A quantitative study on the moderating effect of relationship strength on the decision to bridge or buffer as a response to perceived resource scarcity.

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ABSTRACT,
Firms facing resource scarcity must make strategic decisions about how to manage the emerging risks, often by either distancing themselves from suppliers (buffering) or increasing collaboration (bridging). While existing studies have thoroughly examined resource scarcity, they typically treat it as a single construct, overlooking how different dimensions of scarcity may influence strategic decision-making. Moreover, the potential role of relationship strength in shaping these decisions remains unclear. This thesis investigates how two dimensions of perceived resource scarcity, expected resource scarcity (ERS) and scarcity uncertainty (SU), affect firms' adoption of bridging or buffering strategies, and whether these effects are moderated by relationship strength. A survey of 45 purchasing professionals was analyzed using multiple regression analyses. The results show that only scarcity uncertainty significantly influences firm behavior, specifically by reducing the use of bridging strategies. No significant effect was found for expected resource scarcity, and relationship strength did not moderate either relationship. These findings extend Resource Dependence Theory by showing that perceived uncertainty may lead not to action, but to disengagement from supplier relationships

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Keywords
Supply chain management, perceived resource scarcity, bridging, buffering, relationship strength, Resource Dependence Theory, scarcity uncertainty, expected resource scarcity

During the preparation of this work, the author used ChatGPT in order to assist with coding in RStudio, and Grammarly in order to correct grammar and spelling. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the work

1. INTRODUCTION

Resource scarcity is a well-discussed topic in supply chain literature (e.g., Bell et al., 2012; Kalaitzi et al., 2018; Pfeffer & Salancik, 1978). The causes and consequences of resource scarcity as well as firms' strategic responses to it have been thoroughly examined. However, much of this literature treats scarcity as a single construct. Wiedmer and Whipple (2022) introduce a perspective that looks at different dimensions of resource scarcity. They identify the following two dimensions: expected resource scarcity (ERS), which refers to the predictability of a future shortage, and scarcity uncertainty (SU), which captures the unpredictability of the severity, timing, and duration of a resource scarcity. Yet, these different dimensions have rarely been examined in the literature, which limits our understanding of how managers may strategically respond to different types of perceived resource scarcity. Furthermore, even though firms often respond to resource scarcity by adapting their relationships with suppliers, little is known about whether the strength of the buyer–supplier relationship, defined by the frequency, intensity and duration of interaction (Capaldo, 2007), influences which strategy managers choose when facing different scarcity conditions.

Previous research has examined how firms respond to resource scarcity by adopting strategic responses grounded in Resource Dependence Theory (RDT), which argues that organizations are not self-sufficient but depend on external actors for critical resources (Pfeffer & Salancik, 1978). To manage this dependence, RDT suggests that firms adopt strategic responses. These responses are typically categorized into two types: buffering, which reduces dependency on external actors and bridging, which increases collaboration to manage this interdependence. Buffering strategies include supplier diversification and inventory building, while bridging strategies involve information sharing and joint risk management with the supplier (Bode et al., 2011; Kalaitzi et al., 2018). In addition, several studies have examined how internal capabilities, such as IT integration, may influence which strategy a firm adopts (Liu & Wei, 2024). Together, these studies provide an important foundation for understanding how firms manage risks associated with resource scarcity.

This thesis builds on these insights by examining how ERS and SU influence the adoption of either bridging or buffering strategies, and whether these effects are moderated by the strength of the relationship between the buyer and supplier. While previous studies have examined these constructs individually, the interaction effects between them have not yet been explored. This leads to the following research question:

RQ: How does perceived resource scarcity affect the strategic decision to bridge or buffer and how is this moderated by relationship strength?

This question requires empirical investigation and aims to offer new insight into how firms respond to perceived resource scarcity and make strategic decisions in the context of their existing supplier relationships.

This study contributes to the literature in multiple ways. First, it treats resource scarcity as a multidimensional construct by distinguishing between ERS and SU (Wiedmer & Whipple, 2022). The finding that only SU significantly affects firms' strategic responses, specifically by reducing collaborative behavior, indicates that the type of scarcity matters, and that future research should avoid treating scarcity as a uniform concept. Second, the study offers a behavioral insight into Resource Dependence Theory (Pfeffer & Salancik, 1978) by suggesting that, instead of taking action through bridging or buffering strategies, perceived resource scarcity, especially under high conditions of SU, may lead to inaction. This implies that firms might sometimes refrain from any strategic response at all when facing uncertainty. Third, the study tests whether relationship strength moderates the effect of perceived resource scarcity but finds no support for this influence. This finding suggests that relationship strength may not have the moderating role previously assumed in shaping firms' strategic responses.

2. LITERATURE BACKGROUND

2.1 Resource scarcity

Resource scarcity arises when the availability of critical inputs is inadequate to meet a given demand, placing pressure on firms to reassess their strategic and operational priorities (Bell et al., 2012). Multiple factors contribute to resource scarcity, including a fast-growing population, greater product consumption, environmental changes, market imperfections, and technological limitations. These drivers indicate that scarcity is not just a short-term disruption, but a long-term issue that firms need to strategically adapt to in order to ensure continuity of their operations. In supply chain management, the concept of resource scarcity has evolved to not only include tangible shortages, but also how managers perceive and interpret the risks associated with scarcity. Wiedmer and Whipple (2022) have proposed two dimensions of perceived scarcity: expected resource scarcity (ERS) and scarcity uncertainty (SU). ERS refers to the anticipation that a resource will become insufficient in the future. While SU is a form of environmental uncertainty that is shaped by "the predictability of conditions in an organization's environment" (Miles & Snow, 1978, as cited in Wiedmer & Whipple, 2022). SU encompasses several dimensions, including uncertainty about the severity, timing, and duration of a potential resource scarcity. Shah et al. (2012) examined the cognitive mechanisms that underlie perceptions such as ERS and SU by introducing the concept of how resource scarcity creates its own mindset, the scarcity mindset. Their research suggests that individuals who are exposed to scarcity tend to focus more on immediate challenges arising from this, while neglecting broader, more long-term considerations. When applied in an organizational setting, this mindset may cause managers to make more short-term and risk-averse decisions in response to resource scarcity, particularly under high levels of SU. Sterman et al. (2015) similarly highlight how stress, time pressure and cognitive limitations can influence planning and execution processes. Under such conditions, even typically beneficial practices such as information sharing may negatively impact coordination and resilience (Coşkun & Erturgut, 2023).

Despite these contributions, most empirical studies continue to treat resource scarcity as a single construct (e.g., Bode et al., 2011; Kalaitzi et al., 2018), overlooking important distinctions in how managers interpret and respond to different dimensions of scarcity. This simplification limits the understanding of how firms respond to varying forms of scarcity, such as anticipated

shortages or unpredictable disruptions. Further research is needed to examine how different forms of perceived resource scarcity influence strategic responses. This requires a better understanding of how firms typically manage resource dependence, which will be examined in more detail in the next section.

