Supplier selection based on geographical location: A study built on the agency theory.

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Abstract,
The agency theory is relevant for symbiotic relationships in which a principal delegates a certain task to an agent. The theory has two key elements: adverse selection and moral hazard. Adverse selection poses a potential problem to supplier selection while moral hazard damages the principal during the relationship. In this study the agency theory is applied to buyer-supplier relationships to identify whether adverse selection and moral hazard have a higher probability of occurring based on location. Knowledge on this subject may aid purchasers in their supplier selection processes. In order to gain data on the matter, twenty-one companies and their suppliers were analysed through interviews with experts in the purchasing field. The suppliers were categorised based on geographical location. The data in this study showed differences in both adverse selection and moral hazard based on locational aspects of the suppliers.

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Keywords;
Buyer-supplier, agency theory, supplier selection, local, European, transcontinental, expert interview, moral hazard, adverse selection, principal-agent.

1. INTRODUCTION: THE IMPORTANCE OF BUYER-SUPPLIER RELATIONSHIPS AND THE SUPPLIER SELECTION PROCESS

Within supply chain management there currently is a general trend towards outsourcing (Whipple and Roh, 2010, p. 339). Dolgui and Proth use the following definition for outsourcing: 'the act of obtaining semi-finished products, finished products or services from an outside company if these activities were traditionally performed internally' (2013, p. 6770). According to Carter et al. this trend is to be expected as response to competition (2008, p. 225). Outsourcing is inherently a source of buyer-supplier relationships. Thus, an increase in these buyer-supplier relationships is a logical consequence. Combined with 'the increasing importance of managing quality in supply chains' (Zu and Kaynak, 2012, p. 424), this is a great reason for more research into buyer-supplier relationships. These relationships can greatly differ. Therefore it is to be assumed that before engaging in such a relationship, a buyer may conduct a selection process. Various attributes may be of interest: price, quality, transparency and geographic location. In this study the focus lies on the criteria geographic location.

Buyer-supplier relations can span across the world (Bayo-Moriones et al., 2011, p. 256). Supplier location influences the relationship with the buyer since locations can be linked to various advantages or lack thereof (Dunning, 1980, p. 13; Dunning, 1998, p. 53). For example a trend of outsourcing in regions with lower labour costs such as Eastern Europe, Central and South America, Asia and North Africa has become evident (Bayo-Moriones et al., 2011, p. 256). However, low labour costs are associated with an unskilled workforce and underdeveloped technology. Which can ultimately result in low quality. Most likely costs and quality standards are not the only factors at play. Supplier selection may be influenced through differences in values and beliefs (Erik Eriksson et al., 2009, p. 600), a phenomenon usually referred to as 'cultural barriers'. To underline what is meant with 'culture' in this study, Belot's and Ederveen's definition is used: 'culture is the set of communication habits, norms, values which are shared by a community.' (2012, p. 1085). Another example, closely linked to culture, is language. Conversing with a supplier who speaks a different language may be more problematic for obvious reasons. Peltokorpi and Clausen state that 'deteriorating work relations' is one of the many consequences that cultural barriers and language barriers cause (2011, p. 523). Therefore it is not surprising that that tariff barriers, cultural and communication barriers, ethical standards and trade regulations may also influence the relationship and supplier selection process (Min, 1994, pp. 24-26). Additionally, it is to be expected that the greater the distance to a supplier the higher the transportation costs and carbon emissions. A lack of knowledge on the differences caused by geographical locations of suppliers gives way to a clouded supplier selection process in which a buyer may opt for a supplier without fully understanding the implications of such a decision.

This study aims to extend knowledge on which variables are at play in the supplier selection process by analysing geographically varying buyer-supplier relations from an agency theory perspective. This aim is summarised in the following research question:

RQ: To what extent can supplier selection based on locational aspects be supported by the agency theory?

This perspective on the matter was previously not well-represented in academic literature. By doing so this study provides new insights as to what differences in the relationship are present. This is the academic relevance of the study. The practical relevance is generated through more in depth understanding of the supplier selection process for the purchasers.

In order to answer the research question above, the upcoming chapter makes a distinction between various geographical categories. In the third chapter the study builds on previous research literature to identify the current knowledge on the theory in question. The origin of the theory, its key elements and its validation for use in this study are discussed.

2. SUPPLIER'S GEOGRAPHICAL ASPECT CATEGORISED: LOCAL, EU, TRANSCONTINENTAL

In order to clearly distinguish between various buyer-supplier relationships, three categories were identified: local, EU and transcontinental relations. These buyer-supplier relations are ranked from least remote to most remote supplier.

This study is not the first to use these categories. Local sourcing has been studied by various researchers (Tunisini et al., 2011, pp. 1012-1013; Wagner et al., 2005, pp. 717-718). Amendolagine et al. define local sourcing as: 'Share of inputs sourced domestically by foreign investors.' (2019, p. 84). A similar definition is used by Jung and Lee '…a foreign firm's sourcing of parts or materials locally in the host country' (2018, p. 683) While Munir and Rana state:

> Local sourcing typically denotes the sourcing, purchasing, or procurement products from within a specific radius (distance) from where they will be used or sourced, or from a given geographical area. (2020, p. 1).

Clearly there is a difference between the first two definitions and the latter. Both the definitions from Amendolagine et al. (2019, p. 84) and Jung and Lee (2018, p. 683) are concerned with foreign companies that have expanded to a cross-country structure where they will source their product materials domestically, whereas the definition of Munir and Rana is focussed on any company, multinational or not. This study builds on the definition of Munir and Rana. The geographical area in question will be the company's home country. Therefore the definition used in this study becomes; Local sourcing is the sourcing, purchasing, or procurement of products from within the home country of the company.

The two remaining categories used in this study, EU-sourcing and transcontinental sourcing fall under the more well-known category: global sourcing. The term global sourcing is often linked to other terms such as international sourcing (Gutierrez and Kouvelis, 1995, p. 165; Levy, 1995, p. 344; Bozarth et al., 1998, p. 241) and foreign sourcing (Farinas and Martín-Marcos, 2010, p. 485). Monczka and Trent point out there is a different level of integration between the international business units with the latter two terms compared to the first (1991, p. 3). The term

global sourcing itself has quite a range of definitions. Bozarth et al. define it as: 'combining domestic and international sourcing as a means of achieving a sustainable competitive advantage' (1998, p. 241). While Christopher et al. define global sourcing as follows: 'the integration and coordination of procurement requirements across worldwide business units, looking at common items, processes, technologies and suppliers.' In some studies global sourcing represents an 'umbrella term for cross-border sourcing aiming at cost saving' (Horn et al., 2014, p. 55). However, this does not specify the geographic location of the suppliers. While a procurement relation with a supplier in a neighbouring country falls under global sourcing, so does a procurement relationship with a supplier on the other side of the globe. While literature often still does not account for this issue, some earlier studies make this distinction and divide global sourcing into 'remote' and 'close' global sourcing. (Schiele et al., 2021, p. 61; Schloms, 2020, p. 1). Therefore splitting the general term into two more location specific terms. In this study the terms EU-sourcing and transcontinental sourcing were chosen instead of close global sourcing and remote global sourcing. EU-sourcing refers to procurement relationships within the EU. It shows a clear boundary and countries within this region are prohibited to issue custom duties (European Union, 2008, p. 59). Additionally, there is free movement of goods, persons, services and capital between them (European Union, 2008, p. 59). This category has additional relevance since in a study by Alajääskö it was found that a significant part of the economic players in Europe (Czech republic, Finland, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Sweden and United Kingdom) source 40% or more of their procurement from other European countries (2009, p. 5). Finally Schiele et al. state that transcontinental sourcing 'means that suppliers of a firm are situated in other continents' (2020, p. 57). In contrast to global sourcing this definition also provides a clear boundary, similar to the EU-sourcing, and therefore fits this study.

