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**“EVOLVING RISKS DUE TO EXTREME EVENTS
IN THE ASIA-PACIFIC”**

Introduction

The Asia-Pacific is no stranger to extreme events. In the last fifteen years, it has experienced at least three calamities of epic proportions.

The first was the 1997 Asian Financial crisis, which plunged the region into recession, put millions of people out of work, triggering a political tidal wave that swept Indonesian President Suharto from power and whose ripples were felt for years after.

The second was the 2004 Boxing Day tsunami, which claimed over 230,000 lives across 14 countries flanking the Indian Ocean, thus going down in history as one of the world’s deadliest disasters.

The third was the Tohoku earthquake and tsunami of 2011, which resulted in damages estimated at US\$235 billion for Japan, making it the costliest natural disaster in history. Its impact was felt far beyond Japan, not just because it severely disrupted global supply chains, but more importantly, because it brought the safety of civilian nuclear power into question, leading one major economy – Germany – to forswear its use.

Given the impact of such disasters, it is important that we find better means of understanding and reducing the impact of such extreme events in the region, be they from earthquakes, financial markets, or other sources.

I would like to address three fundamental questions this morning: (1) why do such events surprise, (2) why they are often overlooked or underestimated, and (3) how they can be better managed?

Why Do Such Events Surprise?

Nicholas Nassim Taleb famously described such rare and hard-to-predict events as “black swans”. Black swans have another important characteristic, which is that their impact is large.

Complex systems are characterised by interactions that are hard to detect, and outcomes that are emergent, and therefore likely to surprise. One particular emergent property of such complex systems is that they are “punctuated by rare large events, which often dominate their organization and lead to huge losses.” These are usually black swans. A few years ago, Didier Sornette coined the term “dragon kings” to explain how supposedly predictable events in complex systems can often spin out of control leading to extreme events. I am not sure why Didier chose the term “dragon kings”, but I guess it relates to Chinese mythology in which the dragon king who rules

the oceans wreaks havoc from time to time. Then again, black swans are real, but dragon kings are the stuff of legend.

Let us look at an example of a “dragon king”.

It is not as if earthquakes or tsunamis are unknown risks. Japan is one of the most seismically active regions in the world. *Tsunami* is a Japanese word. In fact, Japan is probably the most well-prepared nation on earth to deal with earthquakes. So why was the calamity that befell Japan on 11th March 2011 such a big surprise?

Part of the reason is that although the risk of an earthquake is known, it is very difficult to assess when it is going to occur, and how severe it will be. The geophysicist and earthquake expert Robert Geller wrote that “earthquake research has been conducted for over 100 years with no obvious successes. Claims of breakthroughs have failed to withstand scrutiny. Extensive searches have failed to find reliable precursors ... reliable issuing of alarms of imminent large earthquakes appear to be effectively impossible.” Predicting tsunamis is just as fraught an exercise, other than being able to say that they are usually triggered by earthquakes.

But an equally important reason is that the chain of events, beginning with the earthquake, followed by the tsunami, which then damaged the Fukushima nuclear power plant causing a meltdown and radiation leakage,

combined in this case with significant human failures including outright negligence and what Margaret Heffernan called “wilful blindness”. It was therefore highly unpredictable. It was a dragon king.

The reality is that it is extremely difficult to estimate the occurrence of such extreme events that result from the cumulative effects of complex interconnectivities. Didier may disagree with me, but I believe that dragon kings are very difficult to forecast.

Why Are Risks Often Overlooked or Underestimated?

Yet even if we are able to correctly identify a particular combination of factors within a complex system that could create a serious risk of a dragon king, chances are that such insights will either be ignored or dismissed by decision-makers.

Many surprises that governments have to deal with – natural disasters, pandemics, even financial crises and political upheavals – can often be assigned probabilities. This ought to lead governments to take precautionary measures. But they do not.

The reasons why they do not are several. In the first place, leaders often have a hard time properly discounting the present value of events that will take place in the future. This tendency to place less emphasis on future

risks and contingencies, and place more weight on present costs and benefits is a common cognitive bias known among behavioural economists as *present-biased preferences* or *hyperbolic discounting*. Many, if not all, governments indulge in it. The institutional position that political leaders occupy discourages them from spending time worrying about a problem that will (hopefully) occur only after they leave office. Democratic governments are often catatonic in the face of problems whose consequences are expected to be felt only in the distant future.

After the Asian Financial Crisis, in the boom years leading up to 2008, most people dismissed the risk of another financial crisis happening. Before 2008, among central bankers, there was a hubris that they had mastered macroeconomic management to the extent that prolonged inflation and deep recessions were no longer possible. Among most financial sector experts – including the IMF – there was a belief that financial innovation, especially in the form of securitisation, had diversified risks and made the global financial system less prone to catastrophic collapses. Those who foresaw an impending crisis – like Nouriel Roubini and Nassim Taleb – were roundly ignored.

Much of our reluctance to grapple with game-changing issues such as the financial crisis stems from an unwillingness to face the consequences of an uncertain and unpredictable future. These consequences interfere with

long-held mental models, business or self-interest to create *cognitive dissonance*. At the heart of it, cognitive dissonance is about denial: the inability to acknowledge uncertainty and unwillingness to accept the need to adapt to a future that might be radically different from the current reality. This is another cognitive limitation that people and governments are prone to – *confirmation* or *consistency* bias. This is the tendency to pay attention only to those things that are consistent with, or confirm, our existing mental models.

How Can They Be Better Managed?

Despite our cognitive limitations and the inherent challenge of anticipating extreme events, I believe that it is possible to reduce the frequency of black swans, and when they occur, to attenuate their impact.

While foresight methodologies like scenario planning cannot predict the future, used intelligently, they can help overcome cognitive biases by challenging our mental models. They make people aware of problems and uncertainties, challenges and opportunities. In turn, awareness can be harnessed to increase willingness to invest in risk mitigation measures.

Of course, the cost of responding to some extreme events can be too high, especially when governments are seen as spending inordinate resources to prepare for eventualities that may never happen. For instance, there is a

possibility of the earth being destroyed by a planet-killing asteroid, but this is probably not a risk that we can meaningfully prepare for at this point in time, given the prohibitive costs today. We cannot eliminate every risk, but we need to manage them in such a way that strategies and their premiums do not have to be all front-loaded.

Risk is very much a social construct. For obvious reasons, Japan takes earthquakes very seriously. Everyone in Japan understands that earthquakes pose a perennial and life-altering, if not existential, threat. Because there is a national consensus, no expense has been spared to earthquake-proof Japan to the maximum extent possible. But there was no such consensus on nuclear safety. Most Japanese believed that nuclear power was safe. It was a dangerous assumption. So the triple disaster of 2011 – the Tohoku dragon king – was accentuated. No doubt, the Japanese will now take the risk of nuclear accidents much more seriously.

In the Netherlands the number one risk is flooding. Since the catastrophic flood of 1953, billions of dollars have been spent building dykes and barrages. I think it would be difficult to find a Dutchman who will disagree that this is money well spent.

The reality is that agreement on what constitute the greatest risks to a nation must be reached through consensus. Without that consensus, the

government and political leadership will find it difficult to allocate resource to mitigate these large risks. A national conversation to assess these risks is important. Otherwise, the alternative is to wait for disaster to strike before action is taken. By then of course it is too late. The British approach, of drawing up a National Risk Register is one way to start such a national conversation, and is worthy of consideration. In the same way, this ICRM Symposium can be seen in its modest way as an effort to frame such a conversation in Singapore, and is therefore a worthy enterprise.

I wish all of you a meaningful Symposium.

Thank you.

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