2.2 Bridging and Buffering

Bridging and buffering originate from the Resource Dependence Theory (RDT). This theory was introduced by Pfeffer and Salancik (1978) and examines how external factors influence organizational behavior. It states that organizations are not self-sufficient and rely on external actors to obtain critical resources, creating interdependence between the two parties. The degree of these dependencies emerges from three factors: the importance of the resource, the substitutability of the supplier, and the level of control a supplier holds over it (Summarized by Kalaitzi et al., 2018). Given these dependencies, organizations must develop strategies to mitigate the risks involved. The two most commonly used approaches for this are bridging and buffering. Buffering strategies are internally focused and try to shield the firm from environmental volatility by establishing safeguards. They reduce the firm's exposure to the supplier, in an attempt to mitigate the potential negative consequences that this relationship might induce (Bode et al., 2011). Common buffering practices include building safety stock, creating product designs that are not dependent on a specific supplier or resource, diversifying suppliers, and creating flexible production processes (Tang, 2006; Bode et al., 2011). On the other hand, bridging strategies aim to manage external interdependencies through collaboration and by increasing the firm's influence over the resource (Pfeffer & Salancik, 1978). These strategies include vertical integration, investments in collaborative structures, forming strategic partnerships, joint-risk management systems, and increased information sharing (Bode et al., 2011) .

Recent theoretical revisions to RDT have shifted the focus from viewing firms as passively constrained by external dependencies, to recognizing firms as active agents capable of shaping those dependencies themselves. Malatesta and Smith (2014) indicate this shift by showing that public organizations increasingly rely on collaboration, stakeholder engagement, and network governance to manage uncertainty when formal control is limited, highlighting that relational capabilities play a role in managing external dependencies. This perspective has opened the door to new research exploring how bridging and buffering are not just shaped by external conditions, but also by managerial perceptions and the internal capabilities of the firm. Wiedmer and Whipple (2022) explored how SU and ERS influence collaboration, an approach that is closely aligned with bridging. They found that SU significantly reduces collaborative intent, which might indicate that firms refrain from adopting bridging strategies under high levels of SU. In contrast, they found no consistent effect for ERS. These findings suggest that perceived scarcity plays a meaningful role in strategic decision-making. Oher research by Liu and Wei (2024) shows how internal capabilities reflect the adoption of bridging or buffering strategies. Firms with higher IT integration tend to favor bridging strategies, while those with strong reconfiguration capabilities lean towards adopting buffering strategies. These findings support the broader view that strategic responses are not just shaped by external conditions, but also by how firms interpret and manage their dependencies.

While bridging and buffering have been widely examined, there is limited research on how different types of resource scarcity might influence the adoption of either strategy. Furthermore, even though internal factors such as IT capabilities, have been explored, the strength of the relationship between the buyer and the supplier is rarely considered as a factor influencing strategic decision making under scarcity conditions. Since both buffering and bridging require interaction with suppliers, they are considered relational strategies. Therefore, the existing relationship between the firm and supplier might have a significant influence on which strategy a firm will adopt. The next section explores relationship strength and its potential moderating effect in more detail.

2.3 Relationship strength

Relationship strength in the context of organizations refers to the quality and closeness of the ties between two firms and is often conceptualized as a multidimensional construct (Hausman, 2001). Stronger ties are often associated with greater trust, information sharing, and collaborative responses to external pressure (Dyer & Singh, 1998). To operationalize the concept of relationship strength, Capaldo (2007) builds on Granovetter's (1973) definition of tie strength as a continuous variable that results from a combination of factors reflecting partner's behaviors in their relationships. He conceptualizes relationship strength as a three-dimensional construct, consisting of a temporal dimension, a social dimension, and a resource dimension. These dimensions are reflected in the extent to which firms exhibit longer timeframes, higher resource commitments, tighter interpersonal relations and trust-based interorganizational linkages. To capture and measure these dimensions empirically, Capaldo identifies three indicators: (1) the overall duration of the relationship; (2) the frequency of interaction; and (3) the intensity of the interaction. The more prominent these characteristics are, the higher the strength of the relationship. In this research only two of these factors will be used to determine the strength of the relationship between the buyer and supplier. The duration indicator was excluded due to data limitations, as discussed in the methodology section.

Recent literature highlights the importance of strong interorganizational ties in fostering collaboration. The relational benefits identified by Dyer and Singh (1998) are supported by Nyaga et al. (2010). They show that collaborative activities, such as information sharing, joint relationship effort, and dedicated investments lead to increased trust and commitment. Trust and commitment, in turn, lead to satisfaction and greater performance. These outcomes reflect the collaborative benefits of strong buyer–supplier ties, which may also make firms more inclined to adopt bridging strategies when facing resource scarcity. However, most of this literature focuses on collaboration as a driver of performance, rather than examining how relationship strength might influence strategic decision-making.

To address this gap, this study tests whether relationship strength moderates the effect of ERS and SU on the likelihood that firms adopt bridging or buffering strategies. While only two of Capaldo's indicators,

frequency and intensity, were included in this study, these still provide a valid indication of relationship strength.

3. HYPOTHESES

To answer the main research question of this thesis: "How does perceived resource scarcity affect the strategic decision to bridge or buffer and how is this moderated by relationship strength?" four hypotheses have been formulated.

3.1 The type of scarcity and its effect on bridging or buffering

When firms anticipate that one of their critical resources will become scarce in the future, they might take precautionary measures to mitigate their exposure to this risk. Prior research shows that buffering strategies allow firms to reduce their dependence on individual suppliers and help them to absorb environmental volatility (Bode et al, 2011). When the resource scarcity is predictable, as in the case of ERS firms have the opportunity to plan and execute these dependence reducing strategies in advance (Wiedmer & Whipple, 2022). SU, on the other hand, refers to a lack of clarity about the severity, duration and timing of the resource scarcity (Wiedmer & Whipple, 2022). Due to this uncertainty, managers tend to adopt risk-averse, internally focused strategies to regain control (Shah et al, 2012). Since buffering provides a way for firms to build autonomy and minimize dependence on suppliers, it is likely to be preferred in uncertain situations. This aligns with the logic of the Resource Dependence Theory (RDT), which suggests that firms seek to reduce their dependence on external actors when facing uncertainty (Pfeffer & Salancik, 1978). Therefore, we hypothesize:

H1a: Expected resource scarcity is positively associated with the likelihood that firms will adopt buffering strategies

H1b: Scarcity uncertainty is positively associated with the likelihood that firms will adopt buffering strategies

Bridging strategies involve collaboration and require time, relational investments, and trust (Pfeffer & Salancik, 1978; Bode et al., 2011). When firms anticipate a resource scarcity, ERS, they may hesitate to adopt bridging strategies due to concerns about supplier dependency or facing competition over limited supply. Even though expected scarcity provides visibility, this same predictability may enable firms to manage the challenge internally, making collaboration unnecessary (Wiedmer & Whipple, 2022). In the case of SU, the unpredictability of resource scarcity makes bridging strategies even riskier. Prior studies show that SU reduces collaborative intent and increases the likelihood of risk-averse and short-term decision making (Wiedmer & Whipple, 2022; Shah et al., 2012). In both cases, firms may prefer autonomy over bridging strategies that involve deeper engagement with the supplier. Therefore, we hypothesize:

H2a: Expected resource scarcity is negatively associated with the likelihood that firms will adopt bridging strategies

H2b: Scarcity uncertainty is negatively associated with the likelihood that firms will adopt bridging strategies.

