



Trends Report:

# DRI 2017 Global Risk and Resilience Survey

## Executive summary

In 2016, Disaster Recovery Institute (DRI) International produced our first global review of trends and predictions for the year ahead. The associated white paper was written by the DRI Future Vision Committee and formed a key output in the DRI International Thought Leadership program for the year.

This report for 2017 builds on that work and links the global trends that we have observed to their direct impact and influence on the resilience profession. A difference from the previous year is that we will publish a Trends Report in November and a slightly later Predictions Report towards the end of the year. In the Predictions Report, we will have the advantage of knowing the results of the U.S. presidential election which might modify our views in the economic and geo-political fields.

The report looks at how accurate our predictions were for 2016, what significant changes have occurred since we made those predictions, and how the committee sees the political, economic, social, technological, environmental, and legal landscape from a risk and resilience perspective.

We have considered 80 different risks and provide analysis from several perspectives. What makes this survey unique is the introduction of a new “Risk and Resilience Index.” This is designed to help certified professionals establish their priorities for the upcoming year based upon current trends and capabilities.

## Introduction

This report is a review of global risk trends that impact the resilience profession. Compiled in October 2016, it is based upon the opinions of a range of highly experienced professionals. The knowledge of committee members is supplemented with an extensive review of expert opinion from published sources, such as the World Economic Forum (WEF), the Organisation for Economic Co-operation and Development (OECD), and the International Monetary Fund (IMF).

The Trends Report adds to traditional risk findings by looking at the direct impact they might have on business operations and the extent to which resilience professionals can contribute to mitigating such outcomes.

All published expert opinion provides a valuable source of input to our thinking, particularly the 80 key risks that our analysis is based upon. As well as the WEF, OECD, and the IMF, we also looked at other important commentators in the field, including the Eurasia Group's view of political risk, the UK's influential think-tank Chatham House, security specialists (such as Control Risk Group), and leading international insurance companies. Our view, however, is from a slightly different perspective in that we are particularly interested in those risks which directly threaten the capability of public and private sector organizations to continue and prosper. Humanitarian crises in many parts of the world are a strong concern of the DRI Foundation, and we actively support the United Nations Disaster Risk Reduction initiatives. However, such crises do not usually create major short-term business impacts beyond the affected region. It is important to recognize that our ratings imply no moral, political, or ethical ranking of importance - they are largely based on our ability to do practical things to mitigate the direct threats we face.



**2016 – How good were our predictions?**

We made 10 main predictions a year ago. It is interesting to look back and see how accurate we were. The predictions:

**1. There will be increased private/public cooperation lobbying for safe harbor legislation to allow safer information sharing.**

*In the U.S., the Cyber Intelligence Sharing and Protection Act (CISPA) is one of five different cyber security bills in process. This requires sharing of internet traffic data between the U.S. government and global technology companies. It is very contentious at many levels and gets to the heart of the security versus privacy debate. The dispute between Apple and the U.S. government over access to the contents of a terrorist's phone was a major global story in 2016 and such conflicts will be increasingly prevalent in 2017.*

Prediction score: 6 out 10

**2. At least one international firm will collapse or be rescued by “a fire sale” to avoid bankruptcy as a direct result of a supply chain failure.**

*Corporate failures as a direct result of a single event or cause are rare. There was no obvious single high-profile event in 2016 that could be completely attributed to a specific supply chain issue but almost certainly supply chain weaknesses contributed to corporate failures. The withdrawal of Blackberry from the smart phone business, which it largely innovated, has caused global comment and analysis. More surprisingly, and in the same sector, the intractable problems Samsung is having with its new Samsung Galaxy 7 might kill its market leadership aspirations. The fast-food retailer Chipotle also suffered severe damage to profitability and share price after quality problems were attributed directly to supply chain policy changes.*

Prediction score: 6 out 10

**3. There will a large scale “heartland” attack in a western country, where the capital and government are not targeted but highly populated residential areas are.**

*Although many might have thought this an easy prediction to score well on, the attacks in Paris, Brussels, Istanbul, and Nice – as well as scores of terrorist-inspired attacks on random towns across Europe and the U.S. – more than confirmed our fears.*

Prediction score: 10 out 10

**4. Flooding will be the most obvious manifestation of climate change, and there will be many disasters in areas that are not traditionally prone to such events.**

*Flooding is becoming increasingly likely almost everywhere. The U.S. had problems which required major FEMA responses at different times during the year, including Louisiana in spring, Wisconsin and Minnesota in summer and Mississippi in the fall. Australia experienced major problems in New South Wales which left much of the state without power. South Australia also suffered from almost unprecedented flooding this year. In more recent*

weeks, Hurricane Matthew destroyed parts of Haiti and caused severe damage in the Bahamas and Florida.

Prediction score: 10 out 10

**5. Large private sector organizations will become more pro-active about their own protection, actively destroying hostile cyber networks and increasing their own anti-terrorist security measures.**

*This is a difficult prediction to accurately measure, given that individual firms are unlikely to openly discuss security measures and pro-active tactics – particularly as some of these might be subject to legal challenge. Informal discussions with experts in the field suggest, however, that this more aggressive stance by large corporates is already well underway. An unidentified financial services company is alleged to have destroyed 100 servers from foreign hackers during 2016 alone.*

Prediction score: 7 out 10

**6. Eurozone will not collapse, but the currency will fall to its lowest ever level against the US dollar, sometimes trading near parity.**

*The Eurozone did not collapse, although fears about another bail-out crisis in Greece and the even more serious risk of a full-scale banking collapse in Italy remain. The Euro exchange rate across the year was largely unchanged against the dollar despite the relative weakness of the Eurozone recovery and the better than expected performance of the U.S. economy. This might be explained, in part, by the uncertainty with the value of the pound following the UK's Brexit vote. However, the fundamental flaws with the Euro are structural and unlikely to be resolved any time soon, so pressure on the exchange rate is set to continue.*

Prediction score: 5 out 10

**7. There will be at least one major natural disaster in Asia involving wide-spread loss of life, environmental damage, and economic dislocation to the affected territory.**

*During the year, an increasing intensity of natural disasters in parts of the region was observed – with typhoons sweeping across China, Japan, and*

*Taiwan described as among the worst ever recorded. Massive landslides in South East China caused much disruption and loss of life. Indonesia experienced severe volcanic eruptions and the Philippines history of severe flooding continued.*

Prediction score: 8 out 10

**8. There will be a failure of critical government services, such as welfare payments and support services which leads to wide-scale civil unrest.**

*The failure of power in Australia demonstrated how quickly infrastructure can fail even in the most developed parts of the world. A large storm took an entire state's power offline, while connections to the national grid were rebooting. The whole state of South Australia was blacked out, and there were no trains or critical infrastructure for about six hours. Only buildings with diesel generators, such as hospitals and airports remained operational.*

Prediction score: 8 out 10

**9. Decisions about the supply chain, with emphasis on resilient and reliable business partners, will favor large corporates and increase merger and acquisition (M&A) activity.**

*Although this trend may be happening, it is difficult to monitor as there are obviously many other reasons why individual firms choose specific partners. M&A activity also varies widely from country to country. In the UK, for example, there were a relatively high level of failure among small and start-up businesses, which is attributed by some to the cost of compliance and increase in regulation.*

Prediction score: 5 out 10

**10. Risk Management will be the dominant discipline and will oversee a transition and consolidation of various resilience subject areas.**

*This consolidation did not move as quickly as we expected, with corporates concentrating more on their key operational and security issues over reorganization of support functions. However, it is a trend that we do expect to continue. There are also concerns about the openness of risk management reporting and the*

*potential security implications of that information being accessible to hackers.*

Prediction score: 5 out 10

The value of predictions is the thought process that goes into determining them. Outcomes are largely random with respect to timing, but none of the predictions made were unreasonable or wrong, and all are likely to happen in the relatively near future even if they did not materialize in 2016. The overall rating of our performance was a score of 70 out of 100 which might be considered “a passing grade with room for improvement.” We will try to do exactly that with our 2017 predictions. We also recognize that the predictions we made in 2015 for 2016 did not cover some areas of the world like South America and Africa. We will give wider geographic coverage in our 2017 forecasts.

## How the world changed in 2016



There have been many international events and trends in 2016 that were surprising to most observers and certainly will change the way next year unfolds. Amongst the most significant (in no implied order of importance) were:

1. The UK voted to leave the European Union (Brexit).
2. Donald Trump became the Republican presidential candidate and, regardless of the result, has changed the terms of political debate in the U.S.
3. ISIS was driven back in both Iraq and Syria to a level we did not predict, mainly by the introduction of Russian forces. However, Russian support for the Assad regime makes a political solution in Syria ever more improbable.
4. A failed apparent coup in Turkey resulted in a massive consolidation of power for President Erdogan and a removal of claimed opponents of the regime at all levels of power or influence in society.
5. Russia became increasingly assertive in trying to establish itself as the dominant world power in the Middle East. It also continues to create conflict in Ukraine with little concern for western opinion.
6. German Chancellor Angela Merkel backed away from her decision to accept unlimited numbers of refugees into Germany, based upon strong opposition both domestically and amongst other EU nations. Merkel's grasp on power in Germany is looking less secure than ever before.
7. Economic globalization is being challenged by newly emerging political parties (from both the right and left) led by populist politicians and finding surprising levels of support.
8. Many governments are starting to challenge the legality of global companies paying taxes outside of the country where they mainly conduct operations. The inversion mergers served to avoid U.S. corporate income taxes. Recent rulings by the U.S. Treasury sought to limit these tax avoidance transactions.
9. The emergence of far right anti-establishment parties across much of Europe accelerated with major support being experienced in France, Holland, Austria and even Germany. Some traditional parties appear on the verge of collapse.
10. Relations between the NATO countries and Russia are at their lowest ebb since the end of the Cold War, and the long-term sustainability of NATO is in question.
11. In Brazil, President Rousseff was impeached amid political and economic chaos for this influential BRICS country. Despite this, and the Zika virus health scare, the Olympic and Paralympic Games were successful, but many feel at a cost which could have been better spent on addressing poverty in Rio.

