

Applying an Enterprise Risk Management (ERM) Framework to Fund Governance*

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Introduction

It is not yet common practice to apply an Enterprise Risk Management (ERM) framework to the governance of investment funds.¹ Upon reflection, however, one realizes that funds are generally structured as corporations, and each fund has shareholders (fund investors), and the mission of each fund is to maximize shareholder values. Even if a fund is of a contractual type, a fund still can be viewed as an enterprise, and also faces similar corporate governance issues. Overlaying fund governance then with ERM processes can be beneficial.

Contrary to what some may assume, risk management is not a means of risk avoidance. Rather it is a means of implementing proper risk taking and, hence, contributing to value creation. ERM's goal is value-creation through enterprise-wide integrated and holistic risk management. Thus, an investment fund can be viewed as an enterprise that creates value

through calculated risk taking. In this sense, there is no reason that an ERM framework cannot be suitably applied to fund governance in a way that helps maximize values for fund investors.

Top management of a corporation/enterprise and its board of directors bear oversight responsibility for ERM processes in their organizations. Similarly, directors of investment funds owe fiduciary duties to investors, and they need to ensure that an integrated risk management process be in place and the process be monitored. In the paragraphs below, this paper discusses how an ERM framework can be applied profitably to the governance of investment funds. The author argues that applying an ERM framework is not only desirable, but also critical in order for a fund director to fulfill his/her responsibilities.

At the same time, applying an ERM framework to fund governance should not create an undue

burden on fund directors. Fortunately, fulfilling duties normally expected of fund directors in a conscientious and systematic fashion coincides with satisfying most of the key components of ERM processes. Helping to foster a risk-aware culture among the stakeholders of a fund is arguably the only new ERM oriented task that a fund director needs to perform in addition to fulfilling other commonly expected responsibilities of a director.

What is ERM?

An often cited definition of enterprise risk management (ERM) is given by the Committee of Sponsoring Organizations of the Treadway Commission (COSO):

[ERM] is a process effected by an entity's board of directors, management, and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of an entity's objectives.²

While this definition presumes that ERM is applied to regular enterprises, most of the expressions are also relevant to investment funds. The only exception might be “strategy setting” mentioned in the second line, as the “corporate strategy” or “objective” of an investment fund is made explicit prior to launch of the fund. Even then, to the degree that a fund’s strategic objective can drift or formally change under certain circumstances, the issue of strategy setting may be relevant.

This definition highlights several important points that have relevance in the application of an ERM framework to investment funds.

- The board of directors and management of an investment fund are responsible for “effecting” the fund’s ERM process.
- The ERM process needs to identify potential events that may affect the fund.
- The ERM process needs to manage risk within the fund’s risk appetite.
- The ERM process helps provide reasonable assurance regarding the achievement of fund objectives.

Absent an effective ERM process, risk management tends to occur at division or business unit levels, each often referred to as a “silo.” The problem with the silo approach is that there is no coordination among different silos and there is no way to form an assessment of the total risk which the enterprise faces. This is true, even if diligent risk management is implemented in each silo. Another key expression in the COSO definition of ERM is “across the enterprise.” It is not difficult to deduce that without a risk management process which is applied across the enterprise, board members and top management cannot pursue integrated risk management.

It is true that, unlike a business enterprise, an investment fund has typically no, or virtually no, employees or departments that may form silos. However, this does not diminish the importance of the ERM process. Instead of internal silos, a fund has a different set of stakeholders such as an investment advisory firm, a fund

administrator, an accounting firm, and investors (sometimes different classes of investors). These stakeholders often have diverging interests as do various silos or business units within an enterprise or corporation.

Fund Directors and ERM

In effecting the enterprise’s ERM process, board members and top management must foster risk aware culture throughout the enterprise. Moreover, they are expected to set the tone of risk culture at the enterprise.³ It is of paramount importance to note that “culture is not merely an intangible concept—its elements can be defined and progress in moving toward a desired culture can be measured.”⁴ Douglas Brooks cites the following three issues when a strong risk-aware culture is absent:

- Not all relevant risks may be identified and assessed.
- Decision makers may not be aware of some risks as decisions are being made.
- Decisions may be made ignoring certain risks.