3.2 The moderating effect of relationship strength

We previously hypothesized that ERS and SU would have a positive effect on the adoption of bridging strategies and a negative effect on the adoption of bridging strategies. However, the nature of the relationship between the buyer and the supplier may influence these responses. Relationship Strength, characterized by the frequency, intensity and duration of the interaction with the supplier (Capaldo, 2007), is associated with higher levels of trust, commitment and collaboration. Therefore, a strong relationship between the buyer and supplier provides firms with better access to information, shared risk management and improved communication channels (Dyer & Singh, 1998). These relational capabilities help firms manage external volatility more effectively, potentially reducing the perceived need to distance themselves from their supplier. When firms face ERS, those that have a strong relationship with their supplier may be less likely to adopt buffering strategies such as building safety stock or supplier diversification (Bode et al., 2011). The trust and stability that come with the strong relationship could reduce perceived vulnerability, allowing firms to rely on their supplier rather than creating distance. Similarly, under high SU conditions, a strong relationship allows for better information sharing and coordination mechanisms, which help the firm cope with the unpredictability without resorting to internally focused, risk-averse buffering strategies. We hypothesize the following:

H3a: Expected Resource Scarcity moderated by a strong relationship strength between the buyer and supplier, decreases the likelihood that a firm will adopt buffering strategies.

H3b: Scarcity Uncertainty moderated by a strong relationship strength between the buyer and supplier, decreases the likelihood that a firm will adopt buffering strategies.

At the same time, these relational benefits may make bridging strategies more attractive under resource scarcity. When experiencing ERS, strong relationships can encourage collaboration, shared planning, and joint problem-solving and risk-management, making bridging a more attractive option. Under SU, the same trust and coordination mechanisms may help firms manage uncertainty and maintain strategic alignment with their supplier. In both cases, relationship strength may reduce concerns about dependency on the supplier and encourage more collaborative strategic responses. Therefore, we hypothesize:

H4a: Expected Resource Scarcity moderated by a strong relationship strength between the buyer and supplier, increases the likelihood that a firm will adopt bridging strategies.

H4b: Scarcity Uncertainty moderated by a strong relationship strength between the buyer and supplier, increases the likelihood that a firm will adopt bridging strategies.

A conceptual model has been developed and can be found in Appendix D. The conceptual model with added coefficients can be found in Figure 2 in the results section.

4. METHODOLOGY

4.1 Sample and Data Collection

In this thesis, a quantitative survey was used to test the proposed hypotheses. This method was chosen because it allowed for efficient and structured data collection across a relatively large group of respondents (Saunders et al., 2023). Since all participants answered the same set of questions, the survey enabled the standardized measurement of subjective constructs such as SU, ERS, relationship strength and bridging and buffering strategies. Standardization was essential to allow for statistical comparisons and hypothesis testing. The survey was conducted through Qualtrics and was part of a group effort involving four students, each contributing their own individual questions related to their research questions. Even though the survey was shared, each member was responsible for their own questions and data processing. The target sample consisted of purchasing professionals who interact with suppliers at least once a week. The respondents were recruited through LinkedIn and personal networks. To participate in the survey, the respondents received an email with a personal link. A notion was added on the introduction page of the survey, stating that answers would not be disclosed to any third party and would be solely used for research purposes. In total, 74 responses were collected. However, due to partial completions and non-quantifiable open responses, the final dataset consisted of 45 completed surveys.

4.2 Respondent's profile

Table 1 provides an overview of the socio-demographic characteristics of the 45 respondents. Most of the participants were male (82,8%). The sample shows a relatively balanced distribution across the service sector (48.9%) and the manufacturing sector (51.1%). A detailed explanation of the sector classification used in the survey is provided in Appendix B. The most common age categories were 45-54 (35.6%) and 35-44 (24.4%). And a majority of the respondents (40,0%) had between 5-14 years of managerial experience.

Table 1 Socio-demographic characteristics of respondents (N=45)

	Frequency	Percentage
Gender		
Female	8	17.8%
Male	37	82.2%
Age		
Under 18	0	0.0%
18-24	2	4.4%
25-34	5	11.1%
35-44	11	24.4%
45-54	16	35.6%
55-65	11	24.4%
Over 65	0	0.0%
Sector		
Service	22	48.9%
Manufacturing	23	51.1%
Years of managerial experience		
0-4	11	24.4%
5-14	18	40.0%
15-24	7	15.6%
25-35	9	20.0%

Note: Percentages may not total 100% due to rounding.

4.3 Measures

The constructs in this study were operationalized using existing scales, measured on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The items used to measure the different constructs can be found in Table 2. The reliability of the constructs was assessed using Cronbach's alpha, following Nunally's (1978) rule of thumb, which states that the construct is reliable when $\alpha > 0.70$.

Expected Resource Scarcity (ERS) was measured using four items adapted from Wiedmer and Whipple (2022) This construct captures the degree to which buyers were able to anticipate the occurrence of the last resource scarcity they experienced. It reached a Cronbach's α of 0.69, which is slightly below the threshold of 0.70, but still acceptable for exploratory research with a sample size of N=45.

Scarcity Uncertainty (SU) was operationalized using three items, also based on Wiedmer and Whipple (2022). This construct captures the unpredictability of resource scarcity, specifically regarding the timing, severity, and duration of the scarcity event. Eventually all 3 items were reverse coded to resolve the issue that the original phrasing of the items reflected certainty rather than uncertainty. However, even after reverse coding, Cronbach's α was only 0.20, indicating low reliability. This could suggest potential interpretation bias or measurement noise. Therefore, it will be further discussed in the limitations section.

Relationship Strength (RS) was measured based on Capaldo's (2007) conceptualization, which includes the frequency, intensity, and duration of the relationship with the supplier. However, only the first two dimensions were retained. The open-ended question that measured the duration of the relationship was removed due to inconsistent and missing responses. Even though this deviates from the original theory, the other two dimensions still managed to capture the concept of relationship strength of the buyer-supplier relationship sufficiently, with an acceptable internal reliability of $\alpha = 0.77$.

The items used to measure *Bridging* and *Buffering* were adapted from Bode et al. (2011), grounded in the Resource Dependence Theory (Pfeffer & Salancik, 1978). Bridging refers to collaborative strategies such as joint problem solving or information exchange with the supplier, while buffering reflects protective actions like stockpiling or diversifying suppliers. Bridging was measured using four items ($\alpha = 0.84$) and buffering with three items ($\alpha = 0.83$). Both constructs showed strong internal reliability.

