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How to Face Uncertainty? Planning, Robust Strategy and Multiple Scenarios the Possible Answers

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Abstract

Scenario planning is a widely used methodology for identifying a broad array of risks and opportunities by analyzing and challenging decision-makers' underlying assumptions. However, in the context of great uncertainty, which scenarios can help managers design effective strategic and financial planning and under what conditions? The paper attempts to answer this question by clarifying the relationship between strategy and planning, scenarios and strategy, and scenarios and plans. Using a representative model, the paper highlights the role of a robust strategy in navigating these complex relationships from both theoretical and managerial perspectives.

Keywords: uncertainty, scenarios, strategy, robust strategy, planning

1. Introduction

The strategic landscape for businesses and organizations has become increasingly turbulent, unpredictable, and ambiguous. The 2008 financial crisis, the COVID-19 pandemic, the Ukraine invasion, the war in Gaza, catastrophic natural disasters, and other pivotal events have introduced unprecedented disruption, forcing most businesses to adapt strategically.

Strategic resilience is essential for accommodating high levels of uncertainty. It involves anticipating and preparing for new challenges and emerging opportunities, which has become a necessary capability for enterprises.

Scenario planning is a commonly employed methodology for identifying risks and opportunities by analyzing and challenging decision-makers' underlying assumptions. In the face of significant uncertainty, scenario planning directly utilizes the processes and techniques of scenario definition (scenario planning) to formulate strategic decisions and subsequent planning.

Nevertheless, linking scenario planning with actual planning is challenging because the core element of scenario planning is learning, not planning. In 1980, André Bérnard, the managing director of the Royal Dutch/Shell Group—one of the major companies where the technique was significantly applied in the 1970s—wrote in the *Harvard Business Review* that scenario analysis was effective primarily in compelling people to think about the future, rather than planning it (Bérnard, 1980). As uncertainty increases, the transition from scenarios to plans becomes even more complex. On the one hand, increasing uncertainty can encourage the use of scenario techniques, while on the other hand, it risks making them less effective for planning purposes.

Based on these considerations, this paper aims to answer the following research question: Is the scenario technique always effective for planning purposes?

Since the link between scenarios and plans is mediated by strategy, the following can be asserted:

- The scenario exercise contributes to the formulation of the strategy
- The plan is a programmatic translation of the strategy

Therefore, it can be hypothesized that the effectiveness of using the scenario technique for planning purposes depends on the nature of the chosen strategic approach. Only when the strategic approach possesses certain characteristics that "robust strategy", does it make sense for company management to use scenarios for strategic planning purposes.

The existing literature in strategic planning is rich in contributions focused on the importance of scenario techniques for strategic planning (Godet, 2000). However, there remains a gap in exploring the conditions under which this relationship is useful and effective.

This paper seeks to contribute to the literature in several ways. It aims to delve into the relationship among scenarios, strategy, and planning, emphasizing that the contribution of scenario techniques to the planning process is not *a priori* valid and effective; rather, its effectiveness and usefulness are conditioned and mediated by the characteristics of strategy. Additionally, the relevance of the research question goes beyond the perimeter of strategic planning. For instance, in the context of accounting and valuation, the centrality of scenarios is strongly affirmed (ESMA, 2022). However, what remains lacking is a deeper exploration of the strategic approach under which scenario techniques are effective and useful.

The remainder of the paper is organized as follows. Section 2 presents the theoretical framework. Section 3 presents the relationship between strategy and planning. Section 4 presents the relationship between scenarios and strategy. Section 5 presents the relationship between scenarios and plans. Section 6 presents the nature of the relationship between scenarios, strategy, and plans using a representative model. Finally, Section 7 provides the discussion and conclusion.

