

Local, EU, and transcontinental sourcing – a discrete choice experiment on the purchaser's preferences

Author: Jasper Daan de Vries
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT,

The tendency of companies to source their products from a widespread range of countries, located all over the world, is increasingly present nowadays. Distinction can be made between three categories of sourcing: local, EU, and transcontinental sourcing. Agency theory and social capital theory have proven that they are able to improve the decision making during the supplier selection process and the performance of the relationship while sourcing from a supplier. To explore how the purchaser's choice between suppliers from the three locational categories can be explained, discrete choice experiments (DCEs) are conducted with purchasers. DCEs are valuable when analysing complex decision making processes, such as the supplier selection process. Attributes that are derived from the agency theory and the social capital theory are included in the DCEs, to study their impact on the decision making of purchasers. The results show that in general, social capital theory has a greater impact on the perceived utility than agency theory, and thus explains a larger part of the purchaser's decision. Especially a well-developed relationship with the supplier is highly valued by purchasers. The study concludes that certain agency theory and social capital theory attributes can be the motivation for companies to choose to source their products from a supplier that is located in another country.

Graduation Committee members: Prof. Dr. H. Schiele
Dr. N. Pulles
T. M. Körber

Keywords

Stated preference experiment, discrete choice experiment, supplier selection, agency theory, social capital theory, local sourcing, EU sourcing, transcontinental sourcing.

1. INTRODUCTION: AN IMPORTANT DECISION PURCHASERS ARE FACING: LOCAL, EU, OR TRANSCONTINENTAL SOURCING?

In the past decades, companies are increasingly moving towards sourcing their supplies from all over the world (Chan, 2017, September, p. 683; Horn et al., 2013, p. 27; Kandil et al., 2020, p. 277). Even though a growing number of companies seems to realise the benefits of sourcing from another country (Cho & Kang, 2001, p. 544; Horn et al., 2013, p. 27), this also poses new challenges to these firms (Cho & Kang, 2001, p. 546). According to existing literature, the main reason for firms to globalise their supply network is the potential benefits it provides, such as cost reduction, improved quality, and availability (Cho & Kang, 2001, p. 544). At the same time, global sourcing entails new challenges: organisations encounter differences in legal systems, logistic challenges, and cultural barriers (Cho & Kang, 2001, p. 546).

Companies located in the European Union (EU) are at the centre of this study. For these firms, three categories of sourcing can be distinguished: local, EU, and transcontinental sourcing. Local sourcing, also known as domestic sourcing (Bohnenkamp et al., 2020, p. 84), is defined as sourcing from suppliers that are located close to the purchasing company (Körber & Schiele, 2021b, p. 4). This research considers a supplier to be local when they are located in the same country as the buyer. Global sourcing can be divided into two categories: sourcing from the EU, and transcontinental sourcing. To be more precise, sourcing from the EU implies sourcing from another country within the EU (Körber & Schiele, 2021a, p. 5). Another global sourcing approach, known as transcontinental sourcing, is defined as sourcing from a different continent (Schiele et al., 2021, p. 57). The aforementioned definitions of local sourcing, EU sourcing, and transcontinental sourcing are the definitions that are used in this study.

In order to benefit from the sourcing approach, companies should select the approach that fits best to the advantages they prefer (Kotabe & Murray, 2004, p. 11). The supplier selection process plays a significant role in this, and making the appropriate decision allows companies to obtain a competitive advantage (Ghodsypour & O'Brien, 2001, p. 15; Verma & Pullman, 1998, p. 739). Agency theory and social capital theory are considered relevant theories with regard to the supplier selection process, as well as with regard to the relationship between purchasing firms and their respective suppliers (Bohnenkamp et al., 2020, pp. 103-104; Steinle et al., 2019, p. 372; Steinle et al., 2014, p. 135). Steinle et al. (2014, p. 135) concluded in their research that aspects from agency theory can be used to make better sourcing decisions. Additionally, Bohnenkamp et al. (2020, pp. 103-104) argue that social capital theory can be used to ensure a smooth occurrence of sourcing projects.

Using the agency and social capital theories as a basis, two discrete choice experiments (DCEs) are conducted to gain a better understanding of why companies choose to source their products from the different locations. In total, seven attributes are deduced from the agency theory and the social capital theory. Besides the agency and social capital theory attributes, two critical attributes for the supplier selection process are also addressed, which are 'price' and 'quality' (Mummalaneni et al.,

1996, p. 119; Verma & Pullman, 1998, p. 741). The 'price' and 'quality' attributes have been used in many studies that attempted to gain insights into the supplier selection process (e.g. Abratt, 1986; Billesbach et al., 1991; Mummalaneni et al., 1996; Perreault Jr & Russ, 1976; Verma & Pullman, 1998; Wind & Robinson, 1968). The participants of the DCEs are purchasers who are part of firms that possess at least two of the aforementioned types of suppliers. Over the past decades, the sourcing decision has received considerable attention. This has been done using a great variety of methods, which also included DCEs (e.g. Mummalaneni et al., 1996; Verma & Pullman, 1998; Wind & Robinson, 1968). However, no DCEs that included attributes from both agency theory and social capital theory have previously been performed. By addressing the agency theory and social capital theory, this study aims to explore the decision-making process of purchasers between local, EU, and transcontinental suppliers.

This objective leads to the following research question:

“How do widely used supplier attributes and attributes obtained from the agency and social capital theories explain the purchaser’s choice between local, EU, and transcontinental sourcing?”

The answering of this main research question is supported by answering the following sub-questions:

“How do purchasers trade-off between widely used supplier attributes and attributes obtained from the agency and social capital theories when choosing from local, EU, and transcontinental suppliers that possess varying levels of these attributes?”

“What is the perceived importance of widely used supplier attributes and attributes obtained from the agency and social capital theories during the supplier selection process?”

The outcomes of the study add on the current research on the supplier selection process by filling a gap in the literature. Few studies analyse the actual decision making process of purchasers (Verma & Pullman, 1998, p. 740), let alone while also including agency and social capital theories. In addition to that, the results of the experiment can be used for further research on these topics. Besides making its contributions to the academic field, the study is considered practically relevant in the way that the insights obtained can be utilised by purchasers to improve their supplier selection process. The results make purchasers more aware of the challenges and benefits of the three different types of sourcing, and of which knowledge on supplier attributes is critical to possess. Therefore, they are increasingly enabled to make the right decision on which supplier to source from.

To answer the research questions, first in section two the distinction between local, EU, and transcontinental sourcing is explored in more detail in the form of a literature review. Moving on to the third section, the literature review is further expanded to topics surrounding the appliance of agency theory and social capital theory on the supplier selection process. Then, the literature review explains how studies have conducted stated preference (SP) experiments over the years, where a closer look is taken at the different types of SP experiments. Lastly, the state

of the art in purchasing with regard to DCEs is elaborated upon. Using this information, two DCEs have been constructed. Section four focusses on an extensive explanation of the research methodology, which includes the sampling methods, design, and analysis of the DCEs. Finally, the paper concludes with a presentation of the results in section five, and by drawing general conclusions and providing a discussion on these results in section six. The upcoming section heralds the beginning of the literature review.

