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# Valuing Collaborative Synergies with Real Options Application: From Dynamic Political Capabilities Perspective

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**Abstract:** This paper aims to justify propositions that the dynamic political capabilities of collaborative partners to manage their institutional contexts are important drivers of collaborative synergies which can be valued by real options. To date, the institutional context of collaborative corporate strategies (strategic alliances, mergers, and acquisitions), particularly the analysis of the influence of government agencies on the synergies or unrealized synergies of collaborative ventures, remains unexplored. Moreover, the interdependence between the institutional dimensions of the collaborative strategies, the dynamic political capabilities of the collaborating partners, and collaborative synergies are needed to be integrated into new conceptual models and a new framework. This paper contributes to this request by providing a cohesive framework of micro-foundations with dynamic political capabilities and demonstrating an application of simple and compound sequentially combined real options for collaborative synergies' valuation in the findings and discussion section. This paper makes several theoretical and empirical contributions to international business, strategic management, and corporate finance. The practical implication of the research is evidence that food retailers who want to grow with the latest consumer trends will need dynamic political capabilities to deal with the impact of an institutional context. Finally, this paper discusses research limitations and future work.

**Keywords:** dynamic political capabilities; micro-foundations; mergers and acquisitions; international alliance; collaborative synergy; simple real option; compound real option



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*“Strategy is concerned with the creation of value; and if the value is the correlate of valuation practices; then it follows that strategy has to be understood in relation to valuation practices.” (Kornberger 2017, p. 1754)*

## 1. Introduction

The institution-based strategy view has become a leading perspective in international business (IB) and strategic management (SM). The institutional-based strategy view involves the institutional dimension when providing relevant answers to the fundamental questions of strategy: What determines the success or failure of a firm in international competition? (Rumelt et al. 1994). This new paradigm is still very young in international business (IB) and the goal of strategic management (SM), and one of its challenges, is to “demonstrate the importance of institutional factors in our understanding of competitive advantage” (Garrido et al. 2014, p. 83). To date, little research has examined the role of dynamic political capabilities as levers or brakes on the institutional factor and its impact on synergies in international collaborative ventures.

This paper aims to justify propositions that the dynamic political capabilities of collaborative partners managing their institutional contexts are important drivers of collaborative synergies which can be valued by real options. In this vein, this paper bridges dynamic political capabilities (Oliver and Holzinger 2008) with the phases of the collaborative ventures' development from cascading impacts of the global governance system's lenses (Petricevic and Teece 2019) and with a measurement of collaborative synergies with an application of compound real options that have been previously presumed to be independent. The paper

poses two research questions: *How do the existence or the lack of dynamic political capabilities of collaborative partners drive or impede a collaborative venture's synergy creation within their supra-national and national institutional contexts? How can the value of collaborative synergies resulting from the dynamic political capabilities of collaborative partners be measured with real options applications?*

The rest of the paper is organized as follows. At the outset, the institutional context is examined as an important lever or brake of synergies in collaborative ventures. The importance of the dynamic political capabilities of the collaborating partners is highlighted as an important antecedent of relational, network, and non-market types of synergies in international alliances. Based on an in-depth literature review, the VUCA (volatility, uncertainty, complexity, and ambiguity) framework (Bennett and Lemoine 2014) was extended regarding the phases of collaborative venture formation and development and micro-foundations of dynamic political capabilities. Next, the application of the simple and advanced real options valuation techniques to measure collaborative synergies is discussed. In the methodology subchapter, research design and methodology are discussed. Two illustrative case studies on collaborative ventures in the global grocery market, namely, the successful merger in 2016 of Ahold and Delhaize, and the termination of the cross-border alliance between Tesco and Carrefour (2018–2021), empirically test and justifies the two provided theoretical propositions. Finally, the paper discusses research findings, theoretical and empirical contributions, limitations of the research, and future work.

## 2. Key Literature Review

### 2.1. Institutional Contexts in International Business

Institutions can be understood as the rules of the game in a society (North 1990; Williamson 1998); they are the humanly devised constraints that structure political, economic, and social interactions (North 1990). This perspective has roots in both the institutional economic (North 1990; Williamson 1985) and institutional theory literature (DiMaggio and Powell 1983; Scott 1995), and thus, “incorporates the role of institutions in understanding why firms differ in terms of competitive advantage” (Garrido et al. 2014, p. 82).

The institution-based view of strategy (Peng et al. 2009) has become a leading perspective in strategic management (SM) and international business (IB). Recognition of the importance of institutions as a competitive advantage or disadvantage is important so that they are no longer treated as background conditions (Peng et al. 2008). This recognition is also closely related to Bamberger's (2008) call for the more formal inclusion of contextual factors (e.g., institutions) in existing models that attempt to advance management theories, such as the dynamic capabilities view and the resource-based view of competitive advantage (Garrido et al. 2014, p. 83).

Nevertheless, the use of the institution-based strategy view as an integrated framework for understanding competitive advantage is still quite new. This implies that further research is needed on what determines the success or failure of an international strategic alliance. Moreover, most of the academic research on the institutional strategy view has focused on emerging market economies (China, India, and Malaysia are three examples) (e.g., Hitt et al. 2004). Therefore, research on the institutional context of industrialized countries could help to integrate the institution-based view into research on dynamic capabilities and core competencies of international alliances.

This paper seeks to contribute to this scientific request by providing an empirical analysis of the institutional context in EU countries (before and after the Brexit) and the USA during the COVID-19 pandemic, thus exploring the impact of governments on international strategic ventures and the dynamic political capabilities of the collaborative partners. In this sense, this paper also contributes to the scholarly call to include institutional dimensions in dynamic capabilities views.

## 2.2. Institutions, Strategic Alliances, and Dynamic Capabilities

Institutions are a critical element of the business ecosystem; regulatory laws and antitrust laws influence part of the business environment (Teece et al. 1997). “The organization of society—particularly the institutional, political, and legal systems—is a critical determinant of success” (Teece 2009, p. 186). Companies with strong dynamic capabilities not only adapt to the economic ecosystem but also shape it by collaborating with institutions (Teece 2009). However, institutions such as regulators, the judiciary, and standard-setting bodies can also constrain the rules by which competition plays out (Teece 2007, p. 1323). Hoffman also agreed that regulatory constraints affect a firm’s profitability in a particular area (Hoffman 2007).

In addition, Teece (2009) argues that antitrust economics has difficulty dealing with the dynamic concepts of competitive advantage and justifies that promoting dynamic (not static) competition benefits consumers the most, if not in the short run, then in the long run (Teece 2009, p. 258). Collaborative partners can sense and even shape the future by seizing new value-added combinations of assets and reshaping organizations, including regulatory and institutional structures, if necessary (Teece 2007, p. 1346).

A strategic collaborative venture is a purposeful relationship between two or more independent companies that involves the exchange, sharing, or joint development of resources or capabilities to achieve mutually relevant benefits (Kale and Singh 2009; Gulati 1995). However, the integration of two (or more) international organizations presents a critical institutional management challenge that the new organization must address by developing dynamic political capabilities (Edwards 2010; Oliver and Holzinger 2008). Dynamic capabilities are the ability of an organization to integrate, build, and reconfigure internal and external competencies to shape and respond to a rapidly changing business environment (Teece et al. 1997).

More specifically, according to Teece (2007, p. 1319), “dynamic capabilities can be divided into the ability to (1) identify and shape opportunities and threats, (2) seize opportunities, and (3) maintain competitiveness by enhancing, combining, protecting, and, when necessary, reconfiguring the firm’s intangible and tangible assets.” More generally, dynamic capabilities thinking helps firms to respond to volatility, uncertainties, complexities, and ambiguities (VUCA) stemming from changes induced by government policies (Teece 2016; Petricevic and Teece 2019). If this is true, what micro-foundations of dynamic political capabilities of collaborative partners are required to manage their institutional contexts in obtaining collaborative synergies?

## 2.3. Dynamic Political Capabilities and Phases of the Collaborative Venture’s Development from Cascading Impacts of the Global Governance System Reshaping

Oliver and Holzinger (2008) argued that the government’s increasingly pervasive influence on firm activities has made firms begin to manage their institutional environment by employing a set of political tactics, such as lobbying, financial contributions, and coalition formation (Bonardi et al. 2005; Hillman and Hitt 1999; Hillman et al. 2004). However, despite growing interest in the reasons and motivations that impel firms to formulate corporate political actions, the IB and SM literature has paid limited attention to strategic institutional (political) management as a source of value creation (Oliver and Holzinger 2008), specifically, to institutional contexts and the impact of the role of governments on international strategic venture’s synergies.

