

Introduction to Sustainable ERM

CAS Working Party on Sustainable ERM (SERM)

Abstract:

Motivation. With consumers and investors putting an increasing focus on Sustainability, traditional enterprise risk management (ERM) becomes less effective in describing an insurer's or reinsurer's true risk, true cost and true value due to lack of a framework to evaluate Environmental, Social and Governance (ESG) performance. This paper draws attention to the need to integrate Sustainability into daily business decisions of (re)insurance companies, thereby establishing a Sustainable ERM (SERM) framework. It provides definitions, methods and a framework to assist the transition to practicing SERM. A capital-based approach is employed to holistically capture human and natural capital indicators that may be left out in the traditional risk-based approach due to less precise measurements or the absence of a universally accepted causal relationship with the profit. This paper is intended to be an introductory paper. Further development and enhancement of the framework would benefit from input from actuaries in collaboration with other risk experts.

Method. The exploration of SERM started with extensive literature review on Sustainability and global trends. The financial logic of Sustainability programs is established to explore opportunities of embedding Sustainability into the ERM function. A preliminary SERM framework is developed from incorporating the industry's leading practices along with research done by thought leaders and institutions.

Results. In general, awareness, measurement and reporting in Sustainability need to be improved among the mainstream (re)insurers, particularly in the US. Industry leaders are promoting the ideas and shaping the best practices; however, it is evident that systematic consideration of Sustainability in general ERM is in its infancy. The contribution of this paper is twofold: to demonstrate the Sustainability imperative and to set a foundation for the SERM framework through establishing a common language and providing sample measurements and governance structure.

Conclusions. Sustainability is becoming a new norm in the corporate behavior, metrics and strategy of industry leaders. This paper serves as the first step towards its integration into ERM for (re)insurers. SERM enables methodology development and stewardship for comprehensive capital management encompassing financial, human and natural capital. If designed and implemented correctly, it improves stakeholder relationships and contributes to sustainable development of the firm as well as the society at large through holistic risk management.

Keywords. Sustainability, Sustainable Enterprise Risk Management (SERM), Enterprise Risk Management (ERM), financial capital, human capital, natural capital, Environmental, Social and Governance (ESG).

1 INTRODUCTION

The concept of Sustainability is evolving as society changes in response to the urgent need to move towards an environmentally, socially and economically sustainable future. At its core, Sustainability is an objective to create long-term business value through preservation and enhancement of financial, human and natural capital. This objective is increasingly established by individuals, corporations and non-corporate organizations of all types. At the national and global level, the objective of Sustainability is reflected in the policies of supporting a green and inclusive economy through realizing The United Nations Sustainable Development Goals (SDGs) [1]. In the private sector, Sustainability entails more than green initiatives or corporate social responsibility (CSR); it inspires long-term business value creation by simultaneously improving corporate performance in utilizing the financial, human and natural resources. These resources are the foundation for financial, human and natural capital that enables corporate value creation. The whole process integrates the

management of Environmental, Social and Governance (ESG) risks in the acquisition, development and deployment of multiple capitals, not just financial capital.

Insurers are not traditionally conditioned to consider business management in terms of multiple capitals or the management of ESG risks. However, there is an interdependency of the environment, society, and business. In fact, many issues an organization faces can be attributed to its failure to perceive the interactions and long-term implications on business outcome. Recognizing this, enlightened businesses started to engage in and explore an environmental and social domain that was previously not a top item of the agenda. The term ‘Sustainability’ as well as associated practices emerged in various aspects, ranging from product development, branding, corporate governance, human capital management, to community involvement. As a result, Sustainability is becoming the new norm in corporate behavior, metrics and strategy as these companies develop supporting governance structure, system, policies and procedures. While the Sustainability programs are developed and deployed, a parallel process to integrate into risk management has been initiated by those in the natural resources or labor-intensive sectors (e.g., energy, manufacturing and consumer goods, etc.). These companies started to identify and manage Sustainability-related risks such as water scarcity, employment relations and supplier risk. The ripple effects soon expanded to banking, investment and insurance – industries that finance and insure their business activities to assess ESG risks.

This paper supports the effort to incorporate Sustainability into Enterprise Risk Management (ERM) with the focus of raising the awareness in the insurance sector. Sustainable ERM (SERM) adopts a capital-based approach to manage an insurer’s overall risk profile within the capital infrastructure. In addition to the examination of financial capital, SERM examines the firm’s utilization and its effect upon critical human capital and natural capital in order to manage stakeholder relationships with its employees, customers, the environment and the general public. As a result, SERM benefits from a broader purpose and outlook than traditional ERM. With continued evolution of regulation and legislation related to corporate governance and long-term Sustainability measurements, SERM will prepare for the company’s business transformation while assisting in producing more effective and meaningful external disclosure including sustainability reports and integrated reports.

This paper provides perspectives as well as the preliminary framework and tools of SERM for insurers to facilitate the critical transition to integrate Sustainability into traditional ERM. Section 2 defines key terms such as Sustainability, SERM, and ESG. Section 3 identifies some of the key benefits of SERM in practice. A framework of how an insurer can measure and manage Sustainability, both qualitatively and quantitatively, associated with governance structure, is introduced in Section 4 with concluding remarks following in Section 5.

As we are in the early stage of recognizing the broad importance of SERM, this paper, as its name reflects, is an introduction to the concept. Much work remains to be completed to further develop the metrics and techniques for effective SERM in practice.

2 Key Terminologies

2.1 Defining Sustainability

Sustainability may be defined in several ways:

- Meeting the needs of the present without compromising the ability of future generations to meet their own needs (UN Brundtland report, 1987).
- The capacity to endure, or continue indefinitely.
- Preserving resources and energy over the long term.
- Providing sustenance and nourishment to keep in existence without diminishing.

For (re)insurers, Sustainability means *creating value consistent with the long-term preservation and enhancement of all forms of essential capital as part of the corporate objective*. By incorporating multiple capitals in the definition, sustainable business breaks away from the traditional mono-capital culture.

It is useful to recognize three broad categories of capital that are important to businesses: financial capital, human capital and natural capital. These correspond to three critical resources in the business processes: financial resources, human resources and natural resources. Sustainability can therefore be considered as *an objective that creates value consistent with the long-term preservation and enhancement of financial, human and natural capital*. Each capital can also have subcategories. Here capital should be considered as metaphors or means to broaden our perception on value creation.

Financial Capital

- Economic resources generated by financing, operating and investing to continuously support core business.
- Monetary assets to cover the economic effects of risk taking activities (in the insurance company this is economic capital).
- Monetary and physical assets as traditionally represented on a balance sheet (for some industries, physical assets such as factories, equipment and infrastructure may be singled out to form a subcategory of manufactured capital).

Human Capital

- Human resources, including people, institutions and relationships on which the health of the organization depends.
- Includes skills, knowledge, subject matter expertise, and knowledge-based tangibles such as models and analytical assets or other intellectual properties (may also be referred to as intellectual capital, a subcategory of human capital).
- Human relationships, employee engagement, trust and partnerships (this type of human capital is also referred to as social capital).
- Brand value (may also refer to as reputational capital).

Natural Capital

- Natural resources and processes needed by organizations to maintain operations, produce products and deliver services.
- Both renewable and non-renewable resources, e.g., plants, animals, air, water, soils, minerals.