2. THE DISTINCTION BETWEEN LOCAL, EU, AND TRANSCONTINENTAL BASED SUPPLIERS

To make a clear distinction between local sourcing, EU sourcing, and transcontinental sourcing, their benefits and disadvantages should be explored. Local sourcing is frequently regarded as the most straightforward sourcing approach (Bohnenkamp et al., 2020, p. 84), due to its domestic characteristic. Local sourcing can provide the buyer with several advantages, such as lower costs, increased flexibility, and delivery reliability (Wei et al., 2012, p. 367). Besides that, the country in which the buyer and supplier are located benefits from local sourcing as well. Local sourcing plays a significant role in the development of local economies (Wei et al., 2012, p. 365), which can indirectly benefit the buying company. Local sourcing improves the local communities by stimulating technology spill overs, as well as stimulating local entrepreneurship and the creation of employment opportunities (Wei et al., 2012, pp. 364-365; Xing, 2015, p. 33).

One of the main reasons for companies to derogate from local sourcing, and to choose for EU or transcontinental sourcing instead, is the greater availability of certain products outside of their domestic country (Cho & Kang, 2001, p. 545). Transcontinental sourcing provides companies with an even greater range of products compared to EU sourcing (Körber & Schiele, 2021a, p. 9). Even though transcontinental sourcing provides companies with a better availability, EU sourcing remains an interesting option as well. Because of the common legislations and policies within the EU, it is increasingly attractive for companies located in the EU to cooperate (Hanf & Soetendorp, 2014, p. 2; Körber & Schiele, 2021a, p. 5). In fact, Glick (2017, p. 197) states that the formation of the EU increased the trade among European countries that are a member with almost 70% during their membership years. Where transcontinental sourcing has the disadvantage of differences in legal systems (Bohnenkamp et al., 2020, p. 87; Cho & Kang, 2001, p. 546; Körber & Schiele, 2021a, p. 5), this remains limited when sourcing within the EU (Körber & Schiele, 2021a, p. 5).

Besides a better availability, EU and transcontinental sourcing can provide buying firms access to products with a better price and quality (Cho & Kang, 2001, p. 544). Japan and West Germany are examples of sourcing locations where suppliers are known for their high quality products (Cho & Kang, 2001, p. 544). Due to globalisation, being able to ensure high quality products has become increasingly important (Solomon et al., 2010, p. 86). In literature, there exists argumentation that local, EU and transcontinental sourcing can all lead to decreased costs for the buying firm (Bohnenkamp et al., 2020, p. 85; Cho & Kang, 2001, p. 544; Horn et al., 2013, p. 27; Wei et al., 2012, p. 367). The question then arises, how can companies benefit from

lower costs with the sourcing strategies at hand? When considering EU and transcontinental sourcing, low wages are the main explanation for the lower costs (Horn et al., 2013, p. 27; Wu & Zhang, 2014, p. 1223). Especially for developed countries, lower wages can result in lower costs when sourcing from other countries and continents (Kotabe & Mudambi, 2009, p. 122). However, the labour costs have started rising in Asian countries such as China (Wu & Zhang, 2014, pp. 1223-1224; Yang et al., 2010, p. 483), which is a trade giant due to its historically well-known low wages (Yang et al., 2010, p. 483). This increase results in companies finding cost savings in local sourcing, instead of in global sourcing (Wu & Zhang, 2014, p. 1234). On top of that, the risks of possible currency exchange rate fluctuations and transport delays can also lead to additional costs, which are typically considered as challenges of global sourcing (Bohnenkamp et al., 2020, p. 87).

All in all, there are no strict guidelines on how to execute the sourcing strategies successfully in order to obtain cost advantages, and which sourcing option is to be preferred in specific cases (Bohnenkamp et al., 2020, p. 85; Horn et al., 2013, p. 27). In the end, each type of sourcing comes with its unique set of benefits and challenges, the main reasons that guide the sourcing decision differ per company (Cho & Kang, 2001, p. 544).

3. THEORETICAL FRAMEWORK

3.1 The appliance of agency theory and social capital theory on the supplier selection process

Agency theory and social capital theory provide companies with assistance when making a decision between the sourcing possibilities, while at the same time providing them with a framework that can be used during the relationship with a supplier (Bohnenkamp et al., 2020, pp. 103-104; Steinle et al., 2019, p. 372; Steinle et al., 2014, p. 135). In this section, the underlying literature of both agency and social capital theories is explored. On top of that, the effects of both theories on the supplier selection process will be elaborated upon.

Agency theory explains the principal-agent relationship. This is used in principal-agent relationships, where the principal assigns tasks to the agent that need to be executed in the interest of the principal (Zu & Kaynak, 2012, p. 426). Principal-agent relationships can result in conflicts when the principal and the agent have contradictory goals, which causes the agent to work in its own interest instead of in the interest of his principal (Maestrini et al., 2018, pp. 323-324; Zu & Kaynak, 2012, p. 426). This is called opportunistic behaviour (Steinle et al., 2014, p. 124). Opportunistic behaviour can occur because of the frequently occurring information asymmetry, which is at the disadvantage of the principal (Maestrini et al., 2018, p. 324; Zu & Kaynak, 2012, p. 426).

Agency theory distinguishes three types of information asymmetry: hidden intention, hidden characteristics, and hidden action (Steinle et al., 2014, p. 127). Hidden intentions and hidden characteristics both apply before a contract between the principal and the agent has been agreed upon (Linder & Foss, 2015, p. 345; Steinle et al., 2014, p. 127). Hidden intentions imply that the underlying motives of the agent are not clear, and thus future actions of the agent during the relationship cannot be predicted

(Steinle et al., 2014, p. 127). Hidden characteristics are present when the principal is not properly informed on the qualities of the agent, and when this is the result of information asymmetry being present before the principal-agent relationship has started (Linder & Foss, 2015, p. 345). When the principal is not able to observe the behaviour of the agent during the relationship, one can speak of hidden actions (Steinle et al., 2014, p. 127). The principal only knows the results of the actions of the agent, but he does not know how the agent contributed to these results (Steinle et al., 2014, p. 127).

With sociology as its origins, social capital defines relationships as a resource that can be used for competitive advantage (Bohnenkamp et al., 2020, p. 88; Steinle et al., 2019, p. 365). There exist three types of capital that enable the conjoint generation and exchange of resources (Steinle et al., 2019, p. 365): cognitive, relational, and structural capital (Bohnenkamp et al., 2020, p. 88; Steinle et al., 2019, p. 365). Cognitive capital is defined as firms having shared values, meanings and interpretations of the relationship, which can be supported by being able to communicate in a shared language or having a similar culture (Bohnenkamp et al., 2020, p. 88; Steinle et al., 2019, p. 365; Yim & Leem, 2013, p. 325). Relational capital consists of having a well-developed relationship built on mutual trust and respect (Bohnenkamp et al., 2020, p. 88; Steinle et al., 2019, p. 365; Yim & Leem, 2013, p. 325). Structural capital includes relational linkages and social ties between both parties (Bohnenkamp et al., 2020, p. 88; Steinle et al., 2019, p. 365; Yim & Leem, 2013, p. 325), which can be intensified by systems that enable communication (Bohnenkamp et al., 2020, p. 89). All three dimensions are interconnected to a great extent (Yim & Leem, 2013, p. 325).