Firms’ relations with regulatory bodies have been viewed primarily as an institutional constraint on firms (DiMaggio and Powell 1983; Pfeffer and Salancik 1978; Scott 2001) rather than a set of opportunities for leveraging firms’ core competencies to earn economic rents (Oliver and Holzinger 2008) or synergies in international collaboration. Regarding institutional strategies of collaborative partners, the institutional environment suggests that a firm’s institutional strategy is likely to be grounded in whether to influence or comply with institutional regulations (Oliver and Holzinger 2008). Moreover, partners are more likely to engage in institutional actions when “they operate in industries that are

concentrated and impose significant political pressures on them” (Oliver and Holzinger 2008, p. 505).

An engagement in institutional actions is a central idea of a recent study by Petricevic and Teece (2019) on the phase of the collaborative venture development from cascading impacts of the global governance system reshaping that is also important for the current paper. Petricevic and Teece provided three clusters of dynamic capabilities needed for developing new responses to the VUCA’s impact on the new global economic order and demonstrated three order cascading effects requiring a re-thinking by global players on how to deploy their dynamic capabilities in the VUCA circumstances (Petricevic and Teece 2019). In this vein, the dynamic capability view on strategy is a relevant framework to study how collaborative partners address or do not address extreme VUCA conditions in their supra-national and national institutional environments.

Creating and capturing value in collaborative ventures in the presence of cascading effects from the systemic erosion of the rule of law in the prevailing global economic order, as described by Petricevic and Teece (2019) requires new frameworks. Having responded to this scientific request, this paper has bridged dynamic capabilities (Teece 2007, 2009), three orders of cascading effects of the institutional environment (Petricevic and Teece 2019), dynamic political capabilities (Oliver and Holzinger 2008), and micro: the foundation of dynamic political capabilities in the integrative construct as shown in Table 1.

**Table 1.** Bridging allocated components of dynamic political capabilities among three phases of a collaborative venture’s development within an institutional context.

The Phase of the Collaborative Venture’s Development from the Cascading Impacts of the Global Governance System Reshaping	First-Order Cascading Effect: Impact of Supra-National Institution Level	Second-Order Cascading Effect: Impact of a National Institution	Third-Order Cascading Effect: Coordinated Strategic Alliance’s Partners’ Response
Dynamic capabilities in the VUCA environment (Petricevic and Teece 2019)	Sensing a change in the general IB environment condition and shaping the impact of supra-national institutions on collaborative synergies	Seizing capacities requiring rapid and coordinated responses to identified opportunities, or neutralizing threats on the national institution-level that can impact collaborative synergies	Transforming the internal systems, culture, and business models and achieving novel resource alignments in search of synergies, both internally and with collaborative partners to address the external institutional changes.
Dynamic political capabilities (Oliver and Holzinger 2008)	Scanning political context and predictive capabilities	Political social capital deployment	Institutional influence capabilities
Micro: the foundation of dynamic political capabilities	Capabilities exploring the supra-national institutional context imposed by regulators, laws, and standard-setting bodies and foretelling permissible constraints	Capabilities exploring and exploiting the national institutional context with high regulative uncertainty through focusing their probing around finding the solution	Capabilities exploiting regulatory and institutional structures through collaboration with them

Source: Adopted from Petricevic and Teece (2019) and Oliver and Holzinger (2008) and extended by the author.

Thereby, the institutional contexts of strategic collaborative ventures are tremendously impactful on their collaborative synergies. Thus, taking the above arguments together, the author proposes,

**Proposition 1.** *The dynamic political capabilities of collaborative partners to manage their institutional contexts across the phase of collaborative venture development are important antecedents of collaborative synergies.*

#### 2.4. Relational, Network, and Non-Market Collaborative Synergies

Collaborative synergy can be defined as a combination of two firms' assets that are more valuable together than they are separate. Having researched the phenomenon of synergies, scholars have referred to a cross-disciplinary approach (e.g., strategic management and corporate finance) and employed multiple theoretical lenses (e.g., resource-based view, IO economics, and behavioral theory) (Haspeslagh and Jemison 1991; Feldman and Hernandez 2021).

The broad appeal of the concept lies in its generality: any two assets joined via a collaboration can potentially create synergistic added market value. Feldman and Hernandez (2021) found that prior works have discussed the several most common collaborative synergies: operational (47.1%), firms' market power (16.5%), and financial (7.6%) as well as agency/governance misalignments as constraints to synergy creation (16.2%). Moreover, the study of Chen et al. (2015) shows that operating synergy is a dominant factor in strategic alliances.

"But this generality has also led to a lack of systematic development and synthesis, which hinders theoretical progress and limits the usefulness of the concept for scholars and managers" (Feldman and Hernandez 2021, p. 1). In this vein, Feldman and Hernandez (2021) have uncovered three novel synergy sources (relational, network, and non-market) arising from partners' external cooperative environments.

The most immediate level beyond the firm is relational synergy, which refers to contractual cooperative partnerships with individual third parties. Relational synergy makes interactions with other firms more profitable by governing business cooperatively, not competitively (Dyer and Singh 1998), and thus, transacting more effectively; each not only attracts more customers (an internal synergy) but also transacts more effectively with each of its customers by offering better terms for both sides (a relational synergy) (Feldman and Hernandez (2021)).

The next level is the network synergy, comprising the collaborative firms' direct and indirect cooperative ties. Network synergies are driven by inheriting new ties that the partnering firms bring to each other's pre-existing network (additive) or eliminating redundant ties that the partners have in common (subtractive) (Hernandez and Shaver 2019). Moreover, by interacting with pre-existing business networks, partners interact with various institutional stakeholders in the non-market environment (Baron 1995).

Non-market synergies can result from external institutional relationships and may require dynamic political capabilities. Whereas network synergy and relational synergies require comparatively low integration or moderate integration (e.g., strategic alliance), non-market synergies require the highest integration relative to the others (e.g., merger and acquisition). Thus, the time required to initially achieve each of those synergy types increases (on average) in that order. Damodaran (2012) defined the formula of collaborative synergy as follows: the value of collaborative synergies equals the values of the combined firms, with synergy minus the value of the separated firms without synergy. Because this specific paper's interest is the application of real options valuation to measure these collaborative synergies, the paper next discusses the compound option application to measure it.

#### 2.5. Simple and Advanced Real Options Valuation of Collaborative Synergies

Real options theory recognizes the strategic value of managerial flexibility to take alternative courses of action over time. Copeland et al. (2000) argue that the fact that the options exist does not mean that they are optimally managed because managers "are usually not familiar with the methodological advances that have made real options easier to apply and to understand" (p. 416). The roots of real options theory date to 1977, when the concept was first introduced. Since then, it has attracted considerable attention, although initially academic. Nowadays, companies tend to recognize the benefits of real option application, but still are reticent to apply it in practice.



Regarding major corporations worldwide, only a few prefer real options valuation to traditional valuation tools, such as discounted cash flow analysis and multiples analysis; it can be surmised that the situation is analogous in collaborative synergies valuation as well. Recognizing the pitfalls of discounted cash flow (DCF) analysis, managers, and analysts traditionally resort to complementary valuation techniques. Amidst the wide range of techniques dealing with decision-making under uncertainty, there seems to be a distinctive one which rectifies the shortcomings of the DCF approach—namely, real options theory (Stout et al. 2008).

As noted by Brandão et al. (2005), real options in the broadest sense can be defined as projects which have option-like characteristics, that is—the value of the project is contingent on developments taking place over its duration. However, conventionally, a real option is understood not as the project itself, but rather as the right and not the obligation to pursue a particular (dis)investment in a pre-determined time frame (Luehrman 1998; Bailey et al. 2003; Adner and Levinthal 2004).

The value of a real option is derived from the uncertainty surrounding either the underlying asset (most commonly—FCFs) or another real option (Copeland and Keenan 1998; Mun 2003, p. 74). Real options, whose value depends on the successful implementation of other options, may be collectively referred to as compound options (Damodaran 2005). Additionally, if there is more than one source of uncertainty associated with the investment, then such options are known as rainbow options (Copeland and Keenan 1998).

A wide range of real option valuation methodologies have been proposed thanks to a regular appearance in academics, financial analysis, and business consulting (Tong and Reuer 2007). Real option valuation approaches are quite distinctive, ranging from simplistic ones (Luehrman 1994) to very complex stochastic optimization procedures (Mun 2002, pp. 260–62). Borison (2005) notes that the results obtained from different real option valuation techniques are likely to differ and even be mutually contradictory. Kodukula and Papudesu (2006, p. 66) listed the main-stream real option valuation techniques which should be applied in a particular situation.

Recombining binomial lattices are one of the most flexible methods to solve a real options problem due to their (relatively) simple calculus and illustrative appeal. This has led to enduring and widespread acceptance of the recombining binomial approach. Currently, it is the most used method to solve a real options problem (Copeland et al. 2000, p. 407; Mun 2002, p. 100; Damodaran 2005; Nembhard and Aktan 2009, p. 25).

