

Abnormal Stock Market Returns to Business Model Extension Announcements — Value Drivers & Moderators

Authors: Thiemo Werner (WU Vienna), Werner H. Hoffmann (WU Vienna)

Correspondence: Thiemo.Werner@s.wu.ac.at

Abstract:

This study investigates how exogenous and endogenous uncertainties, as well as product–industry diversification, moderate the relationship between business model extensions (BMEs) and firm performance, measured by abnormal stock market returns. Utilizing an event study with a unique sample of S&P 500 firms announcing joint ventures in the high-tech sector between 1998 and 2019, we find that BMEs consistently lead to positive abnormal stock market returns. Our results show that BMEs generate positive abnormal returns, and that this value creation is significantly amplified under conditions of company-specific, industry-specific, and economy-wide uncertainty. Further, we find that combining BMEs with product–industry diversification leads to superior value creation under uncertainty, whereas product-industry diversification alone tends to destroy value. These findings contribute to strategy research by identifying key contingencies for successful BMEs and highlighting the strategic interplay between BME and diversification strategies in dynamic environments.

Keywords: Business model, business model extension, uncertainty, diversification, event study

INTRODUCTION

In recent years, both scholarly and practitioners' interest have grown in introductions and extensions of business models, which represent new ways to create, deliver, or capture value (Teece, 2010). We refer to this stream of research as business model extension (BME) literature. Despite this growing interest, empirical research on market value creation through BME remains limited (White et al., 2022; Snihur, 2023). Studies examining the moderators of the BME-performance relationship remain sparse, and in particular, external moderators, such as those contributing to increased endogenous and exogenous uncertainty, remain especially underexplored (Spieth et al., 2014; White et al., 2022; Foss and Saebi, 2018; Hock-Doepgen et al., 2021; Sabaruddin et al., 2023).

These moderators are particularly relevant for practitioners. Consider a recent report by the Boston Consulting Group (2023), which highlights that top leaders seeking to build resilience in the face of economic uncertainty regularly expand into adjacent business models—a strategic priority according to their study. Or consider the British coffee chain Pret a Manger, which extended its business model portfolio with a subscription business model, in addition to its traditional transactional retail business model, to respond to shifting demand during the COVID-19 pandemic (Bryson, 2021).

We review the literature on BME and find that environmental conditions, industry dynamics, and competitive shifts play critical roles in moderating the relationship between BME and firm performance (Nielsen, 2021; White et al., 2022; Sabatier, 2010). For exogenous demand uncertainty (i.e., uncertainty that is outside the control of the focal company), we develop the argument that BMEs are particularly valuable for incumbent firms seeking to maintain relevance in shifting markets BME enables companies to leverage existing capabilities and respond to rapidly changing environments (Anthony et al., 2017; Zott and Amit, 2010; Spieth et al., 2014). In periods of demand uncertainty, BMEs help companies tap into new sources of demand, boosting resilience and competitive advantage (Pisano, 2017; White et al., 2022; Priem et al., 2018). Accordingly, we hypothesize that demand uncertainty positively moderates the BME-performance relationship. Specifically, we examine industry and economy-wide uncertainty.

In addition, firms may experience internal performance shortfalls due to a misalignment between their offerings and evolving market needs, prompting ambiguity about future outcomes (Pidun, 2019). We refer to this as endogenous uncertainty. In such cases, BMEs can serve as a strategic response to underperformance, enabling firms to realign with demand through adaptive changes in value creation, delivery, or monetization (Cyert and March, 1963; Greve, 2003; Teece, 2018).

Similar to the decision to extend a business model, managers may decide to expand their product portfolio and diversify into new product industries. The BME paradigm challenges conventional paradigms of industry classification and diversification strategies (Aversa and Haeffliger, 2017; Lüthge, 2020). Unlike product-industry diversification, which relates to ‘what’ a company offers (new products/industries), BMEs refer to ‘how’ value is created, delivered, and captured (Teece, 2010; Zott and Amit, 2010). We argue that BME and product-industry diversification are orthogonal strategies, and the nature of the BME—whether it occurs in an existing or new product industry—serves as an important moderator of the BME-performance relationship. Although the interaction between BME and traditional product-industry diversification seems intuitively significant, it has been largely underexplored in empirical research. The performance impact of implementing a new business model in a new industry might be fundamentally different from that of implementing a new business model in a company’s core market (such as the Pret a Manger example above). Therefore, we examine how product-industry diversification moderates value creation through BME.

Theoretical research on corporate diversification has shown that diversifying into unrelated industries tends to destroy value due to increased complexity and coordination costs (Martin and Sayrak, 2003; Schommer et al., 2019). However, BME may allow companies to leverage existing resources to tap into new demand sources, potentially moderating the negative effects of traditional product-industry diversification (Zott et al., 2011; Massa et al., 2017). Although BMEs generally lead to positive performance outcomes, their success may depend on whether they occur in existing or new product industries (Aversa et al., 2015; White et al., 2022). We develop hypotheses suggesting that the performance impact of BME is moderated by whether it occurs in combination with product-industry extension. Uncertainty at the firm, industry, or economy-wide level may further enhance the positive

effects of BME in combination with product diversification by increasing the value of strategic flexibility and new growth opportunities (Benito-Osorio, 2012; Volkov, 2015). We therefore hypothesize that the presence of uncertainty—whether exogenous or endogenous—will amplify the positive effect of BME combined with product extension (PE) but conversely exacerbate the negative impact of pursuing isolated product-industry extension.

Indicators for BME are only available in select industries, such as the retail sector (Sohl et al., 2020b, 2022). Because we cannot directly measure the BME-performance relationship in other industries, we use an event study design to assess the impact of BME announcements on abnormal stock market returns. Event studies are commonly used to gauge how the capital market values a strategic decision (Craig, 1997; McWilliams and Siegel, 1997; Kale et al., 2002; Borusyak and Jaravel, 2017). BMEs are not normally announced explicitly; we therefore focus on BMEs that companies pursue when creating joint ventures (JVs). This means we identify JVs that represent a new business model for one of the participating companies and analyze the capital-market response to their formation. Because JVs entail equity holdings, they are announced to financial markets, and these announcements can be dated precisely. We leverage a sample of S&P 500 companies that engaged in JVs in the high-tech industry between 1998 and 2019. This industry is commonly used in research studies because it is characterized by dynamism and strategic renewal (Villalonga and McGahan, 2005; Bouncken and Fredrich, 2016; Kohers and Kohers, 2019). We then analyze our sample using ordinary least square regression models and find evidence supporting most of our hypotheses.

This study makes three contributions. First, it empirically validates BMEs' positive value-creation using market-based measures. Second, it identifies uncertainty as a key external moderator of the BME-performance relationship. Third, it reveals that combining BME with product-industry diversification can mitigate the negative effects of diversification under uncertainty.

We respond to calls for research into moderators of the BME-performance relationship (Sohl et al., 2020b), the impact of externalities on BME (Foss and Saebi, 2018), and the interplay between BME and other types of innovation (Demil et al., 2015).

The remainder of this paper is structured as follows: We first review relevant literature and introduce our hypotheses, and then describe our event-study methodology and unique research sample. The next section presents the results of our statistical models, and we conclude with a discussion of our results and the study's limitations.

LITERATURE AND HYPOTHESES

A growing stream of management literature investigates the concept of the business model (Wirtz et al., 2016; Bosbach et al., 2020; Lanzolla and Markides, 2020; Sohl et al., 2022; White et al., 2022), defined as a system that combines a unique way to create, deliver, and capture value (Teece, 2010; Baden-Fuller and Haefliger, 2013). This concept has seen growing theoretical and practical relevance (Markides, 2023; Mishra and Mishra, 2023) and touches several other streams of the management literature, including external collaborations (Sohl and Vroom, 2017; Feldman, 2020; Menz et al., 2021), industry diversification (Sohl and Folta, 2021; Sohl et al., 2022), competitive advantage (Casadesus and Zhu, 2013; Demil, 2010), shareholder value creation (Markides and Oyon, 2010; Pidun, 2019), and management during times of high uncertainty and disruption (Bivona and Cruz, 2021; Breier et al., 2021). Today, the business model is a powerful construct in strategy and management research and an important driver of heterogeneity in firm-level performance (Sohl et al., 2020b).

Business Model Extensions

In recent years, scholars have begun to recognize that multiple business models may exist in parallel within the same company (Casadesus-Masanell and Ricart, 2010; Sohl and Vroom, 2014). BME describes the extension of a firm's business model portfolio by introducing an innovative model to create, deliver, or capture new value (Spieth et al., 2021). A BME is distinct from the products and services it supports; thus, a company can expand its business model portfolio without altering its existing product or service offerings (Sohl, 2020). Whereas products and services define the industry in which a company competes, the business model describes *how* the company operates—making BME a distinct unit of analysis from traditional product diversification. The strategic decision to invest in a BME (Leiblein et al., 2018) has been analyzed in a multitude of different organizational contexts, which

include fending off disruptive competitors (Markides and Charitou, 2004; Christensen and Raynor, 2013), seizing new growth opportunities (Aversa and Haefliger, 2016; Anthony et al., 2017), commercializing new technologies (Chesbrough and Rosenbloom, 2002; Chesbrough, 2010; Vinokurova and Kapoor, 2020; Snihur et al., 2021), and bridging financing gaps (Sabatier et al., 2010). Several studies also examine BME's effect on performance, concluding that it is positive (Heij et al., 2014; Aversa et al., 2015; Lanzolla and Markides, 2020; Loon and Quan, 2020; Sohl et al., 2020a; White et al., 2022). The fundamental finding of these studies is that BME cultivates strategic flexibility and agility, enabling firms to achieve superior outcomes. This performance impact is achieved because BME allows firms to adapt their customer-value propositions, value-delivery model (including processes and capability usage), and value-capture model (Foss and Saebi, 2017). With these enhanced capabilities, firms can better adapt to external market disruptions and can also seize new growth opportunities by addressing evolving customer needs. With extension to multiple business models, the possibility of resource-sharing and the complementarity of capabilities across different business models is value enhancing (Sohl et al., 2020b).