Table 2 Measurement items

Variable	
Expected Resource Scarcity	
ERS_1	I found the previous resource scarcity in my supply chain to be unexpected
ERS_2	I expected the previous resource scarcity to negatively affect my company.
ERS_3	I anticipated that our operations would be disrupted.
ERS_4	I anticipated that we would not be able to perform our operations as initially planned.
Scarcity Uncertainty	
SU_1	I was confident in how severely the resource scarcity would have an impact on my company.
SU_2	I could accurately estimate the duration of the potential resource scarcity for our business.
SU_3	Reliable information was available about the time when the scarcity issue would affect our business.
Relationship strength	
RS_1	Prior to the resource scarcity, my firm engaged frequently with this supplier.
RS_2	Prior to the resource scarcity, the interaction with this supplier could be described as intensive.
RS_3	How long has there been an established relationship between your firm and the same supplier considered in the previous three statements?
Bridging	
BR_1	After the resource scarcity occurred, my firm established a closer relationship with this supplier in order to collaborate better, in case such a resource scarcity occurs again.
BR_2	After the resource scarcity occurred, my firm improved information exchange with this supplier.
BR_3	After the resource scarcity occurred, my firm engaged in risk management activities with this supplier
BR_4	After the resource scarcity occurred, my firm cooperated more intensely with this supplier
Buffering	
BU_1	After the resource scarcity occurred, my firm made itself more independent of the supplier or the purchased item.
BU_2	After the resource scarcity occurred, my firm increased its protective barriers against disturbances in the supply of the purchased item.
BU_3	After the resource scarcity occurred, my firm searched or developed one or more alternative supplier(s) for the purchased item.

4.3.1 Control variables

To control for other effects than that of the independent variables, four control variables were included in the analysis: age, gender, managerial experience, and industry sector. Age and experience were included to account for any differences in managerial decision making. These differences might arise due to generational perspectives or different levels of work experience. Both of these variables were measured as continuous variables. The third variable that was accounted for was industry sector, we distinguish between product and service-oriented firms. This variable was relevant since the nature of the operations may vary across these sectors, which could influence the way firms manage their supplier relationships. Gender was added as the last control variable. Both sector and gender were coded as dummy variables, with service coded as 1 for sector, and male respondents coded as 1 for gender. The survey items used to measure these control variables are presented in Appendix A and were the same for all 4 students contributing to the survey.

Table 3 Construct Overview: Reliability, and Sources

Construct	Cronbach's α	Source	Notes
ERS	.694	Wiedmer & Whipple (2022)	—
SU	.204	Wiedmer & Whipple (2022)	All items reversed
RS	.768	Capaldo (2007)	RS_3 duration dropped
Buffering	.832	Bode et al. (2011)	—
Bridging	.838	Bode et al. (2011)	—

4.4 Data analysis

The data gathered from the survey was analyzed in RStudio. After cleaning and recoding the data set, the variables for ERS, SU and Relationship Strength were mean centered to be able to interpret the interaction effects and reduce multicollinearity. After this, three regression models were created for each dependent variable (Bridging and Buffering). Model 1 included only the control variables. Model 2 added the main effects of ERS, SU and Relationship Strength. Model 3 extended this model by including the interaction terms between ERS and Relationship Strength, and between SU and Relationship Strength. To test for multicollinearity, Variance Inflation Factors (VIFs) were calculated. The fit of the model was assesses using adjusted R^2 and F-statistics. The reliability of the coefficients was evaluated by comparing each coefficient to its corresponding standard error.

5. RESULTS

5.1 Descriptive Statistics and correlations

Table 4 shows the means, standard deviations and Pearson correlation coefficients for all main variables. SU has a significant negative correlation with both Buffering ($r = –.314$, $p < .05$) and Bridging ($r = –.390$, $p < .05$), suggesting that greater uncertainty reduces the likelihood of engaging in either strategic response. No other significant correlations were observed between the independent and

dependent variables. Among the control variables, age and experience were strongly correlated ($r = .613$, $p < .05$), but neither showed a significant relationship with the dependent variables

Table 4 Correlation Matrix

Variable	M	SD	1	2	3	4	5	6	7
1. Expected Resource Scarcity	4.44	1.09	—						
2. Scarcity Uncertainty	3.91	0.94	-0.154	—					
3. Relationship Strength	5.34	1.27	0.098	-0.06	—				
4. Buffering	4.84	1.44	0.071	-0.314*	-0.102	—			
5. Bridging	4.57	1.19	0.025	-0.39*	0.143	0.198	—		
6. Age	45.82	10.96	-0.421*	0.202	-0.092	-0.061	-0.034	—	
7. Experience	12.56	9.72	-0.257	0.081	-0.133	-0.122	0.096	0.613*	—

5.2 Multicollinearity test

To test for multicollinearity, Variance Inflation Factor (VIF) scores were calculated for all predictors included in the final regression models. As shown in Table 5, all VIF values were below the threshold of 2. The highest VIF score was 1.90 for age, and all other predictors ranged somewhere between 1.08 and 1.82. These results indicate that multicollinearity is not a concern in this dataset.

Table 5 Variance Inflation Factors (VIF) for Model 3 predictors (N=45)

Predictor	VIF
ERS	1.35
SU	1.08
RS	1.09
ERS x RS	1.32
SU x RS	1.22
Age	1.90
Gender (male = 1)	1.10
Experience	1.82
Sector (service = 1)	1.27

5.3 Regression Analysis

To test the hypotheses, a regression analysis for each dependent variable was conducted, one for Buffering and one for Bridging. Three models were created for each dependent variable. Model 1 included only the control variables, Model 2 introduced the independent variables and Model 3 added the interaction terms to test the moderation effects. Table 5 presents the OLS regression results for Buffering and Bridging. Coefficients and standard errors are based on the final models (Model 3). For Buffering, the results showed that there was no significant main effect for ERS. The coefficient was positive as hypothesized ($\beta = .06$), however it was not statistically significant ($p = .823$). Therefore, H1a is not supported. H1b proposed that SU would positively affect the adoption of Buffering strategies and even though the results in Model 2 were significant ($\beta = –0.45$, $p = .048$), this did not apply for Model 3. These results showed a negative coefficient ($\beta = –.44$) and an only marginally significant effect ($p = .066$). This exceeds $p < 0.05$, but might suggest a possibly meaningful relationship in the opposite direction than the one hypothesized. As for the results regarding Bridging, hypothesis H2a predicted a negative relationship between ERS and Bridging. The results did not support this hypothesis, the coefficient was close to zero ($\beta = –.04$) and the p-value ($p = .866$) exceeded the threshold of ($p < .05$). In contrast H2b, which proposed that SU had a negative effect on Bridging, was supported. The coefficient was negative and statistically significant ($\beta = –0.46$, $p = .018$). Hypothesis H2b was the only hypothesis that received full statistical support. Figure 1 shows the plot of H2b. The plot depicts predicted Bridging values across standardized SU scores, with 95% confidence intervals. The plots of the remaining hypotheses can be found in Appendix C. After testing the main effects, the moderating role of Relationship Strength was examined through interaction terms. H3a proposed that a strong relationship with the supplier would weaken the positive effect of ERS on Buffering. The results showed a negative coefficient ($\beta = –0.16$), but no statistical significance ($p = .650$), therefore H3a was rejected. H3b expected a negative moderating effect of RS on the relationship between SU and Buffering. The coefficient was negative ($\beta = -.08$) and the results were not significant ($p = .736$), leading to the rejection of H3b. For Bridging the results were also not supportive of the proposed moderating effects. H4a suggested that RS would positively moderate the effect between ERS and the adoption of Bridging strategies. However, the coefficient was close to zero and not significant ($\beta = –0.02$, $p = .956$). Hypothesis 4b expected RS to have a positive influence on the effect of SU on the adoption of Bridging strategies but was also rejected based on non-significance ($\beta = 0.01$, $p = .967$). To summarize the tested model, Figure 2 presents the conceptual model with standardized regression

coefficients from Model 3. This model for both Buffering and Bridging explained only a small portion of the variance (Adjusted R^2 = –0.039 and 0.019, respectively), which suggests that the overall explanatory power of the models is limited. Altogether, only H2b was fully supported. H1b showed marginal significance (p = .066) in the opposite direction than hypothesized and all other hypotheses were not statistically significant

Table 6 OLS Regression Results for Buffering and Bridging.