Collaborative synergies can be viewed as a simple real option value (market value added) that is created in a merger or an acquisition. However, a compound option exists when a particular real option's value will be determined by the value of another real option, not an underlying asset per se (Copeland and Keenan 1998). In this vein, initiating a cross-border alliance can be viewed as exercising the initial option to generate alliance-based synergies, which in turn leads to the creation of other real options, such as the option to merge and acquire or the option to abandon (Li et al. 2007).

For instance, the sequential compound option could be employed when a strategic alliance goes to acquisition as happened in 2014 with the Italian Fiat and American Chrysler companies. After nursing Chrysler to health in a strategic alliance within five years (since 2009), Fiat acquired the remaining shares and owned 100% of Chrysler via a merger in 2014 and has just completed their merger with the PSA group in 2021 (Guillaume et al. 2021).

The cumulated market value of collaborative business partners before the announced deal terms, excluding the week of the announcement (four-week average), replaces the stock price investment required to obtain the asset (So); the hypothetical future market value of the separated entities forecast by the DCF or EV-based multiples replaces the strike price (E), the expectation of management on obtaining collaborative synergy or the synergy life cycle replaces the time to expiration (T); the domestic three-month rate leading to the collaborated partner replaces the risk-free rate of return (rf); and the annualized standard deviation of return after the deal announcement replaces the stock return variance ( $\sigma$ ) (Dunis and Klein 2005).

The present values of the collaborated firms are dependent on the synergies and collaboration happens only when the market values of collaborative partners are higher than without collaboration. Thus, summarizing the arguments regarding the real options valuation of collaborative synergies, the author formally proposes,

**Proposition 2a.** *Non-market synergies resulting from dynamic political capabilities in mergers and acquisitions deals can be valued with a simple real option,*

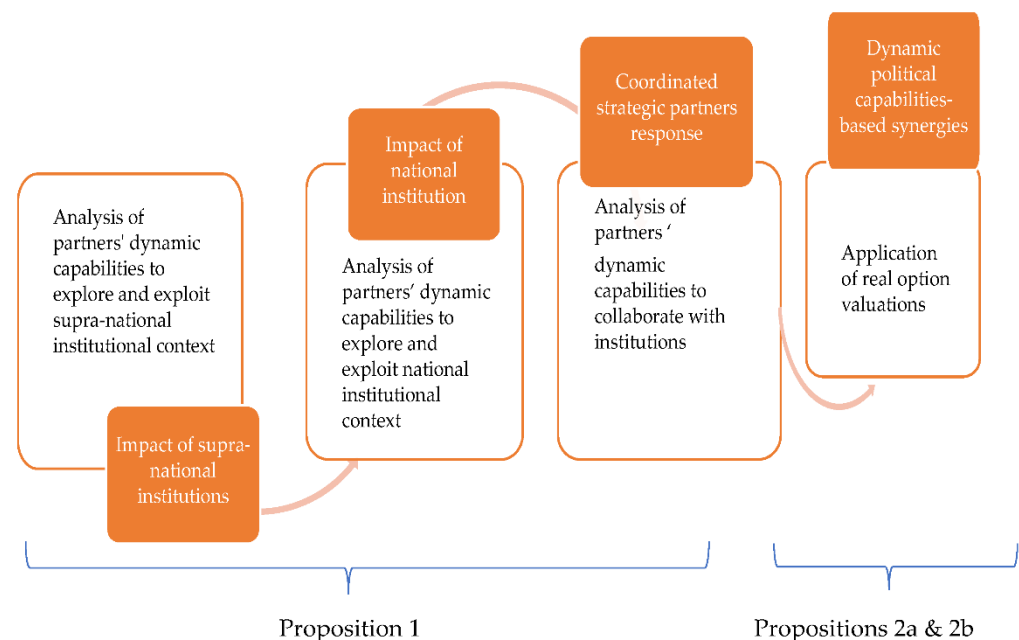
**Proposition 2b.** *Non-market synergies resulting from dynamic political capabilities and initiated by the cross-border alliance, which in turn leads to mergers and acquisitions, can be valued as a sequential compound growth option.*

To give an empirical justification of two theoretical propositions, this paper further discusses research design and methodology and interprets the case studies of the Ahold and Delhaize merger and findings of the strategic alliance between Tesco and Carrefour.

### 3. Research Design and Methodology

The case study methodology has a unique advantage for exploring and investigating a contemporary real-life issue in-depth (Zainal 2007) through the contextual analysis of a collection of “focal activities, outcomes, conditions, and their relationships” (Guo et al. 2021). Yin (1984) defines the case study method as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not evident; and in which multiple sources of evidence are used” (Yin 1984, p. 23). This paper justifies the two phenomenon-driven propositions by employing two case studies as objects to an investigation (Eisenhardt and Graebner 2007).

The conceptual model of research that refers to the dynamic capabilities’ framework, collaborative synergies, and real options application is given in Figure 1. The conceptual model unpacks the specific relationships among the main constructs presented in the theoretical part of the paper and underlines the postulated theoretical propositions.



**Figure 1.** Conceptual model of research: Assessment of the VUCA environmental impact on collaborative ventures, analyses of dynamic political capabilities as the antecedence of collaborative synergies, and real options valuation.

There are three units of analysis conducted in this paper. This paper argues that dynamic alliance capabilities can be developed at various levels: the supra-national in-

stitution level (first unit of analysis), the national institution level (the second one), and the collaborative partner's level (the third one). The phases of the collaborative venture's development from the cascading impacts of the global governance system's reshaping (Petricevic and Teece 2019) were employed to explore the dynamic political capabilities of each phase and their micro-foundations.

The author has chosen powerful objects of research; and thus intriguing research, the four global grocery chains: Ahold (Dutch) and Delhaize (Belgian), Carrefour (French) and Tesco (UK-based). Having qualitatively analyzed the secondary data (mainly open-source data) and quantitatively explored the synergies with a simple and complex (compound) real options application, the case studies research helped explain both the process (synergies creation) and outcome of a phenomenon (synergies valuation) through a comprehensive observation of institutional contexts and the partners' dynamic capabilities that will enrich the readers' understanding about the sub-national and national institutional contexts' impact on international business in general and the importance of the dynamic political capabilities of collaborative partners in particular.

There are two steps to carrying out the empirical case study research in the current paper. First, to validate the first proposition, the author has employed the integrative construct of allocated components of dynamic political capabilities among three phases of a collaborative venture's development within an institutional context given in Table 1. It helped to unpack the micro-foundations of dynamic political capabilities of collaborative partners that provided or ruined the collaborative synergies. Second, to validate the second proposition, the paper demonstrates the application of a simple and sequential compound real option employing the binomial option pricing model (BOPM) to quantify synergies in these strategic collaboration deals.

Li et al. argued that "Case studies in addressing the practical implementation of real options are particularly useful to our understanding of applications of real options theory in practice" (Li et al. 2007, p. 60). To calculate the collaborative synergy as a simple real call premium option, as in the case of the Ahold merger in 2016 and sequential real options in the case of the Carrefour and Tesco alliance (2018–2021) with an application of the Binominal Option Pricing Model, the author has adopted the recommendation of Dunis and Klein (2005) on the real option variable and as shown in Table 2.

**Table 2.** The correspondence between the real and financial call options.

Variables of a Financial Call Option	Variables of a Real Call Option	Sources of Data Used
Stock price (S)	The cumulated market value of collaborative business partners before announcement deal terms, excluding the week of an announcement (four-week average)	YChart.com; company's reports
Strike prices (K1; K2)	The hypothetical future market value of the separated partners without collaboration; forecast by the EV/EBITDA-based multiples	Finance.Yahoo.com; Marketscreener.com; Finbox.com; company's reports; own calculation
Volatility ( $\sigma$ )	The annualized standard deviation of the weekly stock movement of the leading partner after the announcement of the deal	V-Lab. GARCH Volatility Analysis; the United States Securities and Exchange Commission (SEC) Reports; own calculation
Rate of risk-free (r)	Domestic three-month rate of the country of the leading partner of the collaboration	Statista.com; Gurufocus.com
Time to maturity of the option (T1; T2)	Three years or the assumption of the partners on the duration to obtaining synergy	The life cycle of a collaborative synergy.

Source: Developed by the author.

The values of a simple and sequential compound real option or option premiums (collaborative synergies) have been calculated using an Excel spreadsheet for the American and European types of options. The real option variables and binomial option pricing model's parameters obtained from open data to measure collaborative synergies are further discussed in the case study's research.



