

# **How do spillovers impact opportunism in the buyer-supplier relationship? Is it really about opportunism and what are the consequences?**

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## **ABSTRACT**

*The goal for this paper is to see what consequences and implications knowledge spillovers and opportunism have on the buyer-supplier relationship from the buyer perspective. In order to perform this research, a qualitative research method has been selected as the best fit (interviews). 18 business professionals ranging in background from procurement, sales and R&D have been chosen as interview partners.*

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## **Keywords**

Knowledge spillovers, Buyer-supplier relationship, Opportunism, Consequences

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## 1. INTRODUCTION

One of the ways that companies try to leverage their competitive position, is to choose to collaborate with a supplier. This collaboration with the supplier also goes hand in hand with the sharing of information between the parties as it has well-known benefits such as increased commitment, trust and engagement (Nyaga, Whipple, & Lynch, 2010). This sharing of information does come with a risk, the risk of a knowledge spillover (Fallah & Ibrahim, 2004). If the knowledge spillover happens to be sensitive information, it could ultimately weaken the competitive position of the company who shared the information in the first place (Ried et al., 2021).

Following Transaction Cost Analysis (TCA), next to the risk of a knowledge spillover, companies face the risk of opportunism in their supply chain partners (Gelderman et al., 2020).

In order to combat this, the buyer-supplier relationship is usually governed in two ways, through non-relational safeguards such as a non-disclosure agreement or a contract, and through relational safeguards, such as trust. However, this does not always work out, as finding the balance between governing the relationship and overspending can be hard to pinpoint (Eckerd & Sweeney, 2018).

This paper dives deeper into the consequences and implications that knowledge spillovers and opportunism have on the buyer-supplier relationship, based on a qualitative case-study approach. In the end, the result is a best-practice model with tips for business professionals on how to handle this situation.

## 2. RESEARCH QUESTION

The research question for this paper is:

*How do spillovers impact opportunism in the buyer/supplier relationship? Is it really about opportunism, and what are the consequences?*

The goal for this paper is to see what consequences and implications knowledge spillovers and opportunism have on the buyer-supplier relationship from the buyer perspective.

## 3. LITERATURE REVIEW

This literature review will give a condensed overview of the previous literature regarding buyer-supplier spillovers. It will show the current views regarding knowledge spillover, opportunism, its different forms and implications.

### 3.1 Buyer-Supplier relationship

The relationship between a buying firm and a supplying firm is called the buyer-supplier relationship. It refers to the exchange of goods, services and knowledge between the two companies.

Because the buyer-supplier relationship is essential, the topic has interested scientists for several decades now. The growing importance of the buyer-supplier relationship is also shown by the decrease of suppliers that firms are doing business with, as well as the increased engagement of the relationships between these companies (Cannon & Perreault, 1999, Huttinger et al. 2012).

### 3.2 Knowledge spillover

#### 3.2.1 Definition

There is no clear definition for a knowledge spillover. However, the concept of competitive knowledge leakage has been explored before by Pahnke et al. (2015). In other words, knowledge spillover occurs when information is shared with a party, which then further passes on the information to an unauthorized party (Pahnke et al., 2015). Usually, the initial sharing of knowledge occurs between two collaborating parties, such as a buyer and a supplier or two collaborating firms. This information is then further shared with a competitor, making it a knowledge spillover. An example is a buyer sharing design information with a supplier, the supplier then further shares this information with a competitor of the buyer, weakening their market position.

Knowledge spillover is different from knowledge transfer, as knowledge transfer is simply the sharing of any kind of information between two parties, not taking into account positive or negative consequences. (Fallah & Ibrahim, 2004).

When it comes to knowledge spillovers, they can generally be categorized into two different segments; positive knowledge spillovers and negative knowledge spillovers.

#### 3.2.2 Positive knowledge spillover

Positive knowledge spillover occurs when the knowledge spillover provides a benefit to the receiving party (e.g. a buyer receives information from a competitor via a supplier that allows them to operate more efficiently). Positive knowledge spillovers have a positive effect on the length of the relationship between the buyer and supplier (Isaksson, Simeth, Seifert, 2016). An example of this could be a collaboration on how to manufacture a specific part of a product.

These knowledge spillovers within supply chains gives well known positives and benefits for buyers and suppliers involved, such as heightened trust and engagement (Nyaga, Whipple, & Lynch, 2010). These increase effectiveness and efficiency in both the buyer and the supplier (Ireland & Webb, 2006). Trust has also shown to be a good omen of a good interorganizational collaboration (Ireland & Webb, 2006). The knowledge spillover also improves supply chain teamwork and collaboration (Cao & Zhang, 2011; Sheu, Yen, & Chae, 2006). Lastly, knowledge spillover is also accepted to increase the innovation cycle as well (Huizingh, 2011). All these positives combined make knowledge spillover an attractive opportunity for buyers to learn from and grow closer to their suppliers.

