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Creating value from uncertainty

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Tutorial note: **Showing that effective risk management adds value**

We have been advising large businesses and government entities on enterprise risk management (ERM) for many years. Managers often ask us to justify why they should invest in ERM and how they can demonstrate its value in measurable terms. This guidance note distils some of the empirical evidence on the benefits an organisation should expect from an effective ERM framework and process. The way each organisation implements change and assesses its benefits will depend on their context and culture.

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1 Summary

Introduction

We have been advising large businesses and government entities on enterprise risk management (ERM) for many years. Managers often ask us to justify why they should invest in ERM and how to demonstrate its value in measurable terms.

This guidance note distils some of the empirical evidence on the benefits an organisation should expect from an effective ERM framework and process.

Outcomes in brief

There is clear evidence that companies with risk management processes generate better financial and business outcomes than those without. There is also clear evidence that companies with higher levels of risk management maturity perform better than those with lower levels of maturity.

Caveat: correlation and causation

The empirical evidence is expressed in terms of the relationships between measures of risk management implementation and measures of company performance, usually based on financial indicators. It is important to recognise that the fact that one of these measures is strong when the other is strong does not necessarily mean that one causes the other. It might be that they are correlated rather than being in a cause-effect relationship.

There are many reasons why there might be a correlation between ERM effectiveness and company performance (Figure 1). These relationships might, in themselves, offer a valuable guide to decision-making and management. They include:

- A. Strong ERM effectiveness leads to better business decisions, both to recognise and capture opportunities and to avoid problems, resulting in better business outcomes
- B. Organisations that perform well can afford to invest in ERM, and the better the performance the more that can be invested, leading to higher levels of ERM effectiveness

- C. There is another organisational factor, which we might call 'good management' for want of a better term, that drives both ERM effectiveness and business performance; good managers produce good business outcomes, and they also impose sound, structured management processes such as ERM
- D. There may be a virtuous circle that combines several of the factors noted above, whereby good ERM effectiveness drives good business outcomes, and these in turn drive additional ERM effort and improved ERM effectiveness
- E. Organisations that have seen benefits flow from an investment in business process improvement are more likely to have the confidence to invest in further improvement, driving a wider range of performance enhancements that will often include ERM.

Figure 1: Correlation and causation



There seems to be little empirical evidence about the specific reasons for the correlations that are observed although many people will express an opinion on the subject. This paper offers guidance on what to consider as an organisation makes up its own mind about whether to devote resources to ERM and how to go about it.

Project risk management

This note does not discuss the contribution of sound risk management processes to projects and programs. We shall address the evidence for that separately.

2 Sources and measures

Sources

The references section below details the source material on which we have drawn when compiling this guidance note. A summary of the sources and their findings is provided in Table 4 at the end of this note.

Measures of ERM effectiveness

The term ERM is often used loosely. The work described here is mainly concerned with organisations that have, or aspire to have, an explicit risk management focus. Several measures of ERM effectiveness have been used.

- Presence or absence of ERM: Several studies have used content analysis of company annual reports, analyst reports and financial media to determine when terms like 'risk' were first used in relation to a company. This approach has the advantage that only publicly available information is needed.
- Risk management maturity: Many studies have used some measure of risk management maturity, often based on formal maturity assessment models. For example, Table 1 shows the attributes that are used to compile the Risk Management Maturity (RMM) score by the Risk and Insurance Managers Society (RIMS), with each attribute being aggregated from a set of related components. There are several comparable maturity models in widespread use.

Table 1: RIMS RMM attributes

Attribute		What it measures
1	ERM-based approach	Executive support within the corporate culture
2	ERM process management	Integration into business processes to support the reduction of uncertainty and promote exploitation of opportunities
3	Risk appetite management	Accountability within leadership and policy to guide decision-making regarding risk-reward tradeoffs
4	Root cause discipline	Linking outcomes with their sources to minimize or prevent impact of adverse outcomes and maximize value extraction from opportunities

Attribute		What it measures
5	Uncovering risks	Analysing and documenting risks and opportunities to uncover dependencies, including emerging and dynamic risks
6	Performance management	Executing vision, mission and strategy utilizing risk metrics as an integral element in strategy and planning activities
7	Business resiliency and sustainability	Integration into operational planning and execution for ability to recover quickly from setbacks and to maintain something of value

Source: Beals et al (2015)

Measures of business performance

Those researching the value of ERM have used many measures of business performance.

- Financial metrics: Many of the metrics are based on financial indicators such as revenue, earnings before interest, tax, depreciation and amortisation (EBITDA), net profit, share price and so on. Often the specific measure is based on cumulative growth in the indicator, or its variability or volatility. Financial metrics have the advantage of relying on publicly available information, at least for listed companies.
- Survey data: Some studies have used perceived business performance based on survey information rather than pre-existing data (e.g. Annamalah et al, 2018; Gates et al, 2012).
- Value metrics: Many studies have used Tobin's Q, sometimes called the Q ratio, as a measure of company value. Tobin's Q is defined as the ratio of the total market value of the company divided by its total asset value, so it provides an estimate of whether the company is undervalued or overvalued. Annamalah et al (2018) used a different metric, economic value add, which is defined as net operating profit after tax, less total capital multiplied by the cost of capital; $EVA = NOPAT - TC \times WACC$.
- 'Best-in-class': Another strand of analysis examines 'leading companies', where a leading company shows better performance across a range of financial and operating measures, aggregated in some way that seems appropriate for the business sector of interest.

