

Abnormal Returns following Business Model Extensions – The Role of Demand Relatedness

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This article explores the impact of business model extensions (BMEs) on company performance by distinguishing between demand-related (BME-DR) and demand-unrelated (BME-DU) extensions. We explain that BME-DRs can enhance customer utility and, thus, drive firm performance. Furthermore, we hypothesize that a negative business outlook and the degree of diversification are important moderators of the BME-DR–performance relationship. We use an event study methodology to substantiate this claim and analyze abnormal returns following BME announcements. This approach allows us to precisely measure market reactions to announcements of BME-DR and BME-DU. Our findings reveal that BME-DRs lead to higher abnormal stock market returns than BME-DU. Moreover, companies with a pessimistic business outlook disproportionately benefit from BME-DRs. Finally, contrary to our hypothesis, we find that the benefits of BME-DRs do not uniformly accrue. Rather, the relationship between diversification and the effectiveness of such extensions follows an inverted U-shaped pattern, suggesting limited benefits for minimally and highly diversified firms. We discuss these findings and conclude that, beyond a certain level of overall company diversification, the cost of managing added complexity outweighs the benefits of BME-DRs.

Keywords: Business model, demand relatedness, diversification, event study, firm performance

INTRODUCTION

A business model extension (BME) is a new way for an established firm to create, deliver, or capture value from a customer (Teece, 2010). Recent studies have shown that BMEs enhance the performance of incumbent companies (Aversa et al., 2015; Loon and Quan, 2020; Sohl et al., 2020; Sohl and Vroom, 2014; Werner and Hoffmann, 2024). A demand-related business model extension (BME-DR) allows the same customer to use an added business model alongside the existing one without substituting it, thereby increasing customer utility (Priem et al., 2018; Sohl et al., 2022). For example, gas stations have integrated a retail component into their operations, enabling customers to refuel their vehicles and shop for groceries during the same visit (Priem, 2007; Schmidt et al., 2024; Ye et al., 2012). Similarly, in the digital realm, Amazon introduced its Prime service as a complementary business model that customers can use in parallel with its online retail business model (Aversa et al., 2020). Researchers have shown that BME-DRs improve company performance (Priem et al., 2018; Sohl et al., 2020; Sohl et al., 2022; Ye et al., 2012). However, limited research has been devoted to the factors influencing the BME-DR–performance relationship. Our research aims to address this gap. While prevalent research on BME-DR is primarily based on case studies (Aversa et al., 2020; Aversa and Haeffliger, 2017; Sohl et al., 2020; Westerveld et al., 2023), we analyze BME-DR in a large-scale empirical setting with a focus on the creation of market value.

Companies often run multiple, interrelated business models in parallel (Casadesus-Masanell and Ricart, 2010; Kim and Min, 2015; Sabatier et al., 2010; Sohl and Vroom, 2014). Such a business model portfolio allows researchers to analyze new aspects of synergies and complementarities across these models (Westerveld et al., 2023). Synergistic interrelations between the activities of business models have been explored in several settings, including the automobile industry, high-tech sectors, multi-market retail, and industries undergoing digital transformation (Aversa et al., 2015, 2017; Chesbrough and Rosenbloom, 2002; Markides and Charitou, 2004; Sabatier et al., 2010). One focus of research on business models is the synergistic use of existing resources and the capabilities to create new business

models that address new sources of demand. Such research is rooted in a resource-based view of the firm (Penrose, 1959), and argues that using the same resources to satisfy multiple sources of demand increases scale and reduces cost. However, we argue that demand complementarities are a crucial source of advantages in BMEs and build on emerging research that has focused on demand-related business model extensions (Sohl et al., 2020). This stream of research assumes that companies that offer two or more demand-related business models, which customers can use in parallel, can create and exploit customer-specific synergies—for example, through increased customer lock-in or by inducing a higher willingness to pay (Schmidt et al., 2024). For instance, Sohl et al. (2020) examined how adding a business model with a high demand complementarity enhances firm performance and found that this is more profitable than demand-unrelated BMEs. They explained this effect through the creation of cross-business-model synergies that lead to a higher willingness among customers to pay and found evidence to support this claim in a dataset of global retail companies. Aversa et al. (2020) demonstrated how demand complementarities support firm growth and competitive advantage in the digital space through a longitudinal study of Amazon. They demonstrated that Amazon's ability to create demand-side synergies reduces search and transaction costs, thereby increasing customer utility. We add to this stream of research by providing evidence for the effectiveness of demand-related business models in an empirical setting. We also introduce a market-based performance measure (abnormal stock market return), instead of the accounting-based measures used in previous studies, to show that shareholders value BME-DR.

The extension of a business model portfolio allows companies to hedge risks, explore opportunities for growth, and counteract disruptive entrants, leading to increased performance, particularly in changing environments (Anthony et al., 2017; Spieth et al., 2014; Werner and Hoffmann, 2024). For example, restaurants that adopted delivery-based models during the COVID-19 pandemic outperformed their peers by meeting new market demands (White, 2022). It is thus intuitively plausible that when a business has an unfavorable outlook, it tries to maximize its market power and the value

of existing customers by reducing the costs of search and transactions, increasing the customers' willingness to pay, and consolidating its market power (Aversa et al., 2020; Kaufman, 1996). We investigate the effect of an unfavorable business outlook and argue that BME-DR allows companies to strengthen their market power and create value during periods in which their business prospects are limited. In this way, we contribute to research on the moderators of the business model extension–performance relationship.

Finally, we analyze the moderating effect of the degree of company diversification on the BME-DR–performance relationship. Decades of research on corporate diversification have shown that it follows an inverted U-shaped relationship with the performance of the firm: Low-to-medium diversification enhances value, while excessive diversification diminishes it due to the high costs of coordination and control (Palich et al., 2000; Martin and Sayrak, 2003; Montgomery, 1994). However, demand-related diversification can create value even in unrelated industries by leveraging customer complementarities and demand-side synergies (Priem, 2012). Aversa and Hueller (2023) have argued that the diversification–performance relationship may shift to an "S-shaped curve" in the context of digital BMEs, whereby even high levels of unrelated diversification enhance corporate performance owing to lower costs of resource redeployment and stronger customer complementarities. By extending this logic to physical BMEs, we assume that demand-related extensions targeting existing customers reduce upfront investments and the costs of coordination, thus making diversification more effective and profitable. We hypothesize that BME-DR increases companies' capacity for diversification and benefits those that are already well diversified. This part of our study contributes to research on the moderators of the relationship between BMEs and corporate performance (White, 2022), and informs the pluralistic research on corporate diversification (Schommer, 2019).