3. THEORETICAL FRAMEWORK: DISCUSSING THE DISCREPANCY BETWEEN THE EXECUTING AND DEMANDING PARTY

3.1 Philosophical dilemma as origin:

The theory on which this study is built is the agency theory. The agency theory is relevant for symbiotic relationships in which a principal delegates a certain task to an agent. While the theory is widely applicable and used in various business and economic related studies which discuss topics such as expected payoffs (Hughes, 1982, p. 345), its application in entrepreneurial settings (Solomon et al., 2021. p. 467-469) and it is the most used framework in advanced educational courses of control concepts in managerial accounting (Stevens and Thevaranjan, 2010, p. 125), the foundations of the theory have a philosophical reasoning. In 'The wealth of nations', economist and philosopher Adam Smith is one of the first to write down some of the problems linked to delegation, which our society's labour division brings about (Smelser and Baltes, 2001, p. 344). One of the issues Smith discusses is the fact that people will not take the same care with other people's money as they would do with their own (Smith, 1776, p. 700). This lies at the foundation of the agency theory.

While Smith's work can be linked to problems that the agency theory also deals with, a more evident rise of the theory was during the 1960s and early 1970s (Eisenhardt, K.M., 1989, p. 58). In this period literature started describing a risk-sharing problem between collaborating bodies. For the agency theory this implied a risk-averse agent with a risk-neutral principal caused by the agents inability to diversify (Eisenhardt, 1989, p. 60). The literature on difference in risk preferences between the agent and principal was extended by the agency theory by including the 'agency problem'. Therefore the agency theory is focussed on unravelling two issues: the problem of risk sharing and the agency problem (Eisenhardt, 1989, p. 58). Usually the theory and its related problems are viewed from the perspective of the principal (Bergen et al., 1992, p. 2).

3.2 Introduction to the agency problems: moral hazard and adverse selection:

The agency theory leads to two different problems: moral hazard and adverse selection. The theory in general is built on the underlying principle that agents are self-interested, risk-averse and will do anything to limit the amount of work they have to put in while they boast their own abilities (Ekanayake, 2004, p. 49). This principle is only possible due to the information asymmetry between both parties. In some cases the principal may not precisely know what the agent's effort levels are, while the agent naturally knows how much effort was provided. The principals inability to obtain this information enables the agent to shrink effort levels.

The first agency problem, occurs when the goals of the principal and agent are not aligned (Ekanayake, 2004, p. 49) and it is costly or challenging to determine whether the agent has properly executed its tasks. This is called 'moral hazard' (Zu and Kaynak, 2012, p. 426). A basic moral hazard can be explained with a flat salary contract that is offered by a risk-neutral principal to a risk-averse agent. The contract will be accepted by the agent as long as the payment is satisfactory for the risk. The agency theory assumes that after the contract is signed, the agent is eager to lower the effort levels due to moral insensitivity and an incentive to shirk. In other words if there are no observing efforts by the principal it likely leads to lack of incentive for the agent to keep up the agreed upon standards (Stevens and Thevaranjan, 2010, p. 125).

When the principal has no convenient methods of checking whether the agent has the required skills to carry out the task given, the agency problem is also at play. This situation is called 'adverse selection' (Zu and Kaynak, 2012, p. 427). It refers to the inability of the principal to properly judge the abilities of the agent (Eisenhardt, K.M., 1989, p. 61). Due to this inability an unskilled agent has the opportunity to suggest their skills are better than they in reality are (Demski and Feltham, 1978, p. 351). Therefore it hinders efforts to obtain efficient transaction relationships. The principal has to decide between providing the financial requirements for acquiring pre-contractual information or dealing with the losses of foregoing screening (Dahlstrom and Ingram, 2003, p. 767). The financial requirements to gain pre-contractual information can differ greatly, dependent on the amount of information that is desired, the agent's transparency and the general ease to acquire the information. Screening in a principal-agent setting is defined by Dahlstrom and Ingram as: 'assessment of a broad spectrum of an agent's abilities gleaned

from existing relationships as well as aptitudes to perform tasks endemic to an agent's success' (2003, p. 768). After a proper screening process a principal may be convinced of the agents ability and sign an outcome-based contract. This is a contract that rewards the agent for specific outcome scenarios, effectively tying performance evaluations to meeting deadlines and not exceeding budgets (Farrell, 2003, p. 533; Mahaney and Lederer, 2003, p. 3). In case the information desired by the principal is not readily available and the costs of the screening process are too high, a principal can still reduce its risk by opting for a behaviour-based contract instead of an outcome based contract (Farrell, 2003, p. 554). Behaviour-based contracts are structured in a way that incentivise an agent to behave according to prescribed behaviour and may be financially punished for anomalies (Farrell, 2003, p. 553). However, behaviour-based contracts do require the principal to monitor the agents behaviour during the work relationship, which may also come at a cost. Ghoshal and Moran mention that managers who are focussed on limiting unwanted behaviour are losing sight of what is most important, which is managing their business (1996, p. 38). In order to make a calculated choice, the principal needs to properly identify and evaluate the liabilities linked to all options available.

The agency problem is often linked to the term 'opportunistic behaviour' (Steinle et al., 2014, p. 124; Noreen, 1988, p. 359; Kauppi and Van Raaij, 2015, p. 953). In their description of opportunistic behaviour Kelley et al. express that it contains deceit to favour your own position while damaging your collaborator (1989, p. 329). This definition shows that if the agent executes the task with self-interest in mind, instead of the goals of the principal, it can be considered opportunistic behaviour. Since moral hazard refers to the lack of effort from the agent, to the disadvantage of the principal (Eisenhardt, 1989, p. 61), moral hazard is linked to opportunistic behaviour. Opportunistic behaviour is influenced by multiple factors. Steinle et al. mention that dependence plays an influencing role on opportunistic behaviour and describe dependence as 'a situation in which the rewards of a relationship are not available outside of the buyer–supplier relationship' (2014, p. 127). Since supplier dependence is inversely influenced by the amount of alternative customers available on the market (Morgan and Hunt, 1994, p. 33), it is to be assumed that the less alternatives available the lower the levels of opportunistic behaviour. Adverse selection is not necessarily linked to opportunistic behaviour. Adverse selection can be built on 'honest incompetence' and is a precontractual problem (Kauppi and Van Raaij, 2015, p. 958). In contrast to honest incompetence, opportunistic behaviour is deemed to be 'unethical' (Kelley et al., 1989, p. 327). For both moral hazard and adverse selection, the origin of the problem lies in the information asymmetry between principal and agent. Essentially the issue for the principal boils down to a trade-off between investing in measuring behaviour of the agent and transferring the risk to the agent by only measuring the outcome (Eisenhardt, 1989, p. 61). Which option is more costly depends on the level of outcome uncertainty, with high outcome uncertainty the costs of shifting the risk to the agent are unappealing.

