An Exploratory Study of Procurement Strategies for multi-item RFQs in B2B Markets: Antecedents and Impact on Performance

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ABSTRACT

This research explores procurement strategies for multi-item RFQs in business-to-business (B2B) markets using responses from 825 purchasing professionals. The study first establishes procurement strategies that differ based on their level of strategic emphasis, i.e. the importance that is placed on the pursuit of four strategic objectives. Underlying objectives, which are obtained via factor analysis, include the focus on price, security of supply, internal procurement efficiencies, and bundle building. Next, cluster analysis is used to derive prototypical strategic approaches. The three cluster groups that emerge possess the same relative ranking of the four objectives, but differ based on the intensity with which these objectives are pursued. We therefore label these clusters as the three strategic groups of strategists, opportunists, and responders. The research then explores, using an industrial buyer behavior lens, the impact of environmental antecedents in determining a particular strategy. Environmental variables include purchase importance, market uncertainty, supply base availability, buyer bargaining power, item experience, and supply base experience. Finally, the study tests the impact of procurement strategy on the buyer’s perceived performance, suggesting that strategists, placing more emphasis on the pursuit of strategic sourcing objectives, achieve better performance than opportunists and responders.

Keywords: Procurement strategies; Environmental conditions; Purchase Performance; Industrial Buyer Behavior; Survey research
1. INTRODUCTION

The investigation of procurement strategies and mechanisms in business-to-business (B2B) markets, as well as their impact on performance, has been gaining attention, as evidenced by recent studies (e.g., Bichler and Steinberg 2007; Deng and Elmaghraby 2005; Elmaghraby 2007; Kouvelis, Chambers, and Wang 2006; Mithas and Jones 2007). Numerous streams and sub-streams of sourcing strategy research have emerged. For example, Elmaghraby (2000) provided an overview of sourcing strategies in the fields of operations research and economics, and presented a classification of past research based on the number of opportunities present for the buyer to select a supplier (single or multiple selection period(s)), and from how many suppliers the buyer is able to source the items (single or multiple supplier(s)). In addition, Ellram and Carr (1994), who reviewed primarily empirical purchasing research, categorized past work based on purchasing’s strategic concerns, as well as its role in supporting overall company strategies. However, no published empirical research was found that specifically addresses the interplay of the buyer’s objectives in determining procurement strategy, the antecedents that may determine this strategy, and the subsequent impact on performance. The present study examines these links with data collected from a large-scale survey conducted among procurement managers, and makes contributions to research and practice. We investigate these relationships within the context of a multi-item request for quotation (RFQ), for which the development of an appropriate strategy can be especially challenging (Bakos and Brynjolfsson 1999).

The procurement/sourcing (these terms will be used interchangeably) strategy an industrial buyer pursues is influenced by his or her objectives for the event. Depending on the primary objectives sought, associated buying activities can be segmented into prototypical sourcing approaches. For example, prior literature suggested the segmentation into tactical,
leverage, critical and strategic purchases/items (Carter 1999; Kraljic 1983; Monczka, Trent, and Handfield 2005). In the present research we started out with eleven goal statements that may be pursued in a particular sourcing initiative. These objectives were identified from prior literature, and our related interviews and case studies with purchasing professionals. Based on an exploratory factor analysis of the survey responses the objectives were grouped into four overriding categories to achieve parsimony. The labels chosen for the factors are anchored in prior literature, and summarize the underlying individual goal statements. The four approaches deal with the following aspects: (1) price focus, which encompasses the goal of getting the best price, (2) supply security, an approach that tries to minimize risk and assure supply continuity, (3) purchasing efficiency, which is associated with the goal of supply base consolidation and the creation of a streamlined purchasing environment, and (4) bundle building, which aims to group items into larger packages and to avoid uncompetitive bids on less attractive items.

While purchasing professionals may focus on just one of these four objectives, more likely they will pursue a combination of these goals in an integrated strategy. For example, while a buyer may focus on price in a particular sourcing event, the consideration of supply security, and thus the preference for a long-term relationship with the supplier, may also be considered as important. The present study investigates how these objectives are combined, and clusters responding buyers into like groups with similar strategic emphases. This emphasis is defined as the aggressiveness, proactiveness or intensity with which buyers pursue certain objectives in a particular purchase situation. As will be seen, our data differentiate between three procurement strategies, which are linked to the strategic types of strategists, opportunists, and responders. The derivation of these prototypical procurement strategies based on the four primary objectives is a contribution in itself, supplementing prior classification schemes.
Having established the three strategic types, we use an industrial buyer behavior lens to examine influential antecedents which may determine procurement strategy. Central to this stream of research is the investigation of why industrial buyers behave the way they do. We selected six of the most relevant environmental characteristics and explored their impact in determining procurement strategy. These variables include purchase importance, market uncertainty, supply base availability, buyer bargaining power, item experience, and supply base experience. Investigating the impact of these conditions on the derived strategy classification scheme provides a novel perspective to study strategic sourcing decisions made by the firm.

Finally, we examine the impact of procurement strategy on the buyer’s perceived performance and report which strategic stance led to the most favorable outcome. We also explore what firms can do to improve performance. The findings contribute to the literature on the practice-performance relationship.

The remainder of the paper is organized into six sections. The following section highlights relevant literature, including the development of our overriding proposition and the seven hypotheses. The subsequent section describes the research methodology, followed by the data analyses and the presentation of the results. A discussion of these results is next, with the final section providing a summary.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Purchasing research has a long tradition of investigating, classifying and describing procurement strategies. Most studies rely on industrial buyer behavior literature, a research stream originating in the late 1960s and early 1970s that aimed at better understanding industrial buying decisions. Of particular importance were the models by Robinson, Faris, and Wind
(1967), Webster and Wind (1972), and Sheth (1973), which have received much attention. For example, Robinson et al. (1967) developed the BUYGRID framework, consisting of eight buying process steps and three classes of buying situations. The three buying situations (new purchase, modified rebuy, straight rebuy) can be classified according to the newness of the problem, the information requirements, and the consideration of new alternatives. This framework provides the first known conceptual model to analyze procurement strategies and industrial buyer behavior; later studies relied heavily on these findings (e.g., Kiser 1976). Other areas investigated since then included international sourcing strategies (Cunningham 1982), the impact of competition (Hahn, Kim, and Kim 1986), the evolution of procurement strategies (Monczka and Trent 1991), the integration of the product life cycle concept (Birou, Fawcett, and Magnan 1997), green purchasing strategies (Min and Galle 2001), and the impact of power and interdependence in buyer-supplier relationships (Caniëls and Gelderman 2007). Elmaghraby (2000) summarized sourcing strategies in the fields of operations research and economics, while Ellram and Carr (1994) provided a review of empirical studies on strategic sourcing. Despite this proliferation of procurement strategy research, no published studies were found that focus specifically on the multi-item or bundled RFQ, and how environmental conditions within this context can influence the procurement strategy employed and the subsequent purchase performance. The research presented here fills this gap by empirically investigating these relationships via a large-scale survey. Environmental conditions considered include the constructs of purchase importance, market uncertainty, supply base availability, buyer bargaining power, item experience, and supply base experience, all of which will be described in greater detail below.
The design of the appropriate order lot or bundle a supplier is asked to provide bids on (the RFQ) is one of the most challenging tasks in sourcing, with the potential to have a significant impact on purchase performance (Mabert and Schoenherr 2001; Schoenherr and Mabert 2006, 2007, 2008). Including multiple items in an RFQ, instead of just a single stock keeping unit (SKU), provides an interesting context to investigate associated procurement strategies (cf. He and Ioerger 2005). Previous research noted this scenario as becoming increasingly prevalent (e.g. Rosenthal, Zydiak, and Chaudhry 1995), and several studies exist that look at the vendor selection problem within the specific context of multi-item bundles (e.g. Murthy, Soni, and Gosh 2004; Narasimhan, Talluri, and Mahapatra 2006).

While it may be easy to develop a focused strategy for a single item, the inclusion of multiple items in an RFQ is more challenging (Bakos and Brynjolfsson 1999), and tradeoffs could be necessary. In addition, bundling several items together can directly impact cost components, such as the purchase price and operations cost, stressing the significance of this approach (Linthorst, Telgen, and Schotanus 2008; cf. Beall et al. 2003). For instance, while bundling can decrease the costs associated with managing the supply base (because fewer participants need to be managed), suppliers may charge a premium for providing the bundled solution (realizing the desired internal benefits for the buyer, or compensating their internal efforts in supplying all the different bundle components). Furthermore, while significant benefits are associated with bundling, considerable challenges may also be present (Schoenherr and Mabert 2006). As such, if a bundle is not specified correctly, for example if it is too complex, then few or no competitive bids may be placed on the RFQ. This was also noted by Elmaghraby (2007, p. 414) within the context of electronic procurement auctions: “It is important to note once the buyer has defined the bundles of goods that will be auctioned, she has essentially
created a zero-sum game.” Despite the criticality of this issue, little empirical research exists that examines bundling from a B2B sourcing perspective (Schoenherr and Mabert 2008). Therefore, we focus on the multi-item or bundled RFQ in this study (the terms ‘multi-item’ and ‘bundled’ will be used interchangeably).