As we cannot measure the relationship between BME-DR and a company's market performance based on existing indicators, we use an event study setup and measure the impact of a firm's announcement of a BME on stock market return. Such event studies are commonly used to gauge how the capital

market values a strategic decision (Borusyak and Jaravel, 2017; Craig, 1997; Kale et al., 2002; McWilliams and Siegel, 1997). BMEs are not explicitly disclosed by firms. To address this issue, we focus on the BMEs pursued through the formation of joint ventures (JVs). Specifically, we identify JVs that signify the introduction of a new business model for one of the participating companies and analyze the corresponding response of the capital market. As JVs involve equity ownership, their formation is publicly announced to financial markets, and this provides precise dates for our analysis of abnormal returns. For our research setup, we leverage a sample of S&P 500 companies engaged in JVs in the high-tech industry from 1998 to 2019. We analyze each JV to distinguish among BME-DR, BME-DU, and traditional JVs that do not involve a new business model. We then test the hypotheses mentioned above by using ordinary least-squares models.

Our research revealed three findings. First, we find that BME-DR leads to higher abnormal stock market returns than BME-DU, which aligns with past theoretical work and case studies (Aversa et al., 2020; Buss et al., 2020) and provides one of the first large sample-based empirical confirmations of this effect (Sohl et al., 2020). Second, companies with a pessimistic business outlook particularly benefit from BME-DR, highlighting the importance of moderators to the BME-DR-performance relationship. Finally, contrary to our initial hypothesis, we do not find evidence that well-diversified companies benefit particularly from BME-DR. On the contrary, we find that the degree of diversification of an incumbent company moderates the performance impact of BME-DR in an inverted U-shaped relationship, indicating that little-diversified and highly diversified companies do not benefit as much from this type of BME. We then turn to the literature on diversification to discuss these findings and highlight multiple explanations for the observed effects. This work responds to recent research calls to investigate the performance effects of demand-related BMEs (Aversa and Hueller, 2023). We contribute to this direction of research by introducing a novel empirical setting that addresses the challenge of testing demand relatedness (Täuscher, 2018). Beyond the specific sub-streams of business model research, this work adds to the broader literature on corporate strategy. The

business model is a relevant unit of analysis for corporate strategy, particularly in relation to firm scope (Snihur and Tarzijan, 2018; Westerveld et al., 2023). As such, our research offers insights into key mechanisms underlying diversification strategies, managing interdependencies across businesses, and aligning firm activities with dynamic market opportunities. Finally, our findings are also highly relevant for practitioners. For instance, managers should distinguish between the addition of business models that are demand-related and those that are not. They should also recognize that the benefits of demand-related BMEs depend on the environment and their current level of product diversification.

HYPOTHESES DEVELOPMENT

A growing portion of the literature on management has covered the concept of the business model (Bosbach et al., 2020; Lanzolla and Markides, 2020; Sohl et al., 2022; Wirtz et al., 2016). This is a distinct unit of analysis from the product and the industry (Sohl et al., 2022; Zott et al., 2011; Zott and Amit, 2010). Executives can offer the products of their company by using a new business model (e.g., by moving from a transactional offer to a subscription-based offer), expand into new product categories, and combine a product extension with a new business model (Werner and Hoffmann, 2024). Thus, the concept of the business model provides managers with a diversification option that is in addition to traditional product or industry diversification (Aversa et al., 2020; Aversa and Haefliger, 2017).

BME has gained theoretical and practical relevance (Markides, 2023; Mishra and Mishra, 2023), and impacts several domains of the literature on strategic management, including external collaborations (Feldman, 2020; Menz et al., 2021; Sohl and Vroom, 2017), industry diversification (Sohl et al., 2022; Sohl and Folta, 2021), shareholder value creation (Bosbach et al., 2020; Lanzolla and Markides, 2020; Sohl et al., 2022; Wirtz et al., 2016), and management during crises (Bivona and Cruz, 2021; Breier et al., 2021).

BME and demand relatedness

When it is appropriately organized, the addition of a new business model to an existing portfolio of business models has been proven to enhance firm performance (Kim and Min, 2015; Sohl et al., 2022; Sohl et al., 2020). BME holds explanatory power for differences in value creation, competitive advantage, and firm survival (Amit and Zott, 2012; Massa et al., 2017). Many examples have illustrated that companies can target the same product market by using different business models, such as a lease-based model instead of a transactional payment for office printers (Chesbrough and Rosenbloom, 2002; Zott and Amit, 2008).

Recent studies have distinguished between demand-related (BME-DR) and demand-unrelated (BME-DU) business model extensions (Schmidt et al., 2024; Sohl et al., 2020; Westerveld et al., 2023). BME-DU focuses on using existing resources and capabilities to develop new business models that target fresh sources of demand. Rooted in the resource-based view of the firm (Penrose, 1959), this perspective is based on the insight that deploying the same resources to satisfy multiple demands enhances scale and reduces costs. These supply-side mechanisms of resource and capability complementarity in new business models have been examined in numerous studies (Aversa et al., 2015; Kim and Min, 2015; Markides and Charitou, 2004). BME-DR, on the other hand, focuses on synergies related to the customer, not production factors. It entails introducing a new business model that customers can use alongside an existing model without substituting the original, thereby enhancing use and value for customers (Sohl et al., 2020). For example, gas stations that have integrated a retail component into their operations allow customers to simultaneously refuel their vehicles and shop for groceries, thereby increasing the utility derived from their visit (Priem, 2007; Schmidt et al., 2024; Ye et al., 2012). While supply-related research on corporate strategy has primarily focused on value capture for firms, perspectives based on demand-related business models emphasize the strategic significance of consumers and the imperative to create value for them (Priem, 2007, 2012; Ye et al., 2012). Research on BME-DR has only recently attracted scholarly attention (Schmidt et al., 2024; Sohl

et al., 2022). We build on past work to analyze the performance implications of BME-DR and BME-DU.