3 Risk management and business performance

ERM and overall business performance

Several authors have shown that simply having a risk management process of some kind, based on content analysis of reports, correlates with improved business performance.

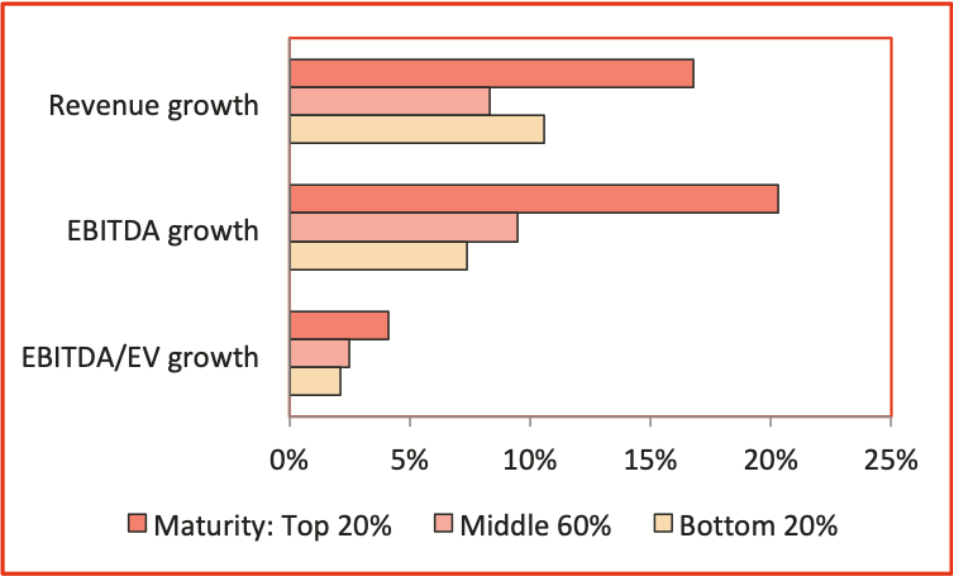
- Hoyt and Liebenberg (2011) showed that publicly listed insurance companies that engaged in ERM were valued roughly 20% higher than other insurers, after controlling for other determinants of value
- Correlations between ERM and performance were replicated by Kommunuri et al (2016) for 199 publicly listed companies in Vietnam and by Rodrigues da Silva et al (2019) for 77 companies listed on the Brazilian stock exchange; Rodrigues da Silva et al (2019) also noted that companies that used ERM reported less variability in value
- Quon et al (2012) found no statistically significant association between risk assessment and company performance for 156 non-financial companies listed in Toronto, but their data was derived for a time period (2007-09) that covered a major financial crisis during which the performance of companies might have been unstable for many reasons, masking the systematic effect of any particular business process.

Using a measure of risk management maturity allows more refined analysis. Several studies have adopted this approach.

McShane et al (2011) observed a positive relationship for 82 publicly listed insurance companies between Standard and Poor's ERM ratings and company performance measured by Tobin's Q. The relationship was stronger at lower ERM ratings than for higher ratings.

Ernst & Young (2012) showed that compound annual growth rates in revenue, EBITDA and EBITDA/EV over the period 2004 to 2011 were higher for companies with the most mature risk management (Figure 2).

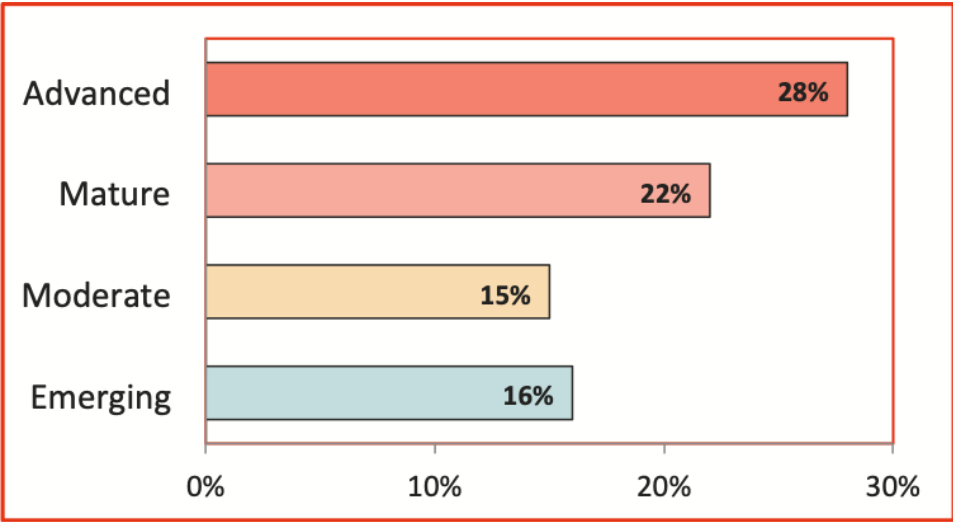
Figure 2: Risk maturity and financial performance



