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## Abstract

Supply chain management (SCM) research has tended to focus on the planning and management of a broad range of activities involved in sourcing and procurement, conversion, and management of logistics. However, the domain is increasingly recognising the significance of coordination and collaboration between channel partners. As such, there is a need to better understand how channel partners make decisions; and in particular, whether there is an alignment in the expectations of these partners. In this study we use an agency theory approach to explore the relative importance of various supply chain components to reveal the decision-making trade-offs that occur when buyers evaluate the services of a third party logistics provider. Our research approach overcomes many of the limitations seen in previous studies that rely on simple rankings by survey respondents through the direct identification of the customer's utility for different service provider attributes. The results confirm the importance of various performance-level attributes and point us towards a new set of higher order capabilities based on professionalism and proactive innovation.



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**ABSTRACT**

Supply chain management (SCM) research has tended to focus on the planning and management of a broad range of activities involved in sourcing and procurement, conversion, and management of logistics. However, the domain is increasingly recognising the significance of coordination and collaboration between channel partners. As such, there is a need to better understand how channel partners make decisions; and in particular, whether there is an alignment in the expectations of these partners. In this study we use an agency theory approach to explore the relative importance of various supply chain components to reveal the decision-making trade-offs that occur when buyers evaluate the services of a third party logistics provider. Our research approach overcomes many of the limitations seen in previous studies that rely on simple rankings by survey respondents through the direct identification of the customer's utility for different service provider attributes. The results confirm the importance of various performance-level attributes and point us towards a new set of higher order capabilities based on professionalism and proactive innovation.

**Keywords:** buyer preferences, logistics services, best-worst experiment, decision making**,** agency theory.

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## INTRODUCTION

Panellists at a recent Wharton Global Forum (8-9 June, 2006) described logistics as "…the connective tissue that makes the global economy work." George Day, the forum moderator, emphasised how logistics can be a huge opportunity for competitive advantage and form the basis of new and innovative business models (Knowledge@Wharton 2006). It is this type of thinking that has elevated third-party logistics services (3PL) to new levels of importance, both operationally and strategically. Initially, 3PLs were engaged predominantly for transportation and warehousing services. However, as a greater number of traditional in-house value chain activities - most notably procurement and production - have been outsourced, logistics companies have increased their capabilities to deliver 'value added' service throughout the supply chain. As a result, today's 3PLs are offering an increased range of services and doing so on a global basis. A number of the notable players in the industry - e.g., DHL, FedEx and UPS - offer highly integrated global services that have been fuelled by their increased range and depth of capabilities and expanding global reach.

The growth of this industry has delivered remarkable financial results over the past decade. In 1995 the overall value of logistics costs in the USA was reported to be approximately US$773 billion. In 1996, the 3PL market that formed a focused part of logistic business activities had an estimated value of US$31 billion, and by 2004 this had grown to $US85 billion. Interestingly, the cost of logistics as a percentage of US gross domestic product (GDP) declined over the same period from 10.4% in 1995 to 8.6% in 2004 (Capgemini 2005). Equivalent figures have been reported in Europe (Logistics 2004) and in Australia (DOTARS 2002). These results are due to a combination of cost-reducing factors such as: improved logistics practices and

education; economies of scale for both the 3PLs and their customers (Lieb and Miller 2002); and technological advances (Peters and Lieb 2000).

Given the strategic importance of supply chain activities it will come as no surprise that the selection and purchase of transportation and logistics services is a complex process that comprises many parts. Firstly, a company must decide which activities to outsource. Secondly, it must select the most appropriate service provider to perform these activities. To date, the academic and practitioner literature has largely focussed on the 'build versus outsource' debate (Clegg, Burdon and Nikolova 2005) together with commentaries on the positive and negative aspects of relationship(s) between the 3PL provider and their customers (e.g. Power and Moosa 2006). Only a small corpus of research has begun to explore the nature of consumer demand in the supply chain industry (Verma, Louviere and Burke 2006).

This study will explore new ground and open up the 'black box' of customer decision making in a business-to-business (B2B) setting by concentrating on the relative importance of those factors contributing to the perception of 3PL service providers. More specifically, we shed new light on those attributes considered most important by using a market utility-based approach that uses a form of discrete choice analysis known as a best-worst experiment. This approach has been shown to be very effective for understanding customer needs and preferences when exploring new service designs (Goodale, Verma and Pullman 2003). For example, Verma, Iqbal and Plaschka (2004) demonstrated its use in service capacity scheduling in e-financial services, and Goodale, Verma and Pullman used it to develop a holistic approach to market-based service capacity scheduling that improved understanding of customer preferences for service attributes (2003, p.165). Iqbal, Verma and Baran (2003) used discrete choice analysis data collected from over 2,000 customers across the United States to show that the level of development of services

and exposure to information influences the features of transaction-based e-services. The value of this mode of research is not just in understanding these decisions but in being able to influence management decisions about the strategic, operational and tactical aspects of their businesses directly.