Demand relatedness and performance

The existing business model literature often links performance benefits to the ability to share resources across business models. Kim and Min (2015) examined the factors influencing the development of business model portfolios, focusing in particular on the role of incumbent assets. They differentiated between complementary assets, which enhance business operations, and conflicting assets, which hinder them. This work is representative of various studies that have explored synergistic assets (Kim, 2015; Markides, 2004; Schwarz, 2017). In contrast to this view, we argue that demand complementarities also provide notable advantages for BMEs. This position builds on the emerging literature that claims that demand-related BMEs have a positive impact on firm performance. As companies offer two or more demand-related business models that customers can use in parallel, they create and can exploit customer-specific synergies (Schmidt et al., 2016).

Customer-specific synergies include opportunities for cross-selling, as in the above gas station example (Brush et al., 2012), reduced search cost (Klemperer and Padilla, 1997), increased customer knowledge, and lock-in leading to a higher willingness to pay (Schmidt et al., 2024; Westerveld et al., 2023). Exploiting these synergies can increase company performance. Therefore, scholars have also started empirically examining the performance implications of demand relatedness. For instance, Sohl et al. (2020) explored how incorporating a business model with a high demand complementarity can enhance firm performance in retail. They described how companies like Walmart operate multiple complementary business models, such as brick-and-mortar retail stores and e-commerce businesses. Customers benefit as they can use the e-commerce offerings (e.g., for a more extensive selection) in addition to brick-and-mortar retail (e.g., for product returns). Their findings suggest that such models are more profitable than demand-unrelated business models, and they supported this claim based on evidence from a dataset of global retail corporations. Similarly, Aversa et al. (2020) investigated how

demand complementarities arise from one-stop and network effects in the digital sector. They argued that reduced costs of search and transactions create customer utility, which in turn benefits company performance through customer lock-in, and a greater willingness among customers to pay. In a longitudinal study of Amazon.com, they demonstrated that these complementarities contribute to sustainable competitive advantage.

Both the above studies have argued that a critical performance-influencing factor is the degree of demand relatedness in the added business model: More related models provide more substantial benefits. If two business models serve the same customers, firms can offer complementary services and benefits of convenience for which customers are willing to pay more. We build on this research and assume that when a company provides multiple business models to the same customers while increasing their utility, this increases customer willingness to pay and creates lock-in effects (Schmidt et al., 2024; Ye et al., 2012). This, in turn, enhances company performance. We further assume that the positive effect of BME-DR can be demonstrated with market-based performance measures, under the premise that capital markets understand and correctly price these positive implications of BME-DR. Following the logic developed by Sohl et al. (2020), we argue that firms may also adopt additional business models that customers primarily perceive as substitutes rather than complements, referred to as BME-DU. In this case, customers typically choose one solution over the other — not both — because their needs are satisfied by just one offering. When business models are substitutes, value creation is mutually exclusive: a customer's choice to use one reduces value-creating opportunities for the other (Christensen, 2013). The above-mentioned positive effects that stem from the parallel use of two business models therefore do not apply to BME-DU. Further, if two demand-unrelated business models coexist, they are inherently in conflict. Managing such overlapping business models within the same firm generates internal competition for resources, managerial attention, and organizational legitimacy (Ahuja, 2016; Ahuja, 2017). Thus, we assume internal conflict between overlapping business models negatively affects firm performance. In summary, we claim the following:

H1: Announcements of a demand-related business model extension (BME-DR) lead to higher abnormal stock market returns than those of a demand-unrelated business model extension (BME-DU).

Moderating effects of business outlook and product/industry diversification

The extension of a business model portfolio often aims to hedge risk, pursue and test new opportunities for growth, and fight off disruptive entrants. Traditionally, BMEs were prescribed for “incumbent firms” in industries undergoing transformation (Anthony et al., 2017; Johnson and Suskewicz, 2020; Johnson et al., 2008). Companies extend their business models to react to a changing environment with a positive performance-related effect (Spieth et al., 2014; Werner and Hoffmann, 2024). BMEs enable companies to tap into new sources of revenue and profits by satisfying new market demands with existing or new groups of customers (Priem et al., 2018).

It is intuitively plausible that when a business has an unfavorable outlook, it tries to maximize its market power and the value of its existing customers. Consider the case of Deseret News, which expanded its business model in response to the decline in the newspaper industry. The company started offering digital solutions, national content, and premium subscriptions that its existing customers could use alongside its traditional newspaper business. This strategic shift helped it sustain its growth and enhance its reputation in a changing media landscape (Anthony et al., 2017). An extensive part of the literature has been devoted to consolidation in times of a pessimistic business outlook. Consolidation allows companies to combine their assets and increase their market power within a given customer segment (Stigler, 1964). Such consolidation, and the increased market power of the consolidated firm, often improves company performance in declining industries (Anand and Singh, 1997). Expanding into new product categories, on the other hand, allows companies to benefit from uncorrelated cash flows across markets, which is particularly advantageous during crises (Kuppuswamy and Villalonga, 2016).

In the context of BMEs, adding a new demand-related business model can maximize the value of existing customers of a given firm. By offering both business models in parallel, companies can reduce customers' search, transaction, and communication costs and increase their willingness to pay (Kaufman, 1996; Ye et al., 2012). This strategy can expand a company's share of wallet and market power in a specific segment, which is intuitively valuable during periods of decline. Contrary to this, Sohl et al. (2022) have argued that the uncertainty associated with economic downturns results in fewer opportunities to capitalize on demand-side synergies. Their research, which focuses on economic crises, suggests that the reduced heterogeneity of consumer demand reduces the benefits of applying multiple business models. However, we focus here on the moderating effects of industry- and company-level business outlooks, which likely do not directly affect the heterogeneity of demand. Demand-unrelated business models are typically associated with sharing existing assets and resources and allow companies to increase their scale and efficiency. However, these models expand the customer base or cause existing customers to substitute the existing business model. We assume that strategies to maximize the value of existing customers are far better than strategies for expansion and substitution during periods of pessimistic industry outlooks that are characterized by decreasing overall demand. Hence, we claim the following:

H2: A more pessimistic business outlook reinforces the positive effect of BME-DR (but not that of BME-DU) on stock market performance.

