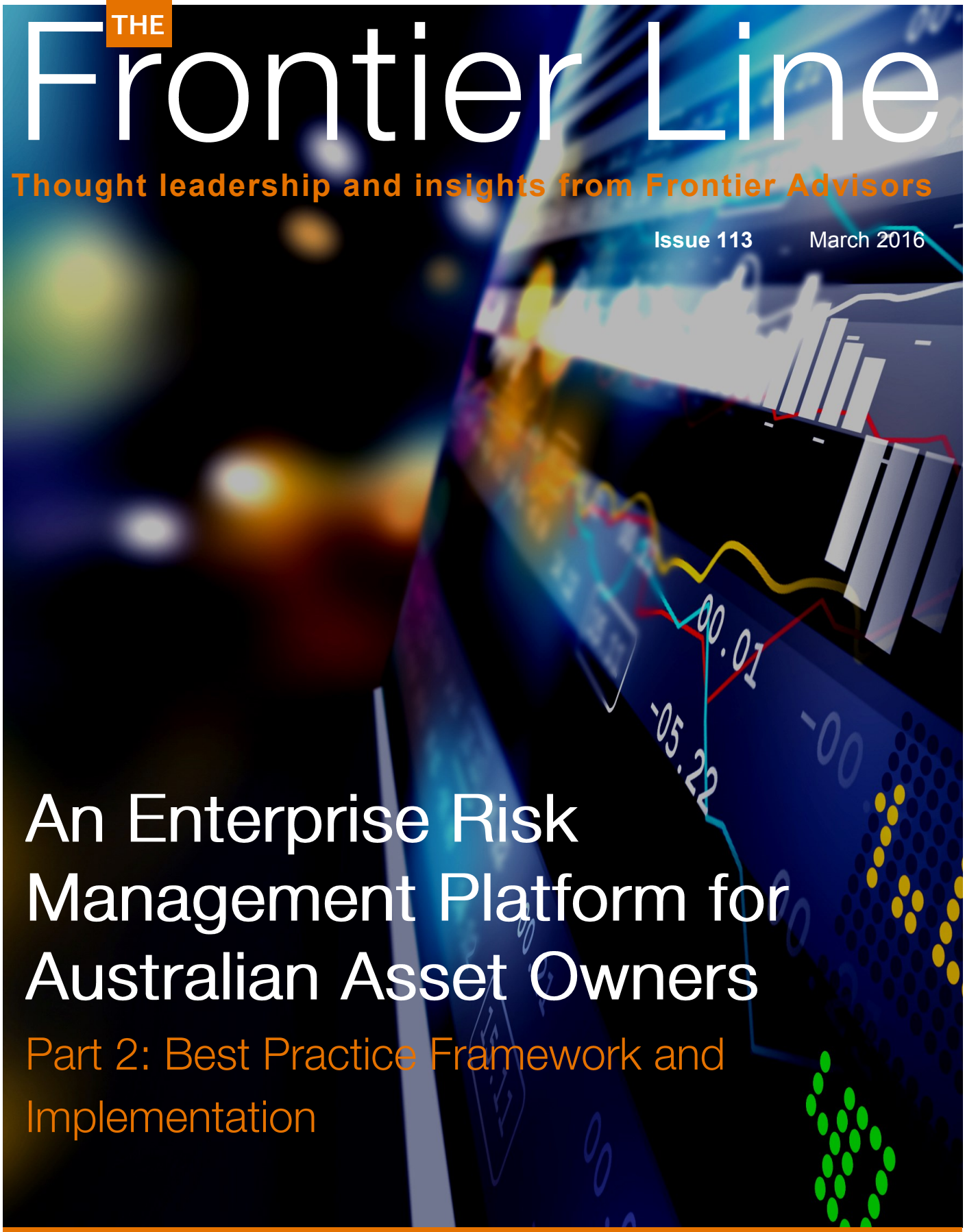
THE Frontier Line

Thought leadership and insights from Frontier Advisors

Issue 113 March 2016



An Enterprise Risk Management Platform for Australian Asset Owners

Part 2: Best Practice Framework and Implementation

FRONTIER ADVISORS

Frontier Advisors

Frontier Advisors has been at the forefront of institutional investment advice in Australia for over two decades and provides advice over more than $250B in assets across the superannuation, charity, public sector and higher education sectors.