12. In Venezuela, continuing low oil prices brought this oil rich country to the verge of collapse. Wide-scale poverty, starvation, and crime are on an unimaginable scale for the region.

13. Previously stable Saudi Arabia is in the middle of a financial crisis with record levels of state debt, harsh spending cuts, and massive tax increases. There also is some popular opposition to involvement in proxy wars in Syria and Yemen.

14. In South Africa, President Jacob Zuma's hold on power is increasingly fragile amid legal and political challenges to his authority, and (for the first time since independence) there is a strong level of opposition to ANC rule.

In conclusion, 2016 was a year in which world stability and security appears at a post-war low. Most regions seem less stable and more unpredictable than a year ago. Many of the unexpected outcomes listed above might not have much short-term direct consequences on how Resilience Management is practiced on a day to day basis, but in a riskier world more things are likely to go wrong and the consequences of such failures will be more difficult to manage.



### The 2017 DRI business risk & resilience survey

In a systematic approach, all major sources of published expert opinions on future risks and imminent trends were researched. Issues identified were divided into six categories under the PESTEL classification – Political (23), Economic (14), Social (16), Technological (10), Environmental (9) and Legal (8). The number of separate items considered by committee members in each classification is shown next to the category definitions (see Figure 1 on the right). Overall, there were 80 different issues considered from three different perspectives: likelihood in 2017, impact, and resilience capability.

**Figure 1**

#### POLITICAL

- 1 Cyber espionage - state sponsored
- 2 Cyber warfare - state sponsored
- 3 Election of extreme populist leader in Europe
- 4 Increased homegrown terrorism
- 5 Growth of fundamentalist extremism
- 6 Hardening of U.S./China relations
- 7 Hardening of U.S./Russia relations
- 8 Israel/Palestine escalation
- 9 New conflicts in Middle East region
- 10 North Korea nuclear threat becomes more viable
- 11 Overthrow of democracy in European or Asian country
- 12 Partial breakup of the EU
- 13 Reappraisal of role and funding of NATO
- 14 Refugees and provision of Emergency Shelter
- 15 Resurgence of Taliban strongholds
- 16 Civil war in Africa or South America
- 17 Russia/Ukraine escalation
- 18 South China Sea dispute escalation
- 19 Growing strain between Turkey and its western allies
- 20 U.S. becomes more isolationist
- 21 U.S. military more involved in Middle East conflicts
- 22 Chemical or germ weapons used internally
- 23 Chemical or germ weapons used externally

#### ECONOMIC

- 24 Banking – systemic failure
- 25 China growth dramatically reduced
- 26 Cyber fraud – commercial
- 27 Cyber theft – commercial
- 28 Failure of a major (iconic) financial institution
- 29 Greece leaves the Euro currency bloc
- 30 Economic shocks caused by uncontrolled migration
- 31 Major unexpected oil price shock
- 32 Man-made disaster (oil, gas, chemicals)
- 33 More outsourcing to higher risk regions
- 34 Supply chain shortages - supplier bankruptcies
- 35 Systemic failure of critical infrastructure
- 36 Terms of Brexit - creates uncertainty
- 37 Unsustainable pensions in developed world

#### SOCIAL

- 38 Active shooters
- 39 Aging population - inter-generational conflict
- 40 Cyber attacks including Ransomware
- 41 Extreme food shortages and famine
- 42 Global spread of animal disease into food chain
- 43 Increased inequality - social pressures
- 44 Increased migration causing social and political unrest
- 45 Increasing resistance to anti-biotics
- 46 Labor disputes targeting critical infrastructure

- 47 More radicalization in western democracies
- 48 Use of social media to promote terrorist propaganda
- 49 Pandemic flu or similar viruses
- 50 Random acts of extreme violence
- 51 Skills shortages in key areas
- 52 Unsupportable level of refugees
- 53 A mosquito spread virus affecting developed world

**TECHNOLOGICAL**

- 54 Driverless cars
- 55 Drones in collision with civil aircraft
- 56 Extreme crime driven by easy access to “Dark Web”
- 57 Failing legacy systems in back offices
- 58 Investment levels in Information security
- 59 Investment levels in overall IT resiliency
- 60 Problems from higher dependency on on-line technology
- 61 Misuse of new technology - biological research
- 62 Misuse of new technology -A/I, IoT, robotics
- 63 Power shortages and wide-scale outages

**ENVIRONMENTAL**

- 64 Political commitment to climate change agreements
- 65 Increased earthquakes and tsunamis
- 66 Increased extreme temperatures
- 67 Increased tornados and hurricanes
- 68 Increased volcanic action
- 69 Increased wide-scale flooding
- 70 Major oil spill causing environment damage
- 71 Nuclear reactor failure/meltdown
- 72 Water shortages

**LEGAL**

- 73 Increased regulatory penalties in finance
- 74 Legal challenge to Brexit vote
- 75 Officer personal liabilities for corporate failure and misconduct
- 76 Increased product recall incidents
- 77 Corporate use of social media – legal exposure
- 78 Increased legal penalties against corporate polluters
- 79 EU legal action on taxation against global corporations
- 80 Privacy or data protection laws compliance

Committee members provided their own input but also solicited views and opinions from colleagues and other resilience professionals as they felt appropriate. Opinions were sought and consolidated from North America, Europe, Middle East, Far East, and Australia. Data provided by other DRI research surveys were also made available to the committee for consideration and incorporation as appropriate.

Expertise of contributors covered finance, technology, healthcare, business services, manufacturing, retail, environment, public sector, and academia.

**Rating Methodology**

The ratings were based upon 1 for the lowest importance and 5 for the highest importance. Average scores across the study are shown in **Appendix 1** of this report.

**Appendix 2** shows the likelihood of a specific risk, threat, or hazard being significant in 2017 ranked from 1 to 80 with 1 being the most likely, 80 being the least likely.

**Appendix 3** shows the seriousness of the impact or consequence should one of the above occur ranked from 1 to 80 with 1 being the highest potential impact, 80 being the lowest.

**Appendix 4** is a risk assessment which combines the figures from Appendices 1 and 2 and ranks them with a weighted risk score from 1 to 80.

**Appendix 5** contains a quartile analysis which groups the 80 items into the following categories:

- High Impact/High Likelihood
- High Impact/Low Likelihood
- Low Impact/High Likelihood
- Low Impact/Low Likelihood

**Appendix 6** shows the importance of each of the 80 items to the professional practices of a risk, resilience or continuity practitioner and our capability to deal with it ranked by a resilience score.

**Appendix 7** is a Risk/Resilience Index which depicts the correlation between the overall risk rating given the item and its importance to resilience professionals.

## The views of our experts



### Political Landscape

*The political landscape is no more certain than it was a year ago despite some issues, such as the Brexit vote in the UK being resolved in principle if not in practice.*

In the U.S., the strong performance of Bernie Sanders for the Democratic nomination – which is possibly even more surprising than the success of the Trump populist agenda – shows frustration with the political elites on both sides of the widening political divide. Conventional wisdom argues that the winner in November will have difficulty in making many fundamental changes because of the complex systems of checks and balances in the U.S. Constitution. However, failure to understand the desire for domestic change, will further increase the frustrations of the parts of the U.S. electorate who widely believe the political elite has no interest in their concerns. The likely scenario of a Clinton victory is not, in itself, a solution to the U.S. political impasse. Although it would generally be welcomed by world leaders, it probably will only create more discontent from the large numbers of disaffected voters who no longer trust establishment politicians to deliver for them. Among millennials in the U.S., a recent poll showed only 30 percent believed that democracy in itself was very important for them or their lives. Clinton might have to take a more populist position with a lower profile international leadership role than she would probably like to adopt. A more isolationist stance from the U.S., regardless of incoming President, is probable with the TTIP trade deal with the EU an almost certain casualty.

In Europe, things are even less clear than in the U.S. For some, Brexit is seen as a catalyst for change in the way Europe operates, but there are many other issues that continue to divide the continent. The EU is finding it difficult to satisfy the demands of 28 member states with respect to trade agreements. The deal with the U.S. (TTIP) is almost certainly going to

fail, and even the less controversial deal with Canada (CETA) faced serious challenges before being finally signed. There are massive economic and political differences between the affluent northern countries led by Germany and the poor southern states increasingly relying on handouts from the EU and IMF. Differences between the traditional core EU countries and the former East Bloc countries over migration and border control are increasingly divisive. The multiple challenges to the EU – which include Brexit, a possible banking collapse in Italy, further Greek bail-outs, migration levels that are unsustainable, security threats from ISIS terrorists driven out of Syria and the rise of anti-EU populist parties – might create the perfect storm. The year 2017 will certainly not see the EU break up, but it might be seen as the year in which the cracks become too wide to keep all parties together on major policy issues. It could be the beginning of a slow end to the idea of a centralized Europe and the start of a more flexible relationship.

Much of the Middle East (including North Africa) is fast approaching a point at which no viable political solution is conceivable. Six countries across the region are embroiled in civil wars that are destroying the fabric of those nations, as well as their people, economy, and infrastructure. The number of refugees fleeing these countries is at record levels. Despite some media fatigue in reporting these events, the situation is probably getting worse, and it is difficult to see any improvement in 2017. The situation in Syria is a humanitarian crisis on an epic scale, ever fuelled by the proxy-wars, the most obvious of which is being played out by Iran and Saudi over domination of the region. The Sunni Shia conflicts are more complex, with various fractions involved, while an internal Wahhabi war mainly involving Qatar and Saudi is also in play. Above all of this is a virtual re-introduction of the U.S. Russia Cold War now

**Multiple challenges to the EU might create the perfect storm.**

relocated from Europe to the Middle East. Recent events suggest U.S.-Russia relations are at their lowest level since the fall of the USSR. Even the normally stable Saudi Arabia has been harmed by the extended oil price slump and is facing both financial problems and political infighting within the ruling dynasties. The UAE seems still relatively unaffected by the situation that surrounds it, but it will be looking very closely at developments in Saudi Arabia.