3.3 Application of theory: utilization of the principal-agent perspective

There are two camps in the agency theory, the positivist research camp and the principal-agent camp. While both of these approaches share the same assumptions about people, corporations and information, there is contrast in their mathematical rigor, dependent variable and style (Eisenhardt, 1989, p. 59). The first and original domain, positivist, is mostly concerned with governance systems that limit opportunistic behaviour from the agent. This approach is less mathematical and is almost solely concerned with the owner-manager relationship of public companies (Eisenhardt, 1989, p. 59). The latter approach, principal-agent, presents the theory as a general theory of principal-agent relationships. In other words, it is also suitable for employee-employee, lawyer-client and buyer-supplier relationships (Ekanayake, 2004, p. 50). In the buyer-supplier relationship the buyer is the principal and the supplier the agent (Shafiq et al., 2017, p. 1390; Zu and Kaynak, 2012, p. 427; Whipple and Roh, 2010, p. 342). This approach usually has specified assumptions which are proceeded by logical understanding and mathematical validation (Eisenhardt, 1989, p. 60).

The focus in this study lies on improving the supplier selection processes through the use of the agency theory. To do so the agency theory needs to encompass buyer-supplier relationships. Therefore, even though this study is not built on mathematical models, it utilises the principal-agent perspective on that matter. It should be noted that a combination of these approaches is not outlandish since they are not contradicting but rather complement each other. The positivist camp identifies the options for contracts, whereas the principal-agent camp identifies the efficiency of these options (behaviour-based contracts versus outcome-based contracts) along different uncertainty levels, risk aversion, information asymmetry (Eisenhardt, 1989, p. 60). Some studies already mention situations of preference for these contracts. Farrell mentions that both when the principal can fully prescribe and monitor the activities of the agent and when there is a high level of goal congruence, a behaviour based contract is preferred (2003, p. 553). Farrell also mentions that outcome-based contracts may be preferred when dealing with the delivery of a pre-specified product (2003, P. 553)

4. METHODOLOGY: FOUNDATIONS OF STUDY PROCEDURES

4.1 Expert interviews: a choice for reliable authoritative data gathering

In order to acquire the data for this study, expert interviews were used. This method originates from sociological methods, but has now moved beyond that scope (Libakova and Sertakova, 2015, p. 116). What is defined as 'expert' varies from study to study. In other literature political leaders, business professionals, teachers and leaders in science or judiciary have all been used as experts (Meuser and Nagel, 1991, p. 442). The use of expert interviews comes with certain advantages. Firstly the gap between case studies and an analysis of countries in high quantities based on easily accessible data can be bridged using expert interviews (Dorussen et al., 2005, p. 317). Secondly, authoritative guidance carries more weight, especially if it concerns less obvious topics (Dorussen et al., 2005, p. 316). Finally, this approach to data gathering is considered to be accurate and reliable due to the level of knowledge that the experts are presumed to possess in the field (Li, 2021, p. 326). Due to their knowledge, experts are similar to doctors diagnosing patients.

To test the validity of the research results it makes intuitive sense to use agreement amongst experts as indicator, which provides a sense of quality for the information provided (Dorussen et al., 2005, p. 318). However, reliability does not necessarily indicate validity (Golafshani, N., 2003, p. 599). Dorussen, Lenz and Blavoukos mention that the validity of the interviews relies more on the quality of the experts (2005, p. 333) but their quality may be hard to prove. They go on by saying they still advise a reliability check. It may not guarantee validity but it is more likely that an accurate conclusion will be reached (Dorussen et al., 2005, p. 334).

To acquire the needed data for this study, twenty-one expert interviews were conducted across various industries (agriculture, engineering plastics, aerospace, food innovation, the production of; fabric, furniture, suction systems, trailers, processing chips and hydraulic machinery).

4.2 Coding: essential in expert studies

Weston et al. mention that there is a reciprocal relationship between the coding activities and the understanding of the phenomenon and thus that coding is essentially part of the analysis (2001, p. 397). This aligns with the statement that coding activities are of utmost importance (Aberbach and Rockman, 2002, p. 675). They add that especially in expert interviews this importance is created since it can facilitate a level of structure while maintaining the richness of the responses given (2002, p. 675). In an earlier study it is already stated that coding is mostly needed when research aims to obtain and use data gathered by open-ended interviews (Aberbach et al., 1975, p. 13).

In this study the program atlas.ti was used for coding. A total of 34 codes were used 217 times in an attempt to capture all relevant responses and data.

5. STATISTICS GATHERED DURING EXPERT INTERVIEWS

5.1 Adverse selection contrasting between buyers and supplier selection processes

As mentioned earlier adverse selection is present when the principal has no convenient methods of checking whether the agent has the required skills to carry out the task given. (Zu and Kaynak, 2012, p. 427). In order to gain data about adverse selection, twenty-one experts responded to whether or not they felt like all needed information about their suppliers was available prior to the collaboration. Throughout the twenty-one expert interviews there were 49 statements directly linked to adverse selection. The statements were labelled as positive and negative (see table 1, Appendix A). In their responses eight experts made statements that indicated adverse selection (positive adverse selection). Among those eight experts was expert four:

> Yes suppliers initially hide information, but that also a part for the bargaining between sales and purchasers. As a purchaser I would like to know everything, but I tell them as little as possible. I won't tell them I have to order the products from them (interview 4).

With a part being overlapping, eleven experts made statements indicating a reduction in the risk of adverse selection (negative adverse selection) such as:

> In the case with the American supplier it is convenient that it is such a big player within the market. So we knew exactly with whom we are doing business (interview 6).

The difference between the various suppliers of a company was also discussed. Ten experts expressed that there was no difference between their information gathering processes for their suppliers.

> In order to gather information we actually use standard purchasing steps. Before we start a relationship, we possess all information we need to start the relationship. And that's all information you can think of: the delivery method, packaging, transport, conditions of the products. There are no surprises when we start a relationship (Interview 10).

In contrast, not all interviewees put in equal effort to obtain information prior to a collaboration/transaction, nor did they put the same relevance on obtaining such information based on the supplier. A common motive was the planned frequency of working with the supplier and the importance of the product supplied. Expert eleven mentioned:

> If we cannot buy it at our main suppliers, we will have to source outside our main suppliers. And that is sometimes for once a year, three times a year or once in a lifetime. At that moment I do not really care about that supplier. I just want the transaction (Interview 11).