Both theories can be used to improve the decision making before selecting a supplier and the performance during the relationship with a supplier. Steinle et al. (2014, p. 136) argue that during the supplier selection process, the supplier opportunism and the information asymmetry should be taken into account. The information asymmetry types hidden intention and hidden action can function as a tool to predict opportunistic behaviour during the relationship (Steinle et al., 2014, p. 135). Furthermore, Bohnenkamp et al. (2020, pp. 103-104) found that social capital has a critical enabling effect on the successful outcome of sourcing projects. The presence of social capital in buyer-supplier relationships positively affects the performance of the relationship (Bohnenkamp et al., 2020, p. 104).

3.2 An overview of stated preference experiments in science

SP experiments have gained increasing awareness among researchers over the past decades (Aizaki et al., 2014, p. XV). The beginnings of SP experiments can be found in mathematical psychology, between 1960 and 1970 (Fowkes, 1998, p. 2). It is not clear when the increase in attention of SP experiments among other professions first appeared (Hensher, 1994, p. 108). However, the popularity started in the field of marketing (Sanko, 2001, p. 5). According to Hensher (1994, p. 108), the paper by Lerman and Louviere (1978) has had a great impact on the general popularity of SP experiments.

In the task of an SP experiment, respondents will state their choice of preference among several options (Hensher, 1994, p. 109). These options consists of a few groups of combinations of attributes that serve as artificial goods or services (Hensher,

1994, p. 109; Sanko, 2001, p. 1). Attributes can consist of either numerical, ordinal, or nominal values (Wind & Robinson, 1968, p. 31). To ensure that the respondent maintains a clear overview of the different attributes and their levels, fewer than 10 attributes should be used (Mangham et al., 2009, p. 153). Having too many attributes may decrease the accuracy of the results of the experiment (Mangham et al., 2009, p. 153).

SP experiments are different than the traditional revealed preference (RP) experiments: whereas SP experiments create an artificial choice situation and asks the respondent to make a choice, in RP experiments choices made by respondents in real situations are being monitored (Ben-Akiva et al., 1991, p. 253). When the goal of the research is to create an estimation of what individuals would choose, the artificiality of SP experiments provides several advantages (Ben-Akiva et al., 1991, p. 253).

First of all, choice sets and their attributes can be pre-configured, which is useful in situations where the attributes of real market options are not clear, and when non-existing options should be pursued (Ben-Akiva et al., 1991, p. 254; Mangham et al., 2009, p. 152). By analysing the results, insights can be gained into the potential popularity of new products, as well as trade-offs that are not present in the real market (Sanko, 2001, p. 9). Secondly, it removes measurement errors between attributes of the choice sets (Ben-Akiva et al., 1991, p. 254; Sanko, 2001, p. 9). Finally, with SP experiments researchers can get multiple responses from each respondents, which provides researchers with more data in a smaller time window (Sanko, 2001, p. 9). The greatest disadvantage of SP experiments is that the choice occurs in a hypothetical situation, which can lead to the results being inconsistent with the real behaviour of respondents (Sanko, 2001, p. 9).

SP experiments consist of three types: ranking the alternatives, rating the alternatives, and making a choice among several alternatives (Mangham et al., 2009, p. 152). A DCE is the task where the respondents are asked to make a choice among several alternatives (Mangham et al., 2009, p. 152). DCEs are a quantitative approach which enable researchers to obtain the preferences of the participants in specific situations (de Bekker-Grob et al., 2015, p. 373; Mangham et al., 2009, p. 152). Ranking-based SP experiments provide researchers with richer data than DCEs (Hensher, 1994, p. 110). Respondents are asked to rank the alternatives. Even though rating-based experiments provide researchers with even richer data, it is argued that humans are more capable of ranking alternatives than rating them (Hensher, 1994, p. 110).

After deciding upon the type of the SP experiment, the number of options per decision moment, the attributes and their possible levels, and the choice sets need to be generated (Mangham et al., 2009, p. 154). What is of great importance during this stage of the SP experiment design, is to create a design where the attributes are orthogonal (Bech et al., 2011, p. 273; Hensher, 1994, p. 117). Orthogonality of the attributes ensures that it is possible to compute the main effects between attributes, by varying the attributes independently from each other in the choice sets (Hensher, 1994, p. 117; Sanko, 2001, p. 15). Orthogonal attributes “means that the attributes of the design are statistically independent of each other” (Mangham et al., 2009, p. 154).

Two design options that can be used for orthogonality between the main effects are considered: full factorial and fractional factorial design (Mangham et al., 2009, p. 154; Sanko, 2001, pp. 15-17; Verma & Pullman, 1998, p. 745). In SP experiments that make use of full factorial design, the respondent is presented each

possible combination of sets of attribute levels (Mangham et al., 2009, p. 154; Sanko, 2001, p. 15). Even though full factorial design provides researchers with more data and thus statistically better results (Sanko, 2001, p. 17), due to time constraints it is often undesirable and impossible to let respondents go through all of the possible combinations (Fowkes, 1998, p. 17; Hensher, 1994, p. 115; Sanko, 2001, p. 17). Fractional factorial designs provide a solution to this problem (Fowkes, 1998, p. 17; Hensher, 1994, p. 115; Sanko, 2001, p. 17). At the cost of statistical power, the experiment is made reasonable for the respondents by using the main effects plan of a fractional factorial design, which is also the most commonly used fractional factorial design plan (Hensher, 1994, pp. 115-116; Sanko, 2001, p. 17). The assumption on which the main effects plan is based, is that “*individuals process information in a strictly additive way, such that there are no significant interactions between attributes*” (Hensher, 1994, p. 116). Despite this simplification, in most cases main effects can explain at least 80% of the variance in data (Sanko, 2001, p. 18).

3.3 Types of stated preference experiments

3.3.1 Ranking-based experiments

In ranking-based experiments, the task of the respondents is to rank a set of alternatives from most preferred to least preferred (Hensher, 1994, p. 110). Researchers argue that individuals are more capable of ordering alternatives than rating them, which is the main reason why they choose ranking-based experiments instead of rating-based experiments (Hensher, 1994, p. 110). Although ranking-based experiments provide researchers with richer data, there is still doubt about the usefulness of ranking-based experiments (Hensher, 1994, pp. 110-111). This holds true especially for lower ranks, which tend to be less reliable after analysis than higher ranks (Hensher, 1994, p. 111). Because of this, the main benefit that comes with ranking-based experiments, which is providing richer data than DCEs, becomes debatable (Hensher, 1994, p. 111).