Other conflicts have continued to ferment during the course of 2016 with no real political will to solve them. North Korea continues its belligerent stance against South Korea, Japan, and the U.S., while China (despite agreeing to UN sanctions with the U.S. as early as February 2016) shows little sign of exerting much pressure on the regime. China's expansion into the South China Sea has largely gone unchecked despite the protests of neighboring countries and international condemnation. Russia continues its conflict with Ukraine at a level that does not attract serious international military attention, but threatens the integrity of the country as a whole. Other former USSR satellites such as the Baltic States who are now members of NATO have deep concerns for their own security. Whether the main NATO powers would back action against Russia to protect them is being openly questioned. If not, does NATO have a real purpose and must individual nations start to spend more on their own defense needs?

Turkey is absolutely key to many issues, and the apparent attempted coup against President Erdogan has changed the dynamics completely. This gave him the opportunity to move closer to a consolidation of political power in the executive branch. The purge not only cut through the military but also through the civil service, judiciary, universities, and even school teachers. Although Erdogan has many reasons for continued cooperation with the U.S. and Europe, he has made overtures to Russia and Turkey's focus could possibly shift more eastwards in the coming years.

Arguably, the world is more unstable than at any time since the end of World War II – given that during that

period there was at least a balance of power with known protagonists. Wars between major players now seem unthinkable, but proxy wars such as the ones we are seeing in Syria and Ukraine are likely to occur more regularly. We are also likely to see more use of technology to conduct cyber wars and cyber espionage by nation states on other nation states. Naturally this is impacting domestic politics in many countries with an alarming growth in populist parties from both left and right. Candidates with very different political philosophies are able to tap into common concerns among groups feeling ignored by political establishments. Brexit owed much to this trend and the strong opinion poll showing of fringe parties in Europe (anti-EU, anti-globalization, anti-immigration, anti-austerity) gives serious concerns for 2017. In particular, Marine Le Pen in the French Presidential elections is a serious indicator of how dangerous this trend might become. She is unlikely to win, but a narrow defeat might, in fact, be the best result for her party and the worst outcome for the French political establishment.



### **Economic Landscape**

*Given the political uncertainty and levels of geopolitical risk in the world today, the economic challenges in many ways have been overlooked by mainstream media.*

However, parts of the world have certainly still not fully recovered from the financial crisis of 2007/2008. Interest rates remain at record low levels, personal debt remains too high in many countries, and many European banks have failed to meet stress test requirements of their regulators. However, the U.S. economy is performing well and in similar countries such as the UK economic indications such as consumer spending, employment, and stock market valuations are at record highs.

In the Eurozone, a further Greek bail-out seems likely and many believe that Greece must inevitably eventually leave the single currency. However, the perilous position of the Italian banking sector



is of much more importance to the EU. Italy did not take the tough actions of Spain, Ireland, and Greece to clean up their debt positions when the crisis first emerged. Now the entire banking system faces possible collapse together with the Italian government. For those who believe that this is purely a problem of Southern Europe, the latest news from Germany indicates that the once mighty Deutsche Bank is on the verge of collapse. Deutsche Bank shares have fallen to their lowest value for 25 years and the IMF has described it as the world's highest risk large bank. The German government is being called to bail out the bank which Chancellor Merkel has apparently refused to consider doing, but many in Germany are calling for just that. The U.S. Justice Department is expected to fine Deutsche Bank more than its entire current market capitalization so there are still very difficult times ahead.

Brexit, which was seen to be a major financial risk for the UK, seems at the moment to be having limited direct impact. In fact, most forecasters have upgraded their forecasts for growth in the UK economy to much the same level as they were predicting when they assumed the UK would vote to remain. The UK economy is performing better than the Eurozone, partly helped by the effective devaluation of the pound against the dollar and Euro following the Brexit vote. The future performance of the UK economy will depend on the trade deals the UK achieves with the EU and the rest of the world. It is now generally assumed that the UK will formally serve notice to leave the EU in early 2017, with probable full separation by late 2019. It is too early to tell whether or not this will ultimately be successful, but 2017 will probably be a difficult year for markets as both sides formally begin negotiations.

For the petroleum-based economies in the Middle East, Africa, and South America, the extended low price of oil (although relatively better than a year ago) continues to wreak havoc on their economic performance. There seems little reason to expect any significant improvement during 2017 as U.S.

fracking continues to provide a cheaper alternative to conventional technologies. This ongoing trend is already creating chaos in Venezuela and Nigeria, with even Saudi Arabia finding the situation challenging.

As always, the performance of China is key to the overall world economic position. Collapse of China's banking, property markets, and equity markets have long been feared, but they have proved to be more resilient than many expected. Slowdown in growth in 2015 resulted in actions to re-stimulate the export economy with less emphasis on domestic consumption than most economists had expected. 2017 is unlikely to see any serious financial issues arising from China that will cause a global crisis.

Perhaps the largest risk to the global trade is a more isolationist approach in the U.S., the breakdown of the Schengen agreement in Europe, and a general political backlash against globalization. Many commentators are already discussing whether we are now in the post-globalization era and, if so, what comes next.

Another actor has started to emerge which might have profound impacts on both the political and economic ability of national governments to control events— global super-companies like Apple, Google, Amazon, and Facebook which have both the financial power and the wide-scale community influence to make serious challenges to the status quo. The coming year is likely to see such companies moving beyond conventional business models and directly influencing the political process. Expect technology companies to start creating financial products – or even launch their own global currencies – which might appeal to younger people. This could be more successful than previous initiatives in this area, such as bitcoins.

Expect technology companies to start creating financial products which might appeal to younger people.



### Social Landscape

*The social trend of greatest concern is the unprecedented level of migration, not only from the Middle East into Europe but also from poor to rich countries throughout the world.*

The distinction between refugees (who are generally welcomed) and economic migrants (who are much less accepted) continues to grow in intensity. The latest manifestation of this crisis is the closure and destruction of the so called “jungle camp” in Calais.

During 2016, there were many events around the world in which emergency managers and resilience professionals have been directly involved (dealing with the response) or indirectly called into action (mitigating operational consequences). Brussels, San Bernardino, Orlando, Dallas, Nice, Baton Rouge, Wurzburg, Munich, Istanbul, Rouen, Chelsea NYC, and many others have become familiar names to us for atrocities this year no matter where we reside.

Obvious targets for terrorism, like the European Soccer Championship in Paris and the Olympic Games in Rio, have not been affected by terrorism, possibly because of the quality of the security, but more likely because the terrorist strategy has changed. We predicted that in 2016 terrorist targets would move away from set piece events towards soft, random, and unexpected targets – and this appears to be the case.

Although many acts of violence are terror-related, they are not necessarily connected to a broader global movement. Some are the result of social disturbance, mental health, and racial tensions. Some are well-organized and targeted, but often appear to be random acts of violence carried out by troubled young people. This may or may not have a link with the increasing distrust in conventional, pragmatic politics. The choice of weapons varies – including unconventional ones such as a vehicle in Nice – but bombs, guns and knives remain the main threats. We do see many active shooter incidents in the U.S. with resilience professionals having to develop specific skills for confronting this increasingly prevalent type of incident.

Social cohesion in the U.S. and Europe seems to have become strained with social media possibly fuelling much of the cynicism against democratically elected leaders. Leaders seem to be unpopular except in countries with strong autocratic iconic individuals at the helm – most obviously, Russia and Turkey. Although many might dispute the value of their election process, few would doubt Putin or Erdogan’s mandate to govern.

There is much discussion about inter-generational conflict as another cause of social unrest, but there seems little evidence that this is the case. Again, increased inequality (meaning the economic gap between rich and poor) is often blamed for social problems, but these seem to be mainly valid only when there are other issues at play such as excessive migration, racial tensions, or mistrust of police.

Although an ever-present threat, medical issues tend to move up and down the list of concerns as one threat replaces another in the media (Ebola was replaced by Zika), and we are regularly told of the imminent failure of antibiotics leading to unimaginable diseases returning to haunt us. The truth of such dire warnings is difficult to determine, but there is no doubt that medical threats, such as a pandemic, do require significant involvement and planning from resilience professionals.

**Terrorist strategy has changed... towards soft, random, and unexpected targets**



### Technological Landscape

*Technological change is all pervasive, bringing with it great opportunities as well as the risk of misuse.*

One area that is rapidly changing is banking – the internet is driving the biggest upheaval to the industry in its history, with branches closing and smartphones providing 24/7 services. Consequently, it is not surprising that technology companies might consider entering the banking market. At the moment, regulation is the major reason that Apple, Google, and Facebook are unlikely to become banks beyond

offering mobile payment systems and money transfer options. PayPal has become popular and is now joined by Apple Pay. Although new banks no longer have to invest in costly branch infrastructure, only the wealthiest firms would be able to raise billions in capital, hire thousands of compliance officers, and meet other regulatory requirements to get banking licences. This is likely to deter technology firms in the immediate future.

During 2016, we had a number of reports relating to the cost of cyber-crime and the need to better protect data and information. However, there appears to have been less intensity about the issue in the media. This may be because so many other bad things happened which were more newsworthy, but all business managers are now aware of the problem. They are not confident that they have a solution, or even that a solution exists, and they are reticent to admit that to their customers and competitors.

Technology is ethically ambivalent – a force for good or evil – depending on what individuals choose to do with it. It is a weapon in the wrong hands, but an opportunity for the right people to create and add value to the world (such as a cure for diseases like cancer). In the medical field, technology could unlock new medical treatments similar to what early pharmaceuticals did a century ago.

