Practice papers

Dynamic board capabilities: Developing board practices that impact corporate renewal and performance

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Abstract A crucial requirement for firms to remain competitive is to consistently and simultaneously engage in exploratory and exploitative activities. The academic literature has broadly accepted that the development of dynamic capabilities (ie firms' abilities to create, reconfigure and improve resources and capabilities to fit their changing environments) are vital to meeting this competitive requirement. Research has predominately addressed these dynamic capabilities from a management perspective. Little attention has been paid to the influence of the board of directors on these firm capabilities even though boards hold the fiduciary responsibility for the corporation and its long-term viability. Even less has been written on how boards ought to organise themselves and develop their dynamic board capabilities to support and govern corporate renewal and performance effectively. This paper aims to start addressing this gap by using two related aims. First, a process framework for board behaviours is proposed that ensures, and supports, a systematic way of building and developing corporate-level dynamic capabilities. Then, evidence is presented and reviewed from a survey of two board member communities which supports the idea that board capabilities are essential for a firm's successful renewal and economic performance, and need to be improved in practice. This framework is closely aligned with well-established components identified by the management literature but differs in having the board as the unit of analysis. A crucial question and action agenda is proposed for boards eager to acquire and develop their dynamic capabilities.

Keywords: *board of directors, dynamic capabilities, governance, innovation, organisation, performance, strategy*

INTRODUCTION

A fast-changing and increasingly disrupted world in need of good governance

In our increasingly volatile, uncertain, complex and ambiguous world, companies face many challenges from technological advances, to socio-economic changes and environmental concerns.[1–5]

Geopolitical tensions add to the business uncertainties that impact companies' investment strategies. Further societal changes in stable democracies, such as calls for greater racial justice and gender equality, have also increasingly been voiced, with subsequent impact on society, business and corporate boards.

Geography has re-entered the competitive discussion following several decades of globalisation. Local competitors are increasingly outplaying multinational companies (MNCs) in local markets, challenging the notion that MNCs would dominate globally due to superior technology.[6] These local actors innovate by assembly 'from the world', adding to the previous trend of product globalisation 'to the world'.[7]

Technological advancements, particularly in artificial intelligence (AI), are similarly reshaping business landscapes at a broad front.[8–10] Other technological shifts include successful, disruptive innovations in electric vehicles and health, illustrated by firms such as Tesla and Moderna, respectively.

Taking a governance perspective, as Hirt *et al.* do,[11] one can add that automotive giants like Ford, General Motors or Volkswagen (VW) missed remarkable opportunities to transform their industries, as they had many more resources (including competences) to deliver electric vehicles than Tesla ever had.[12] Indeed, VW only decided on its major shift to electric vehicles following what became known as the Dieselgate scandal.[13] Its board did not have a great sense of the toxic programme carried out inside the firm, nor were they apprehensive of the threat that Tesla posed. The opportunity cost for sticking with Dieselgate instead of meeting Tesla's competition in electric vehicles early on looms large. VW's board appeared to have been largely absent, if not ineffective, in this strategic play.

Pursuing the governance angle, one can only be amazed at the innovation-related scandals witnessed over the last 30 years, starting with the remarkable failure of Enron. This most-innovative company filed for bankruptcy in 2001. The massive turmoil caused by this failure could have suggested that the world had learned its lesson. The 2007–08 Global Financial Crisis refuted any such conclusion. The uncontrolled diffusion of new financial products, called 'risk-mitigating' and relabeled 'toxic assets', took down financial giants worldwide, including Bear Stearns, Lehman Brothers and the Royal Bank of Scotland. No one — or only a few among board members, senior executives and prudential regulators — foresaw the financial tsunami that shook the world's interconnected financial systems and the economies they were supposed to serve. Nobel Laureate Stiglitz noted that the governance failures were multiple, including boards and their supervisory authorities.[14]

The health sector has recently seen similar governance failures. Theranos reached a US$9bn valuation, claiming it had developed an automated, painless, accurate and rapid blood test. It finally had to admit its claim was a scam, and its stellar board appeared clueless.[15,16] The Sackler family's Purdue Pharma did not just destroy equity, it generated an opioid crisis by selling pain killing drugs which became addictive to those who took them. Their business success killed several hundred thousand Americans and produced a drug epidemic that the US and other countries are still trying to recover from.[17]

As one could expect, these momentous and tragic failures have generated calls, from all sides of society, for corporate boards to be more responsible and competent in exercising their supervisory duties. These calls for improved regulatory supervision of boards and for appropriate sanctions in case of misconduct have mainly been heard in the banking, health and IT sectors and have grown louder at each new corporate or industrial failure. Cumulatively, they contributed to the re-emergence of the field of governance as central to societally acceptable business conduct and reaffirmed the board of directors' responsibility.

Corporate law has long affirmed this principle, but the law needs to be more consistently enforced, as negligent boards are hardly sanctioned. The emergence of sustainability — also referred to as environmental, social and governance (ESG) — as a new corporate standard is one of the significant consequences of this pattern of recurring governance failure. The ESG acronym itself admits (through G) that the governance of corporations needs to be more forcefully addressed. It also demands that corporations pay greater attention to their environmental (E) and societal (S) impacts.

In contrast, turning to the academic literature (eg the article by Barber, Whitehead and Bistrova[18] as one example of an academic treatise on business entitled 'Why Giants Stumble'), the failure factors identified are typically internal to the firm and centred on management: failures in innovation; in achieving efficiency targets or in compliance; in repositioning under pressure; or in pursuing excessively ambitious growth plans. That their boards also failed is hardly mentioned and, when mentioned, barely detailed. As an example, when addressing what to do to avoid these stumbles, Barber *et al.* cite three areas of focus: match the strategic challenge to the management's capabilities, counteract decision-making biases in the senior team by putting in place vital control processes and a robust compliance culture, and, only as a final area of focus, the need to strengthen the board of directors. There is insufficient recognition that effective boards should have mitigated or avoided the first two errors altogether. There is also no indication about which dimensions of board functioning need to be addressed and how this might best be achieved. The academic literature has primarily left this line of investigation unexplored.