Thus, board members, including independent fund directors, must exercise leadership in fostering a risk-aware culture for a fund, as should be done at an enterprise.

Despite sharing common objectives, the roles of the board and senior management are not identical. For instance, unlike senior management, boards “cannot and should not be involved in the actual day-to-day management of risks.” Instead, the role of the board is “to ensure that the risk management process designed and implemented by senior executives and risk management professionals employed by the company act in concert with the organization’s strategic vision, as articulated by the board and executed by senior management.”⁵

The Independent Directors Council and Investment Company Institute jointly published a paper titled *Fund Board Oversight of Risk Management* in 2011. In the paper, the board’s fundamental responsibilities are delineated as follows:

- Director’s responsibilities to oversee risk management are derived from their general fiduciary duties of care and loyalty and are part of their overall responsibility to oversee the management and operation of the fund.⁶
- A fund’s board is not responsible for overseeing the management of the [investment] adviser’s risks or those of its parent or affiliates. ...Nevertheless, the fund board’s focus on the fund’s risks will necessarily entail an understanding of the adviser’s risk that may impact the fund as well as the associated risk management process.⁷
- A board does not manage [a] fund’s investments or its business operations, nor does it manage the risks associated with these activities.⁸

Similarly, the Cayman Islands Monetary Authority (CIMA) issued a *Statement of Guidance for Regulated Mutual Funds — Corporate Governance*, in December 2013. The guidance lists the key responsibilities of the governing body of a fund, along with those of operators (fund directors). Among other duties, the guidance describes the risk management oversight role of the directors in Paragraph 9.9 as follows:

The Operator should ensure it provides suitable oversight of risk management of the Regulated Mutual Fund, ensuring the Regulated Mutual Fund's risks are always appropriately managed and mitigated, with material risks being discussed at the Governing Body meeting and the Governing Body taking appropriate action where necessary.⁹

Thus, for funds domiciled in the Cayman Islands, operators (fund directors) are mandated to oversee the risk management of the fund they serve; in this case it is equivalent to serving as a board member of an enterprise and facilitating its ERM process, including overseeing a more narrowly defined “risk management process.”

The board of a corporate entity faces an array of strategic issues such as defining corporate missions, setting strategic objectives and responding to changing competitive landscapes. The board also oversees the operational aspects of its entity. While ERM is usually not directly involved in the strategic aspects of an entity,¹⁰ it plays a key role in helping the board to meet the objectives of an entity.

By contrast, in the case of an investment fund, strategic decisions such as mergers and acquisitions usually are not the purview of the fund board. Nevertheless, as is the case for a corporate entity, the responsibility of overseeing operational aspects of the fund lies on the shoulders of the fund board and its directors. As ERM addresses and integrates all the key aspects of fund operations, it is clear that applying an ERM framework is a *necessary* condition for fund directors to fulfill their responsibilities. Once this is understood, the logical question becomes whether applying an ERM framework then constitutes a *sufficient* condition for a fund's directors to meet their responsibilities. The aforementioned *Statement of Guidance for Regulated Mutual Funds* by CIMA has 9 sections and only in the last and very brief section does the guidance address risk management. Other sections deal with responsibilities of directors including: Oversight Function, Conflicts of Interest, Governing Body Meetings, Operational Duties, Documentation, and Relations with the Authority. On the surface, it may appear that risk management constitutes a small part of director responsibilities. However, as will be discussed later, an ERM framework does address all of these responsibilities. Indeed, applying an ERM framework and diligently implementing the framework covers all of the fundamental responsibilities that are expected of fund directors by CIMA.

Key Risks of Investment Funds

Investment advisers are in the business of taking and managing investment risks. Therefore, it should come as no surprise that an investment fund faces an array of investment related risks. Addressing these risks constitutes the core competency of investment advisers, and fund directors need to abstain from “managing” these risks. However, there clearly exist other types of important risks that the directors ought to monitor and help mitigate, if appropriate. In the paragraphs below, market risk (investment risk), operational risk, liquidity risk, counter-party risk, and cyber-security risk will be discussed *from the perspective of fund directors*. Please note that these paragraphs are not a general description of each type of risk.