Source: Ernst & Young (2012)

FERMA (2012) found that companies with advanced ERM practices generate stronger EBITDA growth than those with weaker ERM; 28% of companies with advanced ERM had growth over 10% compared with 16% of companies with emerging practices (Figure 3); among companies with an EBITDA growth over 20%, 74% had mature or advanced risk management practices.

Figure 3: Risk maturity and EBITDA growth



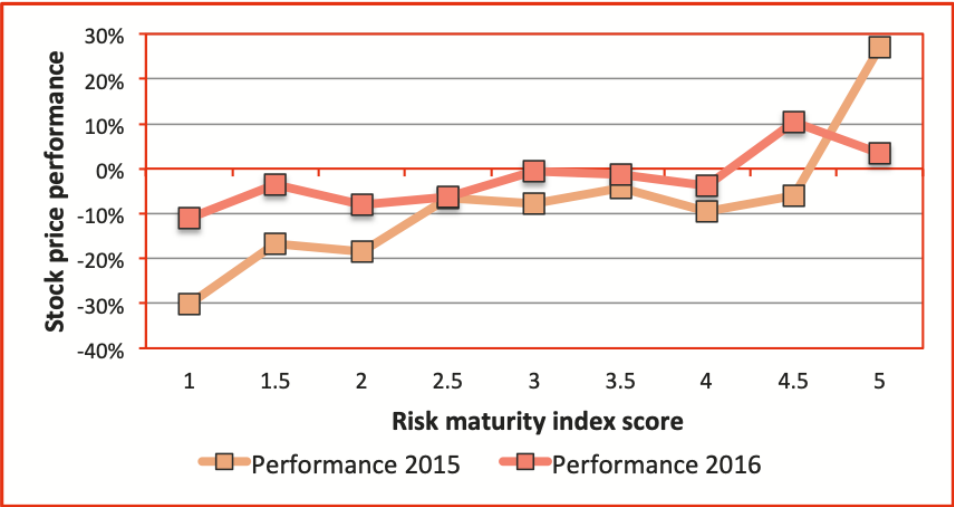
Source: FERMA (2012)

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In a survey of 150 companies, Gates et al (2012) observed a significant positive correlation between perceived risk management capability and perceived business performance.

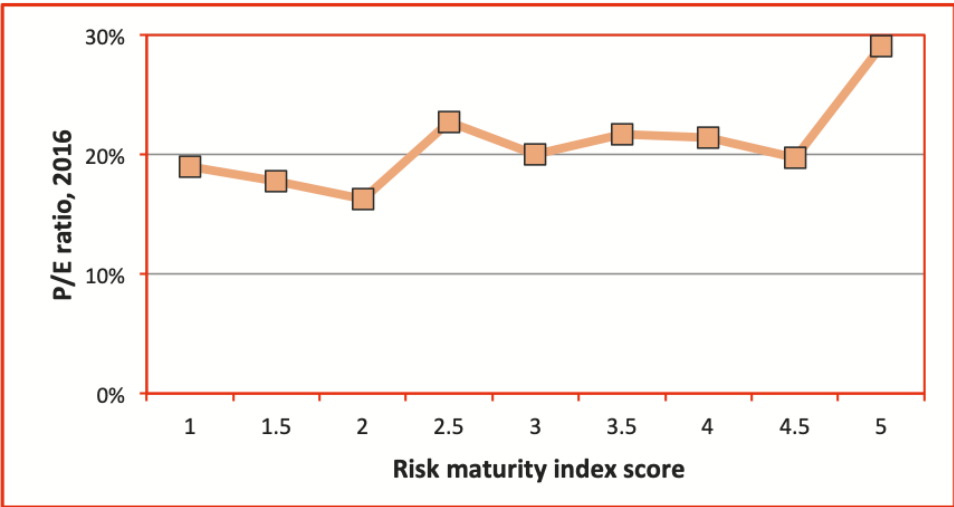
In a survey of 81 insurance brokerage clients, Aon (2017) showed that higher risk maturity scores correlated with higher stock price performance (Figure 4) and market valuation expressed as a price/earnings ratio (Figure 5).