Corporate failures are typically the consequences of board failures since a board's fiduciary duties are all-encompassing, including the responsibility of competitive repositioning, innovation strategy, growth plans, compliance, risk and effectiveness in target setting and reaching those targets. This, therefore, includes the responsibility for developing high level, dynamic capabilities within the firm, which, according to Teece[19] — a point largely accepted by the strategy literature — are essential to firms successfully tackling the preceding challenges.

The second point of this paper, which is close to the first, is that to be able to do so, the boards themselves must evidence such capabilities with an 'outside-in' angle that complements the 'inside-in' and 'inside-out' angles typically emanating from management. The contribution of this paper is to present a framework for dynamic capabilities at the board level that fits board language and practice and supports a more effective exercise of board responsibilities.

This paper is developed as follows. First, the following is briefly reviewed: the notion that the responsibility for corporations lies with their boards and not, as is often assumed, with shareholders or executives. It is underlined that increasingly turbulent times imply that these fiduciary responsibilities are becoming more significant and challenging. The primary academic literature is reviewed on innovation, strategy, risk and performance, with the convergence of this literature on the dynamic capabilities framework of Teece.[20] A dynamic, board capability framework is then presented, which emerged from our engagement with board communities and that independently led to a framework close to that of Teece and other scholars like Doz and Kosonen.[21] Suggestions are provided on how to develop and exercise dynamic board capabilities at the board level beneficially. The final section delves into the main insights from the exploratory empirical research involving board members. Regression analyses of their responses statistically confirm the significance of dynamic board capabilities for corporate performance. They attest to the interconnected nature of these capabilities and their differential impact on their respective corporations' innovation and economic performances.

GROWING RESPONSIBILITIES AND CHALLENGES FOR BOARDS

An often-neglected fact — including by many academics — is that liberal capitalism is built on the premise that the responsibility for companies lies with their boards of directors and not with their management, nor with shareholders, however important these latter stakeholders are.[22] The reasons are simple: shareholders come and go and provide insufficient guarantees, as do executives (who can be fired or leave) and, finally, most shareholders disagree while a firm, as a moral person, ought to speak with a single voice. The voice is that of its board of directors or another person delegated by the board. Thus, board members hold a fiduciary duty to the corporation and not to the shareholders or other stakeholders since a person can only hold one fiduciary duty.

The repeated wake-up calls that have followed the many governance failures over the previous decades, and that were discussed in the introduction, have led to the re-emergence of governance as a serious topic, even for academics. Many observers now agree that the reluctance of corporations to deal with many problems in the world, including climate change and global warming, is the result of governance malfunctions at different levels. Kenneth Dayton in 1984, with remarkable foresight and clarity, stated this conclusion as follows:

1) "*The first principle of governance is that the board has the vital role of protecting the corporation's future*"
2) "*Every time you find a business in trouble, you find a board of directors either unwilling or unable to fulfill its responsibilities*"
3) "*Corporate governance is the Achilles heel of the American corporation*".[23]

Surveys and our interviews and workshops with board members regularly point to a lack of effectiveness of most boards. For example, the autumn 2022 survey of 600 C-Suite executives of listed companies conducted by The Conference Board found that only 29 per cent of the executives rate their board's overall performance as excellent or good, while 33 per cent say that their boards ask probing questions, and a lamentable 21 per cent think their boards spend enough time fulfilling their responsibilities.[24]

Summing up our arguments so far, it is safe to conclude that boards will face unprecedented challenges in upholding their fiduciary responsibilities. They will be held more accountable for governing their corporations and their management in the direction of sustainable performance. They will also have to deal more vigorously with the gaps and bottlenecks that might be or come in their way of corporate effectiveness while simultaneously facing unprecedented turbulence.

A logical conclusion is that boards must supervise and guide the dynamic capabilities vital to their corporations and incorporate these capabilities themselves to fulfil their mandates effectively. This implies a fundamental shift in focus for boards that will require them to better combine their traditional supervisory control (concerning economic and managerial performance assessment) with better guidance for future value creation. Board members' roles must transform from merely safeguarding established competitive advantages to actively inducing innovation and strategic change and building the needed organisational capabilities that allow this change to emerge. Paradoxically, the current, turbulent conditions may thus contribute to a significant improvement in the way companies are governed and boards operate.

There is a significant need for developing board work; however, there is also a noticeable lack of research on effective board behaviour that enhances dynamic capabilities. The authors are eager to start filling this gap by determining what board-level behaviours support developing and using corporate dynamic capabilities for value creation and by proposing practical implications for shaping and implementing such board capabilities.

STRATEGY, INNOVATION AND DYNAMIC CAPABILITIES IN THE LAND OF UNCERTAINTY

The development of strategy was, for a long time, guided by the famous Porterian model,[25] where strategy was seen as the choice of a market position that could be defended against competitors. Thus, the Porterian model focused on barriers against entry and value loss, increasing the firm's power against customers and suppliers and fighting threats from substitute products.