Bundling has been primarily examined in the economics and marketing literature. For example, Adams and Yellen (1976), looking at commodity bundling, discussed why bundling can be such a prevalent practice. Palfrei (1983) analyzed bundling decisions of a multiproduct monopolist, and Avery and Hendershott (2000) investigated bundling within the context of multiple products auctions. Bakos and Brynjolfsson (1999) studied the strategy of bundling information goods. Stremersch and Tellis (2002) provided a synthesis of strategic bundling for marketing; in their review, the authors defined the concept of bundling, provided an overview of the legality of bundling, and formulated twelve propositions suggesting which bundling strategy is optimal in various instances. More recently, Gosh and Balachander (2007) considered bundling as a competitive strategy, McCardle, Rajaram, and Tang (2007) explored the impact of bundling on retail merchandising, and Wu, Hitt, and Chen (2008) developed a customized bundle pricing model. Our contribution lies in the investigation of this issue from an operations and supply chain perspective, specifically using the lens of industrial buyer behavior. While this study does not focus on bundling per se, it uses this practice as an intriguing context worthy of exploration and understanding. Moreover, prior research most often dealt with the offer of the bundled product to a customer downstream, in a business-to-consumer (B2C) setting (downstream bundling), whereas we consider the case of upstream bundling, i.e. the creation of a multi-item RFQ by an industrial buyer offered to suppliers in a B2B context. In the present study we examine this issue from the buyer’s perspective.
Bundling is done for many reasons (cf. Elmaghraby 2007). For example, with multiple items the dollar spend of the RFQ can be significantly increased, generating economies of scales for the supplier (Birou, Fawcett, and Magnan 1997; Kaufmann and Carter 2002) and heightened bargaining power for the buyer (Ramsay 2001a; Schoenherr and Mabert 2006). In addition, transaction costs, such as ordering costs (Looman, Ruffin, and de Boer 2002), can be lowered, and benefits can be achieved via complementarities of the bundled products (Bakos and Brynjolfsson 1999). The right combination of multiple SKUs into a single RFQ can also lead to more competitive bidding (Elmaghraby 2005) and supply base optimization (Das and Narasimhan 2000). Usually, items are bundled together if they rely on similar raw materials or similar production processes, or if they have similar applications or similar technical requirements (Schoenherr and Mabert 2006).

The literature and our field observations suggest various objectives being pursued with multi-item RFQs. Some buyers may look for efficiency when creating multi-item RFQs, while others place a higher emphasis on creating a very competitive environment with the goal of getting the best price. Yet other buyers are more focused on obtaining complementarities between bundled products or ensuring that also less competitive items are successfully procured. Others lean toward supply security and assurance, by the establishment of a collaborative and long-term relationship with the supplier for example (cf. Cunningham 1982). While each of these strategies may be pursued in isolation, a more realistic view suggests that buyers consider all of these aspects, but with differing levels of emphasis (cf. Hult et al. 2006; Hult, Boyer, and Ketchen 2007; Oltra, Maroto, and Segura 2005). We therefore propose that buying strategies can be classified according to how aggressively, proactively or intensely the various goals are pursued. Aggressiveness/proactiveness/intensity is defined as the degree to which buyers follow
certain objectives in a particular sourcing situation (cf. Monczka, Trent, and Callahan 1993). As will be discussed in greater detail below, we presented buyers with a number of goal statements and asked them to indicate their degree of agreement with these objectives being pursued with the focal purchase. Stronger agreement indicated a heightened importance associated with these objectives, and thus a stronger strategic emphasis.

Our *a priori* expectation is that buyers will differ in their procurement strategy, specifically according to how aggressively, proactively or intensely it is pursued, or how much importance they place on each of the objectives. This facilitates the identification of buyer groups that differentiate themselves based on their level of strategic emphasis, which serves as a foundation for further analysis, i.e. the testing of the hypotheses. According to our proposition stated below, buyer groups are expected to differ in terms of their procurement strategy, which is operationalized by the intensity or emphasis with which strategic goals are pursued.

**P1:** *Procurement strategies of buyer groups differ based on the strategic emphasis with which goals of multi-item RFQs are pursued.*

Prior research often employed Miles and Snow’s (1978) strategy typology to differentiate between behavioral groups and strategic types, and labeled them as prospectors, analyzers, defenders, and reactors (cf. Bendoly, Rosenzweig, and Stratman 2007; Stratman 2007). Prospectors are the most proactive and aggressive in their strategy, while defenders are satisfied with the status-quo and do not make too many adjustments in their strategic dealings. Analyzers are a hybrid between these two types. Reactors do not have a well developed strategy; they are characterized as merely reacting to competitive pressure. Based on the application of Miles and Snow’s typology in prior research (e.g., Hambrick 1983), their classification may be applicable
for our study as well. However, while we will use this typology as a starting point, we are open to alternate groupings (e.g., Oltra, Maroto, and Segura 2006). Especially helpful for our research were the taxonomy development studies by Miller and Roth (1996), Frolich and Dixon (2001) and Boyer and Hult (2005), whose suggestions we followed for selecting the best number of clusters and the ensuing taxons.

In developing the hypotheses, described in the remainder of this section, we drew on the bodies of literatures of industrial buyer behavior, bundling, procurement strategy, and the general areas of supply chain management, strategy and procurement. The complete research model is summarized in Figure 1. Environmental conditions included in this research consist of purchase importance, market uncertainty, supply base availability, buyer bargaining power, item experience, and supply base experience, which are all hypothesized to influence and determine procurement strategy. Different types of procurement strategies were identified by considering eleven goal statements, grouped together into four overriding themes, and subjected to a cluster analysis to identify prototypical groups. Following the premise of our proposition above, we expect that these procurement strategy clusters differ based on the strategic emphasis with which each of the four objectives is pursued. In addition, depending on the strength or intensity with which the objectives are followed we hypothesize purchase performance to differ. Specifically, a more aggressive pursuit of procurement strategy should lead to better performance.

Figure 1. Research model
2.1. The Impact of Environmental Conditions on Procurement Strategy

Environmental characteristics have been key factors in describing and explaining industrial buyer behavior (Johnston and Lewin 1996), and were mentioned in the seminal works of Robinson, Faris, and Wind (1967), Webster and Wind (1972), and Sheth (1973). While numerous constructs have been suggested, based on our related field and case study experience, we propose six environmental variables (purchase importance, market uncertainty, supply base availability, buyer bargaining power, item experience, and supply base experience) for our context. These aspects are expected to play an important role in determining the strategic emphasis of the buyer, i.e. the importance or intensity with which strategic objectives of multi-item RFQs are pursued. These variables were also important characteristics in prior studies explaining sourcing decision making and strategy, and will be discussed in the remainder of this section.

2.1.1. Purchase Importance. Purchase importance is a fundamental characteristic of procurement and a major variable in industrial buyer behavior (Johnston and Levin 1996). Purchase importance can be defined as the procuring firm’s perception of the strategic significance of the particular purchase (Cannon and Perreault 1999), or the perceived impact the purchased asset has on organizational effectiveness (McQuiston 1989). The importance of a purchase can be assessed by the relative spend included in the RFQ, whether the items support a core competency of the company, or whether a failure to procure the items would have significant consequences for the firm. With more SKUs included, the impact on the firm of failing to procure the desired bundle will most likely increase, warranting the inclusion of this variable in our study. Prior research established the impact of purchase importance on buyer
behavior (McQuiston 1989) and on the buyer-supplier relationship (Cannon and Perreault 1999); for instance, Iyer (1996) showed that purchase importance influences the extent to which a buyer will consider and explore new alternatives. Within this context, an increase in perceived purchase importance makes the buyer less likely to exclude new vendors from the consideration set (Heide and Weiss 1995). Other articles suggesting the link between purchase importance and behavior include: Johnston and Bonoma (1981), who proposed that higher purchase importance should lead to more involved communication; McQuiston (1989, p. 66), who suggested importance as a causal determinant of “participation and influence in an industrial purchase decision;” and Bunn (1993), who showed that the use of a particular buying decision approach depends on the importance of the purchase (cf. Hunter, Bunn, and Perreault 2006). Based on this review, purchase importance should impact the procurement strategy of the buyer, as assessed by his or her emphasis placed on the four procurement objectives. Specifically, we expect that an increase in importance leads the buyer to pursue the objectives with more emphasis. Our first hypothesis is therefore formulated as follows:

\[ H1a: A \text{ heightened importance of the multi-item RFQ leads to a greater strategic emphasis in the buyer's procurement strategy.} \]

2.1.2. **Market Uncertainty.** Market or supply uncertainty refers to the unpredictability and variability of changes in and the general nature of a firm’s supply market (Elmaghraby 2000; Tullous and Utecht 1992). This uncertainty, which has been an important variable in explaining industrial buyer behavior (Cannon and Perreault 1999), for example the make-or-buy decision (Walker and Weber 1984), can be the result of incomplete or inaccurate information. We assess market uncertainty by whether supply market trends were easy to monitor, whether the forecasts
were accurate, and whether sufficient information was consistently available for making
decisions. Based on these properties we expect market uncertainty to impact how purchasing is
pursued. Specifically, we suggest that procurement strategies are pursued less aggressively with
a higher level of market uncertainty.

Several prior studies provide support. For example, market uncertainty has been linked to
sourcing decision making (Ülkü, Toktay, and Yücesan 2005) and the selection of purchasing
strategies (Cunningham 1982). Moreover, Bunn (1993, p. 45) showed that the use of a particular
buying decision approach depends on task uncertainty, which is “the buyer’s perceived lack of
information relevant to a decision situation,” and Van de Vrande, Lemmens, and Vanhaverbeke
(2006) argued, in their study on external technology sourcing, that high market uncertainty
should be responded with a lower level of commitment. In addition, findings by Hoskisson and
Busenitz (2002) suggested firms favoring joint ventures over acquisitions in the presence of high
market uncertainty; the former approach can be considered as less aggressive when compared to
the latter. Furthermore, Cannon and Perreault (1999) used the concept of supply market
dynamism, which is similar to our market uncertainty construct, as a key determinant for the
resulting buyer-supplier relationship. Tullous and Utecht (1992) suggested that market
uncertainty should influence a firm’s choice of whether to source from a single or multiple
suppliers. In general, multi-sourcing is favored in environments with high uncertainty
(Elmaghraby 2000). Along similar lines, Steensma and Corley (2000), investigating the impact
of uncertainty on the resulting sourcing relationship, suggested higher uncertainty being
associated with less involved relationships. Analogous in our case, high uncertainty is related to
a less involved pursuit of a buyer’s procurement strategy.
Market uncertainty can certainly be labeled as one of the most influential factors in choosing one sourcing strategy versus another (Trevelen and Schweikhart 1988), and several quantitative models have been developed to account for this fact in procurement decisions (e.g., Anupindi and Akella 1993; Bollapragada, Rao, and Zhang 2004). That uncertainty can impact bundling strategy has also been shown in downstream bundling (Palfrei 1983).

Our focus on multi-item RFQs makes this investigation particularly intriguing, since prior research usually did not use this characteristic as a differentiator. Market uncertainty may be higher for bundled purchases than for single-item transactions, since more items need to be considered, potentially increasing the uncertainty in an exponential fashion. Within this context, market uncertainty will have an impact on the strategic emphasis in the procurement strategy of the buyer, i.e. how much importance is placed on strategic objectives in sourcing multi-item RFQs. With heightened market uncertainty causing less confidence, we suggest that buyers are able to pursue their associated objectives with less emphasis, yielding the following hypothesis:

H1b: Increased market uncertainty present for the multi-item RFQ leads to lower strategic emphasis in the buyer’s procurement strategy.