Scholars have also started to examine the potential downsides of BME. Prior research on business models has been found to have a pro-innovation bias, frequently assuming that business model innovation yields universally-positive outcomes for firms (Foss and Saebi, 2017; Heidenreich et al., 2022). Critically, BME seems to follow a “too much of a good thing” trajectory (Pierce and Aguinis, 2013), whereby frequent business model changes can harm firm performance (White et al., 2022). However, as shown by recent studies, the overall effect of BME still seems favorable (Lüthge, 2020; Sohl et al., 2020b; White et al., 2022; Markides, 2023; Heij et al., 2024).

Despite this growing research, we know little about how shareholders in particular, or the capital market in general, react to the strategic decision to extend a business model. A recent review by White et al. (2022) identifies only a small proportion of studies (not all peer-reviewed) that use market-based measures to assess the impact of BME (Zott and Amit, 2008; Chondrakis, 2012; Visnjic et al., 2014; Kim and Min, 2015; Macena et al., 2017; Guo et al., 2018). These focus on Tobin's q as a measure of the firm's forward-looking performance, and none of them consider external moderators of the BME—

market-performance relationship. Also, some focus on specific sub-industries (e.g., mining in Canada), so their findings might not be generalizable (Macena et al., 2017). We build on this research stream and propose that market-based measures can capture the positive effects of BME. Our research focuses on business alliances as the context for analyzing the impact of BMEs. First, as mentioned above, this approach helps address some of the measurement challenges associated with BMEs, which are rarely announced explicitly. Specifically, we examine BMEs that firms undertake when forming JVs. We are interested in the performance impact if the JV's business model is different from the (holding) company's business model and thus represents a BME. Because JVs involve equity holdings, they are formally announced to financial markets, allowing for precise dating of these events and enabling a more accurate assessment of their impact. Second, BMEs carried out through alliances have thus far received limited attention in business model research (Spieth et al., 2021). This gap is problematic because innovation beyond company boundaries is increasingly central to modern innovation processes. Corporate alliances, in particular, enable firms to leverage their partners' resources when pursuing BME, thereby accelerating the development of new business models (Loon and Quan, 2020).

Combining these research streams, we therefore expect that the positive effects of BME will hold for market-based measures and can be operationalized through JV announcements. Because the underlying positive BME-performance relationship has been demonstrated in similar empirical settings, we refer to this as our baseline hypothesis, and it will serve as a point of comparison for our more complex hypotheses.

Baseline Hypothesis (H1): Business–model-extending joint venture announcements lead to higher abnormal stock market returns than regular JV announcements.

The Moderating Effect of Uncertainty

Externalities are crucial factors moderating the BME-performance relationship. External variables such as environmental conditions (Nielsen, 2021), industry situation (White et al., 2022), and changes in the competitive landscape (Sabatier, 2010) have been shown to be significant determinants of BME's effect on performance. Traditionally, BMEs were recommended for “incumbent firms” in transforming industries (Johnson et al., 2008; Anthony et al., 2017; Johnson and Suskewicz, 2020), indicating their relevance during times of uncertainty. We differentiate between two types of uncertainty: (1) Exogenous uncertainty, which arises from external shifts in market demand that limit firms' ability to sell their offerings; and (2) endogenous uncertainty, which results from firms misaligning their offerings with existing market demand.

Endogenous uncertainty

Firm-induced uncertainty is conceptually distinct from exogenous uncertainty arising from macroeconomic volatility or industry-wide demand shifts. In particular, firms may create uncertainty internally through a misalignment between their existing offerings and evolving market needs, which can result in ambiguity around future sales, profitability, and strategic direction (Pidun, 2019). When firms experience performance shortfalls—such as declining return on assets relative to historical or peer-based aspirations—they are likely to engage in problemistic search and strategic adaptation to restore performance (Cyert and March, 1963; Greve, 2003). BME can serve as a concrete strategic response, enabling firms to realign their value propositions, delivery mechanisms, or monetization models to better meet changing customer demands (Teece, 2018).

Under high levels of firm-induced uncertainty, such adjustments become more relevant, both as signals of responsiveness to the current business situation and to set direction for future performance. Therefore, we argue that capital market reactions to BME announcements will be more positive when firm-level uncertainty is high, because investors may perceive such moves as proactive efforts to close performance gaps and reduce ambiguity about firm stability:

- *H2a: Company-level uncertainty reinforces the positive effect of BME on abnormal returns.*

Exogenous uncertainty

Exogenously driven uncertainty is linked to demand shifts within a market. We refer to demand uncertainty—that is, the speed and unpredictability of market changes, driven by fluctuating competition and evolving customer preferences (Pisano, 2017). In uncertain environments, businesses struggle to anticipate market demand (Teece et al., 1997) and must continuously seek new opportunities for sustainable growth. To adapt, businesses dynamically reconfigure their business models—integrating, restructuring, and acquiring key resources (Zhang et al., 2021). BMEs help companies leverage existing capabilities (Zott and Amit, 2010) and respond effectively to market fluctuations (Spieth et al., 2014). Further, by addressing previously untapped market demand, BMEs allow companies to generate new revenue streams and increase profits (Priem et al., 2018).

Shifts within specific industries are another driver of demand uncertainty. Consider the media industry, where multiple disruptions—such as digital streaming, declining print circulation, and changing consumer preferences—have created industry-wide demand uncertainty and necessitated new business models (Christensen and Raynor, 2013; Karimi and Walter, 2016). Similarly, industries undergoing technological disruption or regulatory changes often experience demand volatility that forces firms to adapt. Companies that successfully align their business models with these shifts are more likely to maintain competitiveness and achieve strong long-term performance (Zhang et al., 2021). Therefore, we expect industry uncertainty to positively moderate the BME-performance relationship:

- *H2b: Industry-level demand uncertainty reinforces the positive effect of BME on abnormal returns.*

One major driver of demand uncertainty is macroeconomic crises. During recessions, demand declines across the economy, forcing firms to adjust their business models to maintain competitiveness. In such volatile environments, adaptation allows companies to capture shifting demand and gain a strategic

advantage before competitors react. Consequently, we posit that macroeconomic uncertainty strengthens the positive relationship between BME and firm performance:

- *H2c: Economy-wide demand uncertainty reinforces the positive effect of BME on abnormal returns.*

The use of JVs during times of uncertainty, capitalizing on risk- and resource-sharing opportunities, is well documented (Luo, 2007). Kogut (1991) demonstrated that JVs provide a risk-mitigating option when the development of technology is uncertain. The literature on JVs as real options further describes how diversifying via JVs enhances a firm's growth option value (Tong et al., 2008). As an option for future growth opportunities, JVs seem a suitable vehicle for BME under uncertainty (Trigeorgis and Reuer, 2017). Moreover, JVs enable firms to experiment with new business models without fully committing resources, thus providing strategic flexibility under uncertain conditions. Given that JVs already offer a structured approach to managing risk, integrating BMEs within this framework presents a promising avenue for firms to test and adapt to evolving market conditions.

The Interplay with Product Industry Diversification

Over the past decades, research on corporate diversification has established that diversification into unrelated industries is generally value-destroying (Montgomery, 1994; Martin and Sayrak, 2003; Villalonga, 2004a; Schommer et al., 2019). Diversification that is distant from a company's core business (e.g., in a distant SIC code) has been shown to destroy value. The relationship between product-industry diversification and performance is widely understood to follow an inverted U-shape. At low levels of diversification (i.e., too closely related) or high levels (i.e., too unrelated), performance tends to suffer (Pierce and Aguinis, 2013; Schommer et al., 2019). To understand the basis for this inverted U-shaped relationship, consider the initial benefits of diversification. As a company expands its product offerings, it can realize economies of scope while also providing customers with a broader range of goods and services (Palich et al., 2000; Seth, 1990). Further, the different products may mutually reinforce each other through bundling options or brand synergies (Barney, 1997). In highly

diversified companies, managers must, however, control an increasingly complex portfolio of businesses (Grant, 1988), leading to loss of control and increased coordination costs (Markides, 1992).

The phenomena of business model portfolio diversification and extension have reshaped industry boundaries and traditional definitions of diversification (Massa et al., 2017; Sohl et al., 2020b). Zott et al. (2011), for example, argue that business models offer a more holistic view of how companies operate, emphasizing their connections with both factor and product markets. In contrast, industry classifications provide a more narrow, functional perspective on what companies do, focusing primarily on the products they offer to address specific market segments. There are multiple examples of companies targeting the same product industry with a new business model (see the above Pret a Manger example) or extending into a new industry with an existing or new business model (Chesbrough and Rosenbloom, 2002; Markides and Charitou, 2004; Zott and Amit, 2008). This shift has prompted research into the integration of BMEs with traditional product-industry diversification, as this integration presents corporate managers with four distinct strategic options: (1) maintain the current product industry and business model; (2) enter a new product industry while retaining the existing business model; (3) introduce a new business model within the current product industry; and (4) combine product-industry diversification and BME by entering a new product industry with a new business model. As mentioned above, the BME-performance relationship has been shown to be positive (Heij et al., 2014; Aversa et al., 2015; Loon and Quan, 2020; Sohl et al., 2020a), and this raises an important question: Do performance outcomes differ depending on whether BMEs are implemented within existing or new product industries? This question suggests the possibility that product-industry diversification may moderate the BME-performance relationship.

