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Major Tide Waves

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Digital technology developments

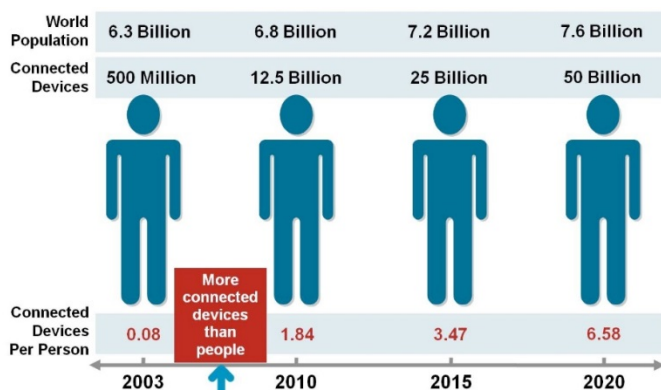
One major tide wave is the breakneck pace of development in digital technology and mobile communications, which are powering big changes in every aspect of business operations.

Most people can recognise how the Internet revolution has changed every aspect of daily life, in communication, business, education, government, and society. The next big revolution, already taking place, is the Internet of Things (IoT), which represents a huge leap to the next level in its ability to gather, analyse, and distribute large amounts of data that we can turn into information, knowledge and, ultimately, wisdom.

According to the Cisco Internet Business Solutions Group (IBSG),¹ the IoT is defined as the point in time when more “things or objects” were connected to the Internet than people. According to this definition, Cisco estimates the IoT was “born” sometime between 2008 and 2009 (see Figure 1).

In 2003, there were approximately 6.3 billion people living on the planet and 500 million devices connected to the Internet. Explosive growth of smartphones and tablet PCs brought the number of devices connected to the Internet to 12.5 billion in 2010, while the world’s human population increased to 6.8 billion. Cisco estimates there will be 25 billion devices connected to the Internet by 2015 and 50 billion by 2020.

Figure 1. The Internet of things was “born” between 2008 and 2009



Source: Cisco IBSG, April 2011

One of the defining features of the IoT is *sensors* that are installed in or connected to networks of computing systems and mobile devices that can transmit and receive data in a real-time, interactive manner. As articulated by Peter Hartwell, Senior Researcher, HP Labs, “With a trillion sensors embedded in the environment—all connected by computing systems, software, and services—it will be possible to hear the heartbeat of the Earth, impacting human interaction with the globe as profoundly as the Internet has revolutionised communication.”

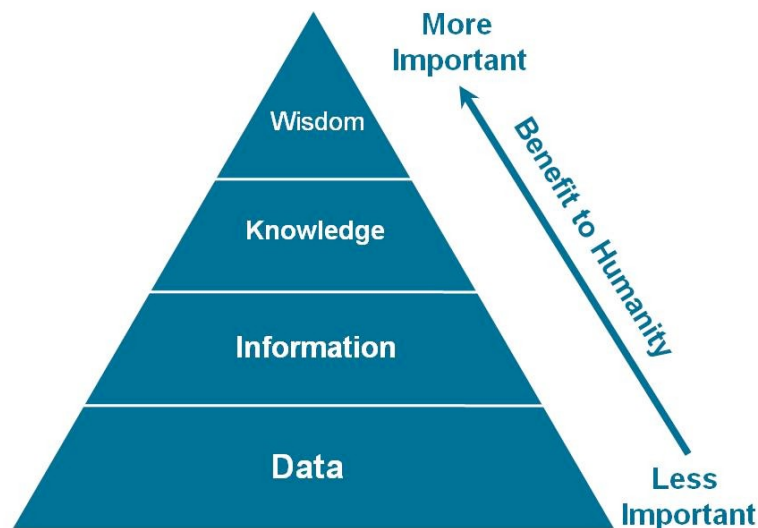
According to the CISCO white paper, the IoT will profoundly change how we communicate. Humans evolve because they communicate. This principle of sharing information and building on discoveries can best be understood by examining how humans process data (see Figure 2). From bottom to top, the pyramid layers include data, information, knowledge, and wisdom. Data is the raw material that is processed into information. Individual

⁺ Deputy Secretary General and Head of Research, The Geneva Association.

¹ Evans, D. (2011) *The Internet of Things: How the Next Evolution of the Internet Is Changing Everything*, San Jose, CA: CISCO

data by itself is not very useful, but volumes of it can identify trends and patterns. This and other sources of information come together to form knowledge. In the simplest sense, knowledge is information of which someone is aware. Wisdom is then born from knowledge plus experience. While knowledge changes over time, wisdom is timeless, and it all begins with the acquisition of data. The IoT dramatically increases the amount of data available for us to process. This, coupled with the Internet's ability to communicate this data, will enable people to advance even further.