2.1.3. Supply Base Availability. Supply base availability characterizes the environment the buyer operates within, as it relates to the number of capable alternate supply sources available for a particular multi-item RFQ. Past research has shown that the availability of competent supply sources determines how buyers treat these suppliers and approach negotiations (Bunn 1993; Cannon and Perreault 1999). Others suggested a link between supply base availability and a decision maker’s decision process (Bunn 1993). The present study assesses supply base availability by noting whether multiple companies could have supplied the buyer.
with the bundled RFQ, and whether suppliers had the necessary capabilities and capacities. We suggest that the number of suppliers affects the strategic emphasis in the procurement strategy of the buyer, i.e. the aggressiveness or intensity with which strategic objectives are pursued, in a positive way. Since bundling items together into a single RFQ can restrict the supply base availability significantly (Schoenherr and Mabert 2007), we argue that the multi-item aspect is particularly interesting to explore.

Prior research provides support for this argument. For instance, Kotabe, Murray, and Javalgi (1998) suggested that the availability of alternative suppliers influences the internal or external sourcing choices of firms, and Choi and Krause (2006) discussed the concept as influencing supply base complexity. Kekre, Murthi, and Srinivasan (1995) established the link between supplier availability and quality, as well as the performance of the finished product. Supply base availability was also a key concern in Spekman’s (1988) study on buyers’ perceptions of strategic vulnerability, and was one of the four determinants of buyer-supplier relationships in Cannon and Perreault’s (1999) research. It has been used in Bunn’s (1993) taxonomy of buying decision approaches, and was a moderating variable influencing the buyer’s strategic decisions in Rutherford, Boles, Barksdale, and Johnson (2008). Additional studies suggested the link between the number of available suppliers and strategic choices of the firm (Engelbrecht-Wiggans, Haruvy, and Katok 2007). Within the context of downstream bundling, i.e. the bundling of products to customers, it has also been shown that the number of buyers can influence the strategy of the seller (Palfrei 1983). Based on this discussion, we suggest that when the choice set within the supply base is large, buyers experience more freedom in executing their strategies. A larger available supply base provides purchasers with more leeway and the
opportunity for a stronger strategic emphasis, i.e. a more aggressive pursuit of strategic objectives in their procurement strategy. The next hypothesis is formulated as follows:

\[ H1c: \text{Better supply base availability present for the multi-item RFQ leads to greater strategic emphasis in the buyer's procurement strategy.} \]

2.1.4. Buyer Bargaining Power. Bargaining power, central to many business relationships (Porter 1980), refers to the clout or influence buyers have over suppliers, and the degree to which favorable outcomes or concessions can be demanded. Power, or the ability to control decision variables in relationships (El-Ansary and Stern 1972), can, for example, be assessed by how important it was for the suppliers, or how eager they were, to get the business. Bargaining power has been an important variable in industrial buyer behavior (Hunter et al. 2006), and in the investigation of buyer-supplier relationships (Johnston and Lewin 1996). Power can impact behavior and the outcome of sourcing negotiations (Schoenherr and Mabert 2007). The less powerful member in a relationship usually provides responses that the more powerful party desires (Leonidou 2005). The entity with heightened bargaining power has more control and influence over which strategy to pursue (El-Ansary and Stern 1972). Associated is the liberty to follow desired objectives more rigorously or with greater emphasis. The more powerful party has fewer limitations in what they can do, or in how strongly they can push preferred agendas. Therefore, procurement strategies should be reflective of and directly account for the level of bargaining power available (He and Ioerger 2005). Bunn (1993) suggested a particular buying decision approach depends on the buyer’s perceived power. Possessing bargaining power for bundled purchases can be especially crucial when the SKUs in the bundle are very dissimilar from each other, potentially making it difficult for suppliers to provide all the items bundled
together (Schoenherr and Mabert 2006). Instead of the supplier foregoing the business opportunity and not bidding on the RFQ due to unfavorable item combinations, the buyer’s bargaining power can entice the supplier to participate. Heightened bargaining power should be particularly useful in our context of multi-item RFQs, enabling the buyer to pursue strategic objectives more meticulously. Additionally, bundling items together usually increases the spend volume of the RFQ, providing the buyer with a better bargaining position (Schoenherr and Mabert 2006; cf. Linthorst, Telgen, and Schotanus 2008). Suppliers should be more motivated to bid for the business due to the potential for greater profit with the increased bundle volume. The power, especially in a multi-item RFQ setting, provides the buyer with more freedom and leverage, which we expect to see as enabling a more rigorous pursuit of their procurement strategies. We therefore hypothesize the following:

H1d: Heightened buyer bargaining power present for the multi-item RFQ leads to greater strategic emphasis in the buyer’s procurement strategy.

2.1.5. Item and Supply Base Experience. This study considers two types of experience, item experience and supply base experience, as impacting the strategic emphasis of the buyer, i.e. the aggressiveness or intensity with which strategic objectives associated with multi-item RFQs are pursued. Both factors have been main variables in industrial buying behavior research. Item experience refers to the degree of knowledge an industrial buyer possess about the items included in the multi-item RFQ. Low item experience exists when items are relatively new or a purchaser possesses little experience with the items. In either case, minimal information has been internalized and little is known about the items; for example, how and from whom to purchase the bundle. Supply base experience measures how knowledgeable the buyer is about the supply
base, including their capabilities, capacities, the availability of the items, and the suppliers’
product spectrums.

The concept of the buyer’s experience, which can certainly impact decision making and
strategic choices (Tyler and Steensma 1998), has been used in numerous prior studies. For
example, a heightened experience was associated with a less extensive search for information
(Weiss and Heide 1993). In addition, Johnson, Klassen, Leenders, and Awaysheh (2007)
assessed experience as impacting the selection of supply initiatives, and Claycomb and
Frankwick (2004) considered a buyer’s prior experience as a moderating variable to various
buyer behaviors in industrial purchasing. Furthermore, Johnston and Lewin (1996), who
synthesized 25 years of research on industrial buyer behavior, following the seminal works of
Robinson, Faris, and Wind (1967), Webster and Wind (1972), and Sheth (1973), identified
experience as one key variable that has been investigated in related research. In fact, it was
already a component of the above cited three first models of industrial buyer behavior. While
experience influences buyer behavior directly, it also indirectly impacts conflict resolution and
negotiation behavior, the buying group characteristics, and the amount of additional information
needed (Johnston and Lewin 1996). Moreover, Sheth and Sharma (1997), investigating supplier
relationships, stressed the importance of considering experience and learning that takes place
over time. Another study suggested that firms with more experience are faced with fewer
obstacles in executing their procurement strategies (Cho and Kang 2001). Experience with
suppliers was a key concern in Spekman’s (1988) study on buyers’ perceptions of strategic
vulnerability, and has been shown as influencing an agency’s procedural choice in Greenstein
(1995). Experience was also a major variable in Åkesson, Jonsson, and Edaniu-Hällås’ (2007)

These arguments provide support for our postulation that experience influences the procurement strategy of the buyer, i.e. the level of engagement with which objectives are pursued. This should be true especially for bundled purchases, which possess a greater complexity due to several SKUs being combined in a single RFQ. The multi-item context places more emphasis on item and supply base experience, since the inclusion of several items, as well as their combination in an RFQ, most likely requires additional experience. In the present study we differentiate between item and supply base experience, as defined above, and present the following hypotheses.

H1e: Better item experience/knowledge present for the multi-item RFQ leads to greater strategic emphasis in the buyer’s procurement strategy.

H1f: Better supply base experience/knowledge present for the multi-item RFQ leads to greater strategic emphasis in the buyer’s procurement strategy.

2.2. The Impact of Procurement Strategy on Purchase Performance

This study defines purchase performance as the buyer’s perceived success of the multi-item RFQ and the associated negotiations. Performance is measured by whether the bundle received competitive bids, whether bundling created internal synergies and savings, and whether purchase price savings were higher than expected. In addition, we assess the general satisfaction of the buyer by asking whether they achieved their goals for the focal RFQ, and whether they would source the bundled RFQ with the same item combination again. The performance measure is subjective, as perceived by the buyer (cf. Athanassopoulos and Iliakopoulos 2003). While we
could have chosen a more objective performance measure, such as in Li, Markowski, Markowski, and Xu (2008), we felt that a subjective one captures the totality of the RFQ event better. Our unit of analysis is the multi-item RFQ, so traditional success measures, such as return on investment or inventory turns, would not be useful. A common success measure in purchasing has also been the percent of savings achieved; however, with this measure we would only focus on the price aspect of the sourcing event, neglecting some of the other objectives that may have been pursued, and which may have actually lead to a higher price (e.g., for the benefit of a reduction in risk). The performance measure specifically relates to the multi-item context.

Past research suggested a link between procurement strategy and performance. For example, Monczka, Trent, and Callahan (1993), who studied supply base strategies to maximize supplier performance, concluded that the ability to compete depends on the development of aggressive strategies. Janda and Seshadri (2001) explored the link between four purchasing strategies (cooperative negotiation, collaborative interaction, supplier base, and temporal relationship) on two dimensions of procurement performance, efficiency and effectiveness. The authors found that especially cooperative negotiation and long-term oriented relationship strategies lead to increased purchase performance. Cousins and Lawson’s (2007) research provided additional evidence for the association of procurement strategy with relationship and business outcomes. Specifically, they explored the impact of the two sourcing strategies of “critical” and “leverage” on using either an arms-length or collaborative relationship approach, as well as the subsequent effect on performance. The authors’ study highlighted the importance of aligning sourcing strategies to particular supplier relationship approaches in order to improve firm performance. In addition, Murray and Kotabe (1999) focused on location and ownership factors of service sourcing strategies and investigated their impact on performance. The authors
found that strategies associated with internal and foreign sourcing of supplementary services have a negative impact on a service’s market performance. The link between sourcing strategy and performance was also studied by Murray, Kotabe, and Zhou (2005) within the context of a transitional economy, China. The authors found that strategic alliance-based sourcing is associated with better market performance, given low levels of product innovativeness and technological uncertainty. Findings from these studies suggest that a more involved sourcing approach should result in better performance. Therefore, we expect that a greater emphasis on strategic goals will positively impact performance. Furthermore, Schoenherr and Mabert (2008) found that more dissimilar or heterogeneous items combined in the bundle lead to lower perceived performance. Investigating the link between strategic emphasis associated with a multi-item RFQ and performance should be of particular interest, providing insight in this more constrained sourcing environment. We hypothesize the following:

H2: A stronger strategic emphasis in the buyer’s procurement strategy is associated with better perceived performance of the multi-item RFQ.