Naturally, many downsides also exist and some of emerging technology will be misused. The “dark-web” seems to be an area in which criminals and social misfits can obtain almost anything they wish – however dangerous, depraved, or illegal their wishes are. How this is going to be controlled is a real challenge to government and law enforcement agencies globally.

Drones look to be a technology of the future, but how long will it be before non-regulated use of drones for private or commercial use causes a civilian air-crash? In the UK, prison authorities are fighting an ongoing battle with the use of drugs by inmates being delivered by drones over prison walls and directly into cells. On a positive note, drones offer faster, automated deliveries – a technology being pioneered

by Amazon - and potentially a host of applications where human intervention is not necessary.

The era of the Internet of Things (IoT) is now upon us. This is the linking of physical devices, vehicles, buildings, and other items embedded with electronics, software, sensors, and network connectivity to enable these objects to collect and exchange data. It is predicted that the IoT could consist of 50 billion objects by 2020. Recent denial of service (DoS) attacks have created unacceptable outages for leading internet firms such as Facebook, Twitter, and Spotify. This has been partly blamed on the ability of hackers to harness the power of these inanimate objects to send vast numbers of messages which block servers.

Driverless cars seem to be on their way, but how can we absolutely guarantee that the computer systems that run them will not fail or be able to stop hackers taking over control? As IoT, artificial intelligence and robotics start to reach their long anticipated potential, how can we ensure they do what we want?

Much of this seems the stuff of sci-fi movies but it is coming ever closer to being part of everyday life.

Yet while all of this is going on, much of the basic technological infrastructure that has supported our companies for decades has not been replaced. We have many legacy systems originally built for mainframes, amended for on-line access and now being further patched up for the mobile era. Without significant investment in technology regeneration and built-in resiliency by many major organizations, such as banks and airlines, we will see an increasing number of costly and reputation damaging service interruptions. One such example was the failure of IT at Delta Airlines which kept all of its non-domestic flights grounded for the best part of a day. There have also been a number of embarrassing service failures at some UK banks over the past few years.

The era  
of the  
Internet  
of Things  
(IoT)  
is now  
upon us.

For resilience professionals, technology reliability is the cornerstone of what they do. It seems like only a few years ago that advances in technology made conventional IT/DR redundant. New systems eliminated single points of failure and created resilient networks and non-stop computing. The on-line world was managed “in the cloud,” specialist FM companies were running our computer operations for us, and 100% availability was becoming the norm. We now realize, of course, that IT/DR has not disappeared, but it has changed. In some ways, with multiple platforms and a complex mix of integrated technologies and applications to understand, it is even more of a challenge. As technology advances, the basic business recovery principles remain unchanged. If you cannot continue without a particular system, service, or application, then you must have a means to ensure that an outage beyond a tolerable time threshold does not happen. This applies if you outsource your IT, run it all “in the cloud,” or still have a conventional internal IT department.



### Environmental Landscape

*The UN Climate Change Conference (COP21), which was signed by 191 nations in Paris at the end of 2015, provides a framework agreement between nations to reduce greenhouse gas emissions to limit temperature rises to below 2 degrees centigrade.*

It has currently been ratified by 61 countries, most significantly the U.S. and China – the two largest producers of greenhouse gases. Some other countries such as the UK have reservations about the agreement and have not yet ratified it.

However, nothing is really implementable in the short-term. The support for it in the U.S. following the departure of President Obama will be patchy at best. China continues to build fossil fuel power stations and will probably seek to meet the letter of the agreement, which is politically expedient, rather than the spirit.

As suggested in last year’s report, the most likely short-term manifestation of climate change is increased levels of flooding which start to cause major civil disruption. It is difficult to prove that this is

occurring, but much anecdotal evidence in all parts of the world suggests it is the case. Ironically, another environmental issue that is becoming a serious global threat is water shortage. This is making previously fertile land now unsustainable for farming in the developing world, leading to famine, mass migration, and humanitarian crises.

Can democratic governments realistically adopt measures that harm their domestic economies without losing elections? Will totalitarian governments feel any real need to take any action, given they face no realistic challenge to their decisions? COP21 provides a starting point, but is it really likely to make a large difference in the short-term?

Although bodies like the United Nations and the European Union are important in setting the tone for environment change, national governments must deliver on their promises, and this is usually a sticking point unless suitable financially viable technologies exist to turn aspirations into realities. Therefore, innovative technology, rather than government treaties, is likely to be the way that significant global environmental changes will happen. Fortunately, this seems to be recognized and major investment in new technologies, often through start-up companies, seems to be bringing many new solutions on-stream.



### Legal Landscape

*There are few sectors or regions in which business continuity is part of any legal requirement to operate.*

The main exception to this is in the financial sector where the regulator in most countries (often the central banks) have defined resilience standards with which firms operating in the sector must comply. This is enforced by the Basel Committee for Financial Supervision which mandated this requirement. There are also related requirements in other regulated sectors, such as energy and healthcare, although they are sector-specific in their demands.

Perhaps, the most obvious issue is the increasing tendency of regulators (particularly in the U.S.) to fine

banks and other financial sector businesses heavily for non-compliance. The U.S. courts are also punishing firms, such as BP, when they are held responsible for environmental damage or corporate negligence. In addition, there is an increasing tendency for corporate officers to be held directly accountable for their actions, which if proven to be negligent, reckless or illegal will result in them facing fines, professional disbarment, or even custodial sentences.

Another area that is gaining attention is the responsibility and liability of firms for what they publish or allow to be published on social media. Clearly, for social networking sites this is their primary business and their legal liability for content is a key risk factor. However, for general businesses – using a plethora of on-line channels to communicate with their clients and the general public – it is also potentially dangerous territory. Gawker was an American website claiming 23 million visits per month in 2015. It promoted stories on celebrities and Manhattan personalities, but it was forced to close as a result of losing a legal action brought against it by popular wrestling personality Hulk Hogan, who was awarded \$ 140 million in damages.

Product recall is another key area closely related to crisis management, but it tends to be handled separately because of the strategic risk to the reputation of the business. There are certainly legal consequences, with failure to act promptly and appropriately leading to lengthy and costly court cases. It is particularly crucial if there are deaths or injuries resulting from the faulty product. The case of automobile airbags made by the Japanese firm Takata is an example. There are now 11 deaths attributed to their faulty airbags. There are 34 million cars fitted with the same type of airbag, which has created the largest product recall in automobile history. In addition to the legal consequences, the impact on profit and reputation is immense.

One legal red herring is the possibility of the UK and EU being thrown into chaos by a legal challenge to

the Brexit vote. This is raised generally by those who did not like the outcome of the referendum. Although this could complicate or delay the exit process, it is unlikely to change the outcome.



## Survey results

While there was some variation in scoring, there was significant consensus on the main issues. Clearly, there are many different ways in which data can be interpreted, and this review has attempted to look at these issues through several different lenses. They are:

1. The **likelihood** of the defined risk, threat, or hazard causing problems in 2017 (See Appendix 2, page 19)
2. The worst-case global **impact**, should this specific risk be realized (See Appendix 3, page 20)
3. A weighted **risk** rating for 2017 based upon a combined likelihood and impact score (See Appendix 4, page 21)
4. A **resilience** ranking in terms of how much the risk affects the resilience professional (See Appendix 6, page 24)
5. A **risk/resilience index** or overall score based upon a combination of the weighted risk and the capability to address them. Ideally, these might be viewed as the priority list for resilience professionals as they plan for 2017 (See Appendix 7, page 25).

The top 20 issues from the 80 overall issues considered are listed below in their order of importance for each of the aforementioned three categories – likelihood, impact, and overall risk. For example, “Cyber espionage – state sponsored” is ranked first for likelihood, but does not reach the top 10 on impact or overall risk (positioned at 46 and 15 respectively). Conversely, “Problems from higher dependency on on-line technology” scores highly on all three classifications (3, 2 and 1 respectively). The complete results for all 80 items with average scores for each based on a 1-5 rating are shown in the Appendices to this report.

**The likelihood of the defined risk, threat, or hazard causing problems in 2017 (See Appendix 2 for complete list)**

- 1 Cyber espionage - state sponsored
- 2 Random acts of extreme violence
- 3 Problems from higher dependency on on-line technology
- 4 Cyber fraud – commercial
- 5 Cyber theft – commercial
- 6 Active shooters
- 7 Cyber attacks including ransomware
- 8 Investment levels in information security
- 9 Growth of fundamentalist extremism
- 10 Increased wide-scale flooding
- 11 Increased migration causing social unrest
- 12 More radicalization in Western democracies
- 13 Unsupportable level of refugees
- 14 Investment levels in overall IT resiliency
- 15 Man-made disaster (oil, gas, chemicals)
- 16 Use of social media to promote terrorist propaganda
- 17 Extreme crime driven by easy access to “Dark Web”
- 18 Refugees and provision of emergency shelter
- 19 US becomes more isolationist
- 20 Terms of Brexit - creates uncertainty

**The worst-case impact of a specific problem or risk being realized (See Appendix 3 for complete list)**

- 1 Nuclear reactor failure/meltdown
- 2 Problems from higher dependency on on-line technology
- 3 Banking systemic failure
- 4 Cyber attacks including ransomware
- 5 Investment levels in information security
- 6 Increasing resistance to anti-biotics
- 7 Power shortages and wide-scale outages
- 8 Systemic failure of critical infrastructure
- 9 Cyber theft – commercial
- 10 Investment levels in overall IT resiliency
- 11 Man-made disaster (oil, gas, chemicals)
- 12 Growth of fundamentalist extremism
- 13 China growth dramatically reduced
- 14 North Korea nuclear threat becomes more viable
- 15 Cyber fraud - commercial
- 16 Extreme crime driven by easy access to “Dark Web”
- 17 Extreme food shortages and famine
- 18 Chemical or germ weapons used externally
- 19 More radicalization in Western democracies
- 20 Unsupportable level of refugees

