Driving forces behind the extra-EU shift: a choice-based contingent ranking experiment on purchasers' preferences

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ABSTRACT,

In an ever-increasing global supply field companies nowadays lean towards sourcing outside of the EU. By dividing the concept of global sourcing into continental and transcontinental sourcing this paper aims to research the known driving forces behind the extra-EU shift derived from literature that is currently being experienced. This is done via a choice-based contingent ranking stated preference experiment held with purchasing experts. The driving forces were transformed into variables to serve as attributes of choice cards of hypothetical suppliers. During this experiment, the purchasing experts were asked to rank suppliers based on their preferences. The data gathered by the experiments held was analyzed with a conjoint analysis in SPSS. The conjoint analysis also allowed for the use of simulation cases, which were used to further research the observed preferences of purchasing experts. The analyzed data were used to validate the currently known driving forces behind the extra-EU shift derived from literature. With this data, the conclusion that purchasing experts value the price-to-quality ratio over everything else during the supplier selection process was drawn

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Keywords
Transcontinental sourcing, continental sourcing, EU sourcing, supplier selection, stated preference experiment, choice-based contingent ranking experiment.

1. INTRODUCTION

Global sourcing has been a prevalent part of the supply chain of companies. Global sourcing has been on the rise for the last decades now (Giunipero et al., 2019, p. 8). This is due to the perceived benefits for example cost-saving, innovations, or partnerships (Koerber & Schiele, 2021, p. 2) (Giunipero et al., 2019, p. 8). However, the rise of global sourcing has become a point of discussion in recent years. The growth of the last decades seems to be coming to a halt, maintaining a constant level between domestic and global sourcing (Auer et al., 2017, p. 2). This halt however, does not mean that there is no change in the sourcing landscape. In order to get a clearer view of the driving forces behind the stagnation of global sourcing, it is best to identify two types of global sourcing, those being: Intra-EU trade henceforth called continental sourcing and extra-EU trade henceforth called transcontinental sourcing (Koerber & Schiele, 2021, p. 1). In the past heaps of research have been done regarding global and domestic sourcing, but relatively little research has been done on continental and transcontinental sourcing. If we dissect global sourcing into these subcategories we see that the sourcing landscape is still very much changing. Scilicet continental sourcing has been on the decline over the last 15 (Eurostat, 2021). In the period from 2003 until 2019 continental sourcing has decreased by 5.3% (Koerber & Schiele, 2021, p. 5). A phase of stagnation can also be identified in the export GDP ratio (Koerber & Schiele, 2021, p. 4). If continental sourcing is on the decline whilst global sourcing is stagnating, this indicates transcontinental sourcing is on the rise. The aim of this paper is to give more insight into the main driving forces behind the shift from continental sourcing towards transcontinental sourcing referred to in this paper as the "extra-EU shift" and its implications for the future. The research question that will be answered will thus be: *What are the main driving forces behind the extra-EU shift based on a ranking-based stated preference experiment?* To get an idea of forces that might be behind the extra-EU shift, first, we delved deeper into both continental and transcontinental sourcing and the characteristics of each specific type of sourcing. second, we explored the known driving forces from literature and the stated preference experiments used in the PSM field. Finally to research the relevance of each of the driving forces a ranking-based stated preference experiment was done. This experiment identifies the relevance of each of the driving forces through the means of 30 companies indicating the significance of each force in their supplier decision-making process. With these results the partial research questions are answered, which in turn made it possible to draw a conclusion by answering the main research question mentioned before.

2. THE STREAMS OF GLOBAL SOURCING

2.1 Global sourcing: sourcing outside of national confines

Global sourcing can be defined as obtaining goods from a geographical location the company does not belong (Golini & Kalchschmidt, 2011, p. 87). However, its definition can be much broader as Trent & Monezka define global sourcing as "integrating and coordinating common items, materials, processes, technologies, designs and suppliers across worldwide buying and operating locations" (Trent & Monczka, 2005, p. 24). The motive behind choosing to source from outside the company's home location is to remain competitive in an increasingly interconnected world (Weigel & Ruecker, 2017, p. 63), as global sourcing has the ability to create this competitive advantage through the means of (material) cost savings as especially intensive labour wages are lower in developing countries, better quality as countries such as Germany and Japan are associated with their high-quality products especially in the automobile industry (Cho & Kang, 2001, p. 544), responsiveness of suppliers, supplier's technological contribution (Trent & Monczka, 2003, p. 609) and availability of products or materials, that would otherwise be unobtainable inside of the domestic market(Cho & Kang, 2001, p. 545).

Although global sourcing comes with significant benefits, it also provides its own drawbacks and challenges. Supply chains in global sourcing strategies are longer and more complex than their domestic counterparts, requiring more effort to handle them due to the far greater difficulty of said task (Trent & Monczka, 2005, p. 26). Global sourcing strategies are in need of higher logistics support as they cover a greater distance than their domestic counterparts, resulting in longer lead times. Together with the possibility of potentially less reliable means of transport than offered in the domestic market, a need for more inventory is created, whilst also making inventory management less flexible. Cultural differences between the buyer and the supplier also hinder the ability to do business, as different values, attitudes, manners, customs, religion, and the language barrier could lead to misunderstandings between involved parties (Cho & Kang, 2001, p. 547); And different regulations than in the company's country of origin will apply throughout the supply chain, as governments of suppliers' countries of residence are able to directly influence buying firms by quotas, tariffs, complicated documentation requirements for processes crossing the border and international and trade bills (Cho & Kang, 2001, p. 548). in addition to these original drawbacks and challenges new concerns have arisen regarding Corporate Social Responsibility, Environmental, Social and Governance (ESG), and new regulations requiring firms to be more transparent and take more responsibility in matters regarding their supply chain (Rühmkorf, 2017, p. 1)(Jiang et al., 2019, p. 36) (Mazahir & Ardestani-Jaafari, 2020, p. 1)

To better understand the Extra-EU shift and the future of global sourcing and the trends surrounding it, the necessity of making a distinction between continental sourcing and transcontinental sourcing has presented itself (Koerber & Schiele, 2021, p. 2). As the development of global sourcing over time has created increasingly dispersed supply chains (Kalchschmidt et al., 2020, p. 1) to the point the umbrella term of global sourcing will have to be dissected into two previously presented streams of sourcing to be able to further develop the knowledge domain of global sourcing. The sourcing distinction creates the following figure 1.

