

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

July 28, 2017

The Advisory Committee on Risk Sharing Mechanisms was convened at 10:00 a.m. on July 28, 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. (represented by proxy Pat Reardon)

EDWARD RYAN, Senior Managing Director, Aon Benfield

MICHAEL SAPNAR*, President & CEO, Transatlantic Holdings, Inc. (represented by proxy Lisa Moser)

BRIAN SECRETT*, Head of Class of Business, Underwriting Performance, Lloyd's (represented by proxy Joseph Gunset)

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

BARRY GILWAY, President/CEO and Executive Director, Citizens Property Insurance Corporation

MICHAEL MILLETTE**, Founder and Managing Partner, Hudson Structured Capital Management

MARIA PAUL, Director, Product Management, RMS

PAUL SCHULTZ, Chief Executive Officer, Aon Securities

**Participated via telephone

Introduction

Deputy Director Seitz welcomed participants to the third 2017 meeting of the ACRSM, which focused on capital markets and insurance-linked securities. The first meeting focused on the direct insurance market, the second meeting focused on how the insurance market handles other types of catastrophic risks and how terrorism risk is handled in other countries. He thanked Mr. Seo for organizing the presenters, the presenters, as well as proxies attending the meeting on behalf of several Committee members.

Chairperson Peters stated that the meeting structure would follow similar structures used in the past, in which each presenter would be granted time to speak, followed by a panel discussion. She then outlined the order of presentations: Paul Schultz from Aon would present first with a focus on the structure of the capital markets; Maria Paul from RMS would then provide information on the modeling of terrorism and other catastrophic risks; joining by phone, Mike Millette of Hudson Structured Capital Management would speak from an asset management perspective, and finally Barry Gilway of Citizens Property Insurance Corporation would speak as a purchaser of catastrophic bonds ("cat bonds"). The panel discussion would be followed by an update from Mr. Ifft on the Terrorism Risk Insurance Program's recently-published small insurer study.

Presentation by Aon Securities¹

Mr. Seo provided an introduction for Mr. Schultz. Mr. Schultz serves as CEO of Aon Securities, and leads Aon Benfield's investment banking team, which provides investment banking products and services to Aon's clients on a global basis. Mr. Schultz specializes in providing clients with strategic advice and access to capital markets.

Aon Securities is an award-winning global investment bank with expertise in mergers and acquisitions, capital raising, strategic advice, restructuring, recapitalization services, and insurance-linked securities. Through partnership with Aon Benfield Analytics, the team also provides catastrophe management and re-insurance and insurance modeling tools, sidecar structuring expertise, and strategy consulting in areas including risk, capital markets, and capital. To date, Aon Securities has advised on more than 100 insurance-linked securities and M&A transactions.

Before joining Aon in 2000, Mr. Schultz spent 14 years at JP Morgan. In his current role, Mr. Schultz has advised Aon plc on issuing the first ever securitization of private equity limited partnerships and advised clients on M&A, starting new companies, issuing senior and subordinated debt, issuing equity and raising alternative capital via the issuance of catastrophe bonds, sidecars, and other collateralized structures and derivatives thereof.

Mr. Seo stated that Mr. Schultz would be providing background information about capital markets and the role they have played to-date in addressing terrorism risk.

¹ Mr. Schultz's presentation is available at https://www.treasury.gov/initiatives/fio/acrsn/Documents/ACRSM_Presentation_Aon_Securities.pdf.

Mr. Schultz stated that his presentation would be focused on the cat bond market, but confirmed that the information provided was generally indicative of all capital and collateralized capacity in the marketplace.

Mr. Schultz opened his presentation with a discussion of the history of the market, and how the market has responded to different types of market activities. He said that this information can serve as a proxy to demonstrate how the market might respond to providing terrorism capacity. Mr. Schultz identified several key highlights in a slide providing an alternative capital market timeline. The market is currently sitting at all-time record of just over \$26 billion of outstanding cat bonds. The market arrived at its current position through the issuance of over \$84 billion (comprised of 400 transactions) in cat bonds over the past 20 years. Despite the young age of the market, it has been very active and it is possible to identify lessons learned in applying the market to terrorism risk. Mr. Schultz outlined three categories of historical events: innovation, market response to events, and landmark milestones.

Early market events (in the first 10 years) were largely driven by innovation in structure, which enabled the ability to create commerce where there was no previous market. Specifically, it took risks that were viewed as esoteric by the capital markets (because there was no exposure or level of comfort) and boiled them down to a point where they could be traded, i.e. where there was protection for the buyer that made them feel comfortable in acquiring the risk, and the provider felt comfortable exposing their capital to events. The main questions in this era were whether the market could come up with new structures, and whether modeling could be developed around these structures. Following this, the market started to see deviations from the initial mandate of property/cat, such as the issuance of the first mortality covered bond issued in 2003.

The market then experienced a period of significant growth in response to events (e.g., natural catastrophes causing losses to clients, or other events such as the financial crisis). The market navigated trading through the financial crisis and provided confidence that it was a robust market that provided liquidity to investors that were investing in these securities. Mr. Schultz stated that this growth in response to events is important in thinking about how the capital markets would respond terrorism events.

Mr. Schultz stated that one of the founding principles was that the capital markets could provide capacity for a volatile business at a much more efficient price point than other markets, because it relied on the entire capital market to diversify the product. As a result, the landmark period of time has experienced significant spread compression (or cost compression) consistent with the way all asset classes are treated globally, as well as the entrance of new clients into the market. This has culminated in record issuance in the first half of 2017.

Mr. Schultz went on to highlight several of the innovations that deviated from the capital markets' initial mandate of property catastrophe coverage. Several of these dealt with life coverage, whether mortality or longevity risk. Medical benefits exposure in the health market has also been transferred. The market has also seen activity related to lotteries, workers' compensation, earthquakes, hurricanes, third-party motor liability, and pandemic exposure. Mr. Schultz stated that from the Committee's perspective, the most interesting development was likely the activity of Operational Re, which transferred operational risks from Credit Suisse via

the Zurich insurance company to the capital markets. This transaction is much more esoteric than looking at a model that examines frequency of catastrophic events. This transfer required a different type of analysis and underwriting by the capital markets to support this transaction, and is indicative of the market's willingness to deviate from its initial mandate of property catastrophe.