Which was quite similar to the response of expert nineteen on the question whether they indeed got all needed information on the supplier: 'Yes, that's correct. Not for all the suppliers. For the ones where we only buy once or twice in a year, I do not care about them' (Interview 19).

Overall there were more negative adverse selection statements compared to positive adverse selection and statements that indicated no difference. The relative frequency of each variable is presented in the figure below.

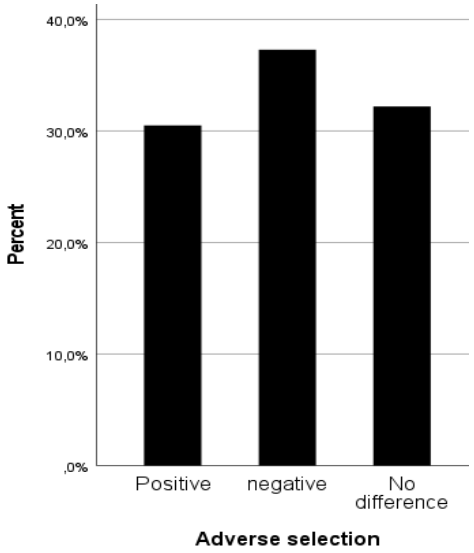

Figure 1. Percentages adverse selection variables

5.2 Varying levels of monitoring effort and a tendency towards positive moral hazard

As mentioned in the third chapter, moral hazard occurs when the goals of the principal and agent are not aligned (Ekanayake, 2004, p. 49) and it is costly or challenging to determine whether the agent has properly executed its tasks (Zu and Kaynak, 2012, p. 426). During the interviews nineteen experts made at least a single comment that directly indicated moral hazards aside from their monitoring processes. This variable will be referred to as 'positive moral hazard' (see table 2, Appendix A) In comparison fifteen experts made at least one similar comment indicating a lack of moral hazard which will be referred to as 'negative moral hazard'.

While it sometimes may be costly or challenging, monitoring is the way to check up on supplier performance. Monitoring can take various forms. In the responses of the expert interviews this also became evident. While fourteen of the twenty-one experts mentioned a form of monitoring, the efforts greatly differed. In some companies they found that checking delivery times, searching for publicly available financial data and or whether the quality of the delivered materials was sufficient for a successful relationship. One of the experts which was asked about the monitoring efforts of the company states: 'What we want to start with from now on is keeping better track of the delivery times and dates. That is for us the most crucial part' (interview 7). However, other experts mentioned more extensive annual or monthly audits in their monitoring efforts. Expert eight mentions:

> We have so called vendor rating which are supplier ratings which reoccurs each month. This tracks data concerning the production. This vendor rating focuses on different variables like: on time delivery, the amount of defaults in ppm, whether they have quality certificates and if they have problems that reoccur. All in all the vendor rating consists of multiple variables all accounting for a percentage in the rating. For example the amount of defaults in ppm counts for 50% of the rating and the required certificates counts for 6%. The moment the rating goes below 90% we start with actions and if the rating keeps dropping we eventually stop the relation (interview 8).

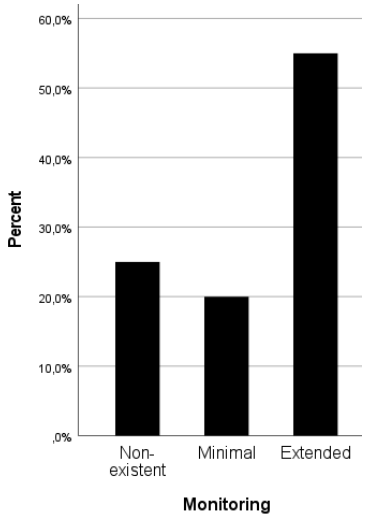

Figure 2. percentages monitoring categories

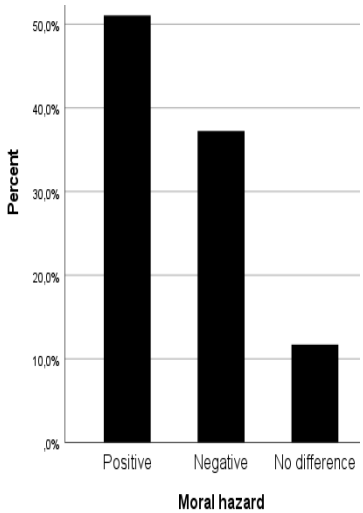

Figure 3. Moral hazard

In figure 2 the respective percentages of three categories in monitoring are presented.

a. expert mentioned monitoring is (nearly) non-existent
b. some clear minimal form of monitoring is mentioned
c. monitoring extends beyond the minimum

The three categories were created to provide a clear overview of the range in efforts the suppliers monitoring

Figure 3 shows the relative percentages of positive, negative and statements indicating no difference in moral hazard.

5.3 Diverse amounts of adverse selection dependent on location

In order to present the results the variables 'positive adverse selection' and 'negative adverse selection' are used once more. These two variables were investigated on co-occurrence with the three previously established geographical categories: local, EU and transcontinental.

Positive adverse selection was most commonly mentioned in relation to transcontinental suppliers and the least with local and EU suppliers. Expert seven mentions: 'China presents themselves as if they have this massive factory, but in reality this is not the case' (interview 7). Another expert also mentioned that Chinese suppliers may misrepresent themselves:

> Many Chinese companies for example, say that they have their ISO certificate and then show it to us. However, if we then ask the authority responsible for that certificates if they know the company and then they say no, of course we cannot accept to work with that supplier. It is quite impossible to build a buyer-supplier relationship with Chinese suppliers when you are not Chinese. For example, taking a look at child labour or other codes of conduct, many Chinese firms tell their European customers that they do not use child labour and surely stick to norms and regulations. However, as a European you cannot look into their business operations (interview 11).

However according to expert one the problem is not limited to China. The response to whether it is harder to acquire the full set of information needed was: 'Yes, it is more difficult to get it from the U.S., Mexico or China, I mean the suppliers from those countries' (interview 1). In the two charts below the frequency of the linkages between positive adverse selection and the geographical aspects are presented.

Negative adverse selection was mentioned by most experts in relation to local suppliers. One statement by expert one provides an example: 'It's very easy to work with these companies basically. Yeah, so you can get the information, it is more transparent working with these companies' (interview 1). The expert also provided reasoning why acquiring information on local companies is easier:

> With Dutch suppliers this is a small industry, right? And people talk to each other and you know the people working in this company later on go to another company. So people talk to each other about how this company works and what is the culture. (interview 1).