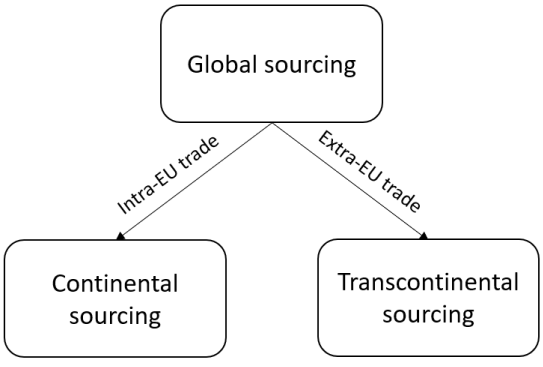

Figure 1: Dissection of global sourcing

2.2 Continental sourcing: sourcing within European continental confines

Continental sourcing, defined as intra-EU trade or trading within the same continent from the European perspective (Koerber & Schiele, 2021, p. 4), has distinct advantages, that differ from its transcontinental counterpart. Continental sourcing brings with it the same legal realm as the other countries that make up the European Union. Next to this, the same currency is used for trade among the EU countries. It has to be noted that not all European countries are part of the EU, e.g. Great Britain has its own currency and legal system. Despite this fact, Kunroo et al. (2016, p. 408) estimate the effect of the introduction of the euro as a currency has increased the inter-European trade by 14%. This effect is 6% higher if both countries have joined the euro. The Schengen agreement introduced in 1995 was found to further increase trade amongst its members with an average of 2%-3%. The formation of the EU has seen a 70% increase in intra-EU trade for its member states (Glick, 2017, p. 197). Countries from Central and Eastern Europe, that became member states after the initial founding of the EU have seen their export-GDP ratio double in size between the years 1990 and 2013 (Vrh, 2017, p. 405). The free trade zone introduced by the European Union has the advantage of creating stronger collaboration between intra-EU buyers and suppliers, lower customs, and political integration of its member states (Felbermayr et al., 2018, p. 339). These factors give the possibility for strong networking opportunities, giving companies the ability to create the aforementioned strong network resulting in a competitive advantage. The introduction of the EU playing field for companies inside of its member states can be seen as the main advantage of continental sourcing. However, the trade with non-member states within Europe still benefits from the existence of the EU.

Continental sourcing is associated with higher responsiveness and flexibility of its suppliers (Gadde & Jonsson, 2019, p. 7). Another association made with continental sourcing is its short lead times in comparison to its transcontinental counterpart, made possible by the shorter distance and shorter time spent at custom control (Hornok, 2011, p. 2). The shorter distance between the host countries brings additional benefits, as countries in closer proximity to each other tend to show higher similarities in culture, idem for preferences, and demand patterns (Kokko & Tingvall, 2012, p. 3).

2.3 Transcontinental sourcing: sourcing within European transcontinental confines

Transcontinental sourcing is defined as extra-EU sourcing or sourcing from another continent as an entity located inside of the EU boundaries (Koerber & Schiele, 2021, p. 5). transcontinental sourcing differs from continental sourcing in terms of its ability to use comparative advantages (Alguire et al., 1994, p. 62). Bounding oneself to basic factors of locations and accepting them as disadvantages can be circumvented by transcontinental sourcing. the principle of transcontinental sourcing entails dispersing activities to a location that has the ability to reap the benefits of its environment. these benefits include the ability for cost savings, higher quality and availability (Alguire et al., 1994, p. 63) (Cho & Kang, 2001, p. 545). . in addition to these benefits transcontinental can also be a gateway to new technologies and markets that present have presented themselves outside of Europe (Ettlie & Sethuraman, 2002, p. 351).

These significant advantages don't come without the more elaborate drawbacks. From a European perspective, significant time-zone differences and cultural disparities hinder the ability to trade. Differences in the legal framework between the EU and the host country of the supplier also have the ability to create challenges for trade (Schiele et al., 2021, p. 57). As governments have the ability to directly influence buying firms through the means of quotas, tariffs, complicated documentation requirements for processes crossing the border and international and trade bills (Cho & Kang, 2001, p. 547). The increased distance between the buyer and supplier in comparison to continental sourcing brings with it its own set of challenges. Lead times are higher compared to other sourcing types, creating the need for higher logistic support throughout the process. Paired with the less reliable means of transport the need for an increase in inventory is created to prevent running out of stock, whilst making inventory management less flexible at the same time (Cho & Kang, 2001, p. 548). Longer lead times and less reliable transport also limit the ability of firms to participate in just-in-time management (Corinna Cagliano et al., 2012, p. 102). Transcontinental supply chains also tend to be larger than their continental counterparts increasing the difficulty of handling them. (Trent & Monczka, 2005, p. 24).

3. THEORETICAL FRAMEWORK: DISCUSSING KNOWN DRIVING FORCES BEHIND THE EXTRA-EU SHIFT AND THE STATED PREFERENCE EXPERIMENT

3.1 Driving forces behind the extra-EU shift derived from literature

Although continental sourcing seems to have its own significant benefits over its transcontinental counterpart, the fact still remains that continental sourcing is on the decline, as global sourcing is stagnating, whilst transcontinental sourcing is still on the incline (Auer et al., 2017, p. 2). From this, the conclusion can be drawn that the advantage to disadvantage ratio for transcontinental sourcing is higher than the corresponding ratio for continental sourcing creating the extra-EU shift that is currently being experienced.

A study from Koerber and Schiele (2022) found driving factors behind the extra-EU shift that concern the following characteristics: possibilities for purchasing volume, the unique selling points of specialized products in innovative technology sectors, the possibility for strategic partners in order to build up local networks and get into local clusters. The price-benefit ratio is over and above decisive for transcontinental sourcing. From the study Koerber and Schiele (2022, p. 12) derive the following six driving factors creating the following figure 2 with said factors:

Global tenureship: well-developed suppliers with a good price-quality ratio are hard to change, as it is time-consuming and complex to develop a transcontinental supplier. This leads to the fact that it is beneficial to keep these suppliers in order to keep a competitive advantage.

Volume advantage: Transcontinental suppliers have better capabilities when it comes to the production of high volumes of specific products, increasing the attractiveness of said suppliers.

Technical exclusivity: In terms of digitalization and electronic components transcontinental suppliers sell products not found elsewhere, this unique selling point forces dependency on transcontinental suppliers upon buying firms.

Market penetration: On a global scale local sourcing, production and clusters are promoted intensively by governments, inside the EU and outside of the EU alike. However, responsiveness is higher within the EU.

Transcontinental suppliers offer the ability to become strategic partners in penetrating markets and getting into foreign clusters.

Quality advantage: The quality of goods produced by transcontinental suppliers is ever increasing, while remaining at a competitive price, generating a competitive advantage.

Capacity/availability: Transcontinental suppliers provide unique opportunities when it comes to access to exclusive materials and capacity.

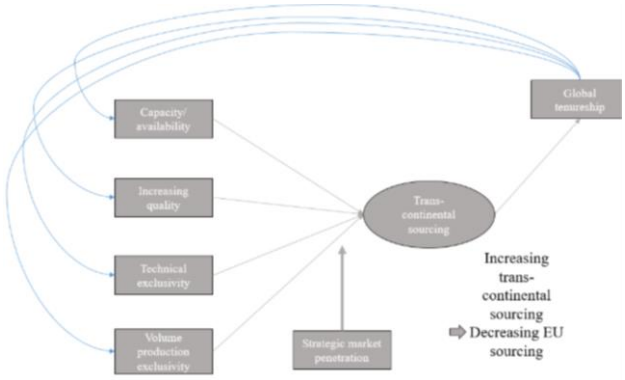

Figure 2: (Koerber & Schiele, 2022, p. 13)

3.2 Stated preference experiment: collecting data by indication of potential preferences

The origins of the Stated preference methods can be traced back to the 1960s, where they were used for studies in the mathematical psychology field (Sanko, 2002, p. 4). However, a study by Kagel and Roth (Kagel & Roth, 1995) shows that the first application of stated preference might even trace back to a study by Thurstone in 1931 (Thurstone, 1931), who tried to study indifference curves experimentally by making participants of the research choose between different combinations of coats, hats and shoes (Sanko, 2002, p. 4). Over the last decades stated preference experiments have seen an increase in awareness amongst researchers (Aizaki et al., 2014, p. 15).