Traditionally, insurers have invested heavily in the measurement and forecast of financial capital for the purpose of business management and financial reporting. However, financial capital does not exist in isolation as there are interdependencies with other forms of capital. For example, human capital is the foundation for an insurer's risk expertise as well as the driving force behind innovation and the evolution of markets. Insurers sell "promises" in the form of insurance policies that depend on the invisible currency of trust – social capital. Natural capital, including utility, water and office supplies such as paper-products, is also vital to an insurer's operations. Thus, corporate sustainability mirrors the conventional triple bottom line accounting framework - social responsibility (People),

environmental stewardship (Planet), and financial success (Profit). The relative prioritization of the triple bottom line or strategic deployment of capitals is driven by the corporation’s mission, vision and values. Sustainability and underlying corporate purpose is the cornerstone of successful business as the organization’s culture and ethical values are reflected in its use of and effects on the capitals.

2.2 Defining ESG

Often discussed in connection with Sustainability, the term ESG, an abbreviation for Environmental, Social and Governance, refers to a large set of extra-financial factors that affect the quality of a business. The investment community was the first to acknowledge the interconnectedness between financial risk and ESG risks. In the banking sector, the United Nations-supported Principles for Responsible Investment (PRI) was launched in April 2006 at the New York Stock Exchange to encourage companies to take a wider view of socially and environmentally responsible investing, thus generating long-term sustainable returns [2]. Increasingly, investors use ESG factors to evaluate corporate behavior and determine the future financial performance of companies. Table 1 presents examples of the broad type of factors that are considered under the umbrella of ESG. Many of these factors could relate to effectively managing financial, human and natural capital through strong governance practices.

Environmental	Social	Governance
<ul style="list-style-type: none"> • Climate change • Environmental compliance (on a legal level) • Environmental Health and Safety (EHS) for employees • Full accounting of externalities • Genuine interest in society • Reporting on environmental impacts and assuming responsibility for actions 	<ul style="list-style-type: none"> • Employee relations • Employee rights • Community involvement • Customer loyalty • External stakeholder rights and involvement • Legal/regulatory breaches 	<ul style="list-style-type: none"> • Anti-takeover provisions • Commitment to a wide range of external standards, principles & initiatives • Management performance relative to employees • Legal protection for investors • Strong shareholder/stakeholder protection commitment by company • Transparency

Table 1: Sample Factors Considered in ESG Analysis

Responding to the growing investors’ needs, Bloomberg has been tracking more than 800 different metrics that cover various aspects of ESG from emission to shareholder rights. It offers terminal users the Bloomberg Intelligence analysis of ESG issues that can potentially affect the firms and sectors.

2.3 Sustainable ERM

Sustainability is becoming embedded in the corporate behavior, metrics and strategy of industry leaders driven by stakeholders' needs and regulatory requirements. Please refer to Appendix A for a detailed discussion of sustainability trends by these industry leaders.

With consumers and investors putting an increasing focus on Sustainability, traditional ERM becomes less effective in capturing the corporation's true risk, true cost and true value due to lack of a framework to evaluate ESG performance. To become a sustainable insurer, it is important to integrate Sustainability into core business and supporting functions. Thus, the global sustainability trends necessitate new definitions and measurements to protect corporate value and manage risk holistically.

Sustainable ERM, or SERM, is defined as the management of financial, human and natural capital for the purpose of stakeholders' value creation to realize sustainable development of the firm and therefore contribute to that of society. SERM is a necessary outcome of continued evolution of corporate responsibility and purpose-driven business. The following are the critical aspects of this definition:

Capital Management

- Comprehensive capital management entails financial capital, human capital and natural capital.
- Capital availability, quality and affordability affect long term viability of an organization's business model and capability of long-term value creation.

Stakeholders

- While the primary stakeholders are shareholders, SERM extends consideration of other stakeholders to include silent stakeholders (the environment and future generations).
- Leadership ethics in SERM ensure that no stakeholder is disadvantaged by the actions of others.

Value Creation

- Expanding the definition of the value beyond economic value to incorporate well-being and stewardship.
- Contributing to more intelligent, sustainable and inclusive growth that captures the true value of human and natural capital.

The multiple capital approach is not entirely new, especially in the sustainable development arena led by the UN. In the realm of business, Forum for the Future suggests a five-capital model while International Integrated Reporting Council (IIRC) promotes six-capital framework. While the number of capital categories may differ, the purpose is to mainstream sustainable business practice of environmentally friendly and socially responsible decision-making.

3 Benefits of SERM

Although ERM has gained traction and industry acceptance over the past decades, SERM is a new concept which requires higher human consciousness in conducting business to be regenerative of multiple capitals. The theoretical and philosophical construct of SERM based on multiple capitals is important in this paper since it is the foundation of subsequent development of tools and

methodologies to achieve the intended goals of the firm's sustainable development. For a detailed comparison between SERM and ERM, please refer to Appendix B.

Appendix A shows the relevance of Sustainability to the insurance industry as supported by global trends; therefore, the integration of Sustainability in ERM is imperative for the insurer's long-term success. Because of the holistic focus of SERM, firms can benefit from 1) comprehensive capital management, 2) improved relationship with stakeholders, and 3) sustainable development.

First, in terms of capital management, the SERM framework encourages development of a methodology to understand and measure values created across all vital capitals. This measurement allows for an assessment of the long-term viability of the business model and strategy through inclusive dialogues and KPI monitoring, and therefore informs decision-making in product enhancement, people strategy, and external communication. A survey as part of the Insurance Working Group of the United Nations Environment Programme Finance Initiative (UNEP FI) found that proper management of ESG factors could enhance insurance company earnings and long-term company value [3].

Additionally, the examination of all capitals enables the firm to realize the true value of its financial capital to support long-term value creation. For example, a company may consciously deplete financial capital in the short-run to enhance human capital through better workplace programs as well as automation and other improvements in its IT system. Studies show that initiatives to reduce the environmental footprint such as sound recycling practices and green building management have produced instances of improved productivity (human capital) and reduced operational cost, which allows for additional financial investments in natural and human capitals. According to these studies, the multiple-capital approach better shapes staffing and funding decisions, which optimizes resource allocation and methodology development.

Another benefit that SERM provides is an improved relationship with stakeholders. SERM allows for an effective means to manage the stakeholder relationship and intangible assets (including human capital and natural capital) through publishing of ESG factors and measurements. The firm's transparency, strategy and durability to attract multiple capital resources improves from the firm's introspective examination of its activities and stakeholders, and supports better decision-making for long-term value creation. The firm has the opportunity to build trust with its stakeholders through transparency and the future-fit value proposition as well as providing a buffer of credibility and sound reputation against potentially damaging events.

Finally, a key benefit of SERM is associated with sustainable development. We are moving into a world where solely generating profits is no longer sufficient to justify a firm's survival. The business model continues building social resilience and functioning as a force for good. Such a firm is seen as one of high purpose. The goals of business and goals of human well-being coalesce to deliver resilience, adaptability and creativity for our common future.