**The weighted risk rating for 2017 based upon likelihood and impact (See Appendix 4 page 21, for complete list)**

- 1 Problems from higher dependency on on-line technology
- 2 Cyber attacks including ransomware
- 3 Investment levels in information security
- 4 Cyber theft – commercial
- 5 Cyber fraud – commercial
- 6 Growth of fundamentalist extremism
- 7 Investment levels in overall IT resiliency
- 8 Man-made disaster (oil, gas, chemicals)
- 9 Increased wide-scale flooding
- 10 Random acts of extreme violence
- 11 More radicalization in Western democracies
- 12 Unsupportable level of refugees
- 13 Power shortages and wide-scale outages
- 14 Increased migration causing social unrest
- 15 Cyber espionage - state sponsored
- 16 Extreme crime driven by easy access to “Dark Web”
- 17 Extreme food shortages and famine
- 18 Negative and illegal use of social media
- 19 Increasing resistance to anti-biotics
- 20 New conflicts in Middle East region

**The resilience ranking in terms of how much the issue directly affects resilience professionals (See Appendix 6, page 24, for complete list)**

- 1 Problems from higher dependency on on-line technology
- 2 Systemic failure of critical infrastructure
- 3 Cyber attacks including ransomware
- 4 Investment levels in information security
- 5 Power shortages and wide-scale outages
- 6 Cyber fraud – commercial
- 7 Cyber theft – commercial
- 8 Investment levels in overall IT resiliency
- 9 Pandemic flu or similar viruses
- 10 Non-compliance on privacy or data protection laws
- 11 Supply chain shortages - supplier bankruptcies
- 12 Failing legacy systems in back offices
- 13 Water shortages
- 14 Cyber espionage - state sponsored
- 15 Increased wide-scale flooding
- 16 Banking systemic failure
- 17 Labor disputes targeting critical infrastructure
- 18 A mosquito-spread virus affecting developed world
- 19 Cyber warfare - state sponsored
- 20 Man-made disaster (oil, gas, chemicals)

Each of these four representations provide important information in their own right, but how valuable they are in driving resilience priorities will vary based upon individual circumstances. Traditional risk management often uses the concept of a quartile analysis showing the linkage between probability and impact. It is simplistic but gives an easy overview of the best risk treatment to be adopted. Traditionally, business continuity planning was a designated treatment for high impact events like terrorist attacks or destruction of infrastructure. Although resilience management looks at this in a more holistic manner, this simple view can still provide some useful oversight. How these results can be shown on this type of analysis is included in Appendix 5, page 22. A sample of these results is depicted below in Figure 2.

For our purposes, however, a new representation called the Risk/Resilience Index (Appendix 7, page 25) has been introduced which very clearly communicates the priorities for certified resilience

professionals. The Risk/Resilience Index combines the rankings on both the risk and resilience scales to give us the best overview of what should be the optimum use of limited resilience resources.

**The Risk/Resilience Index**

It is important to review how close our resilience priorities are to those on the risk score chart. In fact, of the 10 highest scoring risks only six made the Resilience Top 10. Most global risk surveys concentrate on the probability and impact assessment (shown in the weighted risk list – Appendix 4, page 21), but by adding the specialized knowledge of the resilience professional, we can clearly view the issues that must be addressed urgently if we are to achieve improved resilience.

In an ideal world, without other corporate and management priorities to deliver, the business continuity and resilience professional should concentrate efforts on improving their organization’s

**Figure 2: Sample Quartile Analysis of Identified Risks, Threats and Hazards\***

<p><b>High Impact - Low Likelihood</b></p> <ul style="list-style-type: none"> <li>• Nuclear reactor failure/meltdown</li> <li>• Systemic banking failure</li> <li>• Systemic failure of critical infrastructure</li> <li>• Dramatically reduced growth in China</li> <li>• More viable North Korea nuclear threat</li> <li>• Water shortages</li> <li>• etc.</li> </ul>	<p><b>High Impact - High Likelihood</b></p> <ul style="list-style-type: none"> <li>• Problems from higher dependency on online tech</li> <li>• Cyber attacks including ransomware</li> <li>• Investment levels in information security</li> <li>• Greater resistance to antibiotics</li> <li>• Power shortages/outages</li> <li>• Cyber theft - commercial</li> <li>• etc.</li> </ul>
<p><b>Low Impact - Low Likelihood</b></p> <ul style="list-style-type: none"> <li>• Hardening of U.S./China relations</li> <li>• Increased homegrown terrorism</li> <li>• Failing legacy systems in back offices</li> <li>• Election of extreme populist leader in Europe</li> <li>• Civil war in Africa or South America</li> <li>• Supply chain shortages - supplier bankruptcies</li> <li>• etc.</li> </ul>	<p><b>Low Impact - High Likelihood</b></p> <ul style="list-style-type: none"> <li>• Refugees and provision of emergency shelter</li> <li>• Increased extreme temperatures</li> <li>• Increased product recall incidents</li> <li>• Economic shocks caused by uncontrolled migration</li> <li>• Hardening of U.S./Russia relations</li> <li>• Increased inequality - social pressures</li> <li>• etc.</li> </ul>

\*Note: Full list of risks, threats and hazards by quartile segment provided in Appendix 5, page 22

capability to better manage the top 10 risks from the index with some attention given to items 11-20. Although this approach has been based on a global set of risk assumptions, there is nothing to stop individual firms using the same methodology to formulate their own resilience top 10.

### Risk/Resilience Index Top 20

- 1 Problems from higher dependency on on-line technology
- 2 Cyber attacks including ransomware
- 3 Investment levels in information security
- 4 Cyber theft – commercial
- 5 Cyber fraud – commercial
- 6 Investment levels in overall IT resiliency
- 7 Systemic failure of critical infrastructure
- 8 Power shortages and wide-scale outages
- 9 Increased wide-scale flooding
- 10 Man-made disaster (oil, gas, chemicals)
- 11 Growth of fundamentalist extremism
- 12 Pandemic flu or similar viruses
- 13 Non-compliance on privacy or data protection laws
- 14 Cyber espionage - state sponsored
- 15 Random acts of extreme violence
- 16 Water shortages
- 17 Cyber warfare - state sponsored
- 18 Extreme crime driven by easy access to “Dark Web”
- 19 Increased tornados and hurricanes
- 20 Labor disputes targeting critical infrastructure

It is interesting to note that the top seven all directly relate to information technology in some way. Of the top 20, 12 items are information technology specific. Therefore, the need to ensure a strong and clear understanding of the complexities of modern technology as applied to business organizations may now be the single most important skill set for a resilience professional to possess.



## Appendices

### Appendix 1 – Average scores

#	Risk , threat or hazard	Likelihood in 2017	Impact	Resilience
1	Cyber Espionage - State Sponsored	4.8	3.0	3.6
2	Cyber Warfare - State Sponsored	3.4	3.5	3.4
3	Election of extreme populist leader in Europe	2.4	2.8	1.1
4	Increased homegrown terrorism	2.9	2.8	2.4
5	Growth of fundamentalist extremism	4.3	3.9	2.8
6	Hardening of U.S./China relations	2.6	2.9	1.5
7	Hardening of U.S./Russia relations	3.4	2.8	1.5
8	Israel/Palestine escalation	3.0	2.6	1.4
9	New conflicts in Middle East region	3.5	3.5	1.6
10	North Korea nuclear threat becomes more viable	2.4	3.9	1.3
11	Overthrow of democracy in European or Asian country	2.4	2.3	1.3
12	Partial breakup of the EU	2.4	3.6	2.1
13	Reappraisal of role and funding of NATO	2.9	3.3	1.1
14	Refugees and provision of Emergency Shelter	3.6	2.9	2.0
15	Resurgence of Taliban strongholds	2.9	3.0	1.5
16	Civil War in Africa or South America	2.3	2.8	1.6
17	Russia/Ukraine escalation	3.1	3.0	1.1
18	South China Sea dispute escalation	3.3	2.6	1.1
19	Growing strain between Turkey and its western allies	3.1	3.3	1.9
20	U.S. becomes more isolationist	3.6	2.5	1.1
21	U.S. military become more involved in Middle East conflicts	1.9	3.1	1.9
22	Chemical or germ weapons used internally	1.9	3.4	2.1
23	Chemical or germ weapons used externally	2.5	3.8	2.3
24	Banking Systemic Failure	2.0	4.5	3.5
25	China growth dramatically reduced	2.6	3.9	1.6
26	Cyber Fraud - Commercial	4.5	3.8	4.0
27	Cyber Theft - Commercial	4.5	4.0	4.0
28	Failure of a major (iconic) financial instituion	3.0	3.4	2.6
29	Greece leaves the Euro currency bloc	2.3	2.5	2.8
30	Economic shocks caused by uncontrolled migration	3.5	2.8	1.3
31	Major unexpected oil price shock	2.0	3.5	1.5
32	Man-made disaster (oil, gas, chemicals)	3.8	4.0	3.4
33	More outsourcing to higher risk regions	2.9	3.1	3.4
34	Supply Chain shortages - supplier bankruptcies	2.6	2.6	3.8
35	Systemic Failure of Critical Infrastructure	2.6	4.1	4.3
36	Terms of Brexit - creates uncertainty	3.6	3.0	1.6
37	Unsustainable pensions in developed world	2.9	3.0	1.0
38	Active Shooters	4.5	2.4	3.1
39	Aging Population - inter-generational conflict	2.8	2.1	1.4