Five decades of research on corporate diversification has established that diversification in unrelated industries is value-destroying (Martin and Sayrak, 2003; Montgomery, 1994; Schommer et al., 2019; Villalonga, 2004a). There is a consensus that the relationship between diversification and value creation follows an inverted "U" shape. This means that a low-to-medium degree of related diversification is value-enhancing, but the costs of control and coordination at a high degree of

(unrelated) diversification outweigh its benefits, and this ultimately leads to a decline in firm performance (Palich et al., 2000; Schommer et al., 2019).

Research on corporate diversification has traditionally focused on product/industry diversification as captured by the Standard Industrial Classification (SIC). However, the strategic extension of business model portfolios has reshaped industry boundaries and traditional definitions of diversification (Massa et al., 2017). As such, business model portfolio diversification is a new area of diversification research that is different from product/industry diversification. Demand relatedness within otherwise unrelated products/industries can provide a customer with multiple utilities (Priem, 2012). Thus, diversifying into an unrelated industry may be value accretive for the focal firm if it creates demand-side synergies. Aversa and Hueller (2023) extended this argument by proposing that for digital BMEs, the traditional inverted U-shaped relationship between performance and product diversification may shift to an S-shaped curve. High levels of unrelated diversification continue to enhance firm performance in this new model. They attributed this shift to the reduced cost of redeploying resources in the digital space and a greater return from unrelated diversification due to customer complementarities. The latter argument can also be applied to physical businesses. When a well-diversified organization adds a new business model that focuses on existing customers, and can be used in parallel with the company's main business model, this creates customer complementarities. Much of the BME-DR literature does not control for this effect. An exception is Sohl et al. (2022), who controlled for product diversification as an explanatory variable for return on assets, however, they did not analyze its interaction with BME-DR. Traditional product category diversification requires a well-diversified company to add another product line and sell it to new customers, thus driving up the costs of control and coordination as well as introducing a high upfront investment. By contrast, the demand-related BMEs analyzed here likely have low upfront investments and focus on the same customers, thereby reducing complexity and increasing the capacity for diversification at the firm level. We therefore hypothesize the following:

H3: A higher degree of product/industry diversification reinforces the positive effect of BME-DR (but not that of BME-DU) on stock market performance.

METHODOLOGY

To explore the hypotheses developed above, we conducted an event study analyzing the reactions of the capital market to the announcement of a BME. We build on the established use of event studies in the literature on strategy (Borusyak and Jaravel, 2017; Craig, 1997; Kale et al., 2002; Koh and Venkatraman, 1991; McWilliams and Siegel, 1997; Nixon et al., 2004). We follow Spieth et al. (2021) in defining a BME as an innovative model for creating, delivering, or capturing new value for the focal firm. Moreover, we follow recent research in describing the BME as demand-side synergistic if (A) the customer can use both business models in parallel while (B) benefiting from increased use through the parallel use, and (C) the extended business model does not threaten to cannibalize the core business model (Buss et al., 2019; Sohl et al., 2022). The strategic decision to engage in a BME is not necessarily announced to public markets or is announced only with a significant delay – for example, when the first results of the BME are apparent, or the new business model is launched after internal de-risking (Ramdani et al., 2019). To understand the specific effect of the announcement of the BME, we thus analyze the BMEs pursued by companies when creating JVs. This means that we identify JVs that represent a new business model for the participating company and analyze the response of the capital market to its formation. Because JVs entail equity holdings, they are announced to financial markets such that they can be precisely dated.

Data and sample collection

The initial samples were obtained from the alliance database of the Securities Data Company (SDC) via SDC Platinum. To construct appropriate samples, we collected all data on high-tech JVs in the United States in the 22 years from January 1998 to December 2019. The high-tech sector is commonly used in research on alliances (Bouncken and Fredrich, 2016; Kohers and Kohers, 2019; Villalonga and

McGahan, 2005) owing to its dynamic nature, and the prominence of publicly traded companies that view alliances as a key part of their corporate strategy (Kale et al., 2002).

We excluded JVs with more than four participants, as they were less likely to trigger a notable market reaction for individual companies. In line with research on diversification (Villalonga, 2004b), we excluded firms from the financial services and regulated utilities (SIC codes 6000–6999, and 4900–4999). The initial firm-level dataset consisted of information on 1,432 firms that had announced JVs in the high-tech industry. Having obtained financial data for these firms from COMPUSTAT and market-related data on them from the Center for Research in Security Prices (CSPR), we excluded firms that were not part of the S&P 500 index. This substantially reduced the sample size to 268 firms.

Business model extensions

Information on business models is not readily available in a given database. Therefore, researchers typically analyze archetypes of business models (Aversa et al., 2015; Schwarz et al., 2017; Sohl and Vroom, 2014). To create a variable for BME and analyze whether business models are demand-related, we conducted an in-depth qualitative content analysis of the JVs (Schreier, 2012).

We compiled a comprehensive database of JVs that included relevant filings, newspaper articles, 10-K filings, analyst reports, company websites, books, and JV websites. A coding framework was then developed by using the relevant literature on JVs (Bamford and Jenkins, 2021; Koh and Venkatraman, 1991; Reuer and Koza, 2000) and a finite list of pertinent business models (Gassmann et al., 2014). We coded JVs with an external perspective and thus used all the publicly available information at the time of the announcement—similarly to how an investor would operate.