#### 4. Data Analysis, Interpretation, and Findings

Peng et al. (2008) argue that the institutional framework in any given country is always in some sort of transition (e.g., Brexit and the COVID-19 pandemic nowadays). In this vein, Redding (1990) calls for a heavier emphasis on thick descriptions of the context, such as institutions and national cultures, toward a clear strategic understanding: how do such institutions impact firm strategy and performance?

##### 4.1. Rationales behind Ahold and Delhaize Entering a Merger, the Impact of Institutional Context, and Dynamic Political Capabilities

In 2016, the completed \$29 bn mergers between Ahold, the Dutch owner of the Stop and Shop, and Giant chains in the United States with Delhaize, the Belgian operator of American chains Food Lion and Hannaford, has created one of the largest supermarket chains in the United States (Grocery Dive 2020) and has resulted in the merged Ahold-Delhaize combination holding a 4.6 percent share of the United States grocery market, making it the fourth-largest player by revenue (Walker and Gasparro 2015). This merger has enhanced their buying power, scale to innovate, and acquired more resources to battle growing competition from discounters such as Aldi and retail giant Walmart, online players such as Amazon, and upscale chains such as Wegmans and Publix (Grocery Dive 2020).

In the United States, the opening of new stores is regulated by municipalities through zoning and licensing laws (SEC 2017). Ahold Delhaize demonstrates strong dynamic political capabilities by engaging with public policymakers through industry associations or directly via face-to-face meetings and written contacts, input (information on their website), and participation in public hearings or conferences. For instance, in December 2021, Food Lion President Meg Ham joined U.S. President Joe Biden at the White House for a round table discussion on the strength of Food Lion's supply chain, the sourcing of more local products, and COVID-19-driven shifts in consumer behavior (Ahold Delhaize 2021).

The comments on the three-levels of the institutional context of the Ahold and Delhaize merger, their capabilities, and comments on their opportunities to provide collaborative synergies are given in Table 3.

**Table 3.** Comments on the institutional context of Ahold Delhaize in the EU and USA and opportunities and challenges to generate collaborative synergies.

Cascading Impacts of the Global Governance System Reshaping	First-Order Cascading Effect: Impact of Supra-National Institution Level	Second-Order Cascading Effect: Impact of a National Institution	Third-Order Cascading Effect: Coordinated Strategic Partners' Response
Micro: the foundation of dynamic capabilities	Capabilities exploring supra-national institutional context imposed by regulators, laws, and standard-setting bodies and foretelling permissible constraints	Capabilities exploring and exploiting national institutional contexts with high regulative uncertainty through focusing their probing around finding the solution	Capabilities exploiting the regulatory and institutional structures through collaboration with them
Comments on the opportunities, challenges, and dynamic capabilities of Ahold Delhaize	The development of digital technologies is the key factor that determines the supranational intervention in the agricultural economy of the EU today (Kondratieva 2021). Ahold Delhaize was one of the first in the EU to introduce digital technology for discounting expiring products to reduce losses and waste and to increase the number of consumers (Kondratieva 2021) that impact Ahold Delhaize's collaborative synergies.	Ahold Delhaize and its respective subsidiaries is subject to regulation by numerous federal, state, and local regulatory agencies in the United States (SEC 2017). Ahold and Delhaize Group have agreed to sell 81 stores to settle Federal Trade Commission charges that their proposed merger would likely be anticompetitive in 46 local US markets (Federal Trade Commission (FTC) 2016). It provides an opportunity to expand into the US market and generate a collaborative synergy.	The United States government spending trillions of dollars on COVID-19 stimulus and relief packages positively affected consumer confidence and spending in the food and beverages services sector (Ahold Delhaize 2021). This provided the opportunity to increase the customer base and generate collaborative synergies in the US market. The two-year stack comparable sales for Ahold Delhaize USA grew by 16.3% in 2021 (Ahold Delhaize 2021).

Source: Developed by the Author.

Table 3 proves the validity of the first propositions developed in the current paper. To measure this merger's collaborative synergies and validate the second proposition, a simple real call option has been applied in the next section.

#### 4.2. Measuring the Realized Collaborative Synergies of an International Merger by Simple Real Call Option Application

Three years after the Ahold and Delhaize billion-dollar merger, analysts argued that the merger has delivered promised synergies and given the group new core competencies and additional investment in its business. Without the merger, "... Ahold and Delhaize as separate entities would have been weaker players, with less ability to compete on key attributes coveted by consumers such as convenience, price, and experience" (Doering 2018, p. 1). To calculate the collaborative synergy (as a simple real call option premium) of the acquisition of Delhaize by Ahold in 2016, an application of the Binominal Option Pricing Model was adopted following the recommendations of Dunis and Klein (2005) on real option variables and as shown in Table 4.

**Table 4.** Simple real option variables: data and sources. Ahold acquisition of Delhaize in 2016.

Simple Real Option Variables	Sources	Data
Stock price (So)	The cumulated market value of Ahold and Delhaize before the announcement deal	The cumulated market capitalization of the target and acquirer before the announcement (So) is a sum of the market capitalization of both separate companies. The market capitalization of Ahold was €15.8 bn; the market capitalization of Delhaize was €9.1 bn (Ahold Delhaize Group 2015, p. 12). Thereby, the cumulated market capitalization of the separated entities before the merger (So) equals €24.9 bn.
Strike price (E)	The exercise price (E) is the combined hypothetical future market value after one year without a merger. The hypothetical future market value of the separated entities (target and acquirer) after one year has been calculated using EV/EBITDA (Enterprise Value/Earnings before Interest, Taxes, Depreciation, and Amortization) multiples	Having used Ahold's EBITDA of \$2622 M (Ahold Delhaize Group 2015, p. 19) or €2146 M in 2015, and EV/EBITDA multiple of 7.5 (Board Report Ahold 2017, p. 11), the hypothetical future market value of Ahold without the merger has been estimated as €16.1 bn. Having used Delhaize EBITDA of \$1538 M or €1339 M (Board Report Ahold 2017, p. 11) in 2015, and the EV/EBITDA multiple of 7.0 (Board Report Ahold 2017, p. 11), the hypothetical future market value of Delhaize has been estimated as €9.4 bn. Therefore, the cumulated hypothetical future market value of the target and acquirer after one-year equals (E) €25.5 bn.
Time (T)	Duration (T) of obtaining synergy is the managerial anticipation of when collaborative synergies would be fully realized in terms of the year following completion of the merger or acquisition	According to the Ahold Delhaize group data (Board Report Ahold 2017, p. 7), the merger was expected to be accretive to earnings in the first full year after completion, with anticipated run-rate synergies of €500 million per annum to be fully realized in the third year after completion. Therefore, time to expiration in years (T) equals 3 years (Board Report Ahold 2017, p. 7) with six time steps (one step is about 6 months) for the Binominal Option pricing model.
Rf	The annualized risk-free interest rate in the Netherlands in 2015	Leading partner Dutch grocer Ahold acquired Belgian food retailer Delhaize for \$28 billion. Thus, the risk-free rate of return (rf) in 2015 has been defined as Long-Term Government Bond Yields (10 years) for the Netherlands which was −0.20% (Guru Focus 2016)
$\sigma$	Expected volatility ( $\sigma$ ) has been determined based on historical volatilities for three years	Following the United States Securities and Exchange Commission (SEC) reports, the annual volatility ( $\sigma$ ) of the Ahold Delhaize group in 2016 was assumed as 22.2% (V-Lab 2019; SEC report).