Whereas product-industry diversification introduces coordination challenges and increases organizational complexity, BMEs may provide a means to mitigate these difficulties. Diversifying into a new industry typically requires the firm to develop new competencies and infrastructure specific to that industry (Doz and Kosonen, 2010). This contributes to the above-mentioned loss of control and increased coordination costs. Extending a business model, on the other hand, allows companies to tap into customer demand by leveraging their current capabilities and resources. The combination of

business model and industry extension might, therefore, allow companies to enter new product industries while overcoming typical challenges of scope (Sakhartov and Folta, 2014; Aversa and Hueller, 2023). This means that entering a new product industry with a new business model may reduce complexity costs and thus enhance performance. Based on this reasoning, we propose that combinations of BME and product-industry diversification are value-creating, whereas product-industry diversification alone tends to be value-destroying. More specifically, we hypothesize:

- *H3a: PE in conjunction with BME leads to positive abnormal returns.*
- *H3b: PE without BME leads to negative abnormal returns.*

BME, Product Industry Diversification, and Uncertainty

The relationship between product-industry diversification and performance is influenced by uncertainty, whereby a high degree of uncertainty leads to an increased performance benefit from diversification. (2012) argue that uncertainty is a value driver for diversification because it allows firms to spread their risk across multiple industries or product lines. When firms face high external uncertainty—such as volatile markets, technological disruptions, or fluctuating customer preferences—they are incentivized to diversify in order to avoid over-reliance on a single product or market. Diversification provides a buffer against these uncertainties by reducing the company's exposure to any single source of risk. Volkov and Smith (2015) emphasize that under conditions of uncertainty, firms are more likely to pursue diversification because it enhances their strategic flexibility. They argue that diversification provides companies with more growth options and paths to innovation, which are particularly valuable in uncertain environments in which future opportunities and threats are difficult to predict. In this context, diversification is seen as a hedge against the unknown, offering firms multiple avenues for growth and the ability to pivot if one industry or product line becomes unviable due to unexpected changes. However, researchers have focused on product-industry diversification without controlling for the effect of BMEs (Schommer et al., 2019).

Building on this work, we argue that extending a firm's business model—by creating new value propositions, delivery mechanisms, and pricing models—may further enhance the firm's resilience to uncertainty. Extending a business model and thereby tapping into new sources of demand will likely further buffer against specific market or industry disruptions. When a company enters a new product industry using a new business model, it not only taps into new product markets but also creates new ways to conduct business, forming an extended customer value proposition, delivery model, and pricing mechanisms. We expect the benefits of product and business diversification to accumulate during times of uncertainty. At the same time, the downsides of diversification, such as increased complexity and managerial challenges, are reduced as discussed above.

For endogenous uncertainty, this suggests that combining PE and BME will help firms achieve superior strategic outcomes. PE without BME, on the other hand, might be perceived as blind diversification into new industries, leading investors to react negatively. In line with this reasoning, we propose:

- *H4a: Company-level uncertainty reinforces the positive effect of PE with BME and the negative effect of PE without BME.*

In contrast, exogenous demand uncertainty refers to shifting or declining demand within an industry. PE alone allows companies to target new sources of demand; however, when combined with BME, we expect the benefits to be super-additive. Companies gain both the strategic flexibility associated with product diversification and access to new sources of demand through novel business models. Conversely, standalone PEs may be viewed unfavorably by financial markets, because they increase operational complexity without providing the super-additive benefits described. Accordingly, we hypothesize:

- *H4b: Industry-level uncertainty reinforces the positive effect of PE with BME and reinforces the negative effect of PE without BME.*

Finally, under economy-wide uncertainty, firms may face generalized reductions in demand and increased volatility across all industries. Here too, we expect that combining PE and BMEs will be

particularly advantageous, whereas PE strategies without BME may exacerbate firm vulnerabilities. Therefore we propose:

- *H4c: Economy-wide uncertainty reinforces the positive effect of PE with BME and reinforces the negative effect of PE without BME.*

Figure 1 provides an overview of all assumptions.

Insert Figure 1 about here.

METHODOLOGY AND RESEARCH SETUP

To explore our hypotheses, we conduct an event study analyzing capital market reactions to announcements of business–model-extending JVs. Event studies are commonly used in the literature on diversification (Koh and Venkatraman, 1991; Craig, 1997; McWilliams and Siegel, 1997; Kale et al., 2002; Nixon et al., 2004; Borusyak and Jaravel, 2017) and on alliances and joint ventures (Anand and Khanna, 2000; Kale et al., 2002). Researchers have established a framework of methodological guidelines, relevant control variables, and robustness tests suitable for this research. The event study setup provides evidence of the market perspective on future earnings and value creation, represented in the change in the company's share price (Jones and Danbolt, 2005).

Our dependent variable is the abnormal return following a JV announcement that either represents or does not represent a BME. We construct a sample of JV announcements by S&P 500 firms between 1998 and 2019 which we analyze for the effects of BMEs. This long time period has the advantage of including bull and bear markets as well as several severe recessions (Lüthge et al., 2020).

Data and Sample Collection

The initial sample was constructed using alliance data from the Securities Data Company (SDC) database via Refinitiv SDC Platinum. Prior research (Schilling, 2009) identifies several important

shortcomings in the coverage of the SDC alliance database. The most important of these are: (1) a bias toward companies that are reported on by English-speaking news sources; and (2) a bias toward large companies, primarily in OECD countries. Because we focus on S&P 500 companies engaging in high-tech JVs, it is unlikely that these shortcomings will influence our study. As Schilling (2009) concluded: “when the firms of interest tend to be large and operate in technology-intensive industries [...] the datasets are likely to yield reliable results” (p. 259). To construct our sample, we collected data for all U.S. high-tech JVs announced during the 22-year period from January 1998 to December 2019 from SDC. The high-tech JV identifier describes JVs in high-tech industries such as computer equipment, software, advanced electronics, and communication. The high-tech sector is frequently used for alliance research because it is characterized as dynamic, and firms engaging in high-tech JVs are often publicly traded companies that consider alliances an important part of corporate strategy (Kale et al., 2002).

JVs with more than four participants were excluded from our sample because these are unlikely to spark a strong market reaction for one individual company. The JV-level data were then transposed to obtain firm-level data. In line with research on diversification (Villalonga, 2004b), we excluded firms from financial services and regulated utilities industries (SIC codes 6000–6999 and 4900–4999). The initial firm-level dataset comprised 1,432 individual firms that announced entry into high-tech JVs. We obtained financial data for these firms from COMPUSTAT and market data from the Center for Research in Security Prices (CSPR), and excluded firms that were not part of the S&P 500 index, substantially reducing the sample to 268 observations. The focus on S&P 500 companies enables us to create a homogenous sample and facilitates retrieval of financial and performance information.

Coding for Business Model Extensions

Information about business models is not available in a database of the kind that exists, for example, for information about company product industries (SIC codes). Scholars therefore typically analyze archetypes of business models that they identify based on empirical observations (Sohl and Vroom, 2014; Aversa et al., 2015; Schwarz et al., 2017). To identify BMEs, we therefore conducted an in-depth qualitative content analysis of the JVs in our sample (Schreier, 2012). We follow recommendations from

recent literature and applied content analysis supported by natural language processing capabilities in the form of a generative AI (Leppänen et al., 2021).

We started by collecting a rich database of JV information for our sample of 268 announcements. JV announcements by publicly traded companies are documented in detail, with qualitative data available from SEC filings, news reports, analysts' reports, and corporate publications. Then a coding framework was developed based on relevant literature on JVs (Koh and Venkatraman, 1991; Reuer and Koza, 2000; Bamford and Jenkins, 2021) and a finite list of relevant business models (Gassmann et al., 2014). This framework was challenged and refined with input from experienced business model scholars. We followed a five-step coding approach:

- 1) Review the company's main business description.
- 2) Analyze the JV deal text and the JV business description for keywords related to specific business models or joint venture archetypes (e.g., e-commerce).
- 3) Review additional information on the purpose of the JV (collected from 10-K filings, Capital IQ Key Developments database, company websites, books, and JV websites). A minimum of four data sources were considered for each company.
- 4) Compare the company's main business with the JV business and provide a description of the JV in relation to the focal firm.
- 5) Define the final coding of the JV announcement anchored in the above-mentioned coding framework.

We note that for two (or more) companies that jointly engaged in the same JV, each company's purpose could be coded differently. This is why each JV was coded for each participating company independently. In addition to manual, human-based coding, we deployed an artificial-intelligence-based coding tool that utilized the coding framework to challenge human coding. The tool was fed the coding framework and the diverse qualitative information we collected for each JV. It then leveraged a generative artificial intelligence model to classify the JV announcement and provided a specific rationale for its classification. The outcomes of this model were then manually compared with the

human coder's assessment. We observed consistent coding in 88% of cases. The remaining cases were reviewed, discussed, and finally coded. An overview of the final codings is provided in the appendix.

Through this coding, we identified about 24% of companies in our sample as engaged in a business–model-extending JV, evidencing that JVs are a commonly-used vehicle for BMEs. An illustrative example is the JV that Ford Motors Co entered with Microsoft in 1999. This joint venture focuses on providing an online build-to-order system for cars and is viewed as a BME for Ford. It enables customers to customize their order online and receive updates on availability and delivery (a new value proposition), and introduces a new way of purchasing vehicles (value capture) that is a shift from the traditional car buying process. We did not track the long-term success of individual JVs because our measure is the stock market reaction at the time of the announcement, and we therefore focused on information that was available to investors at the time of the JV announcement. During the coding exercise, 17 JV announcements were excluded at the manual review stage because they were duplicative entries or contained severe data errors (e.g., the JV was only rumored).