Market Risk (Investment Risk)

Unlike other types of enterprises, the role of investment funds is to take proper market risk¹¹ or more generally speaking, investment risk, so that risk exposure will translate into investment returns. For this reason, it is nonsensical to try to eliminate or mitigate market risk; when no market risk is taken, there will be no investment returns.

With respect to market risk, “[the] board should be especially sensitive to so-called ‘red-flags,’ or violations of existing risk limits established by the risk management team.”¹² These days, most funds make use of risk management software. This type of software typically calculates value-at-risk (VaR) and/or other risk parameters on a daily basis. When a pre-determined risk limit threshold is violated, a red-flag is raised. It is the responsibility of the management team to take remedial action or, at minimum, take note of red-flag exceptions, and report the exceptions to the board.

Statistically speaking, exceptions are designed to occur with a certain probability. One may be inclined to believe that the fewer the exceptions the better. However, the reality is not that straightforward: if no exception is reported, it may be because the risk limits are set too high, rendering the risk monitoring process useless. On the other hand, if exceptions occur too frequently, it can be either because the fund's investment management team continues to take undue bets, or because the risk limits are set too stringently.

How the management team of investment advisers handles these exceptions is a good indicator of their depth of knowledge, skills in risk management, and the level of their risk appetite. Thus, monitoring and discussing exceptions provides fund directors with (1) valuable opportunities to gauge the level of commitment of the team to risk management, as well as, (2) insight into the firm's risk management culture.

This does not mean that focusing on the exceptions is sufficient for fund directors. Needless to say, a variety of risks related to markets, as well as how the investment manager reacts to these risks, need to be monitored, and potential and actual deficiencies addressed. Moreover, there may exist “unknown risks” at the time of fund inception, and exceptions reports, by nature, cannot handle previously unknown risks. Similarly, it is often the case that an investment portfolio has exposure to risk factors that its portfolio manager does not intend to take. Market risk of this type often causes significant drawdowns as the portfolio manager may be utterly unprepared for the adverse impacts of such factors.

Operational Risk

The failures of hedge funds are often attributed to operational risk rather than market risk. This has been the case since before, as well as during and after, the global financial crisis of the last decade. For instance, in 2003 CAPCO, a financial service consultancy, reported “50 per cent of hedge funds fail[ed] due to operational risk alone rather than bad investment decisions.”¹³ Moreover, “85% of these failures were due to: (1) misrepresentation (reports and valuations with false or misleading information); (2) misappropriation of funds (fraud); and unauthorized trading.”¹⁴

Another study conducted by Castle Hall Alternatives indicates that up to the middle of 2009, “the total financial impact of hedge fund operational failure was estimated to be \$80 billion.”¹⁵ The study also indicates “the most common causes of operational failure are theft and misappropriation, followed by [non-] existence of assets (the manager claimed to own fake securities or operated a Ponzi scheme where reported assets did not exist).”¹⁶

It is interesting that among different hedge fund strategies, long/short equity and managed futures were found to be more vulnerable to operational failures. This finding seems to be counterintuitive, as “these funds trade only exchange traded instruments, typically with little pricing risk and straightforward custody and brokerage relationships.”¹⁷ The study points out two potential reasons for this result: (1) “cooking the books is easier when dealing with more straightforward strategies which do not involve complex securities, high volumes of trades and multiple brokers and counterparties;” and (2) “a long/short equity manager or CTA can plausibly operate with a much smaller team than a more complex hedge fund. In general, the smaller the number of people involved, the easier it is to conduct a fraud.”¹⁸

In March 2016, Skybridge Capital compared four studies of business and operational hedge fund failures. The studies by CAPCO and Castle Hall Alternatives were included in the four studies. Skybridge defines “operational risk” to be “the risk of loss stemming from issues related to middle and back office functions,”¹⁹ and “these issues range from the misvaluation of a fund’s investment portfolio; poor controls on the movement of cash; sloppy trade processing; or even the loss of trading capabilities from a power outage.”²⁰

In addition, Skybridge Capital defines “business risk” as “the possibility of loss stemming from issues related to the hedge fund management firm that are not directly associated with market movements.”²¹ The company claims that one can mitigate these operational risks by conducting thorough due diligence on the operational process of the fund, as well as the third parties involved. Importantly, Skybridge Capital also notes the benefits of having independent directors on the fund’s board.

