

Navigating the Rising Global Uncertainty: The Mandate of Flexibility Strategies in MNCs

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Abstract

The theme of improving global value chain (GVC) resilience has dominated the discussions among operations research scholars and supply chain managers following the GVC disruptions caused by the COVID-19 pandemic. Drawing on the literature on flexibility and real options, this article moves beyond the conventional focus on GVC reconfiguration by advocating for flexibility strategies in response to the rising global uncertainty. It also proposes two illustrative option-creation methods for multinational corporations (MNCs) with the cases of Tesla, Nike, and Apple. The cognitive, organizational, and operational foundations of crafting and implementing successful flexibility strategies are also discussed.

Introduction

The interdependence and the resulting disruptions of global value chain (GVC) during the COVID-19 pandemic have triggered a round of rethinking both in industry and academia. Coincidentally, much of this rethinking has focused on the operational level, for example, on how to improve GVC

resilience with supply chain diversification and optimization, and how to adopt newer technologies for better collaboration with suppliers. The suggested solutions include reconfiguring production methodologies, shortening supply chains, and leveraging advanced technologies for enhanced GVC visibility and control.¹

However, multinational corporations (MNCs), which organize the largest GVCs and suffered the most during the COVID-19 pandemic, face more serious challenges than their GVC operations. Indeed, scrutiny of MNCs and their GVCs has started way before the COVID-19 pandemic, raising the concern of a shrinking globalization.² The rising anti-globalization, nationalism, and protectionism in recent years may blame the MNCs as the very cause of the GVC crisis during the pandemic. The crisis appeared to offer perfect evidence of the failure of globalization, challenging the efficiency of linkages between nation markets.³

Added to the political pressure on MNCs' global operations is the rising uncertainties stemming from the enduring social and economic impact of COVID-19 pandemic, the unpredictable internal political environment in major economies, the increasing state intervention, the collapses of national governments, the escalating geopolitical tension and ongoing wars, and other emerging global threats such as the next pandemic, climate change, and the unprecedented advancement of artificial intelligence (AI).

Given the broad scope of the uncertainties, a complete solution should not only address the global production systems but also market-side challenges, such as shifting demand patterns evident during the COVID-19 crisis that is beyond supply chain management. The intensity and persistence of the uncertainties also call for a holistic review of the multinational networks and an overhaul of their strategies to serve a redefined global market, including market entry strategy and the degree of global integration. More importantly, GVC resilience is not only about the arrangement of supplier network and procurement but also involves the boundary of firm (e.g., make-or-buy in offshoring vs. outsourcing) and location selection (e.g., switching operations between different subsidiaries), which must be planned at the strategy level to enable true operational resilience. As a result, the GVC transformation should be governed by the MNCs' fundamental strategic shift.

In this article, we advocate for a strategic shift towards valuing flexibility in MNCs to better cope with the rising global uncertainties. We review the literature on flexibility and option creation, as well as its applications in MNC strategy, and identify the implications for a strategic solution to GVC reconfiguration. Using several applications with the cases of Tesla, Nike, and Apple, we shed light on two flexibility-creation approaches: the creation of a

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regionalized multi-plant production network for flexibility, and flexible entry strategies for outsourcing vs. offshoring (i.e., make-or-buy) decisions.

We attribute the GVC crisis during COVID-19 pandemic and beyond to a lack of operational flexibility of MNCs with what Dani Rodrik has termed “hyper-globalization,”⁴ characterized by over-reliance on very few countries like China.³ Consequently, the solution is not a retreat from globalization as some predicted as MNCs’ uncertainty avoidance,² but rather possibly a deepening of globalization⁵ to increase operational flexibility to embrace uncertainty. To achieve this strategic shift, MNCs must first abandon the mindset of efficiency maximization when making their strategic decisions, develop organizational dynamic capabilities in identifying and responding to the environmental changes, and invest in various operational technologies supporting option creation and exercise.

The merit of flexibility strategy

The extant literature in international business suggests that the efficiency and maximization paradigm, or the “best-fit” approach, under bounded rationality is prevalent in strategy making in MNCs, such as location choice, entry mode, and GVC configuration.⁶ For example, in offshoring decisions, an MNC would choose a location with the lowest overall costs including manufacturing, logistics, taxes, and other expenses. A market-seeking foreign direct investment for import substitution would prefer a location with the greatest market potential.