#### 3.2.3 Negative knowledge spillover

With all mentioned positive effects from knowledge spillovers, some negative effects also come along with it. Once the information has been shared with the supplier, there is always the risk of intentional or unintentional knowledge spillover to other parties. An example of this is a supplier sharing sensitive information with another buyer of theirs, which weakens the competitive position of the company who supplied the information in the first place (Ried et al., 2021).

An example of negative knowledge spillover is General Motors (GM) sharing sensitive information about its designs with its suppliers, with the goal of getting better purchasing prices (Anand & Goyal, 2009).

In the example of GM, it ended up reducing the competitive position of GM, since the knowledge spillover ultimately weakened their position as their patented knowledge had been shared with unauthorized parties and potentially competitors.

Another risk is that of the buying company sharing valuable knowledge with their supplier (knowledge spillover) and the supplier taking this knowledge and using it to circumvent the buyer, marketing their products straight to the final customers. (Huang, Guan, & Chen, 2018). This will have negative consequences to the buyer as part of their market share will disappear.

For these aforementioned reasons, finding the balance in how much information to share with the supplier is hard to exactly pinpoint. This is further complicated by the increasing globalization and communication technologies used nowadays. Easterby-Smith et al (2008) summarizes it beautifully in a quote: “Devices that are used to prevent knowledge leakage often also hinder knowledge transfer” (Easterby-Smith et al., 2008, p. 685).

Existing information on this issue shows this paradox: companies can take the risk of being overprotective, sharing too little information thereby weakening their competitive position. As well as sharing too much, which also decreases their position in the market (Norman, 2002).

Concluding, depending on what type of knowledge is shared and in what context, a knowledge spillover can be considered a positive or a negative spillover.

**Table 1: Sources positive/ negative knowledge spillover.**

Factors	Reference
<b>Knowledge spillover</b>	
Difference spillover and transfer	Fallah & Ibrahim, 2004
<b>Positive knowledge spillover</b>	
Length of relationship	Isaksson, Simeth, Seifert, 2016
Heightened trust and engagement	Nyaga, Whipple, & Lynch, 2010
Effectiveness and efficiency	Ireland & Webb, 2006
Interorganizational collaboration	Ireland & Webb, 2006, Cao & Zhang, 2011, Sheu, Yen, & Chae, 2006
Supply chain teamwork	Cao & Zhang, 2011, Sheu, Yen, & Chae, 2006
Innovation cycle	Huizingh, 2011
<b>Negative knowledge spillover</b>	
Risk of (un)intentional sharing	Ried et al., 2021
Example GM	Anand & Goyal, 2009

Circumventing supplier	Huang, Guan, & Chen, 2018
Communication technologies	Easterby-Smith et al, 2008
Too little or too much sharing	Norman, 2002

### 3.3 Opportunism

Opportunism is behavior with the focus laying on own benefits using deception (Williamson, 1975).

When it comes to knowledge spillover, it is important to make a distinction between intentional (opportunistic) and unintentional (non-opportunistic) knowledge spillover. Unintentional spillover refers to a knowledge spillover that was not intended to happen in the first place, or in other words accidental. On the other hand, an intentional knowledge spillover has been made with opportunistic goals kept in mind.

Nowadays, unintentional knowledge spillover is made easy with the common use of communication pathways such as e-mail, even though companies try to minimize this risk (Zilberman, Katz, Shabtai, & Elovici, 2013). Therefore, this should be taken as an always existing risk when sharing information with other parties.

On the other hand, knowledge spillover that is seen as premeditated, is usually seen as opportunistic behavior by the partner (Seggie et al., 2013).

Next to the distinction in opportunistic and non-opportunistic knowledge spillover, there is also the distinction to be made between passive and active opportunism, as Wathne and Heide (2000) describe.

#### 3.3.1 Passive opportunism

Passive opportunism is particularly hard to detect and deter. For this reason it might also go unnoticed for a while, making it even costlier than usually thought to be (Crosno et al., 2013). Passive opportunism happens specifically when a company circumvents already settled requirements between the two parties. Passive opportunism is relatively common, however, it is still understudied. It occurs when a company, for its own benefit, avoids obligations previously agreed upon or refuses to comply with new circumstances (Crosno et al., 2013).