Frontier's purpose is to enable our clients to generate superior investment and business outcomes through knowledge sharing, customisation, client empowering technology and an alignment and focus unconstrained by product or manager conflict.

AUTHOR

Lee Eriera

As IT Manager, Lee is responsible for Frontier's technology strategy, including delivery of our proprietary software platforms and management of IT infrastructure. Lee is also a member of our Quantitative Solutions Group.

Lee has over 12 years of experience in similar roles, most recently as Senior Business Analyst at fund of hedge funds business Financial Risk Management. He holds a first class honours degree in Computer Science with Cognitive Science from University College London.

AUTHOR

Michael Sofer

As a Consultant, Michael leads our Quantitative Solutions Group, which provides bespoke financial modelling and quantitative analytics to clients.

Michael is also a member of the Real Assets Team, with a focus on infrastructure research, and provides general consulting advice to clients. Previously, he worked at Bilfinger Berger as a financial analyst in the Project Finance team. Michael completed a Bachelor of Commerce and Bachelor of Aerospace Engineering (Hons). He is also a CFA Charterholder.

An Enterprise Risk Management Platform for Australian Asset Owners

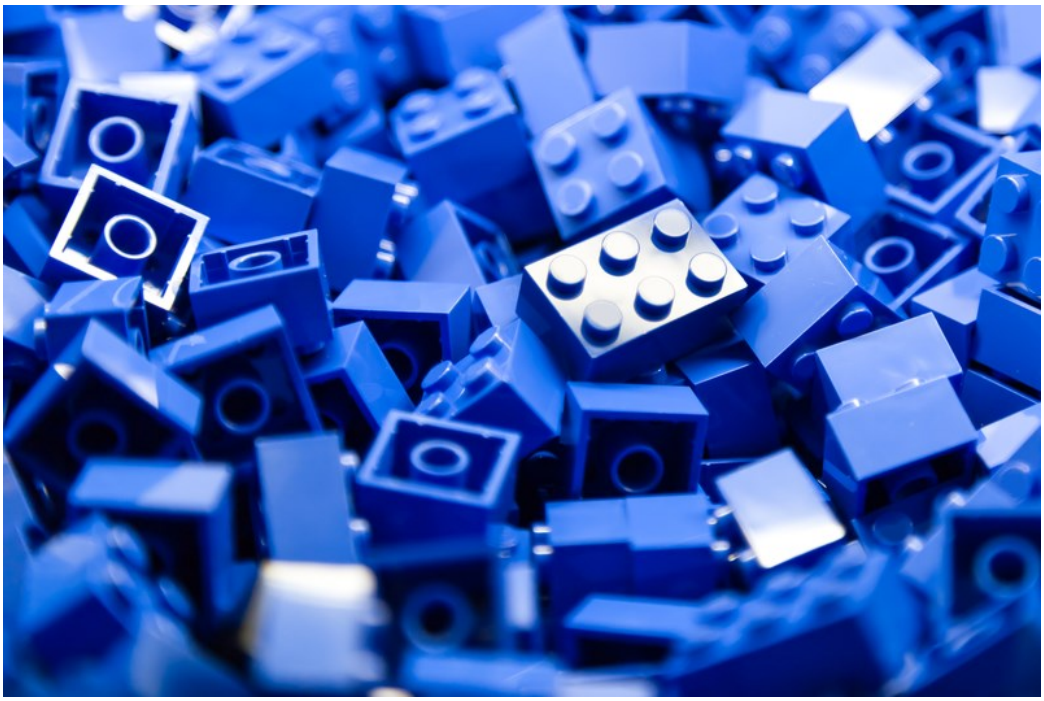
This is the second publication in our series on the enterprise risk management platform, as it relates to investment risk system implementation.

Part 1 of this series of Frontier Lines introduced the idea of an Enterprise Risk Management Platform (ERMP). The concept seeks a consistent risk management philosophy and approach across all divisions of an asset owner's business.