Figure 2. *Humans turn data into wisdom*



Source: Cisco IBSG, April 2011

As the CISCO white paper put it, the IoT represents the next evolution of the Internet. To the extent that we can turn large amounts of data into information, knowledge and wisdom, the IoT has the potential to change the world as we know it today—for the better.

According to Goldman Sachs,² with the rapid development of the IoT, the global industrial sector is poised to undergo a fundamental structural change akin to the industrial revolution. Equipment is becoming more digitised and more connected, establishing networks between machines, humans and the Internet, and leading to the creation of new ecosystems that enable higher productivity, better energy efficiency and higher profitability. Goldman Sachs estimates the IoT opportunity for industrials could amount to USD 2tn by 2020. The IoT has the potential to impact everything from new product opportunities, to shop floor optimisation, to factory worker efficiency gains that will power top-line and bottom-line gains.

Goldman Sachs' report also highlights that the IoT creates huge demand for big data technologies and analytics that enable enterprises to glean insights from significantly larger data sets collected by connected devices. Increased investment in analytical platforms and visualisation technologies will allow enterprises to make sense of the information and react to it.

Opportunities for insurers: big data

Some insurers are embracing predictive modelling capacities in their underwriting and risk selections. The opportunities are much wider and deeper:

- 1) Can insurers use big data to offer parametric or index-based coverages on flood risk?
- 2) Can insurers offer liability insurance products that pay compensation for suffering/loss computed using big data?
- 3) Can insurers work with regulators to develop metrics that are more indicative of emerging risks?

² <http://www.goldmansachs.com/our-thinking/outlook/internet-of-things/>

Opportunities for insurers: cyber risk insurance

The IoT can represent the “buildings” in the digital world, the integrity of data (cyberattack, data breaches or temperament can represent huge business losses). The advent of the digital economy presents new challenges and opportunities. The risk of cybercrime, data breach and IT failures has been on a rapid rise. According to Allianz’s risk barometer, in Germany, the U.K. and the U.S., cyber risks are among the top three corporate risks. Globally, cybercrime was ranked as the eighth business risk in 2014 and 15th in 2013. Along with the fast-paced evolution of new technology, cybercrime is also evolving, with the amount of malware and malicious software for Android devices rocketing by 400 per cent since 2012.

Some insurers are already proactively developing insurance products to help their customers in data protection. These insurers work closely with IT security architects and clients, and combined their knowledge to identify and evaluate threat scenarios, in a multi-stake holder collaboration.

Medical and biology technology

While the Internet of Things is revolutionising the digital world, we are at the brink of as important or even more exciting breakthroughs in medical and biological technology that will change society and the business and financial worlds. Just to mention one specific bio-technology, in a significant breakthrough, scientists announced a commercially viable nanogenerator—a flexible chip that uses body movements such as the pinch of a finger to generate electricity. According to Professor Zhong Lin Wang of the Georgia Institute of Technology, “This development [the nanogenerator] represents a milestone towards producing portable electronics that can be powered by body movements without the use of batteries or electrical outlets. Our nanogenerators are poised to change lives in the future. Their potential is only limited by one’s imagination.”

Such medical and biological breakthroughs are expected to increase productivity and the total wealth of nations. Of course, individuals and corporations will be impacted differently depending on how they embrace the coming changes. How can insurers participate in the wealth creation brought by medical and biological breakthroughs? How can insurers enable their customers in participating in this wealth creation process?

Shifting demographics and economic powers

The global population is seeing unprecedented shifts in the demographic composition. Globally, there are currently about 350 million people over age 70; in 10 years, this figure will go to 1 billion. Some countries (about 45 of them) are experiencing population declines, while other countries are experiencing population growth.

According to the United Nations Report *World Urbanization Prospects*,³ the coming decades will bring further profound changes to the size and spatial distribution of the global population. The composition of population in some European countries (such as France and Germany) is shifting, and tensions are being created by these shifting demographics. The U.S. Census Bureau projects that whites will become a minority in the U.S. by 2043.

The continuing urbanisation and overall growth of the world’s population is projected to add 2.5 billion people to the urban population by 2050, with nearly 90 per cent of the increase concentrated in Asia and Africa. At the same time, the proportion of the world’s population living in urban areas is expected to increase, reaching 66 per cent by 2050. As the world continues to urbanise, sustainable development challenges and opportunities will have major economic implications for both the public and private sectors.

