



# Defining and categorizing tail spend for a better management thereof

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Nieuwleusen, 15-August-2022

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OF TWENTE.**

## Abstract

Tail spend management is a topic on which little research is done. In this paper, it is emphasized why tail spend management is important, what purchasing situations are related to tail spend, what challenges or problems can occur with regards to tail spend and how actionable solutions can solve the challenges or problems for tail spend. Furthermore, concrete advice on defining tail spend for organizations is given. The results of this research will add to purchasing management theory. Moreover, a theoretical framework for tail spend management is developed based on this research. At the start of this research, an extensive literature review is been done. After that, qualitative data is gathered by interviewing twelve purchasing professionals, working for companies in different industries, based in three countries. Thereafter, the interviews have been coded: open, axial and selective. The results of this qualitative research are compared with literature, and have lead to a discussion on tail spend management. The following results have been found. First of all, challenges for tail spend are related to the supplier, contract management, invoicing, the internal organization, capacity and uncertainty regarding tail spend. Secondly, in order to solve these challenges, the following solutions for tail spend are categorized: supplier management, contract management, outsourcing, software, internal processes, company regulations, company strategy, defining tail spend and business case. Despite the fact that tail spend is perceived different by organizations, in terms of both volume as well as in terms of perception, tail spend can be managed effectively by implementing the solutions that have been listed.

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## Management summary

In order to manage tail spend properly, traditional purchasing levers can serve as tools to manage spend within different categories. Moreover, spend can be managed best by dividing it into certain categories. Nevertheless, in this research, management of spend is not done via product categories. Instead, it is done via challenges related to tail spend. Based on this research, challenges related to tail spend are divided into supplier, contract management, invoicing, internal organization, capacity, and uncertainty regarding tail spend, based on this research. In order to overcome these challenges for tail spend, the solutions for tail spend are related to supplier management, contract management, outsourcing, software, internal processes, company regulations, company strategy, defining tail spend and business case, based on this research.

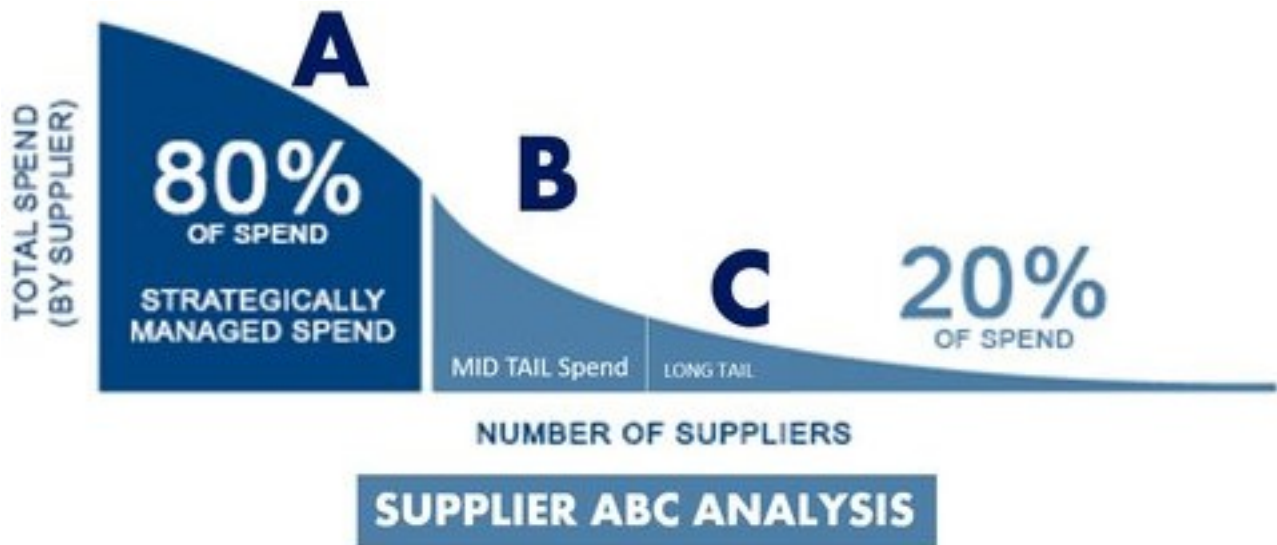
For purchasing professionals, it is advised to define their organizations' tail spend in terms of compliant and non-compliant tail spend. First of all, the organization must know to what extent they are accepting non-managed spend. Afterwards, organizations are able to recognize if they do or do not comply on this criterion. In case of non-compliant tail spend, this can be the cause of one of the challenges for tail spend. To resolve these challenges, organizations may consider implementing the solutions that have been connected to the respective challenge.

Second, purchasing professionals need to take note of the challenges their organization is dealing with, regarding tail spend. To manage tail spend properly, solutions are listed for each challenge connected to tail spend.

## 1. Introduction: Effective managing of the total spend can be beneficial for organizations in general, yet more research needs to be done on tail spend

The categorization of spend is mostly done to attach specific and useful strategies to those categories (Dabhilkar, Bengtsson, & Lakemond, 2016, p. 5). In order to divide spend into categories, different methods can be used, for example: power-dependence perspective, commodity characteristics and spend volume (Caniels & Gelderman, 2005, p. 155; Monczka, Handfield,

Figure 1: Tail Spend Explained by a Supplier ABC Analysis and Pareto's Principle. (<https://www.accelerated-insight.com/spend-analysis/what-is-spend-analysis-abc>)



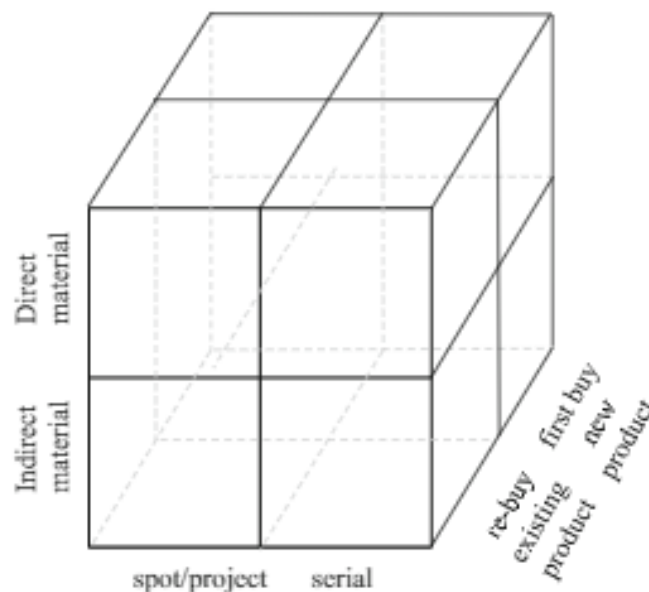
Giunipero, & Patterson, 2015, p. 190). When categorizing is based on spend volume, it can be theorized that Pareto's law is applicable on this spend volume (Figure 1)<sup>1</sup>. Where theoretically 80% of the spend is represented by 20% of suppliers and vice versa. Although the tail spend typically only represents 20% of the total purchasing volume, managing the last 20% of the spend can lead to reduced total spend, less administrative burden and a cut-down on maverick buying, thus managing tail spend can be advantageous for firms (Abdollahnejadbarough et al., 2020, p. 197; Wyld, 2012, p. 3).

As a consequence, strategies and tactics to manage tail spend exist; e.g., cost savings (pooling of demand or process efficiency) and supply base reduction (Monczka et al., 2015, p. 212). Kraljic (1983, p. 112) categorized purchasing items based on profit impact and supply risk into four quadrants: strategic, leverage, bottleneck and non-critical items. Each quadrant is given its own strategies, e.g., efficient processing, inventory optimization and order volume optimization for the non-critical quadrant (Kraljic, 1983, p. 112). However, Hesping and Schiele (2016a, p. 101) state that not all items in a particular category should be managed in the same way. Rather, so called tactical sourcing levers can be used to manage a particular quadrant of the Kraljic matrix or to move

<sup>1</sup> <https://www.accelerated-insight.com/spend-analysis/what-is-spend-analysis-abc>

away from a quadrant (Hesping & Schiele, 2016a, p. 101). These tactical sourcing levers are described as “tactics applied to specify category strategies” (Hesping, 2015, p. 19). In this way, routine items, which is the quadrant for most of the tail spend of an organization, should be managed with tactics like; order volume optimization and efficient processing (Hesping & Schiele, 2016a, p. 102). Nevertheless, routine items are still a heterogeneous group of items. Therefore, it could be interesting to separate this quadrant into different purchasing situations, which will make the groups homogeneous. According to Schiele (2019, p. 51) a purchasing situation can differ among different aspects, e.g., intended contribution (direct or indirect) or frequency (project or serial). In Figure 2 a few purchasing situations are illustrated, combining the three aspects in the figure, already eight (2 times 2 times 2) purchasing situations can be distinguished. However, these eight purchasing situations are not the only purchasing situations that exist. Moreover, each purchasing situation also has its own challenges or problems; e.g., when buying a product for the first time, no previously paid price is available or with project buying, a new contract has to be made for every purchase (Schiele, 2019, p. 52). In order to manage tail spend properly, solutions should be attached to each challenge of each purchasing situation.

Figure 2: Purchasing Situations in Three-Dimensional Model. (Schiele, 2019, p.52)



Therefore, this paper is focussed on (1) the categorization of tail spend into homogeneous purchasing situations, (2) the challenges that arise at each purchasing situation and (3) useful solutions for the different challenges that occur for each purchasing situation in the tail spend. The goal of this paper is to present a theoretical framework for managing all purchasing situations in the tail spend. Therefore, the main question of this paper is: **How can tail spend be managed when it is separated into homogeneous purchasing situations?** In order to answer this question, three sub questions are answered in advance:



1. What purchasing situations can characterize spend?
2. What challenges arise for tail spend?
3. Which methods can be used to manage the challenges within the tail spend effectively?

After finishing this research, new insights are added to the existing sourcing and purchasing strategy literature, and organizations are better able to manage their tail spend. First, a framework with a clear differentiation of tail spend will be added to the literature of strategic sourcing. This framework will include the different purchasing situations in tail spend, the challenges of each purchasing situation and the solutions to manage the challenges of these purchasing situations. The framework comes in addition of the existing literature on the sourcing levers of Hesping and Schiele (2016b). Secondly, the theoretical framework presented by Hesping (2015, p. 19), which can be seen in Figure 3, will be extended with a separation between head spend and tail spend. Next to that, organizations will better understand their tail spend by defining the phenomenon in terms of volume and in terms of compliance. And finally, organizations will be able to better manage their tail spend, due to new insights on solutions for tail spend management.

## 2. Theoretical framework: expanding strategies and tactics for tail spend management and connecting them to dimensions of purchasing situations

### 2.1 Tail spend is a heterogeneous group of needs with low purchasing volume relative to the total spend of an organization: exploring tailor-made solutions might reveal advantages.