While the above examples have focused on the more notable failures of hedge funds, it is clear that operational risk extends to any fund. Other types of funds such as private equity funds and real estate funds are not without operational risk. As a matter of fact, to the extent that these funds typically require longer time frames to harvest risk premia from investments, the importance of operational risk cannot be over-emphasized.

Liquidity Risk

For an investment fund, two types of liquidity are relevant: market liquidity and funding liquidity. In the midst of the last global financial crisis, Lasse Pedersen gave a talk at the International Monetary Fund and the Federal Reserve Board, and defined each liquidity in simple terms: market liquidity risk is “the risk that the market liquidity worsens when you need to trade [and] funding liquidity risk is the risk that a trader cannot fund his position and is forced to unwind.”²²

An extreme form of market liquidity risk occurred around the time of Pedersen’s talk in 2008, and dealers in some markets such as asset-backed securities and convertible bonds shut down and

there were no bids for these securities. In addition, an extreme form of funding liquidity risk was observed “since banks [were] short on capital ...and need[ed] to scale back their trading that require[d] capital.”²³ Importantly, the two types of liquidity can “reinforce each other in liquidity spirals where poor funding leads to less trading,” which “reduces market trading,” thereby “increasing margins and tightening risk management,” and “further worsening funding.” Moreover, the crisis in certain asset classes spread to other asset classes and other markets globally.²⁴

Liquidity risk affects fund investors in a number of ways. To provide several obvious examples: first, the performance of a fund is severely and adversely affected as security prices tend to fall sharply when liquidity dries up. This cost of illiquidity can be extremely significant and needs to be measured properly *ex ante*.²⁵ Second, gates may be imposed, and investors may not be able to withdraw the full amount normally allowed during a redemption period. Third, the policy of side-pockets may be instituted and illiquid assets may be separated from liquid assets. Unless investors remain in the fund, the investors cannot benefit from the sale of side-pocketed assets.

While a greater number of investors face liquidity risk under market stresses, it is possible for investors of a given fund to run into such risk due to solely idiosyncratic causes. For instance, the outright fraud or operational issues discussed previously can trigger a liquidity crisis for a fund. While fund directors cannot prevent market crises from affecting the performance of funds they oversee, imposing redemption restrictions such as gates or side-pockets on investors is a purview of fund directors. When decisions of these types are considered, a conflict of interest between an investment adviser and investors may become acute, and a fund director who is a member of the investment adviser may face conflicting objectives. With the goal of maximizing the value of the fund in the long run, “independent” fund directors should exercise their best judgement in a way consistent with the fund’s ERM framework.

Counter-party Risk

Until the global financial crisis of the last decade, investment funds such as hedge funds were not particularly concerned about the counter-party risk of its service providers. Failures of large financial service organizations, such as Lehman Brothers and Bear Sterns, changed this picture completely. Prior to the crisis, investment advisory firms were content with relying on a single prime broker clearing and safe-keeping securities and cash. Nowadays, investment advisory firms seek to diversify counter-party risk by multiple means, including appointment of an additional prime broker and/or a separate custodian.

Spectacular failures of financial services organizations are not necessarily caused by a world-wide systemic event. A few years before the global financial crisis, Refco, a large commodities and futures brokerage firm, filed for bankruptcy two months after the firm went public. This failure was largely due to an accounting manipulation that hid their mounting debts²⁶ while some client assets were put into an unregulated entity and comingled with the firm’s assets.²⁷ Another noteworthy bankruptcy of a financial services organization that involved comingling of assets occurred in 2007. Sentinel Management Group fraudulently “transferred at least \$460 million of its client assets to its proprietary house

account. ...[Sentinel] also used “securities from client accounts as collateral to obtain a \$321 million line of credit as well as additional leverage financing.”²⁸ Thus, it is critical to go beyond ascertaining and monitoring the credit worthiness of one’s counter-party and to examine how securely client assets are segregated from other assets.