An example of passive opportunism can be shown in the case of construction workers (buyer) in Florida.. They bought wallboard pieces from a wallboard distributor called Banner Supply (supplier). One of the construction workers installing the wallboard panels noticed that it had a lot of emissions from sulfur. He voiced his concern to Banner Supply and after testing it was indeed confirmed that the wallboard contained dangerous amounts of sulfur. At this time Banner Supply chose to replace the wallboard of the construction workers who complained, but chose to keep its mouth shut to all the other construction workers who bought the product. This example shows passive opportunism; Banner Supply chose to withhold information from the other workers even though they knew it could have adverse health effects on them (Brinkmann, 2010).

This type of passive opportunism is called omission of information and is considered to be the most common form of passive opportunism (Seggie et al., 2013).

### 3.3.2 Active opportunism

Where passive opportunism is usually done by the omission of information. Active opportunism, as the name suggests, takes a more active form of taking advantage of the situation. According to Wathne and Heide (2000), active opportunism appears when a firm breaches already agreed-upon terms and conditions between two parties. Another form of active opportunism that Wathne and Heide (2000) note is the forced negotiation. In this scenario a firm would re-enter negotiations with the other party involved simply because the new market conditions are more favorable for the opportunistic party.

Some examples of active opportunism are: breaking contracts (Achrol and Gundlach, 1999) bending facts to suit your position better (John, George, 1984), being untruthful, and bogus allegations (Jap and Anderson, 2003).

Lee, Tseng and Hoyt (2008) showcase a good example of active opportunism. They take the example of Mattel's toy company. The toy company outsourced some of their lines to another company called Lee Der Industrial. They then again subcontracted several different suppliers for their products. Mattel was sure that their products were produced in a way that made sure that the final product did not contain lead. However, a paint supplier that delivered to Lee Der Industrial, provided yellow paint that had lead in it. This was due to a falsification of the certification stating that the paint was lead free. Mattel sold these products for about a year before they issued a recall on the toys. In total more than 1 million products were recalled and a government fine of \$2.3 million was issued against Mattel's toy company (Wolf, 2009).

The example of Mattel's toy company shows how disastrous it can be when a supplier of raw materials shows active opportunism, in this case by falsifying certifications for materials.

## 3.4 Transaction Cost Analysis and Social Exchange Theory

### 3.4.1 Transaction Cost Analysis

It is accepted that opportunism is one of the underlying assumptions for many economic models such as Transaction Cost Analysis (TCA) (Gelderman et al., 2020).

In TCA, there are 2 key assumptions at play. The first is that of restricted rationality. This assumption states that because humans are unable to know everything, there is always a limit to their rational behavior. Following this reasoning, a contract is also never fully complete, which affects how people make their decisions (Hawkins et al., 2008).

The second key assumption is that of opportunism. In TCA, when the possibility comes up, people will act opportunistically if it will make them more profit (John, 1984).

Combining these two key assumptions, it is plausible that in business-to-business exchange, there are big unseen transaction costs in the form of restricted rationality and opportunistic behavior.

TCA has received criticism for its heavy reliance on singular transaction costs. For example, Blois (1990) argues that this transactional mindset holds companies back from forming value-building partnerships.

### 3.4.2 Social Exchange Theory

Another theory that tries to explain exchange is the Social Exchange Theory. The main idea of SET is that exchange has got both monetary and social aspects to it. According to SET,

positive events increase engagement and trust between the parties. Slowly, the relationship will turn into being based on certain norms and values of both companies (Lambe et al., 2001).

Going forward on this notion, SET argues that next to opportunism, there is also a separate way of governing; the relationship between the companies. According to Heide and John (1992), these parties also rely much heavier on relational norms.

However, SET does not deny the presence of opportunism in the relationship. Instead, SET recognizes opportunism as the differentiating factor between relationships governed by SET and relationships governed according to TCA theory. Essentially SET explains why a company would want to cut ties with a partner that acts in an opportunistic manner, even though the economic benefits might be lower in a different partnership (Hawkins et al., 2008).