Tail spend is based on the ABC analysis, which is based on Pareto's law (Braglia, Grassi, & Montanari, 2004, p. 57). Pareto's law originates from the 20<sup>th</sup> century, when Vilfredo Pareto, an economist, argued that 80% of wealth is possessed by 20% of population (Grosfeld-Nir, Ronen, & Kozlovsky, 2007, p. 2317). This law, or principle, implies that 20% of the attributes are responsible for 80% of the phenomenon and vice versa, and is applicable on other phenomena as well (Grosfeld-Nir et al., 2007, p. 2318). For example, Pareto's law is applicable on revenue (phenomenon) of projects (attributes) and on earnings (phenomenon) of customers (attributes). In the case of spend volume of an organization, the suppliers are the attributes and the spend of an organization is the phenomenon, which means that 20% of the suppliers account for 80% of the spend of an organization. Although the law seems simple, tail spend is not the same for every organization. The definition of tail spend depends on the type of organization. According to Abdollahnejadbarough et al. (2020, p. 201), smaller organizations will have a lower cap for tail spend, whereas large organizations have in general a much higher cap for tail spend. Therefore, it can be said that the tail spend of an organization is relative to the total spend of the organization.

In Figure 1, tail spend is illustrated along with the supplier ABC analysis. This ABC analysis clusters suppliers based on annual purchasing volume (Hesping, 2015, p. 35). However, the method is initially used for inventory management, where it is the most well known method for management of spare parts according to Braglia et al. (2004, p. 56). The ABC analysis is based on Pareto's principle, which means, in the case of spare parts, that 20% of the spare parts in the inventory of a firm is responsible for 80% of the consumptions at that company regarding the spare parts (Braglia et al., 2004, p. 57). In the case of suppliers, Pareto's principle can imply that 20% of the suppliers are responsible for 80% of the spend of a company. Braglia et al. (2004, p. 57) state that the ABC analysis clusters the spare parts into three clusters:

- Very important (A);
- Important (B);
- Less important (C).

Moreover, they argue that management attention is only required for the spare parts, which belong to class A (Braglia et al., 2004, p. 57). This means that the tail of spare parts would receive no

management attention at all. Nevertheless, Abdollahnejadbarough et al. (2020) discuss that managing tail spend has advantages like reduced spend, and a lower overall price per unit. Next to that, it is argued that a managed tail spend can reduce maverick buying and coordinates purchases more sufficiently (Wyld, 2012, p. 3). Summarizing, the supplier ABC analysis is a method to cluster suppliers based on their stake in the total spend of a company. This will eventually lead to three clusters: A, B, and C. Where the A cluster stands for the suppliers who have the highest stake in the total spend of a company. Some authors claim that only the A category should receive management attention. Other authors think there are advantages for managing the B and C suppliers as well.

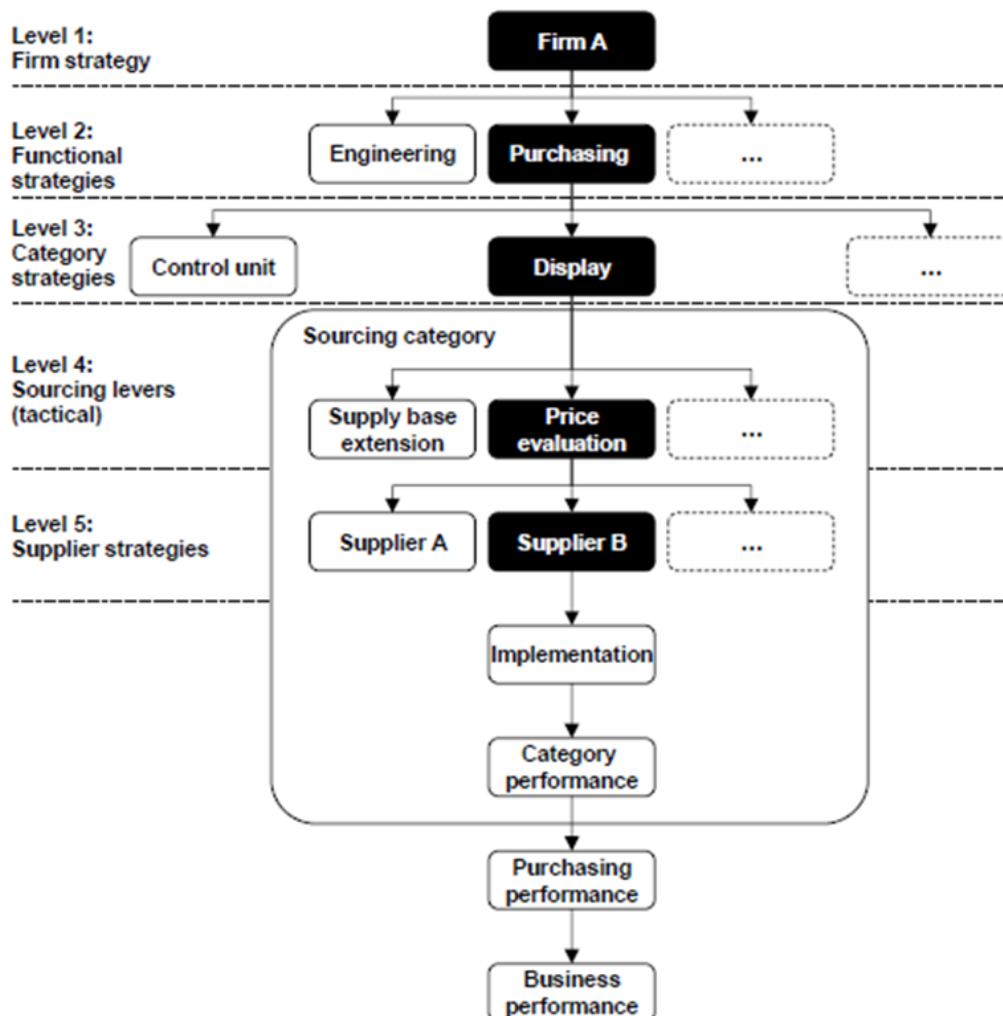
Tail spend is a big part of suppliers or needs of an organization, representing only 20% of the total spend. Therefore, it is more interesting for organizations to strategically manage the head spend (i.e. the 20% suppliers accounting for 80% of the total spend). Kraljic (1983, p. 112) states that non-critical items – items with low purchasing volume/profit impact – should be managed by lower-level purchasers than other quadrants, because non-critical items have less strategic importance. On the other hand, in the same paper Kraljic (1983, p. 116) argues that for some companies it may be valuable to use tailor-made systems to improve the purchasing organization. For example, realize savings for nonstrategic items with the use of purchasing analyses. However, the possibilities regarding tailor-made systems for non-strategic items have not been studied much. In a study of Verizon, the tail spend of Verizon is managed with the help of machine learning algorithms, multi criteria decision making and other sophisticated data intensive methods (Abdollahnejadbarough et al., 2020, p. 208). The methods used by Abdollahnejadbarough et al. (2020, p. 208) are focussed on renegotiation of contracts and bundling of volumes. Therefore, the data intensive methods are used to execute tactical sourcing levers like (1) volume bundling and (2) price evaluation.

Summarizing, tail spend is based on the concepts of the ABC-analysis and Pareto's law. Tail spend represents 20% of spend, which according to the concept represents 80% of the supply base. Therefore, organizations might think of tail spend as less important and low strategic importance. Tail spend management has not been studied much yet. However, according to Kraljic Matrix it may come in handy to invent tailor-made solutions for these non-strategic suppliers.

## 2.2 Separating tail spend from head spend for category strategies in the hierarchy of purchasing strategies should enhance the effectiveness of sourcing levers and solutions

Dabhilkar et al. (2016, p. 19) found in their paper that aligning the priorities of the firm with those of the purchasing function leads to financial returns. Moreover, the performance of a purchasing function will be higher if the purchasing objectives support the overall business strategy (Gonzalez-Benito, 2007, p. 913). So, it can be stated that strategies for purchasing will be more effective for organizations when aligned with the overall strategy. In Figure 3, the hierarchy of

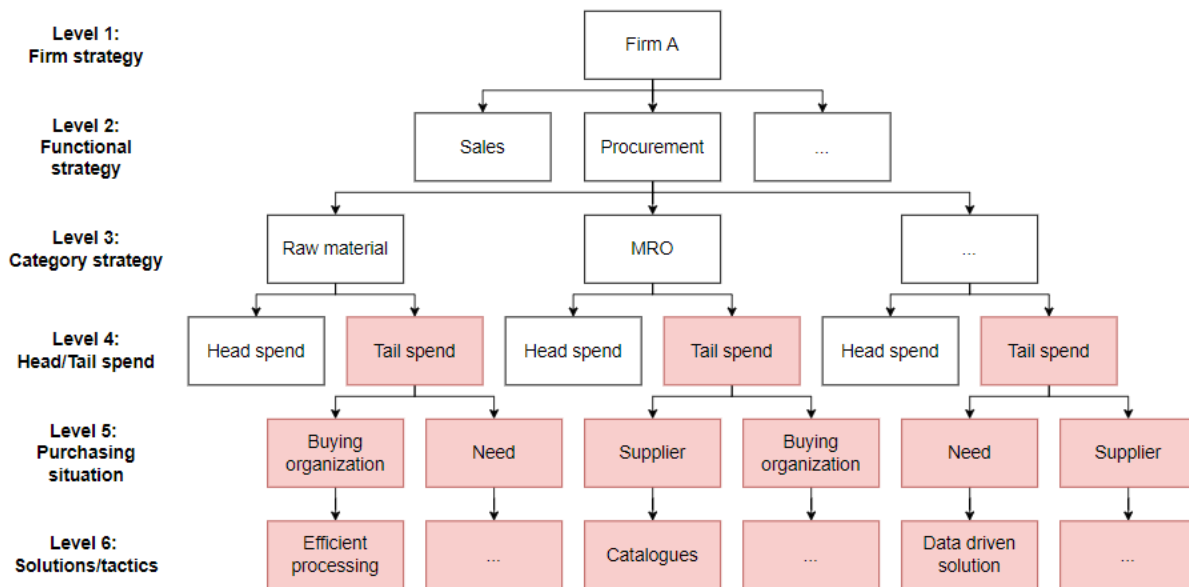
Figure 3: Hierarchy of Strategies: From Firm Strategy to Supplier Strategies. (Hesping, 2015)



strategies is illustrated in a theoretical framework, which is made by Hesping (2015). The different levels of strategies are useful to frame the context of this research. Tail spend will occur in every purchasing category (level 3), and some tactical sourcing levers (level 4) can be useful for managing tail spend. Whereas supplier strategies (level 5) will not be used often for tail spend, because tail spend in general has less strategic importance. Therefore, it can be said that this research will take place between level 3 and level 4 of the hierarchy of strategy (Hesping, 2015). However, this research is focussed on a theme which is not represented in this framework; tail

spend. Therefore, an adjusted hierarchy for purchasing strategies can be seen in Figure 4, whereas the red coloured parts of the model represent the focus area of this research. The figure

Figure 4: Hierarchy of Strategies, Adjusted to Separate Tail Spend From Head Spend, and Including Level 5: Purchasing Situation. (Own illustration)

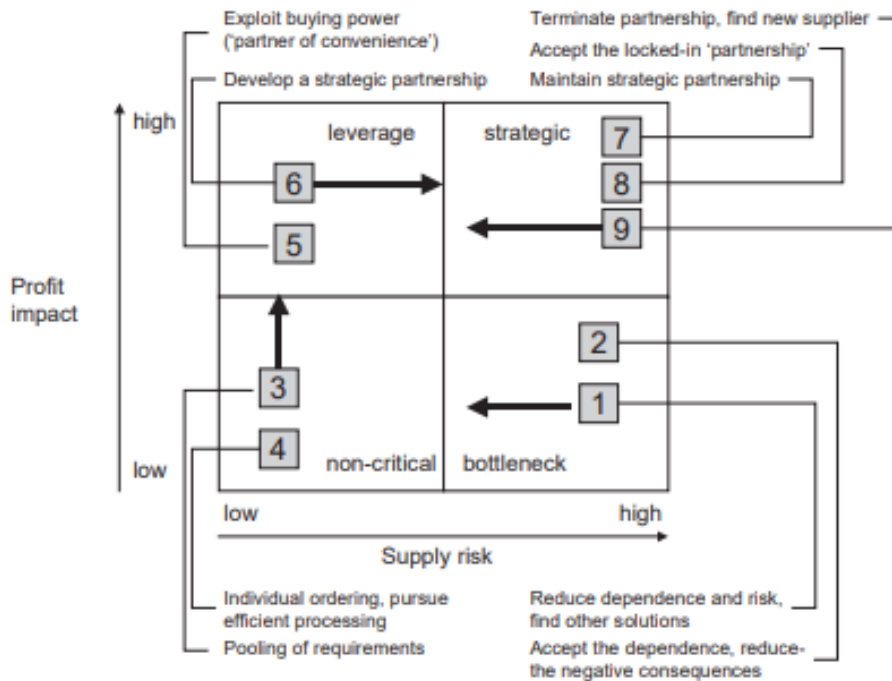


includes a separation between tail spend and head spend, as well as another layer in the framework: purchasing situations. In this way, tail spend is broken down into purchasing situations, in order to assign solutions to these situations, which will enhance effectivity for the solution. Also, the sourcing levers, suitable for the execution of purchasing strategies for the head spend, are separated from the tailored solutions for the tail spend. An example of supplier strategies for purchasing can be seen in Figure 5.