3. METHODOLOGY

3.1. Sample and Data Collection

Data were collected via a large-scale online survey created and administered according to Dillman’s (2000) tailored design method. A random address set of purchasing professionals employed in manufacturing industries was kindly provided by the Institute for Supply Management (ISM), the major procurement and supply management association in the U.S. We focused on the manufacturing industry (standard industrial classification (SIC) codes 2000 through 3900) to make the study more manageable and to diminish confounding effects.
Questionnaire recipients were asked to focus on the most recent multi-item RFQ they were involved, and about which they had sufficient knowledge. Subsequent questions then referred to this focal multi-item purchase (cf. Choi and Hartley 1996).

A total of 825 useable and complete responses were received, yielding an effective response rate of 17.8%. When looking at the respondents’ SIC codes, most firms came from miscellaneous manufacturing industries (23.8%), followed by electronic/electric equipment (16.0%), fabricated metal products (8.9%) and chemicals and allied products (8.7%). All remaining manufacturing SIC codes had a representation of less than 8%. A wide range of different-sized companies was represented in the sample, with an average number of 8,800 employees. A breakdown is provided in Table 1. A one-way analysis of variance (ANOVA) was conducted to assess the relationship between organization size and procurement strategy, whose derivation will be described in the next section. No significant differences were detected.

<table>
<thead>
<tr>
<th>Employment</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=150</td>
<td>114</td>
<td>14.71</td>
<td>14.71</td>
</tr>
<tr>
<td>151-300</td>
<td>104</td>
<td>13.42</td>
<td>28.13</td>
</tr>
<tr>
<td>301-500</td>
<td>101</td>
<td>13.03</td>
<td>41.16</td>
</tr>
<tr>
<td>501-1,000</td>
<td>97</td>
<td>12.52</td>
<td>53.68</td>
</tr>
<tr>
<td>1,001-1,500</td>
<td>113</td>
<td>14.58</td>
<td>68.26</td>
</tr>
<tr>
<td>1,501-8,000</td>
<td>108</td>
<td>13.94</td>
<td>82.19</td>
</tr>
<tr>
<td>8,001-50,000</td>
<td>99</td>
<td>12.77</td>
<td>94.97</td>
</tr>
<tr>
<td>&gt;50,000</td>
<td>39</td>
<td>5.03</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The average focal multi-item RFQ was comprised of 249 individual items, with over three-quarters of the bundles containing less than 100 items. An ANOVA evaluating the relationship between number of items and procurement strategy yielded no significant results. Over half of the RFQs contained primarily direct materials (58.7%), followed by indirect
materials/MRO items (24.8%) and services (7.5%). The average spend of an RFQ was $7.26 million, with the median being $500,000.

To assess non-response bias the first (early) and last (late) two-hundred respondents to the survey were compared (Armstrong and Overton 1977), with late respondents being approximated as non-respondents (Pace 1939). The comparison between the two groups across the final dependent variable, performance, as well as other variables such as spend and number of employees, turned out to be not statistically significant. Non-response bias was thus regarded as not a serious problem.

3.2. Measurement Items and Scales

This section describes the summated rating scales (Spector 1992) used to measure the constructs in our hypotheses. Measurement items were developed based on established scales and/or case studies and interviews with sourcing managers conducted by the authors. Respondents to the survey were asked to indicate their agreement or disagreement with these statements on a seven-point Likert scale, with higher values indicating stronger agreement.

The central variables in our research are the strategic purchasing goals and the associated procurement strategies the company pursues when employing a multi-item RFQ. In order to capture the most current and relevant goals within this context we conducted a series of case studies, interviewing procurement professionals about their strategies and goals followed when creating multi-item RFQs. Simultaneously these efforts were complemented with a review of related literature and the identification of most common purchasing goals used to describe strategy; the literature review above summarizes some of these works. This approach ensured the relevancy and applicability to both industry practice and prior research, leading to the
identification of a comprehensive list of eleven key goals. Respondents were asked to indicate their degree of agreement with the particular goal being pursued in the specific multi-item purchase situation.

Measures for *purchase importance* were developed based on scales used in McQuiston (1989) and Heide and Weiss (1995), adapting them to the multi-item RFQ context. Higher aggregate values indicate an increased importance of the purchase. *Market uncertainty* is measured with a combination of items adapted from Heide and John (1988) and Cannon and Perreault (1999). High market uncertainty is present with a higher aggregate value on the scale. Measurement items for *supply base availability* draw on extensiveness of choice scales by Bunn (1993) and Cannon and Perreault (1999). Higher aggregate scores are indicative of increased supplier availability. Scales by Doney and Cannon (1997) and Bunn (1993) were utilized to develop the *buyer bargaining power* construct. Higher aggregate scores signify a heightened degree of buyer bargaining power. We developed our own measures for the *item experience* and *supply base experience* constructs, since no suitable related scales were available. Insight from our case studies and interviews with purchasing professionals aided in this process. Higher aggregate scores on these constructs signify heightened experience. *Purchase performance* measures how successful the multi-item RFQ is perceived to have been, with higher values being indicative of a better performance. Drawing from case study insights, as well as satisfaction and performance scales by Cannon and Perreault (1999), twelve items were developed that serve as the measure for a successful multi-item RFQ.
4. DATA ANALYSIS AND RESULTS

Data analysis employed a four step methodology. First, key procurement strategies were identified via exploratory factor analysis, followed by cluster analyses. An exploratory approach was chosen since the measures for our strategy dimensions were newly developed for the multi-item context. Second, we purified the measurement items for the environmental constructs, as well as for performance. Since these measures were mostly developed based on prior scales, confirmatory factor analysis was used to assess their psychometric properties. Third, the linkage between environmental conditions and procurement strategy (H1a – H1f) was evaluated via multinomial logistic regression analysis. And fourth, the relationship between procurement strategy (strategic emphasis) and performance (H2) was tested via univariate analysis of covariance.

4.1. Step 1: Identification of Procurement Strategies

In order to succeed in today’s competitive environment, firms should not and cannot treat all purchased items in the same way. Rather, items need to be segmented into categories, and specific supply strategies must be developed for each (Carter 1999). While ABC or Pareto analysis has proven useful, its main criticism is the primary focus on cost. To overcome this limitation a portfolio approach is often employed to segment supply along various criteria, usually resulting in a 4x4 matrix. The seminal work of Kraljic (1983) provided an early framework to distinguish purchases based on the importance of the sourced items and the complexity of the supply market. Other dimensions for classifying purchased items into groups included risk/exposure and cost/value/spend considerations (Carter 1999; Monzcka, Trent, and Handfield 2005). Approaches were often labeled tactical, leverage, critical and strategic. Some
classifications focused on strategies for information exchange, multiple sourcing, or partnership (Bozarth, Handfield, and Das 1998). Rather than relying on established labels, we followed a grounded theory approach (Glaser and Strauss 1967) to identify a set of goals most commonly pursued with multi-item purchases. A set of eleven goals was derived via case study research by the authors. We also drew upon prior studies mentioning bundling goals, such as the achievement of complementarities (e.g., Bakos and Brynjolfsson 1999) among multiple items and the reduction of transaction costs (e.g., Adams and Yellen 1976).

To derive a parsimonious set of overriding procurement objectives, a two-phase approach was utilized (cf. Craighead, Karwan, and Miller 2004) employing both factor and cluster analyses. In the first phase the eleven strategic goal statements were subjected to factor analysis (Principal Components, Varimax Rotation with Kaiser Normalization) to identify common overriding strategic emphases. The results were four one-dimensional constructs explaining 68.2% of the variance (Table 2). The factors were labeled according to the common theme they described. Guidance in the labeling was provided by prior sourcing strategy segmentations and their properties in Kraljic (1983), Carter (1999) and Monczka, Trent, and Handfield (2005). The dimension labeled purchasing efficiency includes goals that aim to create a simpler and more streamlined purchasing environment, as well as the minimization of effort. The factor labeled price focus is concerned with the goal of getting the best price in a competitive environment. The bundle building approach deals with the goals of finding new suppliers that can offer a large portfolio of products, and the associated avoidance of cherry-picking (suppliers only submitting bids on the most attractive items and avoiding less desirable ones). The final dimension of supply security includes goal statements related to risk reduction, collaboration and securing of supply.
Table 2. Factor analysis results

