Dynamic Risk Assessment

Dynamic Risk Assessment

Enterprise Risk Management (ERM) has become an accepted, indeed required, practice within many organisations. Boards, audit and risk committees and management now expect to see their risk functions produce heatmaps, risk registers and report-backs on risk mitigation plans.

Increasingly, however, there is a growing realisation that organisations' biggest exposures no longer show up in the heatmaps and (bottom-up) risk registers, so that boards are starting to see this as an increasingly dated practice. More specifically, questions are being asked as to how do we better incorporate the interplay between exogenous geopolitical and macroeconomic factors and our organisation's existing individual risks?

In other words, how does ERM extend its internal, operational perspective to better address external developments and other exogenous and emerging threats? *What more can ERM do?*

KPMG's Dynamic Risk Assessment (DRA) methodology and software help address these issues and more. Below is a summary of the most frequently asked questions about DRA.

What more does DRA bring to ERM?

While traditional ERM identifies the impact and likelihood of individual risks that an organisation faces, DRA adds the missing components of identifying and quantifying the contagion between risks as a consequence of their underlying bi-directional linkages:

– DRA reveals the connected effects and, with these insights, identifies the clusters of risks that are most recognised to occur.

– DRA calculates and depicts the cumulative out-workings of all of the risks as they amplify and trigger one another both directly and indirectly – generating system-wide effects to the organisation.

– DRA shows the velocity of both individual risks and the connected risk clusters (scenarios).

Why DRA?

The past is a poor predictor of the future. Analyses of past data reveal that the world has gone through several cycles of globalisation and deglobalisation, coinciding with macro-cycles of optimising 'Returns on Capital' and 'Returns on Labour'. The risk modelling techniques that are most commonly deployed in the present day were conceived during a 20-year period of unmatched stability. They focus on easily modelled attributes such as recognisable time series, where known variables and variances revert to the mean. But in a period of transition, such as we are experiencing now, the rapid changes towards uncharted territory, such as rising geopolitical tensions, inflation, wars, climate change, escalating populism, and stressed supply chains provide no stability. Organisations must instead manage their risks in a very different paradigm of pivoting fluxes. The new cycle of partial deglobalisation, in contrast to the past 40 years of globalisation, now generate new complex and contagious emerging risks, where past data, traditional models and prior expectations are ever less helpful and may hinder risk management.

KPMG's DRA identifies and quantifies both existing and emerging risks. After the global financial crisis, we learned that emerging risks behave in a multifaceted and interconnected manner naturally best mapped via networks.

What is DRA?

DRA is a KPMG proprietary risk identification and quantification methodology, underpinned by deep, formal research and facilitated by software. It combines quantitative and qualitative data to reveal how interdependent risks behave within a complex, adaptive system.

DRA identifies and quantifies:

– the most expected risk scenarios the organisation should prepare to face

– extremely severe but less expected scenarios

– cumulative effects of the network on the organisation

– the most effective mitigations of the cumulative effect of the network

– the expected risk velocity – time to impact of the above.

How does it work? What is the DRA process, and is it scientific?

DRA adopts a four-step process, each based on the most recent scientific research and academic findings. It utilises expert elicitation, network theory and behavioural economics.

– Step 1 seeks to find the 'best minds' for expert elicitation – *data sourcing*, applying who science reveals to be the most accurate about the future.

– Step 2 builds on Step 1 by identifying the risks – *risk identification*.

– Step 3 gathers the data for risk quantification and uses the DRA mathematics and software to build the risk network of interconnected risks – *DRA proprietary system and network structuring and risk quantification* from the inputs provided by the 'best minds'.

– Step 4 is the communication and confirmation of the DRA output – *risk reporting*.

A key part of the DRA methodology is the US patented software that is used to collect, quantify, and generate the network of interdependent risks. Unlike traditional ERM models that may quantify the co-variance of two risk variables at any one time, DRA provides a way to collect multiple risk measures simultaneously. Additionally, it accommodates feedback loops of cause and effect collected simultaneously across its many risk variables. The result is that the more-obvious first-order contagion connections are estimated and calibrated more consistently, considering how all the risks interact bi-directionally – directly and indirectly – through each other. In this manner it generates an organisation's system of interactive and mutually reinforcing risks – fit for mathematical analyses.

How long does a DRA take?

Depending on the organisation, the DRA four-step process is achieved in a six-to-eight-week time frame. Participants are required to dedicate three hours (total – each) over this timeframe.

What do you get from a DRA?