This paradigm aligns with the principles of market mechanism under competition, but the outcome of maximization approach depends on the stability of the external and internal environment of MNCs. When environmental changes are within an expected range or highly predictable, the maximization approach is valid and may yield expected returns. However, it may lead to suboptimal outcomes when significant uncertainty is present, because in such context managers are unable to confidently forecast future trends at the time of decision making due to limited information or fundamental unpredictability, especially when uncertainty is so unprecedented that past experience offers little guidance for decision.

In contrast, a flexibility strategy, rooted in real option theory in finance, posits that MNCs proactively manage uncertainty by creating options to handle various future scenarios.⁶⁻¹⁰ Essentially, MNCs can adopt a flexibility strategy by creating options for future uncertainty. When the uncertainty unfolds, MNCs can choose a favorable option (i.e., “option exercise”). For instance, Tesla Motor may import vehicles to the U.S. from its Berlin Gigafactory instead of its China-based Shanghai Gigafactory if high tariffs are suddenly imposed on Chinese imports. The multi-plant setting in this case

creates options to switch production and trade across different countries. In this example, the U.S. - China trade dispute represents a geopolitical uncertainty, and the imposition of high tariffs marks the realization of that uncertainty. Tesla can then divert their China-made vehicles to European market to maintain operational continuity. The cost incurred here may be the loss of economy of scale, underutilized capacity, higher transportation expenses, or other opportunity costs¹¹ because Tesla could have concentrated its production in its Shanghai Gigafactory for highest efficiency, but the benefits include continuously serving the U.S. market and avoiding the enormous divestment costs of operations in China in an extreme situation.

Thus, the merit of flexibility strategy lies in its departure from efficiency-maximization based on the current information when making decisions. Instead of seeking instant efficiency, flexibility strategy aims for long-term operational stability and growth and to mitigate the negative impact of volatility when uncertainty unfolds. It is defensive, yet indeed proactive to embrace uncertainty, in contrast to the uncertainty avoidance in conventional approaches.

In principle, flexibility strategies via option creation follow the behavioral theory of the firm, which suggests that managers may not always pursue the highest profit.¹² They also resonate with economic theories on decision making under uncertainty, which argue that actual maximization may not be achieved because generating and comparing alternatives *ex ante* is constrained by unavailable or unreliable information,¹³ especially when the uncertainties are non-ergodic and transmutable in nature, much like what the world is currently experiencing.¹⁴ Research suggests that option creation and exercise (e.g., enabling shifting opportunities within the MNC network) can reduce downsizing risks of MNCs (e.g., divestments)¹⁵ and mitigate economic exposure to exchange rate fluctuations,¹⁶ and increase the growth options via flexible ownership in international joint ventures (IJV) and, as an outcome, lead to a higher firm value.¹⁷ Understandably, as shown in some empirical studies, the value of option creation and exercise tends to rise with the level of environmental uncertainty.¹⁸

While more longitudinal data is needed to show the value of flexibility strategy in turbulent global events, a historical check for U.S.-based MNCs in 83 financial crises during 1983 and 2005 found that the MNC's switching operations between different countries can mitigate the downsizing risks.¹⁹ Other empirical evidence indicates that MNCs did implement flexibility strategies but not so much in recent decades. Specifically, an early study reported modest use of flexibility strategies, such as switching production in response to exchange rate fluctuations, using a sample of US-based MNCs and their subsidiaries between 1977 and 1993.¹¹ By the end of the twentieth

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century, MNCs were more engaging in regional rather than global operations.²⁰ However, in recent decades since, the locale of global production has been concentrated to very few countries especially China, which joined WTO in late 2001. With merchandise exports grown from 272 billion US dollars in 2001 to 3,513 billion US dollars in 2023,²¹ China has been the world's largest manufacturing nation for 14 consecutive years as of 2023²² and became the top trade partner of over 120 countries.²³

The overspecialization with an emphasis on efficiency and the resulting high concentration of production was observed as a major cause of global supply chain vulnerability during the pandemic.³ More precisely, it is because of the MNCs' lack of flexibility in managing global networks, rather than a high degree of globalization in organizing economic activities. The solution to the issues, therefore, is not decoupling or a retreat from globalization, but the adoption of flexibility strategies in MNCs to purposefully create options for stability and resilience.