3.3.2 Rating-based experiments

In rating-based experiments, the respondents are asked to rate the choice options on a predetermined scale (Hensher & Truong, 1985, p. 239). Rating-based experiments provide researchers with the richest data of the three types of experiments: besides the order, it also provides information on the intensity of preference (Hensher, 1994, p. 111). One disadvantage of rating-based experiments is that due to the different rating scales that can be used, analysis of the results of rating-based experiments becomes more complicated (Ortúzar & Garrido, 1994, p. 185). On top of that, it is argued that individuals are less able to rate a set of choices than to rank them (Hensher, 1994, p. 110). This makes rating-based experiments less reliable and straightforward.

3.3.3 Discrete choice experiments

As a well-respected SP experiment type, DCEs are gaining increased popularity in several disciplines (Bech et al., 2011, p. 273; Hensher, 1994, p. 108). DCEs are a ranking task where only the first preference is stated by the respondents, which makes them less sophisticated than ranking-based experiments (Hensher, 1994, p. 112). Previous studies have shown that DCEs are an effective tool that allow researchers to analyse complex decision making processes, such as the supplier selection process (Verma & Pullman, 1998, p. 741). DCEs are valuable when in the real market, only one alternative of a set of alternatives is chosen (Hensher, 1994, p. 112).

The theory on which DCEs are based is random utility theory, which explains the behaviour of human beings (Louviere et al., 2010, p. 62). Random utility theory is the most commonly used

behavioural theory in science, (Cascetta, 2009, p. 89). It is based on the assumption that individuals make their decisions on a rationale basis, to maximise the benefits (or utility) they can obtain (Cascetta, 2009, p. 90). The perceived utility from one alternative varies dependent on the values of the corresponding attributes (Cascetta, 2009, p. 90). Analysis of DCE results provides researchers with insights into the effects between the attribute levels and the perceived utility of the alternatives (Mangham et al., 2009, p. 153). The formula used to compute the utility U of choice option j for participant p is the following (Watson et al., 2020, p. 79):

$$U_{jp} = \sum_{a=1}^A \beta_{ap} \gamma_{aj}$$

Here, β indicates the weight factor that shows the importance of the a th attribute to respondent p . γ denotes the level of the a th attribute. To obtain the value of β for each attribute, the results of DCEs need to be analysed. Berendsen (2015, p. 18) states that “*the analysis of DCE data involves regression models that have a dichotomous or polychotomous categorical dependent variable*”. Three types of most commonly used regression models can be distinguished: conditional, multinomial, and mixed logit models (Berendsen, 2015, p. 18). The model that should be applied is dependent on the type of variables that are taken into consideration (Berendsen, 2015, p. 18). Attributes that have a different value for each choice set, are analysed using conditional logit models (Berendsen, 2015, p. 18). Multinomial logit models allows for analysis that include variables of which the values do not change during the experiment, an example of which is the age of the respondent (Berendsen, 2015, p. 18). Mixed logit models can be applied when the data that needs to be analysed consists of both attributes and constant variables (Berendsen, 2015, p. 18).

3.4 Discrete choice experiments: the state of the art

In the past decades, numerous studies from different sectors successfully conducted DCEs, which makes the literature rich of studies that apply DCEs (Haghani et al., 2021, p. 5). DCEs seem to receive increasingly interest by researchers (Haghani et al., 2021, p. 2). For example, van Rijnsoever and Eveleens (2021) created an orthogonal DCE that allowed them to get an indication of the perceived utility of entrepreneurs for different attributes of start-up incubators (van Rijnsoever & Eveleens, 2021, p. 6). A recent example in the agricultural sector is provided in the study of Nie et al. (2021), who conducted a DCE with the minimum number of choice sets needed, using a fractional factorial design that ensured orthogonality (Nie et al., 2021, p. 5). The choice sets of the DCE in Wang et al. (2021) consist of ecological restoration scenarios, and are created using the orthogonal design method in SPSS (Wang et al., 2021, p. 3). Other studies also designed their DCEs using fractional factorial design to ensure orthogonality, which allows them to analyse the main effects (e.g. de Bekker-Grob et al., 2015; Elrod et al., 1992; Hanley et al., 1998; Kim & Leung, 2021; Mangham et al., 2009).

While the previous paragraph shows the broad application of DCEs in other sectors, the application of DCEs in the sourcing literature is less widespread. Before researchers started conducting DCEs in the sourcing sector, other SP experiments could already be found in literature. Wind and Robinson (1968), for example, are one of the first to apply SP experiments to explore the behaviours of purchasers. In their research, they use rating-based experiments (Wind & Robinson, 1968, p. 34) in an attempt to explain the supplier selection decision of the purchaser, by gaining an increased understanding on the

determinants of this decision and their relative importance (Wind & Robinson, 1968, p. 29).

In the study of Mummalaneni et al. (1996, p. 118), an overview can be found of previous studies that investigated the importance of different supplier attributes. All of these studies used rating-based experiments, and Mummalaneni et al. (1996, p. 122) conducted a rating-based experiment as well. The work of Verma and Pullman (1998) is one of the few that uses DCEs to analyse the relative importance of different characteristics of suppliers during the supplier selection process. Their main reason for conducting DCEs is because they want to simulate the supplier selection process, where purchasers usually are supposed to select one supplier from multiple candidates (Verma & Pullman, 1998, p. 740). This allows for analysis of the actual importance of the attributes, instead of the perceived importance of the attributes (Verma & Pullman, 1998, p. 740). On top of that, the relative importance of different attributes, and how respondents trade-off between these attributes, become evident (Verma & Pullman, 1998, p. 741).

4. RESEARCH METHODOLOGY: QUANTITATIVE DATA COLLECTION

4.1 Data collection methods and sample selection: literature review and discrete choice experiments with purchasers

Before beginning the experiment phase of the study, a literature review was conducted. First, a distinction was made between local, EU, and transcontinental sourcing. Especially a clear distinction between the latter two was required, since the largest part of the existing literature does not distinguish between EU and transcontinental sourcing. Secondly, the agency theory and social capital theory, and their possible application on the supplier selection process were summarised. Finally, the theory surrounding SP experiments was reviewed, while specifically focussing on the design and analysis of DCEs.

The second part of the study consists of the design, conductance, analysis, and interpretation of two experiments. As discussed in the previous sections, the research questions of the study at hand are answered by conducting two DCEs. In DCEs, the respondents are asked to state their choice of preference out of a set of options. DCEs provide numerical data, which makes the research and its data quantitative (Antonius, 2003, p. 2). DCEs allow researchers to analyse complex decision making processes, an example of which is the supplier selection process (Verma & Pullman, 1998, p. 741). Even though DCEs provide less rich information than other SP experiments, because it is a simplified ranking task (Hensher, 1994, p. 112), it is still the choice of experiment. Although this simplicity comes at the cost of a decrease in the richness of the information, DeShazo and Fermo (2002, p. 138) found that a large number choice options greatly decreases the consistency of the decision makers. Because of the aim of this research, which is to gain knowledge on how different attributes explain the purchaser's choice between local, EU, and transcontinental suppliers, and the complexity of the supplier selection process, DCEs are applied in this study.