Negative adverse selection had the least association with transcontinental sourcing relationships. In fact, only expert six expressed a clear preference for their information gathering during selection of a transcontinental supplier: 'In the case with the American it is convenient that it is such a big player within the market. So we know exactly with whom we are doing business' (interview 6). Additionally, expert two, named some negative adverse selection in transcontinental countries and in the process showed that within the boundaries set in this study, it may be difficult to assess this variable:

> Actually, the Asian supplier… I should say Korea or China or Indian suppliers, they can tell you more at the beginning. Japanese suppliers tend to hide. Partly, we noticed, this is due to the hierarchical structure or company positions (interview 2).

In part 5.1 it was already discussed that ten experts expressed they did not see a clear difference between their suppliers. Naturally this is still evident when the geographical location variable is added.

In the following two charts the frequency of the linkages between negative adverse selection and the geographical aspects are presented. Figure 4 shows the number of experts making positive and negative adverse selection statements and figure 5 shows the amount of statements throughout all documents.

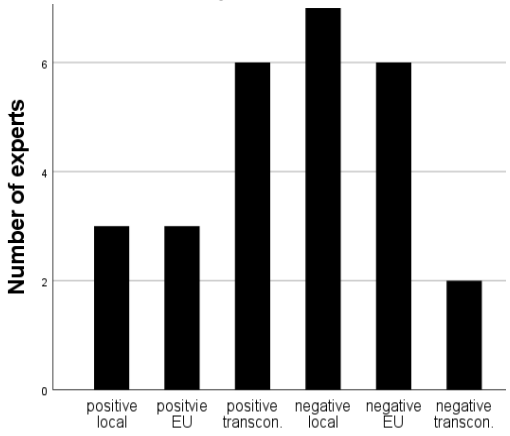

Figure 4. Adverse selection number of experts

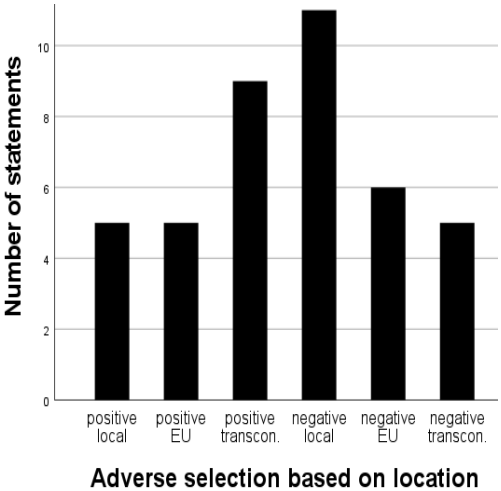

Figure 5. Adverse selection number of statements

Finally the ease of acquiring the needed information was ranked and is presented in figure 6. This data is based on quotes such as the following two, selected from a segment in which the expert discusses differences in ease of data gathering prior to the relationship between their local and EU supplier: 'But for European suppliers in the same industry is more difficult' (interview 1) and 'if suppliers are in other European countries like Poland, Spain or Italy, it's more difficult to get a whole set of information' (interview 1).

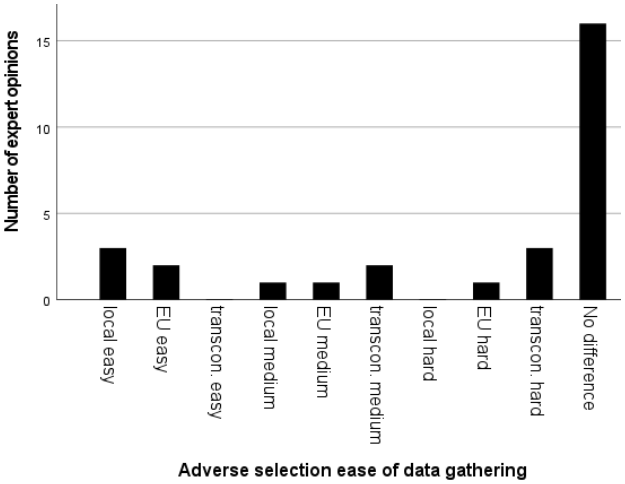

Figure 6. number of expert opinions on ease of data gathering based on location

5.4 Different levels of moral hazard in different locational categories

In this section the variables positive moral hazard, negative moral hazard and monitoring ability are presented in relation to the geograpical location of suppliers.

Most experts linked positive moral hazard to transcontinental sourcing. Local sourcing was mentioned the least in relation to positive moral hazard. In response to whether or not their transcontinental supplier sometimes does not stick to agreements expert fourteen mentions:

> Yes, definitely. They often try to give us reasons for delivering late for example with some new regulations from the Chinese government or something. Then, when we want to see those new regulations they cannot tell us (interview 14).

Expert fourteen is not the only one that mentions late deliveries from China. During interview five the expert stated that when dealing with China the 'delivery time is always insecure'. Apart from delivery issues expert one mentions:

> For the Asian supplier, specifically Korean or Chinese suppliers, quality variation is at play. So you need to watch closely, monitoring them, but they also do correct themselves fast if you point it out (interview 1).

Negative moral hazard is exactly reversed compared to positive moral hazard. It is linked most with local sourcing and the least with transcontinental sourcing. Multiple statements indicating reduced amount of moral hazard locally are built on higher visibility into the local suppliers operations. For example experts

five and eight mention: 'When it comes to the processes of our Dutch supplier we can see everything' (interview 5). 'But our company is of course more aware of the production at the Dutch supplier than the Chinese supplier' (interview 8). However, that is not the only reason for lower moral hazard. To the question whether the supplier ever deviated from agreements in quality or delivery times expert thirteen responded as follows: 'For the local supplier, that has not been the case' (interview 13). The number of experts that made positive and negative moral hazard statements linked to each locational category is displayed in figure 7. The frequency of the positive and negative moral hazard statements is shown in figure 8. The moral hazard statements concerning monitoring and attractiveness are excluded. These are discussed seperately.

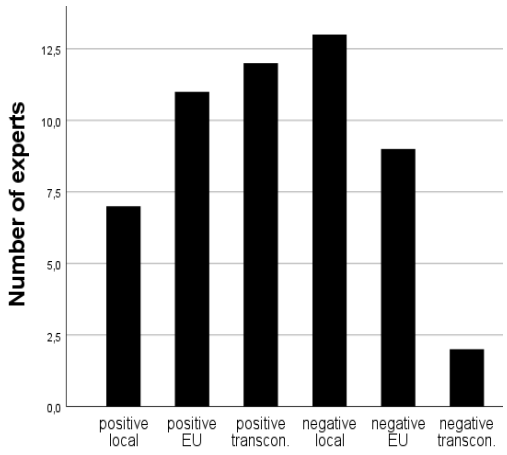

Figure 7. Moral hazard number of experts

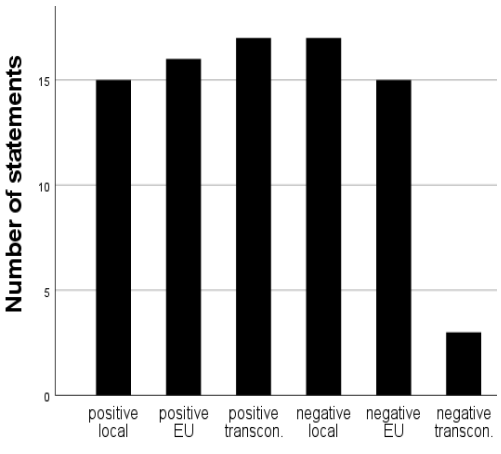

Figure 8. Moral hazard number of statements

In eleven interviews experts commented on whether the locational aspect of a supplier influenced the required monitoring efforts or activities. The ease of monitoring could be assessed based on statements such as the one made by expert fifteen:

> As aforementioned we visit the local supplier every week and that is when their performance is also measured and monitored. With the EU supplier, it is a bit more difficult because they are located further away but I think that visiting once or twice a year is enough because there is a lot of trust (interview 15).