In Figure 5, the arrows represent a strategy to move away from a particular quadrant to the quadrant where the arrow is aiming at. Since suppliers in tail spend are most probable situated in the two lower quadrant of the Kraljic matrix, it could be said that there are already four existing strategies for suppliers in the tail spend of a firm: strategy 1, 2, 3, and 4 in Figure 5. The first strategy; reduce dependence and risk, find other solutions, is aiming to lower the level of dependence on a supplier and to face less supply risk, which will lead to a shift to the non-critical category (Gelderman & Van Weele, 2003, p. 213). Secondly, Gelderman and Van Weele (2003, p. 213) state that the strategy of accepting the dependence and to reduce the negative consequences is useful when there are no other options left. The strategy of accepting dependence and reducing negative consequences can be carried out by putting in place risk management, long-term contracts and safety stocks (Gelderman & Van Weele, 2003, p. 213) The third strategy; pooling of requirements, can be used to shift suppliers to the leverage quadrant of the matrix. In order to

execute this strategy, a company can use a vendor managed inventory system, an e-procurement

Figure 5: Purchasing Strategies for the Four Quadrants of the Kraljic Matrix. (Gelderman and Van Weele, 2003, p. 213)



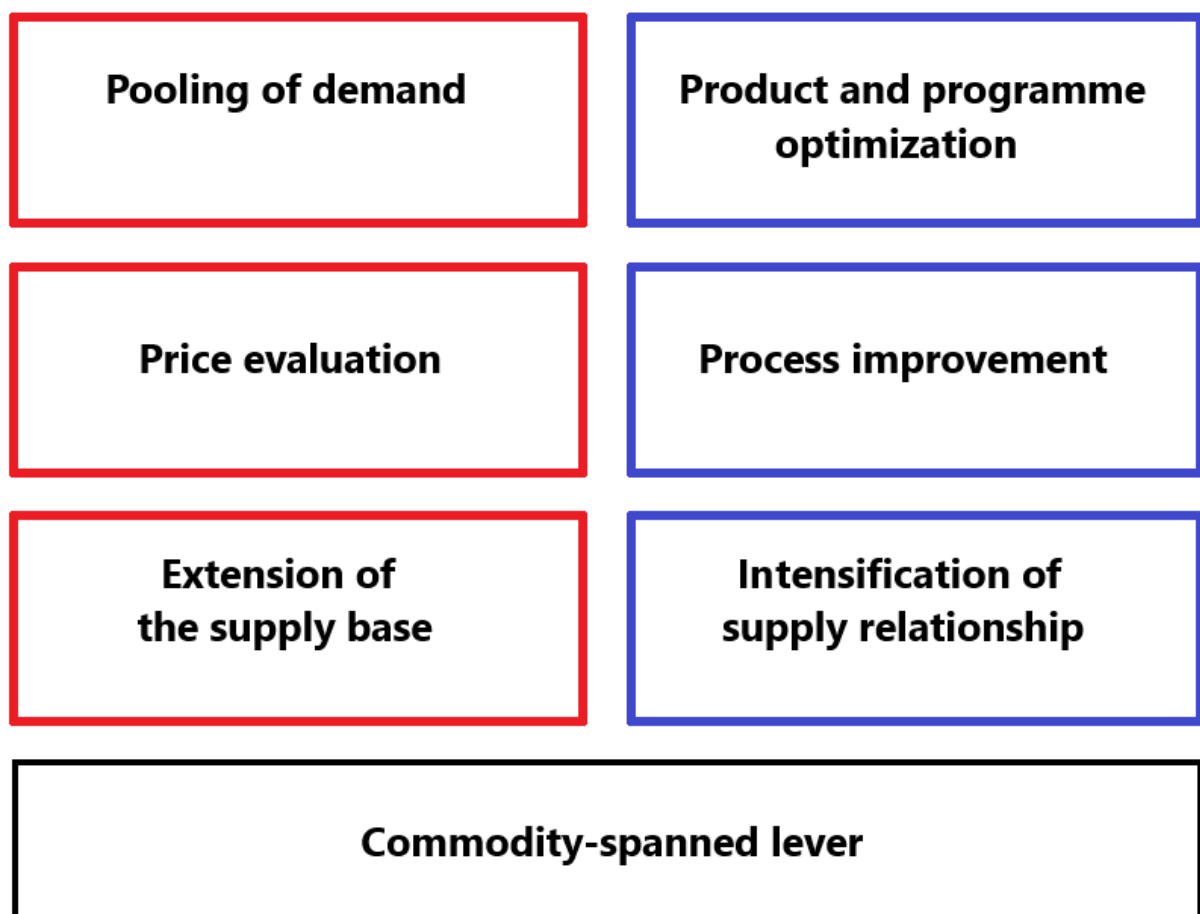
tool or a framework contract with few preferred suppliers. This will lead to less suppliers, less purchasing costs and a shift to the leverage quadrant (Gelderman & Van Weele, 2003, p. 213). The fourth and last strategy for tail spend in Figure 5; individual ordering and efficient processing, is described by Gelderman and Van Weele (2003, p. 213) as a last option to reduce costs. If no options to pool requirements are left, ordering items in the non-critical quadrant should take place as efficient as possible, including the administrative processing thereof, which will reduce purchasing costs (Gelderman & Van Weele, 2003, p. 213).

In summary, purchasing strategies become more effective when they are aligned with the overall company strategy. Moreover, there are different hierarchies for strategies and tactics within an organization. Also, strategies can be applied with the use of the Kraljic matrix. This is a well known tool for purchasers and uses profit impact and supply risk of different products to recommend strategies and tactics for them.

2.3 Seven sourcing levers are already distinguished in tactical sourcing: pooling of demand, price evaluation, extension of the supply base, product and programme optimization, process improvement, intensification of supply relationship, and commodity spanned levers

After level 3 of the hierarchy of strategies (Figure 3), level 4 of the hierarchy of strategies comprises the sourcing levers that can be used within a sourcing category to make the sourcing category more concrete (Hesping, 2015, p. 19). In Figure 6 the seven tactical sourcing levers stated by Schiele (2007, p. 280) are illustrated. Firstly, the levers on the left, coloured red, can be interpreted as commercial levers. Whereas, the levers on the right, coloured blue, are often seen as cross-functional levers (Schiele, 2019, p. 67). The difference between commercial and cross-functional levers is explained by Schiele (2019, p. 67) as “... commercial levers try to exploit existing benefits, while the cross-functional levers try to explore new benefits”. Finally, the lever at the bottom of Figure 6, the commodity-spanned lever, is pointed at the cooperation between and trade-offs with sourcing teams of different categories (Schiele, 2019, p. 67).

Figure 6: Seven Tactical Sourcing Levers. Divided in Cross-Functional Levers, Commercial Levers and a Commodity-Spanned Lever. (Own illustration)



The tactical sourcing levers are defined as follows (Hesping & Schiele, 2016a, 2016b; Schiele, 2007, 2019):

1. Pooling of demand: also called ‘volume bundling’, focussed on bundling the purchasing volume of an organization into bigger contracts or quotations. Hereby, more advantages can be negotiated in the contracts because of a larger purchasing volume; economies of scale.
2. Price evaluation: negotiating lower prices after analysing cost structures and prices of suppliers. For example, similar purchases, own calculations and past offers are compared with quoted prices of one or more suppliers.
3. Extension of supply base: creating more competition in the industries where this is necessary due to high prices and low innovation. Hereby, more suppliers will be able to make a bid or to request on a RFQ. Extending the supply base can be done through international sourcing or by developing local suppliers.
4. Product and programme optimization: can lead to cost savings or quality improvement. Often, target costing is used to make slight changes to a products’ components, which eventually will lead to cheaper alternatives. Product optimization is a cross-functional lever.
5. Process improvement: making processes more efficient or effective. As a result, the costs of these processes will be lower. Also, efficient processes leave more time for purchasers to focus on their main tasks.
6. Intensification of supplier relationship: can lead to co-creation, sustainable competitive advantage, and innovation. This lever cannot be used for every supplier due to its time consuming, costly and risky character.
7. Commodity-spanned lever: in order to let the whole organization profit from the levers, commodity groups should work together. It might occur that one commodity group profits from some lever, whilst another commodity group experiences disadvantage from the same lever.

Summarizing, seven sourcing levers have been distinguished in theory: (1), pooling of demand (2), price evaluation (3), extension of supply base (4), product and programme optimization (5), process improvement (6), intensification of supplier relationship, and (7) commodity-spanned levers. These seven levers can be divided into: cross-functional levers, commercial levers, and commodity-spanned levers.



## 2.4 Three dimensions for purchasing situations open doors for the categorization of spend without using spend volume: Who do you buy from? What are you buying? Who is buying?

In order to design a comprehensive theoretical framework about the challenges and solutions for purchasing situations in tail spend, first of all, the purchasing situations need to be addressed. These purchasing situations can be distinguished from different perspectives. Three perspectives of purchasing are being used in this chapter; (1) who do you buy from, (2) what are you buying, and (3) how is it being sourced (Barrad, Gagnon, & Valverde, 2020, p. 75). The first perspective; who do you buy from, implies purchasing situations regarding the supplier. For example, a supplier can be new or known, where both situations lead to another process or other steps within a process. Secondly, the perspective of the purchased item (what you are buying) is being analysed. A purchased item can be for example existing or non-existing, tangible or intangible, and direct or indirect (Lindberg & Nordin, 2008, p. 293; Schiele, 2019, p. 52 ). Finally, purchasing situations can be seen from the perspective of the buyer (i.e. how is it being sourced?). The buyer of an organization is not always the same person. It can be someone from the purchasing department or from another department. Next to that, the approach of the buyer can differ per situation (Paesbrugge, Vuori, & Kock, 2021, p. 1015). In this chapter, the three perspectives will be explained thoroughly. Also, a table with each purchasing situation and the respective reference is added at the end of this chapter.