The current operating environment of MNCs is marked by significant turbulence originating from rising global uncertainties as listed previously that bring MNCs unprecedented volatility and operation risks. These risks may not be easily mitigated at the operational level such as GVC reconfiguration because the reconfiguration does not fundamentally alter the efficiency-based logic in global operations,²⁴ and its ability in dealing with the uncertainties and risks is thus limited, even though it may be able to relieve some "choke points."³

Thus, flexibility strategies, in contrast with the conventional maximization- and optimization-based strategies, become a mandate for MNCs in today's volatile global landscape. The next section reviews the main streams of flexibility literature, followed by another section with several real-world applications.

Flexible strategies: Option creation and exercise

A flexible strategy, or a strategy focused on creating flexibility, is the approach of strategic planning and implementation through option creation to proactively manage future uncertainty. By creating options, an MNC can choose a favorable option once the future uncertainty in question is resolved. Originated from the real option theory in finance, the scholarly work on option theories in international business and strategy can go back to the pioneering work of Kogut, Trigeorgis, and their colleagues in the 1980s. Four general areas of studies that can be identified,^{6,8,9,10} summarized as follows.

The first area is entry mode choice. This stream of literature views IJV as a tool of option creation when they face currently uncertain but potentially valuable opportunities in host country markets. With the options to

terminate or take over the joint venture in future, they can avoid major losses that might occur if a wholly owned subsidiary (WOS) is established prematurely, or if the subsidiary misses the growth opportunity due to unpredictable changes. In the same vein, other entry modes, such as exporting, licensing, and franchising may also be conceptualized as option creation tools.

Another stream of research emphasizes the value of multinational production and sourcing network in creating flexibility. MNCs often establish multiple plants for global operations to balance the local responsiveness and global integration. Location choice for production is heavily influenced by access to markets, host country advantages such as labor conditions and competitive pressures, and government policies. A flexibility strategy leverages the multi-plant setting by enabling MNCs to switch production between locations to mitigate the impact of volatile exchange rates, unexpected tariffs, or other shocks, and sometimes even to take advantage of arbitrage opportunities arisen from the volatility.

The third area of research considers the option value of sequential investment strategies. MNCs may initially invest in multiple locations with a small scale to keep the follow-up options open. After uncertainty is resolved, large scale investment may follow, or the initial small investments may be abandoned. MNCs may also defer investment decisions while retaining the right to proceed later without obligations. In general, this stream of research treats “wait-and-see” strategy for option creation, which may be more suitable for large and irreversible investments that require substantial commitment from MNCs.

The recent development, maybe considered the fourth area of flexibility studies, argues that MNCs can create flexibility through single location choice⁶ or co-evolving with the host country governments.^{25,26} To achieve flexibility, MNCs can select “ambidextrous” locations where there is balanced portfolio in terms of market potential and productive efficiency, so that the MNCs’ subsidiaries can serve the local markets as import substitution and/or the global markets as export platforms, depending on the future environmental development and the subsidiaries’ evolving role within the MNC network.⁶ In addition, MNCs can collaborate with host governments to gain legitimacy and create a flexible institutional environment through local spawning.^{26,27}

In summary, flexibility can be achieved by creating options internally via internal arrangements via entry mode choice, multi-plant configuration, or sequential investments, externally through partnerships with ambidextrous locations and host country institutions, or through a combination of these

approaches. In the following section, we propose several flexibility creation strategies with multi-plant setting and entry mode selection with examples.

Creating resilience through flexibility strategies: Applications and cases

In essence, a rational model of flexibility strategy-making includes the following components: evaluation of future uncertainty and impact analysis, problem definition and option mapping, option valuation and modelling, and implementation planning including boundary conditions for option exercise.⁹ Among the key challenges are evaluating future uncertainty, balancing short-term efficiency with long-term adaptability, and determining the timing of option exercise. Even though the need for a flexible strategy depends on a set of firm, industry, and country related factors, the rising uncertainty in today's global environment justifies a greater value of flexibility.