<table>
<thead>
<tr>
<th>Strategic Goal</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Purchasing Efficiency</th>
<th>Price Focus</th>
<th>Bundle Building</th>
<th>Supply Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply base consolidation</td>
<td>4.648</td>
<td>1.870</td>
<td><strong>0.787</strong></td>
<td>0.043</td>
<td>0.176</td>
<td>0.078</td>
</tr>
<tr>
<td>A resulting simpler purchasing environment</td>
<td>4.626</td>
<td>1.622</td>
<td><strong>0.750</strong></td>
<td>0.011</td>
<td>0.188</td>
<td>0.272</td>
</tr>
<tr>
<td>More efficient purchasing</td>
<td>5.542</td>
<td>1.356</td>
<td><strong>0.635</strong></td>
<td>0.446</td>
<td>0.007</td>
<td>0.286</td>
</tr>
<tr>
<td>Achieving the best price possible</td>
<td>5.961</td>
<td>1.213</td>
<td>0.098</td>
<td><strong>0.837</strong></td>
<td>0.010</td>
<td>0.137</td>
</tr>
<tr>
<td>Making the bidding as competitive as possible</td>
<td>5.624</td>
<td>1.341</td>
<td>0.050</td>
<td><strong>0.802</strong></td>
<td>0.210</td>
<td>0.198</td>
</tr>
<tr>
<td>Combining attractive and unattractive items in the bundle</td>
<td>4.130</td>
<td>1.764</td>
<td>0.278</td>
<td>0.124</td>
<td><strong>0.805</strong></td>
<td>-0.035</td>
</tr>
<tr>
<td>Avoiding ‘cherry-picking’</td>
<td>4.623</td>
<td>1.704</td>
<td>0.388</td>
<td>0.322</td>
<td><strong>0.659</strong></td>
<td>-0.037</td>
</tr>
<tr>
<td>Finding new supplier(s)</td>
<td>3.775</td>
<td>1.670</td>
<td>-0.224</td>
<td>-0.148</td>
<td><strong>0.602</strong></td>
<td>0.460</td>
</tr>
<tr>
<td>Securing of supply</td>
<td>5.168</td>
<td>1.469</td>
<td>0.112</td>
<td>0.117</td>
<td>0.024</td>
<td><strong>0.795</strong></td>
</tr>
<tr>
<td>Having the least possible risk in sourcing the bundle</td>
<td>4.996</td>
<td>1.484</td>
<td>0.175</td>
<td>0.258</td>
<td>0.045</td>
<td><strong>0.702</strong></td>
</tr>
<tr>
<td>Having a collaborative buyer-supplier relationship</td>
<td>5.202</td>
<td>1.474</td>
<td>0.451</td>
<td>0.145</td>
<td>0.032</td>
<td><strong>0.693</strong></td>
</tr>
</tbody>
</table>

In the second phase, cluster analysis was performed with the derived four constructs to identify prototypical strategic approaches utilized. Since determining the number of clusters can be a challenge, accommodating both parsimony and accuracy, the two-stage procedure outlined by Ketchen and Shook (1996) was followed. The authors suggested using hierarchical cluster analysis to determine the number of clusters, followed by non-hierarchical cluster analysis. The hierarchical cluster analysis using Ward’s minimum variance cluster method was employed and the agglomeration coefficients were calculated. The incremental changes in the coefficients were then computed to detect any large increase in the coefficient. According to Ketchen and Shook (1996, p. 446), “a large increase implies that dissimilar clusters have been merged; thus the number of clusters prior to the merger is most appropriate.” The largest relative change occurred when moving from the four to the three cluster solution (41.09%), suggesting that a three-cluster solution fits the data best. In contrast, the next two largest relative changes were experienced
when moving from a five to a four cluster solution (19.24%), and from a six to a five cluster solution (11.95%).

We proceeded with a non-hierarchical or $k$-means cluster analysis, which is similar to the approach taken by Craighead, Karawan, and Miller (2004) (cf. also Cousins, Lawson, and Squire 2006; Hewett, Money, and Sharma 2002). The three-cluster model, derived above, formed our baseline, against which we compared competing models ranging from two to seven clusters. Following the methodology described in Boyer and Frohlich (2006), we examined each solution in terms of whether the derived clusters differ from each other on the input variable (the four strategic goal dimensions) and on post hoc criteria (the environmental dimensions). These criteria, as well as the managerial interpretability, were utilized to identify the best solution (cf., Boyer and Frohlich 2006). Although a four-cluster solution would have been consistent with prior strategy research and the typology by Miles and Snow (1978), its managerial interpretability was lacking. The additional fourth cluster created was ambiguous, also in terms of distinguishability based on the mean values received compared to other clusters, and did not add value to our interpretation. The three-cluster solution, as suggested by the results of the hierarchical cluster analysis, was used. Table 3 displays the means for each goal dimension, in addition to the means for each cluster. A Scheffé post-hoc test was conducted to examine all possible 24 pair-wise comparisons of cluster means (6 comparisons for each strategic construct). Differences between the means were significant in all cases, confirming a good cluster analysis result.
Table 3. Cluster analysis results

<table>
<thead>
<tr>
<th>Strategic Construct</th>
<th>Overall Mean</th>
<th>Cluster 1: Strategists</th>
<th>Cluster 2: Opportunists</th>
<th>Cluster 3: Responders</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchasing Efficiency</td>
<td>4.94 (3)</td>
<td>5.95 (3/1)</td>
<td>4.55 (3/2)</td>
<td>3.06 (3/3)</td>
<td>385.46***</td>
</tr>
<tr>
<td>Price Focus</td>
<td>5.31 (1)</td>
<td>6.07 (1/1)</td>
<td>5.12 (1/2)</td>
<td>3.36 (1/3)</td>
<td>381.24***</td>
</tr>
<tr>
<td>Bundle Building</td>
<td>4.18 (4)</td>
<td>4.88 (4/1)</td>
<td>3.91 (4/2)</td>
<td>2.84 (4/3)</td>
<td>149.01***</td>
</tr>
<tr>
<td>Supply Security</td>
<td>5.12 (2)</td>
<td>6.02 (2/1)</td>
<td>4.85 (2/2)</td>
<td>3.07 (2/3)</td>
<td>490.13***</td>
</tr>
<tr>
<td>N</td>
<td>317</td>
<td>411</td>
<td>85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a Cluster means are displayed across the constructs. The numbers in the parentheses represent the relative rank of the constructs within each cluster and the relative rank of the cluster within each strategic construct, respectively.***p < 0.001

The final interpretation and labeling of the cluster solutions were guided by various typologies in strategy, sourcing, and supply chain management, as discussed above. While the classification developed by Miles and Snow (1978) received frequent application, we also looked at other typologies in purchasing, operations, supply chain management, and related fields, including how they were derived (e.g., Miller and Roth 1996; Freeman and Cavusgil 2007; Oltra, Maroto, and Segura 2006). As noted, a four-cluster solution could have been fitted to the data, with the last two categories (defenders and reactors) of the Miles and Snow (1978) framework receiving weak support and ambiguous interpretation. The three-cluster solution provided for a sounder managerial interpretation, as discussed in the following.

The interpretation of the three procurement strategy groups was guided by “(a) whether there are significant differences on the cluster means of the [strategic constructs] … at the 0.05 level or less, and (b) the relative ranking of the importance of a [strategic construct] … within a cluster” (Miller and Roth 1994, p. 290). The latter was considered since a high mean value may be associated with a low rank. In Table 3 the relative rank of the constructs within each cluster is denoted by the first number in the parentheses. The second number in the parentheses represents the relative rank of the cluster within each strategic construct. While firms in the three clusters do not differ in their relative rank ordering of the four strategic dimensions, companies do differ.
in the importance they place on the four objectives identified. In other words, respondents did not differ based on which dimension they regard as first, second, third and fourth most important, but based on how much emphasis is placed on each of the objectives. Therefore, we labeled our three clusters as *strategists*, *opportunists*, and *responders* respectively (cf. Freeman and Cavusgil 2007), believing that these labels represent the characteristics of each cluster. It should be noted that all three company clusters follow a certain strategy, either consciously or implicitly. For example, the label *responder* does not imply that firms falling into this group do not act strategically; they may very well do so, but the emphasis with which they pursue their strategic goals is less pronounced compared to the *strategist*. The three clusters are described in further detail below.

When looking at the overall means, the most prominent strategic component was the focus on price and the creation of competition (mean=5.31). This is not surprising given the significant potential of multi-item bundles being able to create economies of scope resulting in a competitive advantage (cf. Ghosh and Balachander 2007). *Price focus* was not only the highest ranked strategic component overall; in each of the three clusters it was also judged to be pursued with the highest emphasis. The basic focus on price or cost has been one of the fundamental strategies in business (cf. Porter 1980) and was the primary objective in early online procurement auctions (Elmaghraby 2007). *Price focus* influences sourcing strategy directly (Åkesson, Jonsson, and Edaniu-Hällås 2007) and was also noted as a strategy that can be pursued by suppliers to attract buyers (Cunningham 1986).

Second in the overall ranking came the emphasis on the securing of supply (mean=5.12), which has been labeled as a crucial responsibility for the purchasing function (Kersten, Schroeder, and Schulte-Bisping 2004; Quayle 2002). The importance of *supply security* is
especially emphasized due to increasing worldwide competition (Leonidou 1998). The offering of supply availability and security was also mentioned as a strategy used by suppliers approaching potential buyers (Cunningham 1986). The emphasis on supply security was consistently positioned second when examining the within-cluster rank in each of the three clusters.

Third in overall rank came the focus on efficiency in sourcing, which included supply base consolidation and the creation of a simpler purchasing environment (mean=4.94). In terms of relative position within each cluster, it was also consistently ranked third. While not being the most important factor, it is still of concern for purchasing professionals when sourcing bundled RFQs. After all, this is one of the drivers for creating bundles (e.g., Bakos and Brynjolfsson 1999). Purchasing efficiency has been a central theme since the early conceptualizations of the discipline. For example, a separate section was devoted to purchasing efficiency in the first college-level textbook on sourcing (Lewis 1933). In recent years, efficiency in purchasing has been significantly increased by the use of electronic procurement tools (Cagliano, Caniato, and Spina 2005).

The bundle building strategy construct was ranked fourth (mean=4.18), which is also consistent across each of the three clusters. This strategy component attempts to ensure that less attractive items are bid on by bundling them together with more attractive ones. Our finding of this aspect being the least emphasized across the groups is consistent with past research (e.g., Schoenherr and Mabert 2006). Nevertheless, bundling can be a valuable strategy in sourcing (Elmaghraby 2007; Ramsay 2001b). How the bundle is structured can have an effect on its value (Linthorst, Telgen, and Schotanus 2008) and impact purchase performance (Schoenherr and Mabert 2008). This is especially critical for the strategists and responders, who both have values
above the midpoint of the scale assessing bundle building; this factor was a real concern for these groups, and should therefore not be neglected.

Examining the three clusters individually, the clear distinction between them is not the relative importance they place on each of the four strategy components (as discussed above, their relative internal ranking was consistent) but the strategic emphasis, the intensity, or the aggressiveness with which they are pursued. Buyers in Cluster 1, labeled as the *strategists*, place the highest emphasis on the four strategic factors. Individuals in this group aim to implement their strategies in a significant way, placing high importance on the pursuit of their goals. Purchasers in Cluster 2, encompassing the *opportunists*, are characterized by exhibiting an intermediate or average strategic emphasis. While objectives are still pursued with importance and intensity, values across the four constructs are consistently lower than the ones from their higher-aiming counterparts. *Strategists* pursue all of their goals in a consistent fashion on high levels, whereas *opportunists* follow a less aggressive approach. Purchasing professionals in Cluster 3, which we labeled the *responders*, are characterized by the lowest values across the constructs. In fact, the means for Cluster 3 are all below the midpoint of the 7-point scale. While this group pursues strategic objectives, their emphasis or intensity with which the strategy components are pursued is rather low, compared to the prior two groups. The *responders* are characterized as the least aggressive in pursuing strategic objectives in their sourcing decisions.