The resource-based view (RBV) furthered the argument by stating that successful firms dominate their competitors by access to unique or rare and valuable resources that are hard to replicate, get access to or substitute for. Barney is often credited as being critical of the emergence of this view, warning that the link between the sources of competitive advantage and obtaining such advantage through good strategies is far from obvious and requires plenty of study and insight.[26] Others are cited as contributing to this view, some of whom trace back to Penrose.[27]

As companies increasingly needed to embrace structural uncertainty and ambiguity, as defined by Knight,[28] where possible outcomes faced by the firm are not known and cannot be listed, authors such as Teece, Pisano and Shuen[29] and Brown and Eisenhardt[30] advocated new approaches to strategy, spurred by the realisation that RBV offered little explanation on how new resources ought to be acquired and managed, and old resources upgraded or shed. The Porterian and RBV views are now seen as excessively static and too focused on the illusion of the ability to maintain a status quo in which internal resources are continuously exploited. These approaches no longer fit modern-day environments characterised by Knightian uncertainty and ambiguity.

A more emerging view of strategy development and formulation was called for, one where — to stay competitive — companies must adapt to their swiftly changing environments and learn to adapt, as Brown and Eisenhardt stated.[31] A proactive combination of cognition, entrepreneurial action, innovation and serendipity[32] was increasingly recognised as crucial to sustainable competitiveness. The broad, conceptual framework of dynamic capabilities, as presented by Teece,[33] became a necessary and pivotal shift in the strategy literature.[34,35]

Teece and his co-authors define a capability as a 'set of learned processes and activities that enable an organization to produce an ordinary outcome'.[36] Ordinary capabilities allow a firm to operate efficiently, such as product development, manufacturing and distribution. Dynamic capabilities allow the firm to reconfigure or update its configuration of ordinary capabilities to meet future needs. This involves designing the acquisition and development of new processes and activities, designing new organisational or business models and changing organisational purpose.

Dynamic capabilities were initially cast by Teece and co-authors around positions (assets and resources), processes (knowledge and learning) and paths (trajectories and legacy in a dynamic context). In revising the original framework,[37] Teece singled out three fundamental, so-called high-level dynamic capabilities: sensing, seizing and transforming. These high-level capabilities are idiosyncratic to the firm, not easily bought on markets nor readily replicated. They must be built over time, and sustainable competitiveness must, for Teece, be rooted in these capabilities.

Teece was not the only one who proposed to cast strategy development as being built on superior processes and dynamic capabilities. He viewed his contribution as broad and generic enough to encompass other similar approaches. A well-known and quite operational approach is the 'Blue Ocean Strategy' approach of Kim and Mauborgne,[38] which focuses on creating new market spaces where firms are uncontested at the time of creation. The key to that approach is to scan for gaps in current market offerings (including by suppliers). The approach is executive-driven, though in very graspable language by boards. It focuses on screening for new value streams through innovative product or service designs addressing market needs that still need to be fulfilled. One can frame the approach by Kim and Mauborgne as a way to produce the creativity and insights that Teece called upon in applying dynamic capabilities.

Another less operational framework was devised by Doz and Kosonen[39] and emerged from their detailed study of Nokia's emergence, success and ultimate downfall. These authors propose the concept of 'Fast Strategy', resting on three dynamic capabilities — strategic sensitivity, resource fluidity and leadership unity — which they view as crucial to the fast adaptation of strategy and organisation to an ever-changing environment. Doz and Kosonen emphasise that insufficient sensing capabilities regarding competitors and value opportunities are the main reason companies miss creating and delivering new or enhanced revenue streams due to innovation. They warned that the lack of sensing capability was a more significant cause of obsolescence than costly failed investments.

Sensing capabilities build on anticipating the future through information gathering on outside opportunities and inside challenges. Experiments or explorations are then needed to allow organisations to validate the relevance of the new information and more fully understand how the newly gained knowledge, once explored, might inform and change the company's core tasks and main business principles or beliefs.[40] When markets and technologies change, profitability and growth are sustained through continuous adaptation and reconfiguration of assets and organisational structures vital for business continuity. Future-oriented and fast decision making becomes crucial in exploring opportunities and avoiding threats. Doz and Kosonen also highlight the importance of management collaboration and preserving unity in this decision process.[41] Kim and Mauborgne focus on the importance of understanding and exploring market opportunities and customer frustrations and the creativity required to envisage innovative value-creating offers and pathways.[42]

Both the contributions of Kim and Mauborgne[43] and Doz and Kosonen[44] detail ways firms might react to the challenge of an ever-more-quickly changing environment. Both involve creating and adjusting ordinary capabilities for current efficiency and value capture while creating and developing dynamic capabilities to ensure longer-term value creation and reduce the risk of facing a changed environment with an outdated strategy or organisation. These can be seen as instances of the general paradigm of dynamic capabilities.

DYNAMIC CAPABILITIES AND BOARDS

A limitation of the dynamic capability framework and its more strategic and managerial implementations is that it has focused, nearly exclusively, on the management level and barely touched the board level. This is the case for most of the strategy and management literature. Little attention has been paid to boards' specific roles and contributions in developing and using dynamic capabilities. To illustrate this point, Teece makes a few comments on boards in his papers. Two comments are of particular note:

> In the Capabilities perspective, what matters most is the board's role in verifying that top management is pursuing a coherent strategic vision and developing strong dynamic capabilities. In addition to the standard financial monitoring function, the board should also be responsible for responding to evidence of strategic malfeasance by management.[45]

> The task of the board is to help managers keep dynamic considerations prioritized over technical efficiency, as the pursuit of the latter cannot lead to (and can undermine) long-run competitive advantage in tight selection environments. In this regard, the dynamic capabilities framework is consistent with recent efforts to promote "commonsense corporate governance" (Bryan, 2016).[46]

This viewpoint on boards is classical. In this view, boards supervise management's effectiveness and, in Teece's language, verify the development by the management of the firm's dynamic capabilities. This leads Teece[47] to qualify governance (Figure 1) as an 'ordinary capability', distinct from the 'high-level dynamic capabilities' of sensing, seizing and transforming.