#	Risk , threat or hazard	Likelihood in 2017	Impact	Resilience
40	Cyber Attacks including Ransomware	4.5	4.4	4.1
41	Extreme food shortages and famine	3.6	3.8	1.5
42	Global spread of animal disease into food chain	2.3	3.4	2.0
43	Increased inequality - social pressures	3.4	2.8	2.1
44	Increased migration causing social unrest	4.1	3.5	1.9
45	Increasing resistance to anti-biotics	3.0	4.3	1.6
46	Labor disputes targetting Critical Infrastructure	2.8	3.4	3.5
47	More radicalization in Western democracies	4.0	3.6	1.3
48	Use of social media to promote terrorist propaganda	3.8	3.5	2.4
49	Pandemic Flu or similar viruses	3.1	3.5	3.9
50	Random Acts of Extreme Violence	4.8	3.1	2.8
51	Skills Shortages in key areas	3.1	2.6	2.3
52	Unsupportable level of refugees	4.0	3.6	1.4
53	A mosquito spread virus affecting developed world	2.8	3.4	3.5
54	Driverless Cars	2.4	1.9	1.3
55	Drones in collision with civil aircraft	2.8	2.3	1.1
56	Extreme crime driven by easy access to "Dark Web"	3.8	3.8	2.6
57	Failing legacy systems in back offices	2.9	2.8	3.8
58	Investment levels in Information Security	4.4	4.4	4.1
59	Investment levels in overall IT Resiliency	4.0	4.0	4.0
60	Problems from higher dependency on on-line technology	4.8	4.5	4.5
61	Misuse of new technology - biological research	2.4	3.6	1.4
62	Misuse of new technology -A/I, IoT, robotics	2.1	3.1	1.4
63	Power shortages and wide-scale outages	3.5	4.1	4.1
64	Political commitment to climate change agreements	2.4	3.4	2.5
65	Increased Earthquakes and Tsunamis	2.9	3.1	3.0
66	Increased extreme temperatures	3.1	2.9	3.0
67	Increased tornados and hurricanes	3.5	3.3	3.3
68	Increased volcanic action	1.9	3.0	1.8
69	Increased wide-scale flooding	4.3	3.5	3.6
70	Major Oil Spill causing environment damage	2.1	2.4	2.3
71	Nuclear Reactor Failure/Meltdown	1.5	4.6	2.4
72	Water shortages	2.8	3.6	3.8
73	Increased Regulatory Penalties in Finance	2.0	2.5	1.0
74	Legal challenge to Brexit vote	2.0	2.5	1.0
75	Officer personal liabilities for corporate failure	2.6	2.1	1.5
76	Increased product recall incidents	3.0	2.9	2.3
77	Corporate use of social media - legal exposure	3.3	2.0	2.0
78	Increased legal penalties against corporate polluters	2.1	1.9	1.0
79	EU legal action on taxation aganst global corporations	3.0	1.5	1.0
80	Non compliance on privacy or data protection laws	3.3	3.6	3.8

## Appendix 2 – Likelihood

#	Risk , threat or hazard	Likelihood
1	Cyber Espionage - State Sponsored	4.6
2	Random Acts of Extreme Violence	4.5
3	Problems from higher dependency on on-line technology	4.5
4	Cyber Fraud - Commercial	4.4
5	Cyber Theft - Commercial	4.4
6	Active Shooters	4.3
7	Cyber Attacks including Ransomware	4.1
8	Investment levels in Information Security	4.1
9	Growth of fundamentalist extremism	4.0
10	Increased wide-scale flooding	4.0
11	Increased migration causing social unrest	4.0
12	More radicalization in Western democracies	3.9
13	Unsupportable level of refugees	3.9
14	Investment levels in overall IT Resiliency	3.9
15	Man-made disaster (oil, gas, chemicals)	3.8
16	Use of social media to promote terrorist propaganda	3.8
17	Extreme crime driven by easy access to "Dark Web"	3.8
18	Refugees and provision of Emergency Shelter	3.8
19	US becomes more isolationist	3.6
20	Terms of Brexit - creates uncertainty	3.6
21	Extreme food shortages and famine	3.6
22	New conflicts in Middle East region	3.6
23	Economic shocks caused by uncontrolled migration	3.6
24	Power shortages and wide-scale outages	3.6
25	Increased tornados and hurricanes	3.5
26	Cyber Warfare - State Sponsored	3.5
27	Hardening of US/Russia relations	3.5
28	Increased inequality - social pressures	3.5
29	Corporate use of social media - legal exposure	3.5
30	Non compliance on privacy or data protection laws	3.5
31	South China Sea dispute escalation	3.5
32	Russia/Ukraine escalation	3.4
33	Growing strain between Turkey and its western allies	3.4
34	Pandemic Flu or similar viruses	3.4
35	Skills Shortages in key areas	3.4
36	Increased extreme temperatures	3.4
37	Israel/Palestine escalation	3.4
38	Failure of a major (iconic) financial instituion	3.3
39	Increasing resistance to anti-biotics	3.3
40	Increased product recall incidents	3.3
41	EU legal action on taxation aganst global corporations	3.1

#	Risk , threat or hazard	Likelihood
42	Increased homegrown terrorism	3.1
43	Reappraisal of role and funding of NATO	3.1
44	Resurgence of Taliban strongholds	3.1
45	More outsourcing to higher risk regions	3.1
46	Unsustainable pensions in developed world	3.0
47	Failing legacy systems in back offices	3.0
48	Increased Earthquakes and Tsunamis	3.0
49	Aging Population - inter-generational conflict	3.0
50	Labor disputes targetting Critical Infrastructure	3.0
51	A mosquito spread virus affecting developed world	3.0
52	Drones in collision with civil aircraft	2.9
53	Water shortages	2.9
54	Hardening of US/China relations	2.9
55	China growth dramatically reduced	2.9
56	Supply Chain shortages - supplier bankruptcies	2.8
57	Systemic Failure of Critical Infrastructure	2.8
58	Officer personal liabilities for corporate failure	2.8
59	Chemical or germ weapons used externally	2.8
60	Election of extreme populist leader in Europe	2.8
61	North Korea nuclear threat becomes more viable	2.8
62	Overthrow of democracy in European or Asian country	2.8
63	Partial breakup of the EU	2.6
64	Driverless Cars	2.6
65	Misuse of new technology - biological research	2.6
66	Political commitment to climate change agreements	2.6
67	Civil War in Africa or South America	2.5
68	Greece leaves the Euro currency bloc	2.5
69	Global spread of animal disease into food chain	2.5
70	Misuse of new technology -A/I, IoT, robotics	2.5
71	Major Oil Spill causing environment damage	2.4
72	Increased legal penalties against corporate polluters	2.4
73	Banking Systemic Failure	2.3
74	Major unexpected oil price shock	2.3
75	Increased Regulatory Penalties in Finance	2.1
76	Legal challenge to Brexit vote	2.1
77	US military become more involved in Middle East conflicts	2.0
78	Chemical or germ weapons used internally	1.9
79	Increased volcanic action	1.9
80	Nuclear Reactor Failure/Meltdown	1.5

### Appendix 3 – Impact

#	Risk , threat or hazard	Impact
1	Nuclear Reactor Failure/Meltdown	4.6
2	Problems from higher dependency on on-line technology	4.5
3	Banking Systemic Failure	4.5
4	Cyber Attacks including Ransomware	4.4
5	Investment levels in Information Security	4.4
6	Increasing resistance to anti-biotics	4.3
7	Power shortages and wide-scale outages	4.1
8	Systemic Failure of Critical Infrastructure	4.0
9	Cyber Theft - Commercial	4.0
10	Investment levels in overall IT Resiliency	4.0
11	Man-made disaster (oil, gas, chemicals)	4.0
12	Growth of fundamentalist extremism	3.9
13	China growth dramatically reduced	3.9
14	North Korea nuclear threat becomes more viable	3.9
15	Cyber Fraud - Commercial	3.8
16	Extreme crime driven by easy access to "Dark Web"	3.8
17	Extreme food shortages and famine	3.8
18	Chemical or germ weapons used externally	3.8
19	More radicalization in Western democracies	3.6
20	Unsupportable level of refugees	3.6
21	Water shortages	3.6
22	Partial breakup of the EU	3.6
23	Misuse of new technology - biological research	3.6
24	Non compliance on privacy or data protection laws	3.6
25	Increased wide-scale flooding	3.5
26	Increased migration causing social unrest	3.5
27	Use of social media to promote terrorist propaganda	3.5
28	New conflicts in Middle East region	3.5
29	Cyber Warfare - State Sponsored	3.5
30	Pandemic Flu or similar viruses	3.5
31	Major unexpected oil price shock	3.5
32	Failure of a major (iconic) financial instituion	3.4
33	Labor disputes targetting Critical Infrastructure	3.4
34	A mosquito spread virus affecting developed world	3.4
35	Political commitment to climate change agreements	3.4
36	Global spread of animal disease into food chain	3.4
37	Chemical or germ weapons used internally	3.4
38	Increased tornados and hurricanes	3.3
39	Growing strain between Turkey and its western allies	3.3
40	Reappraisal of role and funding of NATO	3.3
41	Random Acts of Extreme Violence	3.1
42	More outsourcing to higher risk regions	3.1