Mr. Schultz stated that public entities are already privatizing risks in the capital markets through catastrophe bonds. He highlighted four entities that are doing this: CEA, TWIA, Massachusetts Property, and Citizens Property. Of the largest 20 sponsors in the marketplace, there are four that are public entities. Mr. Schultz also emphasized that the market is much deeper and broader than it was in the past (even as recently as 5 years ago). He stated that approximately 10 sponsors have ceded \$1 billion or more into the marketplace, and the largest clients are ceding almost \$3 billion of capacity to the marketplace.

Mr. Schultz then discussed how the capital markets performed with respect to Superstorm Sandy. He stated that about half of the outstanding cat bonds in the market had some exposure to Sandy, and this caused some uncertainty about what type of losses this event would cause in the market. However, Mr. Schultz stated that the market traded through this issue extremely efficiently, and he believes that the market also provided stabilizing leadership under uncertainty about potential losses. Sandy made original landfall in the Caribbean on October 25, 2012, and there were several cat bonds in the market that were being priced when the landfall occurred. If this event had occurred 5 years earlier, Mr. Schultz suggested that the market would have stopped pricing deals while there was an event in the marketplace, but that did not happen in 2012 and the market traded through the event. This is a testament that the market has matured to a point where it can transact even in the face of potential loss. Sandy then made landfall in New Jersey on October 29, and the market launched three transactions shortly thereafter. The transaction sponsored by USAA was the leading transaction, and the others were for Zurich and AIG. These transactions were completed very efficiently with more capacity and tighter pricing than the clients were launching for.

Mr. Schultz stated that there are no standalone terrorism cat bonds in the marketplace today, however terrorism risk has been included in the coverage of cat bonds (primarily through life or mortality transactions, but also for another bond involving event cancellation for FIFA in 2003). Although there are no bonds in the market today, there are models that can be used as a proxy for risk, and this would be the first step in introducing terrorism cat bonds into the market, as it would help determine what the potential exposure would be. Mr. Schultz said that all cat bonds have been rooted in a model that provides a risk estimate. It doesn't need to be a perfect model, but needs to educate the investor on the potential risk to capital. Mr. Schultz predicted that innovation around trigger and product structure could result in a parametric (or different) approach to providing capacity for terrorism risk. This could be meaningful in a stabilization role where there is an event. He added that managers and direct investors participating in the market have "matured" and now consist of larger teams and subject-matter experts, and therefore the ability to make investment decisions is at its peak.

Mr. Schultz concluded by stating that there is capacity for terrorism risk in the capital markets today, but the markets are likely asking for a greater return on the capacity than other markets so

no activity has occurred. However, because the capacity exists along with the factors noted above, the capital markets could play a stabilization role if a terrorism event occurs.

Presentation by RMS²

Mr. Seo introduced Maria Paul, the Director of Product Management with RMS. RMS is one of the world's leading catastrophe risk modeling companies. Ms. Paul's role involves driving product strategy, and the direction of terrorism, infectious disease, and longevity risk product solutions. This includes the product roadmap, go to market strategy, and marketing strategy. She has led initiatives including guiding the industry's usage of and understanding of terrorism risk models, and delivering consulting solutions for the management of emerging risks such as terrorism and infectious disease. Ms. Paul serves as a representative at various insurance industry events, and is a contributing author for RMS publications. He stated that Ms. Paul would speak about how modeling plays a role in transferring terrorism risk to the capital markets.

Ms. Paul stated that her discussion would focus on two key topics: the key principles of terrorism risk that make it a modelable peril; and why not many deals have transferred into the capital markets, as well as the challenges and opportunities that exist to use the capital markets as a viable solution for risk transfer.

Ms. Paul noted that there has always been skepticism about the ability to model terrorism risk, particularly with respect to frequency, because the element of human behavior involved in terrorism is seen as a limiting factor in the ability to estimate frequency and severity. However, she said that they have gained a lot of experience over the past 15 years and gained extensive data on plots, attacks, and different threat groups, which has allowed RMS to provide insight into both the targeting strategies of terrorism groups, as well as the effectiveness of counterterrorism efforts.

RMS first released its U.S. probabilistic model in 2002, at a time when there was limited data on terrorism. Ms. Paul stated that over the past 15 years, RMS has learned that terrorism risk is as much about the effectiveness of counterterrorism as it is the terrorists themselves. Terrorism risk insurance is effectively insurance against the failure of counterterrorism. So while intelligence officers cannot predict human behavior, they can track communications, monitor online activities, and use informants to stop plots before they mature. There is \$100 billion budget for this counterterrorism effort. In comparison, the cost of the U.S. earthquake early warning system on the west coast is about \$15 million, and there is still a struggle to find funding for that project. As a result, to justify the large counterterrorism budget, large terrorism plots need to be interdicted (and this has occurred). There has not been a major terrorist attack causing catastrophic loss in the past 15 years, and this should give insurers more comfort in managing the risk as a result of counterterrorism efforts, just as if there was a budget to retrofit houses in California, an insurer would be much more comfortable in insuring earthquake risk due to these mitigation efforts.

² Ms. Paul's presentation is available at

https://www.treasury.gov/initiatives/fio/acrsml/Documents/ACRSM_Presentation_RMS.pdf.

