused on finances. Mr. Enoizi said the government alleged that the £30 million per annum Pool Re was paying them was insufficient to cover the amount of risk the government was undertaking. Pool Re responded that any money taken from Treasury to pay insurers would ultimately take the form of a credit, and would therefore need to be re-paid to the Treasury out of future premiums. The negotiation resulted in a far larger annual payment to the government (approximately £150 million per annum). In return, Pool Re was able to negotiate modernization mechanisms that allows Pool Re to act as a more proactive entity.

Turning to counterterrorism actions being undertaken by the British government and Pool Re, Mr. Enoizi noted that British government is looking to address democratic deficits in countries such as Egypt and Tunisia, and has asked whether a risk pooling mechanism should exist in countries where the U.K. has interests Mr. Enoizi suggested that a better option would be developing a private market, perhaps through a conduit similar to Pool Re. To this end, Pool Re has invited private insurers into meetings with the government to have discussion about developing terrorism insurance markets (including mitigation measures) in countries that would not otherwise have access to coverage for terrorism risk. In addition, Pool Re has partnered with the government's Office of Security and Counterterrorism to advise on risk mitigation, and Pool Re now offers a 2 percent premium discount for businesses operating in crowded spaces that comply with the measures recommended by the Office. Mr. Enoizi noted that the businesses able to meet the criteria for this discount comprise a relatively small part of the market, and accordingly Pool Re is working to roll out a self-certifying internet platform for smaller businesses. Businesses in this category who certify that they have performed government accredited actions will receive a larger discount (5 percent). Pool Re also seconded an individual to the U.K. Home Office, and this individual wrote an insurance section for the U.K.'s counterterrorism strategy which focused on involvement of the private market and resilience building. Pool Re has also looked at the resilience of buildings, and recently examined how to protect buildings from drone attacks.

Mr. Enoizi noted that Pool Re uses a flexible pricing model, and premiums change to reflect risk. For example, Pool Re knew it was likely not charging enough in London, and therefore has pushed prices up over time. However, it also recognized that it has likely been charging too much in provincial areas, and therefore has decreased prices to increase take-up rates. Pool Re has also partnered with academia to understand terrorism risk pricing, including pricing for cyber and NBCR risk, and Pool Re is currently sponsoring a Professor of Terrorism Risk Management and Resilience at Cranfield University. Mr. Enoizi emphasized that the pricing mechanisms developed through these collaborations all have a mitigation component, including an obligation or incentive for the insured to access the cover.

Mr. Enoizi said that Pool Re is aware of the coverage gap that exists with cyberterrorism – it is possible to cause physical damage via cyber and Pool Re wants to close this gap. He noted that in the United Kingdom there is a period during which Pool Re is not able to communicate with the government due to elections, however he expects that future discussions with the government relating to cyber terrorism cover will include a condition that insurers implement cyber resilience measures. He estimates that inclusion of cyber in the program would result in a premium increase of approximately 10 to 15 percent.

Pool Re has set up a terrorism risk research and analysis center, which is available to members to help them assess their risk and determine if they want to purchase a deductible in-fill policy (which in turn stimulates the private market). This information is also made available to Pool Re's reinsurers and the government.

Mr. Enoizi noted that Pool Re was the driving force in bringing together pools from other nations to exchange information. 14 countries have national pools, and each operates differently. Mr. Enoizi believes that collaboration is important because sharing information will allow for aspects to be taken from each pool structure build an optimum model that shares risk and premium between the consumer, the insurer, and the government.

Mr. Enoizi stated that Pool Re's objective is to operate only where there is market failure, and the company undertakes a competition law review each year to ensure it is not stifling the private market. Furthermore, Pool Re is incentivizing the market to take as much risk as possible. As a result of the 2014 government review, Pool Re now has the ability to pay insurers a dividend out of its surplus (in effect returning premium to the industry). This ability to pay dividends is intended to correspondingly increase member retention.

Mr. Enoizi said that Pool Re would also like to return more pricing control to the market. Part of the problem with the current structure is that all insurers charge the same premium (set by Pool Re), therefore no insurer has a competitive market advantage. Although he indicated he does not have an answer for how to handle the issue, Pool Re's Chief Underwriting Officer is working on finding a way to create more price differentiation and competition in the market.

Pool Re only covers large-scale property damage, and does not include workers' compensation. The three events over the past few months have shown different forms of loss than originally intended under the program. In the aftermath of the Westminster Bridge attack, major attractions in London were shut down, and business interruptions to the economy were significant but not covered (because Pool Re coverage responds only to property coverage and business interruption resulting from the property coverage). Once the Treasury certified the Westminster attack as terrorism, all of the property policies that would have otherwise covered business interruption losses were no longer covered, therefore creating a gap in coverage.