The remaining sections of this paper set about developing a ratio scale for buyer preferences that captures the relative importance of different attributes in the supply chain. First, we briefly discuss the theoretical background to the paper. Second, we review the random utility literature and describe the best-worst scaling approach. Third, we describe the development of the experimental instrument. Lastly, we discuss preliminary results based on a sample of Australian managers and provide directions for future research.

## THEORETICAL BACKGROUND

The following section establishes the theoretical foundations for this study. It begins with a brief introduction to agency theory before exploring service expectations of third party logistics providers. The discussion then advocates a need for an enhanced understanding of consumer behaviour as a means of improving exchange relationships.

### Agency theory and logistics

Agency theory provides a useful lens through which to examine the interactions between buyers and suppliers of 3PL services. While the theory has traditionally been concerned with the study of problems that arise when firms outsource services to third party organisations (agents), the theory has been successfully extended to consider the need for effective strategies to prevent such problems (Eisenhardt 1989). Of particular interest, has been the application of agency theory as a

tool to better coordinate exchange (Celly and Frazier 1996), and as a means of reducing risks inherent in the consumption of logistics services (Zsidisin and Ellram 2003).

The application of agency theory in the logistics context has tended to explore the use of strategies targeted at either delivering outcomes or enhancing the behaviour of suppliers (Eisenhardt 1989; Lasser and Kerr 1996). Outcome-based strategies are viewed to mitigate risks associated with product and supply issues. Such strategies are more common in firms that are concerned with financial performance (Liker and Choi 2004), and are focused on ensuring suppliers meet customer expectations in the areas such as reliability, delivery speed, service quality, availability of technology and price (Zsidisin and Ellram 2003).

In contrast, the use of behaviour-based management strategies reflects a longer-term commitment to a supplier, with such strategies requiring a substantial investment in terms of both financial and human resources to ameliorate potential problems. These strategies are concerned with the control of more esoteric performance indicators such as branding, culture, quality control and professional development (Zsidisin and Ellram 2003).

A review of the literature reveals a relative paucity of academic and practitioner research that considers the extent to which firms combine and trade-off the various components of outcome and behaviour-based strategies. There also appears to be little research that reports on the effectiveness of such strategies; and subsequently, the degree to which alignment exists between the expectations of the suppliers of 3PL services and their customers. This situation is emphasized by Zsidisin and Ellram (2003), who claim that the success of logistics outsourcing is dependent on suppliers having a better understanding of buyer preferences.

**Understanding buyer preferences**

More than four decades ago, Theodore Levitt (1960) first introduced the idea that the real business mantra is not defined in terms of *product or service features* but in terms of *customer needs*. This insight still holds true today, and has forced managers to think more broadly about attribute variation in business success in relation to the importance of the "augmented product." Essentially, the idea of an augmented product is that it is not sufficient to focus marketing effort on tangible product features alone. Hard as it may be for some in the logistics and transportation field to accept, product features—overnight or 2nd day delivery, the choice of air or ground, even comparative costs—are quickly copied by competitors, and in any case, as Levitt would argue, customers don't buy products, they buy benefits. Instead, the burning issues for business decision makers today are how to achieve reliability levels high enough to enable inventory cost savings, or how to meet rising expectations for service based on visibility and transparency throughout all aspects of the supply chain.

These are the questions that corporate customers such as Dell Computer, Panasonic, Sun Microsystems, Technicolor and others like them are asking, and typically answer, well before asking logistics and transportation providers to bid for their business. The answers vary widely depending upon the individual context, but according to Christopher and Peck (2003) there will only be three or four market determinants driving the choice of supplier. These drivers have been termed the key success factors or market winners; sometimes it will be product performance or price that determines the decision, in other situations it will be responsiveness or reliability that determines the market winners. Understanding the nature of these key success factors is critical to successful supply chain design (Christopher and Peck 2003).

Recent attempts to match supply chain design with product type, such as Fisher's (1997) matrix of efficiency/responsiveness supply chains, have failed to provide empirical evidence to

support the claims (Selldin and Olhager 2002; Olhager and Selldin 2004). However, concerns that the link between customer demand and supply strategy is problematic, do not imply that the reasoning is inherently flawed. Rather, they imply that the focus on "product" needs to be informed by an understanding of "customer behaviour" (Dibb and Wensley 2002). This point was previously made by Gattorna (1998) who suggested that it is possible to develop an appropriate supply chain strategy by developing a more sophisticated understanding of why groups of customers buy a product. These findings suggest that prior research methods may not be appropriate for the task at hand.