Ms. Paul stated that one of the most important features of terrorism risk modeling is being able to represent the degree of control that counterterrorism has over terrorist groups. Terrorists are not easily able to attack countries with good counterterrorism, which helps to explain why so few terrorist plots have evaded interdiction since 9/11. This is modeled by using a controlled process, rather than by modeling terrorism as a series of random events (as is done on the natural catastrophe side). The modeling takes in account three components: the number of plots that are expected to be planned in a year, the likelihood of those plots evading interdiction of counterterrorism, and the likelihood of avoiding a technical difficult (for example the malfunction of a bomb, as seen in the 2010 Times Square bomb attack attempt). This information is looked at objectively by examining terrorism courtroom convictions, as RMS believes that if an individual is arrested and convicted, this is credible evidence of a plot. RMS also analyzes the few plots that have evaded interdiction. Ms. Paul stated that the frequency (or counterfrequency) of attacks in the United States has been close to the RMS modelled average (about one half). This helps validate the approach – although it is not a perfect approach or estimate, it is an objective way to estimate the frequency (or the uncertainty around the frequency).

RMS has also learned that large-scale attacks (those capable of causing catastrophic losses) are not random events. They take years of planning and a number of trained operatives with specialized skills. The more elaborate the plan, the more people need to be involved, and therefore the higher likelihood that the plot will be interdicted. This helps explain why there have been so few successful attacks, as well as why there has been a shift to smaller scale, lone wolf attacks – too many terrorists spoil the plot. As a result, cell size has been incorporated into RMS model since 2008-09. This approach has validated by al Qaeda leadership himself – Osama bin Laden instructed operatives to limit individuals involved in terrorist plots against the United States to under ten.

Ms. Paul stated that choice of weaponry is also a key consideration. Terrorists tend to follow the path of least resistance, and they tend to utilize weapons that have been tried and proven successful. While the RMS model does take into account a full range of terrorist attacks, it also takes into account the likelihood of one attack mode over another (given the logistical burden and security constraints). So while conventional bombs are generally the choice of weapon for terrorists, given the difficulty in purchasing and manufacturing bombs, there has been a shift towards smaller scale attacks. Smaller scale attacks that have been successful have involved improvised explosive devices or light military weapons, and this is what we can expect to see moving forward. While these types of attacks generally do not cause a large industry loss, they still help achieve the attack of terrorist attacks by draining the U.S. economy through subsequent expenditures on security, and impacts on other factors such as tourism and hospitality.

Ms. Paul stated that terrorism is “the language of being noticed” and one of the key objectives is media attention, because it helps to inspire and recruit new members. This helps explain the targeting strategies of certain terrorist groups. Ms. Paul said that we can expect that terrorist attacks will be focused on cities, and areas in those cities with high name recognition and publicity value. Cities like New York and DC are at a higher likelihood of being attacked than smaller cities, however even within a city the risk in different areas is not the same. Terrorists seek to achieve high leverage – maximum impact over the limited number of resources that they

have to put towards these attacks. Therefore, terrorists are meticulous about planning when and where an attack will occur. Looking at these factors is of key value in parameterizing a terrorism model.

If a terrorist plot has reached maturity and evaded all counterterrorism measures, the type of target that is optimal is one where there is an ease of execution (security measures at individual buildings) and achieves the maximum type of sought impact (e.g., loss of life, damage, media attention). As a result, attacks can be expected in areas that are freely open to the public, poorly protected, well-known, and crowded (such as hotels, train stations, and shopping malls). This is reflected in the RMS model by analyzing the likelihood of one area over another.

Ms. Paul stated that there are several reasons why there has not been more capital markets activity despite the improvements in modelling. She said that there has been an increase in stand-alone coverage in the terrorism market, driven by affordable pricing as well as flexible coverage. Ms. Paul said it is estimated that there are about 40+ major insurers providing stand-alone coverage with approximately \$3-4 billion in total capacity. In addition, the cost of insurance-linked securities (ILS) tends to be more expensive relative to traditional re(insurance). The trend towards casualty and liability losses from recent global events is also a contributing factor – because of these events, traditional insurance industry is becoming more innovative in their product offerings, but these offerings aren't expected to result in significant losses that would impact a company's solvency. Finally, TRIA helps to stabilize the market but also puts restrictions on coverage, and there is uncertainty about the future of the market due to the temporary nature of the program. Ms. Paul noted that although there is more comfort in the ability to estimate and utilize models, there is still some apprehension and concern over the future prospect for what future catastrophic terrorist events will look like (such as cyber attacks, or other types of attacks that we have not envisioned), as well as what future government involvement will look like.

Ms. Paul reiterated Mr. Schultz's statement that there has only been one terrorism catastrophe bond, for the FIFA World Cup in 2003, but there are some terrorism-exposed cat bonds as part of multi-peril bonds, as well as collateralized reinsurance. The biggest area where terrorism risk has been transferred to the catastrophe markets has been through excess mortality bonds. Ms. Paul stated that RMS is very active in the analytics for these bonds (all of which are rated), and companies are becoming more comfortable with these structures, and more creative in how they use them.

Ms. Paul stated that RMS's opinion is that in the current counterterrorism environment, companies are feeling more comfortable with terrorism risk. There has also been increased demand for products such as NBCR (nuclear, biological, chemical, or radiological), and although these are still niche products, more becoming available, as are products for extended business interruption coverage. These products do face a greater potential for catastrophic losses, and there is more uncertainty and volatility in what those losses could look like. She stated that if TRIA is eliminated or restructured, this could cause a reduction in capacity that could increase re(insurance) market pricing, and cause ILS to be a more attractive option.

Ms. Paul concluded by reiterating that the continued proficiency counterterrorism environment provides a solid platform for insurance market (as well as the ILS market) risk transfer.

Presentation by Hudson Structured Capital³

Mr. Seo stated that Mr. Millette would be speaking via telephone due to a scheduling conflict. Hudson Structured Capital Management is an alternative asset manager for reinsurance and transportation linked assets based in Connecticut and Bermuda. Hudson Structured invests in reinsurance and insurance-linked assets across all lines of business and all instruments to optimize relative value, as well as mezzanine-level “working layer” risks. Before founding Hudson Structured in 2015, Mr. Millette was at Goldman Sachs from 1994 to 2015. Mr. Millette led distribution for the first 144A catastrophe bond in 1996. He also led teams that developed Goldman’s current businesses in Transport Finance, Intellectual Property Structured Finance, Private Placements and Project Finance, and spearheaded the development of the Principal Funding business in investment banking. He led the Structured Finance Capital Committee and sector teams in the rebuilding of the GS mortgage and consumer finance businesses following the financial crisis.