**Table 2: Sources passive/ active opportunism and TCA/ SET.**

Factors	Reference
<b>Opportunism</b>	
Unintentional knowledge spillover due to communication pathways	Zilberman, Katz, Shabtai, & Elovici, 2013
Premeditated knowledge spillover	Seggie et al., 2013
Passive and active opportunism	Wathne and Heide, 2000
<b>Passive opportunism</b>	
Hard to detect	Crosno et al., 2013
Definition	Crosno et al., 2013
Example passive opportunism	Seggie et al., 2013
<b>Active opportunism</b>	
Definition	Wathne and Heide, 2000
Examples active opportunism	Wathne and Heide, 2000, Achrol and Gundlach, 1999, John, George, 1984, Jap and Anderson, 2003
Example Mattel's toy company	Lee, Tseng and Hoyt, 2008, Wolf, 2009
<b>Transaction Cost Analysis (TCA)</b>	
Opportunism as one of key	Gelderman et al., 2020, John, 1984

assumption	
Key assumptions	Hawkins et al., 2008
Criticism	Blois, 1990
<b>Social Exchange Theory (SET)</b>	
Definition	Lambe et al., 2001
Relational norms	Heide and John, 1992
Difference TCA and SET	Hawkins et al., 2008

### 3.4.3 Implications

Over time, many implications of opportunism have been recognized in the buyer-supplier relationship.

The first, arguable most important implication of opportunism in the buyer-supplier relationship, is a decrease in performance of the relationship (Hawkins et al., 2008). This decrease in performance can be in the speed of innovation, effectiveness of marketing, the supply chain network and in the end in the profit of the companies (Gassenheimer, Baucus, & Baucus, 1996).

Hawkins et al (2008) also writes about the make or buy decision being affected by opportunism in the buyer-supplier relationship. Combining research from Schilling and Steensma (2002) and himself, he was able to conclude that, when looking from the TCA perspective, companies choose to make more products in-house as the cost of opportunism rises.

In other words, if opportunism increases or decreases, the company will choose to produce more or less products in their own factories.

In line with the make or buy decision, TCA also expects the costs associated with the buyer-supplier relationship to increase as a result of opportunism. Examples of this are quality assurance inspections and general surveillance.

When looking from the SET perspective, other performance indicators such as trust (Morgan & Hunt, 1994), engagement (Skarmeas et al., 2002), motivation and trust (Gassenheimer et al., 1996) all are affected negatively by opportunism in the buyer-supplier relationship.

When looking at buyer-supplier new product development, supplier opportunism has been shown to impact design quality and design efficiency. These two aspects are linked to decreasing the overall project performance (Yan & Kull, 2015).

## 4. METHODS

In order to answer the research question of this paper, a combination of literature review, as well as a qualitative analysis have been selected. This qualitative research is performed using semi-structured interviews. About 18 interviews are taken with industry professionals ranging from researchers and developers to supply chain managers. These interviewees are from all around Europe with backgrounds in different industries, giving a broad range of opinions.

This qualitative research's effectiveness will highly depend on how well the interviews will be conducted and interpreted. For this reason a process of guidelines and ethical criteria for the

collection of data are used (Fossey, Harvey, McDermott, & Davidson, 2002).

Quantitative research is more focused on drawing conclusions from big bodies of data, as such to find correlations, links and relationships. Here the individual is usually not questioned as deeply as they would be during a qualitative research.

For the purposes of this paper, a combination of qualitative research methods and quantitative research methods will be selected since for the research question it is important to know one's motivation and individual experiences on the topic (Jamshed, 2014).

### 4.1 Data collecting and interview design

In order to make sure that enough data is collected and the appropriate questions are asked, an interview questionnaire is prepared to be used by all four students in the circle to ensure the consistent questioning of the interviewees. In total, there are 30 questions that are divided into the four different topics, all addressing a specific research question within the circle. On the topic of this research paper, 9 general and 6 specific key questions will be asked.

These interviews are done in a semi-structured manner in order to give the respondent the chance to give more details and give a full answer back. The exact interview protocol used can be found under appendix 1.

We have divided 18 interviews among the 4 students so we can draw a conclusion based on the results of the interviews in combination with the literature review. Any lower number of interviews, and the results could be non-significant.

Also, the interviewees are asked if they are familiar with important key concepts for the interview, such as knowledge spillover and supplier opportunism. If the interviewees are not familiar with the concept, this will firstly be explained to them to make sure everyone is on the same page before starting the interview.

Because some interviewees were in a different geographic location, the interviews were conducted using an online video call. Consent is given by the interviewees for a recording. This recording is taken from the interviews to later be analyzed and archived. The interviews were conducted in multiple languages. These languages include Dutch, English and Finnish.

Afterwards, these interviews are transcribed and translated into English to make sure everyone in the circle is able to use the information from the interviews.

### 4.2 Interview analysis

In order to analyze the data from the interviews, a step by step protocol from Kallio et al. (2016) is used.

Basically, the interview transcripts are analyzed by going through all of them one by one and filling in the final answers to the interview questions in a more condensed manner (removing all unnecessary text). Certain key- words/ sentences will then be selected.

This is followed by putting these results in tables in order to be able to compare the answers of the interviewees and to be able to draw conclusions from them.