The overarching objective is that an integrated framework facilitates a comprehensive understanding and management of risk, wherever it resides, and supports decision making across all levels of the organisation.

This Frontier Line – a product of Frontier's Quantitative Solutions Group – focuses on investment risk as it relates to risk system implementation. In this context, an ERMP promotes a fit-for-purpose risk system solution that integrates cohesively into existing frameworks and succeeds in positively informing investment decisions.

Part 1 explored common considerations when seeking to implement a risk system. This part expands on this topic and delves into the individual building blocks of an ERMP, looking at common issues, areas of best practice and advice for implementation.



ERMP – A best practice framework

As introduced in Part 1, Figure 1 below sets out an ERMP as it relates to investment risk and implementation of a risk system. The focus is on how decisions within each individual component pay attention to the building blocks above and below, but also the framework as a whole. In essence, how an asset owner chooses to source, adjust, analyse and report on data has major implications for the efficacy of the system overall.

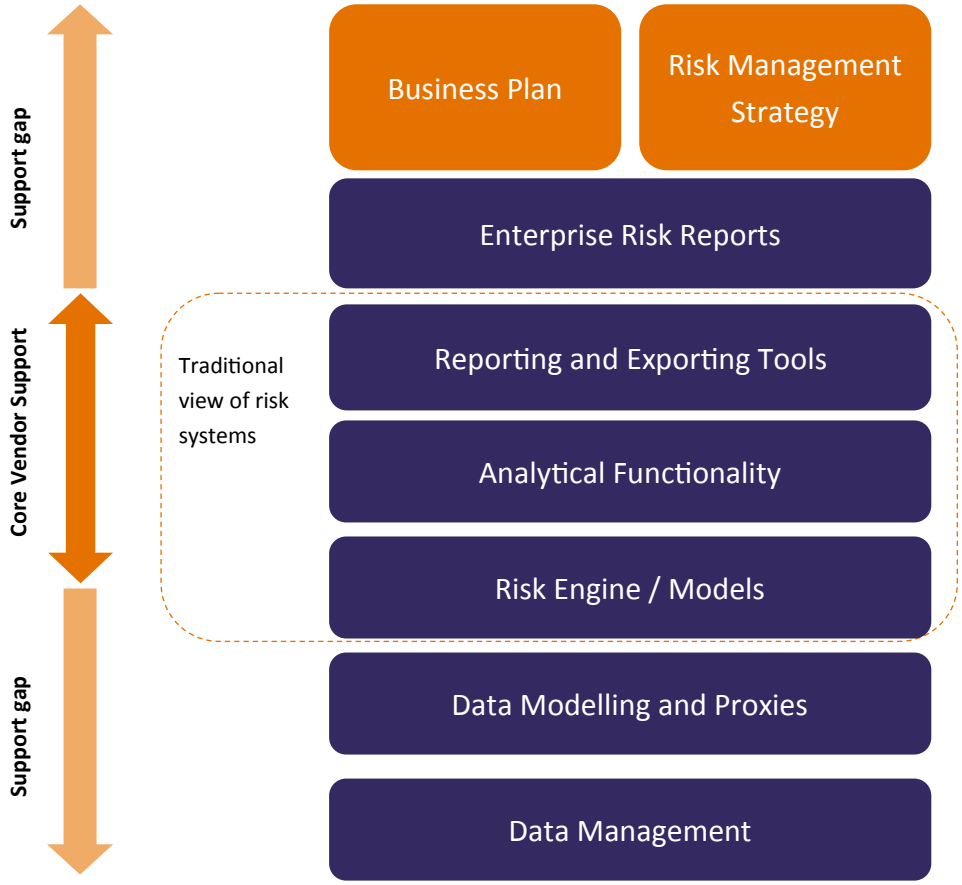
On our most recent international research trip, we observed that risk system vendors are typically very specific in which of the components of the ERMP they support. These are highlighted in the diagram.

This is not a shortcoming – they are businesses structured around building and supporting the risk engine, not the entire process – but it is important to understand the knowledge gap as this has implications for the overall success of a risk system implemented within an organisation.