2. Theoretical Framework

Scenarios describe how specific events could arise and how a future situation could unfold (Schwartz, 1996; Schoemaker, 2022; Godet, 1997; van der Heijden, 2005; Ramirez et al, 2013; Chermack, 2011). The futurist Herman Kahn is considered the founding father of the scenario method. In the 1950s, he developed this approach for the US Ministry of Defense to outline potential conflicts and later examine socio economic question arising out of such conflicts. Further pioneering work was conducted in the 1970s by the company Shell, particularly by Pierre Wack, who led the company's scenario unit from 1971 to 1981. Since then, academics and practitioners have studied and recommended scenario analysis to help business organizations navigate the many uncertainties they face. The external environment is rife with unexpected changes, and it is often challenging to detect ambiguous trends, which makes long-term forecasts worthless the moment they are made. Scenario analysis does not aim to make forecasts but rather to create alternative images of the future (De Jouvenel, 2000; Durance and Godet, 2010; Godet 1997). Therefore, its purpose is not to predict the future but to provide a map of what might occur, boosting organizations' ability to sense, shape, and adapt to whatever happens in the years ahead. Scholars and practitioners have developed several approaches to scenario analysis, all of which share a common goal: not to predict the future but rather to enhance organizational learning (Wright et al, 2013). The primary contribution of scenarios is to enable a strategic thinking process that changes the established mental models of senior managers (de Geus, 2011). In this sense, scenario-building results from a learning process based on formulating assumptions and simulations of future events; consequently, scenarios highlight crucial uncertainties that impact managers' (strategic) decisions. Thus, scenario analysis does not suggest what to think about the future but rather how to think about it.

From these premises, several analysis perspectives concerning scenarios can be identified. Some scholars focus on the definition of the nature of scenarios. For instance, Börjeson et al (2006) drawing from Amara's classification (Amara, 1991) of different types of future (i.e., the probable, possible, and preferable future), identified three types of scenarios: predictive scenarios, which answer "What will happen?"; explorative scenarios, which answer "What can happen?"; and normative scenarios, which answer "How can a specific target be reached?". Following this perspective, but with slight differences, Durance and Godet (2010) distinguished between exploratory and normative scenarios. They stated that exploratory scenarios are concerned with past and present trends and lead to likely futures, whereas normative scenarios are constructed from alternative images of the future, which may be both desirable and feared and are conceived in a retro-projective way. Thus, exploratory scenarios lack human values, while normative scenarios express human values. Both exploratory and normative scenarios can be highly similar or highly contrasted, depending on whether they consider the most probable or extreme trends (Durance and Godet, 2010).

Some scholars adopt a more technical perspective to study developing scenarios, known as "scenarization techniques." (Godet, 1987; Huss, 1988; Ringland, 1998; Schwartz, 1996; van der Heijden, 2005; von Reibnitz, 1988; Van Notten et al. 2003; Bradfield et al., 2005; Börjeson et al. 2007). To clarify the confusion regarding scenario techniques, Bishop et al. (2007) in their review of the scenario analysis literature, highlighted eight broad categories of scenario techniques: judgment, baseline/expected, elaboration of fixed scenarios, event sequences, backcasting, dimension of uncertainty, cross-impact analysis, and modeling. Further, each type comes with two or more variations, resulting in more than two dozen techniques overall. On the other hand, some

scholars adopt a more practical perspective and debate the relations between scenarios and strategic plans, which are intended as programmatic translations of strategy for a specific future time horizon (Krys, 2013, Chermack, 2022, Bradifield et al 2005).

The use and incorporation of scenarios within the business planning process have a long history. Starting from Kahn's work at RAND and later at his Hudson Institute, companies adapted war-planning scenarios as a business-planning tool in the early 1970s. In that context, scenarios offered a set of distinct alternative futures to emphasize that the business environment was uncertain and could evolve in diverse ways. The scenarios provided a context for developing long-term corporate road maps and near-term contingency plans (Strauss and Radnor, 2004; Saritas and Oner, 2004; Saritas and Aylen, 2010). Additionally, an even more specific issue arises within the strategic management debate: using scenarios in financial planning (Mulvey et al 1998; Bradfield et a, 2005).

The relationship between scenarios and financial plans gathers momentum in the context of great uncertainty, where the scenario-building process identifies several images of the future. The relevance of the relationship between scenarios and financial plans goes beyond the perimeter of strategic management and involves the valuation debate. This is also highlighted by the recent European Security Market Authority recommendation, according to which, in contexts characterized by great uncertainty and volatility, it is necessary to move from a single-scenario approach to a multi-scenario approach. Despite the relevance of the relationship between scenarios and plans in practice, the issue remains underexplored in the literature.