Abnormal Stock Market Returns

To measure the value-creating effect of joint venture announcements, we utilize abnormal stock market returns as our dependent variable. This measure is commonly used in the strategic management and finance literature (Kale et al., 2002; Kothari and Warner, 2004; Villalonga, 2004b; Hoechle et al., 2012). By using this method, we make three key assumptions: (1) that markets are efficient; (2) that the JV was not anticipated by investors long before the announcement date; and (3) that there are no confounding effects during the event window (McWilliams and Siegel, 1997). A shortcoming of the SDC alliance database is that announcement dates are often wrongly reported (Anand and Khanna, 2000). Because of this, we used SDC filings, new reports, and historic Bloomberg Wire News to verify the reported announcement dates. We corrected inaccurate announcement dates for 5% of JVs, which is in line with prior research (Lavie, 2007).

We obtained abnormal returns using the Wharton Research Data Services event study function. In the first step, we use an estimation window of 250 days before the event to calculate the expected return

around the event window using the Capital Asset Pricing Model prediction (Markowitz, 1991), using the formula:

$$R^e = \alpha_i + \beta_i(R_{mt})$$

where R_{mt} is the benchmark market return on the announcement date, α_i denotes the expected individual excess return over the market, and β_i denotes firm-specific exposure to market volatility relative to the overall market. We introduce a gap of 10 days between the estimation period and the event window to exclude event-related effects from the estimation.

We then calculate abnormal returns using the formula:

$$AR = R_{it} - R^e = R_{it} - (R_f + \alpha_i + \beta_i(R_{mt} - R_f))$$

We deduct the expected return from R_{it} , which is the actual daily return of firm i on date t . The cumulative abnormal return (CAR) is the sum of the abnormal returns from three days before until three days after the JV announcement: -3, 0 (event day), and +3. The question of what time window is appropriate to estimate an announcement date return has been extensively discussed (McWilliams and Siegel, 1997). We opt for a comparatively short time window which might underestimate the effect of the independent variables but reduces the risk of including unobserved effects in the model. In a robustness test, we re-calculate the models presented in the results section using a longer cumulative abnormal return window of -5 to +5 days and a shorter window of -1 to +1 days around the announcement date; the results are largely consistent with our main models. Abnormal returns could not be calculated for 29 companies because there were insufficient share price data available in the estimation window.

Value Drivers, Moderators, and Controls

This study examines the moderating effects of uncertainty on abnormal stock market returns following announcements of BMEs. We propose three different measures of uncertainty to better understand these moderating effects. We use two financial indicators and one economic indicator, constructed using data from CRSP, COMPUSTAT, and the National Bureau of Economic Research.

To quantify company-level uncertainty, we measure variance in quarterly return on assets (EBIT/Total Assets) for the eight quarters before the JV announcements. Return on assets is a widely used metric in business model research and the literature on performance feedback, with its variance serving as a scaled indicator of profit consistency—a key proxy for company-level performance and uncertainty (Bloom, 2009; Sohl et al., 2022).

To measure industry-level uncertainty, we assess industry dynamism. We follow Malhotra and Harrison (2022) and assess the predictability of industry revenue. To account for seasonality in industry revenue, we use annual data instead of quarterly data over a longer time horizon (three years or 12 quarters). We regress industry-level revenue for the three years before the year of the JV announcement, and our measure of industry-level uncertainty is the standard error of that regression. Finally, to measure economy-wide uncertainty, we use recession indicators for the U.S. economy from the National Bureau of Economic Research. Recessions create demand-based uncertainty (Folta and O’Brien, 2004) and increase the levels of political and economic uncertainty (Baker et al., 2016). By the time a country’s economy is deemed to be in a recession, a prolonged period of uncertainty has passed (Karnizova and Li, 2014). We create a binary variable that equals 1 if the JV announcement was during a recession, and 0 otherwise.

In addition to the above-mentioned moderators, we control for several other factors. Firm size may influence the relative importance of a BME. We therefore control for the natural logarithms of full-year revenue and assets in the year of the JV announcement. Similarly, we control for the value that investors assign to future growth of the company using the natural logarithm of company market capitalization. We control for the percentage holding of the focal firm in the JV because there may be an investor preference for high or low ownership in the JV. Finally, we control for alliance experience because this has been shown to influence shareholders’ reactions to the announcement of additional alliances. For this measure, we use the number of high-tech JVs the firm has entered before the current JV announcement relative to the total assets of the firm. All independent variables are winsorized at the top and bottom 5%. We also test a specification using a winsorized dependent variable (CAR) to ensure our results are not driven by outliers. The results for this setup are qualitatively consistent with our main

findings. For seven of the companies in our research sample, moderating and/or control variables could not be obtained. Our final sample therefore comprises 215 announcements.

ANALYSIS AND RESULTS

Our final sample comprises 215 firms announcing a JV (see Table 1 for descriptive statistics). We first separate our sample into two subsamples: JV announcements that represent a BME and those that do not (as described in Table 1). We then run a simple t-test to understand whether companies that extend their business model realized higher abnormal returns than other companies. This is a first test for H1, and we find that the stock market reacts most positively to JV announcements when the company is extending its business model. The difference between subsamples is statistically significant.

Insert Table 1 about here.

We next test our hypotheses using ordinary regression models in multiple settings. First, we use a setup with the abnormal stock market return as the dependent variable, our BME dummy as the explanatory variable, and a set of controls. The results of Model 1 are reported in Table 2. This initial research setup was validated using the Breusch-Pagan test for heteroskedasticity (Baum and Wiggins, 1999). The results could not rule out the presence of heteroskedasticity, so we adjusted the model to include industry fixed effects by controlling for two-digit SIC industry code, which removes heteroskedasticity in Model 2. This configuration was used for all further models.

Our results support H1, because BME consistently has a positive and statistically significant impact on abnormal stock market returns. Our control variables generally do not have statistically significant impacts.

Insert Table 2 about here.

Table 2 also reports results of tests for hypotheses H2a–H2c in Models 3 to 5. We introduce a series of moderators and analyze their impacts on the cases that include a BME and those that do not. We find that company-level uncertainty (measured by variance in quarterly return on assets) positively moderates the effect of BME, suggesting that companies with higher uncertainty realize higher abnormal stock market returns when their JVs are business-model extending. As Model 4 shows, our results also support H2b, indicating that industry-level uncertainty (measured by industry dynamism) also positively moderates the effect of BME, although this effect is only weakly significant (at the 10% level). Finally, the interaction between BME and economy-wide uncertainty (measured by recession status) has a positive and statistically significant influence on abnormal stock market returns, supporting H2c and suggesting that investors value BME more strongly during economic downturns (Model 5).

To test hypotheses H3 and H4, we combine our BME codings with traditional measures of industry diversification. Specifically, we create a binary variable identifying cases where companies expand into new product industries, defined as a JV in an industry that differs from the focal company’s SIC code by at least two digits. We then combine this indicator with our BME variable, creating two new variables: “PE w/ BME” equals 1 if the JV indicates a new product industry with an extended business model, and 0 otherwise. “PE w/out BME” equals 1 if the JV indicates a new product industry without an extended business model, and 0 otherwise.

Insert Table 3 about here.

The findings of this analysis are reported in Table 3. Model 6 analyzes the effect of product-industry extension using an existing business model (PE w/out BME = 1). The results show that these JV

announcements receive negative investor reactions, thus indicating that product-industry diversification using an existing business model is not value-creating. The results of Model 7 show that, conversely, entering a new product industry with a new business model has a positive influence on abnormal returns.

Models 8–13 use a consistent setup and test for the interaction between product-industry extension with/without BME and company-, industry-, and economy-wide uncertainty. Models 8 and 9 provide statistically significant evidence that announcements of JVs that extend into new product industries and use an extended business model are positively influenced by our measure of company-level uncertainty. Such JVs without an extended business model are negatively influenced by company-level uncertainty. However, this negative influence is only weakly significant at the 10% level.

Models 10 and 11 test the interaction between industry-extending JVs with and without a new business model and industry-level uncertainty. The results indicate that extending a product industry without an extended business model destroys value, whereas doing so with a BME creates value. Finally, Models 12 and 13 test the interaction between product-industry extension with and without BME and our variable for economy-wide uncertainty (identified by recessions). We find evidence that the positive effect of product-industry extension using a new business model is significantly stronger during a recession.

In conclusion, our results support our baseline hypotheses (H1). They also support H3a and H3b, suggesting that BME is a key value driver for abnormal stock market returns following JV announcements and has a positive and statistically significant influence on product–industry-extending JVs. In addition, we obtain support for our hypotheses regarding uncertainty as a moderator of the positive effect of BME on abnormal returns (H2a, H2b, and H2c). We also find evidence that uncertainty reinforces the positive effect of PE with BME (H4a, H4b, and H4c). However, the hypothesized moderating effect of uncertainty on the negative effect of PE without BME could not be consistently identified. We do not find statistically significant results for two of our three measures of uncertainty, although the direction of the effect is as expected (Models 8 and 12).

DISCUSSION OF RESULTS

Our analyses substantiate the notion that BME positively influences value creation, particularly in uncertain and dynamic environments, and in combination with traditional industry diversification. First, we find empirical evidence of the positive economic impact of BMEs. Our evidence adds to the growing empirical confirmation of the value of BME (Aversa et al. 2015; Heij et al. 2014; Loon and Quan 2020; Sohl, Vroom and Fitza 2020; Sohl and Vroom 2014) but also extends these studies because we show that capital markets positively value the extension of business models.