The original concept of an experiment consists of observing one fixed variable, given that the levels of one or more different variables are manipulated, where these manipulations do not happen randomly, but are carefully designed with statistical techniques to determine the cause of changes in the fixed variable (Hensher et al., 2005, p. 100). This particular course of action can be found back in the revealed preference method, in which researchers observe or ask what the individual did, revealing their preference. The stated preference method however, is not actual behaviour, but a statement of preference, as this particular research method asks the participants: “If you were faced with this situation what would you do?” (Sanko, 2002, p. 4). Stated preference experiments create an artificial choice, where the respondents are put in a situation to choose between the alternatives, whereas the traditional revealed preference experiments monitor real situations (Ben-Akiva et al., 1992, p. 253).

Stated preference experiments have several advantages over its traditional revealed preference counterpart, these advantages include: the ability of choice sets to be prespecified; extendibility of the ranges of the attributes; potential prevention of acute multicollinearity among attributes; the possibility to incorporate attributes that by definition are hard to quantify e.g. safety, reliability and availability; and the ability to prespecify attributes, making them able to be measured without error. The stated preference method also has its disadvantages as would be expected, the reliability of hypothetical scenarios is uncertain. The uncertainty comes down to 2 different aspects, scilicet validity and stability. Validity can be explained by the possibility of actual behaviour and choices made in the experiment differing from each other due to: a respondent only considering the in their eyes predominant attribute amongst the alternatives; a response given is influenced by an inertia of a foregone answer e.g. to justify said foregone answer; the respondent uses the questionnaire to communicate his thoughts about the context surrounding the survey; a respondent sets aside situational constraints; and/or if a hypothetical value does not mirror reality a respondent can misinterpret or ignore said value. Stability can be explained by the magnitude of random error in stated preference experiments. Stability is thus determent through the lucidity of the survey and its setting. The response format may additionally have an influence on the stability of stated preference experiments, as participants have a limited ability to express their degree of preference situations (Ben-Akiva et al., 1992, p. 254).

The response formats included in the stated preference are similar to one another, yet distinctly different (Louviere et al., 2010, p. 58). A range of stated preference techniques has been created over the years to improve the ability to obtain participants' actual preferences, which has led to the creation of the most general and widely accepted family of the stated preference experiment as seen in figure 3 (Merino-Castello, 2003, p. 5).

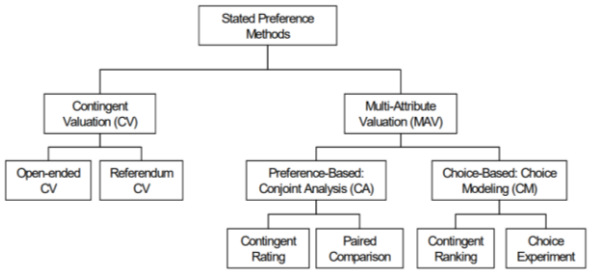

Figure 3.6. The Family of Stated Preference Methods

Figure 3:(Merino-Castello, 2003, p. 5)

3.2.1 Contingent Valuation

Contingent valuation is a direct survey approach (Merino-Castello, 2003, p. 5), in which the researchers sketch a situation with a hypothetical market where goods and services are traded. This hypothetical market should include the specification of the good or service sold, the context surrounding the provision of the good or service and a clear description of how the good or service will be financed. Preference data can either be collected through open-ended questions or through a referendum. Open-ended questions aim to investigate preferences by asking for participants' maximum willingness to pay or minimum willingness to accept. The open-ended questions technique is rarely used in the current day and age, due to the range of biases from participants that have the possibility to influence their answers. Most contingent valuation studies are done using the referendum or dichotomous choice elicitation, which like its open-ended counterpart aims to investigate the maximum willingness to pay or minimum willingness to accept. However, the referendum technique achieves this by asking its participants multiple questions only, whilst giving them the option of choosing either yes or no (Merino-Castello, 2003, p. 6).

3.2.2 Multi-attribute Valuation

The Multi-attribute Valuation consists of a family of survey-based techniques aiming to investigate the preferences of participants in terms of attributes and their levels of goods and services. Participants are presented with multiple scenarios or compositions of attributes and their respective levels and asked to either give them ratings, rankings, or a definite best choice based on the format used in the survey. The participants' preferences can be uncovered by using the participants' given answers (Merino-Castello, 2003, p. 7). Multi-attribute Valuation techniques provide several advantages over contingent valuation techniques: they provide a less costly and more natural manner of evaluating preferences of attributes and their levels; they are far less difficult to pair with cost models; they reduce problems attributed to multicollinearity; and circumvent a portion of response difficulty (Merino-Castello, 2003, p. 8). Multi-attribute Valuation techniques can be split into two separate groups. The first group contains the preference-based approaches, whilst the second group contains the choice-based approaches (Merino-Castello, 2003, p. 8).

3.2.2.1 Preference-based: Conjoined Analysis

Preference-based techniques mainly have the intention of gaining insights into consumer preferences overestimating economic values (Merino-Castello, 2003, p. 8). Preference-based techniques are equally referred to as conjoined analysis. Techniques in this branch of the family use deterministic utility functions. Conjoined analysis comprises both the contingent rating and paired comparison technique (Merino-Castello, 2003, p. 9). In contingent rating exercises, participants are given a number of scenarios to rate individually on a numeric or semantic scale (Merino-Castello, 2003, p. 10), seeing as the scores are given individually no direct comparison is done between the different scenarios. The paired comparison exercise comes into play here as it asks participants to choose between two alternatives and score the strength of their preference of their given choice. This method combines the elements of choice experiments and rating exercises (Merino-Castello, 2003, p. 11).

3.2.2.2 Choice-Based: Choice Modeling

Choice-based techniques are widely used for determining the value of a plethora of goods and services. Its growing acceptance is mainly due to the fact that researchers believe that choosing one preferred stimuli from amongst multiple stimuli is the closest representation of reality (Merino-Castello, 2003, p. 8). Choice-based techniques are also referred to as choice modeling. Techniques in this branch of the family use random utility functions (Merino-Castello, 2003, p. 9). Choice modeling comprises both the choice experiment and contingent ranking technique. In choice experiments, participants are given a set of scenarios with which they are expected to pick their most preferred scenario. Sets usually include a baseline option indicating the status quo. Contingent ranking exercises require participants to rank the given scenarios from most preferred to least preferred. This form of experiment just like its single deterministic choice counterpart requires the inclusion of a baseline option that reflects the participant's currently feasible choice set. This is done to exclude the possibility of forcing the participant of choosing a less desirable option than their current situation as their most preferred option (Merino-Castello, 2003, p. 11). The greatest benefit of the contingent ranking method over its discrete choice counterpart is its ability to gather more statistical information, leading to tighter confidence intervals around the parameter estimates, resulting in the estimate being more precise (Merino-Castello, 2003, p. 12).