Categorization of spend can be done in various ways. First of all, Kraljic (1983, p. 112) divides purchased items into four quadrants of his matrix; strategic, leverage, bottleneck and non-critical items. This matrix has an x-axis and a y-axis which respectively stands for supply risk and profit impact (Kraljic, 1983, p. 112). Whereas profit impact can be measured based on purchasing volume or impact on the business of a company. Next to that, supply risk can be measured in terms of market characteristics like; number of suppliers, competitiveness, substitutes and availability (Kraljic, 1983, p. 112). Hence, the market characteristics are oriented on suppliers. As a consequence, the market characteristics can be used for the first dimension ‘who are you buying from’ as well. Nonetheless, commodities within the tail spend would mostly be placed in the two lower quadrants of the Kraljic matrix (bottleneck and non-critical items) because tail spend has a low purchasing impact. However, it can occur that particular commodities have a low purchasing volume, but still have major impact on the business of a company, and should therefore be placed in one of the upper quadrants of the Kraljic matrix (strategic and leverage items). In summary, Kraljic categorizes based on two measures: supply risk and profit impact. In general, tail spend suppliers have low profit impact.

Therefore, tail spend will mostly be situated in the two lower quadrants of the Kraljic matrix (non-critical and bottleneck items). Other purchasing situations that are found in literature are characterized by the extent to which the supplier is preferred or not and whether the supplier fits in the supply risk profile of the buying organization (Mantena & Saha, 2022, p. 1292; Paesbrugghe et al., 2021, p. 1015).

Secondly, the spend of a company can be categorized based on the characteristics of the commodity. Schiele (2019, p. 52) described several purchasing situations, which comprise indirect or direct, spot/project or serial, re-buy or first buy and existing or non-existing commodities (Figure 2). Each purchasing situation has its own consequences regarding, for example, the negotiation-, logistics-, and research & development process (Schiele, 2019, p. 52). Therefore, managing these purchasing situations should be done in different ways, tailored to the challenges which arise with purchasing situations.

Nonetheless, the categorization of purchased needs is divided into two alternative views by Lindberg and Nordin (2008, p. 293); the goods-dominant logic and the service-dominant logic. In the first perspective, the goods-dominant logic, services are objectified, standardized and specified based on details. At the other hand, the service-dominant logic is not trying to objectify and standardize because of the intangible, heterogeneous, inseparable, and perishable character of services (Lindberg & Nordin, 2008, p. 294). Moreover, Lindberg and Nordin (2008, p. 294) describe services as something which is customized and co-created by buyers as well as suppliers. In conclusion, there are a lot of different characteristics for commodities. Next to that, different perspectives exist on the characterization of commodities; goods-dominant logic and service dominant logic. Other differences between procuring services and goods are buyer perception, and search and contract costs (Wynstra, Rooks, & Snijders, 2018, p. 90).

The final dimension, the perspective of the buyer, is described in this paragraph. Although the perspective is used by Barrad et al. (2020, p. 75), their study does not consist of any concrete purchasing situations for this dimension. Nevertheless, Paesbrugghe et al. (2021) describe several purchasing situations for the perspective of the buying organization. First of all, it is argued that buyers assess their necessary knowledge for a purchase, in relation with what knowledge they possess beforehand (Paesbrugghe et al., 2021). Next to that, Paesbrugghe et al. (2021, p. 1015) state that the buying process is affected by (1) the way the buyer perceives risk for procuring the need, (2) the buyer's access to information, and (3) the approach of the buyer in terms of decision making; whereas the buyer can approach the need in a strategic way as well

as in a transactional way. In Table 1, the purchasing situations from literature are listed per dimension, together with their respective source.

*Table 1: Existing Purchasing Situations for Three Dimensions, Including Their References From Theory.*

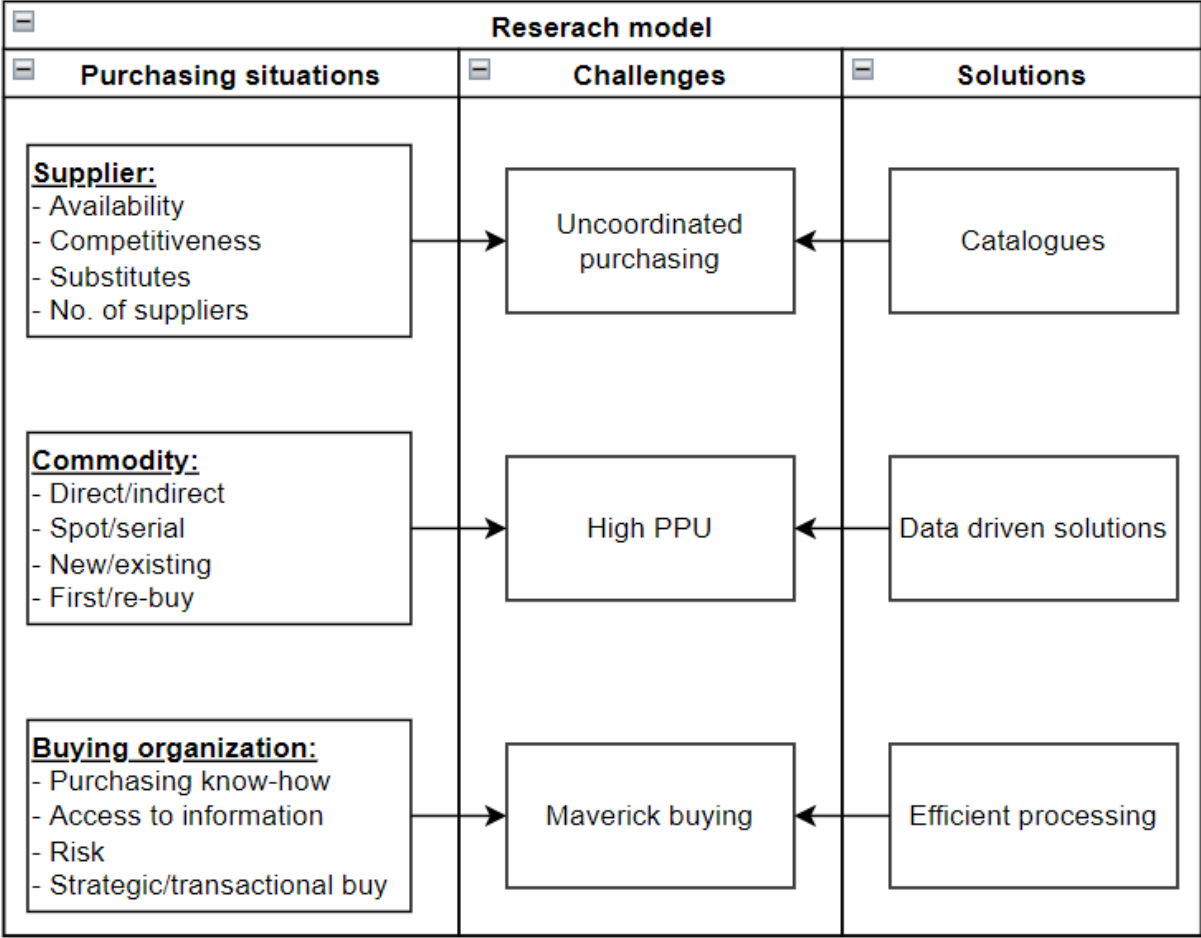
<b>PURCHASING SITUATION</b>	<b>REFERENCE(S)</b>
<b>DIMENSION 1: WHAT IS BEING PURCHASED?</b>	
INDIRECT VS. DIRECT	Schiele (2019), Lindberg and Nordin (2008)
SPOT VS. SERIAL	Schiele (2019)
FIRST BUY VS. RE-BUY	Schiele (2019), Paesbrugghe et al. (2021)
EXISTING VS. NON-EXISTING PRODUCT	Schiele (2019)
TANGIBLE VS. INTANGIBLE	Lindberg and Nordin (2008)
SEPARABLE VS. INSEPARABLE	Lindberg and Nordin (2008)
IMPERISHABLE VS. PERISHABLE	Lindberg and Nordin (2008)
HETEROGENEOUS VS. HOMOGENEOUS	Lindberg and Nordin (2008)
<b>DIMENSION 2: FROM WHO IS BEING PURCHASED?</b>	
PREFERRED VS. NON-PREFERRED SUPPLIER	Mantena and Saha (2022)
SUPPLY RISK ACCEPTABLE VS. NOT ACCEPTABLE	Paesbrugghe et al. (2021)
AVAILABILITY	Kraljic (1983)
COMPETITIVENESS	Kraljic (1983)
SUBSTITUTES	Kraljic (1983)
NO. OF SUPPLIERS	Kraljic (1983)
<b>DIMENSION 3: WHO IS PURCHASING?</b>	
PURCHASING VS. NO PURCHASING KNOW-HOW	Paesbrugghe et al. (2021)
STRATEGIC VS. TRANSACTIONAL	Paesbrugghe et al. (2021)
RISK	Paesbrugghe et al. (2021)
ACCESS TO INFORMATION	Paesbrugghe et al. (2021)

In summary, three main dimensions for purchasing situations have been found in theory: (1) what is being purchased? I.e. the need, (2) From who is being purchased? I.e. the supplier, and (3) who is purchasing? I.e. the buyer.

## 2.5 Categorization of spend based on situations and challenges will enhance effectivity of strategies and tactics for tail spend: a research model

In this paper, it will be researched what homogenous groups do exist within the tail spend of an organization. Moreover, existing theories will be assigned to these homogeneous groups, because it can be theorized that strategies or tactics will be more effective when they are used for specific groups of needs or suppliers. Therefore, a research model is made, which can be seen in Figure 7. The research model consists of three focus areas: purchasing situations, challenges and solutions. The first focus area (purchasing situations) is meant to categorize spend in general. And may help procurement professionals to structure tail spend and to assign specific strategies or tactics to the purchasing situations. The second focus area (challenges) is aimed on tail spend. Abdollahnejadbarough et al. (2020, p. 197) argue that challenges for tail spend are: uncoordinated purchasing, high price per unit, and maverick buying. Subsequently, the challenges can be assigned to a specific dimension for purchasing situations. The last focus area (solutions) is also aimed at tail spend. An example: when there are many suppliers delivering the same product to a company, the challenge of uncoordinated purchasing may occur. In order to cope with this challenge, the buying organization might aim for catalogues, so purchasing can be done in a coordinated way. It can be argued that it is highly important for organizations to pay attention to the management of categories in terms of tailored processes (Ateş, van Raaij, & Wynstra, 2018, p. 77). Therefore the research model is completed with 'solutions'.

Figure 7: Research Model of This Paper: Purchasing Situations Within Three Dimensions, Including Challenges and Solutions. (Own illustration)



The researched model is the basis for the theoretical framework, which will be the product of this research. Eventually, the theoretical framework will be a table with a wide range of purchasing situations. Next to that, each purchasing situation will have one or more challenges assigned. Finally, solutions for these challenges will be presented in the theoretical framework as well. In this way, tail spend will become better manageable for organizations.

Summarizing, in this paper, a research model is used, which is based on theory. The model consists of three main categories: purchasing situations, challenges, and solutions. The research model will be used for the development of a theoretical framework and as a guidance for the outcomes based on the data that is gathered during this research.