In parallel to the shift in demographics, there is a shift in economic power. Based on demographic trends, the U.S. can even command a stronger leadership among advanced economies. The U.S. will continue to grow and remain to be the most dominant economic powerhouse, in part due to its ability to adapt and innovate, and to attract and retain talents. However, thanks to the flattening of access to technology and communication, the emerging economic powers are expected to grow faster. In the next 30 years, the GDP of emerging markets of the E7

³ United Nations, Department of Economic and Social Affairs, Population Division (2014) *World Urbanization Prospects: The 2014 Revision, Highlights* (ST/ESA/SER.A/352), <http://esa.un.org/unpd/wup/Highlights/WUP2014-Highlights.pdf>

countries (China, India, Brazil, Russia, Indonesia, Mexico and Turkey) will be double that of the shrinking G7 countries (U.S., Japan, Germany, U.K., France, Italy and Canada).

There is a growing middle class which is more digital and financially savvy, and these people have needs in funding their own retirement and their children's education in their own home country or abroad. How can insurance respond to these megatrends?

Aftershock of the 2008 financial crisis

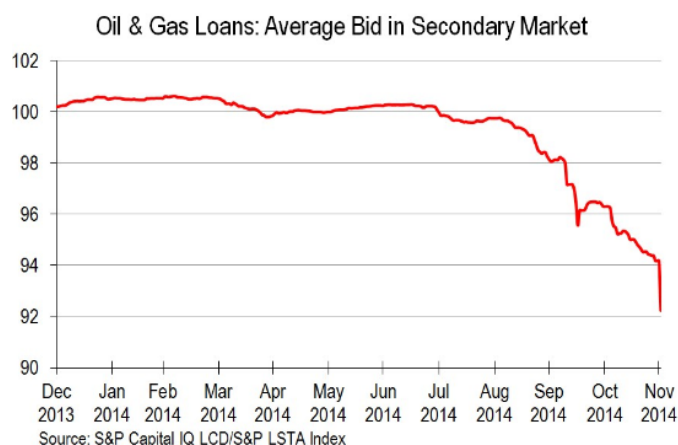
As we now enter the year 2015, the impact of the 2008 financial crisis is still being felt. Indeed, post the 2008 financial crisis, central banks in advanced economies came to the rescue by providing accommodative monetary policies and ultra-low (even negative) interest rates for an extended time period. A prolonged period of low interest rates has prompted some investors to seek higher returns in riskier ventures. Those investments might collapse any time and threaten the stability of the financial system if the economic climate turns bad due to geopolitical conflicts, or the unwinding of quantitative easing.

The rising stock market valuations in recent years are a sign that money went into financial speculations rather than economic investment. It is unlikely the underlying corporations could earn anywhere near enough money to justify prices in any reasonable time frame. Stockholders, however, expect management to sustain or increase prices. This puts pressure on managers to manage for the short term, damaging the long-term prospects of the corporation.

Recent geopolitical tensions in the Russia-Ukraine crisis, and the unexpectedly fast and furious plunge of oil prices have elevated the risk of disruptions to the financial system. For instance, many shale gas ventures in the U.S. are financed through high-yield bonds and loans. According to the writer Adam Galas⁴, "since 2010, U.S. energy companies have borrowed \$550 billion to invest in America's booming shale oil and gas industry. A good deal of this borrowing was through high-yielding junk bonds, which now comprise \$210 billion, or 16% of America's \$1.3 trillion junk bond market". Figure 3 shows the loss in value of oil and gas loans. Adam Galas points to another major risk factor in Russia's corporate debt, which totals USD 660bn, and USD 160bn of which is denominated in foreign currency and held by foreign companies, mostly in Western Europe. Of this debt, between USD 90bn and USD 117bn will need to be repaid in 2015. With Western sanctions shutting off access to foreign credit markets, and Russia's economy likely headed for a steep recession in 2015, the spectre of a wave of corporate defaults triggering a financial crisis in an already fragile European debt market has some analysts concerned.

A prolonged period of low oil prices would create major defaults of these bonds and loans. The world is more interconnected today. Any shocks from advanced economies have the potential to more quickly propagate in emerging markets.

Figure 3. Evolution in value of oil and gas loans



⁴ <http://www.fool.com/investing/general/2015/01/17/should-oil-prices-have-you-worried-about-the-next.aspx>

One can argue that, the quantitative easing (QE) monetary policies of major central banks and the lofty high valuations of financial assets create similar conditions that led to the 2008 financial crisis. A big difference is that today, central banks have already exhausted their conventional and non-conventional monetary policy tools since the 2008 financial crisis: how much lower can interest rates go from current levels? How much capacity do central banks have in purchasing additional assets without jeopardising the confidence of investors?