To better understand this relationship, it could be useful to consider the following basic concepts (Beretta Zanoni & Vernizzi, 2020):

- Scenarios are alternative images of the future development of the external environment.
- Strategy is a set of choices related to developing a business model, given a goal set by the company management and the constraints and opportunities arising from the external environment.
- Strategic plans are the programmatic translations of strategy for a specific future timeline.

In other words, the distinction between scenario-building and strategic plans drives the following question: "What is the relationship between the different scenarios identified in the scenario-building phase, the firm's strategy, and its formalization within a strategic plan?" Even more concretely, one may ask, "Can a specific financial plan be identified for each relevant scenario?"

To comprehend this point, it is necessary to retrace the three elements of the relationship, namely, strategy, plans, and scenarios.

3. The Relationship between Strategy and Plan

The relationship between corporate strategy and planning, or between strategic formulation and planning, has been of "historical" interest, as it has accompanied strategic theory and practice since its inception in the early 1960s. However, this relationship has not always been easy to decipher, having sparked heated debates among scholars and schools of thought over time. For example, the famous controversy between Henry Mintzberg and Igor Ansoff on this topic appeared in the pages of the Strategic Management Journal in the early 1990s (Mintzberg, 1994; Ansoff, 1991). Nevertheless, we can consider that with the emergence and subsequent success of strategic planning as a natural evolution from long-range planning, plans have been seamlessly integrated into the strategic formulation process (Sull et al. 2015).

That said, strategic formulation and planning are distinct phases of management, with the plan functioning as an operational mechanism of strategic governance, serving the strategy rather than being the strategy itself. Therefore, the following considerations apply:

- Although multiple definitions of "corporate strategy" exist (almost a hundred, according to some studies), (Ronda-Pupo & Guerras-Martin, 2012) the consensus is that the term concerns the prospective governance of the enterprise–environment relationship through the definition of corporate objectives and the actions necessary to achieve them.
- Even though the relationship between strategy and corporate planning has been and continues to be a topic that researchers and professionals critically examine, it can be argued that the plan is the programmatic translation of the strategy. In other words, the set of strategic decisions is brought into corporate planning, giving the latter a non-inertial orientation not based on mere extrapolations from the past.
- Beyond the more technical aspects, this distinction between strategy and plan is valuable for

understanding the origin of some dysfunctional situations that can arise when, for example, financial plans are used for evaluation purposes, especially in organizational contexts that are not large or particularly structured.

- In some cases, the connection between strategy and plan appears rather fragile. Most often, the problem stems from the weakness of the formulation processes of both, resulting in the assumptions on which the plan is based being somewhat inconsistent with the choices that define the existing overall strategy.
- In other cases, the formulation of the plan occurs in the substantial absence of an underlying strategy. The reasons can be multiple, but it suffices to think of all those cases in which corporate management is obliged or incentivized to present a plan (to financiers, potential partners, or professionals, among others)—perhaps in a short time and in any case without a prior process of defining the strategy.

Whenever a plan fails to faithfully translate the company's strategy into a programmatic form, it loses its significance. For instance, if such a plan is used as the basis for a discounted cash flow (DCF) evaluation, it risks producing inadequate results. A plan that lacks strategic choices as its foundation is a limited forward-looking tool and, in the worst cases, can be misleading. This is because it essentially lacks the necessary analytical and hypothetical assumptions regarding future objectives, actions, and results.

4. The Relationship between Strategy and Scenario

The relationship between corporate strategy and scenarios also deserves some reflection, starting with understanding the essence of so-called scenario planning (Schoemaker, 2022).

From an application perspective, all scenario-based planning approaches, despite their many differences, develop through the following six fundamental steps (Bishop et al, 2007):

- Definition of the objectives of the analysis and the people involved in the process
- Clarification of the orientations of the people involved in the process (i.e., initial hypotheses, mental models, and more)
- Identification of the most relevant trends and main factors of uncertainty
- Scenario building (i.e., definition of scenarios)
- Strategic formulation
- Monitoring

Each step is carried out using specific techniques, some of which can be quite complex. However, what matters for our purposes is understanding the nature and structure of the fifth step, which is strategic formulation within scenario planning. To explain this step, experts in scenario analysis use the metaphor of wind tunnel testing used for new aircraft models (Van der Heijden, 2005). In this process, to understand the aerodynamic behavior, a prototype of the vehicle is built and tested in a wind tunnel where different weather conditions are simulated, and the results are measured. These measurements allow for improvements to the design of aircraft models and progressive adjustments to their construction characteristics.