France identified a solution to this problem by attaching a €1.4 charge to every policy sold, however Mr. Enoizi said he believes that in Britain he would consider it a failure if the government had to impose a tax to solve a problem that could be instead solved by Pool Re. Accordingly, he stated that a preferred solution would be either to extend Pool Re coverage to business interruption, or persuade the market to remove the terrorism exclusion from their policies. With the exception of this gap, Pool Re provides back-to-back coverage, so the loss would either be a property loss, or a terrorism loss.

The Westminster attack also raised the issue of the use of a vehicle for terrorism. The motor insurance community in the United Kingdom is not pricing for this type of event, and they are therefore worried about the ramifications. Pool Re is having conversations to determine how to close this gap.

Finally, the attack raised the issue of personal injury. Injuries under the attack are covered by the government under the civil injuries compensation program, however these types of injuries can also be viewed as an insurable event that the industry could provide a coverage for.

Pool Re has spent a lot of time trying to determine how to improve its model, and insure other types of "uninsurable" risks such as cyber attacks, pandemics, and climate change. Mr. Enoizi stated that he doesn't believe it is necessary to nationalize these types risks, and a conduit can be developed for the market to take as much risk as it is capable of; leaving the government with the systemically and societally catastrophic risk that it would nonetheless be left with regardless of the private market's involvement.

Mr. Enoizi noted that it is important to address the information gap in how the government relays threat information to businesses. Many businesses complain that they don't know what to tell their employees about threats, and Pool Re can provide a conduit for providing this type of information on how to respond.

Mr. Enoizi said that Pool Re spends a lot of time examining other models, such as the California Earthquake Authority and the New Zealand Earthquake Authority. These models provided Pool Re with an incentive to incorporate mitigation measures into its program. Mr. Enoizi then returned to a discussion of the different terrorism risk pooling mechanisms used around the world, and repeated that the coverage under these programs differs -- for example, some cover life insurance arising from terrorism, some cover injuries that occur from terrorism abroad. Mr. Enoizi presented a chart comparing the different pool models used around the world.[2]

Mr. Enoizi concluded by reiterating that Pool Re's purpose is to add value by changing the behavior of consumers and enhancing resilience in economies. Pool Re has operated for 23 years at no cost to taxpayers, and even if the taxypayer did have to pay (through the Treasury), Pool Re would have to repay these amounts. The risks since 9/11 have changed, and Pool Re in turn has had to change by encouraging private market to take the risk rather than nationalizing it.

Presentation by Federal Emergency Management Agency[3]

Mr. Sapnar introduced Roy Wright, the Federal Emergency Management Agency's (FEMA) Deputy Administrator for Insurance Mitigation. Mr. Wright leads FEMA's federal insurance and risk mitigation administration that delivers the agency's risk management, risk reduction, and flood insurance program. Mr. Wright directs the National Flood Insurance Program (NFIP), the mitigation resilience programs under FEMA's Stafford Act authority, the National Earthquake

[2] This chart is located on page 14 of Mr. Enoizi's presentation, available at https://www.treasury.gov/initiatives/fio/acrsm/Documents/ACRSM_Presentation_By_Pool_Re.pdf.

[3] Mr. Wright's presentation is available at https://www.treasury.gov/initiatives/fio/acrsm/Documents/ACRSM_Presentation_By_FEMA.pdf.

Hazards Reduction Program, and the National Dam Safety Program. FEMA's programs promote a risk-conscious culture, enable faster recover from flood disaster, and address long-term vulnerabilities to life, property, and the well-being of communities across the nation. Mr. Wright chairs the Interagency Mitigation Framework Leadership Group, which coordinates mitigation and resilience efforts across with federal government in consultation with state, local, tribal, and territorial governments, as well as the private sector. He is also responsible for the delivery of environmental and historic preservation technical assistance and compliance across FEMA programs. Mr. Wright was asked to speak about the NFIP's recent experience with purchasing private reinsurance.

Mr. Wright stated that although his program deals with a different peril, it engages with many of the same questions about the appropriate use of reinsurance. Mr. Wright stated that the NFIP is not just about insurance – Congress created the program 49 years ago by laying out four dimensions of focus: the assessment of risk (largely addressed with flood risk maps); working with communities to adopt building codes and standards to reduce future risk; developing incentives to take properties out of harm's way; and offering an insurance product. NFIP covers about 5 million policies offering $1.25 trillion in coverage.