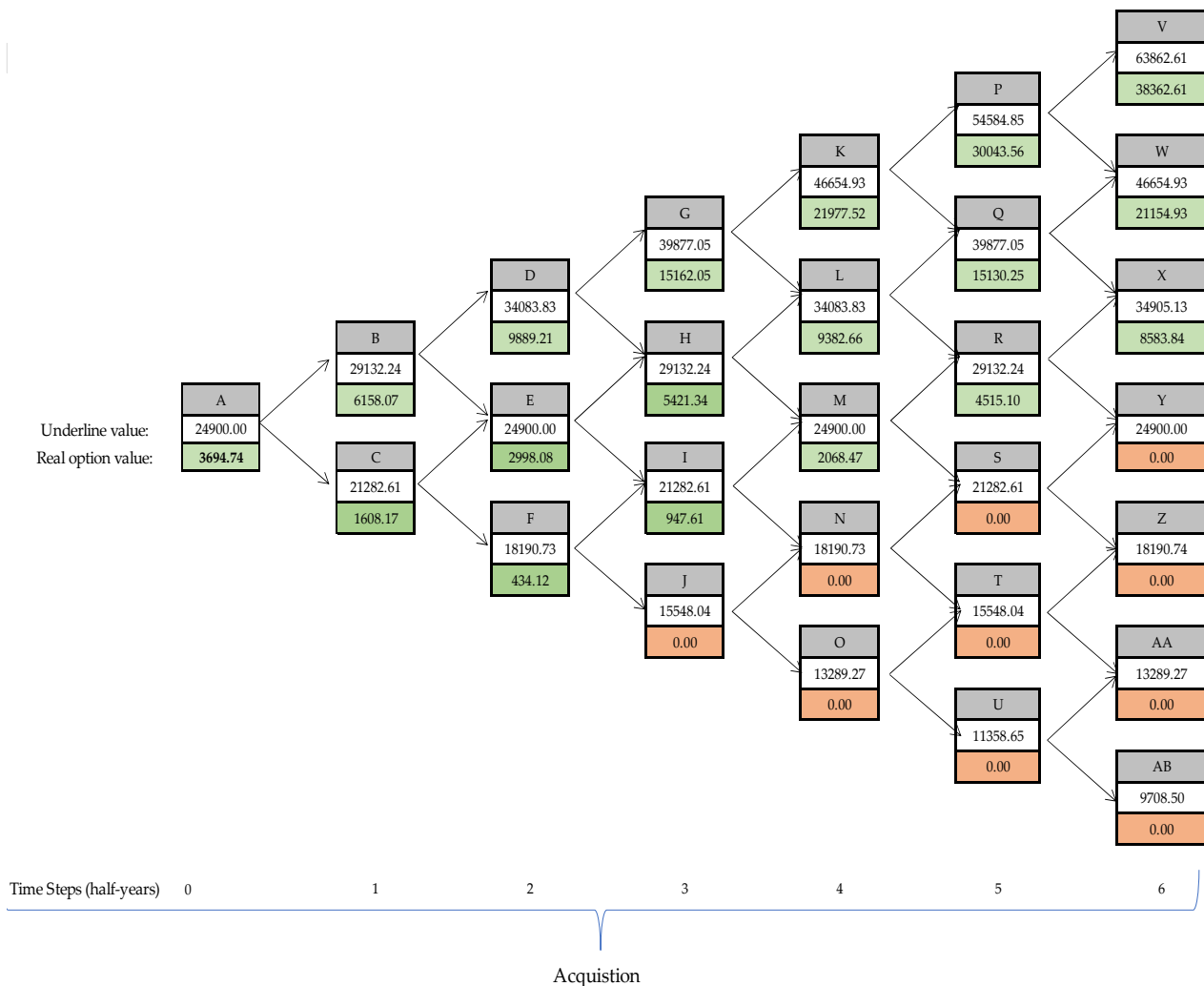
Source: Developed by the Author.

The option premium as a collaborative synergies result has been calculated using an Excel spreadsheet. Results are given in Table 5 and Figure 2 as follows:

**Table 5.** Recombining binomial lattice parameters (Ahold and Delhaize merger).

Parameters of the Simple Binominal Real Option Pricing Model	
time increment (year)	$\delta t = 0.50$
up factor (u)	$u = \exp(\sigma \times \sqrt{\delta t}) = \exp(0.222 \times \sqrt{0.50}) = 1.170$
down factor (d)	$d = 1/u = 1/1.170 = 0.855$
risk neutral probability (p)	$p = [\exp(-0.20 \times 0.5) - 0.855]/(1.170 - 0.855) = 0.458$

Source: Developed by the author.

**Figure 2.** Binominal Option pricing model. Real options lattice: a value of synergies of Ahold Delhaize merger (in € M). Source: Developed by the author.

According to the Binominal Option pricing model (BOPM), the collaborative synergies of the Ahold Delhaize merger equal around €3.7 bn. This result has evidenced that within the three years after the merger, Ahold Delhaize maximized market value according to forecasted synergies (real call option value), and collaborative synergies were fully realized. This result proves the validity of the second proposition developed in the paper.

#### 4.3. Rationales behind Tesco and Carrefour Entering an Alliance, the Impact of Institutional Context and Dynamic Political Capabilities

On 1 July 2018, the two retailers reached a purchasing agreement to cut costs, enhance relationships with global suppliers, expand product choices, and enhance quality while offering lower prices. However, British supermarket chain Tesco and French retailer Carrefour have agreed to end their three-year global purchasing alliance on 31 December

2021. The rationales behind the alliance formation were, firstly, increasing the number of own-branded products in the store (which was the main rationale of the deal) and, secondly, eliminating the middlemen in a face of suppliers.

However, the Carrefour and Tesco joint purchasing agreement was communicated to the Competitive Authority (CA) in France following the provisions of the Law of 6 August 2015 for Growth, Activity, and Equal Economic Opportunities (Macron Law). The CA opened an investigation in May 2019 and already in September 2019 some interim measures based on the Egalim law took place (Gauthier 2020). It was identified as being a very profitable way of collaboration both for Tesco and Carrefour; the alliance impacted the fairness of the market in the following aspects: decreasing market power of supplies and decreasing suppliers' involvement in innovations.

As an outcome of the found problems, the Competition Authority decided to adjust the cooperation terms for five years by excluding several product families from the scope of the alliance. Moreover, an influential role was played by the COVID-19 pandemic which started in 2019. Firstly, the UK and France governments introduced several restrictions on people's gatherings, movements, and collaborations for safety purposes. So customers started to visit offline grocery stores much less often, while making the shopping experience faster. Secondly, the general purchasing power of consumers decreased due to increased unemployment. So the demand for many products which were important to the alliance, and which did not belong to a basic shopping basket (like wine or blue cheese), decreased.

The Brexit event in the UK had some serious consequences on the Tesco-Carrefour alliance. First, with the complication of paperwork (legal environment), it became much more complicated for both countries to perform logistics between countries and interact in general. Second, several immigrants living in the UK left the country due to the complicated process of receiving residency permits (Butcher and Schraer 2018). The comments on the institutional constraints of Tesco and Carrefour and the dynamic political capabilities needed to react, resolve, and adopt have been allocated into three-phases of the alliance life cycles Table 6.

**Table 6.** Alliance's dynamic capabilities and comments on the institutional constraints of Tesco and Carrefour.

The Phase of the Collaborative Venture's Development from the Cascading Impacts of the Global Governance System Reshaping	First-Order Cascading Effect: Impact of Supra-National Institution Level	Second-Order Cascading Effect: Impact of a National Institution	Third-Order Cascading Effect: Coordinated Strategic Alliance's Partners' Response
Micro: the foundation of dynamic political capabilities	Capabilities exploring the supra-national institutional context imposed by regulators, laws, and standard-setting bodies and foretelling permissible constraints	Capabilities exploring and exploiting national institutional context with high regulative uncertainty through focusing their probing around finding the solution	Capabilities exploiting the regulatory and institutional structures through collaboration with them
Comments on the challenges and dynamic capabilities of Tesco and Carrefour	Tesco and Carrefour underestimated the UK's official departure from the EU which brought new regulations and added complexity to moving products across the channel (Walker and Mugudubi 2021); it created uncertainty about the alliance synergies.	Tesco and Carrefour underestimated the French competition authorities who forced the partners to commit to an agreement (Quinn 2021) that seriously undermined the potential scope of the alliance that added complexity to the search for synergies.	Tesco and Carrefour's attempt to gain suppliers by warning them to drop their prices did not work. The vulnerability of the supply chain to perishables was made clear during the COVID-19-related disruptions (Harapko 2021).

Source: Developed by the author.

Therefore, the first proposition has been justified empirically. Supermarket groups Carrefour and Tesco have ended their purchase alliance due to insufficient dynamic political capabilities to build and reconfigure internal and external competencies to address rapidly

changing institutional environments. The partners have not demonstrated strong dynamic political capabilities, what they could have done differently, anyway? What could have been the next growth option for these corporations and why is a possible future merger of Tesco and Carrefour not out of the question?

#### *4.4. Measuring the Unrealized Collaborative Synergies of an International Alliance by Sequential Compound Real Option Application*

Mergers and acquisitions are for a combination of different “functional strengths” (Damodaran 2005) or, more specifically, for a new combination of different tacit and codified knowledge and core competencies. Looking at the successful cross-border merger and further digitalization strategy of the Ahold Delhaize Group, Carrefour and Tesco could accelerate their focus on innovation and create a seamless online and offline experience working closely together for their customers.

The application of the sequential compound option helps to quantify the overall impacts of institutional contexts on the collaboration synergies of the Carrefour and Tesco groups. Having discussed the main rationales behind the alliance, the reasons for termination, and possible next strategic steps, the sequential compound option was applied to quantify the unrealized collaborative synergies of the Carrefour Tesco alliance as a first growth option and the second growth option of possible tight collaboration for Tesco and Carrefour in the form of a merger.

