

The effect of buyer spend and switching costs on attribution of failure to suppliers

Katri Kauppi, Aalto University School of Business, FINLAND, Corresponding author
Address: Aalto University School of Business. PO Box 21210. FI-00076 AALTO
FINLAND, email: katri.kauppi@aalto.fi

Reza Movarrei, Aalto University School of Business, Finland

Alistair Brandon-Jones, University of Bath, School of Management, United Kingdom

Erik Van Raaij, Erasmus School of Health Policy and Management, Erasmus University,
Netherlands

Juri Matinheikki, Aalto University School of Business, FINLAND

The effect of buyer spend and switching costs on attribution of failure to suppliers

In buyer-supplier relationships, pinpointing blame for failures and deciding whether to continue the relationship post-failure is crucial. An unbiased buyer should determine the extent to which a failure results from self-serving behavior of supplier, inefficient interactions, or their own actions purely based on facts. However, we argue that strategic importance based on share in buyer's total spend and switching costs based on availability of alternative suppliers can bias these judgements. Through two experiments with 642 supply chain professionals, we find that failure attribution to a strategically important (vs. unimportant) supplier is less likely, and the bias is stronger for less costly failures. Moreover, the bias is stronger when the buyer knows that failure attribution to the supplier will definitely lead to contract termination. This tendency to avoid blaming the supplier despite supporting evidence when the corresponding corrective action is costly presents a harmful cognitive bias impacting buyer-supplier relationships.

Keywords: Supply failure, attribution, purchasing portfolio, switching costs, experiment

Word count: 6985

1. Introduction

Dependence and power are fundamental and impactful characteristics in buyer-supplier relationships (Brito and Miguel, 2017; Pfeffer and Salancik, 1978; Schwieterman *et al.*, 2020). The purchasing portfolio model as introduced by Kraljic (1983), suggests these aspects should be considered in how buyer-supplier relationships are managed. In the portfolio, the categorization of spend is based on purchasing importance and market complexity (Kraljic, 1983). These essentially imply the degree of dependence and power between the buyer and the supplier. Resources that are important to the other party, heavily concentrated or both give power (Pfeffer and Salancik, 1978).

There is extensive literature *advising* buyers how to manage suppliers based on their position in the portfolio – exploit, balance, diversity (Kraljic, 1983; Caniëls and Gelderman, 2005). Yet very little research has analyzed *actual* buyer behavioral differences against suppliers in different portfolio positions (Li *et al.*, 2022). Brito and Miguel (2017) for example suggest that most previous literature does not consider buyer-supplier relationship power asymmetry in decisions about relationship continuity. Yet Baliga *et al.* (2021) argue that reactions to failure depend on switching costs and availability of alternatives, which differ across categories of the purchasing portfolio. Extant literature (e.g., Handley and Benton, 2012; Miller and Ross, 1975) has assumed that failure attribution by the buyer (the most studied case) as well as by the supplier would be self-serving in a specific way: blaming the other party as strongly as possible while blaming self as weakly as possible. This is because, supposedly, purchasing managers consider the immediate interests of the buyer organization, which are to avoid any responsibility in compensating for the failure. Self-attribution of the failure would entail accepting at least some – including monetary – responsibility for it. But taking into account what purchasing portfolios advice, purchasing managers may not be considering only the short-term impacts of their failure attributions, but also the long-term impacts such as supplier switching. Interestingly, while the former is a well-studied topic within the supply chain management domain (e.g., Wang *et al.*, 2022), the latter (despite its potential impact to significantly affect industrial purchasing behavior) has received little attention.

We assume purchasing managers to be aware of the consequences of their failure attributions across their portfolio of suppliers, especially the increased likelihood of switching to a substitute supplier in case of attributing a failure to a particular supplier. Therefore, we expect to see a bias in such attributions in order to save the organization from the trouble of switching suppliers. Such a tendency to blame the supplier *less* seriously is likely in cases where such switching is challenging and costly, regardless of the specific failure case and performance of the specific supplier. Therefore, we examine the following research questions:

RQ1a. Do buyers' failure attribution decisions depend on the strategic importance of the supplier in question?

RQ1b. Does this bias exist also for important (large) failures?

(RQ2) If failure attribution to the supplier directly leads to contract termination, would this intensify the bias studied in the first research question?

In RQ1, the strategic importance of the supplier is a proxy for the switching costs, and the size of the failure (RQ2) changes the balance between the total costs of ignoring an important incompetency and costs of switching to a substitute supplier. In RQ3 we study whether giving leverage to buyers' attribution of failure would intensify their biases. We attended to these research questions by conducting two vignette-based behavioral experiments

with a total sample size of 642 participants, all with a professional background in procurement and supply chain management.

These questions are highly relevant to practitioners as well as academics because information asymmetry always leaves room for maneuvering on either side of the relationship. Failure attribution biases hinder the risk management efforts of the buyers. On the other hand, knowledge of these biases may help suppliers spot where they might be judged more harshly and thus may lose a critical customer more easily. This is for example the case when the supplier does not have strategic importance for the buyer, but the buyer has such importance for the supplier.

2. Theoretical Background

Buyer-supplier relationship characteristics

The key idea behind the purchasing portfolio is that buyer-supplier relationships need to be managed in a differentiated manner based on their characteristics, minimizing risk and maximizing the use of power (Gelderman and Van Weele, 2005; Montgomery *et al.*, 2018). There is a lot of literature building on the Kraljic (1983) portfolio model (see e.g., Gelderman and Van Weele, 2003 & 2005), and similar models with slight variations have been introduced by other authors as well (see e.g., Lilliecreutz and Ydreskog, 1999; Olsen and Ellram, 1997). The two axes of the purchasing portfolio as categorized by Kraljic (1983), and many of the fairly similar portfolio variations, usually reflect 1) profit impact of the item, and hence the supplier and 2) supply risk, which consist of issues related to item complexity and availability of alternatives (Gelderman and Van Weele, 2005). Thus, the two axes reflect the importance of the supplier to the buyer based on their spend, and the relative power of the supplier (and hence buyer dependence) based on the market availability of alternatives. Based on these, four categories of purchases emerge (see Figure 1): leverage, non-critical, bottleneck and strategic.