However, not all eleven experts that discussed the ease of monitoring related to location mentioned differences. In fact five out of eleven stated there was no difference in their needed efforts based on location. The data resulting from ranking the ease of monitoring is displayed in figure 9 below.

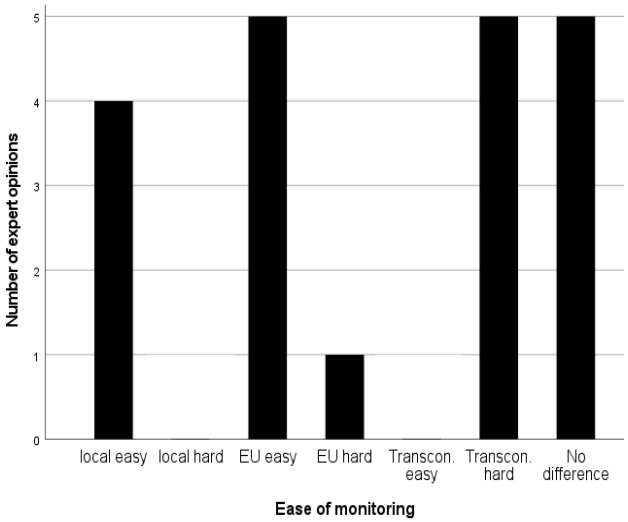

Figure 9. Number of expert opinions on ease of monitoring based on location

Finally the attractiveness of the buyer for the supplier was mentioned in seventeen interviews. However, only fifteen interviews provided this information on all supplier locations. One of these fifteen was interview nine in which the expert expressed: 'For our local supplier we are way smaller than for our EU supplier.' (interview 9). In seven out of these fifteen interviews the experts expressed no difference in their attractiveness for their suppliers based on location, such as expert sixteen: 'we are a significant part of their business, absolutely. That is true for all of them' (interview 16). Table 3 shows the data of all seventeen interviews concerned with buyer attractiveness.

attractiveness:	1	2	3	4	6	7	8	9	10	12	13	14	15	16	17	Total low	Total high	Low %	High %
locally	low	high	equal		low		high	low		x	high	x	high	high	low	4	5	44%	56%
EU	low	high	equal	equal		high		high	high	x	high	low	low	high	low	4	6	40%	60%
Transcontinental	high	low	equal	equal	low	low	high	low	low	high	high	high				5	4	56%	44%

Table.3 Buyer attractiveness based on location

6. CONCLUSION: AN ANALYSIS OF THE RESULTS AND A DISCUSSION ON THEIR RELEVANCE

6.1 Key findings on the agency problems

In this section, the previously presented results are analysed and discussed. This discussion is divided in mulptible subsections. The findings unrelated to geographical location are discussed first.

6.1.1 location irrelevant to positive association with current suppliers, extensive monitoring and evaluations influenced by negativity bias

When adverse selection is analysed without regard for location it becomes evident from figure 1 that the experts mention more about negative adverse selection than positive adverse selection. This could result from a positive association with the suppliers the experts are currently working with. This argumentation is aligned with some statements the experts made, such as expert three, whom expressed that in case a supplier is not up to standard, the purchasing department starts searching for a new one.

Regardless of location, the data shows a tendency for extensive monitoring. In figure 2, 55 percent of the experts described the monitoring efforts of their company as beyond the minimum. Additionally minimalistic monitoring is the least used method. As more statements were made that indicated a lack of monitoring.

Finally, in contrast to the data from adverse selection, figure 3, concerned with moral hazard, shows a higher level of positive adverse selection statements compared to negative adverse selection. Furthermore, the amount of statements that indicate no difference is drastically lower than those concerned with adverse selection. While based on these statistics alone no solid argument can be formulated, the difference may originate from the fact that moral hazard takes place over a longer time span and is thus based on more evaluations compared to adverse selection. In general eveluations are influenced more severly by negative information compared to similar positive information (Ito et al., 1998, p. 887).

6.1.2 Adverse selection shows contrasting findings related to location

In order to analyse the adverse selection data linked to geographical location, the data needed to be adjusted to the difference in inputs. Namely the fact that only fourteen experts with transcontinental supplier knowledge were questioned compared to the eightteen with local supplier knowledge and nineteen with EU supplier knowledge. The graphs were adjusted by dividing the data through the input amount (e.g. local was divided by eightteen) and consequently all were multiplied with the average of inputs, namely seventeen. ‘No difference’ statements were not adjusted as the chance to make this statement was already equal for all categories. The adjusted graphs are displayed in Appendix B.

The data presented in figures 9 and 10 in Appendix B combine both negative and positive adverse selection. Figure nine shows that positive adverse selection is least likely to occur in EU sourcing, while negative adverse selection was most common in local sourcing. This data interferes with one another. EU sourcing shows was mentioned by various experts in relation to negatie aderse selection. However, by comparing the graphs concerned with experts and statements it becomes evident that all six statements were made by differenet experts. This resulted in the fact that while not many statements were made, the amount of experts was relatively high. Moreover, the graphs show that adverse selection is most often linked to transcontinental sourcing. This data implies that while adverse selection may be linked to location, it is not clear whether it is related to distance between the supplier and buyer. However, once expert statements were used to rank the locations, it is evident in figure 11 (see Appendix B) that not a single expert mentioned transcontinental sourcing as being easiest for pre-contractual data gathering and local sourcing was never mentioned as being the most difficult. Which does indicate that data gathering is easier the closer the supplier is located to the buyer. Additionally, figure 11 shows that the ease of gathering data decreases as the supplier is located further away and, although it may be inherently linked to one another, the difficulty of gathering data increases as the supplier is located at greater distance. That being said, figure 1 already showed that various statements about adverse selection were made that indicated ‘no difference’ between suppliers. This statistic is still visible in figure 11 which also shows that sixteen out of the twenty-one experts stated no difference on the ease of data gathering based on location. This statistic could find its origins in multiple causes. The first and most obvious one is that it indicates that in the majority of cases the ease of screening a potential supplier is not directly linked to the distance or the location of the supplier-buyer relationship. It could also be that the no difference statements were made due to very minimalistic screening efforts or the general lack thereof.