Finally, the collected and analyzed data is compared with the existing literature in an effort to find the differences and similarities between the two.

### 4.3 Sample

In total 18 interviews are conducted with the sample of interviewees consisting of business professionals in procurement, sales and Research & Development (R&D) branches of companies. The business professionals are mainly working for Dutch companies (14), next to Finnish (3) and a Czech (1) company (see picture 1). From these companies, number 1, 2, 3 and 18 are non-profit organizations.

Out of the 18 business professionals, 11 are working in procurement, 3 are in management, 3 are in sales and 1 is working in the R&D department.

**Table 3: Interview sample.**

Interview number	Type of company	Location	Position of interviewee	Employees
1	University	Netherlands	Procurement	3000
2	Nature preservation	Netherlands	Procurement	740
3	Care provider special needs	Netherlands	Procurement	5500
4	Automotive supplier	Czech Republic	Procurement	200000
5	Producer of roof safety systems	Netherlands	Management	100
6	Supplier of small technical products to automotive industry	Netherlands	Management	140
7	Railway safety developer	Netherlands	Sales	20
8	Manufacturer of door systems for bus/ tram	Netherlands	Procurement	150
9	Design, contract partner	Netherlands	Management	1340
10	Mechatronics design firm	Netherlands	Procurement	1000

11	Producer of electrical components	Netherlands	Procurement	50
12	Contact agency	Netherlands	Sales	12000
13	Chemical producer	Netherlands	Sales	350
14	Electric vehicle charger manufacturer	Finland	Procurement	460
15	Truck hydraulics producer	Netherlands	Procurement	1000
16	Cable manufacturer	Netherlands	R&D	800
17	Pulp, paper and energy technology supplier	Finland	Procurement	17500
18	Railway provider	Finland	Procurement	7800

## 5. FINDINGS AND RESULTS

Some interesting findings and highlights are chosen from the interviews, as these are most relevant to the research question.

### 5.1.1 Could you please tell me negative examples (knowledge spillover) of knowledge exchange (KE) with your suppliers?

**Table 4: Answers question: Could you please tell me negative examples (knowledge spillover) of knowledge exchange with your suppliers?**

Interview number	Could you please tell me negative examples (knowledge leakage) of knowledge exchange (KE) with your suppliers?
1	No experience with KE.
2	Risk of knowledge spillover.
3	Giving the supplier(s) a direction too quickly.
4	Getting dependent on one supplier.
5	Risk of knowledge spillover.

6	No experience with KE.
7	No experience with KE.
8	No experience with KE.
9	Risk of knowledge spillover.
10	No experience with KE.
11	A project was stolen from them.
12	Risk of knowledge spillover.
13	A supplier doing a knowledge spillover
14	No example given.
15	No example given.
16	Risk of knowledge spillover.
17	Risk of knowledge spillover.
18	Risk of knowledge spillover.

Out of the 18 business professionals, 5 of them do not have experience with knowledge exchange with suppliers. Next to that, 7 out of the business professionals say that the risk of a knowledge spillover as the negative example of knowledge exchange with suppliers. Only 4 out of 18 business professionals were able to name a direct negative example of the knowledge exchange with their suppliers, as simply the risk of knowledge spillover means that the business professionals are not certain that the knowledge spillover occurred.

This suggests that the business professionals do not recognize many negative examples of knowledge exchange with their suppliers.

### 5.1.2 What is your vision on suppliers sharing knowledge to other firms?

**Table 5: Answers question: What is your vision on suppliers sharing knowledge to other firms?**

Interview number	What is your vision on suppliers sharing knowledge to other firms?
1	Suppliers will be held accountable. Does not necessarily lead to contract dissolution.
2	Not mentioned.
3	Depending on the knowledge shared, it is very helpful because they are a non-profit organization. The sharing of sensitive information is prohibited.

4	Not permitted in any way, immediate termination of contract and possible legal prosecution.
5	Knowledge spillovers without permission will have consequences to the relationship, legal action might be taken.
6	Values open communication and transparency, sharing information can be risky.
7	Since a lot of sensitive information is shared with the supplier, a knowledge spillover will lead to immediate termination of the cooperation.
8	No sensitive information should be shared, so as to not put the competitive position at risk.
9	Suppliers must adhere to the signed agreements, knowledge spillover is unacceptable.
10	Depends on if the knowledge spillover is allowed by us, if knowledge spillover is with sensitive information, legal prosecution.
11	Depends on what information is shared, if information is shared market-wide it is ok.
12	If pre-agreed then ok, otherwise not allowed.
13	Depending on the product, sometimes it works well, other times secrecy is required.
14	Not allowed via NDA.
15	Not allowed via NDA, however it probably still happens.
16	Not allowed via NDA, however everyone does it.
17	Not mentioned
18	As long as it is not in the contract it is okay, non critical information such as innovations to reach sustainability goals are allowed.