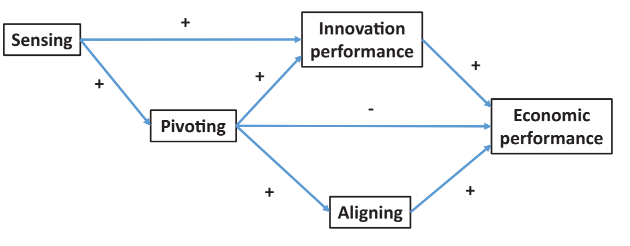

Figure 1: The positive and negative influences of the three dynamic board capabilities on a firm's innovation and economic performance[89]

This view differs from Teece in at least two regards. First, governance of dynamic capabilities is in no way 'commonsense governance' when boards — as confirmed in our workshops — readily admit to often failing at governance, even when they regard the corporation as successful. Secondly, to build this capability, it appears that boards must organise their practice to foment these capabilities at their level. The idea of building dynamic board capabilities is distinct from, but supports, the firm building its dynamic capabilities. These necessities elevate the board capabilities as being high level themselves, in contrast to the board's more 'commonsense monitoring activities' that Teece refers to. Furthermore, the board's dynamic capabilities can become a lens to review and determine board composition going forward.

It is usual to characterise boards as controlling the corporation and its management, distinct from steering the management towards effective corporate renewal. It holds the danger of creating a potential gap between the board and management in developing the company's sustained competitive advantage. Indeed, it risks the board becoming a bottleneck or a key impediment to the necessary change, creating what might be called a 'governance risk', distinct from a business risk.

Many examples can be invoked to attest to this conclusion. The latest board coup at OpenAI can be interpreted this way as it jeopardised this most promising firm.[48] Irreconcilable differences developed between Chief Executive Officer Sam Altman and the OpenAI board, leading Altman to be fired, only to be reinstated one week later, and with the previous board, save for one individual, being replaced with a new 'initial' board. This is one, albeit spectacular, example of how gaps between boards and executives risk the entire enterprise and why boards cannot be kept at a distance or considered administrative entities. The example also attests that the board was neither truly responsible nor effectively able to exercise its fiduciary responsibility.

Corporate boards have long grappled with business risk, particularly following the Global Financial Crisis. It led to developing more refined approaches to handling risk, extending into comprehensive frameworks such as enterprise risk management (ERM). These became a vital tool for both managers and boards in the aftermath of the corporate failures evoked earlier.[49] However, these tools remained quite operational for boards and dealt less with missed opportunities and corporate renewal than with the risk that strategy could not be executed as planned. Once more, the emphasis lay on controlling the management, as the 'M' in ERM denotes. In spirit and reality, these frameworks are far removed from dynamic capabilities.[50,51]

Summarising the above, the motivation for this paper is that boards themselves must develop behaviours and practices that support the development and use of firm-level dynamic capabilities to allow for a value-creating dialogue with management, including corporate renewal, and not one that prohibits or slows down value creation and capture, or one that leads the firm on the path of value destruction. The latter is indeed one risk of greater board involvement. What is clear is that the role boards play in the dynamic capabilities framework has thus far received limited attention. This paper addresses this gap.

RESEARCH METHODS

Many of the insights presented in this paper are rooted in two research projects performed between 2017 and 2021, funded by the Swedish Agency for Innovation (Vinnova) and performed in collaboration with different companies.

These two projects required, and benefitted from, literature searches, interviews with board members and governance experts, exchanges with professionals in workshops and training sessions and personal experiences from roles as directors and chairs of various boards. These have been fundamental sources of insight on the matter studied. The inclusion of practitioners in both executing and writing the research has allowed this study to tap into the wealth of experience-based knowledge on the specific contexts that boardrooms represent and has provided insights into the problems that directors face. Models and frameworks cannot adequately capture this rich contextual diversity, nor are they intended to.

The first framework for board dynamic capabilities was developed in the project OSIRIS, started in 2017, focusing on boards' role in promoting innovation and business renewal. This work was continued and developed further in the SISU Boards project, investigating how boards work with strategy and innovation for sustainable development. Further details on these two research projects are described in Appendix A.

These two projects also allowed us to gather data for a statistical analysis.[52] A digital survey was composed which asked directors and chairs to rate the dynamic capabilities of the board they were most familiar with and the corresponding firm's innovation and economic (output) performance. The survey was distributed to directors and chairs of two different governance networks, one Swedish and one with international board members. The Working Paper should be referred to for the detailed analysis and results of the paper, which, given space constraints, cannot be presented here. However, the statistical results supporting our dynamic board capabilities framework is presented in another paper.[53]

TOWARDS DYNAMIC BOARD CAPABILITIES

The OSIRIS and SISU interviews and workshops strongly confirmed the need and interest of directors in developing dynamic capabilities at the board level.

The dynamic board capability framework is summarised in Table 1. It represents the distinct capabilities that boards should possess to successfully govern value-creating innovation and corporate renewal, as well as ongoing value delivery and capture, in a way that aligns with strategy formulation and deployment in a more dynamic environment. It formulates the ambidexterity requirement that O'Reilly and Tushman[54] framed for corporations and their managers, with little mention of how to best anchor this ambidexterity at the board level. The ability of boards to do so would allow them to exercise the administrative leadership that Selznick so beautifully described in his classic treatise on organisational steering,[55] which he regarded as vital to performance.

The dynamic board capabilities presented above are aligned with the three dynamic capabilities

Table 1: Board behaviours defining dynamic board capabilities

Dynamic board capability	Description
Sensing	Searching and developing new insights into the company's internal and/or external environment, done by the board independently and in collaboration with management and external or internal partners.
Pivoting	They are transforming insights into new strategies or strategic innovation engagements. For the board, these pivots aim to find and explore pathways to new or continued value streams given changing environmental conditions. The overall scope of these initiatives is typically broad, requiring a portfolio logic. Pivots range from exploring how particular activities need to be changed to more broadly examining whether the company's current purpose, mission, vision, culture, structure and materiality impact might beneficially change and, if so, in which direction and how the change might best be accomplished.
Aligning	They ensure revised resource allocation and agile decision making for the new future due to insightful pivoting. The board monitors and supervises that transformation actions are identified and executed to accomplish the new strategy from the current position, including mission or purpose, resources, processes, structure, business model, metrics and culture.

identified by Teece[56] — and, as argued, are also present in the work of Doz and Kosonen[57,58] — although they need adaptation to match the board's role and responsibilities.

