Abnormal Stock Market Returns to Business Model Extension Announcements: Value Drivers and Moderators

Thiemo Werner and Werner H. Hoffmann
WU - Vienna University of Economics and Business, Vienna, Austria

Thiemo.Werner@s.wu.ac.at
Werner.Hoffmann@wu.ac.at

Abstract: The value-creation potential of business model extensions (BME) in incumbent companies remains a subject of ongoing debate and is currently not substantiated by market-value focused empirical research. Especially the moderating role of economic uncertainty and the interplay with traditional product-industry diversification have not been empirically examined. This study aims to close that gap. We utilize an event study setup to measure the value-creating effect of BME and its moderators. Using a unique dataset of joint ventures in the high-tech industry industry, we measure the effects of BME and its moderators on abnormal stock market returns. Our findings indicate that BME leads to higher abnormal stock market returns. This effect is further amplified under company-level, industry-level, and macroeconomic uncertainty. Additionally, we discover that, under these uncertainties, combinations of BME and product-industry diversification are value-creating, whereas product-industry diversification alone tends to be value-destroying.

Keywords: Business Model, Business Model Extension, Uncertainty, Diversification, Event Study

1. Introduction

Companies commonly operate multiple business models in parallel (Aversa and Haefliger 2016). In recent years, there has been growing interest in analyzing the introduction of or extension to a new business model—representing a new way to create, deliver, or capture value (Teece 2010) for incumbent firms. An increasing number of companies are engaging in this form of business model extension (BME) and there is growing scholarly interest in the topic (Leppänen et al. 2021). However, despite this growing interest, empirical research on market value creation through BME remains scarce (White 2022, Snihur 2023).

Furthermore, it is not yet clear which factors influence the BME-performance relationship. 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). It seems intuitive that BME will aid companies during times of uncertainty, but there is a lack of empirical research into the moderating role of uncertainty in the BME-performance relationship. We seek to close this gap. Similarly, the interplay between BME and "traditional" product-industry diversification seems intuitively relevant but lacks empirical research. The effect on performance of a new business model in a new industry might be fundamentally different to that of a new business model in a company's core market (such as the *Pret a Manger* example above). We consider BME to be an orthogonal form of diversification and explore the moderating effects of product-industry diversification on value creation through BME.

Because we cannot directly measure the BME-performance relationship, we create a novel research approach using an event study design to assess the impact of BME announcements on abnormal stock market returns. BMEs are not typically announced explicitly; we therefore analyze the BMEs companies pursue when creating joint ventures (JVs). Because JVs entail equity holdings, they are announced to financial markets, and these announcements can be dated precisely. We build on existing research on the BME-performance relationship (such as Aversa et al. 2015, 2020, Heij et al. 2014, Snihur and Markman 2023, Sohl, Vroom and Fitza 2020, Sohl and Vroom 2014) and hypothesize that uncertainty moderates the BME-performance relationship.

Drawing on corporate diversification theory, we develop hypotheses suggesting that the combination of product-industry extension and BME is likely to receive positive capital market responses, whereas product extensions without BME will be viewed unfavorably. Incorporating the moderating effect of uncertainty, we hypothesize that the presence of uncertainty—whether at the company, industry, or economy-wide level—will amplify the positive effect of BME combined with product extension, but conversely, will exacerbate the negative impact of pursuing isolated product-industry extension.

Using a sample of publicly-traded U.S. firms, we test our hypotheses in an event study. 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 as it is characterized by dynamism and strategic renewal (Bouncken and Fredrich 2016, Kohers and Kohers 2019, Villalonga and McGahan 2005).

In the past, measurement challenges have limited large-sample research on BME. Therefore, we manually assess and categorize JV announcements and employ an artificial intelligence tool to support this categorization (Leppänen et al. 2021). We then use ordinary least square models to analyze our sample and find evidence supporting most of our hypotheses. We discuss these findings and illustrate that, depending on company circumstances, BMEs can generate substantial market value.