Figure 4: Risk maturity and stock price performance



Source: Aon (2017)

Figure 5: Risk maturity and market valuation



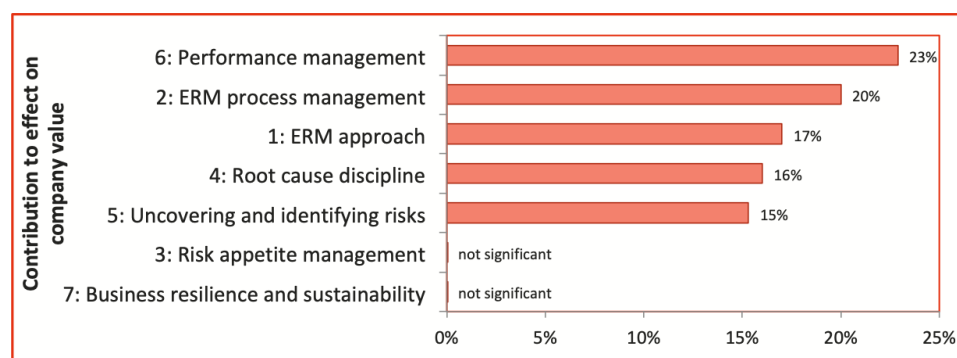
Source: Aon (2017)

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In a sample of 15 oil and gas companies in Malaysia, Annamalah et al (2018) showed a significant correlation between implementation of ERM and improved business performance measured in terms of economic value add.

Farrell and Gallagher (2015) identified a strong correlation between ERM performance and financial performance. Companies in the top tiers of ERM maturity (levels 3-5) were associated with an increase in value of about 25% compared to those in the lower tiers (levels 1-2). They also identified the contributors in the Risk and Insurance Management Society (RIMS) Risk Maturity Model (RMM) that contributed most to the effect of sound ERM on company value (Figure 6, Table 1).

Figure 6: ERM contributors



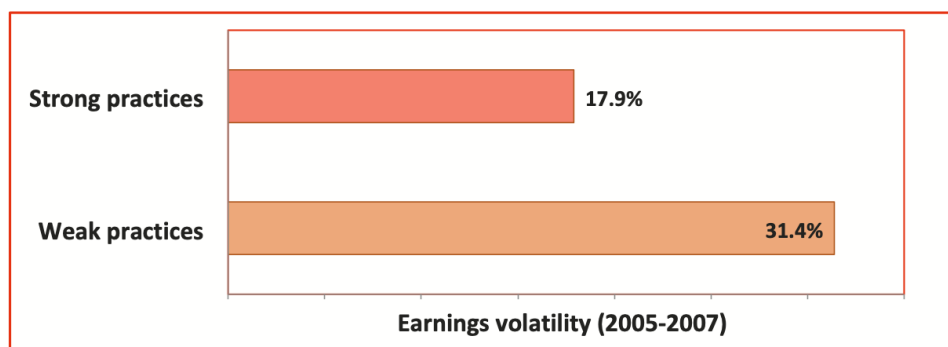
Source: Farrell and Gallagher (2015)

Risk management and performance volatility

Several studies have shown that good risk management practices are associated with more consistent financial outcomes, expressed as lower earnings volatility and lower share price volatility.

FM Global and Oxford Metrica (2010) showed that large multinational companies with strong physical risk management processes had far lower earnings volatility than those with weak practices (Figure 7).

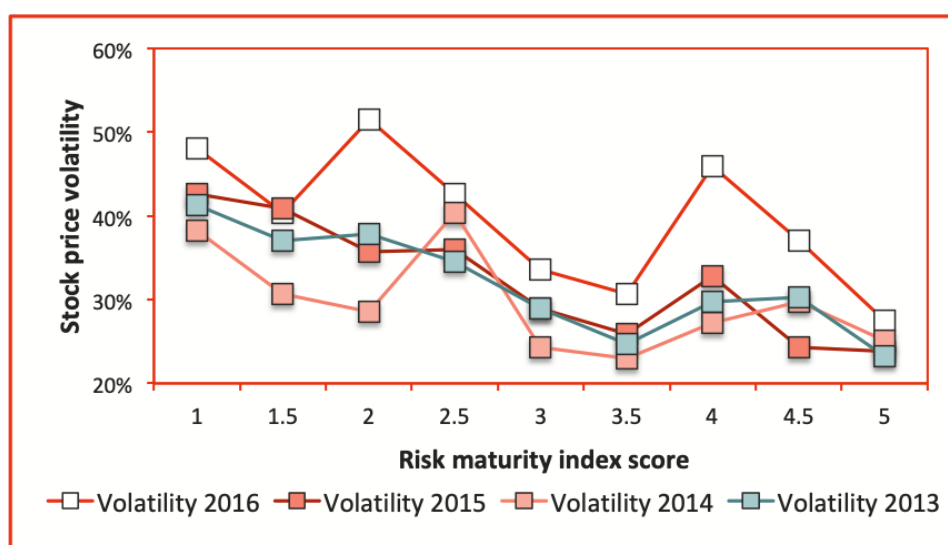
Figure 7: Physical risk management and earnings volatility



Source: FM Global and Oxford Metrica (2010)

Aon (2017) showed higher risk maturity correlates with lower stock price volatility (Figure 8).