Subtle differences can be observed within each cluster when looking at the relative magnitude of the strategy component means. Individuals in Cluster 1, the *strategists*, place similar emphasis of about equal magnitude on the three highest ranked aspects (price focus, supply security, and purchasing efficiency), whereas the jump in magnitude to the fourth factor, bundle building, is significantly larger. This was confirmed via paired-samples $t$ tests. The
change from price focus to supply security, and the change from supply security to purchasing
efficiency, were not significant, whereas the last change, from purchasing efficiency to bundle
building was ($t(316)=13.983, p<.001$). This observation suggests that *strategists* (Cluster 1) place
about equal emphasis on the first three strategy components, whereas the intensity with which
bundle building is pursued is significantly lower.

For the *opportunists*, mean changes in magnitude between the four strategic dimensions
were statistically significant for all three instances. As such, price focus had a significantly
higher emphasis than supply security ($t(410)=5.780, p<.001$), supply security had a significantly
higher emphasis than purchasing efficiency ($t(410)=4.239, p<.001$), and purchasing efficiency
had a significantly higher emphasis than bundle building ($t(410)=9.079, p<.001$). *Opportunists*
thus have a clear rank-order of their strategic priorities, each being significantly different than
the others.

The mean changes in magnitude between the strategy components for the *responders*
were less pronounced. When comparing the mean values of the dimensions in their rank order,
the only statistically significant difference was the mean change from price focus to supply
security ($t(84)=2.064, p<.05$). This suggests that *responders* primarily focus on price, with the
remaining three goal dimensions being of lesser, but equal importance among themselves.
Nevertheless, it must be noted that this test was only significant at the 0.05 level, and not at the
0.001 level, which was the significance level for the other two strategy groups (*strategists* and
*opportunists*).

Overall, these results confirm our *a priori* expectation that buyer groups differ based on
the strategic emphasis placed on their procurement strategy, i.e. the aggressiveness or intensity
with which goals of multi-item RFQs are pursued (Proposition 1). *Strategists* pursue their
strategic objectives on a broad level, and place equal high emphasis on price focus, supply security and purchasing efficiency, the magnitudes of which are all significantly different versus bundle building. *Opportunists* are more selective and differentiate more in their emphasis on strategy dimensions; *opportunists* are characterized as taking advantage of situations that arise, and following a more focused approach. As such, when going down the objectives in their rank order, each is significantly less intensely pursued than the former. *Opportunists* exhibit a clear hierarchy of strategic priorities. For *responders* the focus on price is significantly stronger than the focus on the remaining three objectives, suggesting that price is truly the main determining factor in their sourcing decisions; supply security, purchasing efficiency and bundle building are pursued as well, but with lower and about equal intensity.

We stress again that the label *responder* does not imply that firms falling into this group do not act strategically; they may well do so, but the emphasis with which they pursue their strategic goals is less pronounced compared to the prior two categories. This is consistent with the related typology developed in Freeman and Cavusgil (2007). When moving from *strategist* to *opportunist* to *responder* the authors described the respective strategy as becoming less proactive, less forward-looking, more risk averse, more cautious, and less bold; also, individuals tend to be more satisfied with their current situation and strategic initiatives are pursued gradually and in smaller steps.

4.2. Step 2: Construct Purification

To assess the psychometric properties of the seven multi-item constructs describing environmental aspects and performance, confirmatory factor analysis (CFA) was conducted using LISREL 8.80. Several measurement items were removed, one at time, based on weak item
loadings, high modification indices, small $t$-values of estimates, and low multiple squared correlations. Items were however only deleted if this move could also be substantiated theoretically. The resulting final measurement structure of the seven factors exhibited favorable fit statistics. The Comparative Fit Index (CFI), the Incremental Fit Index (IFI), the Normed Fit Index (NFI), and the Non-Normed Fit Index (NNFI) obtained values of .98, suggesting a good model fit (Bentler 1992; Bollen 1989; Hair et al. 1998; Hu and Bentler 1998). The Root Mean Square Error of Approximation (RMSEA) of 0.04 ($\chi^2 = 833.09, df = 329$) is also below the threshold value of 0.05 (Byrne 1998), confirming the above evaluation. Based on these assessments, the fit of the proposed measurement model was judged to be good. Table 4 summarizes the final measurement items for each construct (means, standard deviations and Cronbach alphas), as well as the sources that were used to derive the items.
Table 4. Final construct measurement items

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measurement Item / Survey Question*</th>
<th>Mean</th>
<th>S.D.</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase Importance</td>
<td>As a portion of our total spend, this bundle’s dollar volume was high</td>
<td>3.50</td>
<td>1.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The items supported a core competency of our company</td>
<td>4.86</td>
<td>1.73</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Compared to other purchases, the bundled items were important</td>
<td>4.81</td>
<td>1.52</td>
<td></td>
</tr>
<tr>
<td></td>
<td>An unsuccessful outcome of the RFQ would have had only minor consequences (R)</td>
<td>4.33</td>
<td>1.78</td>
<td></td>
</tr>
<tr>
<td>Market Uncertainty</td>
<td>Supply market trends were easy to monitor (R)</td>
<td>3.53</td>
<td>1.35</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forecasts were accurate (R)</td>
<td>3.86</td>
<td>1.41</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sufficient information was consistently available for making decisions (R)</td>
<td>3.47</td>
<td>1.36</td>
<td></td>
</tr>
<tr>
<td>Supply Base Availability</td>
<td>Many companies could have supplied us with all the items in the bundle</td>
<td>4.32</td>
<td>1.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Many suppliers had the necessary capabilities to produce all items in the bundle</td>
<td>4.73</td>
<td>1.69</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Many suppliers possessed the required capacities</td>
<td>4.85</td>
<td>1.59</td>
<td></td>
</tr>
<tr>
<td>Buyer Bargaining Power</td>
<td>We had bargaining power</td>
<td>5.37</td>
<td>1.28</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Getting our business was important for suppliers</td>
<td>5.72</td>
<td>1.12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The suppliers paid a great deal of attention to our company</td>
<td>5.62</td>
<td>1.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Suppliers were eager to get the business</td>
<td>5.78</td>
<td>1.04</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Having us as a customer brought intangible benefits to suppliers (e.g. prestige)</td>
<td>5.05</td>
<td>1.37</td>
<td></td>
</tr>
<tr>
<td>Item Experience</td>
<td>We did not have much experience buying the items in the bundle (R)</td>
<td>5.91</td>
<td>1.41</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The bundle contained items that were relatively new to us (R)</td>
<td>5.95</td>
<td>1.38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We had limited knowledge about how and from whom to purchase the items in the bundle (R)</td>
<td>6.02</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>Supply Experience</td>
<td>We had a good knowledge of suppliers’ capabilities</td>
<td>5.73</td>
<td>1.08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We were familiar with suppliers’ product spectrums</td>
<td>5.45</td>
<td>1.13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We possessed good knowledge about the items’ availability</td>
<td>5.48</td>
<td>1.12</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>The bundle received competitive bids</td>
<td>5.85</td>
<td>1.23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bundling created internal synergies and savings, e.g. lower administrative costs</td>
<td>5.20</td>
<td>1.46</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We would repeat the bundling again for the same items in the future</td>
<td>5.68</td>
<td>1.40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We achieved our goals</td>
<td>5.81</td>
<td>1.26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Having several items bundled together increased our bargaining power with suppliers</td>
<td>5.81</td>
<td>1.29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The final purchase price we had to pay for the entire bundle was lower than expected</td>
<td>4.91</td>
<td>1.45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>We regret the decision to bundle the items together (R)</td>
<td>6.09</td>
<td>1.28</td>
<td></td>
</tr>
</tbody>
</table>

* Items were measured on a seven-point Likert scale ranging from “strongly disagree” (value = 1) to “strongly agree” (value = 7). Reverse coded items are denoted by (R).
Recommendations by Anderson and Gerbing (1988) were followed to assess reliability and validity. *Convergent validity* was assessed by examining whether each estimated coefficient loads significantly on its suggested underlying construct, whereas *discriminant validity* was tested by examining whether the confidence interval around the correlation estimate includes 1.0. These requirements are fulfilled in all instances. Results of the confirmatory factor analysis assured *unidimensionality* of the constructs, with all measurement item loadings being above the suggested threshold value of 0.30 (O’Leary-Kelly and Vokurka 1998). *Reliability* was assessed via Cronbach’s alpha (Cronbach 1951), which should have values of above .7 for established scales, and values of above .6 for newly developed scales (Hair et al. 1998; cf. Ward and Zhou 2006). *Construct validity* was confirmed by assessing the psychometric properties of content validity, unidimensionality, reliability, convergent and discriminant validity (O’Leary-Kelly and Vokurka 1998). The development and design of the final survey instrument and its measurement items assured *content validity*. Overall, based on these validity and reliability assessments of the constructs, their measurements were judged to be sound.

Potential common method bias was assessed via confirmatory factor analysis and the Harman’s single-factor test (McFarlin and Sweeney 1992; Boyer and Hult 2005). If substantial common method bias is present then either a single or a general factor will emerge accounting for most, if not all, of the variables (Podsakoff and Organ 1986). The unidimensional model resulted in a $\chi^2 = 6779.47$ with $df = 350$, indicating that the one-factor model has a considerably worse fit. Thus common method bias is not considered as a serious concern.
4.3. Step 3: The Impact of Environmental Dimensions on Procurement Strategy

To test the first set of hypotheses, the relationships between environmental dimensions and procurement strategy, multinomial logistic regression was conducted. An alternate statistical technique could have been discriminant analysis, but logistic regression was selected since it has been suggested as the preferred technique (Hair et al. 1998; Press and Wilson 1978), offering more straightforward statistical tests (Boyer and Hult 2005).