The value of BME is still debated in the academic community (Massa 2017, Snihur 2023). The present study contributes to this debate in general and to the literature on the BME-performance relationship more specifically. We show that uncertainty and its interplay with product-industry diversification are important moderators that have previously not been systemically assessed. We also extend the literature on corporate strategy by showing the importance of considering the effect of BME when analyzing the performance implications of corporate diversification. We respond to calls for research into moderators of the BME-performance relationships (Sohl, Vroom and McCann 2020), external drivers of BME (Foss and Saebi 2018), and the interplay between BME and other types of innovation (Demil et al. 2015).

Not only academics but also practitioners discuss the importance of BME (Foss and Saebi 2017). Many firms have experimented with BME in recent decades, but their efforts have not achieved blanket performance improvements. The nuanced perspective presented in this paper aids practitioners by drawing attention to the important role of moderators in the BME-performance relationship. Our findings provide guidance about situations in which BMEs are most value-creating and how they are best combined with traditional product-industry diversification.

2. Literature and Hypotheses

A growing stream of management literature investigates the concept of the business model (Bosbach et al. 2020, Lanzolla and Markides 2020, Sohl et al. 2022, White et al. 2022, Wirtz et al. 2016). A business model is a system that combines a unique way to create, deliver, and capture value (Baden-Fuller and Haefliger 2013, Teece 2010).

2.1 Business Model Extensions

In recent years, scholars have begun to recognize that multiple business models 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).

Several studies examine the performance effect of BME, concluding that it is broadly positive (Aversa et al. 2015, Heij et al. 2014, Loon and Quan 2020, Sohl, Vroom and Fitza 2020, Sohl and Vroom 2014). However, 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. Because BME is a commonly-used tool in well-established "incumbent" companies, understanding its impact on market-based measures is highly relevant.

Research at the intersection of BME and interfirm relationships remains scarce despite some much-cited theoretical work (Christensen et al. 2011, Sohl and Vroom 2017). Corporate alliances allow companies to build off their partners' resources when engaging in BME and can speed up the process of new business model innovation (Loon and Quan 2020). Empirical work combining alliances and BME focuses on analyzing non-equity contractual partnerships. For example, Spieth et al. (2021) focus on the business model innovation process and show that it occurs within alliances. We build on this research and follow suggestions to analyze the effects of BME in alliances at a larger scale (Spieth et al. 2021, Velu 2015). Combining these research streams, we therefore expect that the positive effects of BME will continue to hold for market-based measures and can be operationalized through JV announcements. Specifically, we hypothesize the following:

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

2.2 The Moderating Effect of Uncertainty

Companies use BME to maximize the value of their existing capabilities (Zott and Amit 2010) and react to changing business environments (Spieth et al. 2014). BME provides a company with a new source of revenue

and profits by satisfying untapped market demand (Priem et al. 2018). As such, the levels of uncertainty and transformation pressure may influence the use and effectiveness of BME. In a meta-analysis, White et al. (2022) show that the relationship between changing an existing business model and firm performance is more positive during times of economy-wide instability. Their study utilizes a macroeconomic environment indicator as a proxy for macroeconomic stability. In their conclusion, the authors call for the identification of additional moderators that impact the performance effects of BME.

Macroeconomic uncertainty is only one level of uncertainty that may increase the benefits of BME. Past research shows increased levels of BME as a response to industry-level uncertainty (Christensen and Raynor 2013, Karimi and Walter 2016). We propose that companies also engage in BME in response to uncertainty about company-level profits (in addition to industry-level, and economy-wide uncertainty). We therefore expect that capital market reactions to BME announcements depend on the degree of uncertainty at firm-, industry-, and economy-wide levels.

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 an 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). This indicates that business model extension via JVs is a suitable setting to test the effect of uncertainty.

Based on this conjecture, we further explore the circumstances in which the addition of a new business model to a portfolio is value-creating. Specifically, we hypothesize:

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

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

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

2.3 The Interplay between Product-Industry Diversification and BME

The phenomena of business model portfolio diversification and extension have reshaped industry boundaries and traditional definitions of diversification (Massa et al. 2017, Sohl, Vroom and McCann 2020). 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 motivates research on the use of BME in combination with traditional product-industry diversification.