The main objective of this article is to advocate for flexibility strategies to address the rising uncertainty faced by MNCs. In this section we propose two illustrative strategies of flexibility creation by applying the theories reviewed previously. We do not intend to be exhaustive and prescriptive in strategy formation and implementation, as option creation and exercise is often context specific in terms of the possibilities at hand and feasibility of implementation.

A regionalized multi-plant flexible production network

To create options through a flexible production network, an ideal multi-plant configuration should meet the following criteria: first, the plants are highly substitutable to each other with minimal switching costs and effort; secondly, each plant should naturally maintain some immunity (i.e., independence) to the factors that may affect other plants;¹⁵ thirdly, each plant should have excess capacity (i.e., redundancy) to fulfill redirected orders from elsewhere; lastly, close coordination facilitated at the headquarters level, including knowledge transfer and sharing and timely decision-making, is required to enable swift option exercise.

Meeting these criteria may require significant reconfiguration of the global production networks of many MNCs. Traditionally, MNCs create distinct roles for plants within their network such as lead factories and specialized units, aligning them with strategic goals such as innovation or cost leadership.²⁸ Although this alignment improves network-level efficiency, it does not necessarily support operational flexibility. Many MNCs have a hub-and-spoke structure of GVC network where a few hubs perform most of the manufacturing, and the peripheral sites involve limited activities. In

contrast, a flexible strategy requires a more equalized structure and a balanced portfolio of host locations⁶ with low interdependence among them.

A desirable configuration could be a global network consisting of multiple regional blocs each of which centers around an ambidextrous location⁶. The regional blocs may be identified by geographic proximity, governance similarity, trade agreements, geopolitical coalition, and so on so that the level of uncertainty in operating within each bloc is significantly reduced. The ambidextrous location as a production base of the regional bloc can offer another layer of flexibility for the MNCs. For example, the location can be a major market or a major production site contingent upon the future evolution of the internal and external environment of the MNCs.⁶ A regionalized supplying network may further reinforce the differentiation between regional blocs.

These regional blocs can then coordinate with each other through inter-bloc production switch to ensure global market coverage under uncertainty and volatility, constituting a regionalized GVC network with global linkages. In an extreme situation, this structure can offer MNCs the flexibility to scale back to regional operations only, similar to a multi-domestic strategy but on a more integrated scale.

Tesla offers a strong case of such a configuration. Its “Gigafactories” for electric vehicles and major components are designed with high modularization and expandability responding to shifting demand. With its three Gigafactories manufacturing Tesla vehicles in Texas, Shanghai, and Berlin, and another factory built earlier in Fremont, CA,²⁹ Tesla can serve its three major markets, the U.S., China, and European region while maintaining significant connections among the three regional blocs with exports. For example, besides serving China and other Asian Pacific countries like Australia and New Zealand, Giga Shanghai has exported vehicles to Europe and North America. With its high automation in manufacturing, the U.S., China, and Germany can be called ambidextrous country locations for Tesla due to their high production efficiency and great market potential in their own states.³⁰ This setting of regionalization with global linkage offers flexibility for Tesla to gain significant efficiency by concentrating its production in China as well as keeping open the option of making and selling vehicles within European region if the European Union imposes a high tariff on China imports.

Another example, Nike, exemplifies great potential for flexible strategies with its evolving global production network. As a leading global brand in athletic footwear and apparel industry, Nike’s manufacturing footprint spans over 33 countries with emphasizing local sourcing of raw materials to promote supply chain autonomy.³¹ In recent years, Nike has relocated its

production from China, its historical global hub, to Southeast Asia including Vietnam and Indonesia,³² possibly reflecting a “China plus one” strategy to increase flexibility.³³ However, its current heavy reliance on Vietnam as the new global production base may introduce new vulnerabilities, if trade protectionism becomes more prevalent in Nike’s major nation markets, especially considering Vietnam’s relatively limited geopolitical influence and bargaining power. In contrast, China has been repositioned as a regional manufacturing center serving the Greater China markets. The switch of Chinese manufacturing from export platform to import substitution signaled Nike’s successful exercise of China’s location-specific flexibility to mitigate geopolitical risks.⁶