By introducing an ERMP as it relates to investment risk, we aim to highlight the importance of viewing and managing an entire risk "ecosystem", rather than simply one single risk system. We believe pursuing this framework enhances the level of contribution from a risk system, and gives it the greatest chance of succeeding in its ultimate objective – helping decision makers make decisions.

The next section provides an overview of best practice within each of the building blocks.

Figure 1: ERMP as it applies to the investment governance framework



Business plan and risk management strategy

In speaking with a variety of asset owners, asset managers and risk system vendors, effective risk systems are always implemented within the context of a clearly defined business plan and risk management strategy. It is an obvious statement, but a lack of clarity and vision around how or why a risk system is being used can limit its ability to deliver true value to an organisation's process of investment management. The analyst running the system, up to the board member formulating strategy, need to understand how its output feeds into the broader governance framework.

With this in mind, we advocate a focus on the following key points.

Adopt a staged approach

Modelling entire multi-asset class portfolios is a comprehensive undertaking. Within an asset owner, it means working with many different asset class teams to source, adjust and model the underlying assets. We recommend a staged approach, choosing to tackle the simpler asset classes first (e.g. equities) and incrementally moving on from there. This helps the operator of the risk system sell its benefits to the investment teams one at a time, building trust and confidence along the way.

Consider your budget

Implementation of a risk system can be an expensive undertaking and is often much more costly than people would at first think. There are expenses not only in purchasing the licence to operate a risk system, but also in the resources to operate it, the IT to run it and the time to analyse and interpret the output. Considering your budget, not just for the system but for all the elements within the ERMP, is important. It informs the types of solutions you can reasonably consider and reasonably support.

Align the philosophy of the risk system to that of your organisation

Risk systems in general have been developed out of trading systems for equities and fixed income. This can ground them with a short-term focus that may not accord with the long-term perspective of asset owners. This short termism can reveal itself in the provided analytics and the reporting. Taking the time to find a system that is able to accommodate your definition and measurement of risk, is critical to achieving a seamless integration of the system with the broader business plan.

Enterprise risk reports

Risk systems support decision making across the breadth of an organisation, from analyst to board member. They should therefore be able to flex their output in response to the use case. This will help to efficiently provide critical and useful information to those who need it. Risk system vendors accomplish this to varying degrees.

Below we highlight several methods to achieve an enterprise-level understanding and support for the risk system.

Start with a blank sheet of paper

Prior to purchasing a risk system, it can be useful to sketch out the types of information and reports required. It does not need to be a work of art, but some prior consideration of what you are looking for can save an enormous amount of time and surprises later on. These wireframes can be incredibly useful in discussions with risk system vendors about what they are able to provide, or can build for you.