The present study seeks to utilise emergent research methods to address the question of supply chain design in a way that more effectively identifies the relative importance of product and behavioural attributes.

## METHODOLOGY

An effective method for evaluating customer demand for various service features (such as those offered by 3PL providers) is to model consumer preferences as a response to experimentally designed service profiles. This approach, commonly known as probabilistic discrete choice analysis (DCA), has been used to model choice preferences of decision makers in a variety of organisational areas spanning marketing, operations management, transportation and economics (e.g., Verma, Louviere and Burke 2006).

The statistical model (i.e. multinomial logit) underpinning DCA draws on Thurstone's (1927) original propositions in Random Utility Theory (RUT) to provide a well-tested theory of human decision making that has been generalised by McFadden (1974). This theory allows scholars to conceptualize individual choice as a process of decision rule formation (Louviere,

Hensher and Swait 2000). When selecting any product, service, or combination of both, a customer will consciously or unconsciously compare alternatives and make a decision that involves tradeoffs of the components of those choices. The result of this process is a 'choice outcome' (Hensher, Rose and Greene 2005), which can be decomposed and identified based on the pattern of choices conditional on the options available.

**Best-worst Scaling**

There are a number of different DCA methods that allow researchers to elicit stated preferences that can then be used as a basis for understanding and predicting actual behaviour *in the marketplace*. One relatively simple method, particularly useful in narrowing down and getting a quick snapshot of preferences, is best-worst scaling. The formal statistical and measurement properties for best-worst scaling analysis can be found in Marley and Louviere (2005).

Best-worst scaling is fundamentally an ordering task that requires respondents to make a selection from a group of items and choose the 'best' (most preferred), and 'worst' (least preferred), items in a series of blocks of N>2 items. The items could be attributes of a product, options in a decision, or bundles of services and products. This approach is particularly effective in creating a preference order when there are a large number of items listed; individuals are better able to determine which 2 items in a group are 'best' and 'worst' than they are at preferentially ordering every item on a large list. Best-worst scaling has the added benefit that it is quick and simple to execute, provides results that are empirically consistent with more complex ordering tasks, and is theoretically in line with the precepts of random utility theory.

The cognitive process undertaken in the selection of the 'best-worst' or 'least-most' important items is statistically equivalent to:

- Identifying every possible pair of items available;
- Calculating the difference in utility between the two items in every pair; and
- Choosing the pair that maximises the difference in utility between them.

Thus, the pair of items chosen maximises the difference in the marginal utilities on offer between each of the various items in each block presented to the decision maker. Empirically, the distance between items is modelled such that the relative ordering of each item is proportional to the number of times it is selected as 'best', less the number of times it is selected as 'worst' (Szeinbach, Barnes and McGhan 1999).

In this study, the intent is to determine the relative ordering of the attributes relevant to the decision of purchasing logistics services of a 3PL. This allows us to reduce a relatively large number of attributes associated with the decision down to a manageable number of important components that can be scrutinized in more detail.

## INSTRUMENT DEVELOPMENT AND EXPERIMENTAL DESIGN

When selecting a logistics service provider there are many factors to be considered. For example, in any B2B purchase decision there is a series of 'logics' that interact and are traded-off in the final selection (Gattorna 2006). To capture the full range of attributes that are potentially important in the selection of a logistics service provider amongst all the alternatives available, an extensive pre-testing procedure was employed. The range of attributes selected were sourced from extensive rounds of qualitative work that included reviewing the academic literature, industry reports and websites, along with insight gained from extensive discussions with experienced academics and practitioners.

The result from this preliminary work enabled us to develop a series of 21 attributes in five general categories that were potentially relevant to the evaluation and selection of a 3PL.

These were: (a) External Face of the Company: *brand* and *culture*; (b) Internal Capabilities: *professionalism, relationship orientation, proactive innovation, global network, customer service support, customer service recovery, risk management,* and *quality certification; (*c) Customer Charges: *parity price* and *surcharge option* in contract; (d) Account Management Process: *account representative presence, top management team availability, management reporting, billing service,* and *track and trace*; and (e) Performance: *reliable performance, delivery speed, supply chain capacity*, and *supply chain flexibility*. Operational definitions were developed to capture the domain for each of the 21 attributes to ensure that each decision-maker understood the meaning of these attributes in exactly the same way (refer *Appendix A: Attribute definitions*).