Overall, around half of the business professionals (8) do not allow their supplier(s) to share information with other parties (knowledge spillover) at all. Sometimes the business professionals will take legal action to deter the supplier from knowledge spillovers.

The other business professionals (8) say that it depends on the knowledge and context in which the knowledge is shared.

Company number 3, the care provider for special needs, even mentioned that they prefer it when suppliers share their data when it comes to the price they have negotiated.

“If you enter into a contract with a supplier where the agreed price is not supposed to be shared, it happens in the corridors. Personally, I like that because then immediately every supplier knows for what price we are willing to buy. Then everyone immediately knows that they don't have to come up with a standard market price at company 3”.

Later on during the interview it was revealed that this is due to company 3 being a non-profit organization. For them the convenience of suppliers knowing what price they accept is bigger than the risk of a lowered competitive position, as they care little about their competitive position in the market. However, knowledge spillovers where sensitive information has been leaked are still unacceptable to them.

### 5.1.3 What mistakes did your company make when your company sees these negative implications as supplier opportunism?

**Table 6: Answers question: What mistakes did your company make when your company sees these negative implications as supplier opportunism?**

Interview number	What mistakes did your company make when your company sees these negative implications as supplier opportunism?
1	No opportunism recognized in the supplier.
2	No opportunism recognized in the supplier.
3	Setting up a professional procurement office, making sure there is no information asymmetry between possible suppliers during the tendering process.
4	No opportunism recognized in the supplier.
5	Did not recognize the risks and no NDA in place.
6	No opportunism recognized in the supplier.
7	Did not exercise enough caution in sharing confidential information with suppliers.
8	Not correctly recording and enforcing the required agreements.
9	No opportunism recognized in the supplier.
10	Not mentioned
11	Employees were not clear enough about confidentiality of the knowledge.
12	No opportunism recognized in the supplier.
13	No opportunism recognized in the supplier.
14	Not mentioned.
15	Not mentioned

16	Not mentioned.
17	No opportunism recognized in the supplier.
18	Not mentioned.

Out of the business professionals, 8 of them did not recognize any opportunistic behavior in their suppliers. 8 out of 18 initially does not seem like a significant amount, but when taking into account that 5 business professionals were not asked about this topic, it means that 8 out of 13 did not recognize any opportunism in their suppliers. In fact, only 4 business professionals recognized opportunism in their suppliers at some point.

The most common mistakes the companies believe they made are: not having any contractual safeguard in place such as a non-disclosure agreement (NDA), not correctly assessing the risks of knowledge spillover and not taking enough care in sharing confidential information with the suppliers.

### 5.1.4 Which conclusions did your company make from these negative examples?

**Table 7: Answers question: Which conclusions did your company make from these negative examples?**

Interview number	Which conclusions did your company make from these negative examples?
1	No opportunism recognized in suppliers.
2	No opportunism recognized in suppliers.
3	No opportunism recognized in suppliers.
4	No opportunism recognized in suppliers.
5	Learn from examples by identifying risks, implementing NDA or other safeguards.
6	No opportunism recognized in suppliers.
7	No opportunism recognized in suppliers.
8	Innovation is critical with the supplier and comes with the risk of intellectual property (IP) loss.
9	Understand why the knowledge spillover happened, as to not let it happen again.
10	Stop cooperating with the supplier, possible legal consequences.
11	No opportunism recognized in suppliers.
12	Not mentioned.

13	First get approval of the final customer when posting information on social media.
14	Not mentioned.
15	If deliberate knowledge spillover, have a discussion and see from there.
16	No opportunism recognized in suppliers.
17	No opportunism recognized in suppliers.
18	Not mentioned.

In a similar trend to the finding in section 5.1.3, 9 out of 18 business professionals report to not have experienced any form of supplier opportunism working at their current company or in previous experiences. Likewise, the conclusions the business professionals that did recognize supplier opportunism draw are to understand why the knowledge spillover happened, and how to prevent it next time over. Interestingly, most of the business professionals only seek an immediate end of the relationship when the knowledge spillover is on purpose, giving the supplier room to explain themselves and possibly mend the relationship between them.