We rigorously evaluated and refined our framework based on input from experienced researchers of business models. We applied a comprehensive five-step approach to coding. First, we reviewed the description and activities of the focal firm. Second, we analyzed the text of the JV agreement for keywords associated with specific archetypes of business models (e.g., e-commerce), and coded them accordingly. Third, we reviewed a minimum of four sources of data to gather supplementary

information on the purposes of the JV and summarized them. Fourth, we contrasted the focal company's main business activities with those of the JV, highlighting them when they offer different customer value propositions, or utilize different delivery or payment models and thus represent different business models. Further, we analyzed the database entries and qualitative information to determine whether the business models focused on the same customers, and could be used in parallel. Fifth, we combined the codes to establish a final code that indicated whether the JV represented a business model extension and, if so, whether the extension was demand-related (BME-DR = 1) or if it was demand-unrelated (BME-DU = 1). Of the 208 JVs in our sample, 59 were a business model extending joint venture, of which 29 represented a demand-related BME. In addition to manual coding by human experts, we implemented an artificial intelligence (AI)-based coding tool to challenge and validate it. Programmed with the coding framework and qualitative information collected for each JV, this tool classified the announcement of the JVs and provided specific rationales for their classification. Integrating AI into our framework enhanced the robustness of our analysis by leveraging the strengths of humans and AI, and ensured a more reliable understanding of the announcements of JVs and their purposes. The AI model ensured the consistent application of the coding framework by minimizing subjective biases and providing objective results. AI algorithms can detect complex patterns and relationships within multi-source data (Tian et al., 2024). Our AI tool also provided a specific rationale for each classification to ensure its transparency and traceability.

The above coding process yielded rich evidence on the use of JVs as a vehicle for BMEs with several demand-related extensions. For instance, Mattel's 2018 "Mattel163" joint venture with NetEase, a software company, exemplifies a BME with the objective of developing digital business models in addition to its physical toys. As the company stated, this entrance into the prepackaged software industry allowed Mattel to "bring together physical and digital worlds" (Mattel, 2023). In parallel with offline play, consumers could play their favorite games online to create increased utility for the parallel use of both business models.

Abnormal stock market returns

We used abnormal stock market returns as the dependent variable of our research to measure the value-creating effect of JV announcements (Hoechle et al., 2012; Kale et al., 2002; Kothari and Warner, 2004; Villalonga, 2004b). This approach relied on three key assumptions: (1) The markets were efficient, (2) the JV had not been anticipated by investors long before the announcement date, and (3) there was no confounding effect during the event window (McWilliams and Siegel, 1997). We obtained the abnormal returns by using the Wharton Research Data Services event study function.

We used an estimation window of 250 days before the event to calculate the expected return around the event window by using predictions of the capital asset pricing model (Markowitz, 1991). To isolate event-related effects, we introduce a gap of 10 days between the period of estimation and the event. The cumulative abnormal return is the cumulative sum of abnormal returns (CAR) over three days surrounding the JV announcement: -3 , 0 (event day), and $+3$. The CAR could not be calculated for 29 companies owing to an insufficient amount of available data on share prices during the estimation window.

Moderators and controls

We constructed two moderators by using quarterly financial data from CRSP and COMPUSTAT. To assess the effects of the business outlook, we used the slope of the two-year revenue growth and the market-to-book ratio of each firm. The two-year growth in revenue was calculated as the difference in revenue over the given period, and provided insights into the company's most recent business performance. The market-to-book ratio reflected the financial market's valuation relative to the firm's own assets on its books, and served as a proxy for the investors' perceptions of the company's future prosperity. To facilitate the interpretation of both measures, we divided them by -1 , so that a high measure represented a negative development and, therefore, a pessimistic business outlook. We controlled for several other factors as well. As the firm size may influence the relative importance of

a JV, we included the logarithm of the full-year revenue and assets of each firm for the year in which the announcement was made. Similarly, we control for the logarithm of the market capitalization of each company. We control for the percentage holding of the focal firm in the JV, as there might be an investor preference for high or low ownership. Finally, we considered alliance experience, which influences the shareholders' reactions to announcing additional alliances (Lavie, 2007). For this, we used the number of high-tech JVs the company engaged in before its most recent JV announcement relative to its total assets. All independent variables were Winsorized at a 5% interval.

ANALYSIS

Our final set of samples consists of data on 208 firms that announced a JV (the moderating and control variables could not be obtained for several companies), as displayed in Table I (including descriptive statistics).

Insert Table I about here.

We test our hypotheses using ordinary least-squares models. We first regress our indicators of demand relatedness (BME-DR and BME-DU) against abnormal stock market returns as the dependent variable. The results of these models are plotted in Table II. Consistently with past research, we find that the BME has a considerable positive effect on our measure of value creation (CAR; see Model 1). Similarly, we find that BME-DR and BME-DU have a considerable positive effect on abnormal returns (Models 2 and 3). When controlling for the underlying positive effect of BMEs (Models 4 and 5), BME-DR continues to influence the CAR, while BME-DU has a negative effect on it. However, the

overall effect of BME-DU on abnormal returns is still positive (0.066–0.033). These findings support hypothesis H1 and suggest that JV announcements involving a BME-DR lead to higher abnormal stock market returns for the company than those obtained following the announcement of a BME-DU.

Insert Table II about here.

We test our second hypothesis by using our measures for the business outlook (Model 6–9). The results show that BME-DR has a considerable positive moderating effect on both measures of increasingly pessimistic business outlooks (RevDev and MtBDev). These findings indicate that companies with a negative business outlook (decreasing revenue and market-to-book value) benefit from extending their business model portfolios using demand-related models. For business model extensions that are not demand-related (BME-DU), we find that there are no significant interactions with RevDev and a considerable negative interaction with MtBDev.

Following this, we construct a new model to analyze the relationship between the BME and traditional product/industry diversification. We establish a measure of the level of diversification at a company to better understand the relationship between traditional product industry diversification and BMEs. For this, we follow Hendrick's (2009) study and measure the Herfindahl Index of each firm based on the revenue reported by its different business segments. Our “Diversification” construct is the sum of the square of business segment revenue relative to the total revenue of the company. We invert this measure for ease of interpretation so that a high "Diversification" measure indicates a company with diverse business segments. We follow our established configuration but add an interaction between BME-DR and BME-DU and our measure of company diversification (Models 10 and 11). However, owing to missing segment-related data on 17 companies, the sample size for these models decreased to 186. We

also add an industry-fixed effect with the two-digit SIC code to the model to control for industry-level differences in investors' preferences for diversification. Contrary to hypothesis H3, we find that more diversified firms benefit from BME-DU as the interaction between BME-DU and diversification was positive (Model 11). We don't find a similarly significant effect for BME-DR (Model 10).