Mr. Millette stated his intent to describe eight transactions that have occurred over the past 21 years with terror as a key risk, as well as instruments in the insurance risk transfer market. Of these transactions, Mr. Millette was directly involved in six transactions, and intended to discuss the other two (Golden Goal and Operational Re) from an observation perspective.

Mr. Millette said that Georgetown Re was an interesting transaction for two reasons. First, it was the first Rule 144A securitization completed in the capital markets, meaning it was the first “true” securitization completed (there were several small private placements of reinsurance risks sold to capital markets investors prior to this, but this was the first bond that was actually tradeable). Mr. Millette was involved in the origination and syndication of his transaction in 1996. The transaction involved two tranches – one matured and the other was wound up in 2001 because Georgetown Re covered St. Paul Re for five classes of elemental and non-elemental risk, and the non-elemental property risk included terrorism. Georgetown Re suffered losses in 9/11, so this is one case in which investors have not only taken terrorism risk, but also suffered terrorism losses from an insurance-linked security. There were several categories, including marine and aviation, in which minor losses made their way to investors. St. Paul subsequently negotiated a mutual commutation (meaning investors agreed to take less than the full principal amount) to allow St. Paul to wind up the coverage. This was necessary in part because St. Paul Re was itself transitioning into another corporate form. This commutation was consensual, meaning that investors accepted the loss and did not take any legal action.

The 9/11 attacks instigated a great deal of discussion about the use of capital markets instruments to hedge terrorism risk. Special Risk Insurance and Reinsurance of Luxembourg was initiated by six large European and Bermudian companies (Allianx, XL, Hannover, Swiss Re, Zurich, and SCOR). This transaction is technically a consortium of insurance and reinsurance companies working to create a company that would offer terrorism capacity. Mr. Millette was involved in

³ Mr. Millette’s presentation is available at https://www.treasury.gov/initiatives/fio/acrs/ Documents/ACRSM_Presentation_Hudson_Structured.pdf.

the origination of this transaction. The transaction involved early modeling of terrorism risk, and a business plan involving strict limits on the amount of coverage that would be offered by zone (geographical blocks defined by square feet thought to be the conventional limit of a terrorism incident). This was not exclusively an insurance and reinsurance transaction, because in 2002, there was an attempt to incorporate other capital markets investors (although they were ultimately not incorporated due to timing transactions). This transaction did not attract enough business to maintain viability, and it was wound up. The capacity that was created was ultimately taken up by other entities, including government sponsors in some cases.

Golden Goal (introduced above) was introduced by FIFA over 2006 World Cup cancellation concerns related to natural disasters or terrorism. War and boycott were excluded as causes, but terrorism was specifically included and modelled, and this risk was successfully placed in the market. The bond has matured since that time.

Starting in 2012, Lancashire, a UK-based company, began to offer a series of “sidecars” or collateralized reinsurance, in which investors share the risk return of certain types of business with the originating company. These were unusual transactions because they included a mix of elemental and non-elemental business. Elemental property risk is property risk arising from the elements (weather, catastrophe, or other natural causes of loss). Non-elemental risk is a synonym for manmade risk (terrorism, explosion, or other manmade phenomena). The Lancashire transaction had a list of type of risks that investors should expect to take, and terrorism was included in this list. Investors have taken a series of these transactions, and over \$1.4 billion have been placed. Part of the rationale for investment was that investors were receiving a large amount of elemental risk being offered through the capital markets, and the non-elemental risk was potentially diversifying. This was likely a consideration for certain investors.

These four transactions involved specific discussion of terrorism and (in most cases) modeling terrorism risk.

XXX, AXXX, and Embedded Value Securitizations are, broadly speaking, all the securitization of life insurance risk that have made their way through the capital markets, with a total approximate value of \$29 billion (the exact transactions included here is debatable, but there are dozens). So-called “embedded value securitizations” are transactions through which a block of life insurance policies that are isolated, and incur expenses (claims), and generate investment income and premiums. When these policies are netted out, the block will generate a stream of profits or losses, and this stream is either paid out to investors, or consume the bond principal. XXX and AXXX transactions are closely related to catastrophe bonds, in which bonds are issued, the proceeds are put into a collateral account, and assuming risks are not realized, the reserves are released and investors are paid principals and interests (if there is a loss, the amount held in the collateral account is consumed and paid out to the company that purchases protection). These transactions all take some degree of terrorism risk, because one of the causes of excess mortality (or degradation of the profit of a life insurance block) is terrorism. The likelihood that terrorism is a key cause of risk in these transactions is quite remote. XXX transactions typically require mortality levels to be at 130 percent of expected (in other words, mortality rates would be similar to the level of excess mortality observed in the 1918 influenza

epidemic). The sort of terrorism event that would cause mortality on that scale would be excessively grave. Mr. Millette stated that embedded value transactions are potentially more exposed to terrorism risk, although to his knowledge none of them have been seriously impacted by terrorism or threat of terrorism.

The next category discussed by Mr. Millette was extreme mortality securitization. There are \$3.6 billion in value of these types of transactions, issued by 5 different companies (1 in Bermuda and 4 in Europe). These transactions are designed to hedge catastrophe bonds against excess mortality. In virtually all of these security offerings, the key risk that was modeled and specified was pandemic, but terrorism was generally also modeled and specified as a second risk. As a group, these transactions involve less remote mortality risk than XXX transactions. These transactions have been successfully placed in the market since 2001, and investors have actively discussed and considered terrorism risk in them.

Since 2010, Aetna has issued a series of transactions called "Vitality Re" at a value of \$1.4 billion. These cover Aetna for medical benefit ratios exceeding certain levels. In practice, the key risk that is modeled and that investors focus on is variability in pricing and claims in pandemics – but terrorism can also impact these transactions.