Evidence has shown that traditional ERM falls short in several crucial areas. Engineered to work backwards from traditional (short-term) financial performance metrics, its lack of emphasis on critical ESG margins underestimates the true financial impact of ESG performance. It is less effective in managing the stakeholder relationship and the firm's intangible assets, since these are often not included in the risk measurements. We see an underutilization of ESG data and information for commercial purposes, and lack of consistent and robust frameworks to combine information from various sources (financial vs. non-financial/extra-financial, hard data vs. soft data, tangible asset vs. intangible asset).

In sum, there are key reasons for an insurer to embrace SERM as an extension of its traditional ERM framework. For the Board and executives of the firm, it allows for the formulation of corporate strategies that simultaneously create economic, environmental and social value. It provides the Chief Risk Officer a holistic framework to manage enterprise risks, especially those that are traditionally considered to be ‘un-quantifiable’ in nature, while managers benefit from increased workforce productivity and satisfaction, having the ability to foster, nourish and protect human and intellectual capital. With the creation of SERM measurement metrics, risk professionals will better understand risk using new data (ESG data/big data) and enhancing tools for underwriting, reserving, investing and risk management. Although it is out of the scope of this paper, ESG data can be used for asset and liability management. Active participation of like-minded actuaries in constructing SERM is important to achieve the noted benefits.

4 Sustainable ERM Framework

Section 2.3 defines Sustainable ERM as the management of financial, human and natural capital for the purpose of stakeholders’ value creation to realize sustainable development of the firm and therefore contribute to that of society. The need for SERM is clear and sustainability literacy is being developed for all stakeholders including ESG investors, employees and customers. This drives a trend to quantify non-financial performance or non-financial capital for disclosure and internal management purposes. It needs to be emphasized here that we did not just create new risk taxonomy of ‘sustainability risk’ under the traditional ERM framework, because the philosophy and guiding principles of SERM are fundamentally different from ERM.

A basic SERM framework focuses on quantifying and managing capitals of the organization; it addresses the potential overlap of Sustainability/ESG risks with other established risks, and manages non-financial capitals that are vital to financial capital.

This section outlines the building blocks of the preliminary SERM framework. It is important to note that the goal of SERM quantification is not to measure various capitals in monetary forms, nor does the framework provide a full account of complex interaction between the capitals to measure company’s Sustainability. Quantification is a means to make sound business decisions. Equally important are qualitative analyses, expert judgment and vision of the company for the future and society at large.

4.1 Methodologies for Capturing Sustainability Information

4.1.1 Qualitative Approach

Companies may use narratives and descriptions to disclose the company’s Sustainability practice in sustainability reports or integrated reports. Narratives are essentially stories to inform audiences on the role the company plays and how it creates value in addition to how much value it creates. The information is often subjective and anecdotal to capture the company’s practice and value proposition on non-financial capitals. Examples include descriptions of waste management, sustainable procurement policies and discussion on ESG integration in investment and responsible business strategy with country-specific implementation plans. The qualitative approach is powerful to deliver the information in its totality compared to the reductionist approach of quantification.

4.1.2 KPI Approach

The Key Performance Indicator (KPI) approach is the most common method to manage and monitor a company’s sustainability practices. Thanks to research done by institutions including The Natural Step and Future-Fit Business Benchmark, there is a good foundation of science-based sustainability principles and standards on which to base sustainability metrics. B Lab has a questionnaire that assesses through various indicators the sustainability performance of a prospective certified B Corp, which is a socially and environmentally responsible business. Because of the advanced regulatory framework on Sustainability in EU member states, there are many materials available in the European region. For example, the European Federation of Financial Analysts Societies (EFFAS) has developed ESG KPIs, including guidance for integration, for all financial sectors. Sustainability Accounting Standards Board (SASB) and the Global Reporting Initiative (GRI) have been refining existing reporting standards including ESG data disclosure. Table 2 provides examples of indicators used in insurers’ Sustainability Scorecard for internal management as well as external reporting.

Natural Capital	<ul style="list-style-type: none"> • Premium volume of green insurance (for a list of products, please refer to [4]) • # of green solutions in asset management and insurance products • ESG investment (\$, % total) on wind farm, clean tech, low carbon infrastructure • Physical unit of CO₂ emission (ton), water consumption (m³), waste generated (ton), waste to landfill (ton) • Recycling rate, etc.
Human Capital	<ul style="list-style-type: none"> • Human capital performance such as return on investment (underlying earnings before tax + employee expenses)/employee expenses, value added (revenues – operating expenses)/headcount), productivity (employee expenses as a % of company revenues and financial impact (employee expenses/headcount) • % of employees who rate the company favorably on engagement index • % of employees who believe the company is a good corporate citizen • % voluntary employee turnover • % female employees & females on Board • Absentee rate • # of work-related injuries & illnesses • % of managed supply that has been engaged on the insurer’s corporate responsibility • # of customer complaints per 1000 policies • Net Promotion Score (NPS), etc.

Table 2: Examples of Key Performance Indicators for Non-financial Capitals Used by Some Insurers

Note that it is possible to use appropriate ESG indicators as individual risk modifiers and underwriting risk modifiers if actuaries/underwriters think there is reasonable causal relationship to claims. For example, in professional liability, ESG factors such as employee turnover rate, quality of HR training, level of industry standards certification, documented risk management and loss prevention are used as rating variables. Traditionally underwriters have a set of ESG-related criteria to judge risk propensity to apply debits/credits. Governance factors such as quality of management and conflict of interest are common in Directors & Officers insurance ratemaking. In Surety underwriting, ESG represent the fourth “C” (Condition) to evaluate contractors for large infrastructures in addition to the traditional three “C”s – Capital, Capacity and Character. ESG risk assessment includes prescribed factors encompassing corruption, compliance, transparency, pollution and biodiversity. According to a survey conducted by the United Nations Environmental Programme Principles of Sustainable Insurance (UNEPFI PSI), underwriters also consider ESG factors such as forced resettlements and community health. [5] Allianz, Zurich, QBE and Swiss Re have implemented their own ESG underwriting guideline for selected industries. The UNEP is a process to develop global guidance to manage ESG risks in insurance underwriting with an initial focus on Property & Casualty business [6].

4.1.3 Monetized Quantification Approach

A monetized quantification approach is the use of scenarios to either simulate losses for areas where there are insufficient internal loss data or for simulating low-frequency, high-severity tail events. The following scenarios are for illustrative purposes only.

4.1.3.1 Scenarios

Suppose a global multi-line insurer is considering a scenario method to measure Sustainability. Examples of Sustainability scenarios can be constructed in the following forms:

1. Scenario 1: Failure to have efficient recycling practice

Details 1: operational by-product is not repurposed efficiently to save money. Company’s low-standard recycling programs alienate sustainability-conscious employees.

Frequency (years) & severity (opportunity costs): 5 years - \$1M, 15 years -\$5M, 40 years-\$35M.

2. Scenario 2: Failure to implement sufficient supply chain risk management

Details 2: The ESG practice of suppliers is unchecked, leading to reputational damage or delayed delivery when unexpected negative ESG-related issues happen in the suppliers.

Frequency (years) & severity: 5 years - \$3M, 10 years -\$10M, 35 years- \$45M.

3. Scenario 3: Failure to pay employees and (sub)contractors fair living wage in local jurisdictions

Details 3: Inadequate employee remuneration becomes a barrier to wellness and competence. Employees are not equally treated in compensation or opportunities, leading to loss of potential talent and increase in operational risk or even possible litigation for employment discrimination.