The respondents are all purchasers at a firm who do source from suppliers of at least two of the three locational categories. This ensured that the purchasers had experience with locational differences between suppliers. They were directly contacted, by

email or by phone, to participate in the experiment. The DCE was conducted online, using platforms such as Microsoft Teams, Skype, and Google Meet. In total, 11 purchasers participated in the DCEs. The respondents were told that all suppliers passed the threshold in order to be seriously considered as a partner. The suppliers are at least of a sufficient level for each attribute, however, some score better than others. They were provided three artificial suppliers with different attribute levels several times, of which they had to state which supplier they would choose.

4.2 Research design: operationalisation of the discrete choice experiment

The decision of splitting the experiment into two DCEs comes from the large number of attributes that is being researched in this study. Having too many attributes may lead to the respondent neglecting to take some attributes into consideration (Mangham et al., 2009, p. 153; Sanko, 2001, p. 22). There is no clear limit on the maximum number of attributes, however, Mangham et al. (2009, p. 153) state that most studies use fewer than 10 attributes. For example, Mummalaneni et al. (1996) use 6 attributes, and Verma and Pullman (1998) use 5 attributes, for their research on the supplier selection process. Each DCE mainly focusses on one theory. The theory of focus for the first DCE is the agency theory, while the second DCE focusses on the social capital theory. However, the 'are we attractive for the supplier?' attribute is added to the second DCE. This is because it is an agency theory attribute that is derived from information asymmetry in general, and thus it has overlap with the other agency theory attributes. Having overlap in subjects among attributes should be avoided when the research focusses on the main effects (Mangham et al., 2009, p. 153). Finally, the DCEs have the 'sourcing location', 'price', and 'quality' attributes in common.

In the first part of the theoretical framework section, the role that agency theory and social capital theory play in the supplier selection process was explored. The three types of information asymmetry for agency theory can be defined as hidden intention, hidden characteristics, and hidden action. For social capital, the three types of capital are: cognitive, relational, and structural capital. Using the theory behind these definitions, an attribute has been designed for each definitions. Additionally, one extra attribute has been created for agency theory, which has an effect on information asymmetry in general. Table 1 shows an overview of the attributes.

Table 1: An overview of the attributes and their levels

Theory	Attribute	Levels
General	Sourcing location	Local/EU/ Transcontinental
	Price	Ideal/Poor
	Quality	Ideal/Poor
	Agency	Previously performed differently
Agency	Supplier is transparent	Yes/No
	Supplier can be monitored	Yes/No
	Are we attractive for the supplier?	Yes/No
	Social capital	Cultural barriers
Relationship with the supplier		Ideal/Poor
Joint IT platform for communication		Yes/No

Hidden intentions are operationalised by creating the attribute named ‘previously performed differently’. This implies whether the supplier at hand performed differently than promised in the past. Whether the supplier performed differently in the past is an indication of the reputation of the supplier, which can be used as an indicator for the presence of hidden intentions (Steinle et al., 2014, p. 129). If the supplier performed differently, it is uncertain for the purchasing company whether the supplier will present this behaviour again in the future. ‘supplier is transparent’ shows whether hidden characteristics might be present. If the supplier is not transparent, the purchasing firm is not able to be properly informed on the qualities of the supplier and thus there is information asymmetry. Thirdly, hidden actions have been implemented in the experiment as the attribute ‘supplier can be monitored’. Being able to monitor the supplier is a way to estimate the extent to which hidden actions are present (Steinle et al., 2014, p. 127). When suppliers cannot be monitored, the purchasing company only gets to see the results, i.e. the product or service delivered by the supplier, and they do not know how the supplier contributed to this product or service. Finally, the ‘are we attractive for the supplier’ attribute gives an indication of how likely it is that a supplier will take advantage of information asymmetry. If the purchasing company (or principal) is an attractive collaborator for the supplier (or agent) as well, a beneficial relationship is likely to emerge. Aspects of a beneficial relationship, such as mutuality and solidarity, can reduce opportunism (Steinle et al., 2014, p. 127). All the agency theory attributes have two levels: ‘yes’, which indicates that the attribute is present, and ‘no’, which indicates the absence of that attribute.

The types of social capital are reconstructed in the form of attributes as well. Cognitive capital can be defined in terms of having a similar culture or language (Bohnenkamp et al., 2020, p. 88; Steinle et al., 2019, p. 365; Yim & Leem, 2013, p. 325). This has been converted into the attribute ‘cultural barriers’, which are either present (‘yes’) or absent (‘no’). For relational capital, ‘relationship with the supplier’ has been created as an attribute. This defines whether the relationship is well-developed (‘ideal’) or not (‘poor’). Finally, structural capital can be strengthened with communication platforms (Bohnenkamp et al., 2020, p. 89), which is why the attribute has been defined as the presence of a ‘joint IT platform for communication’. The attribute levels, which indicate the presence, are ‘yes’ and ‘no’.

Combining the aforementioned attributes with the ‘sourcing location’, ‘price’, and ‘quality’ attributes, choice cards have been created. For the creation of these choice cards, the SPSS command ‘ORTHOPLAN’ has been used. ORTHOPLAN produces choice cards using fractional factorial design. This provides the minimum number of cards needed for the experiment to be orthogonal, and allows for analysis of the main effects (Sanko, 2001, p. 17). It resulted in 9 choice cards per experiment for each locational value, and thus 27 choice cards in total for each experiment. These choice cards were matched using a random number generator, with 9 choice sets per experiment as an outcome, and thus 18 choice sets in total. The choice sets can be found in tables 4 and 5, in the appendix. After conductance of the experiment, in total 99 choice questions were completed per experiment (11 respondents * 9 choice questions). An example of how the choice sets were presented to the respondents can be seen in figure 1. The choice cards show the location of the supplier, and their respective attribute levels. Three suppliers with different locations, or one choice set, are presented to the respondent at the same time. These suppliers are presented in a way that allows the respondent to easily compare them.

Choice 1: Local supplier	Choice 2: EU supplier	Choice 3: Transcontinental supplier
Location: Local	Location: Different country, but in EU	Location: In a different continent
Price: Ideal	Price: Ideal	Price: Poor
Quality: Ideal	Quality: Poor	Quality: Ideal
Supplier can be monitored: No	Supplier can be monitored: Yes	Supplier can be monitored: Yes
Supplier is transparent: No	Supplier is transparent: No	Supplier is transparent: No
Previously performed differently: Yes	Previously performed differently: Yes	Previously performed differently: Yes

Figure 1: An example of a choice card in the DCE

4.3 Analysis method: conditional logit models using SPSS

For the analysis of choice data, regression models are the proper method (Berendsen, 2015, p. 18; Mangham et al., 2009, p. 156; Verma & Pullman, 1998, p. 743). DCEs that contain attributes with different values for each question, are usually analysed using conditional logit models (Berendsen, 2015, p. 18), which is also applicable on this study. Conditional logit models assume that respondents assign a utility to choice options (Steckel & Vanhonnacker, 1988, p. 391), which corresponds with the random

utility theory on which DCEs are based (Louviere et al., 2010, p. 62). An alpha α of 0,05 is used for the analysis phase.