Scenario planning uses a logically similar approach. This strategy is similar to the prototype subjected to tests in the wind tunnel, and the different identified scenarios are like the test conditions reproduced in the wind tunnel. The scenarios, therefore, represent a series of environmental simulations that allow for the preliminary verification of the potential outcomes of adopting a certain strategy.

Using a scenario/strategy matrix makes it possible to evaluate how different strategies (or various options within a strategy) perform in relation to the identified scenarios. Based on past observations of the results of the implementation of these strategies, not all strategic approaches respond equally to changes in scenarios. Some strategies are more flexible and reactive, while others are more rigid and less capable of adapting to changes. From this perspective, a classification can be proposed, identifying the following four distinct strategic categories (Van der Heijden, 2005):

- "Gambling" strategies may perform well in some scenarios but lead to negative results in others. They can be adopted only if the probability of the scenarios occurring can be reasonably quantified and if business continuity will not be threatened by adverse scenarios.
- "Flexible" strategies are formulated in a way that ensures the maintenance of a range of decision options over an extended period. In essence, a flexible strategy is formulated to allow (or even require) incremental adjustments or additions to the initial decisions.

- "Multiple-coverage" strategies involve formulating not one but several strategies, postponing the choice of which strategy to adopt to a time when the reference scenario is sufficiently clear (in the decision maker's judgment).
- "Robust" strategies entail those that tend to perform effectively under all the different scenario conditions identified.

When uncertainty in formulating strategy is high, defining alternative scenarios helps the management better navigate the decision-making process, identify multiple behavioral options, and overcome cognitive biases—objectives fundamental in contexts characterized by high uncertainty.

If this is the common background, what changes in the four represented situations is the way top management addresses uncertainty from a strategic point of view?

The "gambling" strategy is the consequence of the inability to reach a strategic synthesis of the different identified scenarios, leading to a maximization of risk (which takes the form of "gambling"). In the two intermediate situations, the strategic subject cannot formulate a "synthesis" strategy and does not intend to "gamble." In this case, decision-making is somewhat based on a wait-and-see approach, aiming to maintain a certain degree of flexibility over time. However, this wait-and-see approach certainly has a cost, both in terms of organizational efficiency and strategic effectiveness.

Only with the robust strategy can the differences in the identified scenarios (which can be a proxy for the degree of uncertainty) somehow be brought back to a strategic synthesis, which manifests itself in the robustness of the strategy.

5. The Relationship between Scenarios and Plans

Since we have examined the nature of the relationship between strategy and planning and that between strategy and scenarios, we can now move on to the link between scenarios and plans. This link is not particularly strong, as the key element of scenario planning, as previously mentioned, is learning rather than planning (Bénard, 1980).

Once the scenarios have been defined through the scenario-building process, from a strategic planning perspective, each scenario should be associated with a plan that contains reasonably formulated financial forecasts.

That said, how scenarios and plans are eventually connected changes with the strategic context in which the company finds itself. In other words, it changes with the strategic approach adopted.

The "robust" strategy is fundamentally based on a core of choices that can be considered practicable and effective in all identified scenarios (core strategy). It is certainly possible, indeed increasingly likely, that specific decisions will need to be made in relation to the occurrence of one scenario rather than others (strategic options) (Wulf et. Al, 2010). However, when the strategy is robust, the strategic options are complementary, in the sense that they complete the strategic design but do not change its essence.

The time horizon of the scenarios is also different from that of planning, both because the scenarios are projected into a time not necessarily defined precisely and especially because they normally extend beyond the physiological limits of planning. Therefore, it is common for options to manifest themselves even after the end of the planning period.

In the context of a robust strategy, the interplay between scenarios, strategy, and plan does not present significant challenges. The organization adopts a unified strategy, albeit with nuanced variations that may adapt to the emergence of specific events. This cohesive strategy is seamlessly aligned with a comprehensive financial plan.