Figure 8: Risk maturity and price volatility

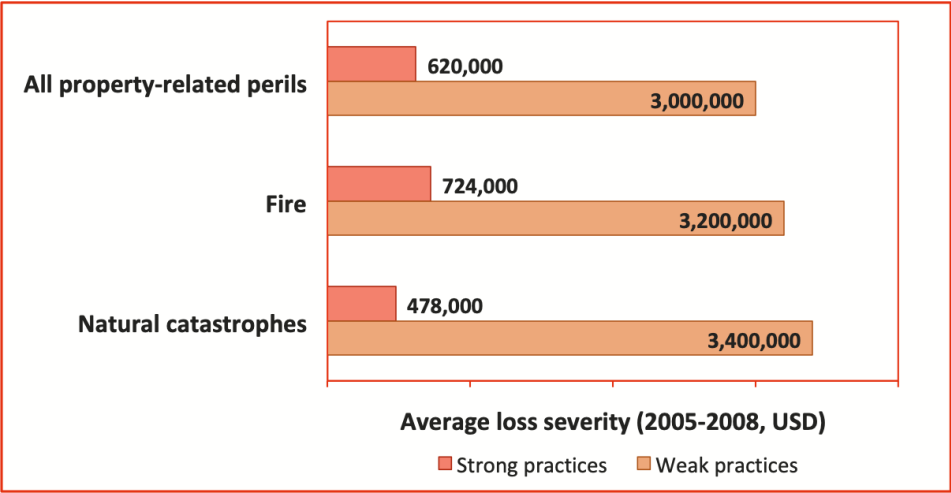


Source: Aon (2017)

Losses, resilience and insurance

FM Global and Oxford Metrica (2010) found that companies with strong physical risk management processes suffered fewer and less severe property losses (Figure 9).

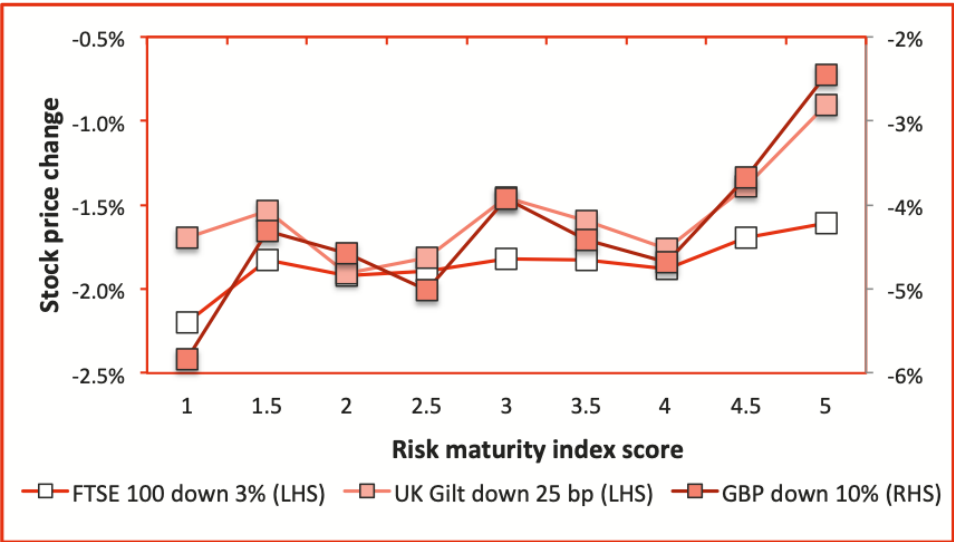
Figure 9: Risk management and property loss severity



Source: FM Global and Oxford Metrica (2010)

Using the Bloomberg Scenario Function, Aon (2017) showed that a higher risk maturity score correlated with improved resilience to market shocks expressed in terms of smaller share price reductions in the immediate aftermath of a simulated market event (Figure 10). Note that the vertical axis represents negative values; a change in the currency generates a much larger change in market price, so this effect is shown on the right-hand axis.

Figure 10: Risk maturity and resilience to a market shock

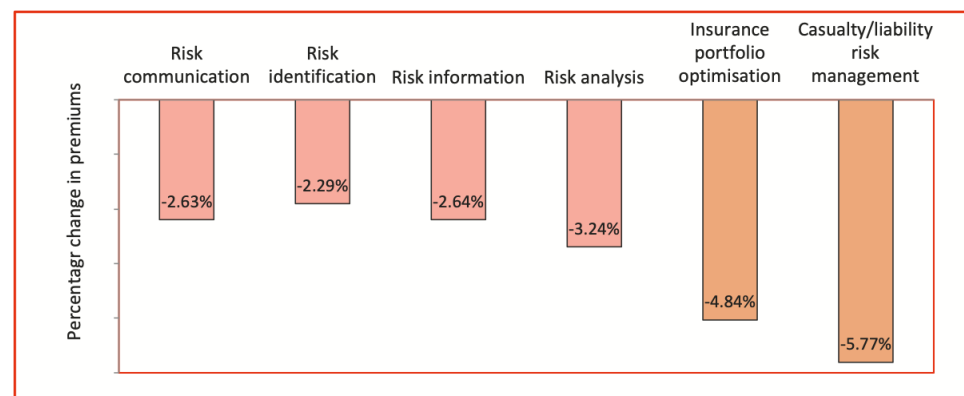


Source: Aon (2017)