Counter-party risk also occurs when a fund has exposure to derivative instruments such as swaps. This type of risk materializes when one of the parties in the derivative contract defaults. Many types of instruments such as interest rate derivatives, foreign exchange derivatives, and credit derivatives are exposed to counter-party risk. Derivatives are a double-edged sword. Judicious use of derivatives can be an effective means of risk management, but its misuse can lead to significant and, at times, insurmountable losses to a fund.

Fund directors are in a position to closely monitor a fund’s exposure to counter-party risk. Just as with market risk, while it is not their responsibility to “manage” this type of risk, overseeing and monitoring how investment advisory firms handle this risk contributes to the goal of value-maximization for investors.

Cybersecurity Risk

According to the Securities and Exchange Commission (SEC), between 2013 and 2014, eighty eight percent (88%) of broker-dealers and seventy four percent (74%) of investment advisory firms experienced cyber attacks. The SEC clearly deems cybersecurity risk as significant and announced in early 2016 that cybersecurity was going to be a priority issue for the year.²⁹

In 2015, RT Jones Capital Equities, a St. Louis-based investment advisory firm, was censured for its failure “to establish the required cybersecurity policies and procedures in advance of a breach that compromised the personally identifiable information (PII) of approximately 100,000 individuals, including thousands of the firm’s clients.”³⁰ According to the SEC,

*The firm failed entirely to adopt written policies and procedures reasonably designed to safeguard customer information. For example, [the firm] failed to conduct periodic risk assessments, implement a firewall, encrypt PII stored on its server, or maintain a response plan for cybersecurity incidents.*³¹

This case was significant in light of the fact that the firm received no indication from its clients that they suffered financial harm. Investment advisory firms are at minimum deemed to be responsible for the “defensive activities” listed in the above paragraph.

Unfortunately for investment advisers, the SEC has become more aggressive in requiring adaption of cybersecurity policies and procedures. For instance, in June 2016, Morgan Stanley was fined \$1,000,000 for violating Rule 30(a) of Regulation S-P, known as the “Safeguards Rule.”³² Specifically, the company’s “policies and procedures were not reasonable for two internal web applications or ‘portals’ [which] allowed its employees to access customers’ confidential account information.”³³ An employee downloaded customer information on his server, and the server was later hacked.

In light of the fact that cybersecurity risk is growing in its frequency and magnitude, the process of fund governance

and an ERM framework should include steps and procedures intended to minimize such risk as one of their primary goals.³⁴ It is worth remembering that a mere occurrence of a cybersecurity breach, even if no actual damage is sustained, can make investors withdraw assets from a fund, as they become wary of an investment advisor’s lack of preparedness for cyber attacks. Furthermore, cyber attacks can be aimed at any point in the chain of relationships surrounding a fund’s operation, such as a fund’s law firm or its accounting firm. A fund’s cybersecurity policies and procedures should include monitoring of its third parties’ preparedness

An ERM Framework as Applied to Fund Governance.

An investment fund generates returns by having exposure to investment risks. This means that investment advisers are in the business of harvesting risk premia by managing investment risks. Successful risk exposure is expected to result in positive changes in the net asset value (NAV) of a fund. A unique aspect of ERM as applied to investment funds is that the most important objective of the funds and the primary goal of the ERM process converge into one: maximization of fund value given the fund’s investment objective and risk appetite.³⁵ Thus, proper implementation of ERM becomes *sine qua non* of successful fund management and governance.

Viewed differently, value maximization is the common thread that ties the top management of investment advisers and fund directors together in pursuing the shareholder (fund investor) objective. In this sense, there should be no resistance in implementing fund ERM. While conflicts of interest at times may occur among different groups of stakeholders, an ERM framework should provide an important guiding principle.