Cox regression analysis in SPSS is executed in order to apply conditional logit models on the data. Two different SPSS files were used for analysis, one for each experiment. Every respondent was assigned $9 * 3 = 27$ rows; 3 rows per choice questions. Each row represents one choice option of the respective choice question. The attribute levels were either 0 or 1, with a value of 0 being 'no' or 'poor', and a value of 1 being 'yes' or 'ideal'. The 'sourcing location' attribute has values ranging from 1 to 3, with 1 being a 'local supplier', 2 being a 'EU supplier', and 3 being a 'transcontinental supplier'. On top of that, the 'sourcing location' has also been recoded into two dummy variables. Local sourcing was chosen as the reference category, and thus the results also show the effects of EU and transcontinental sourcing on the utility.

Besides the attributes, two new variables are added: 'choice' and 't'. The 'choice' variable is a dummy variable that shows if a supplier profile was the choice of preference, with a value of 0 being 'no', and a value of 1 being 'yes'. The 't' variable was required for the survival analysis of Cox regression, with its value being equal to '2 - choice'. This means that when the respective option was the choice of preference, the value of 't' is 1. If it is not the choice of preference, the value of 't' is 0.

5. RESULTS

5.1 Analysis of DCE 1: effects of the agency theory on the supplier selection process

After conducting Cox regression in SPSS, it appears that the 'sourcing location', 'transcontinental sourcing', 'price', and 'quality' attributes provide statistically significant results when using an α of 5%. The significance level p of the other attributes is greater than 0,05, which does not allow for the drawing of conclusions. The weight values β and their respective significance levels can be found in table 2. All locational attributes have a negative weight value, which implies that the perceived utility by respondents will decrease if these attributes are present. For the 'sourcing location' attribute, an increase in the attribute level means that the supplier is located farther away, e.g. in another country within the EU, or on another continent. The negative weight value for the 'sourcing location' attribute showcases that, the farther away the supplier, the lower the perceived utility, ceteris paribus. This is being supported by the negative weight values for the 'EU sourcing' and 'transcontinental sourcing' attributes. Additionally, note that the weight value of 'transcontinental sourcing' is twice the weight value of 'local sourcing'.

The weight values of 'price' and 'quality', which are larger than the weight values for all other attributes, show that these attributes have a great impact on the utility. On top of that, the presence of a good price and a good quality positively contributes to the perceived utility value. When shifting the focus to the agency theory attributes, it is clear that these results are not statistically significant. With a value of -0,071, the 'supplier previously performed differently' has a negative weight value that is extremely close to zero. The negative weight value of the 'supplier is transparent' suggests that transparency of a supplier does not have an impact on the perceived utility. At the same time, the possibility of monitoring a supplier is valued by the respondents, which can also be seen in the positive weight value

attributed to the 'supplier can be monitored' attribute. But as mentioned before, these results have a p -value greater than α , which makes them statistically not significant.

Table 2: Cox regression results of DCE 1

Attributes	β	SE	p
Sourcing location	-0,528	0,145	0,000
EU sourcing	-0,259	0,240	0,281
Transcontinental sourcing	-1,056	0,291	0,000
Price	1,509	0,338	0,000
Quality	2,058	0,424	0,000
Supplier previously performed differently	-0,071	0,235	0,763
Supplier is transparent	-0,209	0,227	0,357
Supplier can be monitored	0,315	0,243	0,194

5.2 Analysis of DCE 2: effects of the social capital theory on the supplier selection process

DCE 2 provides more statistically significant results. The 'sourcing location', 'transcontinental sourcing', 'price', 'quality', 'relationship with the supplier', 'joint IT platform for communication', and 'are we attractive for the supplier' attributes all show a p -value that is lower than α . The results of DCE 2 can be found in table 3. With regard to the attributes they have in common, both DCEs show similar results. 'sourcing location' and 'transcontinental sourcing' both have a negative weight value in DCE 2. This result is also found in DCE 1. However, although the 'EU sourcing' attribute does not provide a statistically significant result, its weight value in DCE 2 is contradictory to the weight value found in DCE 1. On top of that, a positive weight value for 'EU sourcing' also contradicts the negative weight value found for 'sourcing location'. Just as in DCE 1, DCE 2 shows that the weight value of 'transcontinental sourcing' is twice the weight value of 'local sourcing'.

Along with the results of DCE 1, the presence of a good 'price' and a good 'quality' has a positive effect on the perceived utility. When taking a look at the social capital theory attributes, the 'cultural barriers' with its p -value of 0,465 did not provide a significant result. However, 'relationship with the supplier' and 'joint IT platform for communication' have a p -value lower than 0,05, which implies a significant result. Both attributes have a positive effect on the perceived utility, where the effect of the 'relationship with the supplier' attribute is almost as great as the 'price' attribute. Finally, the agency theory attribute provided a significant result as well. The positive impact of the 'are we attractive for the supplier' attribute on the perceived utility is approximately as great as the impact created by the presence of a 'joint IT platform for communication'.

Table 3: Cox regression results of DCE 2

Attributes	β	SE	Sig.
Sourcing location	-0,411	0,152	0,007
EU sourcing	0,186	0,234	0,428
Transcontinental sourcing	-0,821	0,304	0,007
Price	0,862	0,278	0,002
Quality	1,111	0,303	0,000
Cultural barriers	-0,171	0,235	0,465
Relationship with the supplier	0,832	0,290	0,004
Joint IT platform for communication	0,586	0,240	0,015
Are we attractive for the supplier?	0,585	0,251	0,020

Because DCE 2 provided attributes that are derived from agency theory and social capital theory with significant results, the weight values of the attributes that showed significant results have been converted into a bar chart (see figure 2). To allow for a more convenient comparison, the absolute weight values were used. The dark grey bars show a negative weight value, while the light grey bars show a positive weight value. For calculation of the weight values of ‘EU sourcing’ and ‘transcontinental sourcing’, the weight value of ‘sourcing location’ from DCE 2 is used. When attributes on the left side of figure 2 are present, they relatively have the least impact on the perceived utility. At the same time, the presence of the attributes on the right side has the greatest impact on the perceived utility.

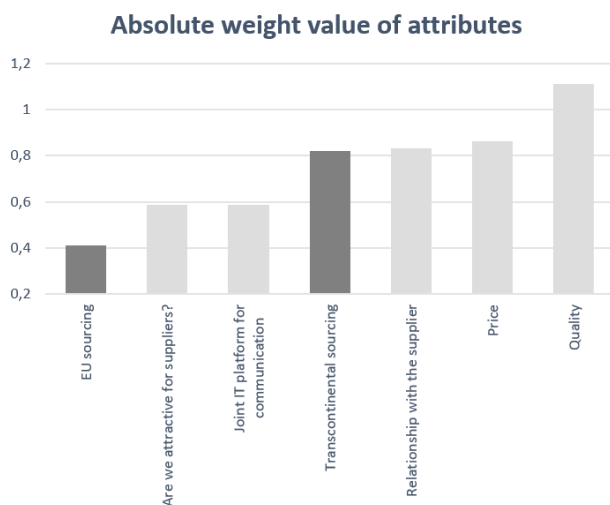


Figure 2: Absolute weight value of attributes

6. DISCUSSION AND CONCLUSION

6.1 Social capital theory explains a greater part of the supplier selection process than agency theory

Answering the research questions provides insights in how purchasers trade-off between the different attributes, and what the relative importance of the attributes is as perceived by purchasers. Since both experiments contain two common attributes, which are ‘price’ and ‘quality’, a comparison between the experiment results is possible with regard to the subjects treated by the sub research questions. The answers for the sub-questions together provide an answer to the main research question:

“How do widely used supplier attributes and attributes obtained from the agency and social capital theories explain the purchaser’s choice between local, EU, and transcontinental sourcing?”