The various strategic options, which modify the strategy and thus the plan, most likely act in the final part of the plan and in a limited manner due to the robustness hypothesis of the strategy. In many ways, the gambling strategy seems to represent a situation exactly opposite to the one just described. As mentioned at the end of the section 4, in this case, the top management deems it impossible to synthesize the diverse conditions presented by the various scenarios. It is not feasible to identify a core strategy, nor is it considered viable, as will be explored shortly, to adopt an approach geared toward strategic flexibility. Consequently, the decision is made to commit entirely to a single scenario and a corresponding strategy/plan without alternatives. Given that the company has chosen to develop a strategy and plan aligned with the realization of a specific scenario, no alternative strategies or plans will be available. This raises the question: Is it possible to hypothesize plans consistent with the other identified non-gambling scenarios? In theory, yes, it is; but in practice, it is a very remote possibility.

Now, let us move on to the two strategic archetypes aimed at maximizing decision-making flexibility, albeit with

different logic. In principle, the trade-off between flexibility and planning is well known: historically, the formulation of plans has developed in strongly rationalist contexts that tends to be rigid and where the decision-maker was confident in the existence of the one best way. In this regard, strategic planning has been a rather faithful heir to its predecessor, long-range planning. Despite decades of scholarly debate on the need for more dynamic strategic planning, in practice, strategic plans often remain rigid, serving as programmatic translations of fully defined strategies. This approach leaves minimal room for flexibility in fundamental orientations.

Ultimately, one must ask whether flexible strategies or, even more so, multiple-coverage strategies can realistically correspond to a plurality of plans. A possible solution for planning in the face of flexible or multiple-coverage strategies is to use decision trees, through which alternative future scenarios are not only identified but also linked to the occurrence of certain decisions and specific events (Damoradan, 2007). In its simplest version, the decision tree is developed through the identification of the following:

- The “root nodes”: These represent the starting point of the decision tree and usually consist of a decision that the subject must make. The outcomes of these decisions lead to the manifestation of alternative future scenarios, known as “event nodes.”
- The “decision nodes”: These are the various decisions that the subject can make along the timeline of the decision tree. Each decision leads to different future scenarios, i.e., different “event nodes.”
- The “end nodes”: These are the outcomes of a specific path along the tree.

When the decision tree is relatively simple, it is feasible to connect plans to the various scenarios outlined within it. For instance, in a five-year plan, you might propose a unified strategy for the first two years. After this initial phase, the plan could diverge into four distinct variations over the next three years, each corresponding to a different end scenario.

6. Nature of the Relationship among Scenarios, Strategy, and Plans: A Representative Model

It is possible to assess the current relevance and critical nature of the relationship among scenarios, strategy, and plans by analyzing recent trends in business valuation, particularly focusing on the cash flows underlying the valuation, the probabilities associated with them, and the scenarios from which those cash flows and probabilities are derived.

As is well known, valuation methods belonging to the income approach family are applied differently depending on how they handle the uncertainty of cash flow forecasts. For simplicity, considering only the DCF method, it is possible to distinguish among the following:

- Single-path DCF, based on a single forecast scenario
- Scenario-based DCF, based on the formulation of multiple scenarios
- Decision-tree analysis DCF, based on the formulation of multiple scenarios that are also sequentially connected over time
- Stochastic simulation DCF, which transitions from discrete scenarios to a statistical simulation where variables move continuously, using multivariate simulation analysis methods

Traditionally, the single-path approach is the most commonly used. With this method, the risk associated with uncertainty is included and measured in the valuation through the relationship between a cash flow (or rather a sequence of cash flows) and one or more rates consistent with the flow.

From a financial theory standpoint, employing the single-path approach necessitates certain precautions that are often overlooked. When we assert that the forecasted scenario is “the most probable,” we implicitly acknowledge that it is not the only possible future scenario. Other scenarios, albeit those with lower probabilities, are not explicitly factored into the valuation. Consequently, the chosen cash flow, associated with the only forecasted scenario, should represent the weighted average based on the probabilities of all future cash flow series, associated with scenarios considered only implicitly. If this is not the case, the rate used, with all other conditions being equal, should be adjusted upwards to incorporate the risk associated with the realization of the single forecasted scenario (conditional scenario).