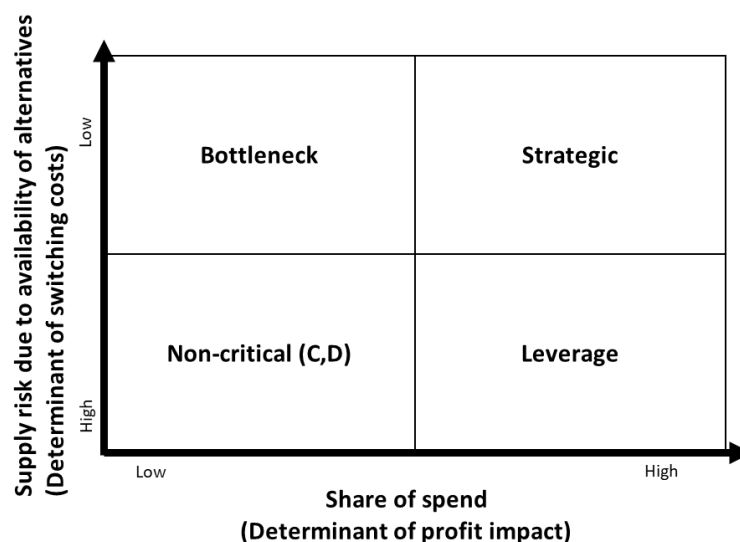


Figure 1 – The purchasing portfolio model (modified based on Kraljic (1983) and Gelderman and van Weele (2005)).

Items in the leverage category enable exploitation of purchasing power, through tactics such as tendering and target pricing, while bottleneck items necessitate a risk mitigation approach through e.g., safety stock and backup planning (Gelderman and van Weele, 2005).

Consequences of switching to a substitute supplier materialize in the form of *switching costs*. Switching costs are the direct and indirect costs resulting from ending a supply relationship and bringing on a new, alternative supplier to replace the old one. These include the effort and resources needed for making such substitution happen and work. Examples include manhours, costs of tendering, loss of production, costs of modifications (if substitute suppliers cannot provide the supply with identical specifications), and costs of supply risk mitigation (as the new supplier would be less familiar and its performance less predictable) (Wagner and Friedl, 2007; Geiger *et al.*, 2012). All these can be referred to as the *absolute* cost of switching as a result of a supply failure (in contrast with the cost relative to buyer's whole business).

Within the Kraljic matrix, these switching costs are conceptualized under supply complexity / risk, a variable that increases when the availability of comparable substitute suppliers decreases. Availability of market alternatives is a key determinant of dependency in the buyer-supplier relationship (Pfeffer and Salancik, 1978; Brito and Miguel, 2017). Dependence can be viewed as the ratio of the parties' importance to each other (Schwieterman *et al.*, 2020). Dependence is determined by the importance of the resources bought as well as whether control over the bought resources is concentrated, or both (Pfeffer and Salancik, 1978). When the supply market for a specific component consists of very few suppliers and they do not have compatible / similar manufacturing skills, technical profile, or quality assurance procedures and so on, then obtaining even a single offer (conforming to the requirements observed by the current supplier) from a substitute supplier may require great effort.

A buyer's dependence on a supplier is determined also based on the percentage of the buyer's cost of goods sold acquired from the supplier (Schwieterman *et al.*, 2020). Unlike switching costs, which depend on the external environment (i.e., the supply market and availability of substitutes), profit impact of a supplier is an internal dimension. It reflects the share of the buyer organization's business (hence its profit) that depends on said supplier (hence, the loss of profit / cost of any disruption in the supply). The profit impact of a supplier (and hence a related failure) is relative to the buyer's entire business.

We use these two factors – switching costs and profit impact - driven from the Kraljic matrix (1983) to represent (and in the experiments, manipulate) the long-term consequences of the buyer attributing a failure to the supplier.

Failure attributions

Supply failure (a purposefully neutral term, see Kauppi *et al.* 2024), refers to a failure in the task the supplier has been delegated by the buyer, for any number of reasons (derived from either or both parties, or external circumstances). In resolving such a supply failure case between a supplier and a buyer, the ideal case (at least for a fair judgement-minded person) is that all needed information is available (i.e., the true cause of the failure fully known) and is also accessible to all relevant parties. Such a setting would not allow for differing perceptions of the cause of failure by the supplier and the buyer. However, because of the uncertainty around the true cause and the mechanism through which the failure has occurred, the cause of failure (or rather the combination of causes) identified by the supplier and the buyer can be uncertain and not necessarily correspond with the true causes (Kauppi *et al.*, 2024). In such instances, causal attributions are made. A causal attribution refers to the perceptual explanation of why an outcome or a consequence has arisen (Kelley, 1973). A failure attribution thus concerns the cause attributed to a supply failure (e.g. whether the supplier or an external situation is to blame).

This uncertainty about failure cause, along with the asymmetrical access of the buyer and the supplier to relevant information would also leave room for interpreting the available (albeit insufficient) information in line with self-serving motives (interests). This means that failure attribution by both the buyer and the supplier will likely be different from their opinion if they did not have any business interests in the matter. At least part of this attribution is expected to be automatic (e.g., the limited available information used selectively to reaffirm existing beliefs), following certain patterns (Blessley *et al.*, 2018; Gardner *et al.*, 2019; Kelley, 1973). An example is the common tendency among buyers to attribute supply failure to the supplier (Arikan, 2020; Reimann *et al.*, 2017).

3. Hypotheses development

A buyer's attribution of a supply failure to the supplier indicates unwillingness to take responsibility or share the damage resulting from the failure. Yet in the case of a supply failure, buyers may also consider the potential effect of their failure attributions on the long-term interests of the buyer organization. Namely, attributing failures to a specific supplier, would increase the likelihood of terminating the contractual relationship with that specific supplier, necessitating switching to a substitute one (Wu *et al.*, 2013).

Buyer reactions to supply failures may differ based on availability of alternatives. Dependence and lack of alternatives in the market is suggested to create tolerance for failures (Baliga *et al.*, 2021; Zhu and Zolkiewski, 2015), supposedly due to attempts to avoid costly switching. Interdependence leads firms to prioritize risk avoidance and survival assurance - weaker parties do not quit the relationship (Brito and Miguel, 2017). If such an argument holds, we would expect purchasing managers to balance between the costs of the failure and the consequences of their attributions. That is, when the long-term consequences of attributing a failure to the supplier are not severe, we expect purchasing managers to be preoccupied mainly with the short-term consequences. This would mean mainly blaming the supplier to avoid sharing costs of the failure. This is also the case that extant literature has thoroughly investigated (Gottschalk, 2016).