### 3. Qualitative research combined with existing theory will lead to more developed tail spend management

#### 3.1 The literature review approach consists of three searching methods: keyword search, journal search, and snowballing

In order to find relevant literature on the topic of tail spend and sourcing in general, a systematic literature review is executed. The systematic literature review consists of three methods. Firstly, relevant articles have been searched for on Scopus. Secondly, the most recent articles of relevant journals for purchasing have been searched for. Thirdly, the snowballing effect is used to find more relevant articles for this research. The systematic literature review resulted in a total of 45 relevant articles for this research, without duplicates, ranging from the year 2000 to the present. The choice for articles ranging from the year 2000 till present can be explained by the extent to which articles are still relevant. In order to find relevant articles, the articles from before the year 2000 have been excluded. The systematic literature review is worked out by searching for specific keywords in the title, abstract and keywords of articles on both Scopus, as well as on four journals which are relevant for purchasing. First of all, there has been searched for seven keywords on Scopus: tail spend, low spend, low value items, routine items, project procurement, spot procurement and service procurement. Next, the initial hits have been filtered on three relevant subject areas; (1) business, management and accounting, (2) decision sciences and (3) economics, econometrics and finance. After that, articles released before the year 2000 have been excluded. From a total of 2.426 initial hits on Scopus, 47 articles have been marked as relevant for this research. In Appendix A, the results of the systematic literature review on Scopus are illustrated. Secondly, four relevant scientific journals have been searched for literature on the topic of tail spend, sourcing, and service sourcing. Volumes of the year 2016 until 2021 have been searched. From a total of 868 articles from four relevant journals, eleven articles have been marked as relevant for this research. The results can be seen in Table 2. The reason for searching these four relevant journals for articles related to the topic of tail spend, sourcing and service sourcing is because of the vast number of articles that these four journals have published from 2016 until 2021, which gave enough opportunity to find these relevant articles. On top of that, a third way of finding relevant articles is used; snowballing. During the reading of the articles, new articles that can be used as a source for this research, are found in the references.

*Table 2: Results of Systemic Literature Review of Relevant Journals.*

JOURNAL	ARTICLES 2016-2021	RELEVANT AND ACCESSIBLE ARTICLES BASED ON TITLE AND ABSTRACT
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<b>JOURNAL OF PURCHASING AND SUPPLY MANAGEMENT</b>	192	4
<b>INTERNATIONAL JOURNAL OF PROCUREMENT MANAGEMENT</b>	204	5
<b>JOURNAL OF OPERATIONS AND PRODUCTION MANAGEMENT</b>	403	0
<b>INTERNATIONAL JOURNAL OF INTEGRATED SUPPLY MANAGEMENT</b>	69	2

### 3.2 Interviewing procurement professionals, working in seven different industries, will lead to a theoretical framework for tail spend management

In order to answer the three sub questions and thereafter the main question of this research, a qualitative research approach is executed. First of all, the data is gathered from electronic sources like existing literature accessible via Scopus, and via interviews with twelve procurement professionals, e.g., procurement consultants, territory buyers, and procurement managers. Next to that, the interviews are analysed with the use of coding. Finally, the research method is both valid and reliable. In this chapter, it will be clarified extensively how each question is answered, in what way data is collected, with which methods data is analysed, why the research methods are justified and how the validity and reliability is accounted for.

#### **The main question is answered based on the outcomes of the sub-questions, which are based on qualitative research and scientific literature**

This paper aimed to derive a theoretical framework for the categorization of tail spend into different purchasing situations, the challenges and problems that arise with each of the purchasing situations, and the solutions that can solve the problems of purchasing situations and make it less challenging. This research's aim is reached by answering three sub-questions and the main question. The main question of this research combines tail spend management together with categorization of spend, into homogeneous purchasing situations. In order to give an answer on the main question, it is interesting to know what purchasing situations do exist. The existing purchasing situations can help categorizing tail spend. Also, the challenges, as well as the solutions for tail spend come in handy for the development of a theoretical framework for the management of tail spend.

The first question is answered by looking at existing literature in the area of spend categorization. Further, the purchasing situations derived from the literature, are being validated by interviewing procurement professionals working for organizations in seven different industries, based in three countries in Europe. The interviews that are held, are semi-structured interviews, which have to lead to a stronger framework of purchasing situations. The semi-structured approach will cause the interview to reach a certain depth, which is useful for interviews with specialists. Eventually, the answer on the first sub-question must lead to a mutually exclusive and collectively exhaustive set of purchasing situations. Secondly, the challenges for tail spend will be researched in the same way as the purchasing situations. This question is related to 'challenges' in the research model of Figure 7. The existing literature about purchasing situations is used to find challenges and problems, which exist for purchasing situations. Eventually, the interviews lead to challenges and



problems that are faced in practice. Also, the challenges and problems that are found in literature, are validated in the interviews. The final sub-question concerns the solutions for tail spend, and is answered with the data from the interviews as well. The question is related to ‘solutions’ in the research model in Figure 7. Next to that, the existing literature is used to look for solutions that can take away or partially solve the challenges for tail spend.

### **Data is collected with half-structured, in-depth interviews**

In order to make a theoretical framework, it is necessary to gather qualitative data through interviews, because researching purchasing situations in general is somewhat explorative. Also, challenges and solutions for tail spend is no studied much yet. Therefore, the choice for qualitative research in the form of half-structured, in depth interviews is justified. Futhermore, quantitative data is more suitable for testing such the product of this research: a theoretical framework. Therefore, a quantitative study would be suitable as a next step, to test the insights of this study, and to make it more concrete. Nonetheless, the qualitative data, gathered in interviews with several specialists in the area of purchasing, is useful for this research’s purpose: designing a theoretical framework. First of all, a model will be made up from existing theory. Secondly, the model will be validated and extended with the use of the interviews. In that way, both theory and practice are used, which will lead to a pragmatic theoretical contribution. The interview protocol is located in Appendix B. The interview protocol is formulated as follows. First, the respondent given background information on the goal of this research and on some highlights from literature. Second, the respondent is asked about purchasing situations and his definition of ‘purchasing situation’. Also, a question about familiarity with dimensions for purchasing situations is asked. Since this can be perceived as ‘vague’, a brief description of the dimensions for purchasing situations from literature is given. Next, the respondent is asked about the challenges he knows for tail spend. Finally, a question about the solutions for the challenges for tail spend is asked. All in all, the interview questions are in line with the research model in Figure 7. The transcriptions of the interviews can be found in Appendix C. Lastly, the respondents of the interviews are categorized by function, industry and country, which is made visible in Table 3.

*Table 3: Overview of Interviewees’ Organizations’ Functions, Industries and Countries.*

#	Function	Industry	Country
1	Procurement manager	Transportation	Netherlands
2	Territory buyer UK + Ireland	Plastics Industry	United

3	Senior procurement specialist	Pharmaceutical industry	Netherlands
4	Category manager indirect	Plastics Industry	Netherlands
5	Procurement manager EMEA	Plastics Industry	Netherlands
6	Territory buyer France	Plastics Industry	France
7	Strategic territory buyer Benelux + Scandinavia	Plastics Industry	Netherlands
8	Business developer	Procurement consultancy	Netherlands
9	Purchasing coordinator	Municipalities	Netherlands
10	Senior procurement officer	Pension fund	Netherlands
11	Category manager corporate services	Automotive industry	Netherlands
12	Procurement consultant	Procurement consultancy	Netherlands

### **Analysing data is done with coding**

The data is gathered with interviews (Appendix B). However, to make it generalizable, the interviews are coded. Firstly, the interviews are transcribed. Secondly, the interviews are codes in three phases: open coding, axial coding and selective coding. According to Locke, Feldman, and Golden-Biddle (2020) coding is not a fixed path, but instead is a process of iteration. The steps in coding can differ among studies, and the purpose of coding is not the same for each study as well. The first part of coding, open coding, is done without looking at prior literature. However, four themes are kept in mind during the open coding part: (1) purchasing situations, (2) challenges, (3) solutions and (4) dimensions. After that, during the axial coding part, the codes are consolidated into sub-categories. The results of axial coding can be found in chapter 4, results. Finally, the selective coding part can be found in chapter 4 as well. In this phase, the connection between the sub-categories is shown, by putting them in context.

### **Reliability and validity are accounted for**

Reliability for in-depth interviews is, however, always point of discussion. Since interviewees give answers based on their own experience, knowledge and beliefs, the data is more or less subjective. On the other hand, questioning twelve procurement professionals individually makes the outcome more robust. On top of that, this study is based on interviews with various purchasing professionals, as can be seen in Table 3. Purchasing professionals ranging from three different

countries, working in seven different industries, having backgrounds in private, as well as public organizations and fulfilling different functions, like: territory buyer, strategic buyer, consultant, and manager. The choice for purchasers from different industries can be explained by the type of purchasing that differs among industries. First of all, manufacturing organizations do purchase raw materials. Whereas service oriented organizations do not purchase raw materials at all. Instead, service oriented organizations do hire consultants or office space. Secondly, private organizations do not have to take into account the regulations for public organizations, who face other challenges for tail spend. In this way, all interviews will together account for a valid, and reliable study. However, when executing the interviews with other purchasing professionals, the results may differ slightly. On the other hand, no big differences in the results will be noticeable. Next to that, the results of this study are valid and accurate. The interviews are held with the right persons; practical as well as theoretical professionals and employees as well as managers all have knowledge about this topic. The half-structured, depth interviews have led to valid results.

#### 4. Results: impacting tail spend management with a theoretical framework, which exposes the connections between themes for purchasing situations, challenges for tail spend, and solutions for tail spend

The results of this study are divided into four chapters, whereas the first three chapters represent one of the focus areas, which are also part of the research model: (1) purchasing situations, (2) challenges for tail spend, and (3) solutions for tail spend. The last chapter summarizes the results into a theoretical framework, which can be used for managing tail spend. Note that the first focus area (purchasing situations) is a combination of the codes for (1) purchasing situations, and (2) dimensions for purchasing situations. To present the results for the focus areas, the main findings are listed and a cross case table is included to visualize the relevant answers of the interviews. The last chapter discusses the relations between the focus areas, and combines the focus areas into one theoretical framework. In brief, eight themes have been found for purchasing situations, of which seven have a connection with a challenge for tail spend. After that, six themes are found for the challenges for tail spend. Next to the seven connections with purchasing situation, nine connections with themes of solutions for tail spend are discovered. All themes and their respective connections are shown in the theoretical framework, which is more extensive than the research model of this study. Nevertheless, in terms of layout there have been no large adjustments in comparison with the research model of this study.

#### 4.1 Spend can be divided in purchasing situations related to the need, buyer, supplier, market, quality, risk, and strategy

Based on the answers that are given by respondents during the interviews, the themes for purchasing situations are related to: supplier, needs, buying organization, risk, strategy, market situation, and quality. In Table 8 the themes can be seen on the Y-axis, next to the codes which have led to the respective theme. On the X-axis the interviewees are shown, divided per industry. The black dots (values) in the figure point out that an interviewees' quotation is connected to the code on the Y-axis. For example, interviewee 9 – who works for the government – mentioned during the interview that purchasing is "...the power of the buying party against the selling party.". This quotation is coded as 'Bargaining power buyer vs. supplier', which is part of the 'Market'-theme. With five out of eleven, 'Level of spend', 'Type of supplier relationship', and 'Negotiating with supplier' are the codes – representing purchasing situations – with the most citations from

Table 4: Cross Case Table of Focus Area 'Purchasing Situations'.