Construct customised reporting

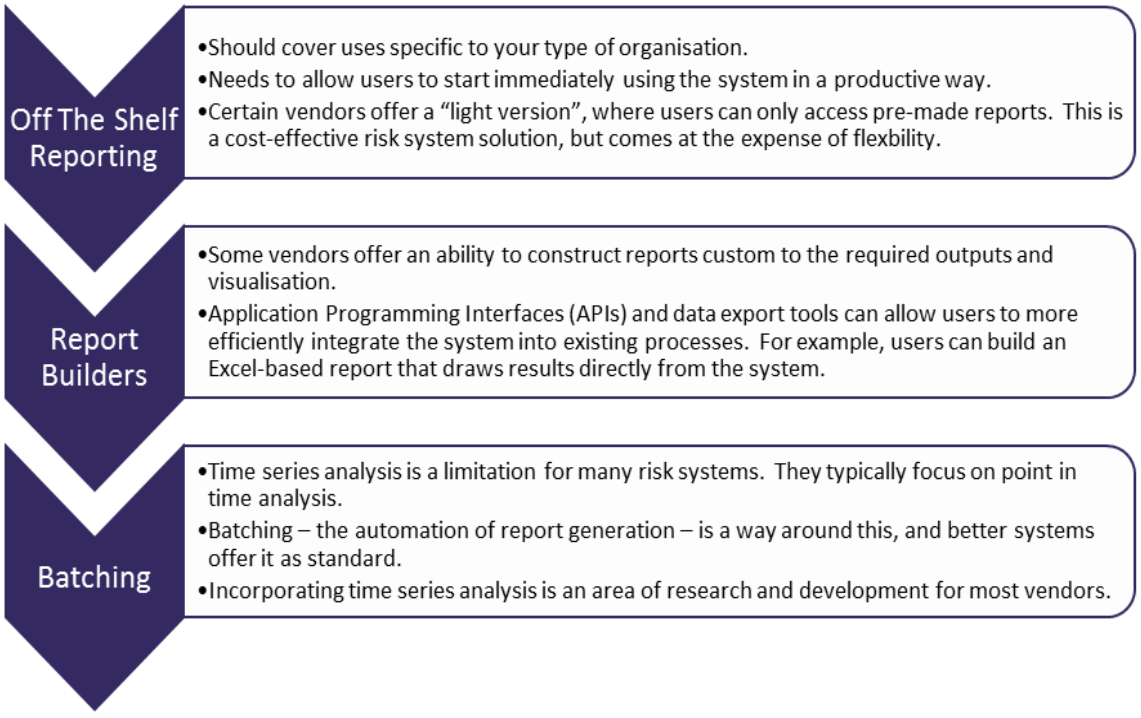
A board member may not need to know today's Value at Risk number, just as a credit specialist may not need to know the entire multi-asset portfolio's sensitivity to rising interest rates. An ability to tailor the depth and breadth of reporting is vital for increasing the value and utility of the system. Some risk systems can do this for you, others allow you the flexibility to integrate their data into your standard reports, and a few can be quite rigid in what they allow you to do. Understanding the reporting capability is a worthwhile undertaking.

Reporting and exporting tools

Reports and exported data are likely to be the main channels through which users connect with the risk platform. In many cases, it will only be specialist risk professionals who are actually using the system interactively. As a result, it is vital that reporting is of a high quality, with flexible tools to produce reports that fit in with your processes.

In order of increasing customisation and complexity, we highlight some critical observations in the flow chart below.

Figure 2: Risk system report building functionality



Analytical functionality

Side-by-side, it is easy to be forgiven for thinking that all risk systems do the same thing. At a fundamental level, all provide similar toolkits of risk and return analytics. However, as always, the devil is in the detail.

Here are some of the interesting observations gleaned from our in-depth conversations with vendors.

Ease of use

For a tool that is intended to be an integral component of one's ERMP, ease of use and the interactivity is everything. Here we see great variation between the vendors, particularly if users haven't grown up around risk systems, programming languages and IT. Examples of superior interfaces include: drill-down reports that provide information in as much or as little detail as required; fully customisable charts and tables; and custom "dashboards" for different users. It is important to get the system out of the showroom and give it a proper test drive on real data and in a real situation. This provides a realistic indication of how it handles in the trenches.

Return and position-level reporting

Often users simply want to see a simple and effective presentation of how they have performed, why and their current portfolio exposures. However, as many vendor tools focus on risk reporting and analytics, these features tend to be poorly represented and supported. Working with the user's custodian may be a more efficient and cost-effective way for sourcing this information.

Scenario analysis

This is an area of significant variation across the risk system universe. At the simplest level, they will tell users how their portfolio responds to instantaneous shifts in particular market factors. This is typically more aligned with a banking philosophy. By contrast, more advanced systems will establish a portfolio's response over time to particular occurrences (e.g. steepening of the yield curve). Finally, what appears to be universally difficult is the ability of a CIO to input their forward-looking view of the world and see how their portfolio stacks up. Ex post, or backward-looking analysis, generally appears to be easier to accomplish.

Risk engine/models

At the end of the day, the risk model dictates the results. They do, however, vary greatly in philosophy, method, granularity and assumptions. Selecting one, or perhaps more dauntingly, understanding one, is a challenge and one which has important ramifications for the results users are ultimately relying upon.

Respecting the high level scope of this document, we highlight some of our key observations below.