According to John Shortreed, a successful ERM framework should have the following components:

- Mandate and commitment to the ERM framework
- Risk management policy
- Integration of ERM in the organization
- Risk Management Process (RMP)
- Communications and Reporting
- Accountability
- Monitoring, review, and continuous improvement.³⁶

Most of these components are self-explanatory, but others may require some elaboration. The first component “mandate and commitment to the ERM framework” requires agreement in principle to proceed with ERM. The related tasks are: gap analysis, context for framework,³⁷ design of framework and implementation of plan. The second component is risk management policy. Here one should clearly delineate “policies for the ERM framework, its process and procedure,” as well as, “policies for risk management decisions such as risk appetite, risk criteria and internal risk reporting. The fourth component, Risk Management Process (RMP) is considered to be the core component of ERM, and consists of: context³⁸; risk assessment (identification, analyses, and evaluation); risk treatment³⁹; monitoring, review, and actions; and communications and consultation.⁴⁰

Exhibit 1 combines (1) a list of duties that a regulator such as CIMA expects a fund director to perform, and (2) the components of an ERM framework described above. Director duties are indicated in the left column inside the circle. The ERM components that correspond to each of the director duties are listed on the right column inside the circle. Other components, in addition to the “risk aware culture” which was discussed earlier in this paper, are indicated within the outer band of the circle.

First, the *mandate and commitment to the ERM framework* becomes a precondition to successfully perform the “oversight” duty of a fund director. CIMA expects a fund director to satisfy him/herself that “the Regulated Mutual Fund is conducting its affairs in accordance with all applicable laws, regulations, rules, statement of principles, statements of guidance and anti-money laundering. ...”⁴¹

Second, the “risk management” duty is expanded into *risk management policy* and *risk management process (RMP)* in the ERM framework. As described earlier, each of risk management policy and RMP has distinct elements. However, these can be viewed as one seamless process for practical purposes.

Third, “operational duties” constitute the central part of CIMA’s guidance, and cover the various aspects of a fund director’s (operator’s) duties.⁴² Thus, from the perspective of CIMA, the accountability rests with the fund director. The fund director in turn holds service providers to the fund accountable for their duties.

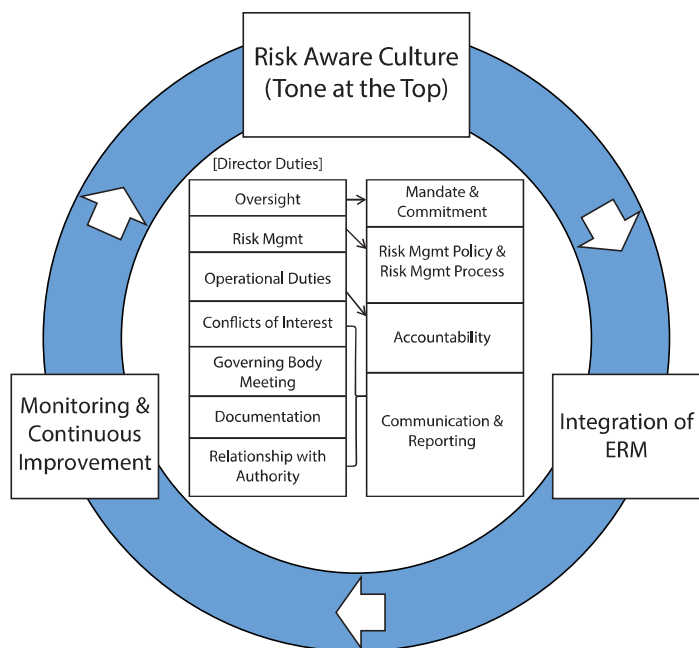


Exhibit 1: Director Duties and ERM Process

Fourth, CIMA requires that “conflicts of interest” be identified, disclosed, monitored, and managed.⁴³ While it refers to “managing all its conflicts of interest,” eliminating the conflicts of interest is not expected. Rather its central focus lies in proper disclosure, and in the ERM framework it is a part of the communication and reporting process. Similarly, the rest of director duties, i.e., “governing body meeting,” “documentation,” and “relationship with authority” can be successfully fulfilled as a part of the communication and reporting process of ERM.