Aon (2017) found that 10% increase in a company's Risk Maturity Index (RMI) score was associated with direct reductions of 2.6% in Directors and Officers

(D&O) insurance premiums compared to similar companies, after controlling for other related factors. Taking into account other indirect premium benefits that flow from reduced volatility, the premium reduction was 3.8%. Figure 11 shows how a 10% improvement in scores in some of the characteristics used in Aon's RMI are related to direct D&O premium reductions (excluding the indirect effects of volatility). Aon's RMI includes components specifically related to insurance; unsurprisingly, these are associated with significant beneficial effects. These results align with the maxim that the best companies don't buy insurance, they sell risk.

Figure 11: Risk maturity components and D&O premiums



Source: Aon (2017)

Best-in-class analyses

The Aberdeen Group has published several analyses based on comparing groups of companies, often in a triage of best-in-class, industry average and laggards, or leaders (typically the best-performing 35%) and followers (the lower-performing 65%). They have used different metrics to determine groupings, including (among many others, according to the industry sector):

- Unscheduled asset downtime
- Overall equipment effectiveness
- Operating margin compared to the corporate plan
- Ability to meet product launch target dates
- Ability to deliver projects on budget and on time
- Financial metrics.

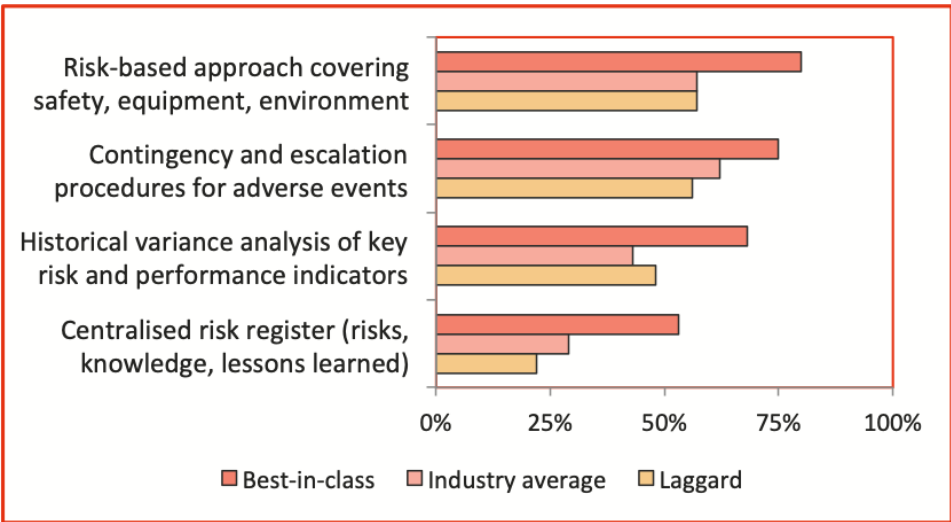
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Aberdeen (2013) showed that best-in-class manufacturers demonstrated better operational risk management practices (Figure 12). They also integrated their risk management information systems with other systems, analytics and

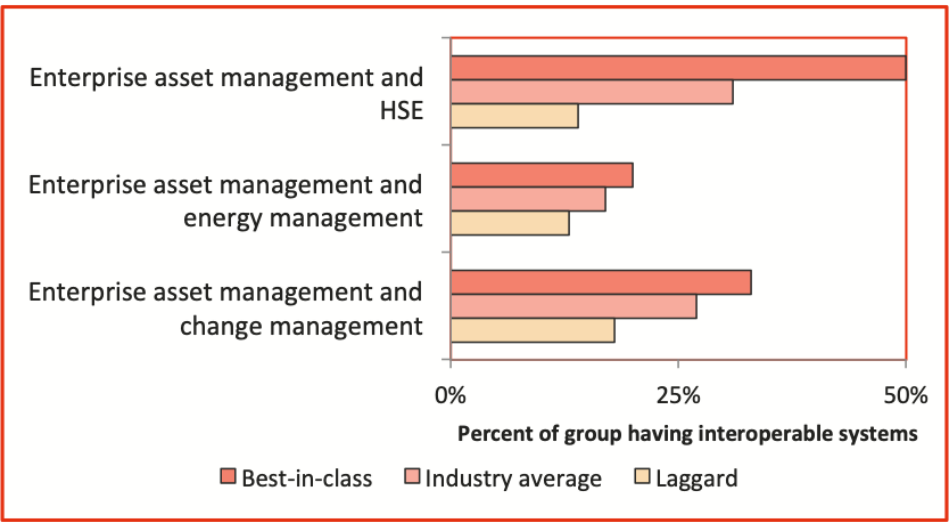
dashboards (Figure 13), ‘to more easily get the “big picture” view of the state of their manufacturing operations – where the biggest risks lie – and most importantly where they should focus their efforts.’ They showed similar outcomes in a later study, Aberdeen (2016).