### 5.1.5 What are the implications of suppliers using knowledge for other customers?

**Table 8: Answers question: What are the implications of suppliers using knowledge for other customers?**

Interview number	What are the implications of suppliers using knowledge for other customers?
1	Suppliers will be held accountable for knowledge spillover. Possible legal action.
2	Not mentioned.
3	Not mentioned.
4	Legal consequences, termination of relationship.
5	If allowed, none. Otherwise legal action.
6	Immediate termination of relationship.
7	Terminate relationship, possible legal action depending on the situation.
8	Not mentioned.
9	Relationship is terminated with supplier.

10	Stop relationship with supplier, possible legal action.
11	Depends on the information shared, no further elaboration.
12	Not mentioned.
13	Penalties from the contract may be enforced.
14	Legal consequences via NDA.
15	Depends on the information shared, no further elaboration.
16	Most of the time nothing, as it cannot be proven. Otherwise legal action.
17	End of relationship, legal action.
18	Rely on the contract, demand that the supplier takes responsibility.

When the business professionals are asked more specifically about the implications of suppliers using knowledge for other customers, it becomes pretty clear that in this scenario there will most likely be legal consequences for the supplier. 10 of the business professionals' answers correspond to there being legal consequences for the supplier. 5 of the business professionals choose to immediately end the relationship with the supplier.

## 6. DISCUSSION

### 6.1 Key results

The overall objective of this research is to see what consequences and implications knowledge spillovers and opportunism have on the buyer-supplier relationship from the buyer perspective.

Although the literature suggests that knowledge spillovers impact opportunism in the buyer-supplier relationship, the findings in this study were inconclusive; no conclusion can be drawn based on the data collected. This is mostly because the data that was collected suggests that the business professionals recognized little to no opportunism, nor knowledge spillovers in their suppliers. There are several factors that are contributing to this finding.

#### 6.1.1 Opportunism in supplier

Firstly, as Crosno et al. (2013) suggests, the most common form of opportunism is passive opportunism. Coincidentally, this is also the hardest form of opportunism to be recognized. The findings further support this, as can be seen in the interviews (section 5.1.1), as only 9 out of 18 business professionals recognized opportunism in their suppliers. This indicates that the business professionals are not aware of opportunistic behavior in their suppliers. However, this does not mean that it is not happening. It is possible that the business professionals simply do not realize that there is opportunism at play here. This is also further supported by TCA, as according to its theory, the supplier will act opportunistically if possible and the business professional will act rationally with the information he or she has at hand.

Alternatively, in line with SET, the relationship between the business professionals and their respective suppliers is based on trust and is strong enough to govern itself. However, this does not seem to match well with the findings from the interviews, as all of the business professionals indicated that they either have an NDA or a different contract in place.

Combined, these theories and findings make the case of some of the business professionals simply not knowing that supplier opportunism is taking place.

### 6.1.2 Knowledge spillover

The opinions of the business professionals regarding supplier knowledge spillovers seems to be quite similar as 8 of them do not allow the suppliers to share knowledge with other firms. The other 8 say that it depends heavily on the context in which the knowledge is shared, for example if sensitive information is shared it is not allowed. One of the non-profit companies actually prefers its prices to be shared with competitors. This way other suppliers know what kind of price to expect from them. In their eyes there are no negative consequences for them as they are not motivated to increase their competitive position in the market.

Interestingly, when looking at the consequences for the suppliers, the business professionals seem to only want to end the relationship immediately if the knowledge spillover was on purpose, usually giving the supplier room to explain themselves. This sparks life into the idea of harsher punishments for suppliers that act in an opportunistic fashion than for suppliers who do not. The actual content of the knowledge spillover seems to matter less than whether or not it was on purpose/ accidental. This ties into the SET, as the relational norm of not breaking the trust barrier seems to be the differentiating factor here (Heide and John, 1992).

This is further supported by the way business professionals treat their suppliers when the supplier uses the knowledge for other customers. In this case, 10 business professionals indicated that legal action will be taken against the supplier, as well as 5 business professionals indicating that an immediate ending of the partnership is imminent.

Again looking from SET, this seems to be in line with the literature as the suppliers using buyer's information can be seen as opportunistic, making the business professionals lose trust in them, in term lowering the likelihood of the continuation of the relationship between them.

## 6.2 Managerial implications

These findings and results have several implications for managers and business professionals.

Firstly, the findings and literature suggest that managers and business professionals due to the nature of passive opportunism often do not recognize opportunism in their suppliers. In order to combat this, managers could make use of SET as it states that the relationship between the buyer and supplier can be used as a governing mechanism. Secondly, the findings show that next to having a good relationship in place, formal contracts such as a NDA or similar contract also help govern the relationship between the buyer and supplier.

The improved relationship in combination with managers being aware of passive opportunism's elusive characteristics and having a NDA or similar contract, should give them a better chance at recognizing and preventing opportunism in the first place.