Most recently, Zurich, on behalf of Credit Suisse, issued a bond called Operational Re, which includes operational risks that were placed in the market. Terrorism risk is included, as is cyber risk.

Mr. Millette stated that he has observed that investors in many cases have discussed the potential correlation between terror risk and other types of capital markets risks. One of the factors that investors consider in investing in insurance-linked securities is the possibility that such securities offer them portfolio diversification, however Mr. Millette said that some investors have expressed concerns that large terrorism events will be correlated to large-scale drops in value in the capital markets as well.

Mr. Millette said that investors have also observed that the quantifiability of terrorism risk is less clear than the quantifiability of elemental catastrophe risk. In other words, natural catastrophe or weather-related risks are stationary risks in which the riskiness lies in the underlying distribution of events that have some consistency over time. Therefore, events of the past and the distribution of them can be used to quantify the likelihood of such events occurring in the future. On the other hand, the factors that lead to terrorist acts vary over time, therefore an incident rate from the past is not a reliable predictor of riskiness in the future.

In addition, natural catastrophe events are more fortuitous than terrorist events. In other words, Mr. Millette stated that natural catastrophe events unfold regardless of human intervention. In an act of terrorism, it is a human-caused event that can be mitigated or prevented.

Mr. Millette stated that all of these factors lead investors to view terrorism risk as being less well-defined (and having more standard error) than elemental risk or even credit markets. However, in certain cases investors have been able to take such risks in transactions, so the lack of certainty about the risk is not determinative.

Presentation by Citizens Property Insurance Corporation⁴

Mr. Seo introduced Mr. Gilway, the President, CEO and Executive Director of Citizens Property Insurance Corporation in Florida. Citizens was created by the Florida Legislature in August 2002 as a not-for-profit, tax-exempt, government entity. Its mission is to provide insurance protection to Florida policyholders who are entitled to but are unable to find property insurance coverage in the private market. Citizens is funded by policyholder premiums and, additionally, if its surplus is depleted in the wake of a particularly devastating storm or series of storms, Florida law requires Citizens to levy assessments on most Florida property-casualty insurance policyholders until any deficit is eliminated.

Mr. Gilway has served at Citizens Property Insurance Corporation since June 2012. As President and Executive Director, he oversees all operations and serves as liaison to Citizens' Board of Governors. Mr. Gilway is an accomplished insurance executive with over 46 years of background in insurance.

Due to Citizens' status as a non-profit government entity and the Committee's interest in looking at how other types of catastrophic risks are handled, Mr. Seo asked Mr. Gilway to spend some extra time discussing Citizens' operations in addition to speaking about his purchase of cat bonds in the capital markets. This request was intended as a continuation of our discussions at June's meeting which focused on other mechanisms for the insurance of catastrophic risk exposures, for terrorism and otherwise.

Mr. Gilway stated that his intent as a speaker was to demonstrate that when faced with an extremely difficult scenario, it is possible to use a multi-faceted approach, including the ILS market, to solve the problem.

Mr. Gilway stated that the Florida market is very unique, and doesn't have the traditional property/casualty insurers found in other states, as most of these left the state after Hurricane Andrew. There are 57 Florida domestic companies that drive the marketplace. There are only 3-4 A.M. Best-rated companies in the Florida marketplace, and the remainder are rated through Demotech. 26 of these companies have less than \$20 million in surplus. These factors create a unique market. The objective in the Florida market has been to increase private market participation within a very different group of insurance companies.

As a result of a Florida bill (1A), Citizens grew quickly and private insurers ultimately pulled out of the market. Mr. Gilway stated that 26% of the residential market in Florida was covered by Citizens when he became CEO five years ago. In addition, one of every two commercial residential properties were covered by Citizens. This ultimately led to Citizens holding \$512 billion in exposure. The Governor said that the size of the risk needed to be reduced, and in addition some of the risk needed to be transferred into the international market.

In response, Citizens created a multi-faceted program in which each component fit together. Part of their effort involved "depopulation" – a program to transfer 1.2 million properties into the

⁴ Mr. Gilway's presentation is available at

https://www.treasury.gov/initiatives/fio/acrs/ Documents/ACRSM_Presentation_Citizens_Property.pdf.

private marketplace. This raised a question about how to create a competitive private market in Florida to sustain these policies. Citizens focused on intense use of technology in order to perform extensive analysis on its book of business and geo-coded the entire book of business. 26 of the 57 companies in the Florida market participated in depopulation.

Another part of Citizens' effort was to create a clearinghouse in which risks were made available and accessible to the private marketplace. The private insurer would then be permitted to select the risks they wanted to take. 16 companies are participating in the clearinghouse at present time.

Although this meant that Citizens was moving off more profitable business that the private industry was willing to take, Citizens was also taking steps to improve the quality of the business (because it suffered from rate adequacy issues).

Mr. Gilway stated that Citizens have the ability to levy assessments (which they call a "hurricane tax" in Florida). There are three levels of assessments, and Citizens can charge up to 45 percent of the premium. The onerous nature of these assessments was an incentive for Citizens to transfer policies to the private market. The Governor of Florida told Citizens that when people are under stress because they are paying for hurricane losses, the last thing they want to do is pay an additional assessment. Therefore, Citizens was charged with doing away with the assessment load. Mr. Gilway stated that Citizens effectively communicated to policyholders about the amount of these assessments, which helped encourage them to transition their policies to the private market.

Florida also has a state-run reinsurance program called the Florida Hurricane Catastrophe Fund (FHCF) that all companies are required to participate in (at different levels). This is the second component of transferring risk – Citizens is required to participate at the 90 percent level.

In 2011, Citizens had \$24 billion in storm risk maximum probable loss. Each year, Citizens was able to decrease overall storm risk through depopulation. Private market risk transfer increased each year, and FHCF decreased (as it is based on overall participation in the market). By the end of 2014, Citizens was able to eliminate any potential of assessments in the private marketplace, and they are now at a \$7.5 billion surplus.