		Plastics					Consultancy		Transport	Pharma	Government	Paralel fund	Automotive	Density
		2	4	5	6	7	8	12	1	3	9	10	11	
Need	Level of spend				•	•	•		•	•	•	•		5
	Specified needs	•						•	•	•*		•		4
	Type of need							•	•		•			4
	Frequency of purchase							•	•		•			4
	Complex buy				•			•			•		•	4
	Investigating specs of need				•			•		•			•	3
	Direct purchase	•						•						2
	Recurring need								•					2
	New product development	•				•								2
	New product	•												1
Value of need									•				1	
Buyer	Type of buying organization			•*		•		•						3
	Interact with supplier outside proc.*		•								•			2
	Knowing what to buy	•												1
	Maverick buying												•	1
	Looking for a supplier	•												1
Contracted spend							•					•	2	
Supplier	Type of supplier relationship	•*	•	•				•		•				5
	Negotiating with supplier	•	•	•	•			•		•				5
	New supplier	•				•					•			4
	Monitoring supplier's performance		•					•			•			3
	Availability in supplier catalogue				•			•						3
	Supplier's geographical location					•		•						3
	Type of agreement with supplier							•		•		•		2
	Certified supplier	•							•					2
	Supplier selection				•	•								2
	Managed supplier							•					•	2
Market	Availability of product	•						•	•				•	4
	Competition in market						•*				•			2
	Bargaining power buyer vs. supplier							•			•*			1
Quality	Dependency on quality						•	•	•*					3
	Type of quality								•					1
Risk(/supplier)	No agreement with supplier				•			•	•		•			4
	Level of risk							•		•				3
	Dependency on supplier							•	•		•			2
	Non-managed supplier								•				•	2
	Supplier's reliability								•	•*				1
Strategy	Long term focus		•				•	•						3
	Partnership with supplier			•*					•		•			3
	Important supplier		•						•					2

different interviews.

Note. \* Procurement department

Followed by six codes with four citations from different interviews: 'Type of need', 'Specified needs', 'Frequency of purchase', 'New supplier', 'Availability of product', and 'No agreement with supplier'.

To give an understanding of Figure 8, and to elaborate on the findings, an example is given for every theme of the first focus area: purchasing situations. The underlying quotations of interviewees that are used in this chapter are marked with an asterix(\*) in the cross case table in Figure 7. First, the theme 'Need' consists of the code 'Specified needs' which is based on the following citation: "One maintenance guy could say 'I want to use a tacker from De Walt'. Another guy could say 'no, it should be Makita', and other guys say "no I work with Hitachi", another one Panasonic. So before you know it, you have five different suppliers of tools that could have been just one." (interviewee 3). Second, interviewee 5 mentioned "No, I think it depends again on the type of company that you're in. As I said, if you produce a ... car, then you will find yourself with a lot of problems because a car is made of a lot of parts. But if you're a company that's making footballs, then you don't have a lot of components there. You can easily get a grip on tail spend, if there is any. So it depends on the company. Not so much the size, but the type of products that are made." This quotation is coded as 'Type of buying organization', which is part of the 'Buyer'-theme. Third, the theme 'Supplier' is, among others, based on the code 'Type of supplier relationship', which in fact is summarizing the quotation of interviewee 2: "And there's ... the relationship, just not there with those sort (tail spend) of suppliers." Next, the code 'Competition in market' is part of the theme 'Market', and can be explain with the following quotation: "The volume you're speaking about ... in relation to the vendors who are able to serve that need." (interviewee 8). Further, the theme 'Quality' consists of the code 'Dependency on quality', which is based on the following citation: "The supplier must be compliant with our demands regarding quality." (interviewee 1). Another code 'Supplier's reliability' is being part of the theme 'Risk', and is explained by interviewee 3: "So do you have a reliable supplier that is delivering on time on full with the right quality you know? Or do you have a not so reliable partner having sometimes delivering under what was agreed or delivering a lower part of quality that we cannot accept?" Finally, interviewee 5 mentioned: "...it's done on the basis of ... a bond with the supplier." This quotation is coded as 'Partnership with supplier', and is part of the theme 'Strategy'. Summarizing, for purchasing situations there have been found eight themes, which are each based on several codes and quotations.

Summarizing, purchasing situations are divided in seven themes based on interviews: need, buyer, supplier, market, quality, risk, and strategy. During the interviews, most of the respondents

mentioned something about the type of supplier relationship and negotiating with a supplier. Followed by 'type of need', 'specified needs', 'new supplier', 'availability', and 'no agreement'.

4.2 Categories for challenges for tail spend are: internal organization, contract management, uncertainty regarding tail spend, supplier, capacity, and invoicing

The challenges that were mentioned during the interviews can be categorised by: internal organization, contract management, uncertainty regarding tail spend, supplier, capacity, and invoicing. With ten out of eleven, ‘Lack of interest for tackling tail spend’ is the recurring topic – representing challenges for tail spend – with the most underlying quotations from different interviews. Followed by ‘Conflicting interests’ (9), ‘Purchasing outside procurement department’ (8), ‘Process around tail spend’ (7), and three codes with six quotations from different interviews: ‘Lack of communication’, ‘Monitoring tail spend suppliers’, and ‘Ineffective contract management’.

Table 5: Cross Case Table of Focus Area 'Challenges for Tail Spend'.

		Plastics					Consultancy		Transport	Pharma	Government	Pension fund	Automotive	Density
		2	4	5	6	7	8	12	1	3	9	10	11	
Internal organization	Lack of interest for tail spend	•	•	•		•	•	•	•	•*	•	•	•	10
	Conflicting interests	•			•	•	•	•	•	•	•	•	•	9
	Purchasing outside proc.*					•	•	•	•	•	•	•	•	8
	Process around tail spend		•		•	•	•	•					•	7
	Lack of communication	•	•		•	•	•	•				•		6
	Monitoring tail spend suppliers	•	•	•		•	•	•				•		6
	Lack of focus on low spend					•	•	•		•				5
	Knowledge on tail spend		•	•		•		•			•			5
	Importance of proc.* unknown							•	•		•			3
	No central buying org.						•	•	•		•			3
	No management support			•			•	•			•			3
	Reactive tackling of tail spend		•			•				•				3
	Supplier relationship outside proc.*	•								•			•	3
	Reluctance to change	•						•		•				3
	Adding supplier outside proc.*								•					1
	Reciprocity								•					1
Contract management	Ineffective contract management		•			•	•	•			•	•*		6
	No agreement with supplier				•		•	•			•	•		4
	No overview supply base	•	•			•		•					•	4
	Setting up account for supplier	•							•		•	•		4
	No central buying org.						•		•	•				3
	Organizing supplier references					•		•						3
	Supplier relationship outside proc.*	•							•				•	3
	No preferred payment terms	•*										•		2
No relationship with supplier					•								1	
Uncertainty regarding tail spend	No agreement with supplier				•		•	•			•			4
	No overview supply base	•	•			•		•				•		4
	Insights on volume of tail spend			•			•	•						3
	Quality of information	•	•					•						3
Supplier	Uncertain ROI for tail spend			•*				•						2
	Supplier not willing to invest	•			•	•								3
	No preferred payment terms	•									•			2
Capacity	No relationship with supplier					•								1
	Capacity within proc.*		•*			•		•	•					4
Invoicing	Filling supplier data OTB**							•			•	•		3
	Expensive invoicing process						•			•	•*	•		4

Note. \* Procurement department

\*\* One Time Buy

To give an understanding of the figure above, and to elaborate on the findings, an example is given for every theme of the second focus area: challenges for tail spend. The underlying quotations of interviewees that are used in this chapter are marked with an asterisk(\*) in the cross case table in



Figure 9. To start, interviewee 3 stated: “Because if a company doesn't see the problem, then they probably make enough margin to not care about tail end spend right? So at a certain point I also tried to address and be aggressive on tail end spend. But I saw that the organization didn't see the needs to address it. So then you're pulling a dead horse as Dutch people would say. So you might want to watch out for that.” The recurring topic for this quotation is ‘Lack of interest for tackling tail spend’, which is part of the theme ‘Internal organization’. Secondly, the theme ‘Contract management’ consists of the code ‘Ineffective contract management’. One of the quotations that explains the code is: “People buy outside of the contracts I agree upon with parties. So that becomes tail spend.” (interviewee 10). Thirdly, interviewee 5 mentioned that one of the challenges for tail spend is “...putting efforts into a problem that you don't know how big it is. If you put too much effort in it and you find out that the problem was not that big.” This quotation is coded as ‘Uncertain ROI for tail spend’, which is part of the theme ‘Uncertainty regarding tail spend’. Another theme for challenges for tail spend is ‘Supplier’. One of the codes for ‘Supplier’ is ‘No preferred payment terms’, which is, among others, based on the following citation: “Payment terms aren't as good as if, you know, spending quite a lot of money with a supplier.” (interviewee 2). Next, ‘Capacity’ is found to be theme for challenges for tail spend. The code ‘Capacity within procurement department’ is part of the ‘Capacity’-theme, and the recurring topic for quotations like: “We don't have the capacity to manage all suppliers.” (interviewee 4). Lastly, interviewee 9 stated “...that's a large number of very low invoices...and that an invoice is costing €40.”. The quotation is being part of the code ‘Expensive invoicing process’, and eventually part of one of the themes for challenges for tail spend: ‘Invoicing’.

In brief, six challenges for tail spend have been distinguished based on the interviews: internal organization, contract management, uncertainty regarding tail spend, supplier, capacity and invoicing. The challenge which is mentioned by the most interviewees is ‘Lack of interest for tackling tail spend’. Next to that, ‘Conflicting interests’ within the internal organization, ‘Purchasing outside procurement department’, and the ‘Process around tail spend’ are often perceived as challenges for tail spend.

### 4.3 Solutions for tail spend are related to the internal organization, company regulations, supplier management, company strategy, software, outsourcing, contract management, business case, capacity, and defining tail spend

During the interviews respondents mentioned solutions which are categorised as: supplier management, internal processes, company regulations, company strategy, software, contract management, outsourcing, business case, capacity, and defining tail spend. With five out of eleven, ‘Enhancing internal communication’, ‘Volume bundling’, and ‘Outsourcing contract management’ are the codes – representing solutions for tail spend – with the most citations from different interviews. Followed by two codes with four citations from different interviews: ‘Involving internal

Table 6: Cross Case Table of Focus Area ‘Solutions for Tail Spend’.