Frequency (years) & severity: 5 years - \$3M, 8 years -\$4M, 15 years- \$10M.

4. Scenario 4: Failure to develop and adhere to ESG underwriting criteria

Details 4: The company offers surety bond to insure loss from non-performance and projects 5% annual growth in premium. Infrastructure projects could have associated ESG

risks such as environmental pollution, natural resource degradation, forced resettlement, poor working conditions and corruption, which are not systematically or wholly assessed by the insurer.

Frequency (years) & severity: 1 years - \$2M, 5 years -\$5M, 8 years- \$9M.

Well-designed scenarios have the benefit of capturing diverse opinions, concerns, and experience/expertise of key professionals and incorporating Sustainability elements in a business model. Since scenarios (in return period loss) often depend upon subjective expert opinions, the challenge is that the abstract nature of the process can lead to unrealistic scenarios while lack of imagination can lead to underestimation. Actuaries involved in the scenario design need to understand the model limitation while striving to translate these opinions into a statistically acceptable construct. For example, the Exceedance Probability (EP) method can be used to simulate the annual scenario losses by fitting into the Poisson distribution and severity distribution. These Sustainability-related scenarios can be easily included in an existing economic capital model.

4.1.3.2 Internal Methodologies

Some companies use internal methodologies to quantify non-financial capital by combining quantitative and qualitative information to gain deeper insight. Some supplement traditional financial return on investment with environmental return on investment (eROI) and social return on investment (sROI) for holistic decision-making. Others may adopt a vendor’s approach. There are many vendors and consulting firms offering customized solutions, metrics and reporting support. These include the Big Four accounting firms, management consulting firms such as Accenture and McKinsey, and sustainability-specialized firms such as SustainAnalytics, Natural Steps, TruCost and Route2Sustainability. For example, KPMG has developed the True Value Tool, which quantifies externalities. PwC’s Total Impact Measurement and Management (TIMM) has a framework to monetize social, economic, environmental and tax impacts. The global efforts to shift onto the sustainable path are also evident in numerous open source resources to raise awareness and offer a platform for collaboration and tools to assist development of sustainable business. Table 3 provides an example of a human capital model piloted by Interface and Route2Sustainability [7].

Value of year-beginning human capital	Based on # of employees, their wages, their tenure years with the company, their years of formal education, and amount of internal training that the company has invested in them
+ annual investment in human capital	Based on fully-expensed new training and development; cost of employee volunteer time during the working hours; cost of medical and pension benefits; and cost of health and wellness benefits
+ annual appreciation of human capital	Based on value of step promotions; and level of employee engagement
- annual depreciation of human capital	Based on wages paid to employees over the year, cost of lost productivity as a result of sickness, absence, and health & safety incidents; cost of lower productivity during overtime worked; cost of lost productivity during turnover and cost of knowledge decay
= Value of year-end human capital	

Table 3: Example of a Human Capital Model Piloted by Interface Route2Sustainability

There are many public sources available to inspire the development of methodologies. Accounting for Sustainability (A4S) has issued guidance on natural capital and social capital quantification. World Business Council for Sustainable Development (WBCSD) has related protocol and toolkit. Both institutions have been working with leaders of various industries to tackle the measurement

challenges.

4.2 Governance of Sustainability/SERM

Good governance practice instills in the company the essential vision, process and structure to make decisions that ensure long-term sustainability. A sound governance structure, which consists of organizational structure, policies and procedures along with roles and responsibilities, is a necessary condition for a robust SERM program. It is an important requirement to have the support from the board of directors and senior management. It is from executive-level sponsorship that Sustainability initiatives will successfully be linked into the current governance structure, creating value for the company and benefits for all stakeholders.

Incorporating Sustainability into the company’s fabric may be done over time in various stages. A basic approach that companies have employed is to create a Sustainability Committee to codify and quantify Sustainability risks across the organization. This is generally a stand-alone committee that starts the process of measuring Sustainability performance through KPIs developed in Section 4.1 and reports on the findings to the board of directors or other interested parties.

A more holistic approach has been put forth in a report by the UNEP FI Asset Management Working Group [8]. In this report a new governance model called “Integrated Governance” is introduced. Various phases to incorporate sustainability efforts within a company are described, with integrated governance presented as the end state or ultimate target of governance practices. The new governance paradigm requires full integration of Sustainability into the corporate strategy, with each traditional board committee integrating Sustainability issues into their charter. Decisions around Sustainability must be made at the top, with the corporate governance committee leading the charge. Table 4 illustrates how various committee roles can be augmented with Sustainability initiatives to create integrated governance. By incorporating this model of Integrated Governance, a company moves Sustainability issues from the periphery of corporate strategy to the heart of it.

Committee	Traditional Role	Additional Sustainability Role
Corporate Governance	Develop and monitor the company’s governance principles.	Monitor and report on sustainability risks and opportunities.
Nominating	Oversee and evaluate the board’s performance	Incorporate ESG targets within board evaluation.
Audit	Oversight of internal controls and audit of major functions; liaison with external auditors.	Ensure compliance with new sustainability regulations.
Compensation	Decide on the remuneration of executive directors/senior executives.	Link sustainability issues material to the business to ESG targets related to compensation.
Risk and Capital	Identify, assess and manage all categories of risk across a company.	Oversee enterprise ESG risk profile.

Table 4 Examples of Committee Roles Augmented with Sustainability Initiatives to Create Integrated Governance.

Under the integrated governance model, the SERM framework is built with the support from various committees based on the company’s mission, vision and values. Corporate governance ensures better processes and infrastructure in place to enable multiple capital measurements and reporting. Companies can select KPIs developed by vendors, other institutions, or adopt internal methodologies as industry best practices emerge. Figure 1 is an illustration of a simple SERM framework. Early adopters would benefit from modernizing the company’s IT and communication structures for Sustainability data, analysis and reporting in advance of many peers to prepare for the pro-Sustainability world.

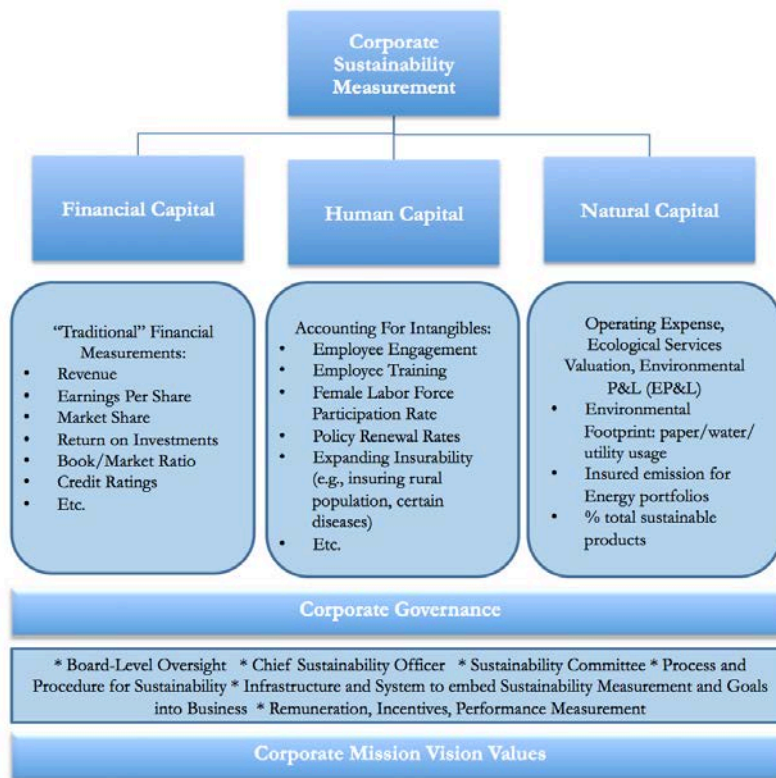


Figure 1 A Preliminary SERM Framework

As noted earlier, ESG risks from core business, i.e., underwriting, investment and claims, are not yet incorporated in the framework in this introductory paper. The next version of the framework may include the quantification of the company’s impact as well as sustainability/ESG assessment along the value chain. Inspiration may be derived from the development of various sustainability scores used by rating agencies and third-party evaluators as well as on-going work at UNEP FI PSI.