Mr. Gilway stated that Citizens' use of comprehensive, detailed data helped with this depopulation answer, because they could speak to an insurer about what types of risks they were looking to assume (mobile homes, high value homes, etc.) that would fit into their overall strategy. Therefore, the depopulation effort is more than just "cherry picking."

Mr. Gilway stated that Citizens' loss ratio under 1.5 million policies was 49 percent. When they reduced to 451,000 policies, the loss ratio was 55 percent (however part of this loss was due to assignment of benefits litigation in Florida; without this the loss ratio would have been 41 percent). Mr. Gilway stated although Citizens was moved off business that were more actuarially sound, they were able to impose an 8.5 percent rate increase in certain territories to achieve adequacy, and still avoid imposing an assessment (although he did note it was beneficial that there were no large events to pay out).

Mr. Gilway presented a chart outlining how premiums are spent, noting that only 7.9 percent goes to commissions. Citizens' also spends 18.45 percent on private risk transfer and 17.9 percent going to FACF. He stated that many insurers are spending less on FACF, because they are able to buy private risk transfer for less money.

In 2011, Mr. Gilway stated that Citizens was not really participating in the private risk transfer market, placing a total risk of \$575 million. In 2012, Citizens entered the cat bond marketplace, with a placement of \$750 million. This continued to increase until 2015, when Citizens spent \$3.9 billion. However, since that time, costs have dropped, and therefore the cost of placement was lower.

Mr. Gilway stated that without question, the inclusion of ILS has created a highly competitive marketplace. The reinsurance pricing and requirements have lowered from 43 cents on the dollar to 29-20 cents on the dollar for the typical company. This impacts an insurer's ability to give more preferred rates. Mr. Gilway noted that ILS products are also fully collateralized.

One of the challenges with ILS is that it takes a lot of time and expense to put together an ILS package. Citizens tends to use ILS on a multi-year basis to help defray costs. He said it is important to educate investors on catastrophe risks. He said that these can't be structured in the United States, which also involves travel. In addition, contract language can be inflexible.

However, over time, ILS has become more flexible. Citizens has been able to incorporate the kind of flexibility it needs, which is important because Citizens doesn't know what its volume will be in the future, and therefore they don't know their future PML. Each year, Citizens has been able to improve the terms and conditions of its ILS bonds. In 2012, Citizens had a 2-year contract with an occurrence loss trigger. In 2013, they obtained a three year contract. In 2014, they made a big change and moved to an aggregate loss trigger. In 2015, Citizens had a 300 million contract, but had call features for the first time. Finally, in 2017, Citizens just completed a \$300 million placement.

Mr. Gilway then presented a chart which visualized Citizens' risk transfer program, and showed where ILS is incorporated. He stated that ILS exists at higher layers, and they have \$300 million in cat bonds, and \$550 million in traditional markets. Over time, they would like to make this an even split. He noted that NBCR losses are handled separately, and they use traditional markets because it offers more flexibility. Citizens generally only buys NBCR protection when they can afford it.

Citizens does not buy reinsurance in its PLA/CLA program because it has a strong surplus. This program has a large enough surplus to be covered by a 1 in 100 event followed by a 1 in 130 event. Citizens does not intend to use reinsurance or ILS unless it experiences a major hurricane.

Mr. Gilway noted that the model used by Citizens to depopulate business in other sectors, but was unsure whether it would be useable in the terrorism market.

Panel Discussion

Chairwoman Peters opened the floor for panel discussion.

Ms. Moser stated that one of her takeaways was that pricing needs to increase in order to stimulate ILS involvement in the terrorism market. She asked the presenters how much pricing would need to increase for this to happen. She asked where the ILS market would be interested in participating, such as in covering deductibles or offering in the higher excess levels. She also asked the presenters if they believe collateral will need to be held longer for a standalone terrorism product compared to traditional hurricane or earthquake cover, due to the possibility that an agency would need to certify the event, individual deductibles would need to be met, and TRIP would need to be triggered.

Mr. Schultz responded that it is difficult to quantify how much the rate would need to change. There are numerous factors, such as what the structure looks like, what premiums are being paid. He added that if the ILS market was broader and there was more competition, an efficient market would reach the necessary price. With respect to collateral, Mr. Schultz stated that the cat bond market today works with a secondary liquid market, and therefore having an extended period of time in which collateral is illiquid is not an issue. If investors choose to have liquidity, they can always trade out (albeit at a price that may not be desirable). Embedded in the current structure, the capital markets can accommodate what the requirements might be to have collateral tied up for longer. Mr. Schultz added that he is not an expert in terrorism, however the structure allows and facilitates a longer tie-up, and investors can trade out if they don't want to stay in.

Mr. Seo stated that Ms. Paul mentioned one of the reasons she doesn't see standalone terrorism deals is because the traditional reinsurance market is handling the risk. Mr. Seo stated that ILS markets generally do not exist to penetrate all lines of the market, and that if the traditional market is not stressed and is operating without any issues, it is not unusual to see ILS not involved in that line. Ms. Paul responded that based on their market observations, traditional market routes seem to be working just fine, and for the few situations when other options were evaluated, it was essentially a pricing issue. From a modeling perspective, RMS has seen that people want to understand and better utilize models so they can take on more risk, without worrying about transferring that risk out. Mr. Seo added that this is happening in both primary insurance and reinsurance, and this is an indication of a functioning market. Therefore, it is not unusual that ILS is not participating in the market. Mr. Schultz agreed that ILS is not meant to be a solution for all segments of the industry, and this has been demonstrated in market development over the past 20 years. ILS does not intend to replace the traditional market. However, ILS can be helpful in situations where risk is being transferred, and that risk can't be handled in an efficient way by traditional markets.