Best-worst scaling applies experimental design techniques that allow us to discern the utility associated with an attribute without having to consider every possible combination of alternatives available. A balanced incomplete block (BIBD) factorial design was used to ensure that each possible attribute pair (available to be chosen) is displayed the same number of times; in other words, the design is fully balanced (Burgess and Street 2004). This design ensured that each attribute is orthogonal (known as an Orthogonal Main Effects Design or OMEP) and with all possible subsets of choices given by $2^5$ factorial. The balanced incomplete design ensures that each attribute appears the same number of times and that the attribute labels are assigned to a different ordering position in each block. This approach also ensures that each attribute has an equal likelihood of being chosen 'best' and 'worst' an equal number of times. Example sets are provided in Appendix B: Sample of Best-worst Experiment, which shows that each individual respondent was required to evaluate the 'most' and 'least' preferred attributes from 21 different choice sets, with five service attributes in each set. In addition to the experimental best-worst task, respondents answered a series of structured firmographic questions so as to collect open-

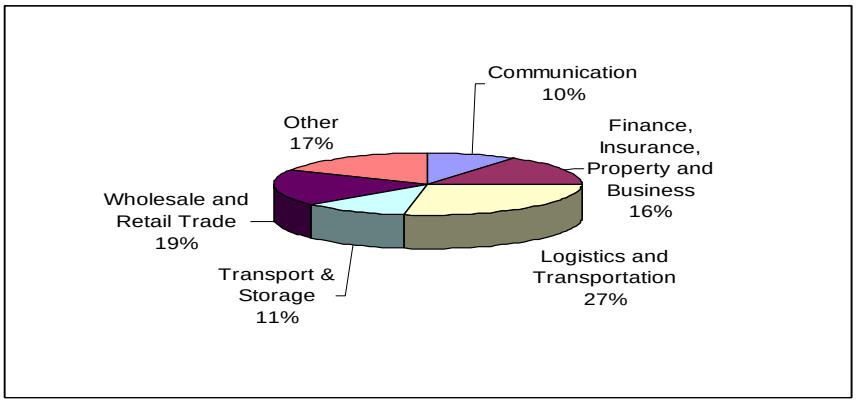
ended descriptions of the process by which they choose a 3PL.

## RESULTS

One hundred and forty-one middle-to-senior managers completed the best-worst experiment – sixty from an international 3PL supplier and eighty-one buyers of 3PL services. The resulting sample size was sufficient for the analysis required, resulting in reliable and identified parameter estimates. The distribution of buyer respondents by industry is shown in *Figure 1: Distribution of buyer respondents by industry*.

FIGURE 1

DISTRIBUTION OF BUYER RESPONDENTS BY INDUSTRY




The best-worst scores were calculated using the following steps:

1. The results were separated into two frequency groups according to the number of times the attribute was selected by respondents. Respondents were required to identify "the feature that matters most to you" ('Best') and "the feature that matters least to you" ('Worst') (refer to *Tables 1 and 2: Ranked results from 'best-worst' experiment*). The 'Best' column illustrates the frequency that the particular attribute was ranked 'best' out of an attribute group. For example, the top scoring attribute for both groups when considering selection of the feature

that matters 'most' was *reliable performance* (selected 221 times for the buyers and 146 times for suppliers); the lowest scoring attributes were *surcharge option* and *brand* for suppliers (both selected 6 times) and *culture* for buyers (selected 13 times). The *surcharge option* was therefore selected by supplier respondents as the 'best' attribute less often than any of the other listed attributes. The 'Worst' column shows the frequency that an attribute was selected as the 'least' important feature by respondents. This column is read in the opposite way to the 'Best' column - the attribute selected the least number of times as 'least important', was *reliable performance* (selected 2 times), by respondents out of the set of 21 options; indicating that it is actually considered to be one of the more important features. It is worth noting that the attributes in this column appear to be almost perfect reciprocals of the 'Best' column, implying consistency in the decisions (or selection of features as 'most' or 'least' important) made by the respondents.

2. The frequencies of the selected 'Best' and 'Worst' responses provide a complete ordering from the highest to lowest ranked attribute.
3. The utilities for each attribute were estimated using a multinomial logit model (MNL) in Latent Gold Choice, with the corresponding utilities for each attribute ranging from positive 2.5 to negative 1.7. For ease of interpretation, we rescale these utilities according to the underlying choice model, noting that the sum of the utilities after exponentiation is 100% (Cohen 2003). This provides a relative 'share of preference' for each attribute within the complete set of attributes. *Figure 2: Share of preference in descending order for each attribute*; plots the graph of the resulting utility shares for both groups of respondents.