5 CONCLUSION

The concept of Sustainability becomes increasingly important as society changes in response to the urgent need to move toward an environmentally, socially and economically sustainable future. SERM is a growing area and fits well into the concept of sustainable development by taking care of people and the environment. Done correctly, SERM will enable effective stewardship of multiple

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capitals and capture ESG risk and opportunities. Disclosure of Sustainability measures from SERM offers additional insight into the quality of a company's management, culture, risk profile and other characteristics for stakeholders. Thus, the function of SERM is critical to corporate sustainability, which depends on the availability and quality of capital resources to the business. Going forward, it will become increasingly important for successful insurance leaders, especially actuaries, underwriters, brokers and other risk professionals, to develop Sustainability knowledge and ESG competency to inspire a global shift toward a sustainable future.

For future research, ESG integration in the core business of insurance may be closely studied to evaluate the insurer's environmental and social impact of its operation.

Appendix A Sustainability Trends

A.1 Stakeholders

Taking the perspectives of stakeholders in the insurance industry and beyond, we see multiple forces have led to the significance of Sustainability and its imperative for the future, where non-action or comfortable inaction will be no longer an option for a sustainable company.

Starting from within the enterprise, Millennials make up the growing cohort of current and prospective employees. A recent Gallup study shows that Millennials look for more than a paycheck; they want meaningful and gainful employment with organizations with purpose [9]. Their evaluation of a company also includes how the company impacts and improves the surrounding community in which it belongs. If a company's culture does not befit the beliefs of the future talent, it will have a difficult time attracting and retaining top talent. Examples of corporations taking action in this regard include sourcing materials from companies that have good sustainability practices and decommissioning products that contain materials that are harmful to the environment. Many committed firms have been requesting sustainability information from suppliers and business partners along the value chain. This includes filling out sustainability questionnaires and providing ESG scorecards for work bids. At the insurance company in which one of the working group members is employed, some large commercial clients are already asking such information.

To be fit for the future, companies have been adopting a sustainability strategy as a competitive advantage. Walmart is a good example. Perhaps a decade ago, Walmart was the most hated corporation in America, 'Saving Money' (for customers) at the expense of employees' fair wage and other exploitative strategies. The company was able to reposition itself out of the negative publicity to focus more on 'Living Better' for stakeholders by embracing Sustainability while engaging the business partners along its value chain. The company saved \$3.4B from 2008 to 2013 by reducing packaging in its supply chain by 5% [10]. Now Walmart has been making progress toward its goal of being 100% powered by renewable energy, creating zero waste and selling products that sustain resources and the environment. The company has industry leadership in the Sustainable Appeal Coalition and Sustainability Consortium. This also influenced the value proposition of competitors like Costco, which has been refining its Sustainability practice and recently announced that it would intensify scrutiny of the products it carries for chemicals out of "regulatory and social concerns" [11]. Similar pro-sustainability corporate practice is driven by socially-aware health-conscious consumers who have also opened up the market for fair-trade products, non-GMOs and locally sourced food. Now the sustainability consumer is an important target market segment.

Another aspect concerns reputational risk. With the proliferation of social media and big data, information including negative ESG press travels faster and broader than ever before to various stakeholders. With the increase of Sustainability literacy in the general public, more and more people care about corporate's environmental and social impact in the process of making a profit. Managing the company's ESG risk is important in managing the reputational risk or protecting reputational capital. In this regard, insurers need to be more thoughtful in their internal and external communication. Active ESG risk management under SERM can enhance an insurer's crisis management or business continuity practice. In addition, offering insurance coverage to corporate clients without assessing whether or not clients violate international environmental and social standards may also expose the firm to serious reputational and compliance risks [12].

Another recent global trend is the increased emphasis on climate change and the implications on regional stability due to environmental and political issues. Often, enterprises are put into a position

to take a stance that could alienate a segment of their sustainability conscious clientele. Having a strong Sustainability practice supported by an SERM framework allows for a company to have a well-crafted commitment that can be communicated to and engaged with all stakeholders. With the recent developments of the Paris Climate Agreement, CEOs from many of the largest corporations in the world representing \$17 trillion in assets have reiterated their continued commitment to climate change mitigation [13]. Other pressing Sustainability issues include environmental degradation, income disparity, plastic pollution and water shortage. Progressive firms have been aligning the corporate objectives and business practices to meet the Sustainable Development Goals (SDGs) to contribute to a more environmentally friendly socially equitable economy. In the long run, growing Sustainability-aware citizens and rising value-driven Millennials are likely to further the impact in policy-making and public domain (e.g., strengthening disclosure and governance standards).

While insurance companies do not heavily rely on natural resources or human labor, commercial clients in sectors such as manufacturing and energy have a large exposure to ESG risk. Insurers stand downstream of the consequences of unsustainable practices. For example, product liability and environmental liability loss are usually generated from covering products and operations that breach one or more ESG criteria. Policyholders' behaviors such as an unhealthy lifestyle and fatigue could trigger health and accident claims. Directors & Officers liabilities expose companies to risks associated with the decisions of insured corporations and executives with respect to sustainable business practices and disclosure of accurate information on these issues to stakeholders. The offering of the insurance products that encourage counter-sustainable behavior, when pro-Sustainability alternatives could easily be encouraged, exposes the firm to significant and unnecessary reputational risk. In this sense, insurers are directly affected by and indirectly responsible for their insureds' ESG damage and 'financed emission' by offering financial protection to these companies. ESG knowledge is, therefore, essential in understanding the quality of insured risks that influences insurer's financial performance. In the realm of Sustainability, financial performance is the lowest in the hierarchy because it is in fact the byproduct of non-financial performance.

Leading companies are positively influencing clients' behaviors to control potential ESG risks. For example, in one business transaction, Zurich discussed how it engaged with management of a construction client to ensure "responsible and sustainable business practice" [14].

As one of the key contributors to sustainable development, insurers can provide incentive for sustainable behavior by reducing the premium for conscious business and healthy lifestyles via Schedule Mod credits. They can extend their risk expertise to educate their clients to manage ESG risk profiles of the business. An example of such practice is for a company to "have effective responses by making decisions based on an ethical approach when it faces dilemma", where a "business transaction may be economically beneficial and perfectly fine from a legal and regulatory perspective, yet may have significant environmental or social downsides" [15].