	Buffering			Bridging		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Intercept	4.885	4.409	4.424	5.465	5.099	5.109
	(1.148)	(1.215)	(1.254)	(0.953)	(0.973)	(1.007)
	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Age	0.004	0.015	0.015	-0.019	-0.010	-0.010
	(0.026)	(0.027)	(0.028)	(0.021)	(0.022)	(0.022)
	(0.866)	(0.576)	(0.586)	(0.390)	(0.655)	(0.661)
Gender-male	0.226	0.285	0.304	-0.484	-0.551	-0.552
	(0.593)	(0.582)	(0.599)	(0.492)	(0.466)	(0.481)
	(0.706)	(0.628)	(0.615)	(0.331)	(0.245)	(0.259)
Experience	-0.011	-0.018	-0.018	0.028	0.026	0.026
	(0.030)	(0.030)	(0.031)	(0.025)	(0.024)	(0.025)
	(0.730)	(0.553)	(0.565)	(0.281)	(0.288)	(0.302)
Sector-service	-0.615	-0.575	-0.620	0.005	0.088	0.085
	(0.479)	(0.473)	(0.493)	(0.398)	(0.378)	(0.396)
	(0.207)	(0.232)	(0.218)	(0.991)	(0.817)	(0.832)
ERS		0.022	0.058		-0.037	-0.035
		(0.241)	(0.257)		(0.193)	(0.207)
		(0.927)	(0.823)		(0.849)	(0.866)
SU		**-0.454**	-0.436		**-0.462**	**-0.460**
		(0.222)	(0.230)		**(0.178)**	**(0.185)**
		(0.048)	(0.066)		**(0.013)**	**(0.018)**
RS		-0.219	-0.237		0.191	**0.192**
		(0.220)	(0.230)		(0.176)	(0.185)
		(0.326)	(0.310)		(0.284)	(0.306)
ERS x RS			-0.160			-0.016
			(0.350)			(0.281)
			(0.650)			(0.956)
SU × RS			-0.084			0.008
			(0.247)			(0.198)
			(0.736)			(0.967)
R^2	0.055	0.168	0.174	0.047	0.219	0.219
Adjusted R^2	-0.040	0.011	-0.039	-0.049	0.072	0.019
F-statistic	0.577	1.068	0.818	0.490	1.484	1.093

N=45. Standard errors and p-values are in parentheses, respectively. *S*tatistically significant coefficients (p < .05) are shown in bold

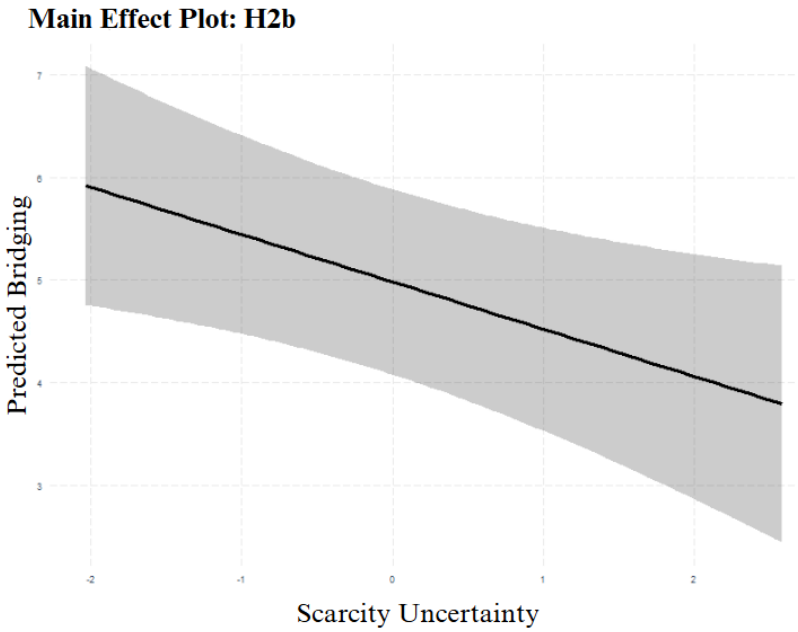


Figure 1 The effect of Scarcity Uncertainty on Bridging (H2b)

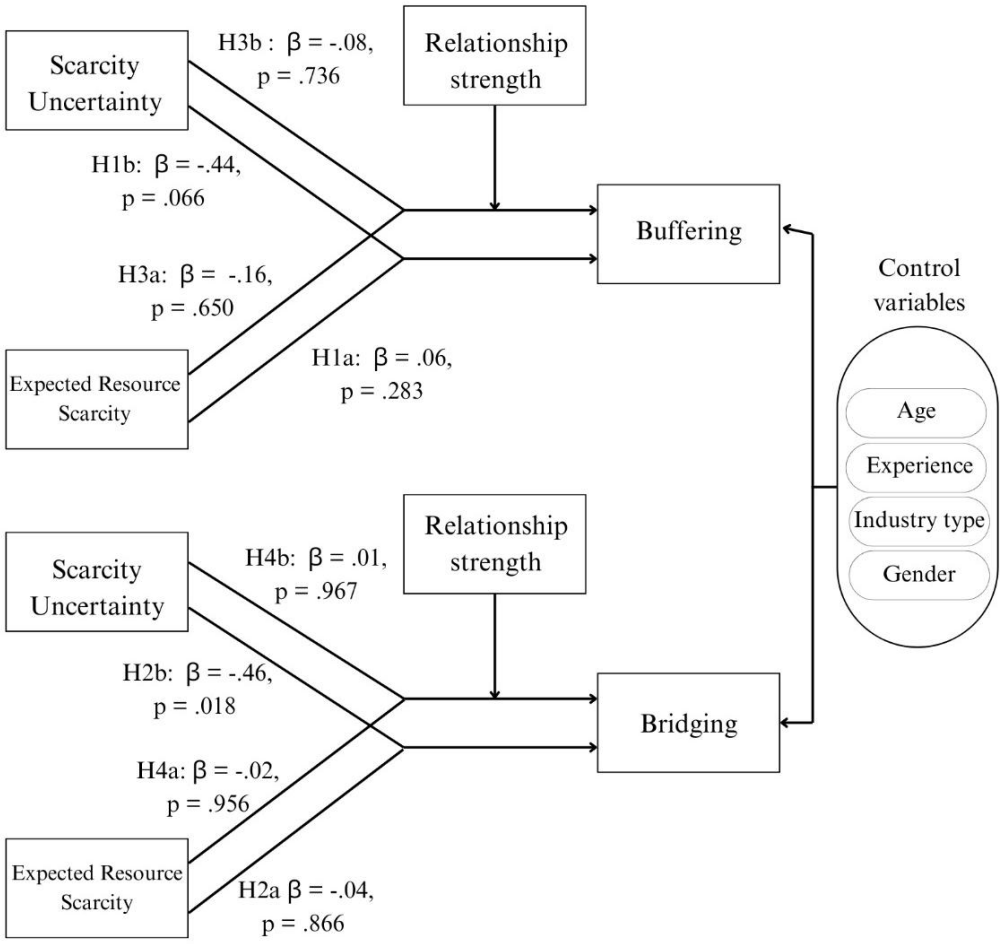


Figure 2 Conceptual model with standardized regression coefficients (Model 3)