To validate our model a split-sample approach was used; the dataset was randomly divided into two approximately equal-large groups, sample I ($N=428$) and sample II ($N=397$), which is similar to the approach used by Bardhan, Mithas, and Lin (2007). Our large initial sample size enabled us to do so without losing statistical predictability. Following the procedure outlined in Schwab (2008), we used sample I to calculate the multinomial logistic regression equations. From this result we took the B coefficients to compute the log estimates of the odds of belonging to each group for sample II and then converted each score into a probability, which was used to estimate group membership (Schwab 2008). A last step involved computing the group membership for sample II directly. Now we had the group membership for sample II (a) predicted by using the B coefficients from sample I, and (b) directly from the data in sample II. We compared these two group classifications for sample II. The estimated model, based on sample I, was able to classify 69.3% of the cases correctly in sample II. This is greater than the 50.4% that would be classified correctly by guessing; with no additional information we would guess that each buyer pursues their goals with medium strategic emphasis, assigning them to the opportunists (Cluster 2). For sample II, 194 of the 397 randomly selected records fell into that group, which would yield a correct classification in 50.4% of the cases (194/397) (cf. Boyer and Hult 2005).
Table 5 provides the result of the overall analysis, regressing the environmental constructs on the categorical dependent variable (*Procurement Strategy*). Since the dependent variable has three levels, two regression models are estimated with the *responders* as the reference category. The coefficient estimates in Table 5 then indicate the probability that the observation falls in one of the two remaining categories (*strategists* and *opportunists*), relative to the probability of falling in the *responders* category. Significant positive (negative) coefficients indicate whether a unit increase in the predictor variable will increase (decrease) the probability of being in that category, relative to the *responders* category, given that the other variables in the model are held constant. Overall, the relationship between the dependent variable (*Procurement Strategy*) and the six proposed influential antecedents is highly significant, as indicated by the chi-square statistic. Specifically, Table 5 shows that *purchase importance, supply base availability, buyer bargaining power* and *supply base experience* are all significant determinants of procurement strategy. These results demonstrate that buyers are able to pursue their strategy with greater emphasis as the importance of the item increases, as more suppliers become available, as the power of the buyer increases, and as the experience with the supply base increases. Environmental conditions clearly shape the purchasing strategy of the firm; depending on the environment, purchasers pursue their strategic objectives either as *strategists, opportunists* or *responders.*
Table 5. Multinomial logistic regression results

<table>
<thead>
<tr>
<th></th>
<th>Strategists</th>
<th>Opportunists</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Wald Statistic</td>
</tr>
<tr>
<td>Intercept</td>
<td>-6.385</td>
<td>24.853***</td>
</tr>
<tr>
<td>Continuous variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchase importance</td>
<td>.562</td>
<td>26.906***</td>
</tr>
<tr>
<td>Market uncertainty</td>
<td>-.124</td>
<td>1.007</td>
</tr>
<tr>
<td>Supply base availability</td>
<td>.283</td>
<td>9.763***</td>
</tr>
<tr>
<td>Buyer bargaining power</td>
<td>.636</td>
<td>16.671***</td>
</tr>
<tr>
<td>Item experience</td>
<td>-.163</td>
<td>1.488</td>
</tr>
<tr>
<td>Supply base experience</td>
<td>.351</td>
<td>4.419**</td>
</tr>
<tr>
<td>Model fit statistics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nagelkerke pseudo $R^2$</td>
<td>.18</td>
<td></td>
</tr>
<tr>
<td>Cox &amp; Snell pseudo $R^2$</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>Chi-square</td>
<td>131.24***</td>
<td></td>
</tr>
</tbody>
</table>

1The reference category is responders.

*** $p < .01$; ** $p < .05$; * $p < .10$.

The results show that the independent variables provide good predictive power for the buyer’s strategic emphasis, i.e. the importance placed on strategic objectives. As a follow-up test, individual logistic regression analyses were conducted to assess the individual hypotheses (Boyer and Hult 2005). The results, presented in Table 6, provide good support, confirming five of our six hypotheses. Specifically, it showed that an increased purchase importance ($H1a$), better supply base availability ($H1c$), heightened bargaining power ($H1d$), and better item ($H1e$) and supply base experience ($H1f$) lead to greater strategic emphasis. This confirms that favorable environmental conditions present for multi-item RFQs enable an accentuated execution of strategy. This is especially true when comparing strategists and responders. More subtle are the differences when comparing opportunists with the responders; these lower-emphasis groups seem to be somewhat similar, although significant differences exist as well, as can be seen in Table 6. There was little support for market uncertainty influencing the strategic emphasis of the buyer ($H1b$).
Table 6. Individual regression analyses

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Wald Statistic</th>
<th>Coefficient</th>
<th>Wald Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comparison A:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategists vs. Responders\textsuperscript{a}</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1a: Purchase importance</td>
<td>.290</td>
<td>22.551***</td>
<td>-.304</td>
<td>10.887***</td>
</tr>
<tr>
<td>H1b: Market uncertainty</td>
<td>-.106</td>
<td>2.391</td>
<td>.188</td>
<td>3.248*</td>
</tr>
<tr>
<td>H1c: Supply base availability</td>
<td>.144</td>
<td>8.130***</td>
<td>-.096</td>
<td>1.630</td>
</tr>
<tr>
<td>H1d: Buyer bargaining power</td>
<td>.675</td>
<td>54.729***</td>
<td>-.269</td>
<td>5.823**</td>
</tr>
<tr>
<td>H1e: Item experience</td>
<td>.223</td>
<td>10.388***</td>
<td>.006</td>
<td>.004</td>
</tr>
<tr>
<td>H1f: Supply base experience</td>
<td>.477</td>
<td>29.244***</td>
<td>-.204</td>
<td>3.078*</td>
</tr>
<tr>
<td><strong>Comparison B:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunists vs. Responders\textsuperscript{a}</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{a}The reference category is responders.

\*** p < .01; \** p < .05; \* p < .10.

4.4. Step 4: The Impact of Procurement Strategy on Performance

Whether procurement strategy is associated with the buyer’s perceived purchase performance, stipulated in H2, was assessed with univariate analysis of covariance (ANCOVA). This approach allows for the test between a categorical independent and a continuous dependent variable, controlling for other continuous variables which may covary with the dependent. The independent variable was the strategy type with its three levels, and the dependent variable was the aggregate score of the performance variables. Since environmental conditions may not only determine procurement strategy, but also the success of the purchase directly, we included the six environmental variables as controls. The test of the overall model was significant, $F(8, 792) = 55.553,$ $p < .001;$ the model explained 35% of the variance in the dependent variable, as indicated by the adjusted $R^2$ and $\eta^2.$ These results suggest a strong relationship between the independent variables and performance. Table 7 presents the results. As can be seen, strategists record a performance score that is .320 higher than opportunists, after having controlled for environmental conditions. Similarly, responders record a performance score that is .768 lower than opportunists, again after having controlled for environmental conditions. Overall, the link between sourcing strategy and performance is significant, and the level of emphasis employed in
procurement strategy explains a large amount of variation in performance. Some environmental variables, which were included as controls, also exhibited a significant relationship with performance. As such, buyer bargaining power, item experience and supply base availability positively correlated with purchase performance. However, even with these control variables included, the hypothesized link between sourcing strategy and purchase performance remained significant, accounting for the largest amount of variance explained in the dependent variable.

Table 7. Analysis of covariance results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-value</th>
<th>Significance</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategists</td>
<td>.320</td>
<td>.063</td>
<td>5.083</td>
<td>.000</td>
<td>.032</td>
</tr>
<tr>
<td>Responders</td>
<td>-.768</td>
<td>.096</td>
<td>-7.964</td>
<td>.000</td>
<td>.074</td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchase importance</td>
<td>.023</td>
<td>.023</td>
<td>1.006</td>
<td>.315</td>
<td>.001</td>
</tr>
<tr>
<td>Market uncertainty</td>
<td>-.038</td>
<td>.027</td>
<td>-1.428</td>
<td>.154</td>
<td>.003</td>
</tr>
<tr>
<td>Supply base availability</td>
<td>.051</td>
<td>.019</td>
<td>2.654</td>
<td>.008</td>
<td>.009</td>
</tr>
<tr>
<td>Buyer bargaining power</td>
<td>.279</td>
<td>.034</td>
<td>8.102</td>
<td>.000</td>
<td>.077</td>
</tr>
<tr>
<td>Item experience</td>
<td>.126</td>
<td>.028</td>
<td>4.574</td>
<td>.000</td>
<td>.026</td>
</tr>
<tr>
<td>Supply base experience</td>
<td>.058</td>
<td>.037</td>
<td>1.550</td>
<td>.122</td>
<td>.003</td>
</tr>
<tr>
<td>Intercept</td>
<td>2.768</td>
<td>.277</td>
<td>9.990</td>
<td>.000</td>
<td>.112</td>
</tr>
</tbody>
</table>

* Results are presented relative to the opportunists category.

Follow-up tests investigating pair-wise differences among the sourcing strategy means were conducted, adjusting for multiple comparisons using the Bonferroni approach. Significant differences existed in all of the six pair-wise comparisons. Overall, these results support the hypothesized relationship, suggesting that a greater strategic emphasis in sourcing strategy is associated with higher performance. Table 8 presents the means and standard deviations for the three strategy groups.
Table 8. Means and standard deviations of performance across strategies

<table>
<thead>
<tr>
<th>Procurement Strategy</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategists</td>
<td>6.058</td>
<td>.736</td>
</tr>
<tr>
<td>Opportunists</td>
<td>5.502</td>
<td>.822</td>
</tr>
<tr>
<td>Responders</td>
<td>4.600</td>
<td>1.491</td>
</tr>
</tbody>
</table>

5. DISCUSSION

This research focused on procurement strategies for multi-item RFQs in B2B markets, with the contention that there are diverse groups of industrial buyers who pursue sourcing with different strategic emphases. Commencing with eleven goal statements developed from field and case study experience, as well as prior literature, four overarching objective groups were derived. These consisted of the focus on purchasing efficiencies, price, supply security, and bundle building. Recognizing that singularity of objective pursuit is unlikely, one would expect to see buyers reaching for multiple goals, but with differing intensity levels and emphases. Our data supported this *a priori* expectation and suggested a three-cluster solution. According to their strategic emphasis, we labeled individuals as *strategists, opportunists, or responders*. Particularly intriguing was the same relative ranking of the four objectives across the three strategy groups. All three clusters regarded the focus on price as most important, followed by the desire for supply security, purchasing efficiency, and bundle building. Price or competition related objectives receiving the highest ranking is consistent with studies in international sourcing (e.g., Monczka and Giunipero 1984), but was contradictory to others that showed non-price factors as being most important (e.g., Min and Galle 1991) (cf. Kaufmann and Carter 2002). When looking at our results, it should be noted that while the focus on price received the highest rank, the emphasis on supply security follows very closely considering the magnitude of the means (Table 3). Buyers not only focus on price, which has been the practice in the past (Grittner 1996), but
also on other objectives of almost equal importance. New facets of competitiveness, such as just-in-time capabilities by suppliers, can explain this development.