We build on this foundation to distinguish between these types of portfolio extensions (business model and product-industry extensions). This provides corporate managers with four distinct strategic options: (1) stay in the same product industry with the same business model; (2) extend into a new product industry with the existing business model; (3) extend the business model portfolio with a new business model in the current product industry; or (4) extend the business model portfolio by entering a new product industry with a new business model. The relationship between BME and company performance has been shown to be positive overall (Aversa et al. 2015, Heij et al. 2014, Loon and Quan 2020), whereas the relationship between product-industry diversification and performance is more complex, and is broadly accepted to be inverted-U-shaped, where too low (or too related) or too high (or too unrelated) a level of diversification is value-destroying (Pierce and Aguinis 2013, Schommer et al. 2019). Based on these findings, 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: Product extension (PE) in conjunction with BME will lead to positive abnormal returns.

H3b: PE without BME will lead to negative abnormal returns.

The relationship between product-industry diversification and performance is influenced by uncertainty, whereby a high degree of uncertainty typically leads to increased capacity for diversification (Benito-Osorio et al. 2012, Volkov and Smith 2015). However, researchers on this topic have focused on product-industry diversification without controlling for the effect of BMEs (Schommer et al. 2019). The combination of business model and industry extension might allow us to overcome typical challenges of scope (Aversa and Hueller 2023, Sakhartov and Folta 2014).

We therefore propose to isolate the effect of BME, and hypothesize that:

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

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

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

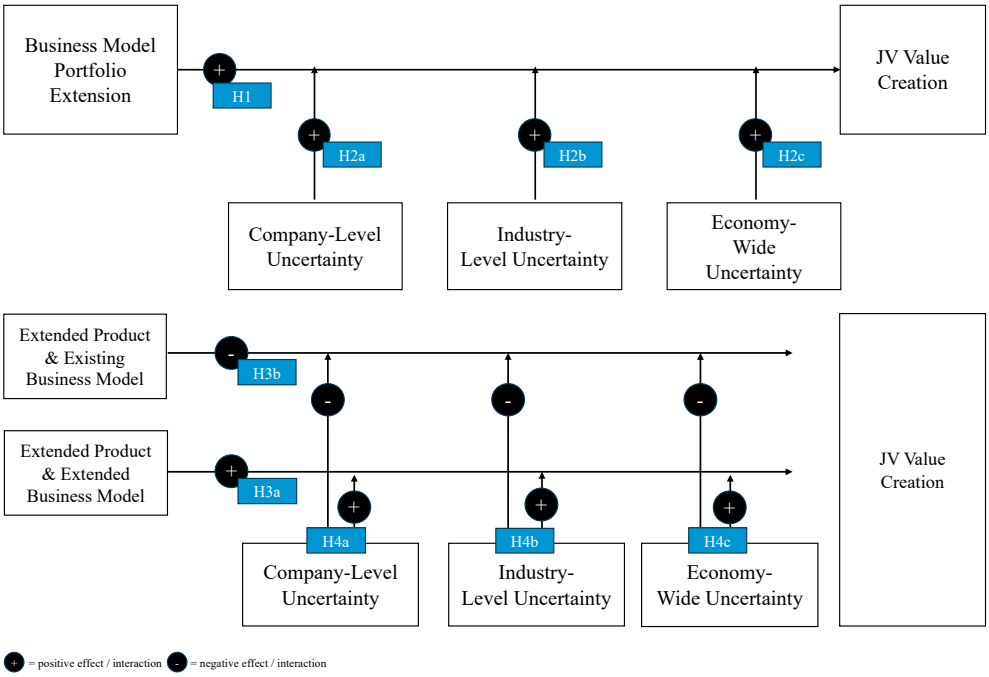

Figure 1: Overview of hypotheses.

3. Methodology and Research Setup

To explore our hypotheses, we conduct an event study analyzing capital market reactions to the announcement of business–model-extending JVs. 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). In this study, our dependent variable is the abnormal return following a JV announcement that either involves or does not involve 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).

3.1 Data and Sample Collection

The initial sample was constructed using alliance data from the Securities Data Company (SDC) database via Refinitiv SDC Platinum. 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 initial firm-level dataset consisted of 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.