On the other hand, when the short-term consequences of attributing a failure to the supplier are not severe, we expect purchasing managers to be preoccupied mostly with the long-term consequences. Thus, their failure attribution is driven largely by position of the buyer in the purchasing portfolio, as characterized by the strategic importance of the supplier to the buyer. This is conceptualized by the two factors mentioned above: the cost of switching to a new supplier, and the relative profit impact based on the supplier share in the buyer's total spend. The buyer's total spend here refers to the monetary amount of all externally procured products and services, including direct and indirect spend. Therefore, we hypothesize:

H1: When switching to a substitute supplier has a large (small) one-time cost, failure attribution to the current supplier is less (more) likely.

H2: When a supplier is responsible for a large (small) share of a buyer's spend, failure attribution to this supplier is less (more) likely.

It is not only the potential switching costs but also the costs of the failure that may impact subsequent actions (Primo *et al.*, 2007). We can expect two alternative moderating effects by the size of damage done through the failure. If purchasing managers are deviating from their perceptions about the true cause of failure when the supplier is strategically important (but not when it is not) then we would expect to observe these two effects (H1-2) only when the short-

term consequences (monetary damage due to the failure) are insignificant. Otherwise, we would expect the effect to be abated. On the other hand, if purchasing managers are deviating from their perceptions about the true cause of failure when the supplier is strategically *unimportant* (but not when it is important) then we would expect to observe these two effects (H1-2) only when the monetary damage due to the failure is significant. Otherwise, we would expect the effect to be abated. In other words, the important supplier would receive an attributional advantage, while the unimportant supplier would receive an attributional disadvantage.

H3a-b: Size of the monetary damage caused by the current failure moderates the effects described in H1 & H2.

Negative evaluations of a supplier performance,, especially if frequent, would likely increase the odds of switching to a substitute supplier (Wu *et al.*, 2013). This relatively intuitive argument implies that the long-term consequences of failure attribution discussed above may be considered likely by the procurement managers (Wagner and Friedl, 2007; Geiger *et al.*, 2012). This perceived likelihood (of consequences / switching to a substitute supplier) would of course depend on the individual traits and personal experience of the purchasing manager within and beyond the current supply contract (Barroso and Picón, 2012). However, if we fix this likelihood at its maximum value, we expect a stronger effect. In other words, if the purchasing manager knows that attributing the current failure to the supplier will *definitely* lead to contract termination and the need to switch to a substitute supplier, then we expect the effects discussed in H1 to be intensified –i.e., the procurement manager being more reluctant to attribute the failure to the supplier. Thus, we hypothesize:

H4: When attributing a failure to the supplier automatically leads (vs. does not automatically lead) to switching to a substitute supplier, such a routine will positively moderate the effect described in H1.

Before proceeding with the empirical procedure used for testing H1-4, in the following section we elaborate on the supporting arguments by describing the purchasing manager's decision making (failure attribution) setting. The failure attribution decision by the purchasing manager is described as four simultaneous decisions corresponding to four common causes of failure (i.e., identifying the extent to which the failure is due to each of these causes): The supplier, the buyer, the buyer-supplier relationship, or something external to both the buyer and the supplier.

4. Failure attribution as a four-dimensional decision

Supplier failure can be described as the breach of a value proposition: a product or service offered by a supplier (to a buyer) fails to realize the value expected from it (Lusch, 2011). In turn, a supply success –i.e., fulfilment of such a value proposition – requires proper functioning of all the elements of the value creation process in a supplier-buyer relationship. In this process (a) a buyer identifies a service or product (or a subcomponent of such) that would be of value – for its customers – and describes its specifications / requirements (b) then the buyer (continuously) communicates these requirements to supplier, and finally (c) the supplier delivers the product or service in conformity with the requirements, hence fulfilling the value proposition (Zokaei and Hines, 2007).

Therefore, poor performance in any step of the process might impede the realisation of the value proposition and result in either a partial or total failure to deliver the desired good or service. Hence, at least four potential causes for a failure can be identified: the *buyer*, the

supplier, the *relationship*, and the *situation*. If the buyer cannot translate the needs of its own customers into the design parameters and quality requirements of the product or service (communicated to the supplier), then the buyer may be the cause of the failure (Kaynak and Hartley, 2008). The buyer may have neglected to provide the supplier with all the information they needed to understand the requirements or the operational context (Kauppi and Van Raaij, 2015). This means that information asymmetry may affect both the supplier (agent) and the buyer (principal) rather than only the latter as outlined in agency theory (Matinheikki *et al.*, 2022).

On the other hand, if the supplier fails to meet the buyer's design specifications and quality requirements or if it otherwise breaches its contractual obligations, such as providing supplies on time, it could be considered the main cause of the supply failure (Griffith and Zhao, 2015), as the supplier is the entity that has represented itself as being willing and capable of providing the target product or service. Negligent behavior on the part of a supplier, such as acting opportunistically and using inferior materials to cut costs, can also result in supplier failure (Gray and Handley, 2015; Handley and Benton, 2012).

An inefficient relationship between the buyer and supplier could be a third factor contributing to a supply failure (Kauppi *et al.*, 2024). While this inefficiency in some cases can be linked to the operations of a certain party (the supplier or the buyer), in other cases it cannot. For example, terms and the contents of the supply contracts are often incomplete, lacking some details that may be needed to improve the buyer-supplier relationship (Esslinger *et al.*, 2019). The buyer-supplier communications can also become exceptionally (in)efficient due to the characteristics of the partnership between two specific (types of) suppliers and buyers rather than individual (in)competencies of them (Paulraj *et al.*, 2008). For instance, the project management software or technical documentation systems used by the supplier and the buyer may be different leading to such issues. Therefore, this cause of the failure relates to the *dynamics* of the bond between the two specific entities involved.

Lastly, unforeseen conditions or situations can lead to supply failure too. Examples of these are an extended pandemic lockdown, an obstruction in the supply of raw materials such as the incidents of Suez Canal blockage, or extreme weather conditions (Carson *et al.*, 2020; Cavinato, 2004; Craighead *et al.*, 2007; Wang *et al.*, 2022). This cause of failure, which means blaming neither self (the buyer) nor the other party (the supplier) is often caused by a kind of disturbance in the otherwise stable business environment that was unforeseen at the time of sealing the supply contract.