Following our exploratory research, it was found that 'sensing' was routinely identified as a disregarded capability in boards. However, the idea and concept of sensing were easy for boards to grasp.

Unlike sensing, board members in the interviews and workshops had difficulties with Teece's concept of 'seizing', perhaps because of their non-executive positions on the board. Pivoting resonated significantly better than seizing as they felt it connoted a greater sense of developing strategy, taking significant initiatives and guiding change in the company's strategy, in opposition to the notion of grabbing opportunity. Pivoting also better characterised the strategic and still adaptable dimensions of actions at this stage. This led us to replace 'seizing' with 'pivoting'.

Furthermore, it was found that 'aligning' was a term that fit board members better than Teece's 'transforming' or Doz and Kosonen's 'leadership unity', which is itself a consequence of effective board work. In addition, aligning refers to the need to keep the corporate leadership aligned — boards and executives — and the efforts to keep corporate processes, strategies and structures aligned. This is particularly true in ambidextrous companies.[59] A further point is that pivoting is already a form of 'transforming' the ambidextrous organisation without yet affecting its primary value delivery and capture activities.

Finally, our exploratory research confirmed the interrelated and systemic nature of the capabilities: poor sensing limits effective pivoting and aligning.

SENSING

The first of the dynamic board capabilities is sensing. This capability includes the development by the board of a due awareness and sensitivity towards the changing environment, scanning and identifying potential new opportunities, as well as emerging threats for the company's offerings and business model and, more broadly, for the company's ability to create, deliver and capture value.

The board typically organises its sensing activities in collaboration with management to gain a better and shared understanding of the potential threats and challenges to the firm and its opportunities. However, the board must also organise its sensing activities independently to avoid becoming overly anchored in the management's knowledge, and possibly biased views, of the organisation. If the board is to be value-adding in its discussions with management, it must develop its own independent and possibly contrarian views on current challenges and opportunities. Furthermore, this independence enables the board to challenge management and not fall into the typical pattern of a so-called 'approval board'.[60] When sensing activities are complementary to those of the management and the organisation, discussions will be more enriching for all.

Using external sources, distinct analytical frameworks[61] and exploratory tools, such as scenario planning,[62] will be valuable in providing boards with new insights. Potential threats may be reframed as opportunities and may be explored at a subsequent stage through experimentation. The increasing pace of change, fueled by disruptive technology advancements, spurs boards to proactively monitor the environment for emerging trends, threats and opportunities. The aim is to ensure that inputs into a potential change agenda reach the company leadership early enough.

Commonly practised means of knowledge-gathering include individual experiences through multi-board memberships.[63] Board members serving in multiple (non-competitive) boards often have rich primary and secondary market and competitor knowledge, gain board maturity through cumulative experience and provide each of their boards with specific and valuable insights gained from the other boards.[64] At the board level, this mimics the practice of independent suppliers sharing insights gained with one client throughout their client network.

Different knowledge and information streams (as simple as Google searches or more structured searches including ChatGPT) can contribute to board members obtaining novel insights regarding competition, upcoming trends, customer demands and preferences, and other aspects of the firm's markets. In the chaotic context we are now in, more than traditional and shared sources of information are needed. Boards should sense (collectively and individually) 'what is it that our executives don't know that might matter?' and 'what anchors might these data or assumptions suffer from?'.[65]

Moreover, the advent of generative AI marks a significant shift in board work. It can be used to distill and nuance information from data and thus amplify overall board intelligence.[66] It can enhance the board's sensing capability in several ways, from early opportunity and threat identification to simulation of business scenarios, provision of tailored research and insights for improved strategic planning and fostering innovative ideas. Board members should remember that generative AI has its own biases, which board members and executives also have.[67,68]

Turning to implementation, the extensive interviews and workshops with board directors and chairs generated two key focus-areas for boards eager to develop their sensing capabilities. These are presented in Table 2, which also presents leading sensing questions that boards might reflect on to develop this essential dynamic capability.

Table 2: Key focus areas and leading questions for developing and maintaining dynamic board sensing capabilities

Board sensing behaviours	Key focus areas for dynamic board sensing	Leading sensing questions for boards
Enhanced board insight in the corporate environment and the fit of the corporation's strategy and organisation with its environment	1) **Scan for environmental changes** Proactively monitor and interpret trends, market disruptions and competitive dynamics, ensuring the company vision remains aligned with these shifts. Do so also independently from the management, ensuring better preparation for discussions with them and greater objectivity and value-added from these discussions. 2) **Review purpose-driven strategic alignment**: Focusing on long-term business sustainability, reassess whether the insights gained from sensing impact the firm's purpose, vision, strategy, culture and organisational structure.	• What mechanisms, processes and roles has the board established to continuously monitor scope changes and possible disruptions in the firm's internal and external environments? • Are these sensing activities done sufficiently independently by the board? Or does the board excessively rely on the management? • How does the board integrate insights from these sensing activities into strategic reframing, exploration, and decision making? • How does the board assess and ensure the company's purpose remains aligned with future business and societal expectations? • What strategies and processes are in place for maintaining a relevant and compelling competitive position in the face of emerging trends and changes?