Once you go multi-asset you never go back

We find that risk systems that offer analysis across the breadth of asset classes fall into two categories. First, there are those that have models specific to the asset classes. Analysis is then combined in a bolt-on fashion. These excel at analysis within an asset class. Incorporating multiple asset classes is less robust. The second category of vendor includes those that have designed multi-asset class risk models from the ground up, based on their own academic research. These accord better with multi-asset class users, but can fall down on providing in-depth insights within aspects of the portfolio. In reality, users with multi-asset portfolios need to find a compromise between providing consistent and integrated analytics across the portfolio, but still providing intelligence within individual asset classes. Staying away from systems at the extreme end of the spectrum is probably best.

Customisability versus rigidity

The method and approach underlying the risk system has everything to do with how the results come out. Some vendors are flexible and relatively model agnostic. They allow you to include your own models or port in models from other vendors. They position themselves more as integrators of other parties' work. This variety can be useful and allow users to test multiple approaches. However, care is needed in assessing the level of support and accountability. Is the vendor able to troubleshoot models they have not developed? The cost of additional modules, data feeds and support also needs to be taken into consideration. By contrast, other vendors are relatively dogmatic in their approach. They have researched and developed superior models and do not accept analysis outside of this approach. This consistency has advantages as well as long as users agree with the underlying methodology.

Time horizon

Many users with multi-asset portfolios are concerned with time as a variable. How will time impact their portfolio exposures and ability to meet overall objectives? However, some systems offer only point in time and do not take proper and careful consideration of the evolution of risk over time. These should be avoided, with preference given to those who genuinely understand the objective of the user.

Research and development

It is important to acknowledge that risk modelling is not an exact science, and continues to evolve over time. Many of the providers we saw had large research functions, which are committed to developing new models, functions and approaches in response to user requirements. The multi-asset class perspective was a hot topic for many.

Knock-on effects

It is all well and good to pick the most advanced system that most accurately matches the investment approach adopted by the user. However, in reality there are many other considerations that flow from this decision. Notably, it affects the two building blocks below it: Data Modelling and Proxies; and Data Management. The system needs to be supported and often as complexity increases so too do the costs, be they financial, time or resource. This speaks to the core of an ERMP whereby each individual item needs to be considered within the context of all the others. The ERMP is only as good as its weakest link, and an overly resource heavy system will not provide the value being sought from it. The best implementations involve a staged approach.

Data modelling and proxies

As highlighted previously, the method selected for modelling assets within the portfolio will inform the data requirement and in turn the required simplifications. Listed asset classes such as equities, and vanilla forms of fixed interest, are typically well recognised and modelled within risk systems. However, more complex securities such as infrastructure, derivatives and credit securities are not well understood. Users are required to either simplify or input detailed data to describe these investments.

In dealing with this problem, we observed the following key points.

Managed data services

As multi-asset owners increasingly turn to external risk systems, providers are beginning to offer managed data services. In return for an hourly cost, risk system vendors can source, verify, clean, store and manage the data associated with your portfolio. This can significantly mitigate one of the biggest problems with taking on a risk system. However, it is very expensive. Many users are not able to pay consulting fees on top of the licensing costs. At the same time, it depends on your context – do you want to view a risk system as a product purchased or as a service employed? We believe the managed data service can be useful for solving particular portfolio problems, but is unlikely to be a viable long-term solution for asset owners.

A consistent approach

Some asset owners have commented that a superior modelling approach is to match it with the valuation process undertaken by the asset class specialists. For example, infrastructure valuation is driven primarily through discounted cash flows. Hence, if the infrastructure assets are modelled as cash flows within the risk system, then this is most likely to yield the most identifiable results. If the results make sense to the specialists, due to consistency of method, then they are most likely to support and make use of the tool.

Unlisted asset class modelling

A topic of frequent discussion, unlisted assets (e.g. private real estate, infrastructure and private equity) are notoriously difficult to accurately model. This makes it difficult to gain a complete or even realistic understanding of the aggregated risks and exposures presented by these holdings. Common approaches include: proxy (i.e. linking to listed equivalents); regression (i.e. linking to factors or exposures that display historical correlation); factor (i.e. associating with underlying fundamentals, such as economic growth and inflation); and cash flow (i.e. modelling the underlying cash flows that constitute the asset). The approach selected has a material impact on the accuracy of the results and the degree to which they represent the fundamental characteristics of the assets being modelled. We have observed that each step forward in terms of accuracy necessitates a more than proportional increase in time and resources committed to the project. Users need to reach a modelling approach that recognises their particular circumstances and objectives, but also their resources and budget.