Insert Figure 1 about here.

We further investigated the above finding by examining the interactions between BME-DR, BME-DU, and a squared indicator of diversification. The results show that diversification squared negatively moderates the effect of BME-DR on abnormal stock market returns (Model 12). Figure 1 illustrates this quadratic relationship, which has an inverted U shape. Companies with a low-to-medium level of diversification benefit from BME-DR, while those with high levels of diversification do not. Conversely, BME-DU has the opposite effect: Companies with low-to-medium levels of diversification do not benefit from it, while those with high levels do. We create binary moderators for low-to-medium levels of diversification (LMDiv; Models 14 and 15) and high diversification (HighDiv; Models 16 and 17) to validate these findings. Our analysis supports the inverted U-shaped and U-shaped relationships of moderation of BME-DR and BME-DU, respectively.

Insert Table III about here.

DISCUSSION

Our results broadly confirm our hypotheses, showing that demand-related BMEs, which engage the same customers and enable them to use both business models in parallel, create significant value. We

hypothesized that this positive effect is driven by increased customer willingness to pay, which outweighs the benefits of traditional synergies in resources and capabilities. This finding aligns with the emerging literature that has highlighted the critical role of demand complementarities (Sohl et al., 2020; Westerveld et al., 2023). Our study is also the first to show that these positive effects of BME-DR are reflected in market-based performance measures, indicating that investors identify and accurately price the positive performance-related implications of BME-DR. This is important, as it will allow academic researchers to incorporate more market-based measures of performance in their work on BME-DR. Furthermore, following Sohl's (2020) framework, we explored the impact of demand-unrelated business model extensions (BME-DU). As we had predicted, the positive effects of BME-DR do not extend to BME-DU. Our findings suggest that companies that implement multiple business models can strengthen customer relationships, increase their share of wallet, and enhance market power, particularly during industry decline or when their business outlook is pessimistic. These findings add to the emerging literature on the moderators of the performance benefits of demand-related business model diversification (Aversa and Hueller, 2023; Buss et al., 2019; Sohl et al., 2020), and provide new insights. While past studies have examined the moderating effects of demand heterogeneity, our study is the first to explore the moderating effects of a pessimistic business outlook. The literature on BME has started exploring the interplay between BMEs and product/industry diversification (Massa et al., 2017). We add to this stream by analyzing the moderating effects of product/industry diversification on the BME-DR–performance relationship. Contrary to our hypothesis, we did not find evidence that a higher degree of product/industry diversification enhances the positive effect of BME-DR on the company's stock market performance. Instead, we obtained the somewhat unexpected result that the effect of BME-DR on abnormal returns is moderated by the diversification of the focal firm in an inverted U-shaped relationship, suggesting that BME-DR follows the pattern of "too much of a good thing" (Pierce, 2013). To understand this finding, we turn to the traditional literature on corporate diversification. Consider the underlying reason for the inverted U-

shaped relationship between performance and diversification: A company that starts diversifying its products can achieve economies of scope while providing its buyers with a range of goods and services (Palich et al., 2000; Seth, 1990). Furthermore, its different products reinforce each other through bundling options or brand synergies (Barney, 1997). When a company with a low degree of diversification adds a demand-related business model to its portfolio, it can similarly create value through the economies of scope and bundling options. For example, the British coffee chain *Pret a Manger* extended its business model portfolio with a subscription-based model in addition to its traditional transactional retail business model (Bryson, 2021). Customers could use the subscription in parallel with the retail model (e.g., to buy food alongside a subscription coffee) to enhance their overall utility. *Pret a Manger* also offered bundling options, such as discounted cookies for subscription holders, to further enhance customer value.

However, the factors that explain the diminishing impact of a high level of diversification also apply to demand-related BMEs. Managers must handle an increasingly complex portfolio of businesses in highly diversified companies (Grant, 1988), leading to a loss of control and higher costs of coordination (Markides, 1992). Suppose a highly diversified company adds a new business model. While the extension may target the same customers (i.e., demand-related extension), it can also introduce organizational complexity by requiring new resources and capabilities. Consequently, at a certain level of overall company diversification, the costs of managing this added complexity may outweigh the benefits of BME-DR (Palich et al., 2000). Consider the hypothetical scenario provided by Aversa and Hueller (2023): If Airbnb were to add an aviation business model to its portfolio, it could realize demand-side synergies, as customers using its platform might also fly with an Airbnb airline. However, the resulting rise in complexity owing to additional resources and capabilities would likely diminish any positive performance-related effect. On the other hand, BME-DUs leverage benefits from resource and capability complementarities. The value driver uses a specific resource or capability across businesses (Teece, 1982; Wernerfelt, 1984). A diversified company that extends its

business model can use and reconfigure its existing assets and capabilities without inducing additional complexity from diversification.

Implications for practitioners

This research underscores the strategic importance of demand complementarities in business model innovation and provides valuable insights for firms aiming to enhance their performance in the market through the effective diversification of their business models. Our findings highlight the need for business executives to clearly articulate their strategic intent when considering adding new business models or evaluating existing ones. Executives must clarify the focus of their BMEs, either on demand relatedness, or synergies in assets and resources. This clarity can help managers select the appropriate type of BME depending on the circumstances of the company. Similarly, our work suggests that not all BMEs yield an equally positive return. Hence, managers should avoid the “novelty trap” of adding innovations to their portfolio without strategic considerations (Leppänen et al., 2021). Finally, our findings suggest that BMEs follow a pattern of “too much of a good thing,” which is why their marginal value is lower for companies that are already well diversified (Pierce, 2013).