A numerical example will help clarify this concept. Consider three scenarios, each assigned a perpetual cash flow and a probability.

Table 1. Weighted Average Expected Cash Flow—Example No.1

	Flow	Probability	Weighted Flow
Scenario 1	100	60%	60
Scenario 2	80	30%	24
Scenario 3	60	10%	6

Note. Average Expected Flow (weighted): 90.

If we assume a 10% cost of capital, the most probable cash flow of 100 would yield a capitalized value of 1000. However, the cash flow to be capitalized should be 90, which is the expected average flow, obtained by weighting the probabilities of the different hypothesized scenarios. The two results, 1000 and 900, can only be reconciled by increasing the rate used in the first case to account for the risk of the conditional scenario, approximately from 10% to 11%. Such an increase would not be necessary if the most probable flow were equal to the weighted average flow, as illustrated in the following second case.

Table 2. Weighted Average Expected Cash Flow—Example No. 2

	Flow	Probability	Weighted Flow
Scenario 1	110	20%	22
Scenario 2	80	70%	56
Scenario 3	20	10%	2

Note. Average Expected Flow (weighted): 80.

In essence, this is the hypothesis that implicitly accompanies the single-path evaluation: the most probable cash flows are also the weighted average flows. This means that the alternative scenarios to the most probable one are symmetrical in both their probabilities of occurrence and their values; consequently, future results approximate a normal distribution, where the mode and mean coincide.

Unfortunately, the robustness of the hypothesis concerning the equality between the most probable flows and the weighted average flows is weakened in contexts where uncertainty and volatility become high; the expected results in the most probable scenario do not necessarily correspond to the expected average results, as the symmetry between the more favorable and less favorable scenarios compared to the most probable one may be lost. Specifically, the less favorable scenario becomes worse, more probable, or both.

In this case, given the difficulties encountered in quantifying the rate adjustment to account for scenario risk, one may choose to abandon the single-path approach by making explicit the following:

- The alternative scenarios
- The cash flows associated with the occurrence of the alternative scenarios
- The probabilities of the occurrence of the scenarios (and therefore the cash flows)
- the weighted average cash flow.

Given the current context characterized by high uncertainty and volatility, the use of the multi-path solution has become much more frequent, even at the regulatory level. For example, the ESMA (European Securities and Markets Authority) has addressed this issue with specific recommendations both in 2020 (pandemic) and in 2022 (Ukraine).

In particular, on May 13, 2022, ESMA analyzed the potential impacts of the great uncertainty on the application of the International Accounting Standard (IAS) 36 Impairment of Assets and exhorted firms adopting International Accounting Standards or International Financial Reporting Standards (IFRS) to consider multiple scenarios when forecasting information (for the purpose of impairments). Later, ESMA's public statement was reclaimed by the Italian Authority for Enterprises and Stock Exchange (CONSOB) and the Italian Valuation Organization (OIV) (2022), who published a paper titled "Non-financial Assets Impairment Test (IFRS 36) after the Ukrainian War."

From a practical perspective, this means that the availability and attribution of specific financial forecasts to each

designed scenario are crucial for identifying the different cash flows that form the basis for developing a useful, effective multiple-scenario valuation. This allows one to distinguish a multiple-scenario method from a sensitivity analysis based on just one financial forecast with some modified variables (Rappaport, 1967). By adopting effective multiple-scenario valuation methods, each of the possible outcomes (or at least some of the possible outcomes) becomes the specific object of financial planning (i.e., cash flow). Thus, it moves from just one valuation result (i.e., the synthesis of several possibilities) to a higher number of valuation results.

Suppose the process of scenarization does not involve specific financial plans, even when complete and effective. In such a situation, conducting a valuation using the multiple-scenario technique will not be sufficient. In other words, to concretely carry out a real multiple-scenario valuation, it is insufficient to have just one strategy and plan associated with a specific cash flow. There should rather be a robust strategy that can adapt to several future scenarios designed through the scenario-building process and create specific financial plans for each scenario.