Nike’s current operational logic appears to prioritize short-term efficiency, assume that the trade disputes revolving around its key markets like the U.S. and China are only transient, or believe that the current tariff threats would not jeopardize its competitive position because most industry leading players have adopted a concentrated production with similar location portfolios. Notably, Nike primarily relies on contractors to manufacture its products,³⁶ possibly creating additional flexibility with flexible firm boundary,³⁴ as will be discussed in the following section.

Supply chain diversification and flexibility remains ongoing efforts by Nike,³⁶ empowered by its extensive global presence, but restructuring its network into regional blocs with global connections would be a more resilient long-term solution. Specifically, Nike may benefit from strengthening its production network in Mexico as a part of North America regional bloc, and expanding its manufacturing bases in East Europe or other locations to serve its key markets in EMEA (Europe, Middle East, and Africa), allowing Nike to better navigate future uncertainties.

To many MNCs, reconfiguring the current multinational network to create flexibility may take significant time and resources. The rising popularity of “China plus one” configuration may be a less costly but only temporary remedy, because it offers limited, short-term flexibility to address future uncertainty.

Flexible boundary of firm through partnership and local spawning

As introduced earlier, IJV can create the options of termination and taking over to manage uncertainty. The application of this method can expand to make-borrow-buy spectrum as a flexible boundary of MNC subsidiaries and flexible governments through a local spawning strategy.^{7,9,27}

First, a flexible agreement can be negotiated with local partner(s) in the host country in terms of degree of commitment ranging from long-term contracts to flexible equity ownership through friendly equity buyback (i.e.,

a flexible boundary of firm), contingent upon future conditions. With different strategic goals of partners in the host country and information asymmetry between parties, such agreements can be mutually beneficial. By nature, the boundary shifts between long-term contracts, joint ventures, and WOS reflect the conventional make-or-buy decisions (i.e., outsourcing to host country companies vs. offshoring via subsidiaries). Indeed, this type of option creation may expand to export, franchising, and licensing as they can also be viewed as lower-commitment options.

Moreover, to make this option creation and exercise viable in terms of timing and costs, MNCs may adopt a local spawning strategy to engage with host country entrepreneurial ecosystem and increase local welfare instead of focusing on global orchestration and integration.²⁷ MNCs' local engagement not only improves the legitimacy of MNCs operations but also helps local institutions co-evolve with MNCs to address broader initiatives like responsible and inclusive economic development.²⁶ As a result, MNCs may gain increased institutional flexibility and receive more tolerance and support to create and exercise options, beyond the spectrum of altering subsidiary ownership structure as an option creation tool.

Apple's iPhone supply chain can be a good example. Apple has concentrated production, historically in China, for its iPhones to serve global markets. It has developed a long-term relationship with partners like Foxconn and Pegatron. Over two decades, Foxconn became not only a key player in Apple's supply chain but also has benefited from Apple's technological support and knowledge transfer. The spinoffs from Foxconn and technologic spillovers through supply chain have contributed to the technological entrepreneurship in China. In return, Apple received extensive institutional support from China not only with a closely coordinated but yet flexible supplier network, but also through those incentives, policy changes, and exemptions offered by various levels of governments.³⁵ During the pandemic, Apple maintained a close coordination with Foxconn and various levels of government in Henan province, China with special arrangements to minimize the disruptions by the COVID-19 lockdowns.^{36,37} Besides, by working with China and the U.S. government, Apple was able to dodge the 15% tariff imposed in 2019 by the U.S. government for its iPhones, iPads, and other products made in China.³⁸

Apple's recent move to relocate iPhone production from China to India can be considered the exercise of an option created through local spawning. Its strategy in response to the frictions between China, the U.S., and European Union ended up with a duplicate of production ecosystem, involving direct investments from Foxconn and numerous other suppliers both in China and India, expatriation of hundreds and thousands of

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engineers for knowledge transfer, and tailored policy changes from Indian governments.