Fifth, the components that jointly comprise the outer band of the circle in Exhibit 1, are also a part of the ERM processes. Among these, a *risk-aware culture* is developed by fund directors setting the tone at the top. The well-known failures of the hedge funds described earlier clearly lacked, among other control issues, the appropriate tone at the top.

Last, another component, *integration of ERM*, by definition, is accomplished when one judiciously and systematically integrates the principle of ERM into fund governance. Moreover, it is no surprise that fund directors need to *continue monitoring and reviewing for continuous improvement*. In this manner these components noted in Figure 1’s outer circle complete the application of an ERM framework to fund governance.

Thus, using the example of duties expected of a fund director by CIMA, Exhibit 1 has illustrated that these duties can be successfully performed by applying the ERM framework to fund governance. In other words, systematically implementing the ERM framework will create the necessary and sufficient conditions to fulfill these duties.

Conclusion

When applied to fund governance, it is clear that an Enterprise Risk Management process becomes more effective when several conditions are met. First, the fund’s board must make its commitment to ERM known to the fund’s investment adviser and relevant third party organizations such as a fund administrator. To the degree that the fund needs to have a solid risk management procedure in place, irrespective of its adaptation of ERM, this should not be a difficult commitment. Through the ERM process, the fund’s board and top management of the investment adviser can help to develop the risk culture of the fund they serve.

Second, the fund’s risk management policy should be articulated in a way consistent with the goal of ERM. Depending on the fund’s objective, the fund’s risk criteria and risk appetite differ. Appropriate risk parameters such as VaR (Value-at-Risk), position limit, and leverage limit should be documented and the mechanism for conveying and reviewing “red-flag exceptions” should be delineated. Just like the first condition, this should not pose a challenge, as an investment adviser should have a solid risk management policy in place in any case. In some cases, the adviser merely needs to include the board in the chain of communication for critical and potentially critical matters.

Third, each element of the Risk Management Process (RMP) must be followed judiciously. This means that the context is established, risks are assessed (identified, analyzed and evaluated), and risks are treated in accordance with the risk assessment. There should also be a mechanism for direct information transfer in place, between the fund’s board and the fund’s third party. Direct access to critical information sources such as fund accounting and portfolio risk reports will enable fund directors to monitor the effectiveness of the RMP.

Fourth, in addition to periodic board meetings, fund directors need to maintain open communication with the key personnel of the investment adviser. Mitigation of non-priced and unrewarded risk, e.g., operational risk and cybersecurity risk, is most effective when the risk is detected prior to its materialization. In addition,

when an extreme market event occurs, it may become necessary to discuss imposition of redemption restrictions with the investment adviser. The importance of fund directors lies in their protecting the interests of investors in a way consistent with the goal of the ERM process for the fund.

In conclusion, assuming that the above conditions are met, applying and implementing an ERM framework will go demonstrably beyond the fundamental responsibilities of a fund director, such as those required by CIMA. Doing so will also contribute to maximizing shareholder value, in other words, maximizing the fund's net asset value in line with the fund's risk appetite. An ERM framework provides guiding principles so that a fund director can perform his/her duties in a systematic and conscientious fashion. A fund's directors are responsible for setting the tone for risk-aware culture for the fund, and while the ultimate beneficiaries of an ERM framework are investors, the service providers including a fund's investment advisory firm also gain from mitigation of unrewarded risks.