NFIP is required to offer coverage to anyone who seeks it, regardless of how many claims they have filed or the nature of their risk. Although NFIP is a national program, Mr. Wright noted that the program is concentrated in certain locations (specifically Florida and Louisiana).

Congress mandated certain discounts in the creation of the NFIP for homes that were constructed in the past. Although these are sometimes referred to as subsidies, NFIP does not make payments to these homeowners, but rather charges these homeowners less than the actuarial rate. This has created the possibility that an event would occur which will require a payout that exceeds the Program's liquidity. Mr. Wright stated that outside of the losses from Hurricanes Katrina and Sandy, the NFIP runs in the black, even with the mandated discounts. NFIP accepts premiums from policyholders throughout the year, but also has a post-event funding mechanism in place.

Mr. Wright acknowledged that the Program is subject to a large amount of political concern. The NFIP is backed by the full faith and credit of the United States Treasury. Under the enabling statute, NFIP has borrowing authority from the Treasury. The NFIP borrowed money from Treasury following Hurricane Katrina, and there has been a small increase in the amount owed due to interest on the principal. Following Hurricane Sandy, NFIP borrowed additional money from the Treasury.

The NFIP is able to take advantage of Treasury interest rates with an average rate of 1.6 percent. However, the interest rates can fluctuate and a doubling of the current interest rate would put the Program in a position where it would not be able to service its debt. Over the past 12 years, NFIP has paid $4 billion to service its debt. Mr. Wright noted that under the enabling statute, the NFIP is not able to include the cost of capital (including servicing debt) in charging premiums, however the Program is required to use the premiums received to service the debt. He stated that under the current framing of the statute, there is no practical way for the NFIP to repay this debt.

Mr. Wright stated that in 2016, the Program suffered a large series of aggregate losses, and in early 2017 borrowed $1.6 billion. This borrowed amount included money needed to make an interest payment to Treasury. This was the second time in the Program's history that money was borrowed to service the Program's debt.

Mr. Wright stated that the priorities of the NFIP are to bring far more transparency to the financial framework of the program. He believes that good public policy and stewardship demands it, and to the degree that the Program is engaging private markets, this transparency is necessary.

In 2012 and 2014, Congress took statutory action to encourage NFIP to secure "risk transfer instruments" such as reinsurance and insurance-linked securities. In 2012, NFIP began a study to analyze risk and understand the viability of reinsurance. Mr. Wright stated that some of his predecessors did not favor purchasing reinsurance, because the cost of reinsurance was higher than the rate offered by Treasury. Therefore, even though the study found that reinsurance was an available option, NFIP decided not to move forward with purchasing reinsurance.

Mr. Wright stated that when he entered a leadership role with FEMA two years ago, he wanted to move forward with reinsurance to ensure a strong financial framework. The Program was not able to transfer all of its top-end risk, but Mr. Wright believed it was important to begin to transfer some of the risk while there was an abundance of capital available in the marketplace. As a result, although the NFIP is still dependent on the Treasury, it now also leverages private markets.

The NFIP is the first federal program that has secured reinsurance, although several government-sponsored enterprises have previously secured reinsurance. The NFIP has authority to enter into arrangements and contracts with companies (both in selling policies as well as signing treaties outside of the federal acquisition processes that would normally be used), although this authority had never previously been exercised. Based on this authority, in Fall 2016, the NFIP ran an administrative reinsurance test and identified three large markets to work with. NFIP used a broker to help facilitate the process to ensure legal compliance as well as to ensure that the markets had confidence in the success of the untested instruments that NFIP was placing in the market.

Mr. Wright said that FEMA's research found that the Trade Agreement Act (TAA) would apply to its reinsurance. TAA says that the U.S. government can only engage in purchasing services from countries that are part of the World Trade Organizations. However, this meant that the NFIP could not engage with Bermuda (a major source of reinsurance). The NFIP was able to work around this as the major reinsurers had subsidiaries in the United States or other TAA-compliant countries, but NFIP nonetheless had to ensure that underwriting, modeling, treaty execution, and claims would be done in a TAA-compliant country.

NFIP purchased reinsurance on an occurrence basis as a "cornerstone" placement. Mr. Wright said that the NFIP intends to continue to build on this purchase, and the program is currently analyzing how it should build out its reinsurance and utilize other instruments in the future.

Mr. Wright stated that NFIP is still learning about ways to relay data to reinsurers while complying with the Privacy Act. For example, the NFIP cannot provide loss information on an address basis while remaining compliant with the Privacy Act, however data can be released at a zip code level and include policy count and losses. Given these restrictions, Mr. Wright said the next step will be to look at losses within a certain distance from the flooding source within those zip codes.

