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# Dynamic Risk Assessment

Over the last 40 years many significant business, financial or economic crises were not foreseen and prevented. This was evident in the global financial crisis where companies and governments failed to anticipate both the crisis and the impact it would have on the global economy, despite the use of extensive risk identification, evaluation and management methodologies.

## Current risk management practices

Traditional risk management methodologies that focus on the likelihood and severity of individual risks do not consider the velocity with which risks can impact operations, interconnectedness of risks or emerging risks that could result in structural breaks. Improvements are required to current risk management frameworks to better capture the aspects of the world we live in today. We call it Dynamic Risk Assessment (“DRA”).

## Dynamic Risk Assessment (DRA) – what should it include?

DRA is a new approach to the assessment or risk management that builds on current two-dimensional (risk probability and severity) practices. Based on many years of research and development KPMG has developed a framework to better capture some of the aspects mentioned above. This is done by combining behavioural science, risk velocity (the speed with which the risk can materialise) and contagion or interconnectedness. Instead of focusing on risks in silos, this framework focuses on the network of key risks and the timeframe

within which risks are likely to materialise. By being able to visualise how each of the key risks may influence or be influenced by other risks within the network, a deeper understanding can be gained on which risks have the greatest potential to amplify risk consequences across the network. This enables organisations to have better informed risk conversations and changes the focus from individual risks to prioritising risk clusters and also the opportunities and competitive advantage that understanding these present.

## The DRA objectives

The objectives of the analysis of systemic risks are to:

- assess and incorporate the potential impacts of current and emerging structural breaks (game changers) on your existing risk profile; and
- access the collective corporate knowledge, experience and history of the most knowledgeable and experienced people within the organisation to identify potential pathways of contagion – a proxy for expected, future correlation – between the risks identified, including the risk implications of emerging structural breaks.

The key is to extract a consolidated view of key risks from within the organisation in an unbiased manner and the methodology needs to consider how risks are connected so as to create risk clusters. This is achieved through network theory.

## How can DRA be of benefit to insurers?

The principle objectives of the application of network theory to your organisation’s risks are to:

- identify which risks the CEO and CRO should prioritise and focus on;
- identify emerging risks as a consequence of evolving structural breaks in the system;
- analyse and identify potential future relationships between the risks identified;
- analyse the systemic behaviours of individual risks;
- identify “centres of gravity”, or risk clusters, within your re-evaluated risk profile;
- identify root points of origin / vulnerability within your risk network;
- use the insights obtained from the above analyses to formulate a longer term fiduciary risk agenda of what “must go right” within the organisation, and which risks “cannot be allowed to go wrong”; and
- identify, map and test the controls around the key risks for reporting and monitoring purposes.

Other benefits of the DRA process include being able to, in the context of key risks and how they may spread throughout the system, answer the questions:

- what are we missing?
- what are our weak links and potentially disastrous aggregate risks?
- what are our opportunities?
- what could be significant disruptive risks?
- what combination of risks have the potential to render us insolvent?

### Regulatory considerations

With the introduction of the new insurance regulatory landscape in South Africa in July 2018, through the enactment of the Insurance Act of 2017 and subsequent supporting Standards, the Prudential Authority (“PA”) set clear minimum expectations for the insurance sector across the three pillars. In particular, the Regulators expect

insurers to introduce Own Risk and Solvency Assessment (“ORSA”) practices and to formalise their existing Enterprise-wide Risk Management (“ERM”) frameworks and governance structures in a way that aligns with local prudential standards (and international best practice).

The ORSA requires insurers to consider not only historical risks but also emerging risks and focus on all material foreseeable risks. The PA expects insurers to be adequately capitalised to be able to deal with a wide range of future scenarios. Such future adverse outcomes are tested through severe but plausible stress and scenarios tests and reverse stress testing.

### Comparison of DRA with traditional risk assessment

A useful, stylised (actual risk descriptions have been removed) case study of a network depiction for a global entity illustrates the insights derived through the application of network theory.