DRA examines the systemic effect of risks and provides insights into:

– *contagion and the spread of risk within a network*


Connections and Impact
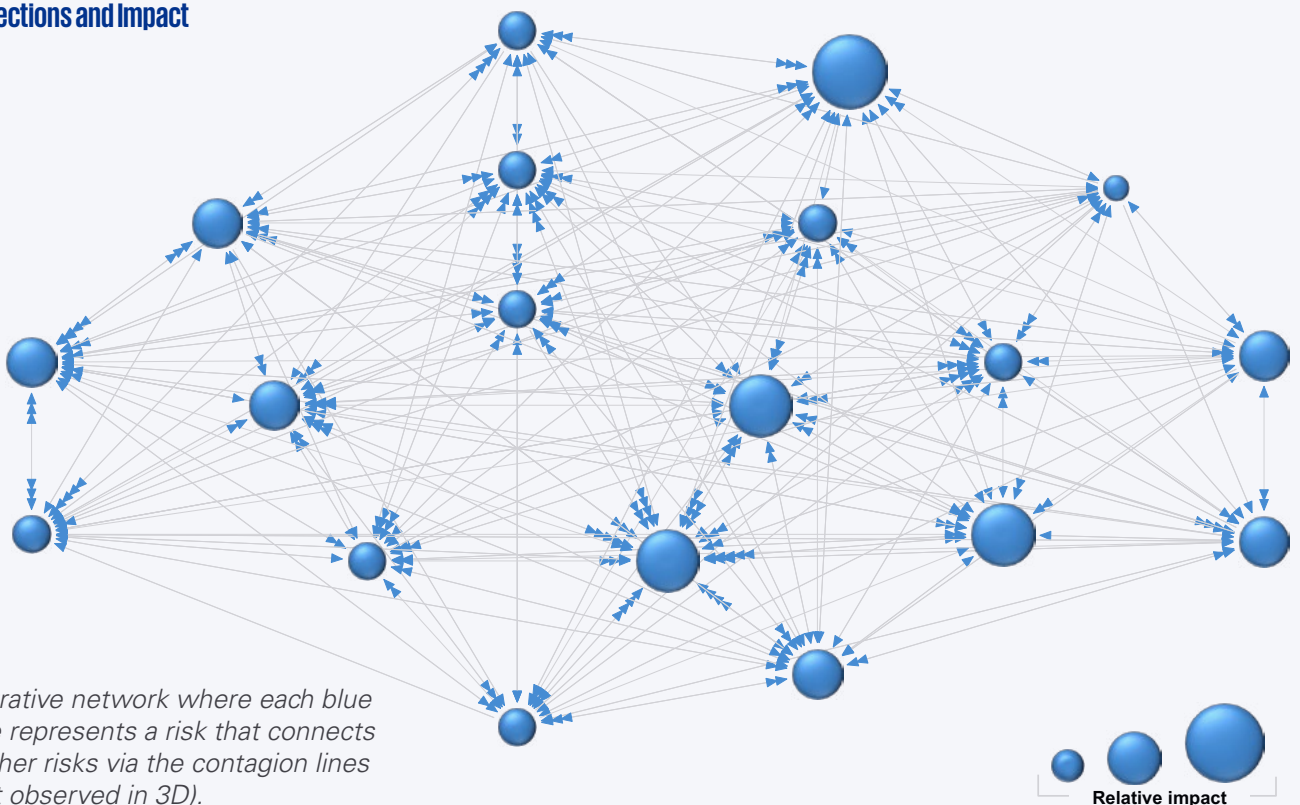
Illustrative network where each blue node represents a risk that connects to other risks via the contagion lines (best observed in 3D).

Relative impact

– *the aggregate effects of a combination of closely related risks that create a scenario*
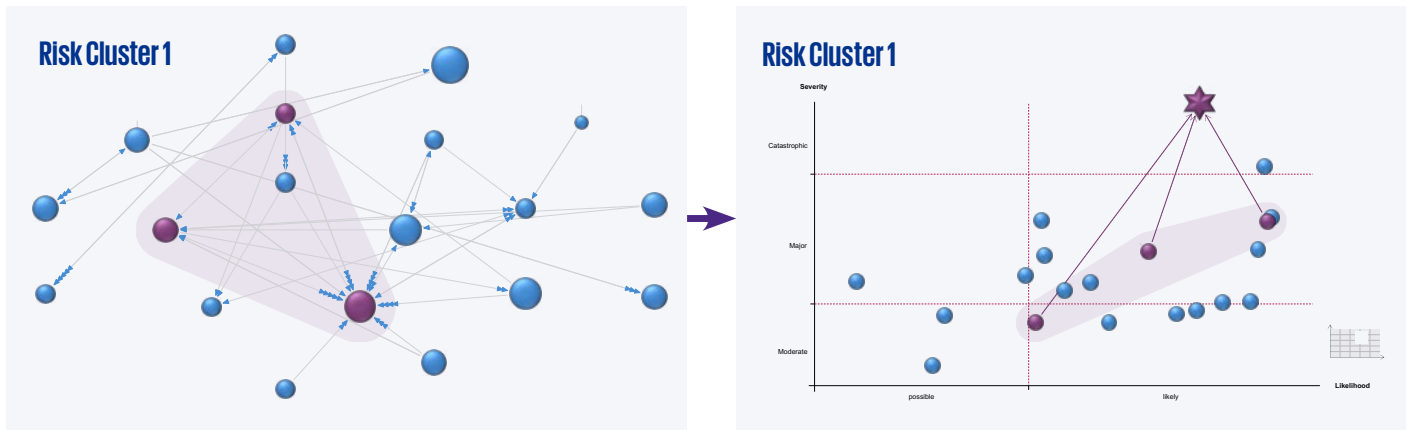
Illustrative effect of how three closely related risks in the network (purple nodes in left network diagram and in the right ERM scaled diagram that shows severity and likelihood axes) can combine to create a scenario (purple star in right ERM scaled diagram) of previously unquantified and un-envisaged higher Severity and Likelihood effects.