Starting with the common attributes, the negative weight value for the ‘sourcing location’ shown in tables 2 and 3 implies that whenever the attribute level increases, the perceived utility by the respondent decreases. What is showcased by this, is that the respondents value sourcing close to their home more than sourcing from farther away. This is the case because the value 1 equals local sourcing, 2 equals EU sourcing, and 3 equals transcontinental sourcing. On top of that, DCE 1 concludes that the weight value of ‘EU sourcing’ and ‘transcontinental sourcing’ is negative as well. The negative weight value of ‘transcontinental sourcing’ is twice as large as the weight value of ‘sourcing location’, which implies that the transition from ‘EU sourcing’ to ‘transcontinental sourcing’ decreases the utility with the same amount as the transition from ‘local sourcing’ to ‘EU sourcing’ does. Although ‘EU sourcing’ is not significant, the significance of the ‘sourcing location’ and ‘transcontinental sourcing’ attributes makes it plausible that the presence of ‘EU sourcing’ has an adverse effect on the utility as well. However, controversially, the results from DCE 2 show a positive weight value for ‘EU sourcing’. Even though the significance is lacking, this finding is contradictory to the findings found on the other attributes in DCE 2 and in DCE 1. This would imply that purchasers prefer a supplier located in another country within the EU over a supplier that is located in their home country. For both experiments, the results for ‘EU sourcing’ were not significant, and thus no definite conclusions can be drawn from these results. The only results that can be relied upon, are the significant results for the ‘sourcing location’ and ‘transcontinental sourcing’ attributes, which are consistent in both DCEs. These indicate that purchaser’s prefer a supplier close to their company.

The ‘price’ and ‘quality’ attributes score consistent in both DCEs. Their high positive weight values suggest that the price and quality play a great role in the supplier selection process of purchasers, and that purchasers strongly prefer suppliers who provide a good price and a good quality. This confirms the statements of Mummalaneni et al. (1996, p. 116), who argue that price and quality play a critical role during the selection of suppliers. The results show that the ‘quality’ attribute is the attribute that has the greatest impact on the perceived utility of purchasers.

Continuing with the agency theory attributes, some remarks will be made although not all results are statistically significant. Due to the lack of significance in the results, it cannot be concluded that the agency theory attributes used in DCE 1 play a role in the supplier selection process. However, the agency theory attribute in DCE 2, which is ‘are we attractive for the supplier?’, does

indicate a significant result. Thus, it can be concluded that this agency attribute plays a role in the supplier selection process. Its positive weight value indicates a positive influence on the utility when the attractiveness is present in both directions.

The only attribute of the social capital theory that does not show a significant result is the 'cultural barriers' attribute. The 'relationship with the supplier' and 'joint IT platform for communication' attributes show clear significant results. The positivity of the weight values show that the presence of a good relationship and a joint IT platform for communication is beneficial for the preference status of a supplier. Thus, the results suggest that relational and structural capital are of importance to the purchasing firm.

With the largest weight value, the 'quality' attribute is perceived as the most important attribute by purchasers. This is followed by the price attribute, with the social capital theory attributes being a bit less important. Only one agency theory attribute is found to be significant, and this is simultaneously the least important attribute according to the weight values. Since the other agency theory attributes do not show significant results, these results suggest that agency theory is of less importance to purchasers than 'price', 'quality', and the attributes related to social capital.

The weight values of the attributes 'price', 'quality', 'relationship with the supplier', 'joint IT platform for communication', and 'are we attractive for the supplier' show that these have a greater impact on the utility than the 'sourcing location'. This is showcased by the fact that the weight value of 'sourcing location' is smaller than the values of the other attributes. Even when a supplier is located farther away, the presence of the 'price', 'quality', 'relationship with the supplier', 'joint IT platform for communication', and 'are we attractive for the supplier' attributes can compensate in the total utility. This way, a local supplier that does not score well on the other attributes, can be less preferred than an EU or transcontinental supplier that scores better on the respective attributes. This finding is also found in literature. For example, Cho and Kang (2001, p. 544) argue that better prices and quality is one of the reasons why firms choose to source their products from farther away.

To conclude, in general local sourcing is preferred among purchasers. Reasons for purchasers to source from another country in the EU, or from another continent, are the presence of attributes that have a positive effect on the perceived utility. The results show that the presence of an attractive price, great quality, a good relationship with the supplier, a joint IT platform for communication, and mutual attractiveness can lead purchasers to preferring a supplier that is located in another country.

6.2 Limitations of the research

Possibly the most important part of the design of DCEs is the decision on which attributes and attribute levels to use (Mangham et al., 2009, p. 153). The attributes and their levels should be chosen based on the type of respondents and the goal of the study, and how well this is done has a great impact on the validity of the research (Mangham et al., 2009, p. 153). The attributes used in both DCEs in this study were obtained from existing literature, to ensure that the attributes fit the subject well. In the DCEs conducted for this study, only the locational attribute contained three levels. The other attributes were simplified by assigning two extreme levels to them: they were either absent or present, or poorly performing or ideally performing. This simplification makes the suppliers in the DCEs less representative compared to the situation in the real world.

The DCEs are designed using the ORTHOPLAN command in SPSS. This command produces a fractional factorial experiment plan, with the minimum number of cards needed. This plan is orthogonal and allows for analysis of the main effects. Because the research is limited to analysing the main effects between the attributes and the utility level, the interactions among the attributes cannot be analysed. Although the main effects explain at least 80% of the variance in data in most cases (Sanko, 2001, p. 18), the other 20% of the explanation is still missing.

Furthermore, DCEs were conducted with mainly Dutch and German purchasers. The DCEs were designed and in some cases also conducted in English, which could cause problems when the purchasers have difficulty with understanding English. When DCEs were conducted in Dutch, the level of translation is of importance, since it is one of the determinators of the reliability.

In the research at hand, a gap in the locational attribute can be found. This attribute consists of local, EU, and transcontinental suppliers. However, suppliers that are not part of the EU, nor located on another continent, such as the United Kingdom, are not included in these categories. Because of the absence of this category, the conclusions drawn are limited to countries within the local, EU, and transcontinental locational categories. Including this fourth category could lead to new insights.

Another limitation of the research comes from the nature of SP experiments, of which DCEs are a part. The hypothetical nature of SP experiments is considered its main disadvantage (Sanko, 2001, p. 9). According to Sanko (2001, p. 9), these hypothetical situations can make the results not representative for the behaviour of respondents in the real world.