6.1.3 Moral hazard influenced by distance in buyer-supplier relationships

Similar to the graphs of adverse selection, the data on moral hazard was also adjusted to the input. The relevant adjusted figures for moral hazard linked to location are presented in Appendix C.

In contrast with adverse selection, the data on moral hazard does seem to be correlated with distance. Both the input adjusted figures 12 and 13 in Appendix C show an increase in positive moral hazard with increased distance to the supplier. Additionally, both graphs show a stronger inverse correlation between distance and negative moral hazard. Moreover, differences in monitoring related to distance became palpable from figure 14 in Appendix C. Aliged with negative moral hazard statements, ease of monitoring statements are inversely linked to distance. Although, the ‘EU easy’ category is not aligned.

While the data does seem to justify the statements above, the moral hazard data has to be adjusted to the attractiveness of the buyers for the suppliers of each location. This is necessary to assess whether the difference in moral hazard actually originates from location or simply from buyer attractiveness. Table 3 shows the attractiveness of the suppliers within each category. In both local and EU there are more suppliers attracted to the buyer than there are outside of the EU. Which would translate to a lower moral hazard with local and EU sourcing than with transcontinental sourcing according to the inverse correlation between dependence and availability of alternative options

(Morgan and Hunt, 1994, p. 33) and the influence of dependence on opportinistic behaviour (Steinle et al., 2014, p. 127). While figures 12 and 13 show a higher frequency in positive moral hazard in transcontinental sourcing which could be explained through the buyer attractiveness, buyer attractiveness cannot account for the difference between local and EU sourcing because in this study the level of buyer attractiveness was higher for EU suppliers compared to local suppliers. Due to a lack of knowledge on the exact amount with which moral hazard is impacted by supplier dependence, no statement can be made on whether or not these differences in location are neglectable. However, the difference between local and EU does not seem greatly affected.

6.1.4 The agency theory supports supplier selection processes

While some data implies that adverse selection is more common in distant sourcing structures compared to close sourcing. For example figure 11 shows this trend. The data acquired concerned with EU sourcing in figures 9 and 10 interferes with this statement. In figure 9 EU sourcing data indicates less positive adverse selection than would be expected from the medium distance variable if distance was the only influential factor. However, negative adverse selection data in figure 9 is aligned with the statement that adverse selection increases with distance. In figure 10 it is visible that in general there are less statements (both positive and negative) made about adverse selection in the EU category. Furthermore, the moral hazard data is also not based on distance due to the EU data in figure 14 which indicates that monitoring in EU buyer-supplier relationships is easier than in local relations. As mentioned earlier in the document, monitoring efforts lead to a reduction in moral hazard (Stevens and Thevaranjan, 2010, p. 125).

However, once the EU data is no longer considered, all figures concerning location (figures; 9,10,11,12,13,14) show clearly that local sourcing is linked to both lower adverse selection and moral hazard, compared to transcontinental sourcing.

Finally figures 12 and 13 show a clear trend with buyer-supplier distance and moral hazard. However, as mentioned earlier, the difference in buyer attractiveness may be of influence between the EU and transcontinental data presented.

In conclusion, the answer to the research question: To what extent can supplier selection based on locational aspects be supported by the agency theory? The following argumentation is derived from the findings mentioned above, supplier selection based on locational aspects can be supported by the agency theory since it gives an indication of the levels of adverse selection and moral hazard based on location. Furthermore the trend that adverse selection arises with distance in the buyer-supplier relationship cannot be proven with data in this document due to the lower amount of statements and the contrasting findings in figure 9. The linkage between distance and moral hazard is more promising, yet needs further research to separate the influences of buyer attractiveness and location between EU and transcontinental relationships.

6.2 Limitations due to generality

There are multiple reasons why te findings in this study are limited. First of all the experts originated from ten different industries. This limited the study to an attempt at drawing conclusions on the global market scale, eventhough these industries may have significant differences between them. This became obvious during the analysis of the expert responses. While the highest quality raw materials may be a neccessity for one company in order to produce safe products, for others it may not extremely influence the end product. These standards companies set for their suppliers may be different in other industries and thus result in different seleciton processes, monitoring needs and required supplier certificates.

Secondly the sudy was limited due to the geographical categories used. While these categories were designed to have clear boundaries, the countries within these boundaries still greatly varied. Expert three, for whom neither germany nor italy was considered local sourcing, commented:

> Well actually I think your category “EU” is too broad. For example I’ve been working with various suppliers in Italy. If there is something you cannot do, it is relying on a deal with an Italian. Additionally, they always have a hard time meeting the delivery window that was agreed upon. In Germany that is not an issue at all. German suppliers also always keep you updated if problems arise. So you know well in advance if there is an issue (interview 3).

This statement shows the variety within the EU. Due to the large amount of countries that fall under ‘transcontinental sourcing’ the variety encountered in that category is likely even higher. The statements presented earlier in this study, from experts six and seven about transcontinental sourcing contradict one another. Expert six is concerned with sourcing in America and mentions the ease of data gathering, while expert seven is concerned with sourcing from China and states it is harder to gain information. Both of them may have agreed with one another on transcontinental sourcing in general. However, due to the research structure more detailed and specific examples were provided rather than general information on the locational categories. In order to acurately present the nuances between these types of soucing with these locational categories a significantly larger sample size is needed to fully represent a large variety of countries in both the EU and transcontinental sourcing categories.

6.3 Academic and practical relevance

6.3.1 Academic relevance through transparency on buyer-supplier relations.

This study could be used as a foundation for more elaborate and extensive research in the field. Moreover, once more knowlegde is attained on the exact impact of either location or attractiveness the remaining of the two factors may be explained with the findings in this study. The study also aids literature in gathering general monitoring statistics. Finally, most importantly the research provides more clarity on the influencing factors of buyer-supplier relationships, by revealing the possible links between location and adverse selection and between distance and moral hazard.

6.3.2 Knowledge on possible supplier attributes based on location supports practical relevance

Practical relevance is attained through the knowledge of experts on various purchasing attributes. The study provides monitoring statistics that may aid global market analysis. Furtherore the

study provides purchasers the knowledge dat advese selection and moral hazard both differ significantly between local sourcing and transcontinental sourcing. For example, the findings in this study show that with local sourcing the level of moral hazard is brought to a minimum, regardless of buyer attractiveness, which is a possible motive to move towards local sourcing for companies. Therefore purchasers are enabled to make better considered decisons in their supplier selection process.

6.4 Future possibilities by extending research samples

In order to gain more understanding about the link between location and adverse selection future reseach could study the differences between the continents. While this study found there was still variation within continental boundaries, it is more location specific than 'transcontinental' as a variable.

Additional future reseach is needed on the exact impact of buyer attractiveness. In order to gain more insight in locational influences on moral hazard future research could interview experts from companies with equal buyer attractiveness. This may present a less flawed perspective on the matter.