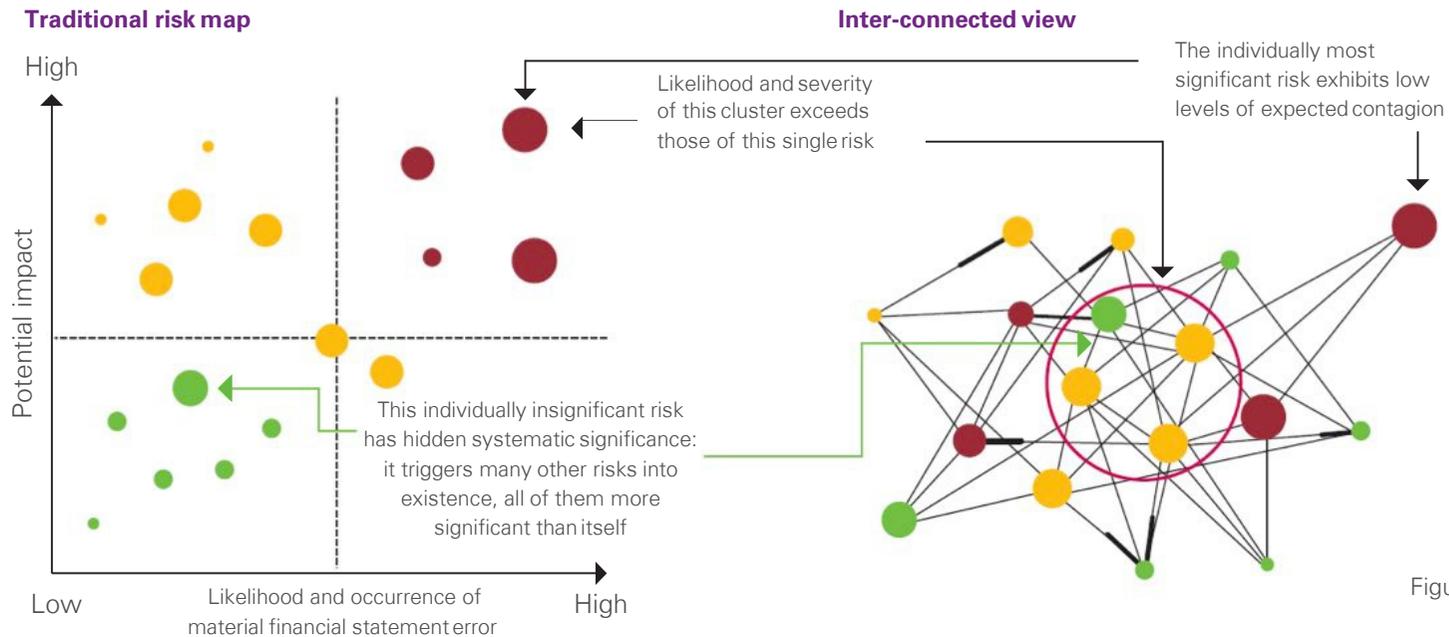


Figure 1

The focus of the traditional risk map, which follows a siloed approach, is on the risks in the upper right-hand quadrant, whereas the focus enabled by DRA, with an understanding of how risks are interconnected is quite different, with individual insignificant risks triggering many others in the risk network.

## Four key insights are observable from Figure 1:

A “green” risk by virtue of its individual likelihood and severity in the diagram on the left conceals its systemic significance, which becomes apparent only when it appears in the centre of the entity’s risk network as a risk with significant expected contagion potentials. The consequences of the risks it triggers exceeds its individual severity. This potential amplification effect – expected contagion – is not observable from the traditional risk depiction methodology on the left;

A “centre of gravity” was determined mathematically to exist between three amber coloured risks, and the green coloured risk. In network lexicon the “centre of gravity” denotes a risk cluster, which has been circled in red in the diagram on the right. The four risks within the risk cluster exhibit more connections to each other than what they exhibit connections to other risks in the network, so that these risks should be monitored and managed together;

Alarming, the severity and likelihood of the risk cluster were found to exceed the likelihood and severity of the most significant, single risk identified in the diagram on the left. As often happens in practice, a number of individually less significant risks can combine to produce an adverse collective outcome of which the severity and likelihood surpasses the most significant individual risk portrayed in the diagram on the left;

Lastly, the individually most significant risk in likelihood and severity may exhibit comparatively low expected contagion. When the individually most significant and likely risk manifests, it is expected to do so in relative isolation – see the red risk on the top right in the right-hand diagram. In this instance, its individual likelihood and severity overestimates its expected contagion and systemic importance.

## Conclusion

Capturing the combined wisdom of experts within your organisation using a framework based on existing science, provides a mechanism to enhance risk management frameworks where they currently fall short.

In addition from the above case study it can be observed that network theory is a useful supplementary examination of an organisation’s risk landscape: the traditional methodology may *obscure* the identification of *the most significant risk* (in this case the risk cluster); it may *underestimate* the *systemic importance* of an *individually significant risk* (the green dot above); and it may *remain silent* on a perspective that *individually significant risks* are, in some cases, *expected to exhibit a low systemic significance* (the red risk in Figure 1).

The DRA will serve as a powerful visualisation tool for material risks faced by the entity and its output can be used as a foundation for robust discussion and debate on appropriate selection of stress and scenarios tests for ORSA projections.

Based on many years of research, KPMG's mathematicians, data scientists, actuaries and behavioural psychologists have developed a comprehensive set of Dynamic Risk Assessment frameworks and tools.





# Dynamic Risk Assessment

## Dynamic approach to risk assessment – extracting the wisdom of experts within your business in an inter-connected world

The traditional, two dimensional approach to risk assessment, which considers likelihood and severity of risks falls short of requirements in the dynamic, interconnected world we find ourselves in. Through our patented Dynamic Risk Assessment framework, KPMG can support you in enhancing your risk management framework through intellectual property regarding behavioural science, risk velocity (the speed with which the risk can materialise) and contagion or interconnectedness. Instead of focusing on risks in silos, KPMG is helping clients gain a better understanding of the network of key risks and the timeframe within which risks are likely to materialise. By being able to visualise how each of the key risks may influence or be influenced by other risks within the network, a deeper understanding is gained on which risks have the greatest potential to amplify risk consequences across the network. This enables organisations to have better informed risk conversations and changes the focus from individual risks to prioritising risk clusters and also the opportunities and competitive advantage that understanding these presents!

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## "A dynamic approach to risk"

There are inherent limitations to a traditional risk management approach, which focuses on evaluating likelihood and impact of independent risk events. KPMG helps organisations understand risk velocity (the speed with which risk can be realised), interconnectivity, and the impact of individual risks on the broader risk network. Instead of focussing on single risk events, organisations gain a better understanding of the network of risks, and which risks have the potential to amplify risk consequences across the network (i.e. risk contagion) if not appropriately understood and addressed