To quantify the impact of BME, we multiply the outcome of our regression analysis (the increase in percentage abnormal returns) by the median market capitalization (see Table 4), and find that, on average, BME announcements create additional value of around \$2.9 billion. These values are comparable to the economic impact found in previous alliance event studies (Kale et al., 2002) although they are higher as our sample uses S&P 500 constituents in the early 2000s to late 2010s, a time during which market valuations were comparatively high. This finding extends the existing literature on market-based evaluations of BME (Chondrakis 2012; Guo et al. 2018; Kim and Min 2015; Macena et al. 2017; Visnjic et al. 2014; Zott and Amit 2008).

Insert Table 4 about here.

Second, we find that company-level (endogenous) uncertainty significantly reinforces the positive effect of BME stock market reactions. This supports the argument that BMEs are particularly valuable when firms face internal performance challenges and strategic ambiguity. In such contexts, BMEs are proactive and targeted responses to restore organizational alignment with market demands, thereby reducing uncertainty about the firm's future trajectory (Pidun, 2019; Teece, 2018). This proactive role of BME aligns with performance feedback theory. Rather than being passive recipients of environmental pressures, firms actively search for solutions when performance falls below aspiration levels (Cyert & March, 1963; Greve, 2003). Business model extension can be understood as a form of

problemistic search—an intentional strategic response to close performance gaps by modifying value creation, delivery, or capture mechanisms. For example, Bromiley (1991) and Greve (2003) illustrate that underperforming firms often take calculated risks, and business model reconfiguration is a common strategic choice in this context. Our findings further suggest that BMEs under conditions of firm-level uncertainty are perceived not as signs of desperation but as credible strategic moves toward renewal.

In addition, we observe that industry-level (exogenous) demand uncertainty also positively moderates stock market reactions to BME. When faced with volatile and unpredictable market environments, firms undertaking BME appear better positioned to capture shifting customer needs and emerging opportunities (Pisano, 2017; Zhang et al., 2021). In periods of macroeconomic or industry-wide turbulence, BMEs seem to serve as credible signals of adaptability and resilience, reassuring investors of the firm's ability to dynamically adjust its resource base and value proposition (Teece et al., 1997; Priem et al., 2018). This reactive adjustment of business models is more directly linked to environmental dynamism and the firm's need to maintain fit with changing external conditions. Business models are updated to accommodate new technological possibilities, shifting customer preferences, or competitor innovations. This adaptive logic is rooted in the contingency perspective of business model, where firms continuously sense and respond to their environment (Heij et al., 2020; White et al., 2022).

Overall, these results suggest that extending into a novel business model is a value-creating strategy during times of uncertainty, thereby contributing to the literature on external moderators of business model extensions (Foss & Saebi, 2018; Spieth et al., 2014). Specifically, we find evidence that BMEs are positively received both when they serve as proactive adaptations to endogenous uncertainty—such as declining performance, reduced competitiveness, or misalignment with evolving customer needs—and when they function as reactive responses to exogenous shocks, including technological disruptions, competitive dynamics, or shifts in market demand. To quantify the impact of BME in highly uncertain situations, we use the 90th percentile of our measures of company- and industry-level uncertainty to represent a company exposed to a high degree of uncertainty. We then multiply these uncertainty values by the regression outcomes (the increase in percentage abnormal returns) and the median market

capitalization. This quick analysis indicates that under these conditions, a business–model-extending JV increases market capitalization substantially.

Third, examining JVs that extend into a new product industry (PE, assessed by SIC code), we find that pure product-industry extension is value-destroying, whereas parallel BME and product-industry extension is value-creating. Company-, industry-, and economy-wide uncertainty moderate this effect. These findings enrich our understanding of the interplay between BME and other types of innovation and diversification (Demil et al., 2015). We link our study to research on traditional industry diversification (Schommer et al. 2019) and demonstrate that the unique properties of BME—providing a company with a new source of revenue and profits by satisfying untapped market demand—are valuable in new product industries.

Overall, this study provides a novel perspective on the much-discussed relationship between product-industry diversification and value creation. Our findings indicate that the business model a company uses to extend into a new product industry matters. We find that the ‘simple’ expansion of a company into a new (and potentially unrelated) industry leads to negative abnormal stock market returns. However, when a different business model is used for this expansion, abnormal stock market returns are positive. This effect seems to be even more pronounced during conditions of uncertainty. Our research setup could not include an effective measure for the quadratic relationship between product-industry extension and value creation, and as such, our results should be interpreted as indicative. As Table 4 shows, we also find that the economic impact of BME when PE is announced, as assessed by the capital market, is substantial.

Implications for Theory and Practice

This study clarifies if and when BME creates value for incumbent companies. We analyze how uncertainty and product-industry diversification moderate the value-creating effects of BME, and add to the evolving empirical research on BME in the domains of strategy, competitive advantage, and innovation. Using a novel research setup, we are among the first to use a capital–market-based measure

to determine the performance impact of BMEs. Our findings have several implications for theory and practitioners.

For theory, we provide a novel perspective that is relevant in multiple research areas. For research on business models, we provide large-scale empirical evidence of the already-documented positive effect of BMEs. We also show that this effect is evident in market-based measures of company performance. Further, we provide novel insights into the role of uncertainty as a moderator of BME's impact, which has previously only been demonstrated in case studies. We contribute to research on corporate diversification by demonstrating that traditional product-industry diversification moderates the BME-performance relationship. Methodologically, we demonstrate an event study design that uses abnormal stock market returns as the dependent variable. To our knowledge, this has not previously been deployed in the field of BME and innovation.

For practitioners, we demonstrate the value-creation potential of BME, particularly during times of uncertainty. We show that creation of new business models is a value-creating strategic option during uncertainty. This is particularly important given the high degree of uncertainty and innovation potential in the current economic climate. Drivers of uncertainty and change, such as global de-integration, digitalization, and sustainability, will only increase the need for individual managers to find value-creating responses such as BME (Adner et al., 2019). We also offer practitioners a novel perspective on external collaborations in general and JVs in particular (Christensen et al. 2011; Sohl and Vroom 2017). We provide a framework that differentiates between different types of JVs (whether business-model extending and whether product-industry extending) and reveals the performance implications of each type.

Our study answers several calls for empirical research on BME (Aversa and Haefliger, 2017; Lanzolla and Markides, 2020; Spieth et al., 2021), and also responds to recent suggestions for research on moderators of BME (Sohl et al., 2020b) and external drivers of BME (Foss and Saebi, 2017, 2018). Further, we induce new research questions related to the interaction between BME and product-industry extension. Finally, this study opens some avenues for future research. We focus on economic moderators of the effect of BME on performance; future research could use large-scale empirical models to explore

other firm-specific moderators such as governance structures (Kim and Min 2015) and business-model synergies (Aversa et al. 2020). Future studies should also investigate the root causes of the difference in the diversification-performance relationship between BME and traditional industry diversification. Exploring the role of economies of scope may be a relevant approach (Sakhartov, 2022; Aversa and Hueller, 2023).

Limitations

This research is not without limitations. First, our key findings rely on the coding of business-model-extending JVs. A business model is, by definition, a simplified model that will not capture the full complexity of a company or a joint venture (Baden-Fuller and Morgan, 2010). We follow a clear research framework, but our coding nevertheless suffers from the inherent challenge of empirical business model research: business models require human interpretation, and therefore not every coding will be replicable by other scholars (Aversa et al., 2020). To promote consistency and objectivity, future research may benefit from more advanced machine-supported coding of BMEs. Second, the archetype-based assessment of business models does not provide a perspective on business model portfolio-level synergies, which have been proven important in value creation (Mawdsley and Somaya, 2018; Hampl et al., 2019; Sohl et al., 2020b) and should be a focus of future research.

Recent research demonstrates that the concept of BME is more nuanced than the binary results in this paper suggest. In particular, the role of demand-side synergistic business models is receiving growing attention (Priem, 2012; Priem et al., 2018; Sohl et al., 2020b). BMEs with demand-side synergies imply that customers can use multiple business models offered by the focal firm in parallel and derive an increased utility. Future research should further explore the value-creation effects and moderators of demand-side synergies. Also, 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.

Appendix: Overview of coded joint ventures

Type of JV	Description	# of observations
<i>JVs with BME</i>		63
<i>Digitization</i>	This pattern relies on the ability to turn existing products or services into digital variants, and thus offer advantages over tangible products, e.g., easier and faster distribution. Ideally, the digitization of a product or service is realized without reducing the value proposition which is offered to the customer. In other words: efficiency and multiplication by means of digitization does not reduce the perceived customer value.	22
<i>E-Commerce</i>	Traditional products or services are delivered through online channels only, thus removing costs associated with running a physical branch infrastructure. Customers benefit from higher availability and convenience, while the company is able to integrate its sales and distribution with other internal processes	12
<i>Two-sided-market</i>	A two-sided market facilitates interactions between multiple interdependent groups of customers. The value of the platform increases as more groups or as more individual members of each group are using it. The two sides usually come from disparate groups, e.g., businesses and private interest groups.	11
<i>As-a-service</i>	This business model involves delivering products or services to customers on a subscription or pay-per-use basis, often through digital platforms. It enables customers to access the benefits of a product or service without needing to own it outright, leading to increased flexibility and cost-effectiveness.	9
<i>Solution Provider</i>	"A full service provider offers total coverage of products and services in a particular domain, consolidated via a single point of contact. Special know-how is given to the customer in order to increase his or her efficiency and performance. By becoming a full service provider, a company can prevent revenue losses by extending their service and adding it to the product. Additionally, close contact with the customer allows great insight into customer habits and needs which can be used to improve the products and services"	9
<i>JVs w/out BME</i>		152
<i>Product Extensions</i>	The focal firm enters the alliance to improve a product (e.g., new features) with an existing business model.	50
<i>Product Manufacturing</i>	The focal firm enters the alliance to manufacture a product with an existing business model.	40
<i>Product Commercialization</i>	The focal firm enters the alliance to commercialize (marketing & sales) an existing product with an existing business model.	23
<i>Technology Partnership</i>	The focal firm enters the alliance to act purely as a technology provider with its existing business model.	16
<i>Research Partnership</i>	The focal firm enters the alliance to conduct research on new product that will be launched with an existing or undefined business model.	8
<i>Geographic Expansion</i>	The focal firm enters the alliance to expand existing products in a new geography with an existing business model.	7
<i>Other Collaborations</i>	Residual category	8
Total		215