Regulators and rating agencies also play an important role in shaping the insurance industry. The more developed a regulatory or legal framework for an ESG factor, the greater the influence the factor has on company operations.

The laws require various financial institutions to adhere to increased reporting of ESG performance including impactful activities on the communities around them, such as society, the environment, consumers and employees. In the US, financial accounting strengthening occurred with enactment of the 2002 Sarbanes-Oxley Act (SOX) after a series of accounting scandals including Enron, Tyco and WorldCom. Today, across the globe, organizations are under increasing pressure to meet more

sophisticated corporate transparency, responsibility and accountability standards for non-financial/ESG parameters. Notably, Europe has applicable statutory requirements and relevant codes of practice. Examples are the ‘New Economic Regulations’ Act (2001) in France and the Companies Act (2006) in the United Kingdom. These two laws impose requirements on companies to report on the environmental and social impacts of their business activities. Effective in 2017, companies with more than 500 employees in the European Union are required to disclose credible data and information on environmental, social and employee matters. The table below is a short summary of new laws related to Sustainability in various countries related to the financial services industry.

Area	Examples Relevant to Financial Sector
Banking	Brazil’s Resolution No 4.327 (2014), Kenya’s Sustainable finance Initiative (2014), China’s Green Credit Guidelines (2012), Colombia’s Green Protocol (2012), Nigeria’s Sustainable Banking Principles (2012), Lebanon’s reserves requirements for energy efficiency (2011) and Indonesia’s Green Protocol (2009), etc.
Securities	Australia’s Stock exchange reporting requirement (2014), EU’s Directive on Disclosure of non-financial information (2013), France’s Grenelle reporting Law (2012), USA’s SEC climate disclosure guidance (2009), etc.
Investment	Malaysia’s Investor Code (2014), Japan’s Principles for Financial Action toward a Sustainable Society (2012), South Africa’s Regulation 28 of the Pension Funds Act (2011) and UK’s Pensions Act Reporting (1999), etc.
Insurance	UK’s Prudential Regulatory Authority exploring climate change & insurance supervision (2014-5), USA’s NAIC climate reporting (2009), etc.

Table 4 Sustainability-Related Policies in Different Countries

For other global initiatives covering ESG policies including metrics and disclosure, please refer to Black Rock’s report [16].

Additionally, stock exchanges and bourses such as the Johannesburg Stock Exchange, the Australian Securities Exchange as well as bourses in Hong Kong, Singapore and Malaysia have included ESG/Sustainability disclosure as a listing requirement. This shows that the ability to assess a company’s relative governance and performance in the context of non-financial factors is of great importance to institutional investors as well as private investors.

Sustainability Key Performance Indicators (KPIs) developed in SERM can be utilized for internal management as well as external disclosure to meet various stakeholders’ information needs. Emerging standards led by the Sustainability Accounting Standards Board (SASB), the International Integrated Reporting Council (IIRC) and Global Reporting Initiative (GRI) are driving the needs and facilitating preparation for Sustainability disclosure. These new accounting and reporting principles not only support ERM to broaden the scope of value under consideration, but also help produce credible data for holistic decision-making under SERM.

In terms of ratings, Moody’s has incorporated Sustainability in its credit rating since 2015 [17]. In the fall of 2015, S&P also launched the S&P Environmental & Socially Responsible Indices in response to clients’ interest in socially responsible investments. In addition, there is a wide range of Sustainability rating agencies such as KLD, Sustainalytics, Trucos, GES, Vigeo, ASSET4 and Calvert. KLD ratings are among the earliest and most influential, especially in the US stock market, and are most widely used by researchers when compared with newer world-based ratings such as ASSET4 and GES. This has enabled positive development to facilitate global adaptation of these ratings

through the Global Initiative for Sustainability Ratings (GISR).

A.2 A Financial Perspective

One main justification for funding a Sustainability program is the enhancement of the financial bottom line: increase earnings and stock growth, lower insurance premiums, decrease borrowing costs and improve access to capital. Accenture, Deloitte, PwC, Goldman Sachs, *Harvard Business Review*, *MIT Sloan Management Review* and others have released data-driven case studies, global surveys and exhaustive reports that offer a compelling business case for Sustainability. In developing its own report, Morgan Stanley took into account a broad meta study conducted by Oxford University in 2014 [15] that reviewed academic studies conducted on the relationship between financial performance and Sustainability. Based on those results and others, the Morgan Stanley report made a strong case that “There is a positive relationship between corporate investment in sustainability and stock price and operational performance” [18]. It is discovered that financial markets value firms that practice Sustainability more, as “high sustainability firms significantly outperformed their counterparts” [19].

Based on the most comprehensive dataset on existing ESG–Corporate Financial Performance (CFP) research to date, Friede, Busch and Bassen (2015) aggregate evidence from 2000 empirical studies to establish the business case for Sustainability. Figure 1 shows a significant portion of the study shows positive relationship between the two.

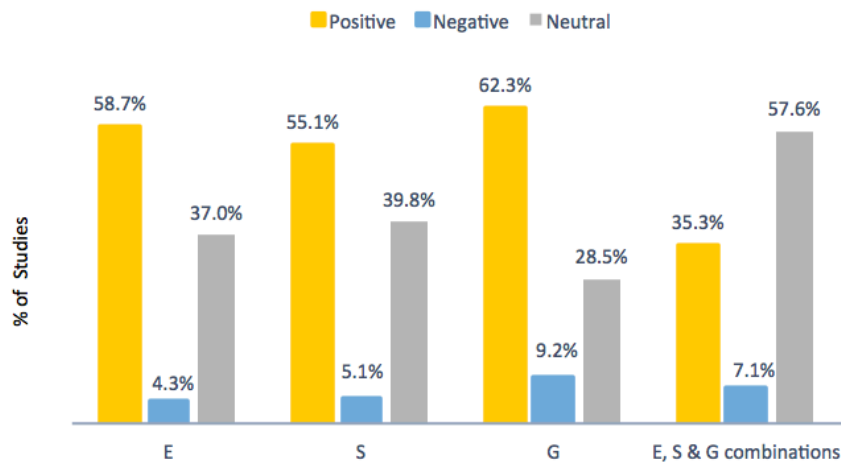
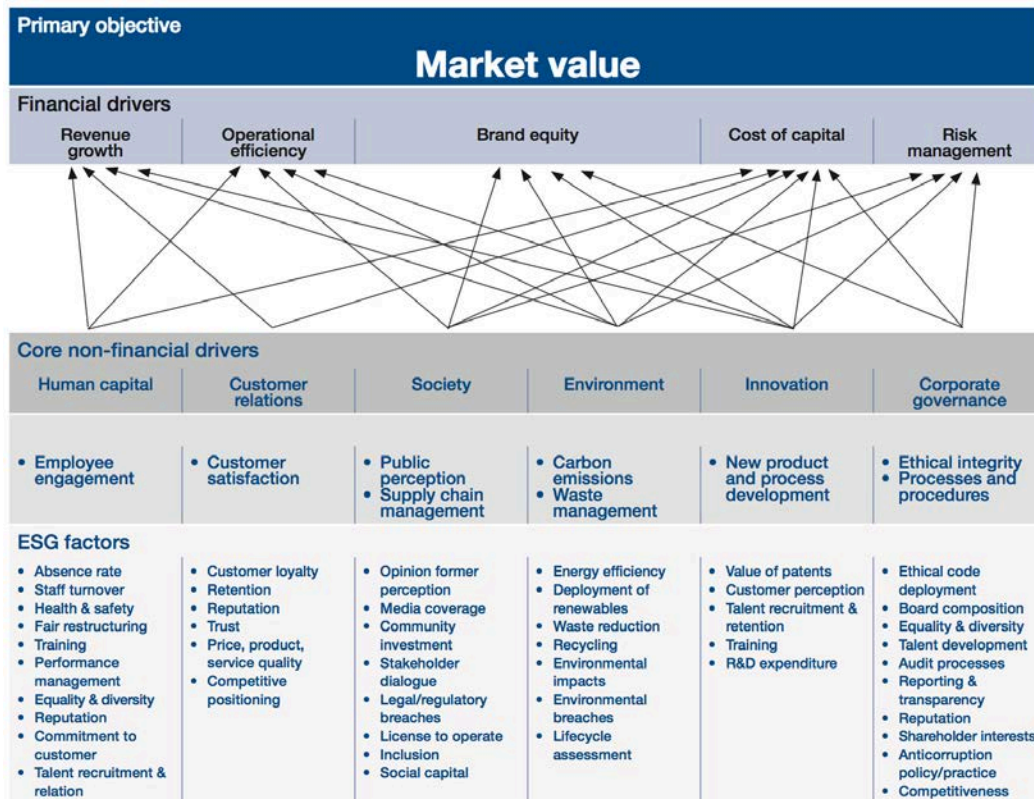