3.2 Coding for Business Model Extensions

Information about business models is not available in a database such as 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 (Aversa et al. 2015, Schwarz et al. 2017, Sohl and Vroom 2014). To identify BMEs, we conducted an in-depth qualitative content analysis of the JVs in our sample (Schreier 2012). We follow the recommendations of 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. Then a coding framework was developed based on relevant literature on JVs (Bamford and Jenkins 2021, Koh and Venkatraman 1991, Reuer and Koza 2000) and a finite list of relevant business models (Gassmann et al. 2014). This framework was challenged and refined together with 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, entering the Chinese market).
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.

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. 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 (new value proposition), and introduces a new way of purchasing vehicles (value capture) that was a shift from the traditional car buying process.

3.3 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 (Hoechle et al. 2012, Kale et al. 2002, Kothari and Warner 2004, Villalonga 2004a).

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). The cumulative abnormal return is the sum of the abnormal returns (CAR) in the three days surrounding the JV announcement: -3, 0 (event day), and +3.

3.4 Value Drivers, Moderators, and Controls

To test the moderating effect of 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 frequently-used variable in the business model literature and variance in return on assets provides a scaled measure of the consistency of company profits (Sohl et al. 2022).

To test the moderating effects of industry-level uncertainty, we assess dynamism in industries at the two-digit SIC code level. 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 36 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 assess the moderating effects of economy-level 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 by the time a country's economy is deemed to be in a recession, a prolonged period of uncertainty (at least seven quarters) has passed (Karnizova and Li 2014). We create a binary variable that equals 1 if the JV announcement was during a quarter in a recession, and 0 otherwise.

In addition to the above-mentioned moderators, we control for several 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 also control for the value investors assign to the 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, 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 to take a 90% interval.

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

4. Analysis and Results

We 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 1999). Because the test results could not rule out the presence of heteroskedasticity we adjusted the model by adding 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 a statistically significant impacts.

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***	0.052***	0.027*	0.013	0.050***
	(0.00)	(0.00)	(0.02)	(0.58)	(0.00)
Alliance Exp. to tot. Assets	9.358	-28.784	-18.779	-29.105	-30.470
	(0.68)	(0.28)	(0.47)	(0.27)	(0.24)
JV Percentage Hold	0.000	0.000	0.000	0.000	0.000
	(0.66)	(0.33)	(0.34)	(0.32)	(0.43)
Ln(Revenue)	0.008	0.023	0.020	0.024+	0.023
	(0.44)	(0.11)	(0.14)	(0.09)	(0.10)
Ln(Assets)	-0.008	-0.020	-0.014	-0.022+	-0.021+
	(0.35)	(0.10)	(0.24)	(0.08)	(0.09)
Ln(MarketCap)	0.006	-0.003	-0.004	-0.002	-0.002
	(0.15)	(0.63)	(0.41)	(0.65)	(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+	-0.031	-0.043	-0.032	-0.025
	(0.10)	(0.64)	(0.49)	(0.69)	(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 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 included a BME and those that did 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 upon announcements of business–model-extending JVs. As Model 4 shows, our results also support H2b, indicating that 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).

The plots in Figure 2 with linear fitting illustrate the above-mentioned effects. Across the sample, economic uncertainty at the company, industry, and economy levels typically has a negative effect on abnormal returns (the higher the uncertainty the lower the abnormal returns after a JV announcement). However, for JV announcements that indicate a BME, uncertainty positively influences abnormal returns.