		Plastics					Consultancy		Transport	Pharma	Government	Pension fund	Automotive	Density
		2	4	5	6	7	8	12	1	3	9	10	11	
Internal processes	Enhancing internal communication				•	•	•	•		•	•			5
	Involving internal stakeholders	•	•		•	•	•	•		•	•			4
	Improve tail spend process						•	•	•					4
	Define reimbursement categories								•	•		•		3
	Easily accessible catalogues						•	•		•		•	•*	3
	Spend discipline						•	•		•				2
	Digital invoicing system								•			•		2
	Avoid bypassing processes							•						1
	Completing supplier data								•					1
	Improve invoicing process	•								•				1
	Limited adding of new suppliers									•				1
	Standardizing needs	•												1
	Structured pricing via price list	•												1
Company regulations	Involving internal stakeholders	•	•		•						•			4
	Define reimbursement categories						•	•		•		•	•	3
	Easily accessible catalogues						•	•		•				3
	Spend discipline						•	•		•				2
	Only proc.* authorised to add supplier								•	•*				2
	Putting restrictions on purchasing								•	•				2
	Communicating contract management					•								1
	Having tech. & strat. buyers													1
	Limited adding of new suppliers								•					1
	Standardizing needs	•												1
Supplier management	Volume bundling	•	•		•	•			•			•		5
	Manage individual suppliers		•						•	•				3
	Manage one product group at the time		•					•						3
	Manage product groups		•						•					2
	Registering supplier selections		•										•	2
	Understand why tail spend exists					•		•						2
	Adding alternatives to supply base	•												1
	Completing supplier data								•					1
	Monitoring spend								•					1
	Partnerships with suppliers				•									1
	Rationalizing suppliers	•												1
	Unique references for suppliers									•				1
	Using preferred supplier's relationship	•*												1
	Using wholesale companies									•				1
Company strategy	Aligning activities with strategy					•*								1
	Develop strategy on tail spend		•											1
	Exemplary management behavior							•						1
	Having procurement strategy					•								1
	Holistic approach on spend									•				1
	Management acknowledging problem									•				1
	Top down approach									•				1
Software	Easily accessible catalogues						•	•				•		3
	Digital invoicing system								•		•			2
	Monitoring spend							•						1
	P2P software								•*					1
	Registering needs - software												•	1
	Reporting tool for added supplier								•					1
	Structured pricing via price list	•												1
Outsourcing	Contract management				•			•		•	•*	•	•	5
	Invoicing process							•			•*	•	•	3
	Managing product groups							•		•	•*	•	•	3
	Tail spend management							•		•	•*	•	•	3
Contract management	Volume bundling	•	•		•	•			•			•		5
	Registering supplier selections		•*			•								2
	Communicating contract management					•								1
	Understand needs of organization					•								1
Business case	Provide insights on cost savings			•			•	•*						3
	Research ROI for tail spend								•					1
Capacity	Improve capacity for proc.*					•								1
Define tail spend	Distinguish (non-) compliant tail spend						•*							1

Note. \* Procurement department

stakeholders', and 'Improve tail spend'. Next to that, eight codes do have three underlying citations from different interviews: 'Define reimbursement categories', 'Easily accessible catalogues', 'Manage individual suppliers', 'Manage one product group at the time', 'Software for invoicing process', 'Outsource the management of product groups', 'Outsource tail spend management', and 'Provide insights on potential cost savings'.

To give an understanding of the figure above, and to elaborate on the findings, an example is given for every theme of the third focus area: solutions for tail spend. The underlying quotations of interviewees that are used in this chapter are marked with an asterix(\*) in the cross case table in Figure 10. First of all, interviewee 11 stated: "...make punch out catalogues, that people can easily find the articles they need, categorized by their definition." 'Easily accessible catalogues' is the recurring topic for this quotation, and is part of the theme 'Internal processes'. Second, the theme of solutions for tail spend 'Company regulations' consists of the code 'Only procurement department authorised to add supplier', which is based on the citation of interviewee 3: "In (organization) it is defined: only procurement can make commercial decisions about the supply chain. No other person within (organization) can select a supplier." Third, the code 'Using preferred supplier's relationship' is part of the theme 'Supplier management', and is the recurring topic for the following quotation: "...they (preferred supplier) may already deal with that supplier, so it may be that they spend hundreds of thousands of euros with them, and we spend €500...they may have a better relationship with that supplier." (interviewee 2). The relationship of this organization's preferred supplier with its respective tail spend supplier is used to eliminate tail spend (interviewee 3) Next, interviewee 7 mentioned that "...the spend should be aligned to your overall strategy, mission and vision. That is very important, that procurement is fully aligned. Then we are talking about all spend in fact." The recurring topic for this citation is 'Aligning activities with strategy', which is part of the 'Company strategy'-theme of solutions for tail spend. Another theme of solutions for tail spend is 'Software', where one of the codes is 'Purchase2Pay software', which is the recurring topic for the following quotation: "Financial settlement, contract management and supplier management, linked in one system." (interviewee 1). Further, outsourcing 'Outsourcing contract management' and 'Outsourcing invoicing' – both part of the 'Outsourcing'-theme – are the recurring topics for the following citation: "We try to profit from their volume...they handle the invoicing, they handle the contracting with every specific individual location." (interviewee 10). Moving on, 'Contract management' is a theme of solutions for tail spend, consisting of codes like 'Registering supplier selections', which is based on a quotation from interview 4: "...to have a really solid argument to choose for suppliers. That's really backed up and that's saved and we can

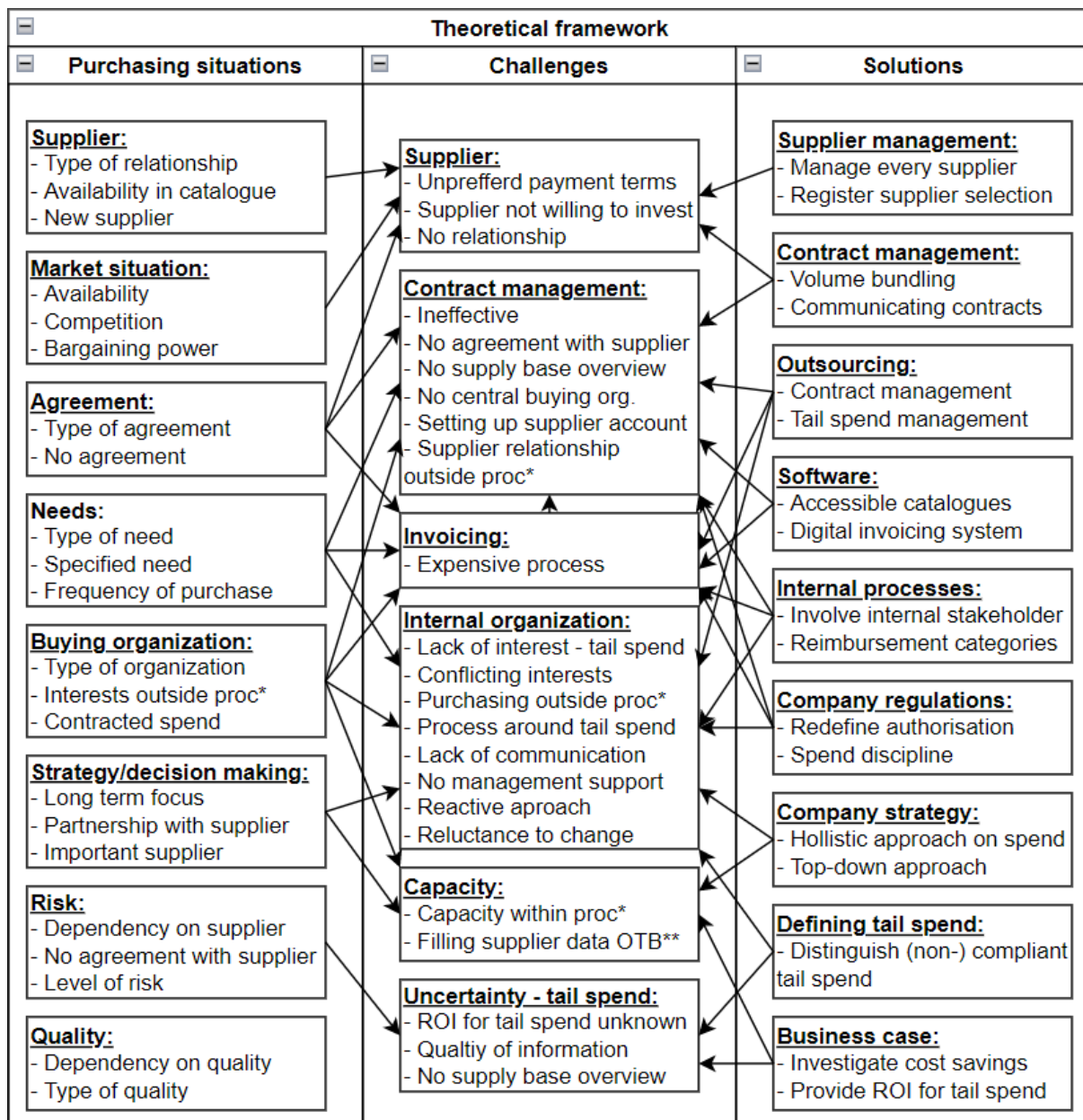
look at it at a later stage. Uh, that's not done for the tail spend and that can be a solution” Subsequently, one of the themes of solutions for tail spend is ‘Business case’, consisting of the code ‘Provide insights on cost savings’. This is the recurring topic for a citation of interviewee 12: “...to convert the process improvements and the processes into euros, because that is what a management team looks at.” Finally, interviewee 8 mentioned that “...you have to discuss with the internal organization to organize the why. And then those are, I would say, the limits of the organization. That's the thing you have to accept and organize. I'm sure that in many organizations the amount of suppliers in tail spend exceeds that (limit). And that's the thing to fight.” This quotation’s recurring topic is ‘Distinguish (non-)compliant tail spend’, which is part of the theme ‘Define tail spend’.

To conclude, solutions for tail spend are categorized by nine themes: internal processes, company regulations, supplier management, company strategy, software, outsourcing, contract management, business case, capacity, and defining tail spend.

#### 4.4 A theoretical framework connects purchasing situations with challenges and solutions for tail spend for a better management thereof

This chapter is meant to summarize the findings of the previous three chapters into one theoretical framework. Next to that, the connections between the themes within the framework are discussed. When combining the coded themes for all three focus areas – purchasing situations, challenges for tail spend and solutions for tail spend – it results in the theoretical framework which is visible in Figure 11. Note that the category for purchasing situations and respectively the category for dimensions for purchasing situations have been combined. Despite the fact that the themes are based on different question, and the two categories have been coded apart from each

Figure 8: Theoretical Framework for Managing Tail Spend. (Own illustration)



other, both categories' themes are in fact dimensions for purchasing situations. The theoretical framework is explained in the next sub-paragraph.

First of all, the theoretical framework in Figure 11 is build from three focus areas: (1) dimensions for purchasing situations, (2) challenges for tail spend, and (3) solutions for tail spend. Secondly, the lines that, on the one hand, combine dimensions with challenges, and, on the other hand, challenges with solutions, are meant to show the connection between two themes of different main categories. Therefore, the connection between themes of the same category is not shown. Thirdly, the themes are based on underlying codes, which make the model more concrete. The most common underlying codes are shown per theme. The full list of underlying codes can be seen in the cross case tables in each of the three previous chapters. Finally, some themes are not connected with any other theme. This means that a theme has no connection with one of the other themes. However, the theme is mentioned because it is the result of the coding, and thereby part of the theoretical framework.

In the theoretical framework, some of the themes are part of two main categories: supplier and contract management. Next to that, some themes are closely related to themes of other main categories. For example, buying organization is closely related to internal organization, agreement is closely related to contract management and internal organization is closely related to internal processes. Moreover, some themes are closely related within main categories. For example, company regulations are closely related to internal processes. A total of fourteen connections exist for the themes of purchasing situations with challenges for tail spend. These connections and their underlying codes and quotations can be found in Appendix D. Whereas, the themes of challenges for tail spend and solutions for tail spend accounted for twenty connections. Those connections and their underlying codes and quotations can be seen in Appendix E.