REFERENCES

- Adner, R., Puranam, P., Zhu, F., 2019. What is different about digital strategy? From quantitative to qualitative change. *Strategy Science*, 4, 253–261. doi:10.1287/stsc.2019.0099
- Anand, B.N., Khanna, T., 2000. Do firms learn to create value? The case of alliances. *Strategic Management Journal*, 21, 295–315. doi:10.1002/(sici)1097-0266(200003)21:3<295::aid-smj91>3.3.co;2-f
- Anthony, S.D., Gilbert, C.G., Johnson, M.W., 2017. *Dual Transformation: How to Reposition Today's Business While Creating the Future*. Harvard Business Press.
- Aversa, P., Furnari, S., Haefliger, S., 2015. Business model configurations and performance: a qualitative comparative analysis in Formula One racing, 2005–2013. *Industrial and Corporate Change*, 24, 655–676. doi:10.1093/icc/dtv012
- Aversa, P., Haefliger, S., 2016. Building business model portfolios: implications for strategic diversification. Working Paper.
- Aversa, P., Haefliger, S., 2017. Business model portfolio diversification. Working Paper.
- Aversa, P., Haefliger, S., Hueller, F., Reza, D., 2020. Customer complementarity in the digital space: exploring Amazon's business model diversification. *Long Range Planning*, 101985. doi:10.1016/j.lrp.2020.101985
- Aversa, P., Hueller, F., 2023. Digital diversification, in: *Research Handbook on Digital Strategy*.
- Baden-Fuller, C., Haefliger, S., 2013. Business models and technological innovation. *Long Range Planning*, 46, 419–426. doi:10.1016/j.lrp.2013.08.023
- Baden-Fuller, C., Morgan, M.S., 2010. Business models as models. *Long Range Planning*, 43, 156–171. doi:10.1016/j.lrp.2010.02.005
- Baker, S.R., Bloom, N., Davis, S.J., 2016. Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131, 1593–1636. doi:10.1093/qje/qjw024
- Bamford, J., Jenkins, B., 2021. Joint ventures: the next frontiers of analysis. *Strategic Management Review*, 2, 163–177. doi:10.1561/111.00000022
- Barney, J., 1997. Gaining and sustaining competitive advantage.
- Baum, C.F., Wiggins, V., 1999. BPAGAN: stata module to perform Breusch-Pagan test for heteroskedasticity. Statistical Software Components S390602, Boston College Department of Economics.
- Benito-Orsorio, D., Guerras-Martín, L.Á., Zuñiga-Vicente, J.Á., 2012. Four decades of research on product diversification: a literature review. *Management Decision*, 50. doi:10.1108/00251741211203597
- Bivona, E., Cruz, M., 2021. Can business model innovation help SMEs in the food and beverage industry to respond to crises? Findings from a Swiss brewery during COVID-19. *British Food Journal*, 123, 3638–3660. doi:10.1108/bfj-07-2020-0643
- Bloom, N., 2009. The impact of uncertainty shocks. *Econometrica*, 77, 623–685. doi:10.3982/ecta6248
- Borusyak, K., Jaravel, X., 2017. Revisiting event study designs. *SSRN Electronic Journal*. doi:10.2139/ssrn.2826228
- Bosbach, K.E., Brillinger, A.-S., Schäfer, B., 2020. More can be better: operating multiple business models in a corporate portfolio. *Journal of Business Strategy*, 41, 47–54. doi:10.1108/jbs-04-2019-0083
- Bouncken, R.B., Fredrich, V., 2016. Business model innovation in alliances: successful configurations. *Journal of Business Research*, 69, 3584–3590. doi:10.1016/j.jbusres.2016.01.004
- Breier, M., Kallmuenzer, A., Clauss, T., Gast, J., Kraus, S., Tiberius, V., 2021. The role of business model innovation in the hospitality industry during the COVID-19 crisis. *International Journal of Hospitality Management*, 92, 102723. doi:10.1016/j.ijhm.2020.102723
- Bryson, J.R., 2021. Chapter 18: COVID-19 and the immediate and longer-term impacts on the retail and hospitality industries: dark stores and turnover-based rental models, in: *Living with Pandemics*. doi:10.4337/9781800373594.00029

- Casadesus-Masanell, R., Ricart, J.E., 2010. From strategy to business models and onto tactics. *Long Range Planning*, 43. doi:10.1016/j.lrp.2010.01.004
- Chesbrough, H., 2010. Business model innovation: opportunities and barriers. *Long Range Planning*, 43. doi:10.1016/j.lrp.2009.07.010
- Chesbrough, H., Rosenbloom, R.S., 2002. The role of the business model in capturing value from innovation: evidence from xerox corporation's technology spin-off companies. *Industrial and Corporate Change*, 11, 529–555. doi:10.1093/icc/11.3.529
- Chondrakis, G., 2012. The strategic management of intellectual property: patent value and acquisitions. Dissertation. Oxford University.
- Christensen, C., Alton, R., Rising, C., Waldeck, A., 2011. The New M&A Playbook. *Harvard Business Review*.
- Christensen, C., Raynor, M., 2013. *The Innovator's Solution: Creating and Sustaining Successful Growth*. Harvard Business Press.
- Craig, A., 1997. Event studies in economics and finance. *Journal of Economic Literature*, 35.
- Demil, B., Lecocq, X., Ricart, J.E., Zott, C., 2015. Introduction to the SEJ special issue on business models: business models within the domain of strategic entrepreneurship. *Strategic Entrepreneurship Journal*, 9, 1–11. doi:10.1002/sej.1194
- Doz, Y.L., Kosonen, M., 2010. Embedding strategic agility a leadership agenda for accelerating business model renewal. *Long Range Planning*, 43, 370–382. doi:10.1016/j.lrp.2009.07.006
- Feldman, E.R., 2020. Corporate strategy: past, present, and future. *Strategic Management Review*, 1, 179–206. doi:10.1561/111.000000002
- Foss, N.J., Saebi, T., 2017. Fifteen years of research on business model innovation. *Journal of Management*, 43. doi:10.1177/0149206316675927
- Foss, N.J., Saebi, T., 2018. Business models and business model innovation: between wicked and paradigmatic problems. *Long Range Planning*, 51, 9–21. doi:10.1016/j.lrp.2017.07.006
- Gassmann, O., Frankenberger, K., Csik, M., 2014. The St. Gallen business model navigator. Working Paper.
- Grant, R.M., 1988. On 'dominant logic', relatedness and the link between diversity and performance. *Strategic Management Journal*, 9, 639–642. doi:10.1002/smj.4250090610
- Guo, B., Pang, X., Li, W., 2018. The role of top management team diversity in shaping the performance of business model innovation: a threshold effect. *Technology Analysis & Strategic Management*, 30, 241–253. doi:10.1080/09537325.2017.1300250
- Hampl, N., Hoffmann, W.H., Sachsenhofer, W., 2019. The evolution of business model portfolios, business model relatedness and the impact on firm growth. Working Paper.
- Heidenreich, S., Freisinger, E., Landau, C., 2022. The dark side of business model innovation – an empirical investigation into the evolvement of customer resistance and the effectiveness of potential countermeasures. *Journal of Product Innovation Management*. doi:10.1111/jpim.12627
- Heij, C.V., Volberda, H.W., Bosch, F.A.J.V. den, 2014. How does business model innovation influence firm performance: the effect of environmental dynamism. *Academy of Management Proceedings*, 2014, 16500. doi:10.5465/ambpp.2014.234
- Heij, C.V., Volberda, H.W., Hollen, R.M.A., 2024. To replicate or to renew your business model? The performance effect in dynamic environments. *Long Range Planning*, 57, 102440. doi:10.1016/j.lrp.2024.102440
- Hoechle, D., Schmid, M., Walter, I., Yermack, D., 2012. How much of the diversification discount can be explained by poor corporate governance? *Journal of Financial Economics*, 103, 41–60. doi:10.1016/j.jfineco.2011.03.025
- Hoffmann, W.H., 2007. Strategies for managing a portfolio of alliances. *Strategic Management Journal*, 28, 827–856. doi:10.1002/smj.607
- Johnson, M., Suskewicz, J., 2020. *Lead from the Future*. Harvard Business Press.
- Johnson, M.W., Christensen, C.M., Kagermann, H., 2008. Reinventing your business model. *Harvard Business Review*, 86, 57–68.