4. METHODOLOGY: CHOICE-BASED CONTINGENT RANKING STATED-PREFERENCE EXPERIMENT: A SELECTION OF DIFFERENT SUPPLIERS

4.1 Experiment design: creation of the choice-based contingent ranking stated-preference experiment

The previously presented literature review was conducted to lay the groundwork for the experiment phase of the study. First and foremost the differentiation between continental supply and transcontinental supply was explored to further the knowledge domain and opportunities in the supply chain research field; secondly, the currently known reasons for the extra-EU shift, according to literature, were explored for a better understanding of the current phenomenon of the extra-EU shift; and lastly, the stated-preference experiment techniques were reviewed to gain a better insight on the currently used experiment techniques in the supply chain research field.

The second phase of the study consists of the design, conductance and the analysis and interpretation of the results of the experiments. To design an experiment researching the extra-EU shift the currently known reasons behind the extra-EU shift have been converted into six different variables:

Price_QualityRatio

Label: Ratio between price and quality

Values: Poor, Ideal

GlobalTenureship

Label: Current supplier

Values: No, Yes

MarketPenetration

Label: supplier located in target market

Values: No, Yes

Volume

Label: Ability to produce large volumes

Values: Minimal, Abundant

TechnicalExclusivity

Label: Technical solution offered by supplier

Values: Normal, Far superior

Capacity_Availability

Label: Unique capacity available

Values: No, Yes

The values of the variables should be meaningful, realistic and should reflect a situation that could possibly be faced by the respondents of the study (Mangham et al., 2009, p. 154). All values have been chosen to be dichotomies to ensure a clear difference between the values of the attributes. The labels are the

questions asked to test the variable it represents as it could influence respondents if they are told what could cause the extra-EU shift. The six variables allow for the use of conjoint analysis as the research method as according to Mangham et al.(2009) there are no restrictions on the maximum number of variables used in conjoint analysis experiments, but in practice, no more than ten variables are used as the larger the number of variables used the more respondents have to take into consideration and the greater the cognitive challenge becomes (Mangham et al., 2009, p. 153). The six dichotomous variables would incur the need for 2^6=64 unique choice cards if all possible scenarios would be created (Sanko, 2002, p. 15). However, the ORTHOPLAN command from the statistics program SPSS is able to reduce the number of choice cards necessary to test for each variable to a minimal amount. It is able to do this by using 'fractional factorial design', meaning it ignores some interaction effects in favour of the main effects (Sanko, 2002, p. 16). Orthogonality evades testing for collinearity between the variables (Sanko, 2002, p. 23), meaning it bypasses the correlation amongst the variables themselves and only tests for the effect of each of the variables as its own separate entity (Mangham et al., 2009, p. 153). 'The basic specification is ORTHOPLAN followed by FACTORS, a variable list, and a value list in parentheses. ORTHOPLAN will generate cases in the active dataset, with each case representing a profile in the conjoint experimental plan and consisting of a new combination of the factor values. By default, the smallest possible orthogonal plan is generated' (IBM, 2021). For this experiment the ORTHOPLAN design looks as follows:

```
Generate Orthogonal Design.
ORTHOPLAN
  /FACTORS=Price_QualityRatio 'Ratio between price and quality' (1 'Poor' 2 'Ideal')
   GlobalTenureship 'Current supplier' (1 'No' 2 'Yes') MarketPenetration 'Supplier located in '+
   'target market' (1 'No' 2 'Yes') Volume 'Ability to produce large volumes' (1 'Minimal' 2
   'Abundant') TechnicalExclusivity 'Technical solution offered by supplier' (1 'Normal' 2 'Far '+
   'superior') Capacity_Abailability 'Unique capacity available' (1 'No' 2 'Yes')
  /REPLACE.
_DATASET NAME finalexperimentinterviews.
```

This ORTHOPLAN design is able to reduce the number of scenarios back to 8 unique choice cards found in appendix 2. These choice cards were copied and made presentable for the participants of the experiment and looked as such:

ID: 1	**Supplier 1**
Ratio between price and quality	
	Poor
Current supplier:	
	Yes
Supplier located in target market:	
	Yes
Ability to produce large volumes:	
	Abundant
Technical solution offered by supplier:	
	Normal
Unique capacity available:	
	No

4.2 Data collection: conducting interviews including the ranking experiment with purchasing experts

The data gathering process was performed in cooperation with five other students and Thomas Koerber. The team was assembled to increase the total amount of participants every member could collect data from, which has ultimately led to 23 interviews held in the end. Whilst this paper focuses on data collection through the means of a choice-based contingent ranking stated-preference experiment, the other papers get their data through the means of a choice-based choice modeling stated preference experiment, semi-structured open interviews and surveys/questionnaires. Together this made up the total interview held with the participants of the study. The interview time ranged from thirty-nine to one hundred and eight minutes. The minimum requirement for the people to be considered as participants was for them to be involved in the purchasing sector of their company and their company to source out of the country they are located in. Due to the current situation (COVID-19) and with regard to working from home policies, both physical and online interviews have been held to gather data. Physical interviews were recorded with voice recording programs, online interviews were recorded with the Microsoft teams recording option. The recordings for the semi-structured open interview part were transcribed with the transcription software Amberscript, provided by the University of Twente. The interviews were held mostly in the native language of both the interviewer and the participant, meaning the transcribed interviews had to be translated to English for data collection, this was done by the use of the program Deepl. Finally, the data was shared with the correct member of the team for them to analyze the data. The data for the choice-based contingent ranking stated-preference experiment can be found in appendix 3.

4.3 Experiment analysis: conductance of a conjoint analysis of the obtained data

Analyzing stated-preference experiments requires different techniques for the different branches. The conductance of the interviews for this paper was done with a choice-based contingent ranking experiment. This experiment was conducted through the means of choice cards. This allows for the use of the CONJOINT command in SPSS, The CONJOINT command allows for the possibility to analyze the importance of different attributes or variables in regard to the decision-making process of respondents (IBM, n. d. -a, p. 1). The CONJOINT enables the ranking given by the participants to be analyzed to get the preferences for each of the variables on the choice cards. The