Figure 12: Operational risk management in manufacturers



Source: Aberdeen (2013)

Figure 13: System interoperability for risk management



Source: Aberdeen (2013)

Based on the experience of over 175 respondents, Aberdeen (2015) showed that leading energy companies are far more advanced than energy followers on most risk management metrics (Figure 14). For this study, energy companies

included organisations engaged in fuel extraction, manufacturing, refining, independent production (solar, wind, fuel cells, nuclear etc.) and distribution.

Figure 14: Maturity of risk management practices in energy companies



Source: Aberdeen (2015)

4 Realising the benefits

Table 2 shows our view of some of the business benefits of risk management and the factors that help to generate them. Table 3 outlines some of the characteristics of the way we in Broadleaf approach our consulting work when we advise organisations on how they might enhance their risk management practices, with an indication of how the way we work adds value.

Table 2: Realising the benefits from ERM

What are the benefits		What aspects of ERM help realise them
1	Enhanced value and resilience of the business	Greater awareness of threats and opportunities to the company's objectives, and the processes for dealing with them
2	Fewer unpleasant surprises and shocks for the company and its shareholders	Greater predictability of performance More confidence in the earnings guidance given to shareholders and the market
3	Greater shareholder confidence in the company	A structured and transparent risk management process, directly aligned to the company's objectives, that supports good governance (an aspect of benefit 1) An ability to demonstrate that shareholder capital is being protected and is being exposed to an appropriate level and type of risk
4	An improved organisational culture	A move away from a prescriptive 'rule-book' approach Clear allocation of accountability for material risks and for the assurance of critical controls A requirement for managers to act with foresight and hindsight
5	Improved business performance	Greater risk management effectiveness, through a structured approach that provides more confidence that important threats and opportunities have been identified and addressed appropriately (supporting benefit 1)
6	Better and faster decisions, and prudent risk taking	Better and more focussed information about threats and opportunities, and greater confidence that decisions are being taken on a sound basis (a driver for benefit 5)
7	Better allocation of resources and capital	Agreed risk management standards and guidelines that are applied consistently across the business, thus allowing 'competing' risks and treatment requirements to be compared more readily (an aspect of benefit 6 that supports benefit 1)
8	Better responsiveness and adaptability in the face of changing circumstances	Identification, monitoring and review of emerging threats and opportunities and potential drivers of change (an aspect of benefits 5 and 6 that support benefit 1)
9	Reduced operational costs and management effort	A more structured and efficient risk management process, built on existing organisational practices, that reduces effort and allows managers to focus on the things that really matter (supporting benefits 5 and 6)
10	Improved organisational learning	Monitoring and review processes, including post-investment reviews and lessons learned activities, that support the capture and dissemination of knowledge about the drivers of successes and failures (supporting benefit 6)

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What are the benefits	What aspects of ERM help realise them
11 Enhanced and more efficient control	Better priority setting that assists managers (and internal audit) to focus their assurance activities on the controls that are the most critical for the business Fewer redundant, or inefficient controls, because only controls that relate to material risks are needed (supporting benefits 1, 3, 12 and 13)
12 Reduced losses and better incident management	Better identification, analysis and evaluation of what might cause loss of money or assets, or cause harm to people or the environment, leading to better treatment actions and improved controls (supporting benefit 1)
13 Reduced insurance premiums	A transparent and demonstrable process for identifying and treating potential threats, with supporting control improvement and assurance processes (supporting benefit 9)
14 Satisfy legal, regulatory and internal compliance and reporting requirements	A codified and transparent process, with associated reporting on risk management status and improvements (supporting benefit 3)

Table 3: How we help realise the benefits from ERM

Our approach	How that adds value
1 We work with managers throughout the corporate and operating parts of the business	Our recommendations are tailored to the way in which you work, to ensure the risk management process meets the needs and supports the operational objectives of managers in different parts of the business This enhances 'ownership' of the framework, and of the risks and controls, by the managers involved
2 We build on existing processes where feasible	We minimise the changes to existing processes where we can, to build on the current strengths of the company, to ensure there is a close fit between current and future practice and to minimise unnecessary disruption This also respects the work done to date and encourages ongoing involvement and cooperation by specialists We try to enhance what is there, not replace existing processes completely unless they are irretrievable
3 We integrate risk management with existing processes where feasible	Where possible, risk management processes should be an integral part of day-to-day operations, rather than an add-on; risk management should not impose unnecessary burdens on busy people without corresponding benefits This ensures that risk management is relevant to managers and their decision making needs It also helps ensure that managers are accountable for the management of risks, as this becomes part of their day-to-day activity Integration also assists risk management to become sustainable in the business