While Apple still has a concentrated production network, Apple and Foxconn's expansion to other countries may be the start of its multi-plant design to reduce its reliance on a single country. Currently, Foxconn is still fully committed to China with its continuous investment,³⁹ leaving an option for Apple to move back whenever the situation demands. Together with its operations in India and earlier attempt in Vietnam, Apple has already created more options to prepare for future uncertainty, including possible geopolitical tension between China and India. In this case, local partnership with local spawning may complement the flexibility creation through multi-plant configuration.

Nike, besides its flexibility strategy by contracting its manufacturing operations to partners in many countries, has also implemented a local spawning strategy to lower its option excise cost and shorten response time. Nike supports its partners by sending expatriate managers to their premises and inviting their leadership to visit Nike headquarters. It also co-invests in technological upgrades and product development with its more developed partners.³⁸

Building a foundation for flexibility strategy

Although the previous section illustrated some methods of benefits of flexibility strategies, adopting such a strategy may require a fundamental strategic shift for many MNCs. In this section we propose some cognitive and organizational foundations that can help develop and implement a flexibility strategy.

Cognitive foundation: Efficiency vs. flexibility

The COVID-19 pandemic triggered a reassessment of what efficiency really means in value chains.⁴⁰ The rising uncertainty at a global scale suggests that MNCs must prioritize flexibility over instant optimization and maximization backed short-term efficiency. As discussed earlier, the current efficiency imperative behind MNCs' global operations is unlikely to lead to a fundamental shift in the status of MNCs or globalization.²⁴ Diversifying supplier networks at the operational level may have only marginal impact. Quite often, the failure to anticipate or adapt to a rapidly changing environment at the strategic and headquarters' level would result in performance volatility and even organizational failure.

Therefore, an updated managerial mindset shifting away from short-term efficiency toward long-term continuity and stability is essential for a flexibility strategy. If efficiency remains the primary language for managers,

it should be “uncertainty-adjusted,” long-term efficiency instead of immediate efficiency based solely on currently available information. From a practical standpoint, cost savings at production stage may not be crucial, considering that major costs of MNC operations are typically incurred at research and development and headquarters levels.²⁴

Managers also need to better understand the costs associated with option creation and exercise. Under a rising level of non-ergodic and transmutable uncertainty, the projection of expected future return is not accurate, and the resulting cost-benefit analysis becomes less reliable. Ultimately, decision-making may eventually rely on the managers’ sense-making on the future world, awareness of real options, and abilities to craft and implement a flexibility strategy. The financial costs of option creation and exercise may depend on creation methods. In a multi-plant configuration, the costs may involve the extra production capacity, loss of economy of scale, switching costs, and the extra coordination required between subsidiaries. In the case of flexible partnerships, the costs may involve extra burdens and profit loss from switching between entry modes such as export, joint venture, and WOS. However, the payoffs of these associated costs could be the savings and profits from operational continuity in serving and growing global markets.

Importantly, the awareness of flexibility strategies plays a significant role in transforming managerial mindsets. Empirical evidence shows that managers who have received awareness training more actively shift subsidiary resources with real options logic, utilize the multinational network, and thus achieve better firm performance, especially in the periods of high market uncertainty.¹⁷ Therefore, training programs on flexibility and real options may meaningfully contribute to the development of cognitive foundation of flexibility strategies.

Organizational foundation: Dynamic capabilities

Decision making under uncertainty requires organizational dynamic capabilities, together with entrepreneurial and semi-improvised managerial action.⁴¹ Dynamic capabilities are “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.”⁴² In a fast-changing environment with high uncertainty, managers must be able to effectively sense emerging threats, seize new opportunities, and transform organizational resources and structures to achieve sustainable growth and profitability.⁴³

Dynamic capabilities are clearly relevant to flexibility strategies in that these strategies do not follow organizational routines in allocating resources based on marginal analysis and maximum exploitation. But rather, option creation can be understood as an innovative process to mobilize, reconfigure,

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and upgrade the existing resources by leveraging MNCs' dynamic capabilities. The process can be guided by the sense-seizing-transform framework and carried out through semi-improvised managerial actions. In this sense, the power of flexibility strategy, like a resilient GVC, goes beyond that of the resource bundle owned by the MNC in generating sustainable competitive advantage (as emphasized in the resource-based view of the firm), because flexibility strategy, on its own, as a dynamic manipulation of resources, may generate superior performance through arbitrage from options.