5. The procurement manager's decision making setting formulated

Let p be the perceived probability of the supply contract termination (switching to a substitute supplier) if a specific combination of attributions (A_n) is made for the current failure (keeping all other factors constant, as presented by α_1).

$$P = \alpha_1 + \alpha_2 A_{\text{supplier}} + \alpha_3 A_{\text{buyer}} + \alpha_4 A_{\text{relationship}} + \alpha_5 A_{\text{condition}}$$

As discussed, we expect attribution of the failure to the supplier (A_{supplier}) to be the most significant term in the equation. For simplicity, we assume that the purchasing manager would consider only the contract immediately following the current (failed contract) with the specific supplier. This contract will be made effective with a probability of $(1-p)$. In that case, let q be perceived probability of the failure reoccurring in the next supply contract with the specific supplier (who has failed), and R_{cause} the perceived *real share* of a cause (e.g., R_{supplier} being the perceived real share of supplier) in the responsibility for the failure (as perceived by the purchasing manager):

$$q = \beta_1 + \beta_2 R_{\text{supplier}} + \alpha_3 R_{\text{buyer}} + \alpha_4 R_{\text{relationship}} + \alpha_5 R_{\text{condition}}$$

Hence, the cost (risk) function for the buyer in the next contract would be as follows:

$$C_{\text{total}} = p \times [C_{\text{substitution}} + (1 - R_{\text{supplier}}) \times C_{\text{failure}}] + (1 - p) \times q \times C_{\text{failure}}$$

Cost of failure (C_{failure}) for the current supplier and the substitute supplier, in the absence of evidence to the contrary, is assumed to be the same. Cost of substituting the current supplier with an alternative supplier ($C_{\text{substitution}}$) is considered to be a function of the strategic importance of the supplier to the buyer (as described by the Kraljic purchasing portfolio) and takes into account both the one-time cost of switching to a substitute supplier, and the share of the supplier in the buyer's total supply chain expends. These two indicate the portion of the supply chain affected by such substitution and the magnitude of the effort (eventually the expenses) needed to handle the substitution.

Finally, $(1 - R_{\text{supplier}})$ indicates the perceived contribution of causes other than the supplier in the responsibility for the failure. This equation assumes that the buyer has some clue as to the aspects of the current supplier that correspond to its perceived real share in the responsibility for the supply failure. Therefore, the substitute supplier would be chosen in a way that, it would not suffer from those aspects. However, the substitute supplier would still be subject to the other causes of failure existing for the current supplier. That is, in the absence of corrective actions (and information regarding the specific future substitute supplier), we expect this contribution to remain roughly the same for the substitute supplier. Hence the cost of failure reoccurring to the substitute supplier is multiplied by $(1 - R_{\text{supplier}})$.

Considering that attributions are the only variables in the cost function that are controlled by the purchasing managers, we expect these experts to determine them in a way that would minimize the total cost function of the organization for the future supply contract. That is, we expect the purchasing manager to deviate from the perceived real contribution of each cause (e.g., R_{supplier}) and adjust attribution of failure to each cause (e.g., to A_{supplier}) to minimize the sum of the cost of switching to a substitute supplier (including the cost of the substitute supplier failing) and the cost of staying with the current supplier (which may repeat the failure).

In order to study whether such optimization happens or not, in the experiments we manipulated $C_{\text{switching}}$ (in both experiments) as well as C_{failure} (in experiment 1) and the certainty with which failure attribution to the supplier would lead to switching to a substitute supplier (in experiment 2). We achieved the latter by saying in the vignette that attributing the failure to the supplier will definitely lead to current supplier's contract termination –i.e., setting α_2 to 1 and other coefficients to 0 (making A_{supplier} the sole determinant of p with a non-zero coefficient). Figure 2 shows the overall model used in the experiments.

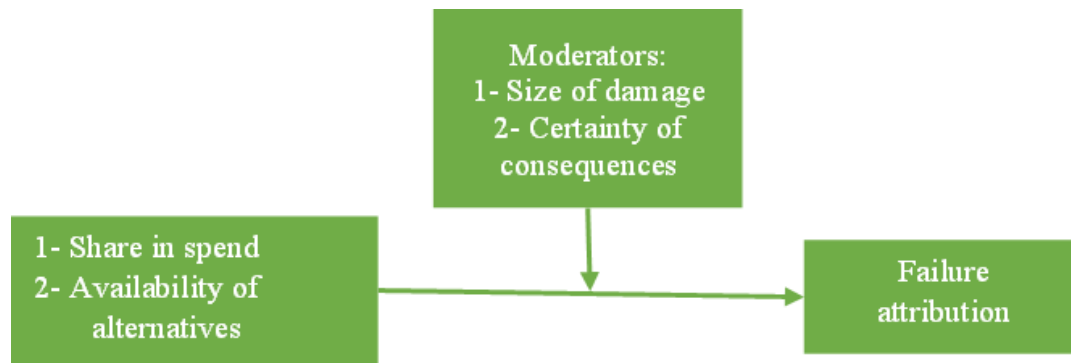


Figure 2 – Conceptual model

6. Methodology

In order to test the hypotheses H1-4, vignette-based online experiments were used. We recruited a total of 642 participants who had decision making responsibilities in the domain of logistics and supply chain management. In addition to the online panel's information on professional background, to increase reliability this profile was also checked in the beginning of the survey and only those who matched the pre-screening information were allowed to take part in the experiment (Eckerd *et al.*, 2021). This specific professional profile corresponded with the perspective from which the hypotheses were formulated; a purchasing manager deciding failure attribution to different potential causes. Participants were recruited through the Prolific Academic panel (an online panel of micro participants with documented professional background and demographics) in the UK and were compensated for their participation. Quality of the data obtained through Prolific platform pool is empirically tested in behavioral economics research applications (e.g., see Peer *et al.*, 2022). Both experiments were run using the Qualtrics software.

Experiment 1 tests H1, H2 and H3a-b, hence testing the main effect of strategic importance of the supplier to the buyer (two independent variables as described earlier) on failure attribution, as well as size of the damage survived by the buyer through the failure as a potential moderator variable. In turn, experiment 2 tests H1 and H4a-b, that is, testing the effect of switching costs to the buyer (thus replicating part of the effect tested in experiment 1) on failure attribution, as well as the potential moderating effect of certainty of the consequences (failure attribution to the supplier automatically leading /not leading to contract termination and switching to a substitute supplier).