Lastly, due to the uncertain nature of knowledge spillovers, it is a best practice to think critically about what information is shared and with whom, as the risk of a knowledge spillover is always present, even if it is unintentional.

## 6.3 Limitations and future research

In this research, several limitations have been recognized. The first one is in the nature of the study, qualitative research. Because this is qualitative research, we cannot make any statistical inferences, we can only use it to generate future potential hypotheses.

Another limitation of this study was the sample size. In total only 18 interview partners were chosen. This is a big enough group to get an approximate idea, but in order to solidify this research's findings in the literature, really a larger sample of interviews is required. This could possibly be facilitated by future research.

Next to that, a further limitation from the interviews was the dropout rate of certain questions. As the interviews were taken by 4 students with 4 different topics, by accident some interview questions were skipped by the interviewers (usually 3-4 answers per question). Luckily, this does not hinder the research much as conclusions can still be drawn from the data.

Despite these limitations, this research still contributes to the literature as new ideas and research topics are sparked into existence by it.

## 7. CONCLUSION

Concluding, according to the findings of this research, the consequences and implications of knowledge spillovers on the buyer-supplier relationship seem to be that if the knowledge spillover is on purpose, the relationship will be terminated. The reason being that this is seen as opportunistic by the buyer, as well as it harming the trust between the two parties.

If the knowledge spillover is not on purpose, the buyer will hear them out and depending on if sensitive knowledge is shared, will continue the buyer-supplier relationship or not. This time, as it is an accident, the buyer does not see it as opportunistic behavior and the trust between the two parties remains untouched.

In both non- and on purpose knowledge spillover by the supplier, legal action might be taken by the buyer depending on the severity of the knowledge spillover.

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## Appendix 1: interview questions

Questions about examples:

I am highly interested in the topic of buyer-supplier knowledge exchange:

Could you tell me how this works in your company?

How do you collaborate with suppliers and which type of knowledge exchange do you have with your suppliers? (+ could you provide some examples; do you also share sensitive knowledge?)

Could you please tell me positive examples of knowledge exchange with your suppliers? (i.e. market advantages, etc)

Could you please tell me negative examples (knowledge leakage) of knowledge exchange with your suppliers?

Do you allow your suppliers to share your exchanged knowledge also with other customers? ( If no: how do you prevent this?; If yes: how do you do this?)

Which departments in your company are involved in the knowledge exchange with your suppliers? (what kind of knowledge to they transfer? E.g., R&D)

Do you have examples of the other way around: in which you received valuable knowledge from a supplier about the market or perhaps other competitors? (Which kind of knowledge was this specifically?)

Could you please tell me some explicit examples of suppliers using knowledge for other customers?

Questions about implications:

Thank you for these examples, now I would like to know something more about the implications out of these examples.

Please tell me which kind of knowledge do the different departments of your company share with the supplier i.e. your department or for example R&D and what is the implication out of this? (positive implications? Negative implications? Can you provide specific examples?)

What is your vision on suppliers sharing knowledge from your firm (i.e. your purchasers or R&D) with other customers?

What mistakes did your company make when your company sees these negative implications as supplier opportunism

What negative impact does this behavior have on access to supplier knowledge?

Which conclusions did your company make from these negative examples (stop relationship/ try to resolve the problem, nothing)?

What are the implications of suppliers using knowledge for other customers?

Questions about contracts:

Now, I would like to talk about contracts between your company and your suppliers.

In what way do your contracts deal with knowledge exchange?

Which specific clauses in the contracts are about knowledge exchange between your company and your supplier?

Do your contracts allow or prohibit the supplier using your knowledge with other firms? What clauses or phrases in the contract address this specifically?

Which clauses did you consider to be particularly effective or ineffective? Which absolutely need to be included?

Do you include project management requirements / rules in your innovation contracts?

In general, how would you reflect on the use of contracts to govern knowledge exchange with suppliers?

Which parties of your company are involved in these contract negotiations and which ones from the supplier side?

Questions about relational safeguards:

I would like to focus now on relational connection between your company and your suppliers.

How would you describe the relationships with your best suppliers which you exchange knowledge with?

How important is relational experience with that supplier?

What is the motivation from you to share your knowledge with that supplier and do you share it with other suppliers as well(or why not?)? (and what is the motivation for the supplier?)

How do you decide to select a specific supplier for your project? (other than financial reasons)

How would you describe the relationship with this selected supplier? How did it impact how your firms exchange information?

Which influence has the relationship to the supplier to accept knowledge exchange to the supplier? (give an example, make specific)

Trust, social safeguards (flexibility, environment, informal contact )