TABLE 1

RANKED RESULTS FROM 'BEST-WORST' EXPERIMENT (SUPPLIERS)

| Attribute Name | Best | Worst | Utility | Exp | Share | Rank |
|---|---|---|---|---|---|---|
| Reliable Performance | 146 | 1 | 2.0771 | 7.9813 | 26.4337 | 1 |
| Delivery Speed | 97 | 3 | 0.9969 | 2.7099 | 8.975 | 2 |
| SC Flexibility | 42 | 22 | 0.8589 | 2.3606 | 7.8181 | 3 |
| Professionalism | 47 | 5 | 0.7041 | 2.022 | 6.6969 | 4 |
| Customer Service Support | 79 | 8 | 0.6584 | 1.9317 | 6.3977 | 5 |
| Track and Trace | 79 | 9 | 0.4903 | 1.6328 | 5.4078 | 6 |
| Proactive Innovation | 37 | 45 | 0.3386 | 1.403 | 4.6466 | 7 |
| Customer Service Recovery | 66 | 8 | 0.2446 | 1.2771 | 4.2297 | 8 |
| SC Capacity | 25 | 31 | 0.211 | 1.2349 | 4.09 | 9 |
| Relationship Orientation | 23 | 53 | 0.0705 | 1.073 | 3.5539 | 10 |
| Risk Management | 14 | 47 | -0.0796 | 0.9235 | 3.0585 | 11 |
| Culture | 18 | 62 | -0.0897 | 0.9142 | 3.0278 | 12 |
| Global Network | 41 | 12 | -0.0907 | 0.9133 | 3.0248 | 13 |
| Parity Price | 45 | 32 | -0.2478 | 0.7805 | 2.585 | 14 |
| A/c Representative Presence | 32 | 25 | -0.5599 | 0.5713 | 1.892 | 15 |
| Mgmt Reporting | 12 | 77 | -0.5674 | 0.567 | 1.8779 | 16 |
| TMT availability | 17 | 87 | -0.6315 | 0.5318 | 1.7613 | 17 |
| Billing Service | 20 | 51 | -0.859 | 0.4236 | 1.4029 | 18 |
| Quality Certification | 9 | 79 | -0.9464 | 0.3881 | 1.2855 | 19 |
| Brand | 6 | 108 | -1.1844 | 0.3059 | 1.0132 | 20 |
| Surcharge Option | 6 | 96 | -1.3939 | 0.2481 | 0.8217 | 21 |

TABLE 2

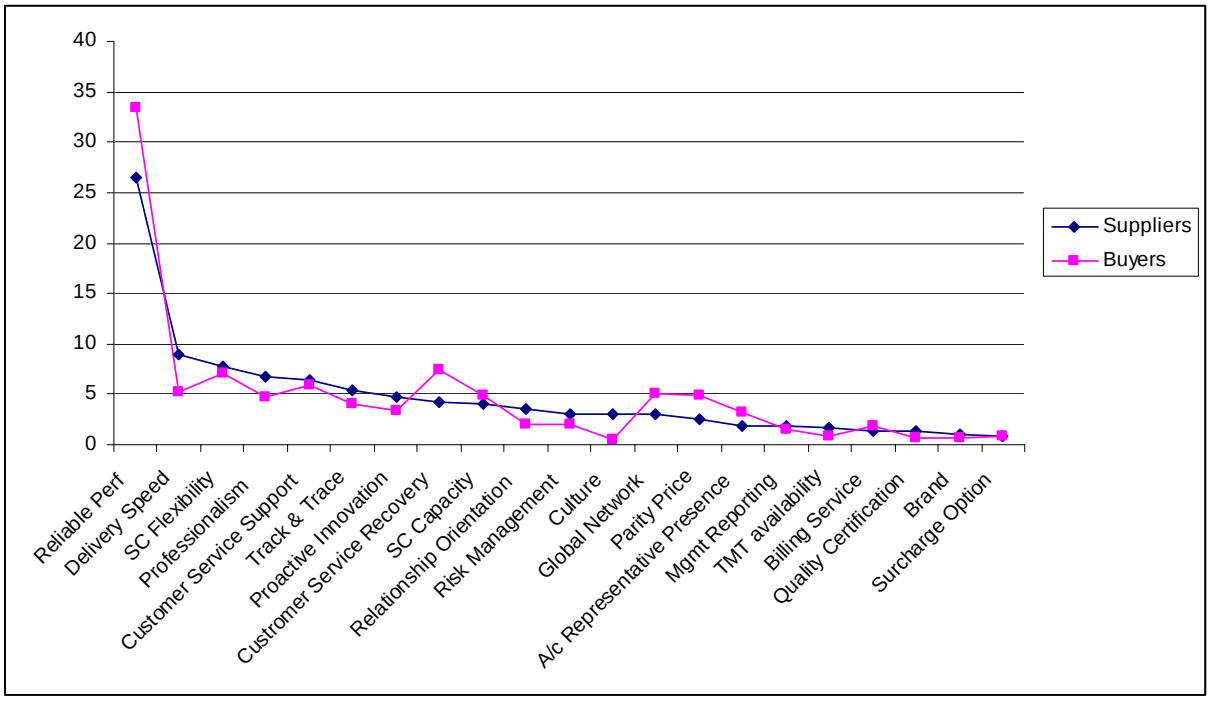
RANKED RESULTS FROM 'BEST-WORST' EXPERIMENT (BUYERS)