CONJOINT plan coding works by first starting the initial code by opening the CONJOINT PLAN. The second line of code gathers the data from the choice cards by giving the route to the file found in appendix 1. The following line opens the data with a route to the data file where all the responses are located (IBM, n. d. -b, p. 14). The following line can either use the sequence or rank command, depending on the structure of the data file. The rank command is used when the data file has the rank as the variable and the choice card ID as the data/value and the sequence command is used when the choice card ID is used as the variable and the ranking as the data/value (IBM, n. d. -b, p. 16), seeing that the latter is used in the data file found in appendix 3 the sequence command was used in the code. Following the sequence command, it starts analyzing the sequence of the responses from Preference 1 to Preference 8. The subject command is used next to specify which variable is used as the identifier, meaning the ranking data is subject to a variable, in this case, it is subject to the Respondent ID, making it possible to connect each respondents ranking to their Respondent ID. In the final lines, the factors are specified, these factors are the same as the variables on the choice cards. The variables should be specified as a type. The most common specifications are discrete, here the values of the variables are not in a particular order or preferred to one another; linear less, here the values are in descending order of preference e.g. 1: ideal, 2: poor; and lastly linear more, here the values are in ascending order of preference e.g. 1: poor, 2: ideal (IBM, n. d. -b, p. 17). Given that for the choice cards all variables were specified in ascending order of preference the linear more specification is used for every variable in this command. The following code was created with the previously stated information:

```
CONJOINT PLAN =
'C:\Users\keekh\OneDrive\Documenten\thesis\thesis.Data\spss files\choice cards.sav'
/DATA =
'C:\Users\keekh\OneDrive\Documenten\thesis\thesis.Data\spss files\experimentresults.sav'
/SEQUENCE = PREF_ID1 To PREF_ID8
/SUBJECT =  Respondent_ID
/FACTORS = Price_QualityRatio (Linear more) GlobalTenureship (Linear more) MarketPenetration
(Linear more) Volume (linear more) TechnicalExclusivity (linear more)
Capacity_Availability (linear more)
```

The conjoint analysis generates several outcomes. These outcomes give the following statistical measures: utility scores, coefficients, relative importance values, correlations and reversals. The utility scores are presented in a utility table containing the estimated utility scores of all the variables as well as their standard error. The coefficient table presents the linear regression coefficients for the factors of the choice cards. Utility scores are calculated by multiplying the level of a factor with its corresponding coefficient (IBM, n. d. -b, p. 32). The coefficients table shows the linear regression coefficients for the variables that are specified to be linear. A utility score for a particular variable is calculated by multiplying the level of the variable times the predicted utility of the variable. This predicted utility of the variable is also called the variable coefficient (B). The relative importance table gives the importance values of each of the factors. Importance values indicate the importance of a factor for the overall preference of the respondents. Importance scores or values are higher when the utility score of the corresponding factor is higher, meaning they play a more significant role than factors with lower importance scores or values. The values are calculated as percentages of the total utility. The importance value is calculated by dividing the utility score of a factor and dividing it by the total utility, this is done separately for each factor. The fact that importance scores represent in sense the percentage a factor makes out of the total utility results in all the scores adding up to a total of 100 (IBM, n. d. -b, p. 33). The correlation table displays the Pearson´s R and the Kendall´s tau, which both estimate the correlation between the observed and estimated preferences of the respondents. The table shows both the score for the Pearson´s R and Kendall´s tau as well as their significance values (IBM, n. d. -b, p. 34). Finally the conjoint analysis generates the table of reversals. Earlier in the code all of the variables or factors were specified to have a linear more characteristic, meaning the second value of the variable is preferred to the first value. The table of reversals shows the number of cases where this statement is not the case and thus reversed, where the first value is preferred to the second value according to the respondents' preferences. These cases are what are called reversals (IBM, n. d. -b, p. 35).

The true strength of the conjoint analysis does not lie in the ability to run an analysis of gathered data, but it lies in its ability to use said gathered data to predict future cases with the preferences of the respondents that were analyzed. The CONJOINT command can also be used with generated choice cards that have no preference data gathered during the interviews/data gathering process (IBM, n. d. -b, p. 34). These choice cards should be added to the data file where the choice cards used in the interviews are located. However, under the variable status, there is an option to change said status to simulation instead of the regular setting of design. The same analysis can be run again using the same code as the new simulation cards have been added to the data file already in use by the CONJOINT command code. The results given by this new analysis will be largely the same as the first analysis run. However, two new tables have appeared in the output given by SPSS. The first newly appeared table is the preference scores of the simulations, this table gives the preference scores obtained by the simulation cards based on the analyzed respondent's preferences from the data-gathering stage (IBM, n. d. -b, p. 35). The second table is the preference probability of simulations table, this table predicts the likelihood of a participant choosing the specific simulation card as their number one preferred choice. This table gives three statistics to base the prediction on: the maximum utility, this determines a score of the probability of participants choosing the specific simulation card as their first preference amongst the simulation cards and gives this score as a percentage calculated by dividing the estimated amount of participants choosing a specific simulation card as their first choice divided by the total amount of participants; the Bradley-Terry-Luce model calculates the probability of choosing a specific simulation card as the first preference amongst the simulation cards a ratio of said simulation cards utility to that of all simulation cards averaged across all respondents; the logit model uses the log of a specific simulation card's utility and ratios it against the log of all simulation cards' utility averaged across all respondents (IBM, n. d. -b, p. 36).

Almost all of the respondents mentioned during the interviews that for them the price-to-quality ratio was the variable they paid most attention to and attached the most value to. To test how much they value the price-to-quality ratio over the other variables two simulation cards are created. The first simulation card has the estimated best value for the price-to-quality ratio that being

Ideal, whilst having the worst estimated value for the other variables. The second simulation card has the opposite, scilicet the price-to-quality ratio value as Poor and all the other variables as their estimated best value. The former being called ID 1 and the latter being called ID 2.

5. RESULTS: IMPORTANCE OF DRIVING FACTORS ACCORDING TO PURCHASING EXPERTS' PREFERENCES

5.1 Choice-based contingent ranking stated-preference experiment results

As mentioned before 23 interviews have been held. The answers they gave to the choice-based contingent ranking stated-preference experiment during the interviewing process are recorded in a table found in appendix 3. After running the conjoint analysis through the means of the CONJOINT command in SPSS the statistics of the respondents' preferences were created. The first table provided by SPSS is the utilities table and can be found in appendix 4. This table provides the utilities of every level of each specific variable. As mentioned before the higher the utility score the more preferred it is, scores with a value below zero/with a negative value are less of a preference according to the respondents (IBM, n. d. -b, p. 32).

The highest utility shown in the table is that of variable: Price-QualityRatio, value: Ideal, with a utility estimate of 3.391, whilst the value: Poor, has a utility score of 1.696. the score for the value: Ideal is significantly larger than the value: Poor indicating a stronger preference for an ideal price-quality ratio. The fact that both utility scores are positive also indicates that this variable was preferred by the respondents.

For the variable: GlobalTenureship both values have a negative utility score, the value: No has a utility score of -0.022 and the value: Yes has a utility score of -0.043 indicating that this variable has not been as preferred as others.

For the variable: MarketPenetration both values again have a negative value indicating once again that this variable is also not as preferred by the respondents, although this time a larger difference can be seen between the scores of the values. The value: No has a utility score of -0.500, whilst the value: Yes has a utility score of -1.000 indicating a larger preference for suppliers to not be in a target market according to the respondents.