Finally, the study sample, which consists of 11 respondents, is too small to make definitive conclusions. Since the study sample is small, it is not likely to be representative for the whole purchasing profession. The conclusions of this study can therefore only be used as a direction for further research.

6.3 The application of the findings for future research

Despite its limitations, the study conducted DCEs in a way that does not exist in the current literature, by using attributes derived from agency theory and social capital theory. To continue on this research, future studies can reproduce the DCEs using a larger sample size. This could show more reliable results. On top of that, conducting these DCEs without the 'quality' and 'price' attributes could lead to new insights as well. This is the case because right now, the 'quality' and 'price' attributes seem to get the most attention from the respondents, while the actual subjects of study are the agency theory and social capital theory attributes. To make the research more extensive, RP experiments can be included, by conducting them together with SP experiments. According to Hensher (1994, p. 113), SP experiments can be useful to support RP experiments in their predictive capabilities. This would have been too extensive for a bachelor's thesis, but future studies can keep this in mind. It would allow for richer data and more insightful results.

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9. APPENDIX

Table 4: Choice sets of DCE 1, consisting of the choice options, attributes and attribute levels

Choice question	Local supplier					EU supplier					Transcontinental supplier				
	A1	A2	A3	A4	A5	A1	A2	A3	A4	A5	A1	A2	A3	A4	A5
1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	1
2	1	0	1	1	1	0	1	1	0	0	1	1	1	0	0
3	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1
4	1	1	0	0	1	1	0	1	0	1	0	1	1	0	1
5	1	1	1	1	0	0	1	0	1	0	1	1	0	1	1
6	0	0	1	1	1	1	1	1	0	1	1	0	1	1	0
7	1	1	1	1	0	1	1	1	1	1	0	0	0	1	1
8	0	1	0	0	1	0	0	1	1	0	1	1	0	1	0
9	1	1	1	1	1	1	0	0	1	1	1	0	1	0	1

Table 5: Choice sets of DCE 2, consisting of the choice options, attributes and attribute levels

Choice question	Local supplier						EU supplier						Transcontinental supplier					
	A1	A2	A3	A4	A5	A6	A1	A2	A3	A4	A5	A6	A1	A2	A3	A4	A5	A6
1	0	0	0	1	1	1	1	1	1	1	1	0	1	1	0	0	1	0
2	1	1	0	0	1	1	1	1	0	1	1	1	1	0	1	1	0	1
3	1	1	1	0	0	0	0	1	1	1	0	0	0	1	1	1	1	1
4	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0	0
5	0	1	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1
6	1	0	1	1	0	1	0	1	1	0	1	0	0	0	0	1	1	0
7	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	0	0	1
8	1	1	0	1	0	1	0	0	0	0	0	1	1	0	1	1	1	1
9	1	0	1	1	1	0	1	0	1	0	1	1	0	1	1	0	1	1

Table 6: Syntax used in SPSS for DCE 1

Explanation	SPSS syntax
<p>The syntax on the right was used to create the choice cards for DCE 1.</p>	<pre>SET SEED 3000. ORTHOPLAN /FACTORS=Location 'The location of the supplier' (1 'Local' 2 'E.U.' 3 'Transcontinental') Price 'The price of the supplier' (1 'Ideal' 2 'Poor') Quality 'The quality of prod provided by '+ 'supplier' (1 'Ideal' 2 'Poor') Monitoring 'If the supplier can be monitored' (1 'Yes' 2 'No') Transparency 'If the supplier is transparent' (1 'Yes' 2 'No') Previous_performance 'Previously '+ 'performed differently' (1 'Yes' 2 'No') /REPLACE /MINIMUM 24.</pre>
<p>The syntax on the right was used to compute the value of 't'.</p>	<pre>COMPUTE t=2-Choice. EXECUTE.</pre>
<p>The syntax on the right was used to analyse the data. The most important part of the results are the weight values and their significance levels of the attributes 'sourcing location', 'price', 'quality', 'supplier previously performed differently', 'supplier is transparent', and 'supplier can be monitored'.</p>	<pre>DATASET ACTIVATE DataSet1. COXREG t /STATUS=Choice(1) /STRATA=ID /METHOD=ENTER Sourcing_location Price Quality Monitoring Transparency Previous_performance /CRITERIA=PIN(.05) POUT(.10) ITERATE(20).</pre>
<p>The syntax on the right was used for additional analysis of the data. The results were extended with the weight values and their significance levels of the attributes 'EU sourcing' and 'transcontinental sourcing'.</p>	<pre>DATASET ACTIVATE DataSet1. COXREG t /STATUS=Choice(1) /STRATA=ID /CONTRAST (Sourcing_location)=Indicator(1) /METHOD=ENTER Sourcing_location Price Quality Monitoring Transparency Previous_performance /CRITERIA=PIN(.05) POUT(.10) ITERATE(20).</pre>

Table 7: Syntax used in SPSS for DCE 2

Explanation	SPSS syntax
<p>The syntax on the right was used to create the choice cards for DCE 2.</p>	<pre>SET SEED 3000. ORTHOPLAN /FACTORS=Location 'The location of the supplier' (1 'Local' 2 'E.U.' 3 'Transcontinental') Price 'The price of the supplier' (1 'Ideal' 2 'Poor') Quality 'The quality of prod provided by '+ 'supplier' (1 'Ideal' 2 'Poor') Joint_platform 'Joint IT platform for comm.' (1 'Yes' 2 'No') Relationship 'Definition of the relationship with supp' (1 'Ideal' 2 'Poor') Culture 'Cultural barriers' (1 'Yes' 2 'No') Buyer_attractiveness 'Are we attractive for the supplier' (1 'Yes' 2 'No') /REPLACE /MINIMUM 24.</pre>
<p>The syntax on the right was used to compute the value of 't'.</p>	<pre>COMPUTE t=2-Choice. EXECUTE.</pre>
<p>The syntax on the right was used to analyse the data. The most important part of the results are the weight values and their significance levels of the attributes 'sourcing location', 'price', 'quality', 'cultural barriers', 'relationship with the supplier', 'joint IT platform for communication', and 'are we attractive for the supplier?'.</p>	<pre>DATASET ACTIVATE DataSet1. COXREG t /STATUS=Choice(1) /STRATA=ID /METHOD=ENTER Sourcing_location Price Quality Joint_platform Relationship Culture Buyer_attractiveness /CRITERIA=PIN(.05) POUT(.10) ITERATE(20).</pre>
<p>The syntax on the right was used for additional analysis of the data. The results were extended with the weight values and their significance levels of the attributes 'EU sourcing' and 'transcontinental sourcing'.</p>	<pre>DATASET ACTIVATE DataSet1. COXREG t /STATUS=Choice(1) /STRATA=ID /CONTRAST (Sourcing_location)=Indicator(1) /METHOD=ENTER Sourcing_location Price Quality Joint_platform Relationship Culture Buyer_attractiveness /CRITERIA=PIN(.05) POUT(.10) ITERATE(20).</pre>