FEMA has established several "moonshots." It would like to see flood coverage doubled by 2023. There are about 150 million households in America, and about 10 million fall within the highest hazard zone. NFIP currently insures 5 million policies. FEMA plans on achieving this goal through the private market as well as through improvement of the NFIP.

Currently, everything in the NFIP is relayed through the private sector (primarily through the write-your-own program), and there are no FEMA employees who sell policies or adjust claims. Many desire to see the private markets grow, and Mr. Wright expressed his commitment to working towards this goal, as he believes private absorption is best for the program. However, there has been an extended political discussion about where private absorption should be placed, and Mr. Wright stated his belief that if there was a "silver bullet" the problem would have been solved long ago. He added that when the Program was created, people assumed that homeowners would move out of harm's way, and the private market would be able to establish and entirely own a market. Yet, to date this has not happened. Accordingly, Mr. Wright stated that NFIP must continue to look at its financial framework and its IT, and continue to change its customer experience.

Presentation by Wharton School, University of Pennsylvania[4]

Mr. Sapnar introduced Mr. Kunreuther, a Professor of Decision Sciences and Public Policy at the Wharton School and Co-Director of the Wharton Risk Management Decision Processes Center. Mr. Kunreuther's area of interest is in the ways that society can better manage low probability, high consequence events related to technological and natural hazards. Mr. Kunreuther is a fellow of the American Association for the Advancement of Science and a Distinguished Fellow of the Society for Risk Analysis. He currently serves on the NASNRC Roundtable on Risk Resilience and Extreme Events. His recent books include *At War With the Weather*, *Insurance and Behavioral Economics: Improving Decisions in the Most Misunderstood Industry*, and *Leadership Dispatches: Chile's Extraordinary Comeback from Disaster*. Mr. Kunreuther received the 2015 Shin Research Excellence Award from the Geneva Association and the International Insurance Society in recognition of his outstanding work on the role of public-private partnerships in mitigating and managing risks, as summarized in his paper "The Role of Insurance in Reducing Losses from Extreme Events: The Need for Public-Private Partnerships."

Mr. Kunreuther wanted to build on the comments made by Mr. Enoizi and Mr. Wright and focus on the role that behavioral economics, in particular linking intuitive and deliberative thinking, plays in insuring against terrorism and other extreme events.

[4] Mr. Kunreuther's presentation is available at https://www.treasury.gov/initiatives/fio/acrsm/Documents/ACRSM_Presentation_By_Wharton_School.pdf.

Mr. Kunreuther stated that data and analysis have shown that some insurance markets work extremely well. Term life insurance, auto collision, and homeowners' insurance are some examples where policy prices accurately reflect risk, because the prices are based on historical data. However, pricing poses challenges for extreme events such as terrorism and flood, which are low probability events that can cause very high consequences. Mr. Kunreuther stated that these create challenges for policyholders, regulators, and insurers we have limited personal experience with these events and limited data, and the data we do have is changing over time. Mr. Kunreuther added systematic biases exist in estimating the likelihood and consequences of these events, and humans use simplified decision rules as a result of these biases.

Mr. Kunreuther highlighted *Thinking Fast and Slow* by Daniel Kahneman as a book that has influenced the work of the Wharton Risk Management Decision Processes Center. This book discusses two systems of thinking: intuitive thinking (system 1) and deliberative thinking (system 2). Mr. Kunreuther stated that intuitive thinking operates automatically and quickly with little or no effort. In intuitive thinking, decision-makers use very simple associations, and emotions and judgmental bias play a key role. Past experience is also extremely important in making a decision, so there are challenges when a decision-maker doesn't have experience with the situation. Mr. Kahneman's book states that humans do extraordinarily well when using intuitive thinking to make everyday decisions (i.e. deciding to stop a car in a near-accident situation), however we do very poorly when using intuitive thinking to handle low-probability events. Therefore, the goal is to move closer to deliberative thinking, which requires examining cost-benefit analysis, interdependencies, and long-term strategies. Mr. Kunreuther said that the goal of decision-makers should be to get to the point where we can recognize intuitive thinking and substitute deliberative thinking.

Mr. Kunreuther then discussed behaviors triggered by intuitive thinking. First, he discussed availability bias, in which people estimate the likelihood of a disaster by its salience. For example, they will make a purchase after a disaster occurs, and not before (even though when asked, they would respond that it's less likely for another event to occur after the first event). The second bias held by humans is the threshold model, in which people fail to take protective measures if the perceived likelihood of disaster is below the threshold level of concern. A third bias is imperfect information, in which people misperceive the likelihood of the event occurring as well as its consequences. Finally, Mr. Kunreuther discussed myopia, which is the focus on short-term horizons in comparing upfront costs of protection with expected benefits from loss reduction. People resist the high up-front cost of protection because they don't believe that they will experience a loss within the short term, even if the long-term benefits will outweigh the cost.