For the variable: Volume much like the variable: MarketPenetration has a negative value for both values of the variable. However, for the variable: Volume the difference between the utility scores is larger than for the variable: MarketPenetration. The utility score for the value: Minimal is -0.674, whilst the utility score for the value: Abundant is -1.348. the fact that both utility scores are negative indicates that the variable: Volume was not as preferred by participants. The difference between the utility scores indicates that participants preferred the value: Minimal over the value: Abundant as its utility score is closer to zero, this means that the respondents had a larger preference for suppliers with minimal ability to produce large volumes.

For the variable: TechnicalExclusivity both the values have a positive utility score indicating that this variable is preferred by the respondents. The value: Normal has a utility score of 0.565, whilst the value: Far superior has a utility score of 1.130 indicating that having a far superior technical solution is preferred by the respondents as the utility score of the value: Far superior is larger than the utility score of the value: Normal.

For the final variable: Capacity_Availability both values have positive utility scores again indicating this variable was preferred by respondents. The value: No has a utility score of 0.391, whilst the value: Yes has a utility score of 0.783, indicating that the respondents preferred to have a supplier with unique capacity available for them.

The second table is the table of coefficients and can be found in appendix 6. This table shows the coefficient scores also known as B of each of the variables. These values were used t calculate the utility of the values of the variables in the utility table. The coefficients are as follows: Price_QualityRatio: 1.696, GlobalTenureship: -0.022, MarketPenetration: -0.500, Volume: -0.674, TechnicalExclusivity: 0.565 and Capacity_Availability: 0.391. With these scores the utilities of the variables are calculated, e.g. variable: MarketPenetration Value: 2: Yes, Utility of value of variable = B * value of the variable, in this example this would result in: -0.500 (B of MarketPenetration) * 2 (value of MarketPenetration: Yes) = -1.000

The possibility exists to calculate the utility scores of choice cards, this is done by taking the constant given at the bottom of the utilities table found in appendix 4 and adding the utility scores of the values of each variable on the choice cards. When this is done for this specific experiment the result comes out as the table found in appendix 5, as seen in this table the order from the most preferred supplier to the least preferred supplier is 8,6,7,3,5,4,2,1, with the best supplier choice card 8 having the attribute of an ideal price-quality ratio, it being a current supplier, it's not located in the current target market, it has minimal ability to produce large volumes, it offers a far superior technical solution and it does not have unique capacity available. The worst supplier choice card 1 has the attributes of a poor price-quality ratio, it is a current supplier, it is located in a target market, it has abundant ability to produce large volumes, offers a normal technical solution, and has no unique capacity available.

The third table provided by SPSS is the importance values table that can be found in appendix 7. The higher the importance score the more important the variable is in the decision-making process of the respondents (Merino-Castello, 2003, p. 33). In order from highest importance to lowest importance the variables are ranked as such: in first place, Price_QualityRatio with a score of 25.555, second place Volume with a score of 24.113, followed by MarketPenetration and GlobalTenureship with a score of 17.379, and 11.918 respectively, the second to last place TechnicalExclusivity with a score of 11.144 and in last place Capacity_Availability with a score of 9.892

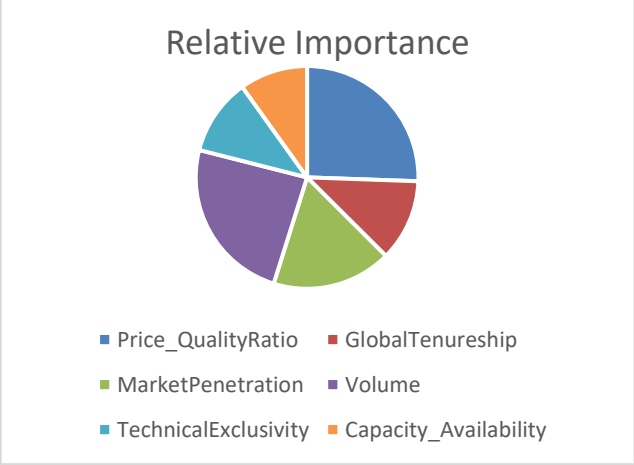

Figure 4: Relative importance scores pie chart

These scores indicate that Volume and Price_Quality ratio have the largest influence on the decision making process of the respondents, together combining for almost half of the total importance. The variable GlobalTenureship is also seen as above average in terms of importance, indicating respondents do truly consider the fact a supplier is already working with them or not.

The fourth table provided by SPSS is the table of correlations found in appendix 8. This table presents the correlation between the observed preference and the estimated preference of the respondents based on the experiment. The Pearson's R has a score of 0.794, this indicates a moderately to fairly strong positive relation between the observed and estimated preference of the respondents. This indication gets further proof in the significance score of the Pearson's R being 0.009 which is lower than the standard alpha of 0.05, which gives us the evidence to say the relation is at least not zero. The Kendall's tau has a score of 0.643, although lower than the Pearson's R it still indicates a moderately strong positive relation between the observed preference and estimated preference of the respondents. This gets further backed up by the significance score of the Kendall's tau, which is 0.013. The significance score of Kendall's tau is also higher than that of the Pearson's R, but is still lower than the standard alpha of 0.05, also indicating that the correlation between the observed preference and estimated preference of the respondents is at least not zero (Frost, 2018, p. 1).

The last table provided by SPSS is the table of Reversals found in appendix 9. When a respondent chooses the opposite of the expected preference e.g. minimal ability to produce large volumes over abundant ability to produce large volumes, this is called a reversal and the higher the number of reversals the lower the correlation between the estimated preference and observed preference of the respondents (IBM, n. d. -b, p. 35). Amongst the answers of the 23 respondents, 45 reversals have been recorded. The two variables with the most reversals are MarketPenetration and Volume with 14 and 11 reversals respectively. This makes up more than half of the reversals. This indicates that either the respondents did not take these variables into consideration during the decision-making process or actively prefer the predicted less preferred outcome. GlobalTenureship has 9 reversals and thus makes up one-fifth of the reversals. This is also a relatively high number of reversals. TechnicalExclusivity has 6 recorded reversals. Price_QualityRatio and Capacity_Availability have the least reversals with 3 and 2 respectively only making up one-ninth of the reversals combined. These variables have relatively few reversals indicating that respondents prefer the expected preferred outcome.

5.2 Results of the simulation cards prepared after the experiment

The simulation results of the experiment result in two tables provided by SPSS. These two tables are the Preference Scores of Simulations found in appendix 9 and the table of Preference Probabilities of Simulations found in appendix 10. The preference score for ID 1 is larger than the score of ID 2 with the former having a preference score of 5.467 and the latter having a preference score of 3.533, indicating that according to the previously given preferences of the respondents they are more likely to pick ID 1 over ID 2. In the table of Preference Probabilities of Simulations the maximum utility of the simulation cards, with ID 1 scoring 80.4% and ID 2 scoring 19.6%. According to the previously given preferences of the respondents 80.4% would choose ID 1 over ID 2, whilst 19.6% would prefer ID 2 over ID 1. The Bradly-Terry-Luce score further proves the preference for ID 1 as it scores 60.7%, whilst ID 2 scores 39.3% indicating that ID 1 has a 60.7% chance to be chosen over ID 2. The logit score of ID 1 also strengthens its case for being the most preferred simulation card as it logit score is 74.5%, whilst ID 2 has a logit score of 25.5%, indicating that the logistic probability of the respondents choosing ID 1 over ID 2 is 74.5%, whilst the reverse only has a logistic probability of 25.5%.