- Jones, E.A.E., Danbolt, J., 2005. Empirical evidence on the determinants of the stock market reaction to product and market diversification announcements. *Applied Financial Economics*, 15, 623–629. doi:10.1080/09603100500065461
- Kale, P., Dyer, J.H., Singh, H., 2002. Alliance capability, stock market response, and long-term alliance success: the role of the alliance function. *Strategic Management Journal*, 23, 747–767. doi:10.1002/smj.248
- Karnizova, L., Li, J., 2014. Economic policy uncertainty, financial markets and probability of US recessions. *Economics Letters*, 125, 261–265. doi:10.1016/j.econlet.2014.09.018
- Kim, S.K., Min, S., 2015. Business model innovation performance: when does adding a new business model benefit an incumbent? *Strategic Entrepreneurship Journal*, 9. doi:10.1002/sej.1193
- Koh, J., Venkatraman, N., 1991. Joint venture formations and stock market reactions: an assessment in the information technology sector. *Academy of Management Journal*, 34, 869–892. doi:10.5465/256393
- Kohers, N., Kohers, T., 2019. The value creation potential of high-tech mergers. *Financial Analysts Journal*, 56. doi:10.2469/faj.v56.n3.2359
- Kothari, S.P., Warner, J.B., 2004. The econometrics of event studies. *SSRN Electronic Journal*. doi:10.2139/ssrn.608601
- Lanzolla, G., Markides, C., 2020. A business model view of strategy. *Journal of Management Studies*. doi:10.1111/joms.12580
- Lavie, D., 2007. Alliance portfolios and firm performance: a study of value creation and appropriation in the U.S. software industry. *Strategic Management Journal*, 28, 1187–1212. doi:10.1002/smj.637
- Leiblein, M.J., Reuer, J.J., Zenger, T., 2018. What makes a decision strategic? *Strategy Science*, 3, 558–573. doi:10.1287/stsc.2018.0074
- Leppänen, P., George, G., Alexy, O., 2021. When do novel business models lead to high firm performance? A configurational approach to value drivers, competitive strategy, and firm environment. *Academy of Management Journal*. doi:10.5465/amj.2020.0969
- Loon, M., Quan, X.I., 2020. Theorising business model innovation: an integrated literature review. *Australian Journal of Management*, 46, 548–577. doi:10.1177/0312896220976751
- Lüthge, A., 2020. The concept of relatedness in diversification research: review and synthesis. *Review of Managerial Science*, 14, 1–35. doi:10.1007/s11846-018-0293-0
- Lüthge, A., Pidun, U., Knyphausen-Aufseß, D.Z., 2020. Approximating relatedness from a business model perspective: towards a taxonomic approach. *Review of Managerial Science*, 1–34. doi:10.1007/s11846-019-00375-y
- Macena, J.-C., Marhfor, A., Durand, S., 2017. Business model and firm's financial performance: evidence from the canadian mining sector. *ACRN Journal of Finance and Risk Perspectives*.
- Malhotra, S., Harrison, J.S., 2022. A blessing and a curse: how chief executive officer cognitive complexity influences firm performance under varying industry conditions. *Strategic Management Journal*. doi:10.1002/smj.3415
- Markides, C., 2023. Business model innovation: strategic and organizational issues for established firms.
- Markides, C., Charitou, C.D., 2004. Competing with dual business models: a contingency approach. *Academy of Management Perspectives*, 18, 22–36.
- Markides, C., Oyon, D., 2010. What to do against disruptive business models (when and how to play two games at once). *MIT Sloan Management Review*, 51.
- Markides, C.C., 1992. Consequences of corporate refocusing: ex ante evidence. *Academy of Management Journal*, 35, 398–412. doi:10.5465/256379
- Markowitz, H.M., 1991. Foundations of portfolio theory. *The Journal of Finance*, 46, 469. doi:10.2307/2328831
- Martin, J.D., Sayrak, A., 2003. Corporate diversification and shareholder value: a survey of recent literature. *Journal of Corporate Finance*, 9. doi:10.1016/s0929-1199(01)00053-0
- Massa, L., Tucci, C.L., Afuah, A., 2017. A critical assessment of business model research. *Academy of Management Annals*, 11. doi:10.5465/annals.2014.0072

- Mawdsley, J.K., Somaya, D., 2018. Demand-side strategy, relational advantage, and partner-driven corporate scope: the case for client-led diversification. *Strategic Management Journal*, 39, 1834–1859. doi:10.1002/smj.2788
- Mewilliams, A., Siegel, D.S., 1997. Event studies in management research: theoretical and empirical issues. *Academy of Management Journal*, 40, 626–657. doi:10.2307/257056
- Menz, M., Kunisch, S., Birkinshaw, J., Collis, D.J., Foss, N.J., Hoskisson, R.E., Prescott, J.E., 2021. Corporate strategy and the theory of the firm in the digital age. *Journal of Management Studies*, 58, 1695–1720. doi:10.1111/joms.12760
- Mishra, S., Mishra, P., 2023. AI business models and its impact on business strategic framework. *International Journal of Financial Engineering*, 2350001. doi:10.1142/s2424786323500019
- Montgomery, C.A., 1994. Corporate diversification. *Journal of Economic Perspectives*, 8, 163–178. doi:10.1257/jep.8.3.163
- Nixon, R.D., Hitt, M.A., Lee, H., Jeong, E., 2004. Market reactions to announcements of corporate downsizing actions and implementation strategies. *Strategic Management Journal*, 25, 1121–1129. doi:10.1002/smj.423
- Pidun, U., 2019. Corporate strategy, theory and practice. doi:10.1007/978-3-658-25426-1
- Pierce, J.R., Aguinis, H., 2013. The too-much-of-a-good-thing effect in management. *Journal of Management*, 39. doi:10.1177/0149206311410060
- Pisano, G.P., 2017. Toward a prescriptive theory of dynamic capabilities: connecting strategic choice, learning, and competition. *Industrial and Corporate Change*, 26, 747–762. doi:10.1093/icc/dtx026
- Priem, R.L., 2012. Insights and new directions from demand-side approaches to technology innovation, entrepreneurship, and strategic management research. *Journal of Management*, 38, 346–374. doi:10.1177/0149206311429614
- Priem, R.L., Wenzel, M., Koch, J., 2018. Demand-side strategy and business models: putting value creation for consumers center stage. *Long Range Planning*, 51, 22–31. doi:10.1016/j.lrp.2017.07.007
- Reuer, J.J., Koza, M.P., 2000. Asymmetric information and joint venture performance: theory and evidence for domestic and international joint ventures. *Strategic Management Journal*, 21, 81–88. doi:10.1002/(sici)1097-0266(200001)21:1<81::aid-smj62>3.0.co;2-r
- Reuer, J.J., Tong, T.W., 2010. Discovering valuable growth opportunities: an analysis of equity alliances with IPO firms. *Organization Science*, 21, 202–215. doi:10.1287/orsc.1080.0397
- Sabatier, V., Mangematin, V., Rousselle, T., 2010. From recipe to dinner: business model portfolios in the European biopharmaceutical industry. *Long Range Planning*, 43, 431–447. doi:10.1016/j.lrp.2010.02.001
- Sakhartov, A.V., 2022. Corporate diversification and risk: portfolio effects and resource redeployability. *Strategy Science*, 7, 317–329. doi:10.1287/stsc.2021.0154
- Sakhartov, A.V., Folta, T.B., 2014. Resource relatedness, redeployability, and firm value. *Strategic Management Journal*, 35, 1781–1797. doi:10.1002/smj.2182
- Schilling, M.A., 2009. Understanding the alliance data. *Strategic Management Journal*, 30, 233–260. doi:10.1002/smj.731
- Schommer, M., Richter, A., Karna, A., 2019. Does the diversification–firm performance relationship change over time? A meta-analytical review. *Journal of Management Studies*, 56. doi:10.1111/joms.12393
- Schreier, M., 2012. *Qualitative Content Analysis in Practice*. Sage publications.
- Schwarz, J., Terrenghi, N., Legner, C., 2017. From one to many business models: uncovering characteristics of business model portfolios. *Proceedings of the 25th European Conference on Information Systems (ECIS)* 2285–2300.
- Sirmon, D.G., Hitt, M.A., Ireland, R.D., 2007. Managing firm resources in dynamic environments to create value: looking inside the black box. *Academy of Management Review*, 32, 273–292. doi:10.5465/amr.2007.23466005
- Snihur, Y., Markman, G., 2023. Business model research: past, present, and future. *Journal of Management Studies*, 60, e1–e14. doi:10.1111/joms.12928