6. DISCUSSION

This thesis examined how firms respond to different dimensions of resource scarcity by adopting either bridging or buffering strategies, and whether these responses are influenced by the strength of the relationship between the buyer and the supplier. The study is grounded in the Resource Dependence Theory (RDT), which explains how organizations manage external dependencies (Pfeffer & Salancik, 1978). To examine these strategic responses, the study introduced two distinct dimensions of perceived resource scarcity, ERS and SU (Wiedmer & Whipple, 2022). While previous research has explored bridging and buffering as general responses to scarcity (Bode et al., 2011; Kalaitzi et al., 2018), it has typically treated scarcity as a single construct, overlooking how different perceptions of scarcity may lead to different strategic responses. Furthermore, while previous studies have examined relational factors such as trust or collaborative intent (e.g., Dyer & Singh, 1998; Wiedmer & Whipple, 2022), few have operationalized relationship strength as a multidimensional construct (Capaldo, 2007) to test its role as a moderator in how firms make decisions under conditions of resource scarcity. This study addresses these two gaps by explicitly distinguishing between ERS and SU and by introducing relationship strength as a moderating variable in a firm's strategic decision to bridge or buffer.

The empirical results of the study show that one hypothesis received full support: H2b, this hypothesis proposed that SU negatively affects the adoption of bridging strategies. This suggests that when managers are uncertain about the severity, duration and timing of a resource scarcity, they are less likely to engage in collaborative actions such as information sharing and joint risk management activities (Bode et al., 2011). In contrast, H1b, which predicted a positive effect of SU on buffering, showed a marginally significant effect in the opposite direction ($p = 0.066$). All hypotheses related to ERS (H1a and H2a) and all hypotheses related to the moderating effect of relationship strength (H3a-H4b) were not supported. These findings highlight the relevance of distinguishing between different forms of resource scarcity and suggest that this distinction has a meaningful effect on the strategic responses of firms. The study also finds that relationship strength has no significant effect in the decision to bridge or buffer when dealing with resource scarcity.

Overall, the results indicate that SU drives disengagement from suppliers in the form of reduced adoption of bridging strategies. Under conditions of ERS, firms do not show a clear preference for either buffering or bridging. Contrary to theoretical expectations, strong buyer supplier relationships do not push firms to greater engagement in bridging activities and appear to have no moderating effect on firm's strategic response to resource scarcity.

6.1 Implications for literature

This study contributes to the supply chain management and resource scarcity literature by showing that not all forms of resource scarcity lead to the same behavioral response, indicating that the type of scarcity matters. Whereas prior studies have often conceptualized resource scarcity as a single construct (Bode et al., 2011; Kalaitzi et al., 2018), this study introduces and empirically tests a distinction between ERS and SU, two dimensions of scarcity that have been introduced by Wiedmer and Whipple (2022). The finding that only SU significantly influences the strategic response of the firm, specifically by reducing bridging behavior, is consistent with earlier theoretical claims by them. This insight helps refine how resource scarcity is conceptualized in the supply chain literature by showing that its dimensions matter. Future academic research could build on this distinction by considering the different influences of ERS and SU. Such research could establish a more detailed understanding of how firms navigate different types of scarcity, which may offer better managerial insight in difficult situations.

This study also contributes to RDT (Pfeffer & Salancik, 1978) by demonstrating that different forms of perceived resource scarcity shape strategic responses in different ways. RDT assumes that firms respond to resource scarcity by adopting bridging or buffering strategies aimed at managing their external dependencies. However, this study found that under conditions of high SU, firms decrease the implementation of bridging strategies, without increasing buffering strategies. This suggests that high uncertainty may lead to inaction instead of a strategic response as RDT would predict. The finding aligns with behavioral research by Shah et al. (2012), who show that scarcity narrows attention to immediate concerns, often at the expense of long-term planning. This may help explain why managers refrain from engaging in collaborative strategies with their suppliers under high levels of SU.

The last contribution is to the literature on buyer-supplier relationships by examining whether the strength of the relationship between the buyer and supplier moderates the firm's strategic response to different types of perceived resource scarcity. While prior studies suggested that strong relationships enhance coordination and information sharing during disruptions (Dyer & Singh, 1998), this study has not found any of those effects. Relationship strength, operationalized as the frequency and intensity of interaction (Capaldo, 2007), did not influence the adoption of bridging or buffering strategies under either ERS or SU. This suggests that effectiveness of relationship strength in shaping strategic decisions might be limited.

6.2 managerial implications

The findings of this study offer several practical insights for purchasing professionals managing supplier relationships when facing resource scarcity. First, the distinction between ERS and SU is relevant for decision making. Managers should be aware that the uncertainty surrounding the resource scarcity, rather than the awareness of when the scarcity will occur, is what triggers the disengagement from suppliers. This finding suggests that firms might unconsciously reduce collaborative efforts such as information sharing when the resource scarcity is perceived as uncertain. It is important that managers are aware of this, since reduced engagement with the supplier can limit the ability to co-develop solutions or share risks in these uncertain periods.

Second, the finding that ERS did not have any effect on bridging or buffering behavior, may indicate that some purchasing departments are underreacting to early warning signals of resource scarcity. This result should encourage managers to review if forecasts of resource scarcity are translated into proactive strategies or if these risks are being ignored due to the perceived lack of urgency caused by the predictability of the resource scarcity. Strengthening preventative strategies may help

reduce the uncertainty that such disruptions eventually cause.

Lastly, the absence of the moderating effect of relationship strength indicates that even well-established supplier relationships may not be sufficient to influence strategic responses under resource scarcity. Managers should not assume that a strong relationship with a supplier will automatically result in action. While strong relationships can foster trust and communication under normal conditions (Dyer & Singh, 1998), they may not be enough when firms face high levels of SU. It is therefore important to complement relational efforts with additional capabilities to ensure that the firm can effectively respond when resource scarcity occurs.

6.3 Limitations and further research

While this study offers relevant theoretical and managerial insights, several limitations should be considered when interpreting its findings. First, the use of survey data introduces the risk of interpretation bias, especially for abstract constructs such as SU and relationship strength. Despite the use of validated items, reversed questions may have caused confusion among respondents, which could help explain the low internal consistency of the SU scale (Cronbach's $\alpha = 0.20$). However, this may also be due to the construct capturing multiple distinct aspects of SU, specifically uncertainty about the duration, timing and severity of the scarcity. There was also a significant effect for H1b in Model 2. Even though this disappeared in Model 3, the p-value was still relatively low. Therefore, it might be worth investigating if there is a significant effect between buffering and SU when using a bigger sample size. Additionally, one item measuring relationship strength (relationship duration) was removed This item was open-ended and often received vague responses such as "many decades" or "several years," or was left unanswered. Because these responses could not be reliably coded and removing them would have significantly reduced the sample size, the item was excluded. While this decision preserved statistical power, it reduced the theoretical completeness of the relationship strength construct. Another limitation of the construct relationship strength is that it did not include other important relational dynamics such as trust, mutual commitment or shared norms. Further research could attempt to include a better operationalization of relationship duration or explore how alternative conceptualizations of relationship strength might create a different effect.