6. CONCLUSION: THE ABSOLUTE IMPORTANCE OF THE PRICE-TO-QUALITY RATIO

The choice cards with the highest utility in the experiment were 8,6.7 and 3. When looking at these 4 choice cards it is directly noticeable that these 4 choice cards have one thing in common and that is an ideal price-to-quality ratio. This indicates that the respondents valued the ideal price-to-quality ratio over all other variables. This indication gets further backing when looking at the utility scores of the values of the variables. An ideal price-to-quality ratio has a utility score of 3.391 indicating that this has a large influence when considering the choice of supplier. A poor price-to-quality ratio has a utility score of 1.696 which is the second-highest utility score achieved in this experiment. This also gives the indication that a poor price-quality ratio also has a large influence on the decision for a supplier. The other two values that had an impact on the decisions made by the participants according to the utility scores were the supplier having a far superior technical solution and the supplier having unique capacity/availability. The former is seen as being the third most preferred and the latter being the fourth most preferred.

The most favoured attributes/variables according to their importance score are the price-to-quality ratio, the ability to produce large volumes and if the supplier is located in the target market. Price-to-quality ratio is again shown to be the most important factor in the decision-making process of the respondents with an importance score of 25.555. However, now two other variables have a large influence on the decision of the respondents, these being the ability of the supplier to produce large volumes and if the supplier is located in a target market. The former being not far behind the price-to-quality ratio with an importance score of 24.113 and the latter whilst still being of importance is still quite a bit behind the two variables with an importance score of 17.379

The correlation between the observed preferences and the estimated preferences according to the model is moderately strong according to Kendall's tau with a score of 0.643. According to Pearson's R, the correlation is moderately strong to fairly strong. Both of these views get more proof when looking at the significance scores which are 0.013 and 0.009 respectively allowing for the conclusion that at least the correlation between the observed preferences and the estimated preferences of the respondents is significantly more than zero.

The reason for the correlation between the observed preferences and the estimated preferences of the respondents only being moderately to fairly strong is the number of reversals in the experiment and the negative utility scores. These two factors combined show that variables with negative utility scores/variables that were taken into account less during the decision-making process (GlobalTenureship, MarketPenetration and Volume) also have the most numbers of reversals, making it unclear if the estimated least preferred value is preferred over the estimated most preferred value or that the respondents did not take those variables into account and coincidentally chose the estimated least preferred value over the estimated most preferred value, leading to a different outcome than estimated. The supplier being in a target market, the ability of the supplier to produce

large volumes and the supplier being a current supplier of the firm total for 34 out of the 45 reversals indicating that these three variables have either been seen as not being a priority in the decision-making process or that the reverse is preferred over the estimated preference. Seeing that both the utility score of these variables are all negative it looks like these variables were not taken into account as strongly, although the importance values of these variables suggest otherwise as both market penetration and volume are in the top three importance scores.

Looking at the total preference computed in the simulation cases and the maximum utility a clear preference can be noted for ID 1. This ID corresponds to the choice card with the value for price-quality ratio being Ideal, whilst the other variables had the worst estimated values attributed to them. This scenario has been indicated to be more likely to be preferred by the respondents than ID 2, which had a poor price-quality ratio, whilst all the other variables had the best-estimated values attributed to them. 80.4% of the respondents would choose ID 1 over ID 2 according to the maximum utility score; according to the Bradley-Terry-Luce score ID 1 gets chosen over ID 2 60.7% of the time; and according to the logit score ID 1 has the logistic probability to get chosen over ID 2 74.5% of the time. With all of these statistics, we can safely say that respondents attach more value to the variable Price_QualityRatio than they do to all of the other variables combined. However, since there are variables with negative utility scores this might have influenced the outcome of this simulation.

Overall it is possible to state that currently known driving forces behind the extra-EU shift give a moderately to a fairly accurate representation of purchasing experts' preferences according to the data collected from the respondents. However, the ability to produce large volumes, the supplier being located in a target market and the supplier being a current supplier have shown to have either a very weak or opposite effect, whilst the unique capacity available of the supplier and the technical solution offered by the supplier were seen as not that important by the respondents in their decision-making process. The simulation has also shown that the respondents would prefer a supplier with an ideal price-to-quality ratio with all the other variables having the worst estimated value over a supplier with a poor price-to-quality ratio with all the other variables having the best-estimated values.

Influence on the supplier selection process of purchasing experts

strong	weak	Weak or inverse
Price-to-quality ratio	Unique capacity available	Ability to produce large volumes
	Technical solution offered	Supplier being located in target market
		Supplier being a current supplier

Table 1: influence of the variables on the decision-making process of purchasing experts

This leads to the conclusion that purchasing experts mostly look for a good price-to-quality ratio over everything else, showing that the current model might not put enough emphasis on the importance of the price-to-quality ratio of suppliers.

The importance of the price-to-quality ratio can also be seen in the initial trend towards global sourcing in general. The first wave of companies moved towards a global sourcing strategy to achieve cost benefits over its more expensive local counterparts (Cho & Kang, 2001, p. 545). Later the driving force behind global sourcing became the quality of the global suppliers or to be more specific the consistency of the quality provided by the global suppliers (Min & Galle, 1991, p. 15). This is also consistent with the answers the respondents gave during the interviewing process. They also stated the quality aspect of the price-to-quality ratio was most important to them. The quality of transcontinental suppliers is currently growing faster than the cost of said suppliers (Koerber & Schiele, 2022, p. 13), leading to the logical conclusion that the current extra-EU shift will continue, however the rising transportation cost due to the COVID-19 pandemic might be able to offset this shift according to the respondents.

7. DISCUSSION

7.1 Limitations

The research presented in this paper does have its limitations. One of the more common limitations in research also applies to this research paper, that being the interview biases. The way questions are formulated or answered and conversations that take place might influence the answers given by the respondents. The research might also have been influenced by the time constraint on the interviews as participants might not have had ample time to fully consider their answers. This might further be amplified by the difficult cognitive challenge the experiment provided as this was a common response by the respondents. This comes back to the limitation of choice experiments, the clarity of the variables and their corresponding values limits the ability of respondents to rank the choice cards to their full capacity. Even though the variables were taken from existing literature the values and labels of the variables were made to not give away too much information about the variable to decrease the likelihood of biases. This however, could have led to unclear or non-corresponding representations of the variable. Another limitation connected to the stated-preference experiments is that they are rooted in a hypothetical nature A limitation that could also have influenced the experiment is the fact that most of the interviews have been held in either German or Dutch, whilst the choice cards were presented in English. There is a possibility that there were misunderstandings due to English not being the native language of the respondents. Finally, there is the possibility for the researcher to wrongfully interpret the data gathered by the experiment.