| Attribute Name | Best | Worst | Utility | Exp | Share | Rank |
|---|---|---|---|---|---|---|
| Reliable Performance | 221 | 3 | 2.4854 | 12.0059 | 33.4267 | 1 |
| Customer Service Recovery | 102 | 8 | 0.974 | 2.6485 | 7.374 | 2 |
| SC Flexibility | 111 | 23 | 0.9264 | 2.5254 | 7.0312 | 3 |
| Customer Service Support | 75 | 7 | 0.7553 | 2.1282 | 5.9254 | 4 |
| Delivery Speed | 70 | 19 | 0.6259 | 1.8699 | 5.2062 | 5 |
| Global Network | 87 | 29 | 0.6136 | 1.8471 | 5.1426 | 6 |
| SC Capacity | 72 | 35 | 0.5564 | 1.7444 | 4.8567 | 7 |
| Parity Price | 86 | 43 | 0.5486 | 1.7308 | 4.8189 | 8 |
| Professionalism | 64 | 16 | 0.5259 | 1.692 | 4.7108 | 9 |
| Track and Trace | 54 | 26 | 0.3718 | 1.4503 | 4.038 | 10 |
| Proactive Innovation | 78 | 66 | 0.1869 | 1.2055 | 3.3564 | 11 |
| A/c Representative Presence | 40 | 28 | 0.1403 | 1.1506 | 3.2035 | 12 |
| Risk Management | 21 | 43 | -0.2775 | 0.7577 | 2.1095 | 13 |
| Relationship Orientation | 45 | 73 | -0.2844 | 0.7525 | 2.095 | 14 |
| Billing Service | 21 | 58 | -0.444 | 0.6415 | 1.786 | 15 |
| Mgmt Reporting | 25 | 85 | -0.638 | 0.5283 | 1.471 | 16 |

| | | | | | | |
|---|---|---|---|---|---|---|
| TMT availability | 18 | 111 | -1.1659 | 0.3116 | 0.8677 | 17 |
| Surcharge Option | 18 | 132 | -1.2786 | 0.2784 | 0.7752 | 18 |
| Quality Certification | 17 | 137 | -1.4024 | 0.246 | 0.6849 | 19 |
| Brand | 22 | 157 | -1.4963 | 0.224 | 0.6235 | 20 |
| Culture | 13 | 161 | -1.7235 | 0.1784 | 0.4968 | 21 |

FIGURE 2

SHARE OF PREFERENCE IN DESCENDING ORDER FOR EACH ATTRIBUTE




## DISCUSSION

Supply chain research has traditionally been dominated by investigations of functional components, such as facilities location and transportation (Geoffrion and Powers 1995), inventory management (Cohen and Lee 1998), materials management, purchasing and distribution (Turner 1993). This explicitly assumes that the decision criteria are functional and related to those aspects of the choice that matter to the direct cost or efficiency of the supply

chain. In this study we have taken a different approach and asked "What factors matter most to the decision makers responsible for choosing a supply chain provider?" What this reveals is that although outcome-based performance measures such as reliability, delivery speed, flexibility and capacity are important, they are not the only factors that matter to the customer. Our results highlight the extent to which higher-order capabilities, such as *supply chain flexibility* and *professionalism* matter to consumers of 3PL services. In addition, we not only show which attributes of 3PLs matter to the decision maker, but the extent to which they matter *relative to one another*.

The results indicate a strong degree of congruence in the views of buyers and suppliers at the extremes of the distribution. In other words, both buyers and suppliers have similar views regarding the most desirable attributes (i.e. reliability, flexibility, professionalism and support) and least desirable attributes (i.e. certification, branding and surcharges) of 3PL services. In terms of agency theory, these results seem to suggest that when considering what is most important, both buyers and suppliers appreciate strategies that combine elements of both the outcome and behaviour-based viewpoints.