BYD Motor's strategic shift during the COVID-19 pandemic provides an illustrative case of the importance of dynamic capabilities. When the auto market stalled and demand for personal protection equipment (PPE) surged, BYD assembled a cross-divisional team that designed and manufactured mask production machinery within seven days. Within several months, BYD became the largest mask manufacturer in the world, shipping 50 million masks per day.⁴⁴ The quick transition from automobiles to PPE, with the nonwoven fabric as the only shared input of the two businesses, demonstrated its strategic and operational flexibility underpinned by dynamic capabilities.⁴⁵

Operational foundation: Scalability and technologies

Scalable operations and technology adoption can support a flexibility strategy by reducing the costs of option creation, shortening the time for adjustment and option exercise, and improving post-adjustment performance. For example, Foxconn maintains a flexible workforce to quickly adjust its production capacity at minimal cost. Tesla's gigafactories can assemble different vehicle models and trims thanks to its modularized product design and flexible manufacturing process.⁴⁶ Modularization may also support a balance between standardization and customization when products are manufactured in a multi-plant network but serve diverse markets.

Besides the technologies recommended in the supply chain literature, such as AI, data analytics, real-time monitoring, and cloud computing, to enhance organizational agility, within-MNC coordination, and supply chain transparency,⁴⁷ a diversified technology base may ease the constraints of option creation by reducing asset specificity between different options, as also observed in the BYD case. AI, in particular, can help develop manufacturing systems that are more responsive to the external environment and changing customer needs, adding another layer of flexibility at the operational level.⁴⁸

Discussions and conclusions

With ongoing challenges facing MNCs' global value chains, some predict a major retreat from global expansion, while others believe that no significant changes would occur. Our position is that flexibility strategy is key to the future of MNCs' global operations. Drawing on the literature on real options theory in international business, this article calls for a fundamental shift from an efficiency-based to a flexibility-based strategic approach to address rising global uncertainty and to restore MNCs' legitimacy and competitiveness. As the flexibility perspective suggests, an uncertain world does not necessarily curtail globalization. By creating options with geographic configurations for a more flexible MNC network and with local partnership and spawning, a flexibility strategy may actually lead to a deepening of global engagement. It also serves as a corrective to hyper-globalization, which created vulnerabilities through over-reliance on a small number of countries.

It is important to note that the MNCs' ability to create options and the appropriate methods for doing so depend on a set of firm-, industry-, and country/global-level characteristics, besides the foundations proposed in the previous section. In addition, MNCs must carefully frame uncertainties based on their potential impact and assess their own resources and capabilities within their specific industry and geopolitical contexts. For example, in information-driven, knowledge-intensive sectors, flexibility creation through outsourcing may hinder effective knowledge transfer. A multi-plant production network under hierarchical control may be preferred for resilience and responsiveness.⁴⁹ Also, reliance on outsourcing may generate a lock-in and hold-up effect and increase the long-term costs of flexibility. On the other hand, locational asset specificity and economies of scale may pose challenges for multi-plant configuration. Upgrading operational methods, such as through flexible production systems and emerging technologies may alleviate some of these challenges, but local embeddedness and host country integration can be critical to success for certain industries. Thus, the multi-plant network may need to be complemented with other methods for option creation to achieve effective flexibility.

To conclude, flexibility strategies are imperative for MNCs to navigate rising uncertainties, avoid downsizing risks, and pursue growth opportunities, especially in a world where no one has a crystal ball to foresee the future. Once again, it is essential to evaluate the option creation costs and benefits and to balance between them. Different flexibility strategies come with different cost structures, and studies suggest that excessive or non-shiftable redundancies may fail to deliver real flexibility.⁵⁰ Lastly, without managerial capability and flexibility literacy to exercise strategic

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options in a timely and creative manner, the potential value of option creation in strategy-making may not be fully realized.

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