Limitations and avenues for future research

We use a novel methodology to explore the effects of demand relatedness, but it has certain limitations. First, while we follow a clear research framework, our coding is subject to the challenge inherent in empirical research on business models—the need for human interpretation—which can affect the replicability of the results (Aversa et al., 2020). This limitation reduces the applicability of our research and should, therefore, be considered when discussing its outcomes.

Second, we might not have accurately captured the impact of digitally enabled BME-DR. Digital diversification that leads to demand-side synergies has created value, even in unrelated industries (Alaimo and Aaltonen, 2023; Menz et al., 2021). Future studies should focus on the performance-related implications of digital BME-DR and explore these effects in more detail.

Furthermore, prior research has identified a range of variables that influence stock market reactions to alliance announcements, including the existence of an alliance management capability within the focal firm (Kale, Dyer, & Singh, 2002) and the reputation of the alliance partner (Stuart, 2000). While it is a limitation of our study that we did not directly control for these factors, we took steps to mitigate the risk that our findings are driven by such unobserved variables. Specifically, we examined whether key structural characteristics — (1) of the focal firm (size and profitability) and (2) of the alliance partner (size and profitability) — are similarly distributed across the analyzed subgroups. These proxy measures allow us to assess whether other established drivers of abnormal returns, such as alliance management capability (positively associated with firm size and profitability) and partner reputation (positively associated with partner size and profitability), could systematically bias our results. Based on this analysis, we are confident that the effects we observe are unlikely to be explained by differences in these known factors across subgroups.

Our research also has several implications for the research. First, it extends the emerging body of work on demand-side synergies by providing large-sample, event-based empirical evidence for the performance benefits of BME-DR. While prior studies have primarily relied on case-based or accounting-driven analyses (e.g., Sohl et al., 2020; Aversa et al., 2020), our use of abnormal stock market returns introduces a market-based lens and offers a replicable methodology for assessing how capital markets price demand-side complementarities. This opens avenues for future research on the valuation effects of different business model configurations.

Second, our findings contribute to the diversification literature by showing that BME-DR performance effects follow an inverted U-shape depending on firm-level diversification. This suggests a boundary condition for the value of customer-based synergies and calls for greater integration between the business model and diversification literatures, particularly in understanding the non-linear effects of complexity and coordination costs.

Third, we show that BME-DRs are especially valuable under adverse conditions—specifically, when companies face a pessimistic business outlook. This highlights the contextual sensitivity of BMEs and suggests further research into temporal, industry-specific, or macroeconomic moderators. In sum, we encourage scholars to expand theory on how demand-relatedness, organizational scope, and environmental conditions jointly shape the value of BMEs, and to consider stock market-based methodologies as a viable complement to traditional performance metrics.

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APPENDIX

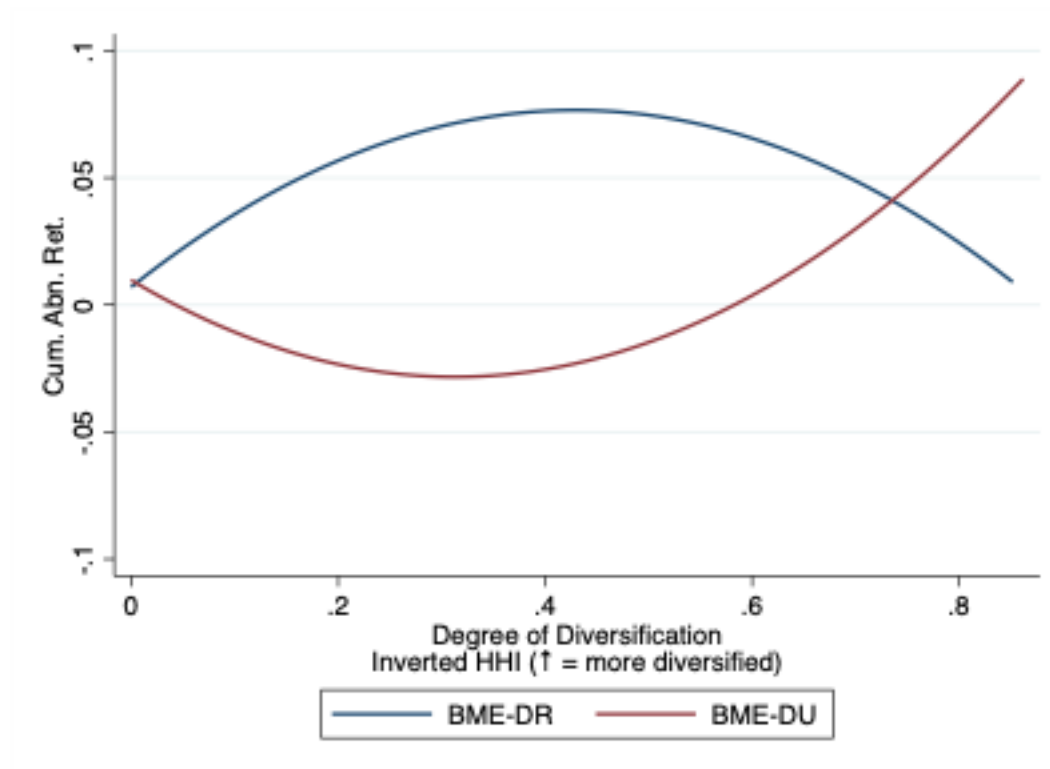


Figure 1: Quadratic fit of business model extensions that are demand-related (BME-DR) and those that are not (BME-DU) against the abnormal returns (CAR), depending on the degree of company diversification.

Table I: Descriptive statistics, including a sample split.