The little things matter

Risk systems are all about data aggregation. They typically utilise security level information to formulate total portfolio views and exposures. This is coupled with the fact that users employ risk systems to tell them their portfolio sensitivities in unexpected or extreme market environments. These facts together amplify the potential for results to be mistaken or deviate from expectation. As an example, simplification of the nature of a call option can have a material impact on aggregated portfolio results. It speaks to having transparent assumptions and knowing the simplifications being made.

Data management

Now that the risk models and the underlying data they require have been discussed, we can look at how that data is actually obtained and managed.

Data feeds

Wherever possible, automated feeds should be implemented – particularly the main feed of valuations data from the custodian. Often these files were required for other legacy manual processes and continue to be provided in these forms – usually Excel or text files. Custodians should be able to generate a feed, or at the very least, a system-generated file which can then be reliably imported into your database as a repeatable process. Some vendors already have established relationships with the larger custodians and can supply pre-built feeds from their systems.

Look-through

One potential issue is with portfolio holdings in pooled investment vehicles. Generally speaking, the custodian will only have fund-level valuations data and any look through to the security-level must be obtained directly from a fund's investment manager, again typically provided in a manual Excel spreadsheet. A best practice approach would be to proactively provide a standardised file format to managers so that the returned data can be easily fed into a database.

Market data

Risk models also require extensive market data inputs, for example index returns as well as data like yield curves, currency rates, correlations, etc. Most vendors have pre-built feeds of the data their models require across a range of market vendors, and they will work in partnership with the customer to ensure all licencing issues are covered off. The key issue here is to ensure that market data requirements are reviewed and consolidated with other uses across the business, to ensure redundant licences aren't being paid for.

Data cleansing

Regardless of the level of automation achieved with incoming data, there will always be cleaning and reconciliation work required before that data is ready for use. This may include basic tasks like mapping new securities and holdings to system identifiers, but also review and quality assurance processes. Wherever possible, these processes should be well-defined and repeatable, with a focus on exception-based reporting to improve efficiency and effectiveness.

Data warehouse

Many risk systems vendors will provide a database to store the various sources of input data. However, most expect this data to be cleaned, mapped and in a structure ready to use by the system itself. What may not be provided is somewhere to stage and manage incoming data as it goes through collection, cleaning and reconciliation processes. Without a structured place to store this data, these processes become much more ad hoc and inefficient, in the worst case leading to an unmanageable mass of Excel sheets.