Both experiments were built upon real supply failure cases in the software industry (experiment 1) and automotive industry (experiment 2). The case study used in experiment 1 was derived and modified from an interview done by the present researchers in a software enterprise –with confidential information removed to comply with the confidentiality agreement obligations of the researchers. The case used for experiment 2 was obtained from an industry chronicle with sensitive identifiers removed. These cases were presented as vignettes explaining the necessary details of the failure case as well as the manipulated details within the vignettes (described further in each experiment).

After reading through the vignette, we asked participants to attribute the responsibility for the failure to each of these four potential causes: (1) the buyer (2) the supplier (3) the relationship between the buyer and the supplier, and (4) the situation (unforeseen causes). These potential failure causes were adopted from Eberly *et al.* (2011) and were slightly modified to fit the perspective used in hypotheses. We aimed to distinguish between attribution

to relationship issues and attribution to unforeseen conditions and also study such attributions from the buyer's perspective rather than from the supplier's perspective. In Eberly's configuration, internal attribution refers to attribution to the supplier and external attribution refers to attribution to *either* the buyer *or* the situation (undistinguished). If the same scale is applied to the buyer, internal attribution would mean attribution to the buyer and external attribution would mean attribution to either the supplier or the situation (undistinguished). Obviously, we needed to differentiate between situational attribution and supplier attribution to test our hypotheses and achieve the clarity and symmetry that we desired.

The dependent variables –the extent to which supply failure should be attributed to each of the potential causes– were measured (for each cause separately) with two items taken from Eberly *et al.* (2017): “To what extent the issue described in the scenario does reflect an aspect of...” and “To what extent the issue described in the scenario was because of...”. Each of these two questions were followed by four 7-point Likert scales (anchored on 1=not at all and 7=to a great extent) associated with the four potential causes of supply failure: (a) the buyer (b) the supplier (c) the buyer-supplier relationship (d) an unforeseen situation. Participants were asked to read all 4 items of each question before answering to gain an overview of the situation first. The minimum value of Cronbach's alpha for the scales (among 8 values associated with the four attributions across four experiments) was .711 indicating reasonable reliability. In the analyses, we set the minimum value of attributions (equivalent to not at all because of the supplier) at zero and used the share of supplier in the total sum of attributions (when such a sum is set at 100%) as the dependent variable.

The survey also included a realism check. The realism check (Dabholkar, 1994) included two items: (i) The situation described in the scenario was realistic and (ii) I had no difficulty imagining myself in the situation described in the scenario. We used the average of these two items to study whether our documentation of the cases have been sufficiently realistic (although both were documented real cases). The results show that participants in both experiments had considered the vignettes to be realistic and imaginable ($M_{\text{experiment 1}} = 5.68$, $SD = 1.07$; $M_{\text{experiment 2}} = 6.04$, $SD = 1.22$). Pairwise comparison revealed no significant differences across experimental conditions, meaning that, all were perceived to be equally realistic.

7. Experiment 1: The main effect and moderating effect of size of damage

Design and procedure

A total of 418 participants (28.2% women; $M_{\text{age}} = 43.71$ years, $SD = 9.26$) were recruited through Prolific panel in the UK. Participants were randomly assigned to one of the eight conditions of a 2 (share of spend: high vs. low) X 2 (one-time switching costs: high vs. low) X 2 (size of failure damage: high vs. low) between-subjects design. All participants were presented with the same failure case (except for manipulated parts), occurring in a company that develops software solutions for small and medium-sized businesses. Participants were asked to assume the role of an outsourcing expert, who has been managing a contract with a supplier (a software development sub-contractor) to develop a number of modules for the buyer firm's new enterprise solution.

Participants read (in some detail) that the software module provided by the supplier has failed because of some consistency issues with other software developed by the buyer organization. The precise software architecture requirements were not explicitly communicated to the supplier, but their own software engineering team (buyer side) were insisting that the consistency requirements were likely obvious to the supplier –even though they were not mentioned in the contract. Conversely, the supplier argues that such requirements were not

apparent citing other technical reasons. Therefore, they had developed the modules as they expected the buyer would want them, based on their own experience. In their view, all the contractual obligations were thus fulfilled. The responsibility for the supply failure was intentionally made vague to allow for detecting nuances of attributional biases in response to manipulations.

Three sections of the vignette were modified to manipulate the levels of the independent variables as well as the moderator variable: (a) depending on the experimental condition of share of spend, the software modules developed by this supplier were described as accounting for around 42% (vs. 6%) of the total software development budget of the buyer company, (b) depending on the experimental condition of one-time switching costs, participants read that several (vs. very few) software developers (sub-contractors) could potentially develop this specific module for the buyer organization. Thus if the contract with the current sub-contractor gets terminated for any reason, the switching costs for the buyer company would be low (vs. high). Finally, (c) depending on the experimental condition of size of failure damage, participants read that the failure case was solved by patching the module before integrating it into your enterprise solution, and that developing such a patch had involved a significant (vs. a modest) cost. Then participants answered the dependent variable questions along with the realism check and a few demographic questions.

Results

To test the hypotheses, we ran a 3-way ANOVA which revealed a significant main effect for switching costs ($F(1, 410) = 5.11, p < .05, \eta_p^2 = .0012$), no significant main effect for share of the supplier in the buyer's supply expend ($F(1, 410) = .933, p > .05$), and interestingly a significant main effect for the moderator variable, size of the damage done through the failure ($F(1, 410) = 4.14, p < .05, \eta_p^2 = .01$).

Moreover, we obtained a marginally significant interaction effect for switching costs and size of the damage done through the failure ($F(1, 410) = 2.66, p = .1, \eta_p^2 = .007$). When size of the damage done through the failure was notable, participants who had read about large switching costs were less likely to attribute the failure to the supplier ($M = 29.91, SD = 12.54$) than those participants who had read about small switching costs ($M = 35.99, SD = 20.55, F(1, 208) = 6.539, p = .011$). However, this was not the case when size of the damage done through the failure was *not* notable, as then participants who had read about large switching costs were as likely to attribute the failure to the supplier ($M = 29.33, SD = 15.51$) as those participants who had read about small switching costs ($M = 30.26, SD = 13.12, F(1, 208) = .217, p > .1$). The interaction effect between share of the supplier in buyer's spend and size of damage done through the failure was not significant ($F(1, 410) = 1.94, p = .16$).