	Sample Overview						
	mean	p50	sd	W/out BME	With BME	BME-DR	BME-DU
CAR	0.000	-0.010	0.060	-0.020	0.030	0.040	0.010
Experience (past HT JVs)	3.22	2.00	2.99	3.48	2.56	3.41	1.73
JV Percentage Hold	45.24	50.00	10.04	46.27	42.66	45.80	39.61
FY Revenue	44'693	26'151	47'214	41'916	51'705	48'826	54'488
Total Assets	87'140	32'548	136'291	86'144	89'655	101'211	78'483
Market Capitalization	103'530	56'318	124'900	112'899	79'869	62'974	96'201
Observations	208			149	59	29	30

Table II: Regression (Models (1)–(9)) with the CAR as the dependent variable.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
BME	0.050*** (0.00)			0.033*** (0.01)	0.066*** (0.00)	0.035*** (0.00)	0.063*** (0.00)	0.034*** (0.01)	0.066*** (0.00)
Alliance Exp. to tot. Assets	13.058 (0.57)	6.929 (0.76)	0.449 (0.99)	13.061 (0.57)	13.061 (0.57)	1.555 (0.95)	-0.223 (0.99)	10.875 (0.63)	16.883 (0.45)
JV Percentage Hold	0.000 (0.41)	-0.000 (0.95)	0.000 (0.73)	0.000 (0.61)	0.000 (0.61)	0.000 (0.94)	0.000 (0.79)	0.000 (0.61)	0.000 (0.39)
Log(Revenue)	0.009 (0.36)	0.014 (0.15)	0.011 (0.32)	0.011 (0.26)	0.011 (0.26)	0.011 (0.27)	0.013 (0.20)	0.010 (0.31)	0.014 (0.14)
Log(Assets)	-0.008 (0.36)	-0.012 (0.19)	-0.008 (0.38)	-0.010 (0.27)	-0.010 (0.27)	-0.015 (0.11)	-0.016+ (0.09)	-0.013 (0.15)	-0.014 (0.12)
Log(MarketCap)	0.005 (0.23)	0.004 (0.36)	0.002 (0.64)	0.005 (0.21)	0.005 (0.21)	0.010* (0.03)	0.009* (0.05)	0.009* (0.05)	0.006 (0.18)
BME-DR		0.060*** (0.00)		0.033* (0.04)					
BME-DU			0.021 (0.11)		-0.033* (0.04)				
BME-DR=1						0.043* (0.02)		0.040* (0.01)	
BME-DU=1							-0.035+ (0.08)		-0.040* (0.01)
RevDevPos						0.035+ (0.07)	0.049* (0.02)		
BME-DR=1 # RevDevPos						0.134* (0.04)			
BME-DU=1 # RevDevPos							-0.033 (0.47)		
MtBDevPos								0.004 (0.58)	0.018* (0.01)
BME-DR=1 # MtBDevPos								0.043*** (0.01)	
BME-DU=1 # MtBDevPos									-0.070*** (0.00)
Constant	-0.101+ (0.05)	-0.079 (0.12)	-0.058 (0.28)	-0.100* (0.05)	-0.100* (0.05)	-0.072 (0.16)	-0.076 (0.14)	-0.094+ (0.06)	-0.099* (0.05)
Observations	208	208	208	208	208	208	208	208	208
R-squared	0.127	0.116	0.024	0.145	0.145	0.185	0.170	0.188	0.205
Adjusted R-squared	0.101	0.089	-0.005	0.115	0.115	0.148	0.132	0.151	0.169

Table III: Regression (Models (10)–(17)) with the CAR as the dependent variable.

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
BME	0.036*	0.074***	0.038***	0.074***	0.034*	0.077***	0.034*	0.077***
	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
Alliance Exp. to tot. Assets	-48.440	-37.061	-49.621	-36.375	-32.243	-25.326	-32.243	-25.326
	(0.12)	(0.23)	(0.11)	(0.23)	(0.22)	(0.33)	(0.22)	(0.33)
JV Percentage Hold	0.001+	0.001*	0.001+	0.001*	0.001	0.001	0.001	0.001
	(0.07)	(0.03)	(0.05)	(0.03)	(0.15)	(0.16)	(0.15)	(0.16)
Log(Revenue)	0.032*	0.031*	0.032*	0.031*	0.030*	0.028+	0.030*	0.028+
	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.05)	(0.03)	(0.05)
Log(Assets)	-0.031*	-0.024+	-0.032*	-0.024+	-0.027*	-0.024+	-0.027*	-0.024+
	(0.02)	(0.06)	(0.01)	(0.06)	(0.03)	(0.05)	(0.03)	(0.05)
Log(MarketCap)	-0.004	-0.004	-0.004	-0.005	-0.003	-0.003	-0.003	-0.003
	(0.46)	(0.41)	(0.48)	(0.36)	(0.53)	(0.56)	(0.53)	(0.56)
Diversification	0.025	-0.014						
	(0.32)	(0.59)						
Diversification Sqrd (2)			0.035	-0.018				
			(0.19)	(0.49)				
BME-DR=1	0.101*		0.098***		0.011		0.068***	
	(0.01)		(0.00)		(0.65)		(0.00)	
BME-DU=1		-0.136***		-0.107***		-0.007		-0.065***
		(0.00)		(0.00)		(0.77)		(0.00)
BME-DR=1 # Div	-0.105+							
	(0.08)							
BME-DU=1 # Div		0.175***						
		(0.01)						
BME-DR=1 # Div2			-0.153*					
			(0.01)					
BME-DU=1 # Div2				0.193***				
				(0.00)				
LMDiv=1					-0.012	0.002		
					(0.21)	(0.87)		
HighDiv=1							0.012	-0.002
							(0.21)	(0.87)
BME-DR=1 # LMDiv=1					0.058*			
					(0.03)			
BME-DU=1 # LMDiv=1						-0.058*		
						(0.03)		
BME-DR=1 # HighDiv=1							-0.058*	
							(0.03)	
BME-DU=1 # HighDiv=1								0.058*
								(0.03)
Industry fixed effects	----- included -----							
Constant	-0.047	-0.094	-0.044	-0.095	-0.032	-0.066	-0.044	-0.065
	(0.51)	(0.19)	(0.53)	(0.18)	(0.64)	(0.32)	(0.51)	(0.33)
Observations	186	186	186	186	208	208	208	208
R-squared	0.326	0.344	0.340	0.349	0.306	0.307	0.306	0.307
Adjusted R-squared	0.201	0.222	0.217	0.229	0.179	0.180	0.179	0.180
p-values in parentheses								
+ p<0.10, * p<0.05, *** p<0.01								