However, in practice, the multi-scenario approach for evaluation purposes is often adopted in a limited manner. Typically, it starts with a plan that includes future cash flows (corresponding to the scenario deemed most probable). Some assumptions—and, occasionally, even just one assumption—are then modified, usually in a positive or negative direction to create two alternative scenarios to the base one. This is called the best case/worst case (BCWC) approach (Damodoran, 2007).

With the BCWC approach, alternative scenarios are not introduced. Instead, a sensitivity analysis is modestly conducted on a single scenario (i.e., the plan). This means the multi-path approach risks being only superficial, as it might not capture the true essence of uncertainty. It does not just affect the oscillation of some key value drivers but also touches the very nature of the hypothesized future.

Alternatively, the likelihood that the technique in question is reduced to a relatively simple “sensitivity” analysis depends on the strategic approach adopted. This simplification is generally acceptable only when the adopted strategic approach has certain characteristics (what we have defined as the “robustness” of the strategy). In all other cases, the multi-scenario technique for evaluation purposes is either not adoptable or is only adoptable by verifying the presence of additional conditions.

4. Discussion and Conclusion

The last 20 years have proven that events characterized by great discontinuity and unpredictability occur more frequently (Altig et al., 2020; Baker et al., 2020; Bose et al., 2022). The most striking examples are undoubtedly the 9/11 attacks, the great financial crisis of 2008, the sovereign debt crisis of 2011, the COVID-19 pandemic of 2019, the Ukrainian war of 2022, and, finally, the Israel-Gaza war of 2023. However, despite the great relevance and shocking reaction elicited by these events, they are the consequences—not just the causes—of the turbulence that economic systems are forced to confront. The ultimate cause of that turbulence seems to be the growing complexity of the modern world, fostered by the development of new technologies, demographic changes, climate challenges, and the redesign of new economic and geopolitical balances between countries.

In this context, it is quite easy to comprehend how challenging it is to make effective forecasts and elaborate effective strategic planning (Schwenker & Wulf, 2013; Weston, 2020). Increasing complexity and market turbulence make traditional forecasting and strategic management methods less precise and capable of coping with uncertainties (Lindgren & Bandhold, 2009). This kind of unpredictability and volatility also affects the process of asset and enterprise valuation, which is naturally based on future forecasts. The valuation process can be extremely complicated if the analyst cannot compare the present (and the possible future) to any events that have already occurred.

The ESMA recommendations align with this perspective. In the face of great uncertainty, an explicit method should be used to identify several possible future scenarios and relative future results to which specific probabilities are attributed. This can only be achieved by effectively applying a real multiple-scenario approach. By doing so, valuation can gain the rationality it requires. However, it is only by adopting a robust strategy that organizations can truly implement a multiple-scenario approach, as only a robust strategy can consider and adapt to several different scenarios. If this is not the case, just one scenario (usually the most probable one) is considered.

Robustness is an important criterion for making sound decisions in the context of uncertainty (Metz et al., 2001; Rosenhead et al., 1972). Where risks are well-defined, quantitative analysis should aim to identify optimal strategies. However, when uncertainties are significant, robustness may be preferable to optimality as a criterion for evaluating decisions. In recent years, formal methods of finding robust strategies have emerged across

various subject areas, including operations research (Kouvelis & Yu, 1997), Bayesian analysis (Berger, 1985), control theory (Zhou & Doyle, 1998), and engineering (Ben-Haim, 2001). Generally, the robust decision-making methods theory has been designed to reduce problems of overconfidence by challenging analysts and decision-makers to explore a wide range of plausible futures and facilitate agreement by providing an analytic framework in which parties can agree on near-term actions that are robust across many expectations and values. One important attribute of robust decision-making methods is that they can help decision-makers design robust strategies whose initial components may not be obvious. For instance, robust strategies are often adaptive, evolving in response to new information (Dibrell et al., 2014; Lempert et al., 2006). In the strategic literature, the concept of robustness is closely related to the concept of strategic agility, which is deeply rooted in strategic management.