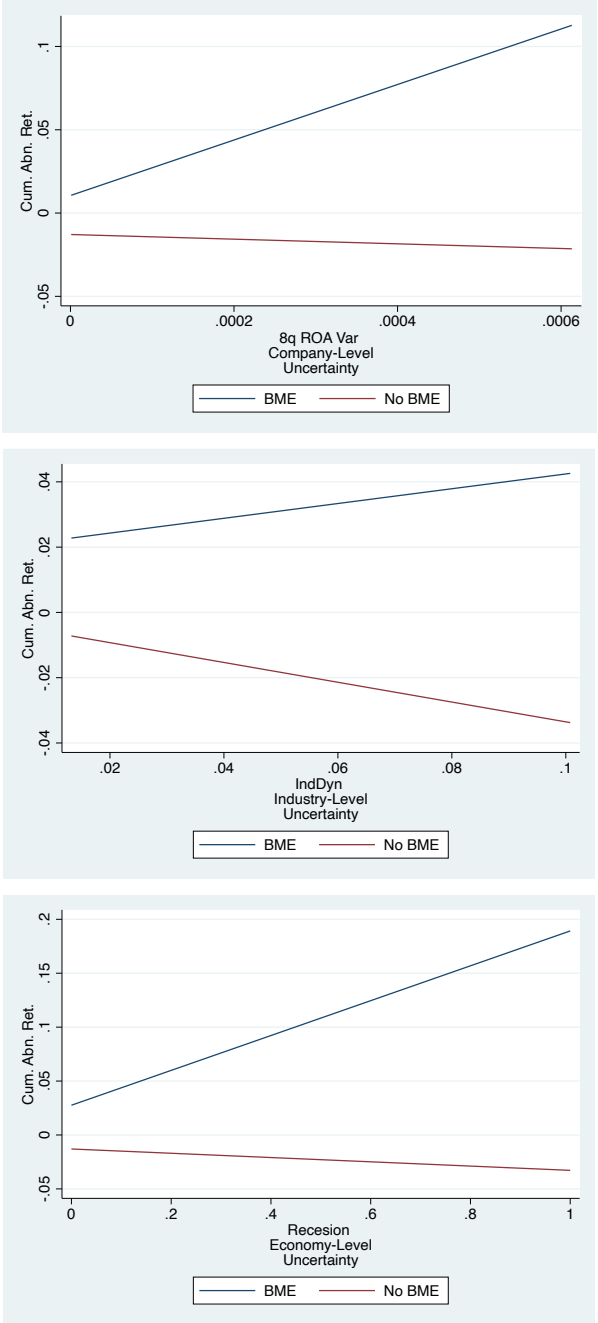

Figure 2: Plot of CAR–Uncertainty relationship split by BME vs. no BME JV announcements.

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 in new product industries, defined as a JV in an industry that is at least two digits from the SIC code of their focal company.

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.

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	-60.787	-60.950	-56.380	-60.582	-39.501	-73.840	-68.383
	(0.18)	(0.23)	(0.25)	(0.26)	(0.25)	(0.32)	(0.16)	(0.17)
JV Percentage Hold	0.000	0.000	0.000	0.000	0.000	-0.000	0.000	0.000
	(0.58)	(0.48)	(0.48)	(0.36)	(0.46)	(0.76)	(0.52)	(0.58)
Ln(Revenue)	0.022	0.017	0.023	0.015	0.023	0.020+	0.023	0.017
	(0.15)	(0.23)	(0.13)	(0.31)	(0.13)	(0.08)	(0.14)	(0.22)
Ln(Assets)	-0.020	-0.016	-0.020	-0.011	-0.021	-0.016	-0.020	-0.016
	(0.12)	(0.20)	(0.13)	(0.36)	(0.11)	(0.10)	(0.13)	(0.18)
Ln(MarketCap)	-0.003	-0.003	-0.003	-0.004	-0.003	-0.006	-0.004	-0.003
	(0.60)	(0.58)	(0.55)	(0.42)	(0.62)	(0.15)	(0.52)	(0.57)
PE w/out BME = 1	-0.028***		-0.021+		0.013		-0.027***	
	(0.00)		(0.07)		(0.54)		(0.01)	
PE w/ BME = 1		0.049***		0.033*		0.012		0.047***
		(0.00)		(0.01)		(0.53)		(0.00)
8-Quarter ROA Variance			79.571*	17.730				
			(0.04)	(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	-0.348		
					(0.21)	(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	-0.017
							(0.85)	(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	0.000	-0.001	-0.014	-0.017	0.051	0.016	0.009
	(0.78)	(1.00)	(0.99)	(0.85)	(0.86)	(0.47)	(0.83)	(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

The findings of this analysis are reported in Table 3. Model 6 analyzes the effect of a 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 industry-product 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 announcement 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 (P-value 0.1).

Models 10 and 11 test the interaction between industry-extending JVs with and without a new business model and industry-level uncertainty. The results suggest 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/without BME and our variable for economy-wide

uncertainty (identified by recessions). We find evidence that product-industry extension using a new business model during a recession statistically significantly increases abnormal stock market return.