Figure 1 ESG Categories and Their Relationship to CFP

The European Academy of Business in Society (EABIS), in partnership with EU CSR Alliance Laboratory, studied the ESG-CFP linkage and mapped ESG factors to revenue-related outcome. The following diagram, Value Creation Framework, is created based on an extended literature review of more than 170 papers [20].



Those ESG factors arise from creation and/or usage of company’s critical capitals. Thus the Sustainability assessment is a critical component of risk management to protect the corporate value.

Grant Thornton conducted a study to understand why companies fund Sustainability programs. The report reveals that the top driver towards more sustainable business practices globally is cost management, cited by 67% of respondents in 2014 up from 56% in 2011 [21]. Another study shows that people’s willingness to buy, recommend, work for and invest in a company is driven 60% by their perceptions of the company and only 40% by their perceptions of the products [22]. This is likely an increasing trend: to fund Sustainability as a business enabler and strategic differentiator.

As a starting point, many Sustainability leaders have tackled attainable projects based on their unique ESG profile. Recognizing that not all initiatives are equal in terms of costs, efforts, and benefits, prioritizing and tackling these “quick win” projects show that an enterprise is thinking strategically as it embarks on a long-term journey of Sustainability. As an enterprise becomes more experienced and adept at implementing Sustainability related efforts, with feedback from various stakeholders and learning from prior efforts combined with technological advancement lowering the cost of resources over time, projects that were not financially viable before become more feasible and affordable. In addition, many positive externalities result from practicing Sustainability – intangible assets such as a stronger reputation and more positive brand recognition from being an enterprise that values

Sustainability and cares for its community, which often resonates well with local government and regulators, Millennials, and the future generation of workforce. Consequently, this would lead to improved employee engagement within the company and superior human resource cost efficiency.

A.3 Industry Leading Practice

Insurers provide a unique case in Sustainability since they not only manage their own risks from business activities but also manage the risks of customers while striving to remain profitable. The industry bears the financial consequences from internal inefficiency, unsustainable behavior and business practice of clients and partners all along the insurance value chain. Sustainability trends directly affect insurers' financial statements, which ties corporate success to the ESG performance of the company and their clients, as well as the activities of other agents not directly under the corporation's control. Hence managing the Sustainability-oriented activities of business units and clients, influencing behavioral trends in the marketplace, and monitoring those through an ESG assessment are vital to the long-term success of insurance companies [23].

Common themes across industry leaders can be linked to guidance provided by the United Nations Environment Programme Finance Initiative (UNEP FI). The UNEP FI exists to encourage systematic change in global finance to support a sustainable world, and guidance to insurance companies is through its Principles for Sustainable Insurance (PSI) which launched in June 2012 at the Rio+20 Summit. A company that adopts PSI can become a signatory of the Principles and a member of UNEP FI. The UNEP FI provides several action steps for each Principle that an insurance company can take in creating their SERM framework. As of year-end 2016, more than 100 organizations have adopted the Principles, including insurers representing approximately 20% of world premium volume and USD 14 trillion in assets under management.

The Principles, listed below with sample action items, are part of the insurance industry criteria of the Dow Jones Sustainability Indices and FTSE4Good. For a more complete list and detailed information, please refer to UNEP FI PSI website at www.unepfi.org/psi.

Principle 1: We will embed in our decision-making environmental, social and governance issues relevant to our insurance business.

Sample action items:

- Establish a company strategy at the Board and executive management levels to identify, assess, manage and monitor ESG issues in business operations
- Integrate ESG issues into recruitment, training and employee engagement programs
- Integrate ESG issues into the investment decision-making and ownership practices (e.g., by implementing the Principles for Responsible Investment)

Principle 2: We will work together with our clients and business partners to raise awareness of environmental, social and governance issues, manage risk and develop solutions.

Sample action items:

- Dialogue with clients and suppliers on the benefits of managing ESG issues and the company's expectations and requirements on ESG issues
- Provide clients and suppliers with information and tools that may help them manage ESG issues

Principle 3: We will work together with governments, regulators and other key stakeholders to promote widespread action across society on environmental, social and governance issues.

Sample action items:

- Dialogue with governments and regulators to develop integrated risk management approaches and risk transfer solutions
- Dialogue with media to promote public awareness of ESG issues and good risk management

Principle 4: We will demonstrate accountability and transparency in regularly disclosing publicly our progress in implementing the Principles.

Sample action items:

- Assess, measure and monitor the company's progress in managing ESG issues and proactively and regularly disclose this information publicly
- Participate in relevant disclosure or reporting frameworks

Common among these Principles is effective communication. As stated by the UNEP FI, “transparency is an integral form of accountability to the public, particularly in a voluntary and aspirational framework” [24]. Stakeholders within a company (e.g., employees) will benefit from understanding the goals of the above principles as it relates to their job responsibilities. Stakeholders outside of the company (e.g., investors and policyholders) will benefit from information shared as it relates to their own decision making. Adhering to the Principles will ensure a company fully embraces, and is a leader of, sustainable insurance practices.

Since ESG factors are relevant to both the insurance and investment operations of the insurance companies, industry leaders have also adopted Principles of Responsible Investment (PRI) for asset management. For more information on PRI, please refer to UNEP FI PRI website at www.unepfi.org/pri.

Appendix B

The guiding principles of SERM are compared against the standards of traditional ERM to evaluate this evolving means of holistic risk management.

While ERM focuses primarily (and often exclusively) on financial capital, SERM incorporates other forms of capital into risk management and decision making. As discussed in Section 2, in addition to the examination of financial capital, SERM examines the firm's utilization of, and effect upon, human capital (the firm's relationship to its employees, customers and suppliers), and natural capital (its relationship to the environment). As a result, the capital-based SERM approach benefits from a broader purpose than traditional ERM.