Many economists appreciate what the central bankers of advanced economies are doing to rescue the economy from falling into recession. On the other hand, the very actions of the central bankers are creating new risks. Only two weeks into 2015, the Swiss National Bank has shocked the world by abolishing the pegging of the Swiss franc to the euro and created major havoc on FX markets. The QE of the European Central Bank is creating new dynamics for monetary systems in the world.

Accumulated structural issues of the global financial system

Jose Vinals, the IMF's top financial counsellor, has highlighted a structural problem: *the world economy needs more productive investment and less in speculative assets*, which, in many cases, are now overvalued and pose big stability risks. Not enough of the easy money pumped into economies by advanced countries' central banks is going into economic activities that support growth. Instead, too much is going into financial risk-taking that poses challenges to global financial stability. The world economy is at risk from the build-up of certain excesses in financial risk taking. Many assets are richly valued and way out of line from fundamentals.

Flooding easy money into the financial system has not resolved the accumulated structural issues. Looking at the recent election in Greece as an example, structural issues such as high unemployment and heavy indebtedness are plaguing the Greek economy and creating a political backlash and mistrust on the part of the prevailing international financial order.

While the financial system is flooded with easy money, in the real economy, there is a "drought" and "thirst" for financing. According to the OECD, Swiss Re and other sources, the projected need for infrastructure over the next several decades is enormous. The global annual infrastructure spending requirements are estimated to increase from USD 2.6tn to around USD 4tn by 2030. In OECD countries, private core infrastructure amounted to 1.7 per cent of GDP (privately owned roads, railways, communication networks, electricity, gas and water supply works). The need for infrastructure investment is not only in emerging economies, but also in advanced economies. For instance, in the U.S., the Netherlands and Germany, the private core infrastructure investment share is less than 0.7 per cent of annual GDP, compared to an OECD average of 1.7 per cent.

The effects of ultra-low interest rates

For insurers, prolonged low interest rates in effect create a situation of financial repression: indeed, the super-low interest rates take money from savers and give it to financial speculators. As a consequence of ultra-low interest rates, investors are actively searching for yield in alternative investment channels.

In the ultra-low interest rate environment, the hunger and thirst for yield have attracted much alternative capital to the (re)insurance market for property catastrophe risks. The global non-life insurance sector has witnessed in recent years a tide wave of alternative capital coming to the insurance industry from pension funds and hedge funds, putting more pressure on the pricing level for catastrophe insurance. Increased market pressure has given impetus to the recent tide wave of mergers and acquisitions of general (re)insurance companies. Among the latest news are the XL Group's acquisition of Catlin and the announced merger of AXIS Capital and Partner Re.

Due to a flush of insurance capital, there is no shortage of supply for insurance. On the other hand, the demand for insurance protection has not increased accordingly, despite the fact that there are increasing uninsured exposure, creating a mismatch of supply and demand for insurance capital.

The low interest rate environment also poses challenges to the traditional life insurance business model which channels saving into long-term investment (consisting predominantly of low-yield sovereign debts).

Climate risks

The World Economic Forum (WEF) has just released a report⁵ on the biggest risks in 2015. Extreme weather events, such as floods and storms, ranked as the second biggest threat to the world over the next 10 years. Extreme weather events can potentially cause major damage to property and infrastructure, as well as cause human losses. Heat waves, extreme rainfall and drought-related shortages of water and food will increasingly test the resilience of infrastructure in these and other cities. In particular, 15 of the world's 20 megacities—those with over 10 million inhabitants—are located in coastal zones threatened by sea level rises and storm surges.

According to the recent report *New Climate Economy*, the next 15 years will be critical, as the global economy undergoes a deep structural transformation. Around USD 90tn is likely to be invested in infrastructure in the world's urban, land-use and energy systems. How these changes are managed will shape future patterns of growth, productivity and living standards.

The ongoing climate changes call for more investment in resilience, which requires well-rounded knowledge of risk exposure assessment, project finance, and cost-benefit analysis of projects (infrastructure, buildings and products) in light of the impact of various hazards to the communities.

Adaptation and resilience: Insurers have much to contribute to help communities to develop adaptation and resilience measures. Firstly, insurance coverage provides financing to restart an economy after a disaster. Secondly, insurers can offer risk engineering services to municipalities and corporate customers to prevent losses, and integrate risk engineering services with insurance coverage.