#	Risk , threat or hazard	Impact
43	Increased Earthquakes and Tsunamis	3.1
44	Misuse of new technology -A/I, IoT, robotics	3.1
45	U.S. military become more involved in Middle East conflicts	3.1
46	Cyber Espionage - State Sponsored	3.0
47	Terms of Brexit - creates uncertainty	3.0
48	Russia/Ukraine escalation	3.0
49	Resurgence of Taliban strongholds	3.0
50	Unsustainable pensions in developed world	3.0
51	Increased volcanic action	3.0
52	Refugees and provision of Emergency Shelter	2.9
53	Increased extreme temperatures	2.9
54	Increased product recall incidents	2.9
55	Hardening of US/China relations	2.9
56	Economic shocks caused by uncontrolled migration	2.8
57	Hardening of US/Russia relations	2.8
58	Increased inequality - social pressures	2.8
59	Increased homegrown terrorism	2.8
60	Failing legacy systems in back offices	2.8
61	Election of extreme populist leader in Europe	2.8
62	Civil War in Africa or South America	2.8
63	South China Sea dispute escalation	2.6
64	Skills Shortages in key areas	2.6
65	Israel/Palestine escalation	2.6
66	Supply Chain shortages - supplier bankruptcies	2.6
67	U.S. becomes more isolationist	2.5
68	Greece leaves the Euro currency bloc	2.5
69	Increased Regulatory Penalties in Finance	2.5
70	Legal challenge to Brexit vote	2.5
71	Active Shooters	2.4
72	Major Oil Spill causing environment damage	2.4
73	Drones in collision with civil aircraft	2.3
74	Overthrow of democracy in European or Asian country	2.3
75	Aging Population - inter-generational conflict	2.1
76	Officer personal liabilities for corporate failure	2.1
77	Corporate use of social media - legal exposure	2.0
78	Increased legal penalties against corporate polluters	1.9
79	Driverless Cars	1.9
80	EU legal action on taxation aganst global corporations	1.5

### Appendix 4 – Weighted risk score

#	Risk , threat or hazard	Risk score
1	Problems from higher dependency on on-line technology	21.4
2	Cyber Attacks including Ransomware	19.7
3	Investment levels in Information Security	19.1
4	Cyber Theft - Commercial	18.0
5	Cyber Fraud - Commercial	16.9
6	Growth of fundamentalist extremism	16.5
7	Investment levels in overall IT Resiliency	16.0
8	Man-made disaster (oil, gas, chemicals)	15.0
9	Increased wide-scale flooding	14.9
10	Random Acts of Extreme Violence	14.8
11	More radicalization in Western democracies	14.5
12	Unsupportable level of refugees	14.5
13	Power shortages and wide-scale outages	14.4
14	Increased migration causing social unrest	14.4
15	Cyber Espionage - State Sponsored	14.3
16	Extreme crime driven by easy access to "Dark Web"	14.1
17	Extreme food shortages and famine	13.6
18	Use of social media to promote terrorist propaganda	13.1
19	Increasing resistance to anti-biotics	12.8
20	New conflicts in Middle East region	12.3
21	Cyber Warfare - State Sponsored	11.9
22	Non compliance on privacy or data protection laws	11.9
23	Increased tornados and hurricanes	11.4
24	Pandemic Flu or similar viruses	10.9
25	Terms of Brexit - creates uncertainty	10.9
26	Systemic Failure of Critical Infrastructure	10.8
27	Active Shooters	10.7
28	Refugees and provision of Emergency Shelter	10.4
29	China growth dramatically reduced	10.2
30	Growing strain between Turkey and its western allies	10.2
31	Failure of a major (iconic) financial instituion	10.1
32	Water shortages	10.0
33	Economic shocks caused by uncontrolled migration	9.6
34	Chemical or germ weapons used externally	9.4
35	Russia/Ukraine escalation	9.4
36	Reappraisal of role and funding of NATO	9.3
37	Labor disputes targetting Critical Infrastructure	9.3
38	A mosquito spread virus affecting developed world	9.3
39	Hardening of US/Russia relations	9.3
40	Increased inequality - social pressures	9.3
41	North Korea nuclear threat becomes more viable	9.2

#	Risk , threat or hazard	Risk score
42	U.S. becomes more isolationist	9.1
43	Banking Systemic Failure	9.0
44	More outsourcing to higher risk regions	9.0
45	Increased Earthquakes and Tsunamis	9.0
46	Increased extreme temperatures	9.0
47	Resurgence of Taliban strongholds	8.6
48	Unsustainable pensions in developed world	8.6
49	Increased product recall incidents	8.6
50	Partial breakup of the EU	8.6
51	Misuse of new technology - biological research	8.6
52	South China Sea dispute escalation	8.5
53	Skills Shortages in key areas	8.2
54	Political commitment to climate change agreements	8.0
55	Increased homegrown terrorism	7.9
56	Failing legacy systems in back offices	7.9
57	Israel/Palestine escalation	7.9
58	Global spread of animal disease into food chain	7.6
59	Hardening of US/China relations	7.5
60	Major unexpected oil price shock	7.0
61	Nuclear Reactor Failure/Meltdown	6.9
62	Supply Chain shortages - supplier bankruptcies	6.9
63	Misuse of new technology -A/I, IoT, robotics	6.6
64	Corporate use of social media - legal exposure	6.6
65	Election of extreme populist leader in Europe	6.5
66	Chemical or germ weapons used internally	6.3
67	Civil War in Africa or South America	6.2
68	Drones in collision with civil aircraft	6.2
69	U.S. military become more involved in Middle East conflicts	5.9
70	Aging Population - inter-generational conflict	5.8
71	Increased volcanic action	5.6
72	Greece leaves the Euro currency bloc	5.6
73	Officer personal liabilities for corporate failure	5.6
74	Overthrow of democracy in European or Asian country	5.3
75	Major Oil Spill causing environment damage	5.0
76	Increased Regulatory Penalties in Finance	5.0
77	Legal challenge to Brexit vote	5.0
78	EU legal action on taxation aganst global corporations	4.5
79	Driverless Cars	4.5
80	Increased legal penalties against corporate polluters	4.0

## Appendix 5 – Quartile analysis

### Risk, threat or hazard

#### High impact - high likelihood quartile

Problems from higher dependency on on-line technology

Cyber Attacks including Ransomware

Investment levels in Information Security

Increasing resistance to anti-biotics

Power shortages and wide-scale outages

Cyber Theft - Commercial

Investment levels in overall IT Resiliency

Man-made disaster (oil, gas, chemicals)

Growth of fundamentalist extremism

Cyber Fraud - Commercial

Extreme crime driven by easy access to "Dark Web"

Extreme food shortages and famine

More radicalization in Western democracies

Unsupportable level of refugees

Non compliance on privacy or data protection laws

Increased wide-scale flooding

Increased migration causing social unrest

Use of social media to promote terrorist propaganda

New conflicts in Middle East region

Cyber Warfare - State Sponsored

Pandemic Flu or similar viruses

Failure of a major (iconic) financial institution

Increased tornados and hurricanes

Growing strain between Turkey and its western allies

Random Acts of Extreme Violence

Cyber Espionage - State Sponsored

Terms of Brexit - creates uncertainty

Russia/Ukraine escalation

#### High impact - low likelihood quartile

Nuclear Reactor Failure/Meltdown

Banking Systemic Failure

Systemic Failure of Critical Infrastructure

China growth dramatically reduced

North Korea nuclear threat becomes more viable

Chemical or germ weapons used externally

Water shortages

Partial breakup of the EU

Misuse of new technology - biological research

Major unexpected oil price shock

Labor disputes targeting Critical Infrastructure

A mosquito spread virus affecting developed world

Political commitment to climate change agreements

Global spread of animal disease into food chain

Chemical or germ weapons used internally

Reappraisal of role and funding of NATO

More outsourcing to higher risk regions

Increased Earthquakes and Tsunamis

Misuse of new technology -A/I, IoT, robotics

U.S. military become more involved in Middle East conflicts

Resurgence of Taliban strongholds

Unsustainable pensions in developed world

Increased volcanic action

**Low impact - high likelihood quartile**

- Refugees and provision of Emergency Shelter

---

- Increased extreme temperatures

---

- Increased product recall incidents

---

- Economic shocks caused by uncontrolled migration

---

- Hardening of US/Russia relations

---

- Increased inequality - social pressures

---

- South China Sea dispute escalation

---

- Skills Shortages in key areas

---

- Israel/Palestine escalation

---

- U.S. becomes more isolationist

---

- Active Shooters

---

- Corporate use of social media - legal exposure

---

- EU legal action on taxation against global corporations

**Low impact - low likelihood quartile**

- Hardening of US/China relations

---

- Increased homegrown terrorism

---

- Failing legacy systems in back offices

---

- Election of extreme populist leader in Europe

---

- Civil War in Africa or South America

---

- Supply Chain shortages - supplier bankruptcies

---

- Greece leaves the Euro currency bloc

---

- Increased Regulatory Penalties in Finance

---

- Legal challenge to Brexit vote

---

- Major Oil Spill causing environment damage

---

- Drones in collision with civil aircraft

---

- Overthrow of democracy in European or Asian country

---

- Aging Population - inter-generational conflict

---

- Officer personal liabilities for corporate failure

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- Increased legal penalties against corporate polluters

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- Driverless Cars

NOTE: IMPACTS AND LIKELIHOOD REFER TO 2017 TIMESCALE ONLY  
 Items will move up and down quartiles in future years

### Appendix 6 – Resilience score

#	Risk , threat or hazard	Resilience score
1	Problems from higher dependency on on-line technology	4.5
2	Systemic Failure of Critical Infrastructure	4.3
3	Cyber Attacks including Ransomware	4.1
4	Investment levels in Information Security	4.1
5	Power shortages and wide-scale outages	4.1
6	Cyber Fraud - Commercial	4.0
7	Cyber Theft - Commercial	4.0
8	Investment levels in overall IT Resiliency	4.0
9	Pandemic Flu or similar viruses	3.9
10	Non compliance on privacy or data protection laws	3.8
11	Supply Chain shortages - supplier bankruptcies	3.8
12	Failing legacy systems in back offices	3.8
13	Water shortages	3.8
14	Cyber Espionage - State Sponsored	3.6
15	Increased wide-scale flooding	3.6
16	Banking Systemic Failure	3.5
17	Labor disputes targetting Critical Infrastructure	3.5
18	A mosquito spread virus affecting developed world	3.5
19	Cyber Warfare - State Sponsored	3.4
20	Man-made disaster (oil, gas, chemicals)	3.4
21	More outsourcing to higher risk regions	3.4
22	Increased tornados and hurricanes	3.3
23	Active Shooters	3.1
24	Increased Earthquakes and Tsunamis	3.0
25	Increased extreme temperatures	3.0
26	Growth of fundamentalist extremism	2.8
27	Greece leaves the Euro currency bloc	2.8
28	Random Acts of Extreme Violence	2.8
29	Failure of a major (iconic) financial instituion	2.6
30	Extreme crime driven by easy access to "Dark Web"	2.6
31	Political commitment to climate change agreements	2.5
32	Increased homegrown terrorism	2.4
33	Use of social media to promote terrorist propaganda	2.4
34	Nuclear Reactor Failure/Meltdown	2.4
35	Chemical or germ weapons used externally	2.3
36	Skills Shortages in key areas	2.3
37	Major Oil Spill causing environment damage	2.3
38	Increased product recall incidents	2.3
39	Partial breakup of the EU	2.1
40	Chemical or germ weapons used internally	2.1
41	Increased inequality - social pressures	2.1