5. 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.

Second, we find that uncertainty at the company-, industry-, and economy-wide levels increases the positive impact of BMEs. Our results indicate that extension to a novel business model is a value-creating strategy during times of uncertainty. This finding adds to the literature on external moderators of BME (Foss 2018, Spieth 2014). We show that in addition to macroeconomic uncertainty (White 2022), industry- and company-level uncertainty also have positive effects on BME. Whereas previous research on alliances and BME focuses on non-equity partnerships (Spieth et al. 2021), our research shows that JVs are a commonly-used tool to engage in BME. Our study is thus linked to the literature on alliances as strategic options by emphasizing that BME JVs are used to explore new markets and growth opportunities (Hoffmann 2007, Reuer and Tong 2010, Varadarajan and Cunningham 1995). We also show that BME JVs are appropriate—and value-creating—tools under uncertainty (Tong et al. 2008, Trigeorgis and Reuer 2017).

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.

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 & 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.

5.1 Limitations

This research is not without limitations. 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). 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). 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, Sohl, Vroom and McCann 2020) and should be a focus of future research.

References

Amit R, Zott C (2012) Creating value through business model innovation. *MIT Sloan Manag. Rev.*

Anthony SD, Gilbert CG, Johnson MW (2017) *Dual Transformation: How to Reposition Today's Business While Creating the Future* Press HBR, ed. (Harvard Business Press).

Aversa P, Haefliger S, Hueller F, Reza DG (2021) Customer complementarity in the digital space: exploring Amazon's business model diversification. *Long Range Plann.*

Aversa P, Hueller F (2023) Digital diversification. *Research handbook on digital strategy*.

Baden-Fuller C, Haefliger S (2013) Business models and technological innovation. *Long Range Plann.*

Bamford J, Jenkins B (2021) Joint ventures: the next frontiers of analysis. *Strateg. Manag.*

Bouncken RB, Fredrich V (2016) Business model innovation in alliances: successful configurations. *J. Bus. Res.*

Chesbrough H (2010) Business model innovation: opportunities and barriers. *Long Range Planning*

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. *J. Econ. Lit.*

Demil B, Lecocq X, Ricart JE, Zott C (2015). Introduction Introduction to the SEJ Special Issue on Business Models: Business Models within the Domain of Strategic Entrepreneurship. *Strateg. Entrep. J.*

Feldman ER (2020) Corporate strategy: past, present, and future. *Strateg. Manag. Rev.*

Foss NJ, Saebi T (2017) Fifteen years of research on business model innovation. *J. Manag.*

Gassmann O, Frankenberger K, Csik M (2014) The St. Gallen business model navigator. Working Paper.

Hoechle D, Schmid M, Walter I, Yermack D (2012) How much of the diversification discount can be explained by poor corporate governance? *J. Financ. Econ.*

Hoffmann W, Schaper-Rinkel W (2001) Acquire or ally? -A strategy framework for deciding between acquisition and cooperation. *Manag. Int. Rev.* (MIR)

Hoffmann WH (2007) Strategies for managing a portfolio of alliances. *Strateg. Manag. J.*

Holtström J (2021) Business model innovation under strategic transformation. *Technol. Anal Strateg.*

Johnson M, Suskewicz J (2020) *Lead from the Future* (Harvard Business Press).

Johnson M, Christensen CM, Kagermann H (2008) Reinventing your business model. *Harv. Bus. Rev.*

Kale P, Dyer JH, Singh H (2002) Alliance capability, stock market response, and long-term alliance success: the role of the alliance function. *Strateg. Manag. J.*

Kim SK, Min S (2015) Business model innovation performance: when does adding a new business model benefit an incumbent? *Strateg. Entrep. J.*

Kogut B (1991) Joint ventures and the option to expand and acquire. *Manag. Sci.*

Koh J, Venkatraman N (1991) Joint venture formations and stock market reactions: an assessment in the information technology sector. *Acad. Manag. J.*

Kothari SP, Warner JB (2004) The econometrics of event studies. *SSRN Electron. J.*