It can be argued that, over the medium to long term, one effective way of putting money into more productive use, is to invest in adaptation and disaster prevention measures, as well as provide pre-event insurance protection of public infrastructures, so as to increase the overall efficient allocation of capital and boost economic productivity.

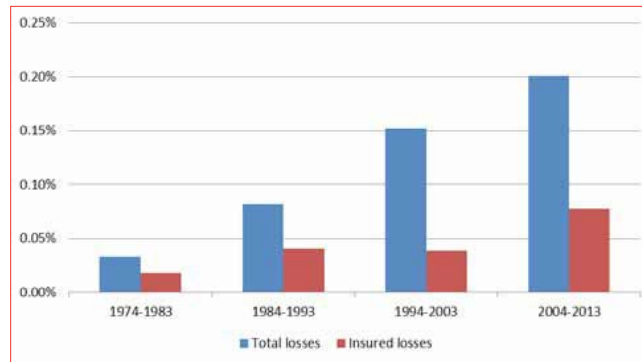
Underinsurance: challenges and opportunities for insurers

The Geneva Association recently published a report, *The Global Insurance Protection Gap—Assessment and Recommendations*. The research report shows that general (non-life) Insurers are facing a widening protection gap. Figure 4 compares global total losses resulting from natural catastrophes with associated insured losses, as a percentage of global GDP, over the period 1974 to 2013. The protection gap, i.e. the difference between insured and total losses as a share of GDP, has widened consistently over the period.

Figure 5 shows that most underinsured markets are emerging economies, similar to the findings of the Lloyd's study. Insurance gaps in many emerging countries are exacerbated by the rapid pace of urbanisation. The Indonesian capital Jakarta is a case in point. A 1-in-a-100 year earthquake loss would leave a USD 10bn protection gap. This shortage is estimated to rise to about USD 30bn by 2023 on the back of rapidly increasing asset values.

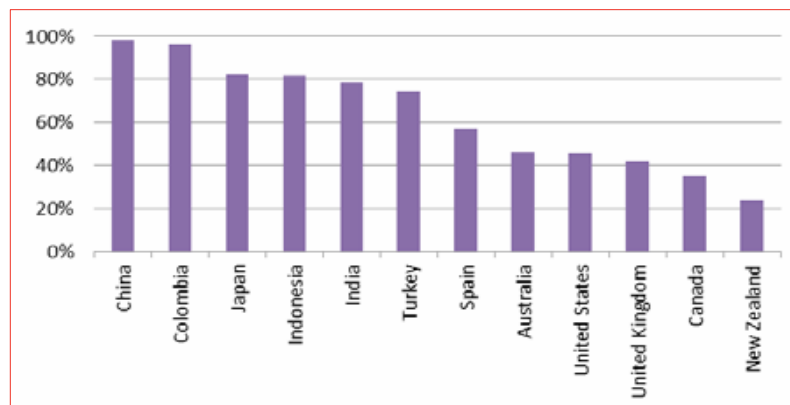
⁵ World Economic Forum (2015) *The Global Risks Report 2015*, <http://www.weforum.org/reports/global-risks-report-2015>.

Figure 4. Total global losses vs insured losses resulting from weather-related catastrophes (1974–2013, 10-year average, in per cent of GDP)



Source: Swiss Re Economic Research & Consulting

Figure 5. Natural catastrophe protection gap in per cent of economic losses (1974–2013)



Source: Swiss Re Economic Research & Consulting

Insurers face increased complexity due to regulation and financial reporting

With the previously mentioned challenges and opportunities for insurers, it is imperative for insurers to be more proactive and innovative in their business model and product offerings, and to fulfil their role in serving the broader economy. A key question is: What are the major hurdles for insurers to reach that goal?

At the ground level of the day-to-day operating environment for insurers, very quickly we will see that overly burdensome complexity in regulation and financial reporting requirements are putting a strain on the (financial and human) resources of insurers. The intent for harmonised global regulation is all good and noble, especially in light of the recent 2008 financial crisis. However, the original intent can easily get lost in the process of implementation, and in ever-increasing complexities. These ever-increasing complexities are the main hurdles for insurers to fulfilling their full potential in contributing to economic stability and development.

Here, what is really needed is greater wisdom on the part of policymakers, regulators and supervisors at the highest level. The insurance industry must contribute to that required wisdom, for the sake of the well-being of consumers and the long-term health of the financial system.

Insurers have a business model that focuses on the long-term. The international community would be better served if insurers are enabled to serve as stabilisers and not be subject to the swing of day-to-day financial market volatilities.