To build on these findings, future research could further investigate how different internal organizational capabilities could have an influence on whether firms choose to bridge or buffer under conditions of ERS and SU Similarly, more research could be conducted on the effect of behavioral factors, such as risk perception in shaping firms' strategic responses. Through examining both organizational and psychological drivers some of the variance in the behavior of firms that face similar scarcity conditions and supplier relationships could be explained. This would strengthen the existing theoretical understanding of how firms strategically respond to resource scarcity.

Lastly, an exciting opportunity for research lies in the implementation of AI in supply chain management. A recent article by Roman et al. (2025) demonstrates how digital twins can improve supply chain resilience. Digital twins are real-time virtual replicas of physical systems that integrate data from IoT sensors, enterprise systems, and AI simulations. They allow firms to forecast disruptions and potentially simulate the effects of resource scarcity, supporting more informed and proactive strategic decision-making. Future research could explore how such technologies influence managerial responses to scarcity conditions. In particular, digital twins may, due to their forecasting abilities, offer new insights into how ERS affects strategic decision making. A promising research question could be: "How does the use of digital twins to forecast resource scarcity impact managerial decision making under uncertainty?"

7. REFERENCES

Bell, J. E., Autry, C. W., Mollenkopf, D. A., & Thornton, L. M. (2012). A natural resource scarcity typology: Theoretical foundations and strategic implications for supply chain management [Article]. *Journal of Business Logistics*, *33*(2), 158-166.

Bode, C. W., S. M., Petersen, K. J., & Ellram, L. M. (2011). Understanding responses to supply chain disruptions: insights from information processing and resource dependence perspectives. *Academy of Management Journal*, *54*, 833–856.

Capaldo, A. (2007). Network structure and innovation: The leveraging of a dual network as a distinctive relational capability. *Strategic Management Journal*, *28*(6), 585-608.

Coşkun, A., & Erturgut, R. (2023). How Do Uncertainties Affect Supply-Chain Resilience? The Moderating Role of Information Sharing for Sustainable Supply-Chain Management. *Sustainability*, *16*, 131.

Dyer, Jeffrey & Singh, Harbir. (1998). The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage. The Academy of Management Review. 23. 10.2307/259056.

Hausman, A. (2001). Variations in relationship strength and its impact on performance and satisfaction in business relationships. *Journal of Business & Industrial Marketing*, *16*(7), 600-616.

Kalaitzi, D., Matopoulos, A., Bourlakis, M., & Tate, W. (2018). Supply chain strategies in an era of natural resource scarcity. *International Journal of Operations & Production Management*, *38*(3), 784-809.

Liu, H., & Wei, S. (2024). Bridging versus buffering: how IT capabilities and dependence advantage shape responses to supply chain disruptions? *Industrial Management & Data Systems*, *124*(5), 1795-1822.

Malatesta, D. and Smith, C.R. (2014), Lessons from Resource Dependence Theory for Contemporary Public and Nonprofit Management. Public Admin Rev, 74: 14-25.

Nunnally, J. C. (1978). Psychometric Theory: McGraw-Hill series in psychology (2nd ed.). McGraw-Hill.

Nyaga, G.N., Whipple, J.M. and Lynch, D.F. (2010), Examining supply chain relationships: Do buyer and supplier perspectives on collaborative relationships differ? Journal of Operations Management, 28: 101-114.

Passenier, A., & Lak, M. (2009). Scarcity and Transition-Research Questions for Future Policy, Ministry of Housing, Spatial Planning and the Environment and Ministry of Foreign Affairs, The Hague.

Pfeffer, J., & Salancik, G. R. (1978). he External Control of Organizations: A Resource Dependence Perspective. *Harper & Row, New York, NY*.

Pfeffer, J., & Salancik, G. R. (2003). The External Control of Organizations: A Resource Dependence Perspective. *Stanford University Press, Stanford, CA.*

Roman, E.-A., Stere, A.-S., Roșca, E., Radu, A.-V., Codroiu, D., & Anamaria, I. (2025). State of the Art of Digital Twins in Improving Supply Chain Resilience. *Logistics*, *9*(1), 22.

Saunders, M., Lewis, P., & Thornhill, A. (2023). *Research Methods for Business Students* (9th ed.).

Scott, W. R., & Davis, G. F. (2015). *Organizations and organizing: Rational, natural and open systems perspectives* [Book].

Shah, A. K., Mullainathan, S., & Shafir, E. (2012). Some consequences of having too little. *Science*, 338, 682–685. ste

Sterman, J., Oliva, R., Linderman, K. and Bendoly, E. (2015), System dynamics perspectives and modeling opportunities for research in operations management. Journal of Operations Management, 39-40: 1-5.

Tang, C. S. (2006). Perspectives in supply chain risk management. *International Journal of Production Economics*, *103*(2), 451-488.

Whipple, J. M., Lynch, D. F., & Nyaga, G. N. (2010). A buyer's perspective on collaborative versus transactional relationships. *Industrial Marketing Management*, *39*(3), 507-518.

Wiedmer, R., & Whipple, J. M. (2022). Perceptions of Resource Scarcity in Factor Markets: The Effect on Managerial Attention and Collaboration [Article]. *Journal of Business Logistics*, *43*(4), 421-447.

Li, X., et al. (2022). "Enduring buyer–supplier relationship and buyer performance: the mediating role of buyer–supplier dyadic embeddedness and supplier external embeddedness." European Journal of Management Studies 27(3): 291-316.

APPENDIX
Appendix A: Measurement items including control variables

Variable	Source
Independent variables	
Expected Resource Scarcity	
ERS_1 I found the previous resource scarcity in my supply chain to be unexpected	Adapted from Wiedmer & Whipple (2022)
ERS_2 I expected the previous resource scarcity to negatively affect my company.	
ERS_3 I anticipated that our operations would be disrupted.	
ERS_4 I anticipated that we would not be able to perform our operations as initially planned.	
Scarcity Uncertainty	Adapted from Wiedmer & Whipple (2022)
SU_1 I was confident in how severely the resource scarcity would have an impact on my company.	Wiedmer & Whipple (2022), adapted from Ashill and Jobber, 2010)
SU_2 I could accurately estimate the duration of the potential resource scarcity for our business.	
SU_3 Reliable information was available about the time when the scarcity issue would affect our business.	
Relationship strength	
RS_1 Prior to the resource scarcity, my firm engaged frequently with this supplier.	Exploratory
RS_2 Prior to the resource scarcity, the interaction with this supplier could be described as intensive.	
RS_3 How long has there been an established relationship between your firm and the same supplier considered in the previous three statements?	
Dependent variables	
Bridging	
BR_1 After the resource scarcity occurred, my firm established a closer relationship with this supplier in order to collaborate better, in case such a resource scarcity occurs again.	
BR_2 After the resource scarcity occurred, my firm improved information exchange with this supplier.	Bode et al. (2011)
BR_3 After the resource scarcity occurred, my firm engaged in risk management activities with this supplier	
BR_4 After the resource scarcity occurred, my firm cooperated more intensely with this supplier	
Buffering	
BU_1 After the resource scarcity occurred, my firm made itself more independent of the supplier or the purchased item.	
BU_2 After the resource scarcity occurred, my firm increased its protective barriers against disturbances in the supply of the purchased item.	Bode et al. (2011)
BU_3 After the resource scarcity occurred, my firm searched or developed one or more alternative supplier(s) for the purchased item.	
Control variables	
Age	
What is your age?	
Gender	
What is your gender?	
Experience	

How many years of experience do you have in a managerial role?