Mr. Kunreuther then discussed how decision-makers can move to a system of deliberative thinking which respect to insurance. Although insurance is a mechanism for protection against financial loss, many people view it as an investment mechanism and therefore do not purchase insurance because they believe they will not receive a "return" on their investment. For example, even if an individual purchases flood insurance after a flood, a few years later they will stop buying premiums because they believe they could have saved money on the premiums they "invested." To counteract this behavior, Mr. Kunreuther suggested highlighting the importance of buying insurance for peace of mind, and reminding policyholders that the best return on an insurance policy is no return at all. He stated that the Decision Processes Center had proposed the idea that an insurance company could give a "bonus" to a policyholder at the end of the year, and encourage the policyholder to use that bonus to celebrate the fact that they did not experience a loss. Mr. Kunreuther suggested that this framing could help relieve the anxiety and worry an individual experiences when they do not have insurance protection.

Mr. Kunreuther also emphasized counteracting availability bias by highlighting the financial problems that would result if a disaster occurs and the business does not have insurance. He also stated that it is possible to successfully overcome the threshold model by expanding the time horizon when looking at potential losses – for example the probability of experiencing a flood in the next year may be one in a hundred, however if an individual stays in their house for the next 25 years, there is a greater than a one in five chance of experiencing at least one flood. Framing the possibility of loss in this way increases the likelihood that an individual will buy coverage, and they will be willing to pay more for that coverage. He added that the Decision Processes Center is working with FEMA and a White House Task Force to determine the best way to communicate this information type of information to consumers and encourage the purchase of insurance to protect against future losses.

Mr. Kunreuther stated that insurers can be subject to the same biases. As an example, he stated that prior to 9/11, U.S. insurers did not charge anything for terrorism insurance despite the attempted bombing of the World Trade Center in 1993, the 1995 Oklahoma City bombing, and other terrorist attacks throughout the world. After 9/11, many insurers refused to provide terrorism coverage, or if they did they charged extremely high premiums.

This behavior shows that prior to 9/11, insurers treated the likelihood of a terrorist attack in the United States as below their threshold level of concern. After 9/11, availability bias played a key role, as insurers focused on the enormous potential claim payments from another terrorist attack and therefore determined that terrorism was an uninsurable risk. Mr. Kunreuther stated that the passage of TRIA was an interesting solution to this problem, but also noted that it took 9/11 for TRIA to emerge as an option. Mr. Kunreuther added that imperfect information also played a role in insurer behavior, because insurers failed to take into account the likelihood of a future terrorist attack in determining premiums.

Mr. Kunreuther stated that one of the difficulties with providing terrorism risk insurance is estimating the risk of terrorist attacks. Terrorism events are unpredictable, and the United States has limited data available to assess terrorism as a risk. In addition, terrorism risk is impacted by dynamic uncertainty, because the likelihood and consequences of terrorist attacks are determined by a mix of strategies and counter-strategies which will change over time. As a result, past experience cannot play the same role as it does analyzing other types of risks (i.e. automobile or homeowners' coverage). Mr. Kunreuther also noted that interdependency plays an important role in terrorism risk, because terrorists will respond to security measures by attacking more vulnerable targets, and damage to an unprotected target can impact a protected one. Finally, the government has influence on the risk of future attacks and the will of terrorist groups. Mr. Kunreuther re-emphasized Mr. Enoizi's and Mr. Wright's statements that mitigation is extremely important, but addressing these challenges is also critical.

Mr. Kunreuther concluded by identifying the theoretical features of a public-private partnership for insuring terrorism and other extreme events, and discussing whether these theoretical features could be implemented in practice. Under this theoretical scheme, the facility at risk would pay for small losses, through deductibles or other mechanisms. The private insurer would pay for medium losses, the reinsurer would pay for large losses, and the federal government would for catastrophic losses. The government could also play an additional role. In flood insurance, for example, the government plays a role in flood plain management, building codes, and land use regulations.

Mr. Kunreuther noted that the TRIA program has many of the features outlined in this type of public-private partnership. Insurers have a deductible that they must meet, and the private insurance industry pays for much of the losses. Private reinsurers may enter and provide coverage for the next layer, and ultimately the government covers catastrophic losses.