We also obtained a (non-hypothesized) significant interaction effect for the two dimensions of the Kraljic model; the switching costs and share of the supplier in buyer's spend ($F(1, 410) = 4.23, p < .05, \eta_p^2 = .01$). When share of the supplier in buyer's spend was low, participants who had read about large switching costs were less likely to attribute the failure to the supplier ($M = 28.79, SD = 13.61$) than those participants who had read about small switching costs ($M = 35.51, SD = 19.35, F(1, 207) = 8.25, p = .004$). This was not the case when share of the supplier in buyer's spend was high. Participants who had read about large switching costs were as likely to attribute the failure to the supplier ($M = 30.45, SD = 14.52$) as those participants who had read about small switching costs ($M = 30.74, SD = 15.02, F(1, 207) = .884, p > .1$).

8. Experiment 2: The moderating effect of certainty of attribution consequences

Design and procedure

A total of 224 participants (31% women; Mage = 44.10 years, SD = 11.38) were recruited through Prolific panel in the UK. Participants were randomly assigned to one of the four conditions of a 2 (switching costs: high vs. low) X 2 (certainty of attribution consequences: certain vs. not) between-subjects design. All participants were presented with the same failure case (except for manipulated parts), occurring in a company (the buyer) that manufactures small electric cars. Participants were asked to assume the role of a purchasing manager, who has been managing a contract with a supplier (an electric motor company) to provide motors for a small 2-seater car still in production (by the buyer).

Participants read that, recently, there have been several complaints from drivers in Northern Europe about the unexpected functioning of the car in situations where it was run primarily on autopilot. Then they read (in some detail) that the failure could have several reasons, but one slightly more likely reason being that the response time requirements of the autopilot function may not have been fully supported by the electric motor unit in low temperatures. The precise operating temperature range requirements of the autopilot had not been communicated to the supplier explicitly, but the buyer's design team were thinking that the requirements should have been obvious to the supplier. On the other hand, the supplier was arguing that such requirements were not obvious, thus, they had developed the electric motor as they expected the buyer to want them. Then, participants read that this specific supplier had an average performance, nothing particularly good or bad compared to other suppliers.

The independent variable and the moderator were manipulated by modifying two sections of the vignette. Depending on the experimental condition of (a) switching costs, participants read that several (vs. very few) suppliers could potentially manufacture this specific electric motor for the buyer. Thus if the contract with the current supplier gets terminated for any reason, the switching costs for the buyer company would be low (vs. high). Depending on the experimental condition of (b) certainty of attribution consequences, participants read that based on their company's (the buyer) policies, attribution of such a case to the supplier's operations, would (vs. would not) automatically lead to termination of the corresponding contract. Lastly, participants answered the dependent variable questions along with the realism check and demographic items.

Results

To test the hypotheses, we ran a 2-way Anova in which the main (overall) effect of certainty of attribution consequences on failure attribution ($F(1, 219) = .324, p > .05$) was not significant while the main effect of switching costs on failure attribution ($F(1, 219) = 2.19, p = .1$) was marginally significant. We also obtained a marginally significant interaction effect for switching costs and certainty of attribution consequences ($F(1, 219) = 3.61, p = .057, \eta_p^2 = .017$). When the certainty of attribution consequences was high, participants who had read about large switching costs were less likely to attribute the failure to the supplier ($M=30.24, SD=16.8$) than those participants who had read about small switching costs ($M=37.44, SD=14.10, F(1, 108)=5.9, p=.017$). However, when certainty of attribution consequences was low, then participants who had read about large switching costs were as likely to attribute the failure to the supplier ($M=34.85, SD=16.54$) as those participants who had read about small switching costs ($M=35.59, SD=17.09, F(1, 112)=.055, p > .1$).

Table 1 summarizes the results of our hypothesis testing for both experiments.

Hypothesis	Result	Interpretation
H1	Supported	When switching to a substitute supplier has a large (small) cost, failure attribution to the current supplier is less (more) likely
H2	Rejected	When a supplier is responsible for a large (small) share of a buyer's spend, this does not affect failure attribution to the supplier
H3a	Supported	Size of the monetary damage caused by the current failure moderates the effect described in H1
H3b	Rejected	Size of the monetary damage caused by the current failure did not moderate the effect described in H2
H4	Supported	When attributing a failure to the supplier automatically leads (vs. does not automatically lead) to switching to a substitute supplier, such a routine will positively moderate the effect described in H1
Posthoc	NA	Share of the supplier in buyer's spend positively moderated the effect described in H1

Table 1 – Summary of hypotheses results

9. Discussion

We aimed to study whether the power balance and dependence from the perspective of the buyer would affect failure attribution to the supplier. We used the Kraljic purchasing portfolio to conceptualize these through profit impact and switching costs and hypothesized that both dimensions would equally affect failure attributions in a way that unimportant suppliers in either case would receive a harsher failure attribution. However, we found that in this specific application, it is the switching cost dimension and not the share of spend that biases failure attribution. This complements extant research focused on purchasing portfolio models and the way they would / should affect buyers' purchasing decisions (Caniels and Gelderman; 2005).

The focus of the present research was attribution of failures to suppliers. However, , to obtain a holistic view, we also measured failure attribution to the buyer itself, the buyer-supplier relationship and unforeseen conditions. Figure 3 presents the dominant attribution of failure according to the four categories of the purchasing portfolio. From there one can see, that with non-critical items buyers are most prone to blame the supplier. Yet for bottleneck items, where they are highly dependent on the supplier due to low availability of alternatives, self-blame is strongest. Somewhat surprisingly, the blame to supplier is more moderate in the leverage-category, where the suggestion is usually to "exploit" power. Perhaps a high share of spend does translate to larger switching costs within the buyer's own organization despite availability of alternatives.

We found support for hypothesis H3a as the size of the monetary damage caused by the current failure positively moderated the main effect of switching costs. In other words, switching costs were biasing attribution decision making only when size of the damage done through the failure was notable. This along with the non-hypothesized main effect of size of damage (experiment 1) and the moderating effect of certainty of long-term consequences (switching costs being realized due to contract termination) indicates that the mental optimization described earlier in terms of balancing short-term costs and long-term costs (does indeed happen – at least to some extent.