7.2 future research

In the past ample research has been done on global sourcing as a whole. However, lately researchers have noticed a new research domain by broadening the meaning of global sourcing and dividing it into continental sourcing and transcontinental sourcing. This paper has aimed to test the known driving forces behind the current extra-EU shift. However, not all of these driving forces have been found to affect the decision-making process of purchasing experts, thus requiring further research to be done. This research is shown that the driving forces behind the currently experienced extra-EU shift are still relatively uncertain and more research is needed in terms of continental and transcontinental sourcing.

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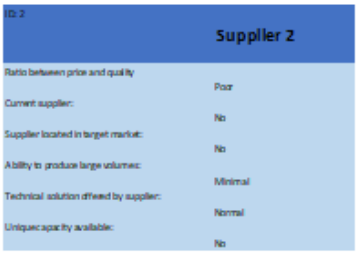
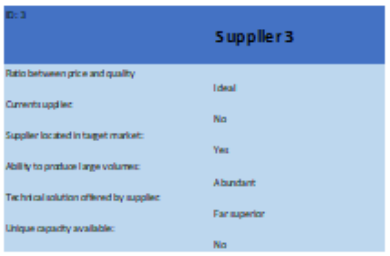
10. APPENDICES

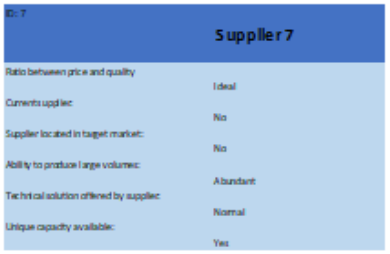
appendix 1: choice card information for the experiment

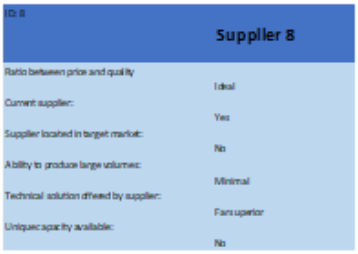
Price_Quality ratio	Global Tenureship	Market Penetration	Volume	Technical Exclusivity	Capacity_ Availability	Status_	Card_
Poor	Yes	Yes	Abundant	Normal	No	Design	1
Poor	No	No	Minimal	Normal	No	Design	2
Ideal	No	Yes	Abundant	Far superior	No	Design	3
Poor	Yes	No	Abundant	Far superior	Yes	Design	4
Poor	No	Yes	Minimal	Far superior	Yes	Design	5
Ideal	Yes	Yes	Minimal	Normal	Yes	Design	6
Ideal	No	No	Abundant	Normal	Yes	Design	7
Ideal	Yes	No	Minimal	Far superior	No	Design	8

Appendix:2 choice card designs









Appendix 3: choice-based contingent ranking stated-preference experiment results

Respondent_ID	PREF_1	PREF_2	PREF_3	PREF_4	PREF_5	PREF_6	PREF_7	PREF_8
1	5	8	2	6	7	1	3	4
2	7	8	3	6	5	1	4	2
3	6	7	8	3	5	1	4	2
4	5	8	2	6	7	1	4	3
5	5	8	2	7	6	3	1	4
6	6	8	3	5	7	2	1	4
7	7	8	1	5	6	4	2	3
8	7	8	1	4	6	3	2	5
9	5	8	2	1	4	6	7	3
10	5	8	3	4	6	1	7	2
11	4	7	3	5	8	2	1	6
12	7	8	4	5	6	3	2	1
13	6	7	3	8	5	1	4	2
14	3	8	1	2	7	4	5	6
15	5	8	1	6	7	2	4	3
16	7	8	6	4	3	1	2	5
17	5	8	3	6	7	1	4	2
18	7	8	3	6	4	1	5	2
19	5	8	1	6	7	2	3	4
20	7	8	4	3	6	2	1	5
21	7	8	5	3	4	2	1	6
22	8	7	6	3	4	1	2	5
23	7	8	2	5	6	3	4	1

Appendix 4: utilities table SPSS

Utilities

		Utility Estimate	Std. Error
Price_QualityRatio	Poor	1.696	1.543
	Ideal	3.391	3.087
GlobalTenureship	No	-.022	1.543
	Yes	-.043	3.087
MarketPenetration	No	-.500	1.543
	Yes	-1.000	3.087
Volume	Minimal	-.674	1.543
	Abundant	-1.348	3.087
TechnicalExclusivity	Normal	.565	1.543
	Far superior	1.130	3.087
Capacity_Availability	No	.391	1.543
	Yes	.783	3.087
(Constant)		2.315	5.723

Appendix 5: calculated utility estimates of the choice cards

Price_Quality ratio	Global Tenureship	Market Penetration	Volume	Technical Exclusivity	Capacity_ Availability	Estimated Utility	Card_
Poor	Yes	Yes	Abundant	Normal	No	2.576	1
Poor	No	No	Minimal	Normal	No	3.771	2
Ideal	No	Yes	Abundant	Far superior	No	4.857	3
Poor	Yes	No	Abundant	Far superior	Yes	4.033	4
Poor	No	Yes	Minimal	superior	Yes	4.228	5
Ideal	Yes	Yes	Minimal	Normal	Yes	5.337	6
Ideal	No	No	Abundant	Normal	Yes	5.184	7
Ideal	Yes	No	Minimal	Far superior	No	6,010	8

Appendix 6: Importance Values table SPSS

Importance Values

Price_QualityRatio	25.555
GlobalTenureship	11.918
MarketPenetration	17.379
Volume	24.113
TechnicalExclusivity	11.144
Capacity_Availability	9.892

Averaged Importance Score

Appendix 7: Correlations table SPSS

Coefficients

	B Coefficient Estimate
Price_QualityRatio	1.696
GlobalTenureship	-.022
MarketPenetration	-.500
Volume	-.674
TechnicalExclusivity	.565
Capacity_Availability	.391

Appendix 8: table of Reversals SPSS

Number of Reversals

Factor	MarketPenetration		14
	Volume		11
	GlobalTenureship		9
	TechnicalExclusivity		6
	Price_QualityRatio		3
	Capacity_Availability		2
Subject	1	Subject 1	2
	2	Subject 2	1
	3	Subject 3	2
	4	Subject 4	4
	5	Subject 5	3
	6	Subject 6	1
	7	Subject 7	2
	8	Subject 8	2
	9	Subject 9	4
	10	Subject 10	1
	11	Subject 11	2
	12	Subject 12	1
	13	Subject 13	1
	14	Subject 14	3
	15	Subject 15	2
	16	Subject 16	2
	17	Subject 17	2
	18	Subject 18	1
	19	Subject 19	1
	20	Subject 20	1
	21	Subject 21	2
	22	Subject 22	1
	23	Subject 23	4

Appendix 9: table of Preference Scores of simulations SPSS

Preference Scores of Simulations

Card Number	ID	Score
1	1	5.467
2	2	3.533

Appendix 10: table of Preference Probabilities of Simulations

Preference Probabilities of Simulations[b]

Card Number	ID	Maximum Utility[a]	Bradley-Terry-Luce	Logit
1	1	80.4%	60.7%	74.5%
2	2	19.6%	39.3%	25.5%

a. Including tied simulations

b. 23 out of 23 subjects are used in the Bradley-Terry-Luce and Logit methods because these subjects have all nonnegative scores.