In order to give more credit to the claim that distance influences buyer-supplier relationships upcomming research could study the distance relationship with moral hazard from a geographically different buyer perspective. All local sourcing relationships in this study were located in either The Netherlands or Germany. The linkage between supplier remoteness and moral hazard should also be tested from a different buyer location, preferably multiple.

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Appendix A

Adverse selection	Positive	Negative
Indicates:	Indicates adverse selection	Indicates lack of adverse selection
Example:	Surely, they will not tell me everything immediately (interview 5)	Yes, yes [we got] all the info [we needed] (interview 21)

Table 1. Examples positive and negative moral hazard

Moral hazard	Positive	Negative
Indicates:	Indicates moral hazard	Indicates lack of moral hazard
Example:	'If there is something you cannot do is relying on a deal with an Italian' (interview 3).	*Did you have the feeling that the supplier was behaving different than he had promised?* Expert: 'No, I did not have that idea' (interview 9).

Table 2. Examples positive and negative moral hazard

Appendix B

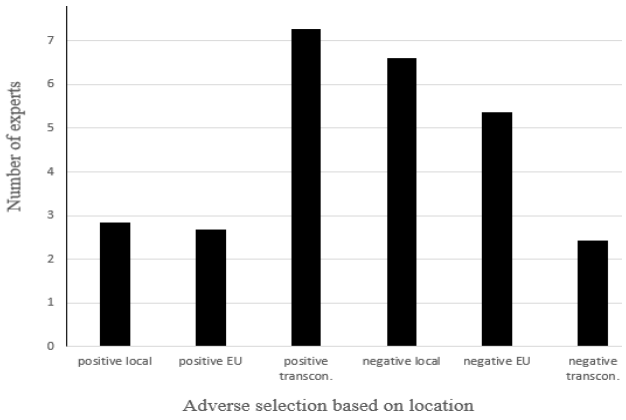

Figure 9. Adjusted adverse selection number of experts

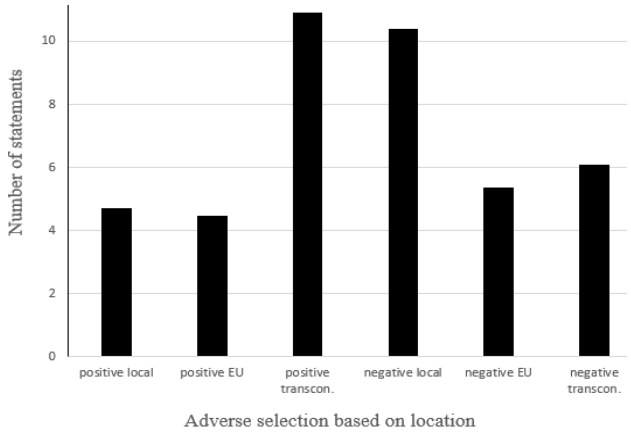

Figure 10. Adjusted adverse selection number of statements

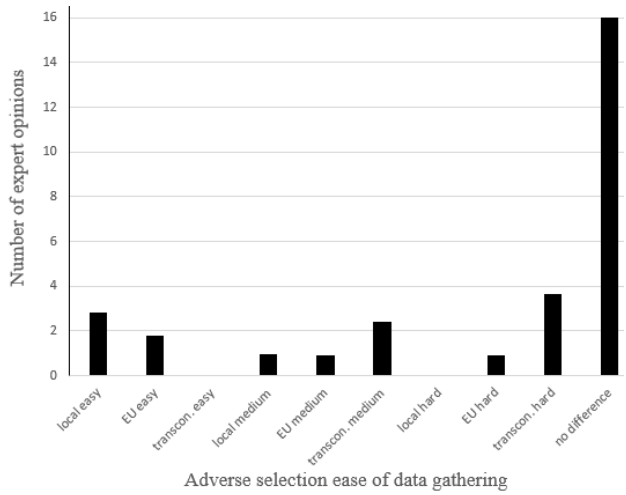

Figure 11. Adjusted ease of data gathering

Appendix C

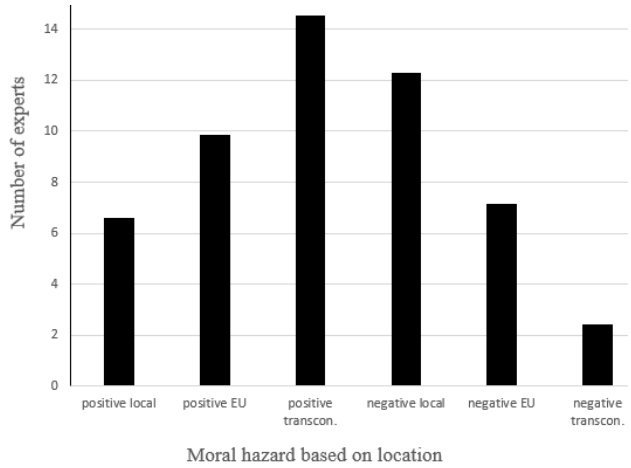

Figure 12. Adjusted moral hazard number of experts

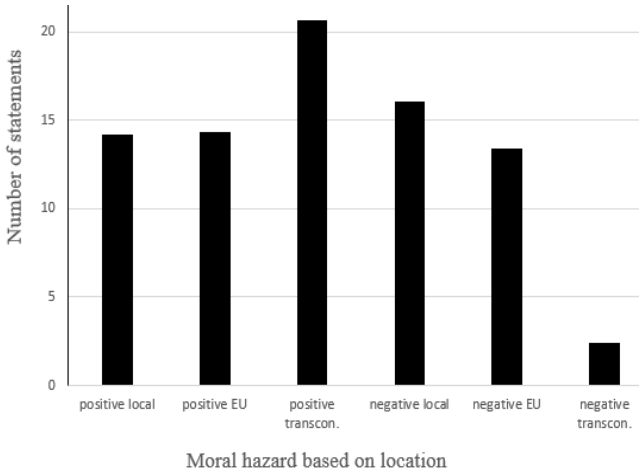

Figure 13. Adjusted moral hazard number of statements

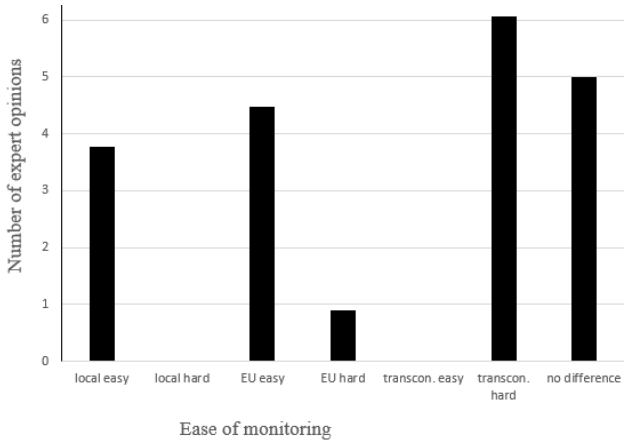

Figure 14. Adjusted number of expert opinions on ease of monitoring based on location