Endnotes

**The author would like to thank David M. Modest and Andrew B. Wesiman for their valuable comments.*

1. Interestingly, Norm Champ, Deputy Director, Office of Compliance Inspections and Examinations at U.S. Securities and Exchange Commissions in his speech in 2012 indicated that the advisers of hedge funds should ask themselves if “senior managers [are] effectively exercise[ing] oversight of enterprise risk management.” Speech by SEC Staff: What SEC Registration Means for Hedge Fund Advisers, <https://www.sec.gov/News/Speech/Detail/Speech/1365171490432>.
2. This definition is cited a number of times by different authors. See, for instance, Branson (2010), p.56.
3. Branson (2010), p. 51.
4. Brooks (2010), p. 87.
5. Branson (2010), p. 52.
6. Independent Directors Council and Investment Company Institute (2011), p. 9.
7. Op. cit.
8. Independent Directors Council and Investment Company Institute (2011), p. 10
9. Cayman Islands Monetary Authority (2013), p.8.
10. However, ERM can provide valuable inputs into the strategy formulation.
11. In risk management terminology, “market risk” generally refers to risk related to exposure to financial securities and derivative instruments. By contrast, in modern finance literature, “market risk” refers to systematic or non-diversifiable risk. In this paper, “market risk” is considered to be the equivalent of “investment risk.”
12. Branson, p. 53,
13. CAPCO (March 10, 2003). This press release caused controversy in the hedge fund industry, but some claim that their categorization of operational risk was inaccurate and the case for the operational risk was overstated.
14. Other causes of operational risk cited by CAPCP were staff processing error, technology failure, and poor data. Op.cit.
15. Castle Hall Alternatives (2009), p. 5.
16. Op. cit.
17. Op. cit.
18. Castle Hall Alternatives (2009), p. 9.
19. Skybridge Capital (March 2016), p.1.
20. Op. cit.
21. Op. cit.
22. See Pedersen (November 15, 2008).
23. Op. cit.
24. Op. cit.
25. A recent article by Lindsey and Weisman (2016) proposes the use of a barrier option-pricing methodology to measure the true cost of illiquidity.
26. See, for instance, Washington Post (October 15, 2005).
27. This is sometimes referred as “custody risk.”
28. United States Securities and Exchange Commission v. Sentinel Management Group, August 27, 2007.
29. Financial Times (January 23, 2016).
30. US Securities and Exchange Commission (September 22, 2015).
31. Op. cit. SEC also noted the following:
 - R.T. Jones stored sensitive PII of clients and others on its third party-hosted web server from September 2009 to July 2013.
 - The firm's web server was attacked in July 2013 by an unknown hacker who gained access and copy rights to the data on the server, rendering the PII of more than 100,000 individuals, including thousands of R.T. Jones's clients, vulnerable to theft.
 - After R.T. Jones discovered the breach, the firm promptly retained more than one cybersecurity consulting firm to confirm the attack, which was traced to China, and determine the scope.
 - Shortly after the incident, R.T. Jones provided notice of the breach to every individual whose PII may have been compromised and offered free identity theft monitoring through a third-party provider.
 - To date, the firm has not received any indications of a client suffering financial harm as a result of the cyber attack.
32. ThinkAdvisor (June 8, 2016).
33. Op. cit.
34. In designing an ERM framework, metrics such as key risk indicators (KRI) are utilized. It is beyond the scope of this paper to discuss the details of such metrics.
35. In most cases, maximizing fund value means maximizing net asset value given the fund's risk appetite. However, there are some funds, whose objective differs from pursuing higher risk-return ratio.
36. Shortreed (2010), p. 101.
37. The external context includes “market conditions, competition, technology trends, legislative requirements,...” etc. The internal context includes “the complexity of organization ..., key internal drivers of organization, the objective of organization, stakeholders and their perceptions ...” etc. Shortreed (2010), p. 112.

38. “The context looks at the law, market, economy, culture, regulations, natural environment, stakeholders’ needs, issues, and concerns.” Shortreed (2010), p. 105.
39. “Risk treatment includes the identification of a control option and implementation of the selected control. Shortreed (2010), p.109.
40. Shortreed (2010), p. 101.
41. CIMA, p. 2.
42. To illustrate, the Paragraph 6.7 of the CIMA guidance (page 5) indicates that “the Operator is responsible for:

6.7.1 Ensuring or receiving confirmation that the constitutional and offering documents of the Regulated Mutual Fund comply with Cayman Islands law, and for licensed funds, the Rule on Contents of Offering Documents.

6.7.2 Ensuring the investment strategy and conflicts of interests policy of the Regulated Mutual Fund are clearly described in the offering documents; and

6.7.3 Ensuring that the offering documents describe the equity interest in all material respects and contains such other information as is necessary to enable a prospective investor to make an informed decision as to whether or not to subscribe for or purchase the equity interest.

43. CIMA, p.3.

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