Mr. Millette stated that the insurance-linked securities market consists of approximately \$30 billion of outstanding coverage. The capital supplied in the capital markets by investors is provided through collateralized reinsurance. You can see the amount of collateralized reinsurance market by subtracting the outstanding catastrophe bond market (\$30 billion) from the total size of insurance-linked funds (\$75 billion), creating a difference of over \$40 billion. In addition, not all outstanding catastrophe bonds are held in these funds. Ultimately, this shows

that a majority of non-life capital markets activity is in collateralized reinsurance form. Mr. Millette stated that these are private and so the transactions are harder to see, and may have different risks from those in the visible market. Therefore, it is likely that collateralized reinsurance activities are placing risks such as terrorism and cyber into the capital markets from the reinsurance markets.

Mr. Seo asked Mr. Millette if he agreed that the capital markets are ready to respond to terrorism risk in order to stabilize the market after a disrupting event. Mr. Millette stated that it is absolutely the case that the capital markets become active in cases in which there is capacity demanded for insurance and reinsurance protection that exceeds the appetite of the reinsurance markets (at a price level that people are willing to pay). This is also seen in natural catastrophe and other risks (including life). However, the markets are now at a different stage, because there are now a series of capital markets institutions that are active in the reinsurance markets, based on portfolio objectives rather than social utility for the markets overall. Mr. Millette said whenever there is a gap in the reinsurance market, there is speculation in the trade press about whether capital market investors will want to take up that risk. Most recently, this press coverage has focused on cyber risk, and it is possible that capital markets will become involved.

Mr. Millette said that after 9/11, specialty risk insurance and reinsurance was an attempt by European and Bermudian insurers to create a private market mechanism to supply terrorism risk capacity to corporations. However, it was priced at a level that was not accepted by corporations, and many corporations instead relied on self-insurance, insurance from public vehicles, or obtained insurance elsewhere in the market.

Terrorism risks generally fall into three categories: Tier 1, Tier 2, and all others. Mr. Ryan asked Ms. Paul whether she thought there was a chance of a terrorist attack "in the middle of nowhere" based on RMS's modeling parameterization (in light of Ms. Paul's statement that the RMS model showed a terrorist attack to be most likely in New York or Washington D.C.). Ms. Paul responded that in parameterizing risk, RMS takes into consideration both cities where attacks could occur, as well as locations within cities (i.e. government buildings, hotels, skyscrapers), and these have a different relatively likelihood of occurrence. That said, RMS uses a similar structure to other rating agencies such as A.M. Best. Ms. Paul said that RMS is trying to help companies that all risk in a city is not the same. For example, in Manhattan, the pricing tends to be flat across the geography, however RMS has a steep gradient within the city. Not all areas of Manhattan are the same, and some areas in Manhattan might even have a lower risk than Boston, even though Boston falls into Tier II as a risk. Therefore, Ms. Paul reiterated that one of the primary uses of the model is to examine which risk is better. Aggregations and potential losses based on cities and target cities is not granular enough, because there is a very large variation within individual areas. This variation is not just based on geography. Ms. Paul provided hotels as an example of a high-risk target, because it has easy access, is crowded, and it is difficult to examine everyone entering the hotel. However, hotels are not the same, so RMS will also look at a hotel's name recognition, the number of rooms, and its star rating. This helps entities decide which risk is better for their portfolios, even though the pricing may be the same.

Mr. Gunset stated that it appeared the panel was in agreement that the traditional market is doing a very good job with traditional reinsurance. Based on Mr. Millette's comments about the

quantifiability of loss, as well as the uncertainties, the human element, the move towards soft targets, Mr. Gunset asked the panel where they saw growth potential with respect to terrorism (as well as in the capital markets overall), and whether they believed investors would lose interest at some point. Mr. Schultz responded that there is a natural point in the market where there will be a saturation of property risk that can efficiently trade in the capital markets, however he doesn't believe that point has been reached yet. As a result, the willingness of investors who are exposing their capital to look at different risks and perils is increasing, and will occur more rapidly going forward. Mr. Schultz stated that if TRIA is not renewed and there is a greater need by seeding companies to have capacity, this would be the type of event that would cause the capital markets to step in (as would a large terrorism event), as it would cause a shift in the balance of supply and demand. Mr. Millette stated that he agreed with Mr. Schultz that there is not much risk of investors losing interest. Over the past 20 years, there has been a buildup of investor engagement. The investors who have participated in those areas have become more broadly engaged in thinking about other sectors of insurance. This engagement will increase when these sectors become stressed and there is a pricing opportunity. Independent of this, the scale and buildup of capital has created its own imperative – investors are seeking to find investors that are diversifying, and they are seeking reasonable returns. Therefore, even absent a significant event, investor interest will increase. As an example, Mr. Millette stated that earlier in the year there was an auto liability bond completed for Generali in Europe. This demonstrates that liability risk has now made its way into a securitized form for multiple companies, including one that calls itself a fund.

Mr. Millette stated that insured losses have attracted investor attention. Investors will frequently study the market and determine whether or not there is an opportunity to put capital to work, and investors who are knowledgeable about the sector wonder whether terrorism insured losses have created an opportunity and capacity for attractive returns. As an example, two recent global hacking events (Petya and WannaCry), have generated some level of investor attention. There has been broad awareness among the press and investors that these events, did not generate very large insured losses. This makes investors wonder whether the risk is interesting to study with respect to capital markets – if large events do not generate large insured losses, but could potentially generate large returns, this is interesting to investors. Therefore, Mr. Millette advised against having fixed judgments about what pattern of event and response will create involvement in the capital markets.