In 2014, prior to the most recent re-authorization of TRIA, the Decision Processes Center conducted a study with RMS involving a variety of terrorism risk scenarios and examined the impact in four different cities (Chicago, Houston, Los Angeles, and New York). Mr. Kunreuther provided several charts showing the outcome of these scenarios.[5]

Mr. Kunreuther identified several open questions for the Committee to consider:

- How do you estimate the risk of terrorist attacks?
- What data can the public sector provide to address the need to estimate risk?
- How do you construct worst-case scenarios that will make people pay attention?
- What is the role of catastrophic modeling companies in providing data?
- What mitigation measures can be undertaken to reduce future losses?
- What data can the public sector provide to mitigate future losses?
- What premium reductions should be applied to encourage investment in risk-reduction measures?
- What impact will a future large attack have on insurer behavior?
- Will uninsured firms who suffer losses receive federal relief? (Mr. Kunreuther noted that if federal relief if provided, individuals will not purchase insurance)
- Are there affordability issues that need to be dealt with? How should it be handled if an individual cannot afford coverage?
- What can we learn from international comparisons?

Mr. Kunreuther summarized his thoughts by stating that stated that people do not understand the role of insurance, and we need to help them understand. Insurance can help spread the risk of unavoidable disasters and offer incentives to invest in adaptation or mitigation measures. He added that decision-makers need to combat myopia and encourage consumers to purchase insurance by focusing on the long-term while providing short-term incentives.

Panel Discussion

Chairwoman Peters opened the floor for panel discussion.

[5] See presentation for these charts.

Chairwoman Peters noted that there is an increased focus in the insurance industry on analytics, from a determinative perspective, an aggregation perspective, and potentially a probabilistic perspective. How much will these analytics have an impact on risk capital? Mr. Enoizi said that deterministic analytics have improved a great deal, but on the probabilistic side there are still issues. It is nonetheless important to work on improving probabilistic analytics. He said that Pool Re has looked into developing heat maps of events to determine where it is more likely that a terrorist attack will occur, and then incorporating this relative risk into pricing. Mr. Kunreuther added that the existence of catastrophic and reinsurance protections encourages businesses to purchase policies. He stated that one of the benefits of TRIA is that federal protection is provided despite an estimate of probability, with the expectation that 140 percent of the protection will be charged back at a future date. He said this system works because it is difficult to charge a premium when you cannot determine the probability of an event occurring. Mr. Wright stated that from a pricing perspective, having data is important, yet he has not seen data emerge that has had an impact on consumer action. He added that the United States has more flood data available than any other country, but even if a consumer is shown this data in a variety of ways, there is no impact on behavior. The consumer has an expectation that someone else will pay for the loss even if they do not purchase insurance. Mr. Wright stated that pricing signals do affect consumer behavior, therefore having sufficient data to inform the price is beneficial, though it remains insufficient because consumers use data to reinforce their pre-existing opinion that they do not need to purchase insurance. Mr. Kunreuther added that insurance premiums should reflect risk (even if the premium is not actually charged) so that policyholders are able to understand the risk and can decide whether they want to take action or mitigate the risk. He stated that he is on the FEMA/TEMA committee, which has pushed very hard to do this, but acknowledged this is possible with respect to flood risk in a way that it is not possible for terrorism risk due to the lack of information available about probability. Chairwoman Peters responded that there is a difficulty in assessing whether rates for terrorism risk are truly reflective of the risk and aggregation.

Mr. Hendrick asked the panel whether they had done any research on the differences between acts of fortuity (e.g., weather, forest fire, flooding) and acts done by individuals deliberately trying to cause damage (e.g., terrorism, cyber attacks). He questioned how you determine the appropriate risk level when the causative agent is someone is trying to cause damage. Mr. Kunreuther concurred that it is difficult to do so, particularly because a terrorist may react to any mitigation actions that you take, however there are mitigation measures that can be taken to reduce damage. In terms of the risk of an event occurring, it is much harder to estimate an act initiated by a human because you don't have the scientific data that you would for flooding or an earthquake. He also noted that there is an added risk with human-caused events because as a policyholder, you could take the proper steps for mitigation, but still be affected if a neighboring building is attacked. Mr. Enoizi noted that there is some knowledge about the types of risks that the market will accept. For example, although the private market may not write for risks such as NBCR or cyber, it will write for small or medium-sized risks in the provincial towns of England. Therefore, Pool Re believes it is important to find a way to let the market write these risks, and push the catastrophic risks to the government. Mr. Enoizi noted that the key is to finding this balance of which risks the market will accept. He added that it is impossible to know whether the pricing Pool Re uses is right until an event actually occurs, but noted that he has the ability to adjust prices, and that the price of commercial reinsurance also serves as a check on whether the pricing is accurate.