PIVOTING

Having identified potential opportunities and threats in their firm's internal or external environment through sensing, boards discuss these new opportunities or threats, independently and with management. These discussions lead to initiatives being agreed upon which more thoroughly explore the identified challenges. Greater insights are thus gained into value creating opportunities, involving new product or service offerings, business processes, market segments, technologies or the business model itself.

During pivoting, boards focus on guiding the management in framing and selecting a compelling portfolio of exploratory, probing initiatives which correspond to potential change options. A key question in portfolio management is whether there is an excessive number of probes or, conversely, too few. The number of probes should be informed by sensing, and boards will have to strike an acceptable balance between too few and too many. Boards probe the relevance and expected benefits of the pivots suggested by management and the scenarios underlining them. Other aspects that boards should consider pertain to the speed with which the organisation may exploit positive results from the pivots. Boards should regularly review the protection and ambition presented by the strategy and the innovation portfolio and the degree to which it needs to be adapted if it offers adequate mitigation of the risks and uncertainty facing the organisation under its current strategy.

Pivoting is the capability by which boards guide the corporation and its management in exploring strategic shifts by entering into new innovation engagements and initiatives, thus contributing to the strategic renewal aimed for.[69] Effective sensing and pivoting capabilities allow corporations to foresee better, act faster and more decisively to environmental changes and seize and exploit opportunities more quickly.

Pivoting into a new strategic direction is typically accompanied by investments in particular technologies, product/service designs or emerging technologies and businesses with a reasonable chance of reaching market acceptance.[70] Given the unavoidable costs of change, boards need to be united in their leadership to make fast, bold decisions that pivot the corporation into a new direction.[71] Boards will also be spurred on by the realisation that the cost of avoiding uncertainty is likely to include lost innovation opportunities or deteriorating market positions, which can be high.[72]

It was found in interviews and workshops that board members are increasingly and dynamically involved in the strategy development process to ensure speed, guiding on insights and stepwise decision making, moving into an equally guiding and monitoring role of the process. Nahum and Carmeli similarly confirmed that a high level of board involvement in strategy development established trust between the board and management and led to solutions that significantly improved the firm's performance.[73]

Exploration choices are rarely fully thorough or complete. This makes corporate and board strategy development necessarily an iterative and incomplete process that engages the board of directors in framing and proactively testing hypotheses and drafting strategy. Subsequently, the speed and degree with which the results of these innovation initiatives can be integrated into the current strategy is greatly improved.[74] Particularly promising or concerning results may even lead the board to consider reviewing the corporate purpose and changing its relations and objectives regarding particular stakeholders. Reviewing the corporate culture may be another item in this discussion. All these must involve board members to avoid growing gaps between the management, the board and the firm's environment and stakeholders.

Turbulence has significantly reduced the certainty of predictions and the success of strategic moves. Innovation initiatives must form a coherent and complete innovation strategy, for which the board is ultimately responsible.[75,76] For boards, pivoting entails exploring changing landscapes and envisaging different strategies and organisational structures ahead of implementation. These explorations will provide the board with the knowledge and familiarity required for significant strategic change.

Also, within pivoting, AI will increasingly play a crucial role in proactively exploring the risks

Table 3: Key focus areas and leading questions for developing and maintaining dynamic board pivoting capabilities

Board pivoting behaviours	Key focus areas for dynamic board pivoting	Leading pivoting questions for boards
Renewal and innovation focus through developing a strategy with a portfolio of strategic options and initiatives.	3) **Balance risk and opportunity** Evaluate significant short and longer-term risks and opportunities in a timely fashion. Guide the formulation and execution of strategy with innovation initiatives to dynamically address these risks in a well-balanced renewal and innovation portfolio. 4) **Explore the potential for change** Explore innovative avenues and the learning revealed by the pivots. Deliberate on potential changes in the firm's value chain, structure, strategic approach, purpose and values as a result of the pivots.	• How does the board ensure a holistic and integrated assessment of the company's material risks and opportunities? • How has the board evaluated the potential future impact of identified risks and opportunities on the company's future performance and current strategic direction? • What strategies has the board ensured to address the impacts of these risks and opportunities proactively? • What specific roles and responsibilities does the board assume in guiding the development and exploration of needed strategic change?

associated with new strategies.[77] Furthermore, it will contribute significantly to analysing extensive datasets, facilitating the generation and validation of new ideas and innovation areas.[78]

Table 3 summarises the board's pivoting behaviours, the key focus areas for dynamic board pivoting, and the leading questions supporting this capability's development.

ALIGNING

Once the results are evaluated on the ensuing pivoting, boards must align the results generated with the organisation's activities. This typically requires companies to adapt the organisation where necessary, sometimes completely replacing parts of it and freeing up already dedicated resources, even from currently revenue-generating initiatives. What is often ignored at this stage is the need to adapt the board itself to fit its composition with current and expected challenges; the board too often represents the past with its composition lagging behind current corporate realities. As mentioned earlier, the board's dynamic capabilities should serve as a lens through which board composition is renewed.

Undoubtedly, decisiveness and speed in adjusting and moving resources to support continued value creation is crucial, as stressed by Doz and Kosonen.[79,80] The crucial importance of dynamic re-alignments between an organisation, its environment and its strategies has been well argued by Santos[81] as crucial to an organisation's performance. Effective monitoring of realignments will support the effective execution of the agreed-upon changes.

The systemic point behind the three board capabilities is that the quality of sensing and pivoting and the board's involvement in these activities will allow the same boards to act more quickly and decisively in the aligning stage. The same holds true for management. Aligning keeps a company from falling into inertia, confusion, chaos or excess, as happened to Kodak when it went all out acquiring digital technologies in replacement of its analogue film.[82]

Besides reconfiguring resources, capabilities and organisational structures, aligning might also include changes to long-term ambitions and goals for the firm, if not purpose, altogether.[83] A continuous dialogue with owners and other stakeholders regarding mission, financing, performance, incentives and impact is vital, as all these topics must be addressed.[84] In sum, aligning puts pivoting results into corporate action.