ERM's purpose is to assess, manage and monitor risks, optimize risk taking in relationship to financial strategic goals, keep risk level within the appetite, and satisfy the requirements of regulators and rating agencies. Extending this purpose, SERM requires that the firm understands the risks it faces through both financial and non-financial aspects of the business. It optimizes risk taking in relationship to strategic goals related to financial, human and natural capital. This includes the consultation with a wider range of stakeholders to incorporate their needs.

The strategic focus of SERM is consequently over a longer time horizon than traditional ERM. The focus of SERM is to develop a holistic picture of the entity's value creation story, particularly how the company generates value over the short, medium and long term in terms of the firm's investment in the multiple capitals.

Introduction to Sustainable ERM

The table below provides a comparison between Traditional ERM and SERM in terms of several broad criteria.

Criteria	Traditional ERM	SERM
Capital Considered	<ul style="list-style-type: none"> Financial capital 	<ul style="list-style-type: none"> Financial capital, human capital, and natural capital
Purpose	<ul style="list-style-type: none"> Assess, manage and monitor risks Optimize risk taking in relationship to financial strategic goals Keep risk level within appetite Satisfy regulators and rating agencies 	<ul style="list-style-type: none"> Assess, manage and nourish multiple capitals and optimize risk taking in relationship to Triple-Bottom-Line strategic goals Identify and monitor KPIs across multiple capitals in order to optimize impacts, mitigate risks and improve performance
Strategic focus	<ul style="list-style-type: none"> Identify and manage events and perils that may cause variation from the achievement of specific strategic goals Strengthen financial capital Help measure financial value and return on investment from the financial capital employed 	<ul style="list-style-type: none"> Understand interrelationship of various capitals to optimize business activities Wider partnership within companies (e.g., marketing, HR) Help develop full and holistic picture of the entity's value creation story - how the company generates value over the short, medium and long term in context of measuring return on the entity's investment in natural, human, and financial capitals
Leadership	<ul style="list-style-type: none"> Tone from the top, require support from the Board to be successful 	<ul style="list-style-type: none"> Inspire growth, Net Positive in business operation, underwriting and investment Nourish and cultivate human and natural capital as part of business activities
Risk Defined/Boundaries	<ul style="list-style-type: none"> All risks the organization faces and generates with the focus on key risks Exposure to any conceivable event or fact and resulting impact positively or negatively – variation from the expected 	<ul style="list-style-type: none"> All risks along the insurance value chain with special focus on ESG risk from clients, suppliers and other business partners which may impact ESG risk profile of the corporation
Accounting	<ul style="list-style-type: none"> Financial accounting (fail to effectively capture intangible value) 	<ul style="list-style-type: none"> Develop green accounting, sustainability accounting for ESG issues. SASB standards are being developed

Criteria	Traditional ERM	SERM
Constraint	<ul style="list-style-type: none"> Market short-termism detects organizational focus on financial capital Organizational inertia 	<ul style="list-style-type: none"> Not universally accepted in the financial institutions largely due to lack of awareness Lack of funding
Measurement	<ul style="list-style-type: none"> Statistical/actuarial/economical models on data Key Performance Indicators (KPIs) Focused on more 'matured' risk (with more hard data and sophisticated modeling) 	<ul style="list-style-type: none"> Need to start with data collection: ESG matrices available from data providers, company's own decisions Example of ESG indicator: financed/insured emission (% investment in fossil fuel, Energy client composite in underwriting portfolio) Manage and measure environmental footprint ESG data is available from data providers to measure non-financial capital
Data	<ul style="list-style-type: none"> Mainly hard data (historical loss) 	<ul style="list-style-type: none"> Both hard data and soft data -include ESG data Use big data for risk management
Reporting	<ul style="list-style-type: none"> Financial reporting Quantifiable 	<ul style="list-style-type: none"> Use integrated reporting to move beyond financial information alone to capture and communicate the full value of an organization Quantified + Narrative
Value	<ul style="list-style-type: none"> Economic value Monetized 	<ul style="list-style-type: none"> Shared value Produce by multiple capitals Not necessarily monetized
Culture	<ul style="list-style-type: none"> Risk-aware culture Have 'risk owners' for accountability 	<ul style="list-style-type: none"> Culture to consider and manage environmental and social risks Embed ESG performance matrices in remuneration Encourage systems thinking in decision-making Develop Sustainability literacy through employee training and internal advocate Innovation and experimentation to build solutions

Introduction to Sustainable ERM

Criteria	Traditional ERM	SERM
IT	<ul style="list-style-type: none"> • Important to effectively manage risks – to ensure risk limits are followed • Business intelligence systems integrate enterprise data flows and generate analytic information for risk management decision making, internal controls testing and credit evaluation needs 	<ul style="list-style-type: none"> • Build analytical infrastructure for information processing • Manage analytical asset including big data and relationship capital
Organizational Structure	<ul style="list-style-type: none"> • Risk management responsibility is decentralized and integrated into all levels of the organizations (aka Risk Management Function – RMF) • Chief Risk Officer 	<ul style="list-style-type: none"> • While CROs should take additional responsibilities of Sustainability in terms of risk management, they should collaborate with CSO (Chief Sustainability Officer) if the companies have established a role • Broad oversight on Sustainability
Standards	<ul style="list-style-type: none"> • COSOII • ISO 31000:2009 • BS31100 (UK), AS/NZS 4360 (Australia/New Zealand) • Corporate governance (in some region like South Africa, social responsibility is one of the key characteristics) 	<ul style="list-style-type: none"> • Standards are not compulsory or certifiable as of now • General Sustainability frameworks corporations can adopt include Sustainability Helix, Future-fit Business Benchmark, ThriveAbility framework
Asset	<ul style="list-style-type: none"> • Models • Use ERM to optimize business models and risk management 	<ul style="list-style-type: none"> • Add to existing ERM intangible asset management
Communication	<ul style="list-style-type: none"> • Matrices and metrics are woven into reporting structures that engage the entire organization 	<ul style="list-style-type: none"> • Collaboration along value chain • Stakeholders’ legitimate needs and concerns are addressed in the integrated reporting • Progress is shown in selected KPIs

Criteria	Traditional ERM	SERM
Regulatory Requirement	<ul style="list-style-type: none"> Basel II/III, Solvency II, Sarbanes-Oxley 	<ul style="list-style-type: none"> Various examples of policy innovation: EU Directive on disclosure of non-financial information, Japan's Principles for Financial Action towards a Sustainable Society, Australia's stock exchange reporting requirement, Brazil's Resolution No. 4.327
Rating Agency Expectation	<ul style="list-style-type: none"> S&P, Moody's, Fitch, etc. evaluate risk management functions of insurance companies, take ERM into account when assigning credit ratings 	<ul style="list-style-type: none"> Still in development Sustainability criteria/factors are being considered in evaluating credit-worthiness for certain industries.

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The CAS Working Group on Sustainable ERM (SERM) Members

Sandra J. Callanan, FCAS
George E. Davis, FCAS
Voon Seng Lai, FCAS
Tom Wakefield
Fan Yang, *Chairperson*