Commonly sequential compound options are simply referred to as compound or (corporate) growth options (Copeland and Keenan 1998; Li et al. 2007). Kumar (2005) examined when terminating an alliance via acquisition or divestment creates value for partners. An American option is exercisable at any time and provides a binomial solution (lattice) for analysis of the results. The European compound option can be used as well to obtain a more precise estimation of option value. The European compound option is exercisable only at expiration, where the duration of an option (T) is the expectation of management on obtaining collaborative synergy. Previous studies on the periods of obtaining synergies in M&A deals of stock-listed companies recommended up to 10 years duration (T) for achieving synergies (Damodaran 2002), three years after the merger (Vergos 2003), or even one year (Dunis and Klein 2005, p. 7).

Because the merger could have been hypothetically started on 1st January 2022 for the valuation of the second call option (merger), the assumption was given that the duration of obtaining synergy would have been taken three years, until the end of the 2024 year. Similarly, when Dutch grocer Ahold acquired Belgian food retailer Delhaize for \$28 billion in 2015, synergies were declared after three years (Board Report Ahold 2015).

To calculate the collaborative synergies (as real option premium) of the alliance Tesco-Carrefour 2018–2021 with an application of the sequential Binominal Option Pricing Model, the author has adopted the recommendation of Dunis and Klein (2005) on the real option variable as shown in Table 7.

Below are the sequential option (Kodukula and Papudesu 2006) variables considered, a binomial solution, and an analysis of the result. Parameters of the Binominal Option Pricing model are given in Table 8.



**Table 7.** Sequential compound real option variables: data and sources.

Sequential Compound Real Option Variables	Sources	Data
Stock price $S(t_0)$	The cumulated market value of Tesco and Carrefour before the announcement deal	Tesco PLC (TSCDF)—market cap as of 29 June 2018: \$32.84 bn (Tesco 2022) or €38.97 bn (Exchange rate 2022a). Carrefour SA (CRERF)—market cap as of 29 June 2018: \$12.27 bn (Carrefour 2022) or €14.49 bn (Exchange rate 2022a). Therefore, the price of the underlying assets, $S(t_0)$ , was €53.46 bn.
Strike price $E(1)$	The hypothetical future market value of the separated entities is forecast by the EV-based multiples. The future value of Tesco, PLC was calculated with EV/EBITDA multiple in 2018, and the future value of Carrefour SA was calculated using the EV/EBITDA multiple in 2018	Tesco PLC. EBITDA was £2.776 bn in 2018 (Fin Box 2022a). Tesco PLC's EV/EBITDA multiple in 2018 was $8.2 \times$ (Fin Box 2022a). The hypothetical future market value of Tesco PLC without an alliance equaled £22.76 bn or €25.72 bn (Exchange rate 2022b). Carrefour SA's EBITDA was €2.303 in 2018 (Finance Yahoo 2022). Carrefour SA's EV/EBITDA multiple in 2018 was $6.8 \times$ (Fin Box 2022b). The hypothetical future market value of Carrefour SA without an alliance equaled €15.66 bn. Thus, the strike price ( $E(1)$ ) was €41.38 bn.
Strike price $E(2)$	The future value of Tesco, PLC was calculated with the EV/EBITDA multiple in 2022 (Fin Box 2022a), and the future value of Carrefour SA was calculated using the EV/EBITDA multiple in 2022 (Fin Box 2022b)	Tesco PLC. EBITDA was £3.858 bn in 2022 (Fin Box 2022a). Tesco PLC's EV/EBITDA multiple in 2022 was $8.1 \times$ (Fin Box 2022a). The hypothetical future market value of Tesco PLC without an M&A equaled £31.25 bn or €37.17 bn (Exchange rate 2022c). Carrefour SA's EBITDA was €4.912 in 2022 (Market Screener 2022). Carrefour SA's EV/EBITDA multiple in 2022 was $7.8 \times$ (Fin Box 2022b). The hypothetical future market value of Carrefour SA without an M&A equaled €38.31 bn. Thus, the strike price ( $E(2)$ ) was €75.48 bn.
Time (1)	Duration ( $t_1$ ) obtaining collaborative synergy of the alliance formation	The assumption of the duration ( $T_1$ ) for achieving synergy was 3 years (Godfrey 2021).
Time (2)	Duration ( $t_2$ ) obtaining collaborative synergy of the merger or acquisition deal	The assumption on the duration ( $T_2$ ) for achieving synergy was 3 years (Vergos 2003; Čirjevskis 2020)
$R_f$	The annualized risk-free interest rate in France in 2018	According to the Global Power of Retailing 2018 (Deloitte 2018, p. 19), Carrefour was number nine on the list of top retailers whereas Tesco was number eleven. Thus, Carrefour was assumed as a leading partner. The average risk-free rate ( $R_f$ ) of investment in France in 2018 was 1.60% (Statista 2022).
$\sigma$	Carrefour SA's historical volatilities within the first week after the announcement of the alliance formation with Tesco PLC (1 July 2018–8 July 2018)	Thus, the average Carrefour SA stock volatility ( $\sigma$ ) equaled $\sigma = 34.50\%$ (V-Lab 2022).

Source: Developed by the Author.

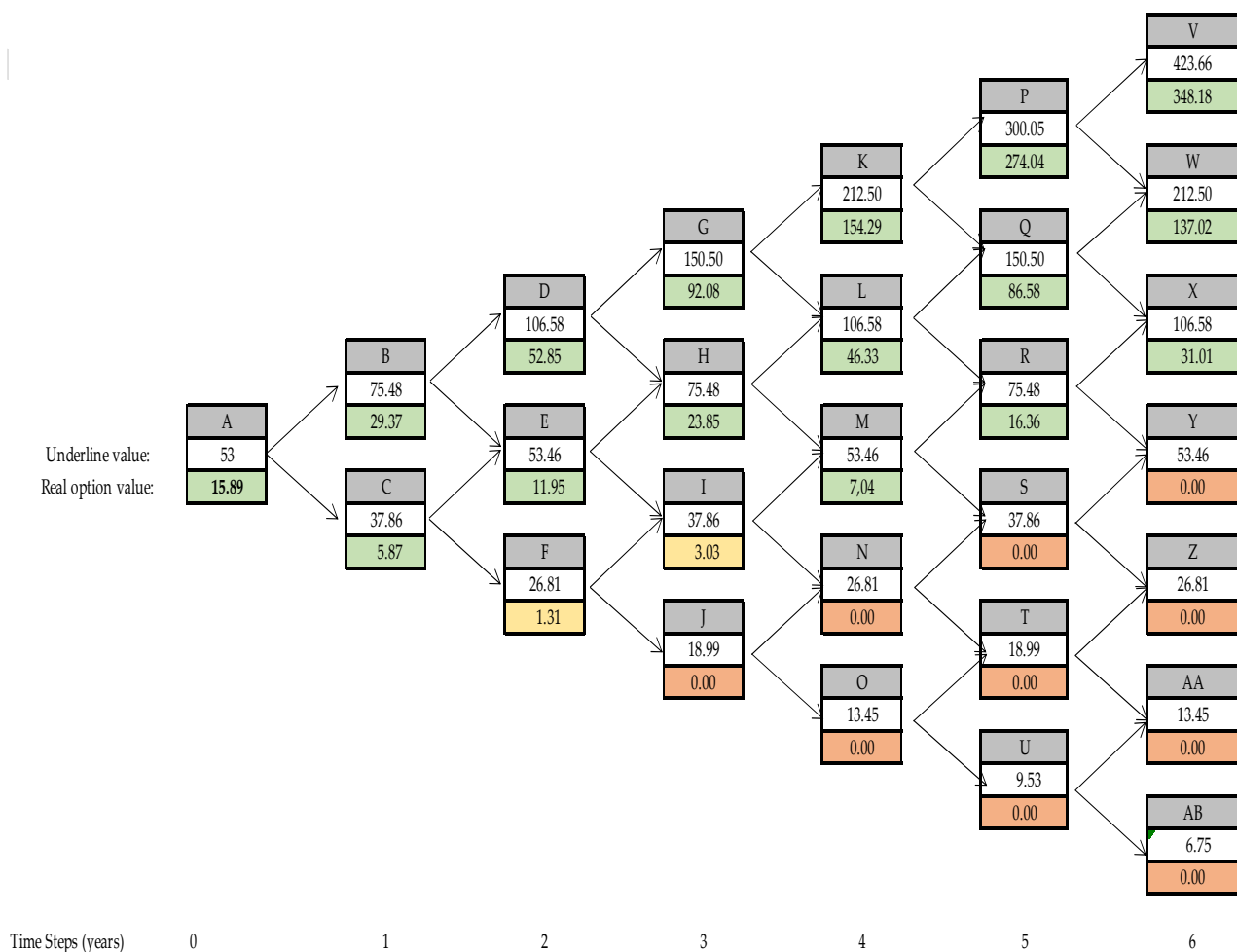
**Table 8.** Recombining binomial lattice parameters.