Systems integration

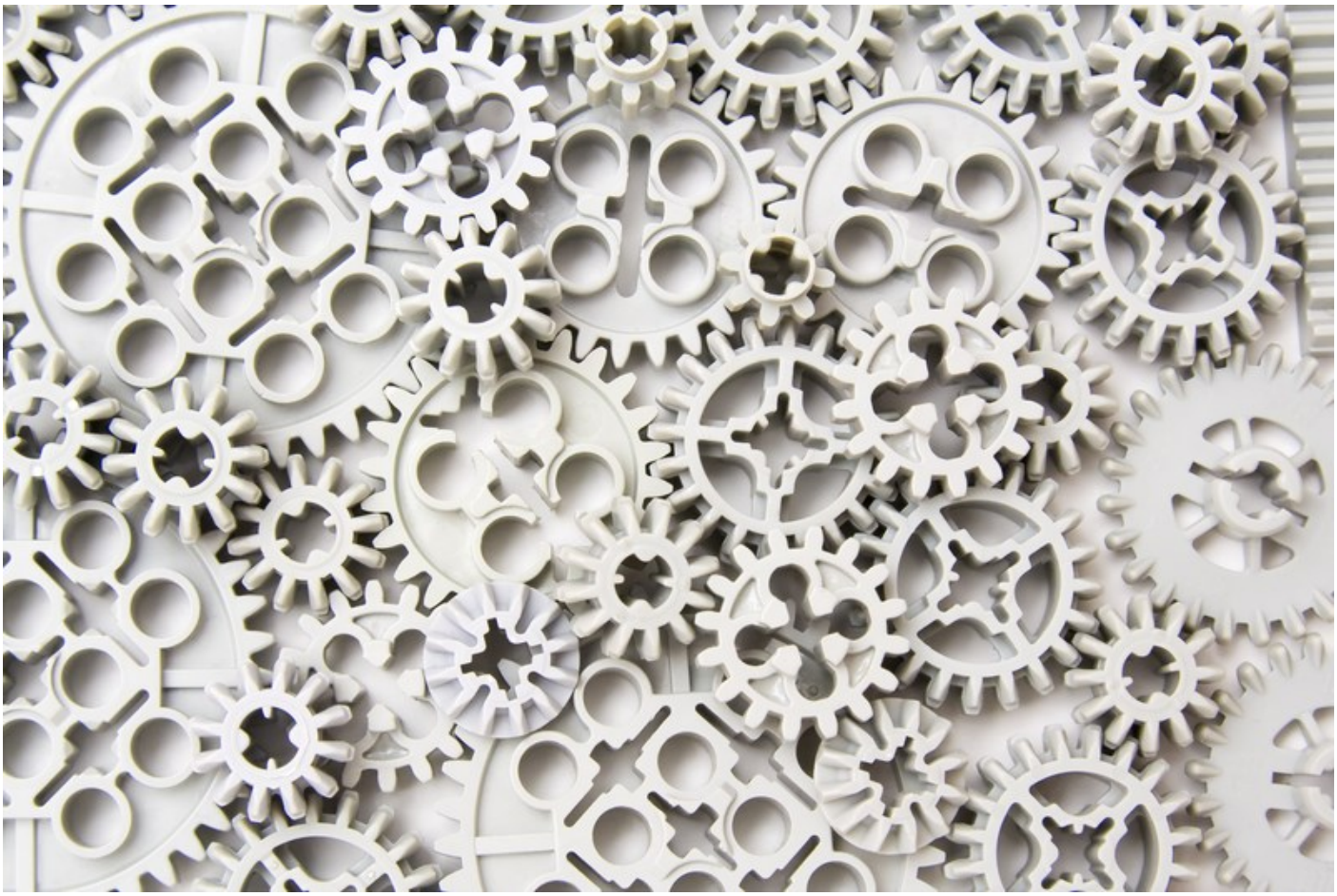
Furthermore, the set of cleaned and structured input data may be a valuable resource for other processes outside of risk management. It may be worthwhile ensuring that it is readily available for integration and re-use by other systems. These requirements further indicate the need for a centralised data warehouse which is integrated with, but separate to, the risk system. Implementing a data warehouse is a significant IT project in itself, and we expect is not something that's often in place before embarking on a risk system implementation program.

The final word

An Enterprise Risk Management Platform (ERMP) helps asset owners scalably and consistently deal with risk as a concept across its variety of business units. In respect of implementing a quantitative risk system, it provides a framework for achieving a fit-for-purpose, productive and effective solution.

This paper highlights the breadth and depth of each component of the ERMP, as well as their interdependence on each other. Consistent throughout, it is paramount to reflect a business's philosophy, objectives, resourcing and budget.

With the scale of the issue now thoroughly scoped, our third and final Frontier Line on ERMP will look at matters of practical implementation. It shows how all asset owners are able to scope, build and use a risk system that acknowledges their unique circumstances. It also provides a roadmap for achieving the ideal solution through a staged approach.



FRONTIER ADVISORS

About Frontier Advisors: Frontier Advisors is one of Australia's leading asset consultants. We offer a range of services and solutions to some of the nation's largest institutional investors including superannuation funds, charities, government / sovereign wealth funds and universities. Our services range from asset allocation and portfolio configuration advice, through to fund manager research and rating, investment auditing and assurance, quantitative modelling and analysis and general investment consulting advice. We have been providing investment advice to clients since 1994. Our advice is fully independent of product, manager, or broker conflicts which means our focus is firmly on tailoring optimal solutions and opportunities for our clients.

Frontier Advisors Pty Ltd ABN 21 074 287 406 AFS Licence No. 241266