– *velocity of individual risks and connected risk clusters*
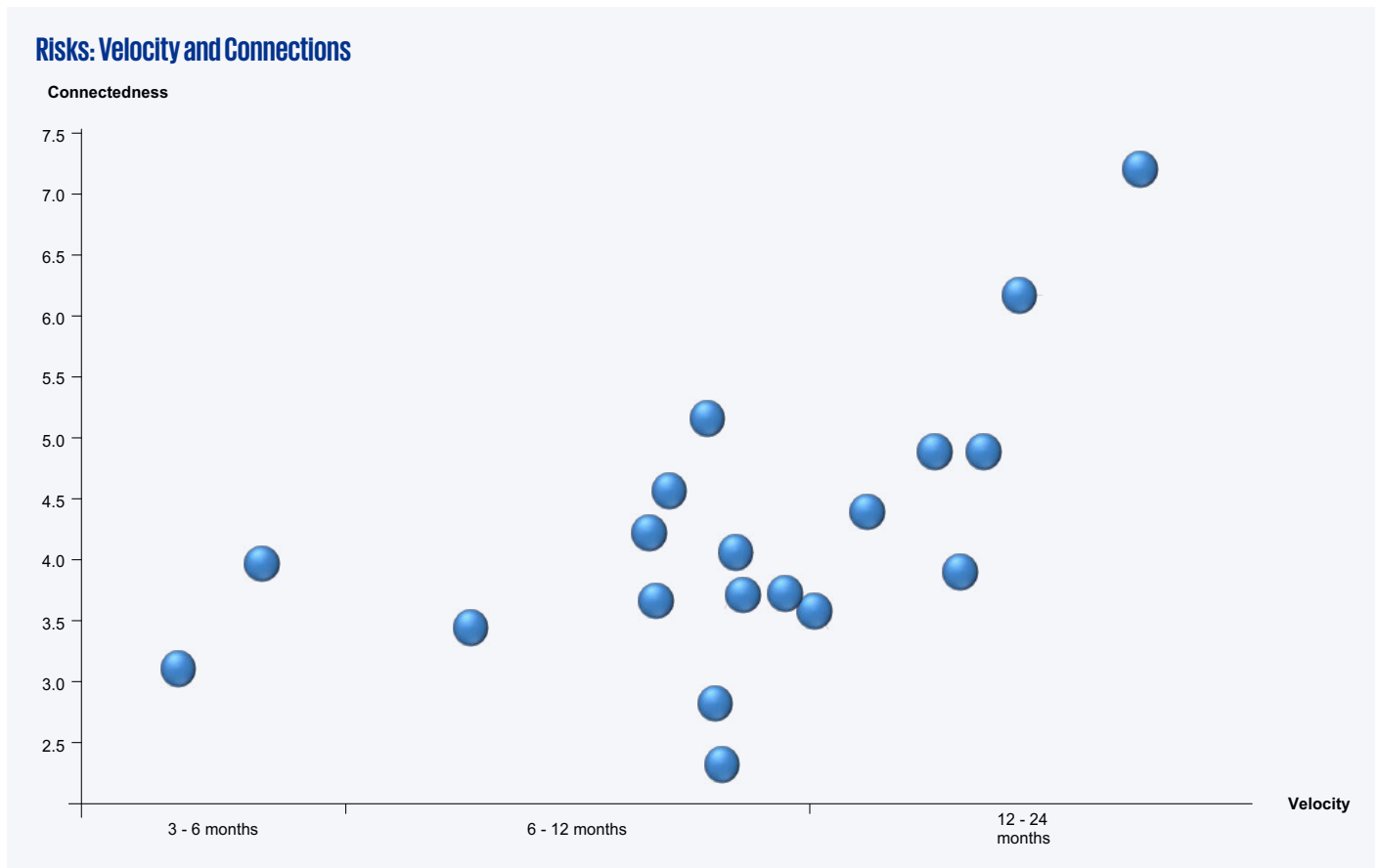
Illustrative representation of the velocity of individual risks showing time to impact in months.