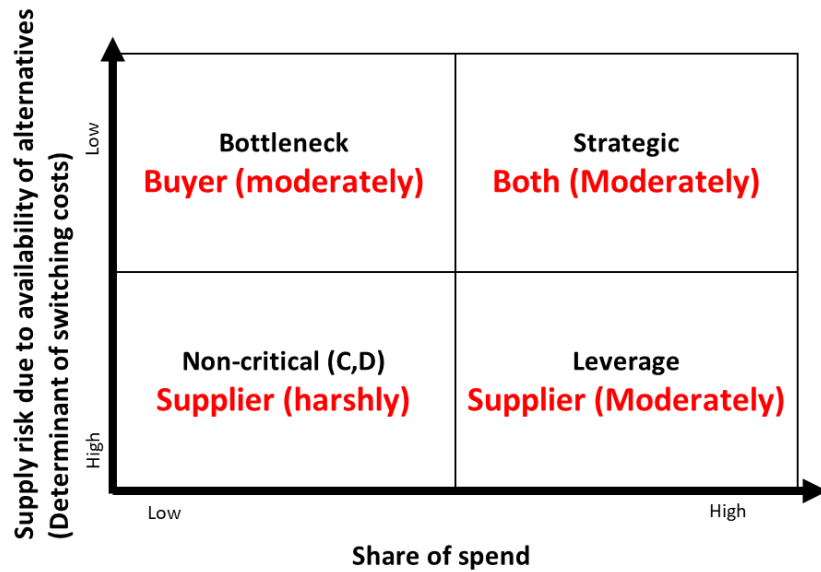


Figure 3 – Dominant attribution of failure cause according to the purchasing portfolio

Finally, a somewhat counterintuitive result was that while insignificant as a direct determinant, share of spend as one dimension of the purchasing portfolio moderates the effect of switching costs as the other dimension. The bias depending on the switching costs was observed only when the supplier was unimportant in terms of share of spend. This is an interesting nuance in the dynamics of the purchasing portfolio factors and their effects on failure attribution towards a supplier. It demonstrates that different category suppliers may be treated (unintentionally) differently in cases of failure.

Recognizing how buyer-supplier power and dependence impact buyer behavior in instances of failure is important also from a practical perspective. Vanneste and Frank (2014) suggest that in interorganizational relationships, “forgiving is important, beneficial and frequent”. They further suggest forgiveness to be an important governance mechanism in inter-organizational relationships. Buyers in dependent positions may be more reluctant to voice complaints given how the supplier might use their power in such situations. Yet not voicing complaints may lead to future supplier abuse of power if they perceive a situation where they can “get away with anything”. Hence, we urge buyers to consider carefully to what extent they enable dependence to impact their behavior in failure situations. Whether it is contractual clauses, proper root cause analyses or something else, attributions based on power only should be avoided. Indeed, Vanneste and Frank (2014) find forgiveness to be a double-edged sword. Lesser forgiveness in interorganizational relationships is associated with an incentive effect for the other party to work harder but also a higher likelihood that the relationship gets terminated. More forgiveness, on the other hand, provides suppliers less incentives for effort.

Current research on purchasing portfolio models is mostly normative. Yet equally important is to understand the extent to which such norms are actually adhered to in actual purchasing behavior – and what biases can ensue. Our work on understanding buyer behavior across the purchasing portfolio failure cases is a first step towards it. However, our work is limited by its industry, geographic and purchase type scope, and further work is thus warranted to gain a better understanding of buyer failure attributions.

References

- Arikan, A. T. (2020) 'Opportunism is in the eye of the beholder: Antecedents of subjective opportunism judgments', *Journal of Business Ethics*, 161(3), pp.573–589.
- Baliga, A.J., Chawla, V., Ganesh, L.S. and Sivakumaran, B. (2021) 'Service failure and recovery in B2B markets—a morphological analysis', *Journal of Business Research*, 131, pp.763-781.
- Barroso, C. and Picón, A. (2012) 'Multi-dimensional analysis of perceived switching costs', *Industrial Marketing Management*, 41(3), pp.531-543.
- Blessley, M., Mir, S., Zacharia, Z. and Aloysius, J. (2018) 'Breaching relational obligations in a buyer-supplier relationship: Feelings of violation, fairness perceptions and supplier switching', *Industrial Marketing Management*, 74, pp.215-226.
- Brito, R.P. and Miguel, P.L. (2017) 'Power, governance, and value in collaboration: Differences between buyer and supplier perspectives', *Journal of Supply Chain Management*, 53(2), pp.61-87.
- Carson, J., Waddingham, J. and Mackey, J. (2020) 'Organization member action proximity and attributions for managerial crisis response failure', *Management Decision*, 58(10), pp.2177-2193.
- Caniëls, M.C. and Gelderman, C.J. (2007) 'Power and interdependence in buyer supplier relationships: A purchasing portfolio approach', *Industrial marketing management*, 36(2), pp.219-229.
- Caniels, M.C. and Gelderman, C.J. (2005) 'Purchasing strategies in the Kraljic matrix—A power and dependence perspective', *Journal of purchasing and supply management*, 11(2-3), pp.141-155.
- Cavinato, J.L. (2004) 'Supply chain logistics risks. From the back room to the board room', *International Journal of Physical Distribution & Logistics Management*, 34(5), pp.383-387.
- Craighead, C.W., Blackhurst, J., Rungtusanatham, M.J. and Handfield, R.B. (2007) 'The severity of supply chain disruptions: design characteristics and mitigation capabilities', *Decision sciences*, 38(1), pp.131-156.
- Eberly, M.B., Holley, E.C., Johnson, M.D. and Mitchell, T.R. (2017) 'It's not me, it's not you, it's us! An empirical examination of relational attributions', *Journal of Applied Psychology*, 102(5), pp.711.
- Esslinger, J., Eckerd, S., Kaufmann, L. and Carter, C. (2019) 'Who cares? Supplier reactions to buyer claims after psychological contract over-fulfillments', *Journal of Supply Chain Management*, 55(4), pp.98-128.
- Gardner, W.L., Karam, E.P., Tribble, L.L. and Cogliser, C.C. (2019) 'The missing link? Implications of internal, external, and relational attribution combinations for leader–member exchange, relationship work, self-work, and conflict', *Journal of Organizational Behavior*, 40(5), pp.554-569.
- Gottschalk, P. (2016) 'Blame game and rotten apples in private investigation reports: The case of Hadeland and Ringerike Broadband in Norway', *Journal of Investigative Psychology and Offender Profiling*, 13(2), pp.91-109.