This line of thinking is consistent with the resource based view of the firm (RBV) literature (Barney 1991), which emphasises that an organization should develop capabilities to acquire, integrate, reconfigure and release resources that are embedded in a social, structural and cultural context. Developing these capabilities is a long-term process; but this is exactly why they can be a source of sustainable competitive advantage. Our results reveal that customers value these resources when they are developed and available from a 3PL. From a more operational standpoint, our results provide guidance to 3PL providers on how to evaluate aspects of their augmented product offering. This is particularly valuable for the manager who is bombarded by

lists of all the attributes that they believe create customer value, without any effective guide as to the relative value (or validity) of this ordering (Anderson, Narus and Van Rossum 2006). Best practice suppliers have been shown to base customer value propositions on a select few attributes that clearly matter most to their target customers. These supply chain leaders go on to demonstrate the value of these attributes and show that they can provide superior performance; for these companies all communication with customers is in ways that convey a sophisticated understanding of their customers' own business priorities.

Despite great advances in the performance of logistics activities the industry has come under new cost pressures due to factors such as increased fuel prices, interest rates and larger inventories. Not surprisingly, 3PL companies are re-evaluating their strategic responses and planning activities to evaluate the relative importance of factors other than price and price sensitivity. The results reported here support Gattorna's claim (2006) that the secret to designing a supply chain is to start by understanding the needs and preferences of customers and then reverse engineer business processes, company culture and leadership to support the requirements of the market.

However, the outcomes of this research reveal that there is less alignment between the extremes; highlighting some very interesting differences between buyers and suppliers. Results indicate that buyers of 3PL services are more likely to adopt an outcome-based strategic position between the extremes focusing on performance based criteria for evaluating services (i.e. service recovery, capacity and price), while suppliers are more likely to value intangible attributes (i.e. relationships, risk management and culture). This finding offers a valuable strategic insight, suggesting that if suppliers are unable to provide products and services that are meaningfully

different from their competitors, then buyers will revert to a consideration of performance based attributes.

## CONCLUSION AND FUTURE WORK

In attempting to better understand the preferences of firms who purchase 3PL services from specific companies, research to date has largely focused on price and performance related attributes. Although price is obviously an important factor in a consumer's decision, it is also important to recognize that demand for 3PL services is a function of all the other factors that make up the experience, such as: *reliable performance, supply chain flexibility* and *professionalism* etc.

Further, a growing body of research exists to suggest that binary ('best-worst' or 'yes-no' or 'least-most') responses are simple and reliable estimates of customer demand. It is cognitively easy for respondents to indicate that "I prefer A" or "I do not like B" and "I think A is the most important attribute, and B is the least important attribute in the set of {A B C D E}". Furthermore, the approach is scale free and avoids problems that commonly arise in traditional research where respondents are required to rate attributes according to a set scale (e.g., 1 to 5 or 1 to 7). The problem with traditional likert scales is that the scores can mean different things to different respondents. Additionally, respondents often suffer from biases such as 'yea-saying', 'nay-saying' and 'middle of the road'. The best-worst scaling procedure used in this study forces the respondent to select items of relative importance through trade-offs and therefore provides data that is scale free.

An important limitation in this study is the assumption that all buyer respondents are willing to purchase services from a 3PL provider. In other words, demand is conditional on

respondents 'buying' (or more accurately in the supply chain industry, simply *choosing*) a 3PL provider. Future work should provide an opt-out option to capture either unconditional demand where a respondent may desire to stay with some status quo or "not demand or require" the services of a 3PL provider.

In summary, this study has provided greater understanding of what attributes are considered important to both customers and providers of 3PL services. These results offer several attractive value propositions to these service companies because it shows where resources should be allocated (whether they are positive such as performance reliability or negative such as billing service). Future research will be based on a twofold approach. First we will profile variation in customer preferences into naturally occurring segments that might imply the need for a different commercial relationship. Second, we will extend the approach presented in this paper to address the issue of *how* people choose within an option. Seven of the most important attributes have been allocated different levels of service. For example, the attribute price will be based on four levels—similar to what you currently pay; higher by 4 or 8 percent to what you currently pay; and lower by 4 percent to what you currently pay. This will allow us to evaluate preferences in line with more traditional choice modelling research (Verma, Louviere and Burke 2006).

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## APPENDIX A: ATTRIBUTE DEFINITIONS

**Account Representative Presence –** refers to the level of contact provided by the Account Representative. A high presence Account Representative would call you, make a presentation, or address your concerns many times a month.

**Billing Service** – accuracy, flexibility and currency of billing service.

**Brand** – reflects overall competence that the supplier will deliver. In a supply chain context we can distinguish between a market leader (>40% market share) and a new player in the market (<10% market share).

**Culture** – includes the unwritten rules that guide appropriate "norms" of behaviour. In other words, it is the "way we do things around here" and can either be similar to your own company or not.