Table 4 summarises the board's aligning behaviours, the key focus areas for dynamic board aligning, and the leading questions that support the development of this capability at the board level.

Table 4: Key focus areas and leading questions for developing and maintaining dynamic board aligning capabilities

Board aligning behaviours	Key focus areas for dynamic board aligning	Leading aligning questions for boards
Resource reallocation and decision making for effective Implementation and value delivery and capture	5) **Implement the lessons from the pivots** Guide the implementation of the results and learn from the pivots. Transform the organisation to a new and more resilient state. 6) **Rebalance value capture and delivery with value creation** Realign priorities, processes and resources, including performance metrics, change to the new culture, adjust talent allocation and performance management. Oversee and balance short, medium and long-term objective progress and ensure continued governance of innovation and value delivery and capture.	• What is the appropriate balance of resources that should be allocated between short, medium and long-term initiatives to ensure sustainable growth and value capture? • What is the current state of the innovation portfolio, and how does the board oversee its evolution to ensure it aligns with the company's longer-term strategic objectives? • How is the board safeguarding the progress of strategic change initiatives, and what mechanisms are in place for ongoing monitoring? • How is the board ensuring the needed realignment of the company's purpose, processes, resources and culture in response to strategic pivots, and how does it continue to sense and adapt to external changes? • Should the board composition itself be changed to ensure a better fit with current and expected challenges?

SENSING, PIVOTING AND ALIGNING ARE SYSTEMIC AND DYNAMIC BOARD CAPABILITIES THAT IMPROVE THE BOARD'S GOVERNANCE

Sensing enhances a firm's strategy review and opportunity-seizing, significantly impacting innovation performance. It helps a company spot opportunities and threats, as well as assess their impact on risk and reward. Effective sensing ensures crucial input for successful pivoting and is a key factor in value creation. Incorporating sensing as a dynamic capability enables quick adaptation and effective organisational decision making.[85,86]

Pivoting is about taking the right strategic renewal initiatives. Once such initiatives can be evaluated, strategy, organisation and leadership changes can be contemplated, preparing the company for its present and future opportunities and challenges. Pivoting explores the insights for future value creation. Balancing the actual incurred costs of experimentation with the opportunity costs of missing out on necessary innovations and strategic changes is a crucial and challenging task for both the board and management, for which the board is ultimately responsible. However, in striving for a suitable, ambidextrous approach, more independent boards are likely to be less entrenched in existing strategies and more prone to explore and discuss alternative strategic options.

Aligning, the third dynamic board capability, ensures timely and decisive implementation of the insights produced by pivoting insights, preventing possible losses from misaligned processes or units. However, pivoting alone can negatively impact economic performance when not integrated with aligning due to its disruptive nature and initial costs. The Kodak example is stellar, and our statistical analyses confirm this possibility, as will shortly be explained.

After thoroughly exploring the results of pivoting, forceful aligning helps deliver value from the innovation initiatives more rapidly and forcefully so that sensing and pivoting are effective. Aligning also aims to eliminate wasteful or harmful activities, allowing sufficient experimentation, which, given its uncertain nature, invariably includes a non-negligible amount of failure.

These three dynamic board capabilities — sensing, pivoting and aligning — should, therefore, not be seen as fixed steps in an annual agenda, but as components of a dynamic and cyclical system, where each step informs the succeeding one. This approach, led by the board, allows firms to be more adaptive and better able to anticipate and respond to potential challenges, aligning their innovation efforts more proactively and effectively.

Informal workshops with board members provided a first test of our dynamic board capabilities framework.[87] The results strongly indicate the need for boards to improve each of the three capabilities: 46 per cent of the informants sampled estimated that their boards lacked a good process to foresee changes that might impact the company; 49 per cent felt they were lacking in taking balanced risks to ensure their corporate renewal; and 51 per cent affirmed that their capability to balance short and long-term value creation was lacking. Despite the mere descriptive nature of these statistical results, the workshops confirmed that many board members viewed their boards as needing more dynamic board capabilities to skilfully guide and govern the long-term value creation of corporations in uncertain and turbulent times. Moreover, the systemic nature of dynamic board capabilities implies that the share of boards having a fully-fledged composition of these capabilities (including sensing, pivoting and aligning) is likely to be even lower — and likely much lower — than the percentages presented for them individually. Although these are not rigorous numbers and are based primarily on self-reported data, possessing all three capabilities could explain the poor performance of boards in exercising effective dynamic board governance.

Our statistical analysis of the survey results in connection with the OSIRIS and SISU projects provided interesting validation of our dynamic board capabilities.[88] The dynamic board capabilities of sensing and pivoting were found to have a positive influence on the firm's innovation performance but a negative one on the firm's economic performance. The firm's economic performance is only affected by the adoption of the three capabilities combined. The direct impact of pivoting on economic performance is, as expected, negative since pivoting projects represent costly investments that still need to affect the firm's main revenue-generating activities. Only when taken together do sensing, pivoting and aligning contribute to a positive economic performance. These results underline that the three dynamic capabilities jointly ensure both positive innovation and economic performance for the firm's greater sustainability. These first results are thus encouraging for our framework.

CONCLUSION

This paper has argued the need for boards to develop their dynamic capabilities to carry out their corporate responsibilities more effectively and ensure more sustainable value creation. The dynamic capabilities at the board level are identified as sensing, pivoting and aligning, which closely align with the dominant dynamic paradigm in the strategy and organisational fields. These three capabilities were validated in conversations and workshops with board members, and their pertinence was confirmed through a statistical analysis of data obtained from board members in these workshops.