- Snihur, Y., Zott, C., Amit, R., 2021. Managing the value appropriation dilemma in business model innovation. *Strategy Science*, 6, 22–38. doi:10.1287/stsc.2020.0113
- Sohl, T., Folta, T.B., 2021. Declining markets, resource specificity, and redeployment decisions. *Strategic Management Review*.
- Sohl, T., McCann, B.T., Vroom, G., 2022. Business model diversification: demand relatedness, entry sequencing, and curvilinearity in the diversification-performance relationship. *Long Range Planning*, 102215. doi:10.1016/j.lrp.2022.102215
- Sohl, T., Vroom, G., 2017. Mergers and acquisitions revisited: the role of business model relatedness. *Advances in Mergers and Acquisitions*, 16, 99–113. doi:10.1108/s1479-361x20170000016006
- Sohl, T., Vroom, G., 2014. Business model diversification, resource relatedness, and firm performance. *Academy of Management Proceedings*, 2014, 10894. doi:10.5465/ambpp.2014.158
- Sohl, T., Vroom, G., Fitza, M.A., 2020a. How much does business model matter for firm performance? A variance decomposition analysis. *Academy of Management Discoveries*, 6, 61–80. doi:10.5465/amd.2017.0136
- Sohl, T., Vroom, G., McCann, B.T., 2020b. Business model diversification and firm performance: a demand-side perspective. *Strategic Entrepreneurship Journal*. doi:10.1002/sej.1342
- Spieth, P., Laudien, S.M., Meissner, S., 2021. Business model innovation in strategic alliances: a multi-layer perspective. *R&D Management*, 51, 24–39. doi:10.1111/radm.12410
- Spieth, P., Schneckenberg, D., Ricart, J.E., 2014. Business model innovation – state of the art and future challenges for the field. *R&D Management*, 44, 237–247.
- Teece, D.J., 2018. Business models and dynamic capabilities. *Long Range Planning*, 51, 40–49. doi:10.1016/j.lrp.2017.06.007
- Teece, D.J., 2010. Business models, business strategy and innovation. *Long Range Planning*, 43. doi:10.1016/j.lrp.2009.07.003
- Tong, T.W., Reuer, J.J., Peng, M.W., 2008. International joint ventures and the value of growth options. *Academy of Management Journal*, 51, 1014–1029. doi:10.5465/amj.2008.34789680
- Varadarajan, P.R., Cunningham, M.H., 1995. Strategic alliances: a synthesis of conceptual foundations. *Journal of the Academy of Marketing Science*, 23, 282–296. doi:10.1177/009207039502300408
- Villalonga, B., 2004a. Does diversification cause the “diversification discount”? *Financial Management*, 5–27. doi:10.2139/ssrn.227828
- Villalonga, B., 2004b. Diversification discount or premium? New evidence from the business information tracking series. *The Journal of Finance*, 59, 479–506. doi:10.1111/j.1540-6261.2004.00640.x
- Villalonga, B., McGahan, A.M., 2005. The choice among acquisitions, alliances, and divestitures. *Strategic Management Journal*, 26, 1183–1208. doi:10.1002/smj.493
- Vinokurova, N., Kapoor, R., 2020. Converting inventions into innovations in large firms: how inventors at Xerox navigated the innovation process to commercialize their ideas. *Strategic Management Journal*, 41, 2372–2399. doi:10.1002/smj.3209
- Visnjic, I., Wiengarten, F., Neely, A., 2014. Only the brave: product innovation, service business model innovation, and their impact on performance. *Journal of Product Innovation Management*, 33, 36–52. doi:10.1111/jpim.12254
- Volkov, N.I., Smith, G.C., 2015. Corporate diversification and firm value during economic downturns. *The Quarterly Review of Economics and Finance*, 55. doi:10.1016/j.qref.2014.08.002
- White, J.V., Markin, E., Marshall, D., Gupta, V.K., 2022. Exploring the boundaries of business model innovation and firm performance: a meta-analysis. *Long Range Planning*, 55, 102242. doi:10.1016/j.lrp.2022.102242
- Wirtz, B.W., Pistoia, A., Ullrich, S., Göttel, V., 2016. Business models: origin, development and future research perspectives. *Long Range Planning*, 49. doi:10.1016/j.lrp.2015.04.001
- Zott, C., Amit, R., 2008. The fit between product market strategy and business model: implications for firm performance. *Strategic Management Journal*, 29, 1–26. doi:10.1002/smj.642
- Zott, C., Amit, R., 2010. Business model design: an activity system perspective. *Long Range Planning*, 43, 216–226. doi:10.1016/j.lrp.2009.07.004

Table 1: Descriptive statistics, including sample split.

	Table A			Table B			
	Mean	p50	SD	W/out BME	With BME	Delta (significance)	t
CAR	0.00	-0.01	0.06	-0.02	0.03	-0.05***	-5.14
Experience (past HT JVs)	3.16	2.00	2.97	3.43	2.49	0.94*	2.14
JV Percentage Hold	45.28	50.00	10.28	46.18	43.12	3.05*	2.00
FY Revenue	43,640	25,329	46,807	41,230	49,454	-8,224	-1.17
Total Assets	84,901	31,850	134,629	84,633	85,547	-914	-0.05
Market Capitalization	101,947	54,130	124,154	112,718	75,960	36,758*	1.99
Observations	215			152	63	215	
* p<0.05, *** p<0.01							

Table 2: Regressions (1)–(5) with Cumulative Abnormal Return (CAR) as the dependent variable.

	(1)	(2)	(3)	(4)	(5)
BME=0	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)	0.000 (.)
BME=1	0.049*** (0.00)	0.052*** (0.00)	0.027* (0.02)	0.013 (0.58)	0.050*** (0.00)
Alliance Exp. to tot. Assets	9.358 (0.68)	-28.784 (0.28)	-18.779 (0.47)	-29.105 (0.27)	-30.470 (0.24)
JV Percentage Hold	0.000 (0.66)	0.000 (0.33)	0.000 (0.34)	0.000 (0.32)	0.000 (0.43)
Ln(Revenue)	0.008 (0.44)	0.023 (0.11)	0.020 (0.14)	0.024+ (0.09)	0.023 (0.10)
Ln(Assets)	-0.008 (0.35)	-0.020 (0.10)	-0.014 (0.24)	-0.022+ (0.08)	-0.021+ (0.09)
Ln(MarketCap)	0.006 (0.15)	-0.003 (0.63)	-0.004 (0.41)	-0.002 (0.65)	-0.002 (0.65)
8-Quarter ROA Variance			-7.223 (0.83)		
BME=0 # 8-Quarter ROA Var.			0.000 (.)		
BME=1 # 8-Quarter ROA Var.			220.383*** (0.00)		
Industry Dynamism				-0.205 (0.58)	
BME=0 # Ind.Dyn.				0.000 (.)	
BME=1 # Ind.Dyn.				0.985+ (0.06)	
Recession					-0.012 (0.57)
BME=0 # Recession					0.000 (.)
BME=1 # Recession					0.231*** (0.00)
Industry fixed effects	excluded	----- included -----			
Constant	-0.084+ (0.10)	-0.031 (0.64)	-0.043 (0.49)	-0.032 (0.69)	-0.025 (0.69)
Observations	215	215	215	215	215
R-squared	0.125	0.250	0.315	0.265	0.288
Adjusted R-squared	0.100	0.128	0.195	0.136	0.163
p-values in parentheses + p<0.10, * p<0.05, *** p<0.01					

Table 3: Regressions (6)–(13) with Cumulative Abnormal Return (CAR) as the dependent variable.

	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Alliance Exp. to tot. Assets	-69.953 (0.18)	-60.787 (0.23)	-60.950 (0.25)	-56.380 (0.26)	-60.582 (0.25)	-39.501 (0.32)	-73.840 (0.16)	-68.383 (0.17)
JV Percentage Hold	0.000 (0.58)	0.000 (0.48)	0.000 (0.48)	0.000 (0.36)	0.000 (0.46)	-0.000 (0.76)	0.000 (0.52)	0.000 (0.58)
Ln(Revenue)	0.022 (0.15)	0.017 (0.23)	0.023 (0.13)	0.015 (0.31)	0.023 (0.13)	0.020+ (0.08)	0.023 (0.14)	0.017 (0.22)
Ln(Assets)	-0.020 (0.12)	-0.016 (0.20)	-0.020 (0.13)	-0.011 (0.36)	-0.021 (0.11)	-0.016 (0.10)	-0.020 (0.13)	-0.016 (0.18)
Ln(MarketCap)	-0.003 (0.60)	-0.003 (0.58)	-0.003 (0.55)	-0.004 (0.42)	-0.003 (0.62)	-0.006 (0.15)	-0.004 (0.52)	-0.003 (0.57)
PE w/out BME = 1	-0.028*** (0.00)		-0.021+ (0.07)		0.013 (0.54)		-0.027*** (0.01)	
PE w/ BME = 1		0.049*** (0.00)		0.033* (0.01)		0.012 (0.53)		0.047*** (0.00)
8-Quarter ROA Variance			79.571* (0.04)	17.730 (0.59)				
PE w/out BME=1 # 8-Quarter ROA Var.			-91.587 (0.10)					
PE w/ BME=1 # 8-Quarter ROA Var.				143.368* (0.03)				
Industry Dynamism					0.582 (0.21)	-0.348 (0.23)		
PE w/out BME=1 # Ind.Dyn.					-1.065* (0.03)			
PE w/ BME=1 # Ind.Dyn.						0.809+ (0.07)		
Recession							0.006 (0.85)	-0.017 (0.40)
PE w/out BME=1 # Recession							-0.032 (0.43)	
PE w/ BME=1 # Recession								0.237*** (0.00)
Industry fixed effects	----- included -----							
Constant	0.021 (0.78)	0.000 (1.00)	-0.001 (0.99)	-0.014 (0.85)	-0.017 (0.86)	0.051 (0.47)	0.016 (0.83)	0.009 (0.90)
Observations	215	215	215	215	215	215	215	215
R-squared	0.185	0.229	0.203	0.258	0.206	0.285	0.189	0.270
Adjusted R-squared	0.052	0.104	0.063	0.128	0.066	0.160	0.046	0.141
p-values in parentheses + p<0.10, * p<0.05, *** p<0.01								

Table 4: Hypotheses, outcomes and financial impact estimate.

Hypothesis	Expected Impact	Observed Impact	Significance (p-values: + p<0.10, * p<0.05, *** p<0.01)	Financial Impact (in \$bn)
H1: BME	+	0.052	***	\$ 2.9
H2a: BME # CompUncert	+	220.383	***	\$ 3.9
H2b: BME # IndUncert	+	0.985	+	\$ 5.5
H2c: BME # EconUncert	+	0.231	***	\$ 12.8
H3a: PE w/ BME	+	0.049	***	\$ 2.7
H3b: PE w/out BME	-	-0.028	***	\$ -1.5
H4a1: PE + BME # CompUncert	+	143.368	*	\$ 2.5
H4a2: PE w/o BME # CompUncert	-	-91.587	n/s	-
H4b1: PE + BME # IndUncert	+	0.809	+	\$ 4.5
H4b2: PE w/o BME # IndUncert	-	-1.065	*	\$ -5.9
H4c1: PE + BME # EconUncert	+	0.237	***	\$ 13.1
H4c2: PE w/o BME # EconUncert	-	-0.032	n/s	-