Robustness is defined as the ability to remain flexible when facing new challenges, continuously adjusting a company's strategic direction, reassessing previous choices, and changing direction in light of new developments (Brueller et al., 2014; Doz & Kosonen, 2008; Weber & Tarba, 2014). As Lewis et al. (2014) emphasized, strategic agility is delicate, synthesized as it is by a complex balance among a stable commitment to a vision, the importance of a strategic planning process, and the ability to be adaptable and open to emerging decisions. Therefore, by starting from the agility concept and moving to the valuation context, we can define a robust strategy as one that can adapt easily to different identified scenarios (van der Heijden, 2005). A robust, adaptive strategy might set signposts, the observation of which would suggest that the future is evolving along one of several critical paths. The strategy might also specify actions to respond to one or more of the signposts observed (Dewar, 2001).

Given the difficulty of considering the multiplicity of potential future paths, even experienced decision-makers may have little idea about the most robust combinations of signposts and responses. Therefore, a robust strategy allows organizations to cope with the different future scenarios identified with relative ease. If this is the case, strategic plans and their related financial forecasts can also be shaped according to several scenarios because the same strategic framework drives them. In other words, it is impossible to truly adopt a multiple-scenario method without a robust strategy that informs the definition of the specific financial plans associated with the scenarios identified through the scenario-building process.

A correlation exists between the robustness of a strategy, its implicit risk, and the expected performance results; in physiological conditions, the more robust a strategy is, the less risk there is and the higher the expected performance level there will be. The situation is very different when the strategy is not robust because, in that case, the strategy and plan are highly idiosyncratic to just one of the many scenarios identified. Organizations would need extremely different strategies or, at least, an alternative robust strategy that can adapt flexibly to cope with the other future scenarios identified. This involves not adapting the ongoing strategy plan to alternative scenarios but creating new strategies and plans to cope with new and different scenarios. Naturally, this complex exercise undoubtedly concludes that the multiple-scenario method is only adoptable if the strategy is adequately robust.

Operationally, the implications of this are numerous. While scenario techniques can generally prove useful during the strategic learning phase, they may not always be as beneficial in the subsequent stages where strategic choices are made and activities and financial flows are planned. In these phases, the likelihood that scenarios will play a concrete role depends on the robustness of the chosen strategy. In other words, it depends on the "versatility" of the adopted strategy concerning the nature of the identified scenarios.

It is essential to clarify in advance what contribution an organization expects from a scenario planning process. Is it a contribution limited to exploring possible changes or generating ideas, or should it also extend to the decision-making and planning stages? In the latter case, the adopted strategic approach strongly influences the technique's effectiveness. As explained, this basic verification becomes even more necessary and delicate if the scenario technique is used to value a company (or a Cash Generating Unit -CGU- or an asset).

It is also important to emphasize that the effective application of scenarios for strategic purposes requires avoiding misinterpretations of what a scenario is. Conducting a scenario analysis does not equate to performing a sensitivity analysis, unless the difference between the identifiable scenarios is limited to some variation of one or a few key drivers, a possibility that is inconsistent with the hypothesis of increasing environmental discontinuity, which is the very reason for using scenarios.

Our contribution to the existing literature focuses on exploring the relationship between the robustness of a strategy—an attribute of the adopted strategic framework—and the usefulness of scenario analysis for strategic planning. Additionally, we emphasize the importance of evaluating the actual effectiveness of the scenario

technique by distinguishing between an initial learning/exploration phase and a subsequent decision/planning phase. Added to this we focus on the importance of having a "robust" approach to strategy i.e. the only perspective able to adapt planning to the uncertainty of the current context. This is the major contribution of this paper to a literature that is rich of papers regarding scenarios analysis, of studies relating to the importance of strategic planning but still poor on the combination of the two issues, especially when uncertainty occurs and managers need to face the necessity of planning with the difficulties of realizing the possible future paths. The paper has also managerial and practical implications. It higlights how, in times of great uncertainties, the financial planning process should be necessarily linked to a robust strategy approach and how scenarios techniques can be seen as a useful tool to implement it. In other words, the paper suggests to managers and entrepreneur a new way of approaching the strategic planning process, translating into practice the ESMA recommendations.

The paper has some limitations related to the absence of a real case study and the lack of empirical data that could help to better understand the practical implications of the relationship between robust strategy, scenarios and financial planning. Future studies should be conducted with the aim of deepening our understanding of the adopted strategies using empirical data, specifically what we might define as their degree of robustness, while also enriching the conceptual framework of the relevant attributes of a strategic approach.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal and publisher adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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