For boards to effectively guide and support increased innovation and firm renewal in a more dynamic world, balanced with company supervision, boards need to practise and aim to master these three capabilities, which will become ambidextrous complements to their traditional supervisory capabilities. These capabilities also provide a platform for linking more effectively with the executives, guiding management on these matters more collaboratively. Likely, the most significant contribution to developing the dynamic capabilities at the board level is a more systematic and more responsible governance and steering of the firm and its challenges in our turbulent world. A much-improved interplay between the board and the management in these matters is both an aim and a necessity for effective governance.

Board research is complex because of the difficulty of accessing informative and well-structured data. Our idea was to open a direction of research, taking the board as the unit of analysis and focusing on its responsibility and how the board might exercise its fiduciary duty to the corporation.

One area of future research is to gain a better and firmer understanding of the process dynamics of the board's interactions with the executives and their relative contribution to building the firm's overall dynamic capabilities. There is also the risk of boards leaning too heavily on and interfering with the duties of management, leading to the potential for value destruction through excessively forceful steering of the board. Potential consequences could be managerial demotivation and, even worse, steering the firm in the wrong direction. Thus, the board needs to manage its challenging and intervening tensions while not substituting the executive roles, which would result in a loss of independence in oversight, replacing the executive function. In sum, the board must develop its governance strategies and practices for effective corporate steering and interactions with the management. The domain of board strategy to steer corporate strategy is undoubtedly a question that begs further research and frameworks.

Finally, the research confirms how the three dynamic capabilities impact innovation and the firm's economic performance. Our empirical research was based on subjective data from boards, which may be considered a sufficient beginning given the difficulty of accessing board data. Nevertheless, there is a need for further studies that empirically validate the findings using more objective data.

APPENDIX A: THE OSIRIS AND SISU PROJECTS

PROJECT 1: OSIRIS

This project was performed in close collaboration with two participating companies. First, a literature study of existing theories on strategic innovation work in company boards was performed to outline the overall state of the science in this specific field. After that, an interview study capturing the state-of-the-art boards' innovation work practices in companies with different ownership structures was undertaken, identifying experienced problems and needs regarding supporting frameworks.

A generic framework comprising crucial aspects of boards' innovation work was developed by combining insights from the literature study and the interviews. This framework was adapted and implemented in the two collaborating companies. This step included interviews identifying specific innovation needs and existing practices and workshops and seminars to develop suitable work practices. Finally, project results were validated and diffused through a series of workshops, presentations at conferences and the writing of popular articles and handbooks targeting directors and managers.

Throughout the entire duration of the project, the research team performed interviews with senior executives, board members and governance experts. They held a series of board workshops both with participating boards as well as with groups of board members and in board networks. Semi-structured, in-depth interviews were conducted with over 50 board members and global governance experts. The authors interviewed board members and chairs from the two collaborating companies and board members, chairs and governance experts in Sweden, Denmark, Norway, Netherlands, the UK, France, Australia, Canada and the US. Each interview lasted 1–1.5 hours and first covered personal data on numbers and types of boards served and for how long (the interviewee role). It also covered the challenges of the company, the challenges of the board, the approach taken to corporate renewal and innovation by both the company and the board, the role of the board, board practices and identification of better practices. Besides the expert interviews, interviews and workshops have been performed with the boards participating in the project. Moreover, six workshops with board members and one workshop with innovation leaders at more operative levels have been performed (see Table 5).

PROJECT 2: SISU BOARDS

This project was also performed in collaboration with several companies, following a similar structure. In the first step, an updated review of established knowledge was performed through a literature study and an interview with the company boards involved. The researchers then performed several interviews with board directors and relevant scholars on an *ad hoc* basis throughout the project. Due to the pandemic, most interviews were performed online. These interviews offered helpful input to the further development of the framework and its validation at the later stages of the project.

The developed framework was adapted to, and implemented in, two companies. This work took place in close collaboration with the company boards

Table 5: Description of workshops held in the OSIRIS project

Workshop date	Participants
May 2018	20 experienced board members and chairs in public, private and private equity companies from all over Sweden
May 2018	70 experienced board members and chairs in public, private and private equity companies from all over Sweden
September 2018	15 members of Founders Alliance Chairs and board members of private companies
November 2018	~50 board members and chairs from Swedish companies
March 2019	~120 experienced board members and chairs in public, private and private equity companies and governance experts from all over the Nordic countries
March 2019	~75 board members, chairs in public, private and private equity companies, and executive leaders from all over Sweden
April 2019	More than 250 Innovation leaders from all over Europe

Table 6: Description of workshops held in the SISU Boards project

Workshop date	Participants
August 2019	~20 board directors
October 2019	~30 people at a Vinnova programme conference
October 2019	~100 management researchers at an event organised by a research institute
November 2020	~50 innovation managers at an event organised by a professional association for innovation managers
November 2020	~70 Swedish board directors online at an event organised by a regional chamber of commerce
July 2021	~50 international board directors online at INSEAD Directors Network
October 2021	~20 board directors of a network run by Digoshen International
October 2021	~20 board directors at Boards Impact Forum

and their management teams, including interviews identifying specific innovation needs and existing practices and workshops and seminars to develop suitable work practices.

In addition to interviews and workshops, the researchers also performed two international surveys to validate the developed framework. The first of these surveys, the Board Innovation Survey, was performed in the second half of January and the beginning of February 2020. The survey was distributed to one board director network in Sweden and a second international director network. The second survey focused on board corporate renewal and sustainability and was performed in early May 2021.

The survey results have contributed significantly to the development of fruitful board and management actions for combined strategy and innovation work. The detailed survey results, including in-depth descriptions of data collection and the statistical analyses performed, are presented in the working paper.[90]

Besides expert interviews, collaborations with participating boards and surveys, the authors conducted several external workshops, primarily validating results, as described in Table 6.

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