Parameters of the Sequential Binominal Option Pricing Model	
time increment (year)	$\delta t = 1.00$
up factor (u)	$u = \exp(\sigma \times \sqrt{\delta t}) = \exp(0.345 \times \sqrt{1}) = 1.412$
down factor (d)	$d = 1/u = 1/1.412 = 0.708$
risk neutral probability (p)	$p = [\exp(0.018 \times 1) - 0.708] / (1.412 - 0.708) = 0.438$

Source: Developed by the author.

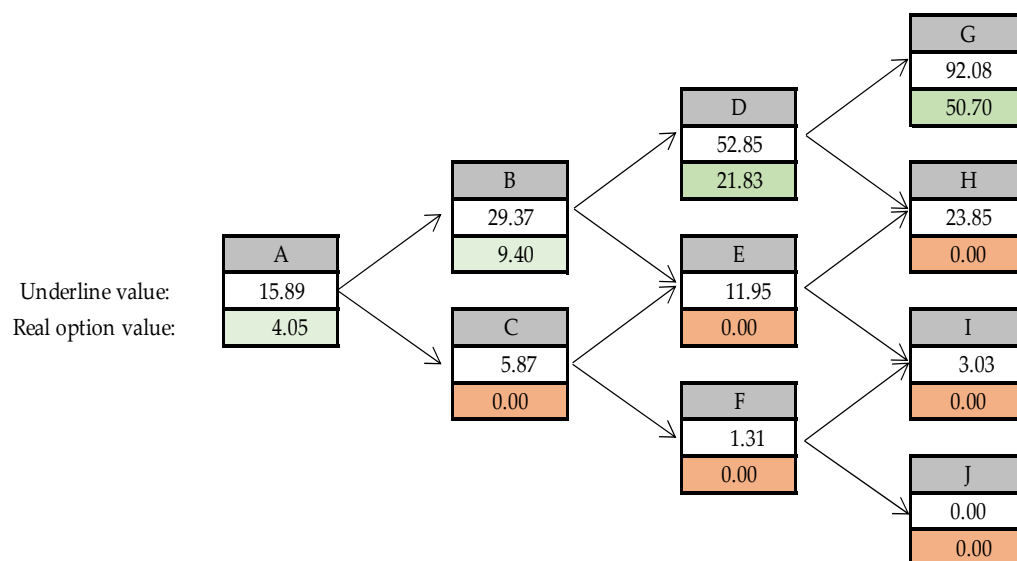
There are two sequential options available on the synergies of collaborative strategy. A merger and acquisition (second call option) are dependent on an alliance (first call option). The option value calculations (synergies) are done in sequence, starting with the longest option. First, the option values for the merger and acquisition option employing the binomial lattice was calculated. The option values of the longest option (merger and acquisition) then become the underlying values for the preceding option (alliance), for which the option values (synergies) were calculated using backward induction.

Having employed backward induction, the option value of the synergies (merger and acquisition) was calculated as shown in Figure 3. The top numbers are underline values. The bottom numbers are option values. The red color option values indicate the exercise of the option to abandon, or no synergies made.

**Figure 3.** Binomial lattice for the merger and acquisition (longest) option of the sequential compound option (in € billion).

To calculate the option values for the predecessor option (alliance) for its three-year lifetime, the option values of the successor option (merger and acquisition) as the underly-

ing values were used. Exercising the option of the alliance's synergies creates the option for merger and acquisition; hence the merger and acquisition synergies option values are treated as the underlying values for this calculation as shown in Figure 4.



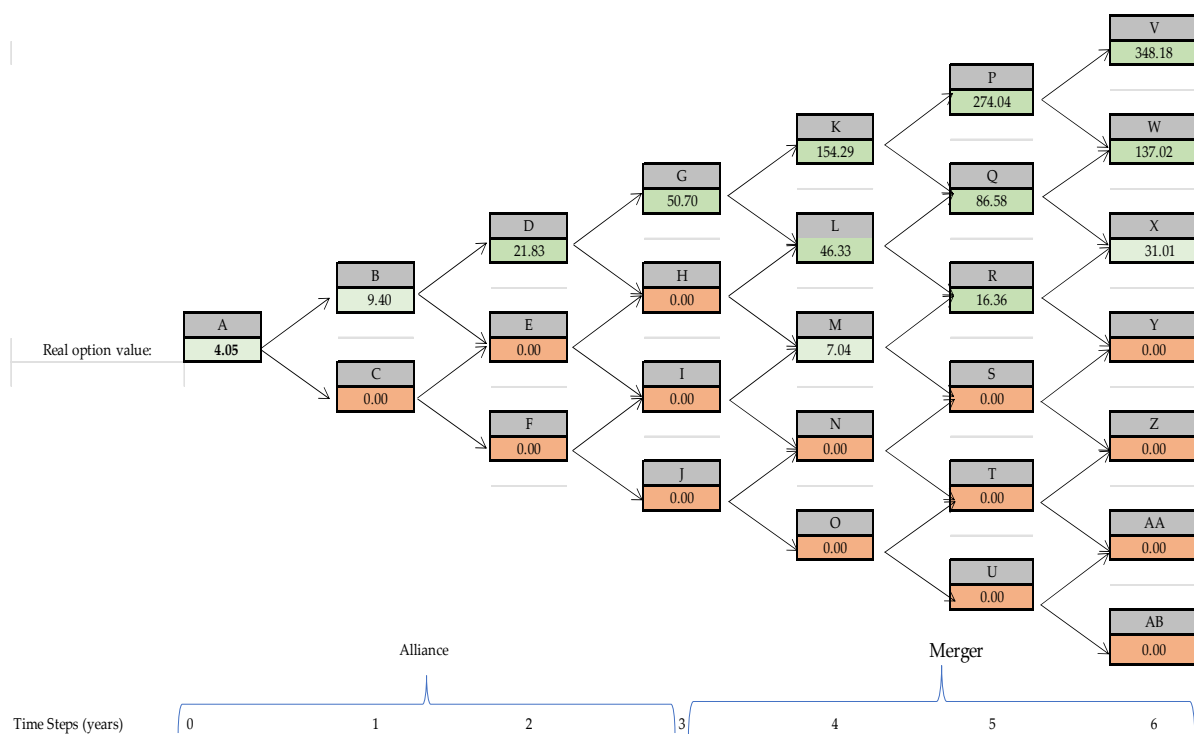
**Figure 4.** Binomial lattice for the alliance (predecessor) option of the sequential compound option (in € billion).

In this case study, the option lives of three and six years are used for an alliance and merger, respectively. The individual option lives represent the expectation of management on obtaining collaborative synergy. A closer examination of the Tesco and Carrefour collaboration strategy's synergy's options results indicates that the real option valuation for the options to merger and option to ally are 15.89 € bn and 4.05 € bn, respectively.

If the market uncertainty and political complexity would have been clarified by the end of the alliance phase, then the merge payoff (synergies) would have been expected to be significantly higher than obtained result in Figure 2. Tesco and Carrefour could have moved forward with the merger. However, due to the significant impact of the institutional context of the EU, France, and the UK, market uncertainty during pandemic COVID-19, and the lack of dynamic political capabilities for the next option (merger and acquisition), the partners have probably shelved it for later consideration.

The combined sequential real option (synergies) calculation with relatively modest results (4.05 € bn) and the majority of nodes with zero values of synergy justify their strategic decision to terminate collaboration as shown in Figure 5.

Kodukula and Papudesu (2006) argued that the Black–Scholes option pricing model (BSOPM) can also be employed to value sequential options starting with the longest option first. “As in the binomial model, the option value of the successor option becomes the asset value for the predecessor option” (Kodukula and Papudesu 2006, p. 156). Having applied a combined sequential compound real option to value Tesco and Carrefour collaboration synergies, the option valuation result (tacit synergies) was estimated at €2.17 bn and evidenced that the possible merger of two global grocery retailers might not be excluded in the future.



**Figure 5.** Binominal lattice for the combined sequential compound option (in € billion).

## 5. Discussion and Contributions

The institution-based view paradigm is extremely young in the IB and SM disciplines and one of its challenges in the next few years is to demonstrate the importance of institutional factors for our understanding of competitive advantage (Garrido et al. 2014). The case studies' results justified that the institutional context can be a key to the promotion or failure of collaborative synergies of an international alliance.