– *emergent risks and/or previously unseen risks*
– *contagion and the systemic keystones of the network.*

Any other benefits from DRA?

DRA provides other flow-on benefits, including:

– Breaking down organisational silos that a conventional bottom-up ERM process may follow, and which are frequently bounded and biased by organisational structure and/or individual and functional roles, responsibilities and taxonomies.

– Facilitating the generation of a common risk lexicon across the organisation, thereby adding to a common understanding of the meaning of the risks and their inter-relationships.

– Sourced from behavioural economic sciences, DRA applies de-biasing techniques throughout the four-step process to reduce the human biases that occur in traditional risk assessment approaches.

– The DRA process helps to identify previously unseen or unarticulated risks by cultivating 'intellectual alpha' from experts when they build on their collective wisdom.

– The output of DRA allows for a closer collaboration and cooperation across the Three Lines of Defence. Taken further, it can accelerate a maturing of the risk and assurance functions' respective frameworks.

– The insights from DRA enhance and enrich board and board committee conversations with management and, where applicable, can add value to disclosure and reporting.

Where can DRA be applied?

DRA is a risk identification and quantification methodology enabled by software. For this reason, it is agnostic to industry, sector, geography, organisational size, risk function maturity, and/or situation. It is well suited to 'intractable problems' but has equally been successfully deployed for:

– strategic top-down risk assessments

– geographical areas and product lines

– organisational areas, e.g. in a subsidiary, business unit or function

– consideration of a potential merger, acquisition, integration, or divestment

– industry and/or sector insights

– major projects, e.g. transformation project risks

– research into global problems, e.g. agri-food or energy

– sustainability strategies and ESG challenges.

How can the insights from DRA be used?

Understanding how risks are interdependent and behave in a network, and depending on the question being posed, DRA can assist with unlocking the following insights:

– Align the organisation's strategic risks to its strategy, or provide a basis on which to challenge the strategic assumptions on which the business' viability and prosperity is premised.

– Act as a decision-making tool in determining optimal risk mitigation priorities through understanding and assessing those risks that are systemically most influential to the organisation. Correspondingly, be well placed to know which risks are most vulnerable and which require dynamic and pre-emptive risk indicators for early warning.

– Identify the scenarios of risks that the organisation's experts agree as being interconnected, making the organisation better placed to know which risk scenarios and which combined risks should be collectively addressed through new or enhanced responses. Similarly, this insight can inform the compilation of the combined assurance plan.

– Identify the velocities of individual risks and probable risk combinations. This can provide insight into the timeframe that an organisation will have to respond to an unfolding risk event, assisting in crisis management and disaster recovery planning.

– Understand how risks behave in a system. It enables an organisation to identify those risks that are less connected and therefore less influential. This may create opportunities for management to delegate these risks to other competent, upcoming/future management within the organisation.

Do you have case studies?

DRA has been used globally across 20 countries, 5 continents and across industries and sectors.

Clients that have benefited are in the Fortune 10, 100, 500, and listed on the NYSE, FTSE, CAC, DAC, JSE, and Tokyo Stock Exchanges.

Contact us

Need more information?

Want to speak with a subject matter expert?

Kevin Smout
**Partner, Risk Strategy &
Technology and Global
Leader for Governance,
Risk & Assurance Services**
T: +61 8 9263 7105
E: ksmout@kpmg.com.au

Michael Hill
**Global Lead, Assurance &
Integrity Head of Risk Consulting
for Infrastructure, Government
& Healthcare**
T: +61 3 9288 5589
E: mwhill@kpmg.com.au

Stuart Johnson
**Lead Partner, Project Controls
& Assurance**
T: +61 3 9288 6182
E: spjohnson@kpmg.com.au

Peter Beaton
**Partner, Governance,
Risk & Control Services**
T: +61 7 3233 9630
E: pbeaton@kpmg.com.au

Caron Sugars
**Partner, Governance, Risk &
Control Services and Board
Advisory Services**
T: +61 8 9263 4850
E: ccobargsugar@kpmg.com.au

Paul Lichtenstein
**Partner, Financial Risk
& Advanced Analytics**
T: +61 3 9288 6420
E: plichtenstei@kpmg.com.au

Katherine Shaw
**Partner, Governance,
Risk & Control Services**
T: +61 2 9335 8056
E: kashaw@kpmg.com.au

KPMG.com.au