**Customer Service Recovery** – prompt and empathetic recovery and resolution of errors or problems concerning customers.

**Customer Service Support** – prompt and effective handling of customer requests and questions.

**Delivery Speed** – amount of time from pickup to delivery.

**Global Network** – whether a supplier is fully represented at a global level and can reliably deliver to remote locations.

**Management Reporting –** report customizability, range and flexibility. Highly customized reports can be delivered at a frequency determined by the customer.

**Parity Price** – this is what the customer pays for the service or product. A parity price is one that matches (or is very close to) that of the competition.

**Proactive Innovation** – proactive activity aimed at providing new solutions to improve the customers business and address any potential problems and challenges.

**Professionalism** – Employees exhibit sound knowledge of products and services in the industry and display punctuality and courtesy in the way they interact and present to the customer.

**Quality Certification** – such as ISO certification, TAPA (Technology Asset Protection Association) and Corrective Action Process etc. This certification would also cover associated third parties (where relevant).

**Relationship Orientation** – characterised by sharing of information and trust in the exchange partner.

**Reliable Performance –** consistent "on time" delivery without loss or damage of shipment.

**Risk Management** – this relates to the security of supply chain systems. It could include, for example correct levels of insurance for the company and third parties, capability to ensure packages are as stated using X-ray equipment, or other audit trail systems.

**Supply Chain Capacity –** the ability to cope with significant changes in volumes e.g., demand surges and deliver through multi-modal transport services including: international express and domestic, by air; ocean; and land.

**Supply Chain Flexibility –** ability to meet unanticipated customer needs e.g., conduct special pickups, seasonal warehousing

**Surcharge Option in Contract** – the contract includes the right to add surcharges due to unanticipated costs e.g., fuel, unusual fluctuations in levels of currency exchange rate, security surcharges.

**Top Management Team Availability** – the frequency and quality of involvement by the "top management team" with your management team during the exchange relationship.

**Track and Trace –** transparency and "up to the minute" data about the location of shipments end-to-end.

## APPENDIX B: SAMPLE OF BEST-WORST EXPERIMENT

| Question Number | Which feature matters LEAST to you? (Select ONLY ONE ) | Sets of features for you to consider | Which feature matters MOST to you? (Select ONLY ONE) |
|---|---|---|---|
| 1 | ○ | Professionalism | ○ |
| | ○ | Global Network | ○ |
| | ○ | Customer Service Support | ○ |
| | ○ | Surcharge Option Contract | ○ |
| | ○ | Top Management Team Availability | ○ |

| Question Number | Which feature matters LEAST to you? | Sets of features for you to consider | Which feature matters MOST to you? |
|---|---|---|---|
| 2 | ○ | Relationship Orientation | ○ |
| | ○ | Customer Service Support | ○ |
| | ○ | Customer Service Recovery | ○ |
| | ○ | Account Representative Presence | ○ |
| | ○ | Management Reporting | ○ |

| Question Number | Which feature matters LEAST to you? | Sets of features for you to consider | Which feature matters MOST to you? |
|---|---|---|---|
| 3 | ○ | Proactive Innovation | ○ |
| | ○ | Customer Service Recovery | ○ |
| | ○ | Risk Management | ○ |
| | ○ | Top Management Team Availability | ○ |
| | ○ | Billing Service | ○ |

| Question | Which feature | | Which feature matters |
|---|---|---|---|

| Number | matters LEAST to you? | Sets of features for you to consider | MOST to you? |
|---|---|---|---|
| 4 | ○ | Global Network | ○ |
| | ○ | Risk Management | ○ |
| | ○ | Quality Certification | ○ |
| | ○ | Management Reporting | ○ |
| | ○ | Track and Trace | ○ |

## ABOUT THE AUTHORS

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Tim Coltman's current area of interest is the design and implementation of e-business systems (CRM, ERP and SCM) to support improved organizational performance. He has spent the last five years understanding both the drivers and constraints to success for organizations such as the SAS Institute. Before his academic career, Tim spent 10 years in business as an IT project manager working in management consultancy, government and higher education sectors.

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John Gattorna is one of the few Australian business-academics to have been continuously engaged in the evolution of supply chain thinking, from the early days of "physical distribution" (1975), through "logistics management" (1980s/1990s), to the current "supply chain management" era (1990s/2000s).

Over the last 25 years John Gattorna has taught and researched at eight universities around the world; consulted to over 100 multi-national corporations; and published widely on the emerging topic of "supply chains". He is now regarded internationally as a prominent "thought leader" in the field, and continues to be sought after as a keynote speaker on the international conference circuit.

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