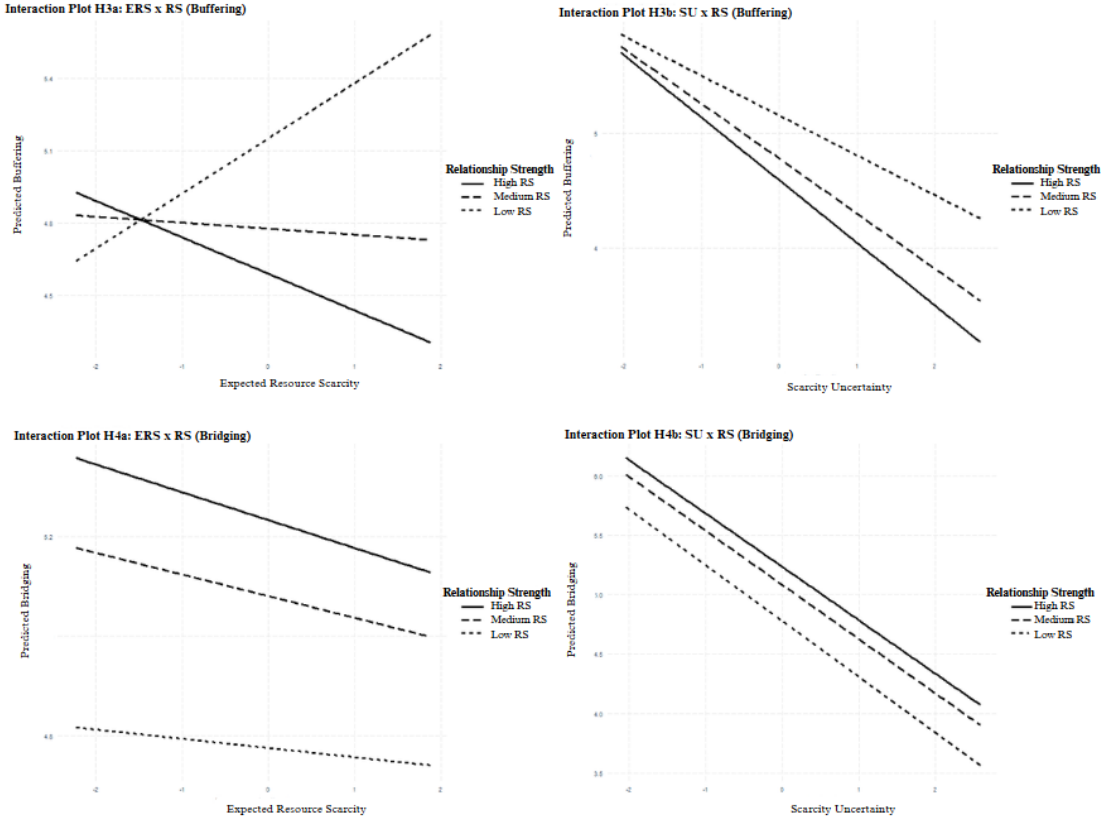
Industry sector

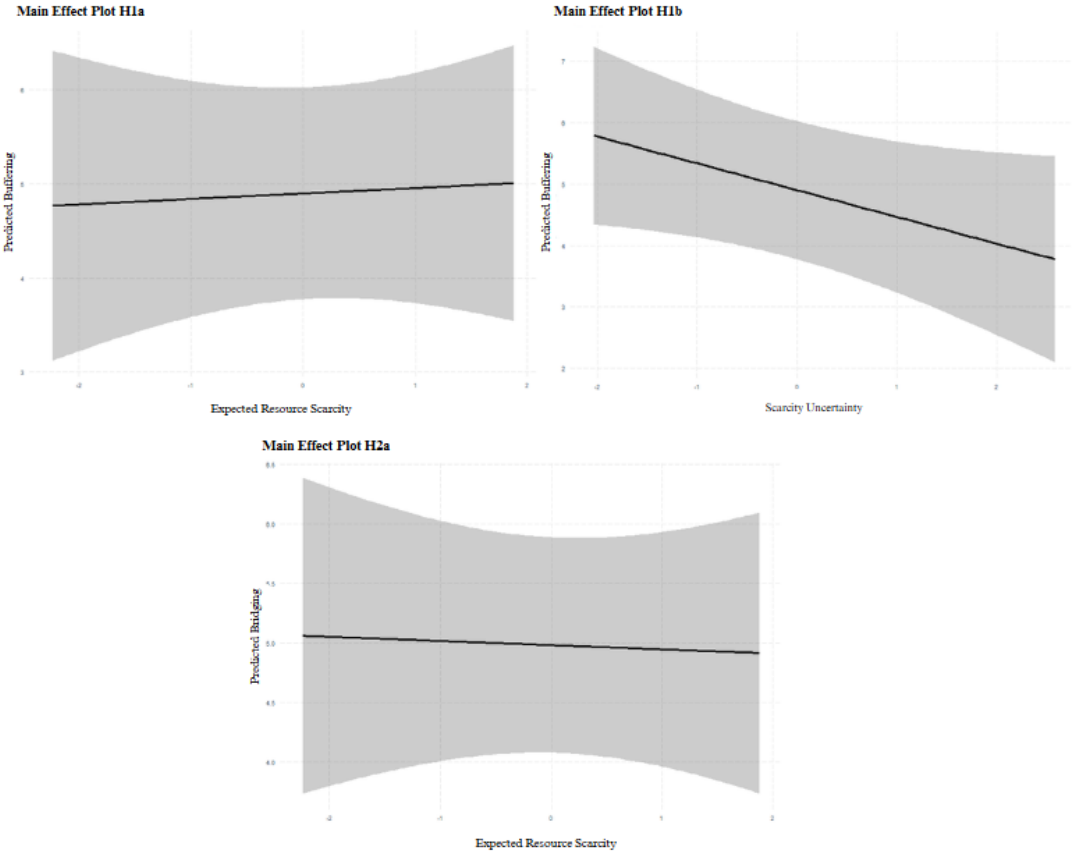
In which sector does your organization primarily operate? (e.g., manufacturing, healthcare, education, logistics, public sector, etc.)

Appendix B: categorization of manufacturing and service

Manufacturing	- Manufacturing - Construction - Agriculture/food industry - Technology (production) - Pharmaceutical industry (production)
Service	- Logistics - Consultancy - Public sector - Energy public sector - Banking/financial - Retail - Healthcare - Education - ICT - Telecom - Hospitality/tourism - Transportation
	-

Appendix C: Interaction plots and main effect plots





Appendix D: Conceptual model before adding coefficients