Mr. Clark noted that Pool Re has been in existence for 25 years and has up to $8 billion in protection. He asked Mr. Enoizi how much debate they have had within Pool Re about determining the proper amount of capital, and the proper proportion of sharing across sources of capital. Mr. Enoizi responded that Pool Re has had many debates about how much is enough capital, and in the 1990s when small attacks were a weekly occurrence it might have been better to have the capital reside with the private market, however now that the risk is with larger "black swan" events it could be better to have this capital reside with the Treasury. However, Mr. Enoizi stated that he believes the private market is better at with the ability to efficiently model claims, and the current system incentivizes private market activity.

Returning to the discussion of whether the current level of capital is sufficient, Mr. Enoizi stated that the ability to model radiological or nuclear losses has demonstrated that £6.5 billion is not enough. However, he added that increasing the capital from £6.5 to £20 or £30 billion is not the right action, and the money would be better spent investing in mitigation to either prevent the event or limit damage.

Mr. Driscoll commented that the risk retention of the U.S. insurance industry under TRIA is fairly sizeable in comparison to Pool Re. He also stated that conventional terrorism and NBCR risks can be bifurcated. NBCR risk losses are unknowable and governments can provide protection for these losses, however for conventional terrorism the reinsurance market has capacity beyond the confines of TRIA, and he therefore suggested that may be where reform should be focused. Given this, he asked Mr. Enoizi how much capacity he believed was in the market beyond the $2 billion in reinsurance that Pool Re has purchased. Mr. Enoizi responded that he wasn't sure because Pool Re hasn't attempted to purchase additional coverage, but it has thought about bifurcation and is actively looking at whether Pool Re should increase the market retention on conventional terrorism, but leave it at its current level for NCBR and cyber. Mr. Enoizi added that he believes it would be possible to purchase more reinsurance, but it would not be sufficient to cover a large loss (i.e. the size of 9/11) given certain risk aggregations.

Mr. Sapnar stated that Pool Re does not have mandatory offer or purchase provisions, as compared to the United States which has a mandatory offer requirement (at the federal level) and price restrictions (at the state level). Mr. Wright added that NFIP does not have mandatory offer provisions, but it does have some provisions which require purchase of flood insurance for federally-backed mortgages in certain areas. Mr. Sapnar asked the panel to comment on: (1) the merits of a "mandatory offer" program that does not require purchase as well, (2) why Pool Re has chosen to not make offer or purchase mandatory, and (3) how the post-funding mechanism under TRIA (which requires 140% recoupment) would operate if an event occurs that only impacts a few risks/insurers, but nonetheless results in the imposition of a policy surcharge across the industry. Mr. Enoizi responded that very few of the European pools have mandatory offer or purchase provisions, including Pool Re. He stated that he does not believe in mandatory coverage, but having a mandatory offer provision would be a positive step in reducing moral hazard. He said a mandatory offer provision would erase post-event issues if a consumer chose not to purchase terrorism coverage, because they made an affirmative decision to not purchase.

He added that if a large event occurred, Pool Re would be required to raise rates for all policyholders to ensure that no insurers went insolvent. Mr. Kunreuther stated that for low probability events, a decision must be made about what to do if people do not purchase insurance (or go undetected when they are required to have insurance, but they cancel their policy). Should people be required to purchase insurance because it is a societal problem? Should be people entitled to protection if they live in high hazard areas? He noted that the requirements can be placed in the private sector – for example individuals who take out mortgages are required to have homeowners' insurance. Mr. Kunreuther stated that his work has advocated for an "all hazards" policy which would include all risks (such as flood, earthquake, etc.), but a system which also has a role for the public sector in handling catastrophic risks, mitigation, and issues of fairness. A question still exists of how this system would provide disaster relief an individual who lives in a high hazard area but may not have coverage (i.e. because they are not a homeowner). With respect to who should pay for losses, Mr. Kunreuther stated that this is an open question and the Wharton Risk Center has not explicitly addressed this issue except to say there are different ways of dealing with it. Uniform rates suggest that everyone is responsible for payment, while risk-based rates take the position that individuals in high-risk areas should be responsible (although this creates questions about affordability and fairness which may need to be addressed through public sector involvement through vouchers or tax credits). Mr. Wright stated that the NFIP faces these issues, and the question of who should pay after a loss becomes a very difficult conversation. He added that part of the reason that the NFIP still has a debt of $24.6 billion is because it has not found an answer to this question, and in the interim it takes advantage of the low-interest rates to just pay interest on the NFIP's debt.