The test of our proposition confirmed that buyers differ in their emphases with which strategic procurement objectives are pursued. Antecedents impacting this emphasis were explored with the first six hypotheses, linking environmental conditions to procurement strategy. The results indicate that a heightened purchase importance (H1a), a better supply base availability (H1c), and increased buyer bargaining power (H1d) all lead to greater strategic emphasis. Hypotheses H1e and H1f were also supported, confirming the influence of item and supply base experience on the level of strategic intensity employed in procurement. More experience enables the buyer to place greater emphasis on their strategic objectives. This result brings clarification to prior surprising findings by Johnson, Klassen, Leenders, and Awaysheh (2007), whose data suggested that more experienced sourcing executives are less likely to pursue strategic initiatives. This is similar to Tullous and Utecht’s (1992) study; their data did not support the proposed link between supply base experience and sourcing strategy.

Hypothesis H1b, linking market uncertainty to strategic emphasis, was not supported. An uncertain market with incomplete information does not make purchasers less confident in executing their strategy; in other words, the emphasis with which strategic goals are pursued is not affected by the uncertainty present. This result, although counter to our expectation, is consistent with findings in Tullous and Utecht (1992). While these authors argued for a link between market uncertainty and the choice between single or multiple sourcing, their data did not support the relationship. The explanation offered was that buyers may not have associated how market uncertainty could have influenced strategy, and vice versa, i.e. how strategy could have been a response to higher uncertainty with the related aim to reduce it. A similar
explanation can serve in our instance to explicate this counterintuitive result. Alternatively, market uncertainty could have been perceived as a given and inherent within the system. While the buyer may have realized the presence or absence of uncertainty, it may be seen as “too external”, with the buyer’s strategy unable to reduce it. A further aspect that could have resulted in this unsupported relationship is the measurement of market uncertainty. While our measures were developed based on established scales and the psychometric assessment was satisfactory, alternate measures should be explored. We encourage future research to bring clarity to this issue.

These results are insightful for industrial buyers who, depending on the environmental conditions, are provided with a framework determining procurement strategy. The results are also useful for suppliers who, if able to estimate the environmental conditions that the buyer faces, can tailor their marketing strategies and offers accordingly. For example, suppliers are likely to have a better chance of achieving more of their objectives when selling to buyers that place lower emphasis on strategic objectives.

While some of these results may seem intuitive, our unique contribution lies in the examination of these relationships for the multi-item RFQ and a confirmation of anecdotal evidence. We are not aware of any published studies that investigate this environment specifically; the potential existence of differences between the multi-item and single-item RFQ was illustrated in the development of the hypotheses above. To our knowledge, the present study is the first to look at the impact of environmental parameters on procurement strategy, and its subsequent influence on performance, within the context of multi-item RFQs. We propose a unique way of examining sourcing strategy, namely by looking at it as a composite of the pursuit
of several goals. Our main differentiating factor is the strategic emphasis with which the strategies are pursued.

As an additional aid for practicing managers, interaction graphs are presented in Figure 2 for the six environmental variables determining procurement strategy. The graphs map the predicted response probabilities for choosing the respective sourcing strategy (y axis) to increasing values on the independent environmental variable (x axis). For example, the first chart in Figure 2 presenting purchase importance, illustrates that as the importance of the purchase increases, the likelihood of pursuing the sourcing strategy with greater strategic emphasis increases. Similarly, the second chart in Figure 2 indicates that as market uncertainty increases, the chances of following a strategy with greater strategic emphasis decreases. Overall, the chances of being a strategist, i.e. pursuing a strategy with a greater emphasis or intensity, increases as (i) purchase importance increases, (ii) market uncertainty decreases, (iii) supply base availability increases, (iv) buyer bargaining power increases, (v) item experience increases, and (vi) supply base experience increases. As these environmental conditions change in the direction indicated, the graphs suggest that respondents in our sample were more likely to fall in one strategy category versus the others. Overall, the charts represent a cohesive summary of best practices exhibited by the companies in our sample and provide insight into what the average respondent in our sample would do. Practitioners can use these plots and relationships to benchmark their sourcing strategy, compared to the average response of purchasing professionals in our sample.
Figure 2. Estimated probability plots of environmental variables determining procurement strategy

Legend:

- Strategists
- Opportunists
- Responders

Purchase Importance

Market Uncertainty

Supply Market Availability

Buyer Bargaining Power

Item Experience

Supply Base Experience
The hypothesized link between procurement strategy and performance \((H2)\) was supported, after having controlled for the direct impact of our environmental conditions on performance. The result confirms that buyers possessing greater strategic emphasis experience better performance. It should be noted that performance is measured as a qualitative assessment of how successful the multi-item RFQ negotiations and their outcome were perceived by the buyer. We consciously did not use a hard quantitative measure, such as percent saved compared to the prior purchase of the products, since this would only focus on one of the four dimensions of strategic orientation.

Three of the six environmental variables, included as controls, also positively correlated with purchase performance. Specifically, buyer bargaining power, item experience and supply base availability exhibited significant coefficients influencing performance. These findings are consistent with prior literature. First, bargaining power, or the power imbalance between buyer and supplier, has been noted as a crucial variable influencing buyer-supplier relationships, sourcing strategy and outcome (e.g., Boulding and Staelin 1990; Dowlatshahi 1999; Paulraj and Chen 2007; Saeed, Malhotra, and Grover 2005). Our study confirmed that bargaining power has a direct relationship with performance. Second, the link between experience and purchase performance seems logical, although very few studies exist that investigate this relationship (Gao, Pan, Lu, and Tao 2008). However, related research on the impact of knowledge on performance provides support (Edmondson, Winslow, Bohmer, and Pisano 2003). In particular tacit knowledge, or experience that represents a resource under the resource-based view of the firm (Barney 1991), should be able to influence performance. Future research is encouraged to investigate this relationship specifically in sourcing. And third, our data suggest that a larger supply base does not only influence procurement strategy, but also the performance achieved.
This is consistent with prior findings which associated a larger supply base availability with potential lower cost and better quality in favor of the buyer (Kekre, Murthi, and Srinivasan 1995). Our study confirmed this relationship. However, even with these control variables included, our hypothesized link between procurement strategy and purchase performance remained significant, and accounts for the largest amount of variance explained in the dependent variable.

The supported relationship between procurement strategy and performance suggests that buyers should aim at pursuing a strategy that is as aggressive as possible. However, not all purchasing professionals are able to do so, primarily due to the constraints placed on them by the environment. If individuals are able to alter the environmental conditions in their favor, for example by obtaining additional market knowledge and thus increasing supply base experience, a more aggressive procurement strategy becomes feasible. Nevertheless, the effort expended in such tasks may not be worth the rewards reaped in the end, and such investments should be considered carefully.

6. CONCLUSION

This research investigated procurement strategies for multi-item RFQs in B2B markets, making several contributions. First, it established important sourcing strategies and objectives which differ based on the emphasis, intensity or aggressiveness with which they are pursued. Overriding sourcing objectives, which were derived based on factor analysis, included the focus on price, supply security, purchasing efficiency and bundle building. Cluster analysis was employed to identify comprehensive sourcing strategies. A three-cluster solution fit the data best, indicating that buyers can be differentiated by the level of strategic emphasis. The clusters were
labeled *strategists*, *opportunists* and *responders* to reflect their orientation. While the relative ranking of the four sourcing objectives across the three clusters remained the same, their relative importance within each cluster differed. Second, environmental antecedents impacting sourcing strategy were explored, detecting significant relationships. Specifically, greater strategic emphasis is present with an increase in purchase importance, supply base availability, buyer bargaining power, item experience, and supply base experience. And third, the impact of sourcing strategy on performance was confirmed, with a more goal oriented or aggressive strategy leading to better performance. Our unique contribution lies in the examination of these relationships for the multi-item RFQ. Furthermore, we developed estimated response curves that illustrate the three procurement strategies being predictably and significantly different from each other across the environmental variables. Additionally, we confirmed with a large-scale survey what was primarily anecdotal evidence. This study contributes to the growing body of academic research by grounding the formation and selection of sourcing strategies in prior research and theory, and to industry practice by providing insight and guidance informing facets of procurement strategy.

As with any research, limitations exist. While our construct measures were developed based on past literature and case study insights, and although these measures possessed favorable psychometric properties, they might not be able to capture the true underlying nature of the respective dimension. This is, for instance, the case for market uncertainty, which could also be measured by items developed in Chen and Paulraj (2004). With a different conceptualization of market uncertainty, the link to strategy type, which was not supported in our study, might become significant. This stresses the need for replication, which is crucial for the reliability of empirical research (Kaynak and Hartley 2008).
Further research extensions exist. First, from an industrial buyer behavior perspective, it will be insightful to examine the three strategy types further in greater detail, for instance in terms of what specific activities are conducted with each. Industrial buying behavior research has suggested variables such as extent of analysis, information search, and procedural guidance (Hunter, Bunn, and Perreault 2006). To what extent these activities are pursued with each sourcing strategy should be attractive avenues.

And second, an investigation of how each strategy is executed should be of interest. For example, will companies with greater strategic emphasis rely primarily on face-to-face negotiations, or will they experiment with more transactional negotiation modes, such as competitive bidding or online reverse auctions? Whichever strategy and mode of execution is applied, the impact on performance needs to be assessed. It is hoped that the present study serves as a motivation to pursue this area of research further.

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