Mr. Clark noted that the discussion about capital markets focused on a lack of capacity in traditional markets, and the movement of exposure from public sector balance sheets. He asked the panel what needs to happen to bring \$2-3 billion from ILS investors to the table under a restructured TRIA program. Mr. Schultz acknowledged that there is correlation between the capital markets and terrorism, however he does not believe that correlation itself makes terrorism risk less attractive to investors, it just makes it a different type of risk that investors will work through. With respect to capacity, Mr. Schultz did not know how it would be possible to bring \$2 billion in terrorism capacity – it is in the realm of possibility, but first it would be necessary to understand how it will enter the market, how it would be helpful to bring in this capacity, and what the price point would need to be. Mr. Schultz stated that if the terrorism backstop ceases to exist, and aggregators are thinking about how to differently manage aggregations, this would become a productive discussion in which the capital markets would be involved. However, until

this happens, it is difficult to predict how this involvement would occur. Mr. Millette added that the way the capital markets and traditional markets respond tends to be more integrated than the meeting discussion implied. Today, rather than the capital markets responding when there is a gap in the traditional markets, traditional insurers and reinsurers would seek to create sidecars to offer coverage, and seek partners to acquire some of this risk. At this point, there are approximately two dozen sidecar programs in which insurers and reinsurers take portions of their incoming risk and cede them to capital market investment partners. Therefore, the market approach is likely to be quite integrated. In addition, brokers would likely introduce risk limits both traditional markets participants as well as capital markets participants to participate through collateralized reinsurance.

Mr. Clark asked Mr. Gilway what steps Citizens had to take to address politics and optics when it elected to set up an entity offshore in a tax-efficient market. Mr. Gilway responded that any type of risk transfer is a political hurdle in Florida, because any cost associated with risk transfer is included directly in the rating algorithm. The decision to move into the ILS markets ultimately came down to costs, and it remains so today. Citizens compared ILS markets to the traditional markets in terms of total integrated operating cost with setting up Everglades Re, the administration costs of Everglades Re, and the brokerage costs. Mr. Gilway commented that although the Committee seemed to be struggling with the nature of the risk to be put into the ILS markets, the situation of Citizens was different because ultimately the goal was to mirror the same flexibility and risk being placed into the reinsurance market. He said that Citizens' entry into the market initially raised concerns about the availability for other entities seeking capacity in the Florida marketplace. As a result, there was no way politically that Citizens could have placed \$2 billion in risk in the traditional marketplace, because this would have been perceived as driving up overall pricing and ruining competitiveness in the traditional marketplace. Therefore, ILS was an ideal option for Citizens as it used different investors and did not take away from capacity in the Florida market.

Mr. Wolfe asked Ms. Paul how it is possible to prospectively quantify counterterrorism efforts, when most of the information available is protected from a privacy and government security standpoint. Ms. Paul stated that the risk landscape for larger catastrophic attacks is more stable than smaller "lone wolf" attacks (which are more random, but also less likely to cause significant losses). Although RMS takes event of all sizes into consideration, as all events have some component of government response, RMS does focus on the larger, more stable risks in its modelling as these are more likely to cause catastrophic losses. It is unlikely that the government will stop funding these programs in the near future, and therefore a lot of higher level counterterrorism information is available to include in modeling. Therefore, Ms. Paul stated it is unlikely that counterterrorism efforts will change dramatically without forewarning. In addition, the types of events are also unlikely to change dramatically, as terrorists tend to pursue the types of attacks that were previously viable.

Mr. Wolfe asked the panelists to provide estimates on today's market capacity, and asked Ms. Paul to confirm whether her previously-provided estimate was from a U.S. or global perspective. Ms. Paul confirmed that her estimate was based on a U.S. basis. Mr. Schultz said a standalone terrorism policy placed today could be several million dollars, and this could be replicated several times, but it was unlikely that a single policy of \$1 billion could be placed. Mr. Ryan

followed-up by asking whether Mr. Schultz foresaw a future in which capital markets were as confident in the modeling of the terrorism risk as they are modeling natural catastrophe (and if so, does this imply there could be billions put towards terrorism exposure). Mr. Schultz said that the models for natural catastrophe and terrorism are different, however in the 1990s natural catastrophe property models were viewed as a tool, and over time the markets gained confidence in them, however other underwriting factors are also used (and the same would hold true for terrorism). Mr. Millette reiterated that there have been at least \$3.56 billion of extreme mortality securitizations that have cleared the market which cite terrorism as an included risk. Although this doesn't mean that the terrorism included in these transactions would be the same as terrorism that may be placed in the market to supplement TRIA, it does show that investors can take risks on that scale. He added that the current scaled securitized natural catastrophe risk is over \$70 billion, and the fact that other types of risk may have a less seasoned model with a higher standard error may indicate that investors are not ready to invest at the \$70 billion level, they may be ready to take on a risk of several billion dollars (and this amount could grow over time).

Mr. Gunset asked Ms. Paul whether there is any publicly-available data that RMS would like to have that is not currently collected. Ms. Paul responded that getting data more quickly would be helpful, because there is a lag time between when things happen and when the data becomes available. However, she also noted that having better (more accurate) data from companies to put into the models would result in better loss estimates. Ms. Paul also noted that RMS has a "best estimate" that it uses to interpret that data it receives, and it would be beneficial for them to have a better understanding about the uncertainty involved in interpreting this data, to better understand the potential range of losses.

Update on Terrorism Risk Insurance Program

Mr. Ifft stated that since the Committee's last meeting, Treasury completed its first study on the Competitiveness of Small Insurers in the Terrorism Risk Insurance Marketplace, which was delivered to Congress and released to the public on June 30. The study was based in significant part upon the mandatory data call conducted this year by Treasury. Because there is now only one year of comprehensive data concerning the Program, the determinations and observations made in the study were for the most part tentative, and Treasury will continue to analyze the issues identified in the study in 2019, when the next iteration of the study is due and at which point Treasury will have three complete years of data concerning the participation of small insurers in the terrorism risk insurance marketplace.

The data call is continuing as to insurers other than small insurers, and such companies have until October 1 to complete various reporting templates in addition to that that were due on May 15. In addition, Treasury has already begun the process of reviewing the existing reporting templates to determine if any changes are warranted, and if further modifications can be made to streamline the reporting and reduce burden on participating insurers.

New Business

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

Chairwoman Peters adjourned the meeting at 12:31 p.m.

I hereby certify these minutes of the July 28, 2017 Advisory Committee on Risk Sharing Mechanisms public meeting are true and correct to the best of my knowledge.

A handwritten signature in black ink, appearing to read 'LB', is written over a horizontal line.

Lindsey Baldwin
Designated Federal Officer