Mr. Sapnar asked Mr. Wright to provide any lessons learned about the process of entering the private market. Mr. Wright stated that NFIP spent too much time (approximately three years) studying the issue after making a public commitment to purchase reinsurance, due to a lack of political will. Mr. Kunreuther added that NFIP is a valuable program, but the involvement of the private market creates the potential problem of "cherry picking" where the federal program will end up paying for all of the high risk premiums, and end up in more debt than it was before. As a result, one of the issues that needs to be looked at is the structure of how the private sector is involved. Mr. Wright noted that while these may be good questions to ask, when Congress is making a decision about the structure of a program, they are considering different criteria than a private market.

In response to a question from Mr. Ryan, Mr. Enoizi confirmed that Pool Re's market retention is £150 million, which is apportioned among the members of the pool based on the terrorism premium that they cede to the pool. Mr. Ryan noted that Mr. Enoizi had talked about giving insurers more "skin in the game" but stated that his understanding was that insurers were collecting premium and giving 50% to Pool Re, 50% to the government, and then recouping 25% of the profit. Mr. Enoizi confirmed that this understanding was correct, and added that up until two years ago, the retention was £100 million (and it had remained at that level for about 15 years), and they are now pushing that retention up. He stated that the 25% profit recoupment resulted from negotiations with the U.K. Treasury two years ago, and its purpose was to substantially increase market retention and redistribute the premium so it was not all ceded to Pool Re, but rather kept with the insurer (which in turn enabled the insurer to keep more of the risk). Mr. Ryan asked whether this caused insurers to recoup more premium than their exposure (because the money they were receiving back was greater than the £150 million retention). Mr. Enoizi responded that it was not, and confirmed that the insurers have net exposure that is greater than the premium they are collecting, however he noted that many of these insurers have far greater retentions in other areas (like natural catastrophe) so he can foresee the market retention easily be raised to £500 million in the near future, and even more in the longer-term. The intention is ultimately to turn Pool Re into a true catastrophe program where insurers hold a greater amount of ground-up losses. Mr. Ryan asked whether an insurer's expected recoupment should be line with their exposure from an actuarial perspective, and Mr. Enoizi stated that it would be in an ideal world, but at the moment this is not the case. Mr. Ryan followed up by asking whether Pool Re risked insurers not participating if they were not receiving recoupment in line with their exposure. Mr. Enoizi said this may be the case, but if it happened the result would be that the insurer would begin to write insurance coverage in the private market, which is not a bad thing.

Mr. Hendrick asked Mr. Enoizi for an estimate of the size of the private terrorism insurance market in the United Kingdom. Mr. Enoizi stated that 90% of the market cedes to Pool Re and a 10% private standalone market.

Mr. Hendrick asked Mr. Kunreuther whether fairness is a more appropriate factor when looking at personal lines of insurance, compared to commercial lines that generally protect companies and corporations. Mr. Kunreuther said it generally is more appropriate when discussing personal lines of insurance, however in the case of terrorism, small businesses are the ones indicating that they cannot afford coverage, they don't want to purchase it, or that they will be "rescued" if they go under after an event. Therefore, affordability and fairness is still a possible discussion from the perspective of looking at small businesses.

Update on Terrorism Risk Insurance Program

Mr. Ifft stated that Treasury conducted its first mandatory data call as required under the 2015 Reauthorization Act. The first phase of this data call was completed in May 2017, and in this phase insurers were required to submit information related to group affiliations, written policies, direct earned premiums by jurisdiction, exposure bases by jurisdiction, and reinsurance programs. Based on this information, Treasury is analyzing how small insurers are impacted by TRIA, and will be issuing a report which will be made public and distributed to the Committee. Mr. Ifft stated that Treasury received a large amount of information from the data call, and believes that it received responses from a very high percentage of insurers (by premiums) in the domestic licensed market. In addition, Treasury received substantial data from captive insurers and alien surplus insurers, which Treasury will also continue to analyze. Mr. Ifft stated that since 2017 was the first year the data call was mandatory, and because the focus of this year's mandatory report to Congress was on small insurers, the due date was bifurcated and all insurers except small insurers are required to submit additional information no later than October 1, 2017 if they did not submit complete templates by May 15. Mr. Ifft stated that he hoped to have more information available about the data call for the October 2017 ACRSM meeting.

New Business

Chairwoman Peters confirmed that there was no new business to discuss and stated the Committee would re-convene at its next meeting on July 28, 2017.

Chairwoman Peters adjourned the meeting at 12:14 p.m.

I hereby certify these minutes of the June 9, 2017 Advisory Committee on Risk Sharing Mechanisms public meeting are true and correct to the best of my knowledge.

Wendy Peters, ACRSM Chair