Lavie D (2007) Alliance portfolios and firm performance: a study of value creation and appropriation in the U.S. software industry. *Strateg. Manag. J.* 28(12)

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. *Acad. Manag. J.*

Loon M, Quan XI (2021) Theorising business model innovation: an integrated literature review. *Aust. J. Manag.*

Malhotra S, Harrison JS (2022) A blessing and a curse: how chief executive officer cognitive complexity influences firm performance under varying industry conditions. *Strateg. Manag. J.*

Markides C, Oyon D (2010) What to do against disruptive business models (when and how to play two games at once). *MIT Sloan Manag. Rev.*

Massa L, Tucci CL, Afuah A (2017) A critical assessment of business model research. *Acad. Manag. Ann.*

Mawdsley JK, Somaya D (2018) Demand-side strategy, relational advantage, and partner-driven corporate scope: the case for client-led diversification. *Strateg. Manag. J.*

Menz M, Kunisch S, Birkinshaw J, Collis DJ, Foss NJ, Hoskisson RE, Prescott JE (2021) Corporate strategy and the theory of the firm in the digital age. *J. Manag. Stud.*

Mishra S, Mishra P (2023) AI business models and its impact on business strategic framework. *J. Finan. Eng.*

Montgomery CA (1994) Corporate diversification. *J. Econ. Perspect.*

Priem RL, Wenzel M, Koch J (2018) Demand-side strategy and business models: putting value creation for consumers center stage. *Long Range Plann.*

Sabatier V, Mangematin V, Rousselle T (2010) From recipe to dinner: business model portfolios in the European biopharmaceutical industry. *Long Range Plann.*

Sakhartov AV (2022) Corporate diversification and risk: portfolio effects and resource redeployability. *Strateg. Sci.*

Schommer M, Richter A, Karna A (2019) Does the diversification–firm performance relationship change over time? A meta-analytical review. *J. Manag. Stud.*

Schreier M (2012) *Qualitative Content Analysis in Practice* (Sage Publications).

Snihur Y, Markman G (2023) Business model research: past, present, and future. *J. Manag. Stud.*
Snihur Y, Zott C, Amit R (2021) Managing the value appropriation dilemma in business model innovation. *Strateg.*
Sohl T, Folta TB (2021) Declining markets, resource specificity, and redeployment decisions. *Strateg. Manag. Rev.*
Sohl T, Vroom G, Fitza MA (2020) How much does business model matter for firm performance? A variance decomposition analysis. *Acad. Manag. Discov.*
Sohl T, Vroom G, McCann BT (2020) Business model diversification and firm performance: a demand-side perspective. *Strateg. Entrep. J.*
Spieth P, Laudien SM, Meissner S (2021) Business model innovation in strategic alliances: a multi-layer perspective. *R D Manag.*
Teece DJ (2010) Business models, business strategy and innovation. *Long Range Planning* 43(2–3).
Tong TW, Reuer JJ, Peng MW (2008) International jv and the value of growth options. *Acad. Manag. J.*
Trigeorgis L, Reuer JJ (2017) Real options theory in strategic management. *Strateg. Manag. J.*
Vanneste BS (2017) How much do industry, corporation, and business matter? A meta-analysis. *Strateg. Sci.*
Velu C (2015) Business model innovation and third-party alliance on the survival of new firms. *Technovation*
Villalonga B, McGahan AM (2005) The choice among acquisitions, alliances, and divestitures. *Strateg. Manag. J.*
Vinokurova N, Kapoor R (2020) Converting inventions into innovations in large firms: how inventors at Xerox navigated the innovation process to commercialize their ideas. *Strateg. Manag. J.*
Visnjic I, Wiengarten F, Neely A (2016) Only the brave: product innovation, service business model innovation, and their impact on performance. *J. Prod. Innov. Manag.*
White JV, Markin E, Marshall D, Gupta VK (2022) Exploring the boundaries of business model innovation and firm performance: a meta-analysis. *Long Range Plann.*
Wirtz BW, Pistoia A, Ullrich S, Göttel V (2016) Business models: origin, development and future research perspectives. *Long Range Plann.*
Zott C, Amit R (2010) Business model design: an activity system perspective. *Long Range Plann.*

Masters Research Paper