"Despite a significant stream of literature exploring DCs, the following question remains: how do dynamic capabilities allow organizations to adapt to changes and succeed?" (Cristofaro and Lovallo 2022, p. 1). In this vein, this paper advances the theoretical conceptualization of dynamic political capabilities and their micro-foundations to provide insights into how collaborative business partners may solve institutional challenges and create a collaborative synergy.

Thus, the first novelty is a micro-foundation of the dynamic political capabilities of the alliance. The institutional context and, particularly, dynamic political capabilities, were missed in previously published scholars' papers (e.g., Čirjevskis 2019), which might be because the institutional context was not as important as it is today. Today the institutional context in any EU country is in dramatic transition due to BREXIT and the post-COVID-19 period that cannot be ignored.

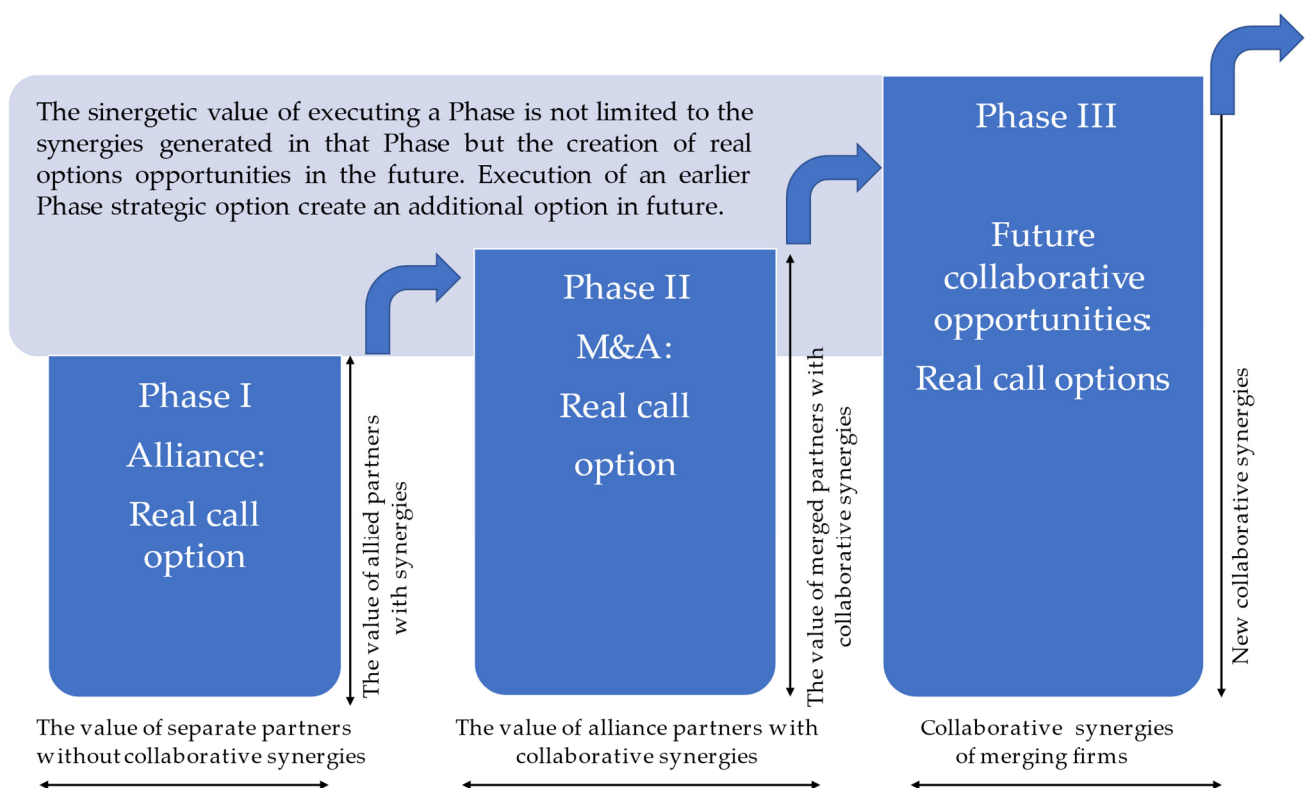
The dynamic capabilities framework (Teece 2007, 2009) has missed the importance of dynamic political capabilities needed in pursuit of competitive advantage. Oliver and Holzinger (2008) provided dynamic political capabilities but they did not link them to the collaborative partners' capabilities development. Thereby, regarding the second novelty, the author has bridged dynamic capabilities (Teece 2007, 2009), dynamic political capabilities (Oliver and Holzinger 2008), and the phases of the collaborative venture's development (Petricevic and Teece 2019) that have previously been presumed to be independent.

Petricevic and Teece (2019) argue that creating and capturing value in the presence of cascading effects from global, international, and national institutional contexts affects the international business players, requiring new tools. In this vein, the third novelty is the application of simple and advanced (compound) real options to measure collaborative strategies in international alliances, mergers, and acquisitions. Having responded to the

first research question, the case studies have synthesized three cascading impacts of the global governance system and illuminated the micro-foundations of the dynamic political capabilities in the VUCA environment.

Having summarized theoretical and managerial contributions, the case studies have justified this paper's first proposition, that dynamic political capabilities are important antecedents of collaborative synergies. Moreover, the paper argues that the execution of the collaborative strategies provides subsequent phased strategic options (Mun 2002) which are nonexistent without the dynamic political capabilities of partners in place.

Having answered the second research question, this empirical research has advanced the real options theory by application of the combined sequential real option to value collaborative synergies and thereby supported with quantitative evidence this paper's second proposition. Below, the author has developed a practical framework with recommendations on collaborative strategies' synergies bridging the strategic management discipline and real options theory in the whole cohesive construct given in Figure 6.



**Figure 6.** The framework of valuing collaborative synergies using multiple sequential compound options (adopted from Mun 2002, p. 246 and extended by the author).

To conclude, the novelty and the contributions of the current paper to international businesses, strategic management, and corporate finance lay in the formulated micro-foundations of the dynamic political capabilities, analyses of their impact on collaborative synergies, and empirical application of the combined sequential compound real option to value collaborative strategies from alliance (first option) to merger or acquisition (second option).

## 6. Conclusions, Limitations, and Future Work

Teece argues that “... Management theory is not physics ... . Deductive logic is a more useful approach. ‘Appreciative’ (qualitative, observation-based) theorizing is perhaps the best way of characterizing the methodology of choice” (Teece 2014, p. 335). Having used deductive logic in the current paper, the case studies represent important



aspects of institutional contexts that impact the collaborative synergies of an international collaborative endeavor.

This paper is a novel theoretical and empirical contribution to the important micro-foundations of the dynamic alliance's political capabilities and prerequisites of collaborative synergies from the institutional-based view on competitive advantage. The paper focused on integrating three important research perspectives: institutional theory, dynamic capabilities framework, and real options theory. In this vein, the case studies provided an analysis of supra-national and national institutional contexts, the importance of dynamic political capabilities of collaborative partners, and the application of the simple and advanced real options valuation to the quantitative assessment of collaborative synergies.

Therefore, the paper contributes to the scientific discussion on the framework of dynamic capabilities by demonstrating that international partnerships are underpinned by an institutional-based perspective. The practical implication of the research is the evidence that food retailers who want to grow with the latest consumer trends will need the dynamic capability to deal with an impact of an institutional dimension by developing core political competencies.

There are several limitations to the application of the current research framework. A sequential compound option means that the execution and value of future strategic options depend on previous options in a sequence of execution. For some collaborative strategies, the option to the next stage may not be explicit or intuitive. However, when uncertainty is high, a strategy can be redesigned into appropriate phases based on real options analysis. In this vein, the option values for multiple strategic scenarios can also be calculated and the strategy chosen that offers the highest synergetic value for strategy execution.

Regarding limitations, Mun (2003) argued that computing a sequential compound option is a quite complex task. "It involves identifying the various embedded options and deciphering their relationship to each other. This task is made more difficult when either the time horizon for the execution of the second option or the amount required for the second investment is unclear" (Mun 2003, p. 288).

A key external stakeholder in a business is the government, which is normally expected to provide the rules of the game, define the degree of competition, and foster institutional conditions for the value co-creation process (Pitelis 2022). "As noted by North (1981), this is more the exception than the rule. Nevertheless, firms should incorporate the role of the government, its actions, and its failures in their BMs and BMIs" as recently recommended by Pitelis (2022, p.750 ). In this vein, more interviews with industry practitioners and their expert judgments are needed.

When it comes to future research, apart from methodologies enumerated in the preceding case studies, there is a range of alternative (and often unorthodox) methodologies. These range from approaches derived from fuzzy set theory (Brach 2003, p. 330) to game-theoretical frameworks, collectively known as Option Games (Ferreira et al. 2009). Hence, this is a promising future research area.

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