- Geiger, I., Durand, A., Saab, S., Kleinaltenkamp, M., Baxter, R. and Lee, Y. (2012) 'The bonding effects of relationship value and switching costs in industrial buyer–seller relationships: An investigation into role differences', *Industrial Marketing Management*, 41(1), pp.82-93.
- Gelderman, C.J. and Van Weele, A.J. (2003) 'Handling measurement issues and strategic directions in Kraljic's purchasing portfolio model', *Journal of purchasing and supply management*, 9(5-6), pp.207-216.
- Gelderman, C.J. and Van Weele, A.J. (2005) 'Purchasing portfolio models: a critique and update', *Journal of Supply Chain Management*, 41(3), pp.19-28.
- Gray, J.V. and Handley, S.M. (2015) 'Managing contract manufacturer quality in the presence of performance ambiguity', *Journal of Operations Management*, 38, pp.41-55.
- Griffith, D. A., & Zhao, Y. (2015) 'Contract specificity, contract violation, and relationship performance in international buyer–supplier relationships', *Journal of International Marketing*, 23(3), 22-40.
- Handley, S.M. and Benton Jr, W.C. (2012) 'The influence of exchange hazards and power on opportunism in outsourcing relationships', *Journal of Operations Management*, 30(1-2), pp.55-68.
- Kauppi, K., Brandon-Jones, A., van Raaij, E.M. and Matinheikki, J. (2024) "'If only we'd known": Theory of supply failure under two-sided information asymmetry', *Journal of Supply Chain Management*, 60(1), pp.32-52.
- Kauppi, K. and Van Raaij, E.M. (2015) 'Opportunism and honest incompetence—seeking explanations for noncompliance in public procurement', *Journal of Public Administration Research and Theory*, 25(3), pp.953-979.
- Kaynak, H. and Hartley, J.L. (2008) 'A replication and extension of quality management into the supply chain', *Journal of operations management*, 26(4), pp.468-489.
- Kelley, H.H. (1973) 'The processes of causal attribution', *American psychologist*, 28(2), pp.107.
- Kraljic, P. (1983) 'Purchasing Must Become Supply Management', *Harvard business review*, 61(5), pp. 109-117.
- Li, J., Chai, L., Tangpong, C., Hong, M. and Traub, R.D. (2022) 'An empirical investigation of buyer–supplier relationship typologies and their behavioral and performance outcomes', *Journal of Business & Industrial Marketing*, 37(4), pp.874-892.
- Lilliecreutz, J. and Ydreskog, L. (1999) 'Supplier classification as an enabler for a differentiated purchasing strategy', *Global Purchasing & Supply Chain Management*, 11, pp.66-74.
- Lusch, R.F. (2011) 'Reframing supply chain management: a service-dominant logic perspective', *Journal of supply chain management*, 47(1), pp.14-18.
- Matinheikki, J., Kauppi, K., Brandon-Jones, A. and van Raaij, E.M. (2022) 'Making agency theory work for supply chain relationships: a systematic review across four disciplines', *International Journal of Operations & Production Management*, 42(13), pp.299-334.
- Miller, D.T. and Ross, M. (1975) 'Self-serving biases in the attribution of causality: Fact or fiction?', *Psychological bulletin*, 82(2), pp.213.

- Montgomery, R.T., Ogden, J.A. and Boehmke, B.C. (2018) 'A quantified Kraljic Portfolio Matrix: Using decision analysis for strategic purchasing', *Journal of Purchasing and Supply Management*, 24(3), pp.192-203.
- Olsen, R.F. and Ellram, L.M. (1997) 'A portfolio approach to supplier relationships', *Industrial marketing management*, 26(2), pp.101-113.
- Paulraj, A., Lado, A.A. and Chen, I.J. (2008) 'Inter-organizational communication as a relational competency: Antecedents and performance outcomes in collaborative buyer–supplier relationships', *Journal of operations management*, 26(1), pp.45-64.
- Peer, E., Rothschild, D., Gordon, A., Evernden, Z. and Damer, E. (2022) 'Data quality of platforms and panels for online behavioral research', *Behavior Research Methods*, p.1.
- André Mendes Primo, M., Dooley, K. and Johnny Rungtusanatham, M. (2007) 'Manufacturing firm reaction to supplier failure and recovery', *International Journal of Operations & Production Management*, 27(3), pp.323-341.
- Reimann, F., Kosmol, T. and Kaufmann, L. (2017) 'Responses to supplier-induced disruptions: A fuzzy-set analysis', *Journal of Supply Chain Management*, 53(4), pp.37-66.
- Pfeffer, J., Salancik, G. (1978) *'The External Control of Organizations: A Resource Dependence Perspective'*. Harper and Row, New York.
- Schwieterman, M.A., Miller, J., Knemeyer, A.M. and Croxton, K.L. (2020) 'Do supply chain exemplars have more or less dependent suppliers?', *Journal of Business Logistics*, 41(2), pp.149-173.
- Vanneste, B.S. and Frank, D.H. (2014) 'Forgiveness in vertical relationships: Incentive and termination effects', *Organization Science*, 25(6), pp.1807-1822.
- Wagner, S.M. and Friedl, G. (2007) 'Supplier switching decisions', *European Journal of Operational Research*, 183(2), pp.700-717.
- Wang, Q., Cheng, L., Craighead, C.W. and Li, J.J. (2022) 'The roles of locus of causality and buyer attribution in resolution of recurrent supplier-induced disruptions', *Journal of Operations Management*, 68(1), pp.55-93.
- Wu, W.Y., Hou, Y.C., Fu, C.S. and Chang, C.Y. (2013) 'Identifying failure recovery strategies for paper industrial suppliers', *Industrial Marketing Management*, 42(8), pp.1233-1244.
- Zhu, X. and Zolkiewski, J. (2015) 'Exploring service failure in a business-to-business context', *Journal of Services Marketing*, 29(5), pp.367-379.
- Zokaei, K. and Hines, P. (2007) 'Achieving consumer focus in supply chains', *International Journal of Physical Distribution & Logistics Management*, 37(3), pp.223-247.