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Our approach	How that adds value
4 We base our work on the latest standards and on the best practices we have seen elsewhere	This 'future proofs' the organisation's approach to risk management and ensures it benefits as much as possible from the experience of others
5 We help you produce a risk management process and framework that is tailored to your organisation, its risk profile, its context and needs	We usually conduct a gap analysis, and agree with you where enhancements are necessary This 'bespoke tailoring' ensures that you adopt the most effective and efficient approach to managing risks
6 Our approach to implementation is tactical and timely	We try to minimise disruption to the natural flow of work and your calendar of activities We fit in with your strategic and operational planning processes and add value to them rather than delaying or extending them We take advantage of any opportunities that might occur to promote risk management and to demonstrate its benefits to managers
7 We work with your specialist staff at all times	This transfers skills to them and builds their ownership of the framework They will be confident to continue with the implementation of the framework once we have withdrawn
8 We ensure that the framework includes processes for continuous improvement	Once you have made the investment, the framework should be self-sustaining and remain current

5 Source material

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Literature summary

Table 4: Summary of some of the literature

Reference	Companies	ERM measure	Performance measure	Outcomes
Aberdeen Group (2013)	119 executives, manufacturing companies	Range of indicators of good risk management	Unscheduled asset downtime, overall equipment effectiveness, operating margin vs. corporate plan	Best-in-class manufacturing companies have better operational risk management practices
Aberdeen Group (2015)	187 energy companies	Range of indicators of good risk management	Asset downtime, equipment effectiveness, compliance, injuries, audit action completion	Energy leaders (top 35%) are far more advanced than energy followers (bottom 65%) on most risk management metrics
Annamalah et al (2018)	120 senior managers from 15 Malaysian oil and gas companies	Survey of 14 elements of ERM	Economic value add	Implementation of ERM significantly improves the organisation's business performance
Aon (2017)	81 insurance brokerage clients	Aon Risk Maturity Index	Directors and Officers insurance premiums	Higher RMI scores were associated with better stock price performance, reduced stock price volatility, greater resilience to market shocks and significant reductions in D&O insurance premiums
Ernst & Young (2012)	576 company interviews, 2,750 analyst and company reports	Unspecified risk maturity measure	Revenue, EBITDA, EBITDA/EV	Companies with more mature risk management practices outperform their peers financially
Farrell and Gallagher (2015)	225 publicly listed companies, range of countries and sectors	Risk and Insurance Management Society's Risk Maturity Model	Tobin's Q	Strong correlation between ERM performance and financial performance; companies in the top tiers of ERM maturity (levels 3-5) are associated with an increase in value of about 25% compared to those in the lower tiers (levels 1-2)

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Reference	Companies	ERM measure	Performance measure	Outcomes
FERMA (2012)	809 responses from members of 22 European national risk management associations	Four levels of maturity based on 13 survey questions	EBITDA growth over previous five years	Companies with advanced ERM practices generate a stronger EBITDA growth; 28% of companies with advanced practices had growth over 10% compared with 16% of companies with emerging practices
FM Global and Oxford Metrica (2010)	520 multinational companies, earnings over USD 1 billion	Proprietary physical risk management data from FM Global (scale 1-100)	Earnings volatility, property losses	Companies with best practices in managing property risks produced earnings that were 40% less volatile than those with less advanced physical risk management; risk and severity of property losses were many times smaller
Gates et al (2012)	150 company members of The Conference Board	Survey rating	Survey rating	Significant positive correlation observed between perceived management capability and perceived business performance
Hoyt and Liebenberg (2011)	117 US publicly listed insurance companies, period 1995-2005, 687 observations	Content analysis of financial reports and news media for use of ERM	Tobin's Q	'Insurers engaged in ERM are valued roughly 20% higher than other insurers, after controlling for other value determinants'
Kommunuri et al (2016)	199 publicly listed companies of Ho Chi Minh City and Hanoi Stock Exchanges, 2009-2013, 995 observations	Content analysis of annual reports for use of ERM	Return on assets, Tobin's Q	ERM is not highly correlated with return on assets; ERM is correlated with Tobin's Q
McShane et al (2011)	82 publicly listed insurance companies	Standard and Poor's ERM ratings	Tobin's Q	Positive relationship between ERM rating and company performance at lower ERM ratings, but the relationship flattens for higher ratings
Quon et al (2012)	156 non-financial companies on the Toronto Stock Exchange Composite Index, during 2007 and 2008	Risk exposure and consequences from content analysis of annual reports	Sales, EBIT margins, Tobin's Q	No statistically significant association between risk assessment and company performance (but the time period covered a major financial crisis)

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Reference	Companies	ERM measure	Performance measure	Outcomes
Rodrigues da Silva et al (2019)	77 companies listed on the Brazilian stock exchange IBrX100 index, 2004-2013, 649 observations	Content analysis of annual reports for use of ERM	Tobin's Q	Positive association between ERM adoption and company value; companies that use ERM reported less variability in value

6 Contact

If you would like further information about this topic please contact us. We will endeavour to reply promptly.

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