#	Risk , threat or hazard	Resilience score
42	Refugees and provision of Emergency Shelter	2.0
43	Global spread of animal disease into food chain	2.0
44	Corporate use of social media - legal exposure	2.0
45	Growing strain between Turkey and its western allies	1.9
46	U.S. military become more involved in Middle East conflicts	1.9
47	Increased migration causing social unrest	1.9
48	Increased volcanic action	1.8
49	New conflicts in Middle East region	1.6
50	Civil War in Africa or South America	1.6
51	China growth dramatically reduced	1.6
52	Terms of Brexit - creates uncertainty	1.6
53	Increasing resistance to anti-biotics	1.6
54	Hardening of US/China relations	1.5
55	Hardening of US/Russia relations	1.5
56	Resurgence of Taliban strongholds	1.5
57	Major unexpected oil price shock	1.5
58	Extreme food shortages and famine	1.5
59	Officer personal liabilities for corporate failure	1.5
60	Israel/Palestine escalation	1.4
61	Aging Population - inter-generational conflict	1.4
62	Unsupportable level of refugees	1.4
63	Misuse of new technology - biological research	1.4
64	Misuse of new technology -A/I, IoT, robotics	1.4
65	North Korea nuclear threat becomes more viable	1.3
66	Overthrow of democracy in European or Asian country	1.3
67	Economic shocks caused by uncontrolled migration	1.3
68	More radicalization in Western democracies	1.3
69	Driverless Cars	1.3
70	Election of extreme populist leader in Europe	1.1
71	Reappraisal of role and funding of NATO	1.1
72	Russia/Ukraine escalation	1.1
73	South China Sea dispute escalation	1.1
74	U.S. becomes more isolationist	1.1
75	Drones in collision with civil aircraft	1.1
76	Unsustainable pensions in developed world	1.0
77	Increased Regulatory Penalties in Finance	1.0
78	Legal challenge to Brexit vote	1.0
79	Increased legal penalties against corporate polluters	1.0
80	EU legal action on taxation aganst global corporations	1.0

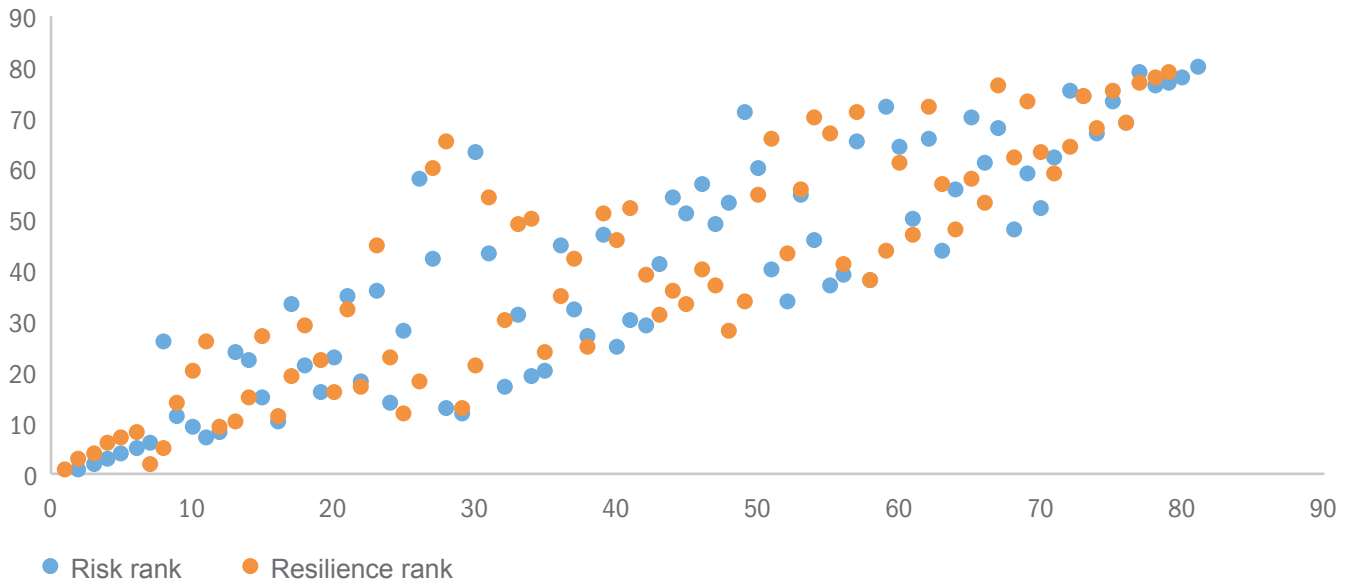


## Appendix 7 – Risk/Resilience Index

Index rank	Risk , threat or hazard	Risk rank	Resilience rank
1	Problems from higher dependency on on-line technology	1	1
2	Cyber Attacks including Ransomware	2	3
3	Investment levels in Information Security	3	4
4	Cyber Theft - Commercial	4	6
5	Cyber Fraud - Commercial	5	7
6	Investment levels in overall IT Resiliency	6	8
7	Systemic Failure of Critical Infrastructure	26	2
8	Power shortages and wide-scale outages	11	5
9	Increased wide-scale flooding	9	14
10	Man-made disaster (oil, gas, chemicals)	7	20
11	Growth of fundamentalist extremism	8	26
12	Pandemic Flu or similar viruses	24	9
13	Non compliance on privacy or data protection laws	22	10
14	Cyber Espionage - State Sponsored	15	15
15	Random Acts of Extreme Violence	10	27
16	Water shortages	33	11
17	Cyber Warfare - State Sponsored	21	19
18	Extreme crime driven by easy access to "Dark Web"	16	29
19	Increased tornados and hurricanes	23	22
20	Labor disputes targetting Critical Infrastructure	35	16
21	Use of social media to promote terrorist propaganda	18	32
22	A mosquito spread virus affecting developed world	36	17
23	Increased migration causing social unrest	14	45
24	Active Shooters	28	23
25	Failing legacy systems in back offices	58	12
26	Banking Systemic Failure	42	18
27	Unsupportable level of refugees	13	60
28	More radicalization in Western democracies	12	65
29	Supply Chain shortages - supplier bankruptcies	63	13
30	More outsourcing to higher risk regions	43	21
31	Extreme food shortages and famine	17	54
32	Failure of a major (iconic) financial instituion	31	30
33	Increasing resistance to anti-biotics	19	49
34	New conflicts in Middle East region	20	50
35	Increased Earthquakes and Tsunamis	45	24
36	Chemical or germ weapons used externally	32	35
37	Refugees and provision of Emergency Shelter	27	42
38	Increased extreme temperatures	47	25
39	Terms of Brexit - creates uncertainty	25	51
40	Growing strain between Turkey and its western allies	30	46

Index rank	Risk , threat or hazard	Risk rank	Resilience rank
41	China growth dramatically reduced	29	52
42	Increased inequality - social pressures	41	39
43	Political commitment to climate change agreements	54	31
44	Increased product recall incidents	51	36
45	Increased homegrown terrorism	57	33
46	Partial breakup of the EU	49	40
47	Skills Shortages in key areas	53	37
48	Greece leaves the Euro currency bloc	71	28
49	Nuclear Reactor Failure/Meltdown	60	34
50	Hardening of US/Russia relations	40	55
51	Economic shocks caused by uncontrolled migration	34	66
52	Global spread of animal disease into food chain	55	43
53	Resurgence of Taliban strongholds	46	56
54	Reappraisal of role and funding of NATO	37	70
55	North Korea nuclear threat becomes more viable	39	67
56	Chemical or germ weapons used internally	65	41
57	Russia/Ukraine escalation	38	71
58	Major Oil Spill causing environment damage	72	38
59	Corporate use of social media - legal exposure	64	44
60	Misuse of new technology - biological research	50	61
61	U.S. military become more involved in Middle East conflicts	66	47
62	U.S. becomes more isolationist	44	72
63	Hardening of US/China relations	56	57
64	Increased volcanic action	70	48
65	Major unexpected oil price shock	61	58
66	Civil War in Africa or South America	68	53
67	Unsustainable pensions in developed world	48	76
68	Israel/Palestine escalation	59	62
69	South China Sea dispute escalation	52	73
70	Misuse of new technology -A/I, IoT, robotics	62	63
71	Officer personal liabilities for corporate failure	75	59
72	Aging Population - inter-generational conflict	74	64
73	Election of extreme populist leader in Europe	67	74
74	Overthrow of democracy in European or Asian country	73	68
75	Drones in collision with civil aircraft	69	75
76	Driverless Cars	79	69
77	Increased Regulatory Penalties in Finance	76	77
78	Legal challenge to Brexit vote	77	78
79	Increased legal penalties against corporate polluters	78	79
80	EU legal action on taxation aganst global corporations	80	80

### Correlation of Risk vs Resilience Rankings for 2017





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