A comparison between the theoretical framework in Figure 11 and the research model in Figure 7 learns that the literature differs from what is found during the interviews with twelve procurement professionals. Whereas based on literature only three dimensions for purchasing situations were distinguished, eight dimensions for purchasing situations have been themed based on interviews. The three dimensions for purchasing situations from literature have been found in the interviews as well. The five newly found dimensions are: (1) market situation, (2) agreement, (3) strategy/decision making, (4) risk, and (5) quality. For challenges for tail spend, three specific challenges are mentioned in the research model in Figure 7. In contrast to Figure 7, in Figure 11 six themed dimensions of challenges for tail spend are shown. So, instead of three specific

challenges, six themes of challenges are included in the theoretical framework. The same goes for solutions for tail spend. In first instance, three specific solutions for tail spend are found in existing literature. However, during the interviews nine themes of solutions for tail spend are discovered. Considering the differences for each of the three focus areas, it can be said that the model based on this research differs from what is been found in existing literature.

The theoretical framework in Figure 11 does not visualize concrete advice on how to manage tail spend. However, the underlying codes and quotations can guide organizations with regards to their tail spend. The practical implications of Figure 11 are discussed in chapter 5.2. In this paragraph a few connections will be highlighted and explained with the use of their respective code and quotation. For the full list of connections, Appendix D and Appendix E can be consulted. First of all, the connection between the themes of dimensions for purchasing situations and the themes of challenges for tail spend is emphasized. For example, row four – agreement with contract management – explains that the code ‘ineffective contract management’, which is a recurring topic for quotations like “people buy outside contracts I agree upon with parties. So that becomes tail spend.”. Therefore, purchasing situations related to the agreement are connected with challenges related to contract management. Another case, row eleven, shows that ‘capacity within the procurement department’ is a recurring challenge for tail spend. Interviewee 4 stated “We don’t have the capacity to manage all suppliers.”, this explains the connection between the themes ‘buying organization’ and ‘capacity’.

Secondly, the connection between the themes of challenges for tail spend and solutions for tail spend is explained. For example, in row six the connection between on the one hand ‘contract management’ and on the other hand ‘software’ is explained by the code ‘Purchase2Pay software’, which is the recurring topic for the quotation “Financial settlement, contract management and supplier management, linked in one system.”. Secondly, in row fifteen the connection between ‘internal organization’ and ‘defining tail spend’ can be found. This connection is emphasized by the code ‘divide tail spend in compliant and non-compliant tail spend’. This code is the recurring topic for the quotation “Understand the why. Accept it to a certain extent. I think maybe there is like a conflict. And the question is, where is tail spend non compliant? Because you will have like compliant tail spend, which is OK, and non compliant.” Moreover, the code about compliant and non-compliant tail spend gives a partial answer on the question about the definition of tail spend. Despite the proposition that tail spend is not the same for each organization, every organization can, in fact, divide its tail spend in compliant and non-compliant tail spend.

Tail spend management can be given an impulse by using the theoretical framework in Figure 11, which exposes the connections between three main categories – purchasing situations, challenges for tail spend and solutions for tail spend. First of all, the themed purchasing situations are supplier, market situation, agreement, needs, buying organization, strategy/decision making, risk, and quality. Whereas quality did not show a connection with one of the themed challenges for tail spend. Secondly, the themed challenges for tail spend are supplier, contract management, invoicing, internal organization, capacity, and uncertainty regarding tail spend. Moreover, all challenges had both a connection with at least one theme for purchasing situations as well as at least one theme for solutions for tail spend. Finally, the themed solutions for tail spend are supplier management, contract management, outsourcing, software, internal processes, company regulations, company strategy, defining tail spend and business case. The next chapter will conclude on the three sub-questions and the main question of this research.



## 5. Discussion: tail spend can be managed considering purchasing situations, challenges and solutions

This research is focussed on improving tail spend management both in a theoretical as well as in a practical manner. By developing a theoretical framework with purchasing situations for more effective use of tactics and better tail spend management. In this section the results of this research are discussed. First of all, the sub-questions, as well as the main question are concluded on. Second, the managerial implications of this research will be discussed. After that, the limitation of this study are considered. Lastly, recommendation for future research are given. In short, Tail spend can be managed by using a theoretical framework, which can guide procurement professionals through characterization of spend, together with challenges and solutions for tail spend.

### 5.1 How tail spend can be managed effectively: in conclusion

This paragraph will conclude on the main question, which is to look for purchasing situations to manage tail spend. The answer on the main question will add new insights to tail spend management and will give procurement managers the opportunity to improve the tail spend management for their organizations. First, the three focus areas – purchasing situations, challenges for tail spend and solutions for tail spend will be summarized.

The expected three dimensions for purchasing situations are all part of the theoretical framework, which is the product of this research. However, these three dimensions are accompanied by six other dimensions for purchasing situations: market situation, agreement, risk, strategy/decision making, and quality. Therefore, the expectation was not wrong, but was incomplete.

Based on the results of this research, it can be said that tail spend can be split into separate purchasing situations. However, the results do not show that the purchasing situations are homogeneous. In fact, recurring purchasing situations for tail spend do say something about the challenges that can occur. The theoretical framework that is created, based on the interviews, visualizes what purchasing situations can lead to which challenges. Furthermore, the theoretical framework connects certain solutions to those challenges as well. It must be said that the theoretical framework for managing tail spend is strengthened by the underlying codes and quotations from the interviews. On the other hand, the theoretical framework in Figure 11 is mostly not the same as the research model of this paper, which is based on existing literature. It is clear that based on the interviews more dimensions of purchasing situations have been identified. Also, in contrast to Figure 11, the challenges and solutions for tail spend were more concrete and specific in the

research model in Figure 8. The theoretical framework in Figure 11 shows six themed challenges for tail spend and nine themed solutions for tail spend.

For example, ineffective contract management is a recurring topic in challenges for tail spend. The code is based on quotations from six different interviews, and therefore a well represented challenge. On top of that, Barrad et al. (2020, p. 74) argue that contract compliance is key to reduce cost. To solve the problem of ineffective contract management, several solutions have been mentioned during the interviews, which have resulted in the following recurring topics: easily accessible catalogues, communicating contract management, and only procurement department authorised to add supplier. Next to that, in their study Barrad et al. (2020, p. 74) state that organizations can detect their incompliance regarding contract management by looking for patterns when cross correlating data of contracts with data of invoices.

Another example of a solution for tail spend is 'Defining reimbursement categories'. In several interviews, respondents mentioned product categories like travel, presents and company diners, for which they argued that those transactions would be suitable for reimbursement. In that way, the supplier would not need to be added to the supply base. That is beneficial, because filling supplier data for one time buys is perceived as a challenge based on the interviews. Next to that, the transaction will not load the invoice process, which is also beneficial, because the invoicing processes seems to be a challenge for tail spend, based on the interviews. Moreover, marking suitable categories for reimbursement can be seen as maximizing a product categories' performance according to Ateş et al. (2018, p. 77).

Next to that, based on both theory and practice, it can be said that tail spend differs for every organization. In one interview it was mentioned that an organization did not face any non-managed spend at all (interviewee 3). On the other hand, interviewee 4 stated that his organization did not have the capacity to managed all spend. However, managing tail spend can be done effectively by creating the right conditions for a buying organization. For example, by aligning tail spend management with strategy (interviewee 7), and by putting the right company regulations in place for tail spend management (interviewee 1, 3, 7, 8, 10, 11, 12). Also, managing tail spend does not always have to be done within the buying organization itself. Outsourcing of certain parts is one of the solutions for challenges like capacity within the procurement department. Outsourcing could comprise contract management, the invoicing process, certain product categories or even tail spend management as a whole (interviewee 3, 4, 6, 9, 10, 11, 12).

## 5.2 Organizations may consider to first focus on their head spend, whereafter the focus needs to be on the tail: managerial implications

The findings in this research can be beneficial for purchasers in every industry. Especially for purchasers who are new or moderately new to the topic of tail spend, this research can serve as the basis for tail spend management. In this paragraph, the most important, practical implications for organizations are summarized.

First of all, the theoretical framework in figure 11 can be used by procurement professionals for managing their organization's tail spend. Despite the model does not show concrete advice per situation, the model can have practical value for organizations when it is used together with the specific situation in Appendix D and E of this research. For example, an organization can find that they are struggling with contract management (challenge). In this case, figure 11 shows that solutions from four different themes can help overcoming this challenge: (1) contract management, (2) outsourcing, (3) software, and (4) internal processes. On top of that, in Appendix E concrete advice is stated for the connection between the challenge 'contract management' and the four solutions. According to Appendix E, organizations that are struggling with contract management should consider to communicate their contracts with the internal organization or to develop catalogues for specific product groups.

Secondly, the previous chapter made clear that solutions for tail spend are less based on the traditional seven purchasing levers. Instead, most tailored solutions for tail spend are much more actionable, e.g., outsourcing, software, and company regulations. On the other side, supplier management and internal processes, two of the themes of solutions for tail spend, are strongly related to the traditional seven purchasing levers, e.g., extension of the supply base, intensification of supplier relationship and process improvement.

Thirdly, procurement professionals can compare their tail spend with the themes for purchasing situations, the respective challenges for tail spend, which are connected to the situations, and eventually the tailor-made solutions for tail spend. This comparison will mark a starting point for the improvement of the organization's tail spend management. In other words, procurement professionals can use the theoretical framework provided in this research to discover the steps they need to take to lift their tail spend management to a higher level. For example, an organization which is not having management support for tail spend management (interviewee 4, 8, 12), is better off by aligning tail spend management with company or procurement strategy (interviewee 4, 7) or by putting in place exemplary management behaviour (interviewee 12). On the other hand, if there is lack of capacity within the procurement department (interviewee 1, 3, 4, 7), or the organization

is having an expensive invoicing process (interviewee 8, 9, 10, 11), it might be interesting to implement software solutions (interviewee 1, 2, 8 10, 11, 12).

### 5.3 Limitations of this research and future research: mutual exclusivity together with collective exhaustiveness, and sequence for solutions can enhance tail spend management

First of all, it is tried to make the theoretical framework mutually exclusive and collectively exhaustive. For example, some themes within the theoretical framework have some overlap with 'buying organization', 'buyer', or 'internal processes'. Or the themes 'strategy' and 'buying organization', because the strategy is mostly developed by the buying organization. Therefore, the theoretical framework is not mutually exclusive. Also, despite the fact that the theoretical framework is based on the data collected during interviews of twelve purchasing professionals, working in seven different industries, at organizations based in three different countries, it might be the case that the theoretical framework does not cover all themes existing. Therefore, it can be said that the theoretical framework is not collectively exhausting all matter, and the content of the theoretical framework is not mutual exclusive. On the other hand, this is a possibility for the further development of the theoretical framework. First of al in terms of robustness, and secondly with regards to exhaustiveness. Also, it might be interesting to test the theoretical framework in practice, to discover more about the framework in its relation to practice. In other words, the framework can be developed with the use of more data, and the framework can be tested with the use of qualitative data.

Secondly, the research is not focussed on decision making for tail spend management. For example, there is no actual business case for tail spend management and the research does not point out what sequence must be put into practice for managing tail spend. Despite that the theoretical framework can be useful for organizations, the fact that there is no attention paid to the sequence of solutions, is a weakness of this research, and makes it less useful. To overcome this limitation, future research might become of interest when focussing on a maturity model for tail spend management. Questions related to sequence, and maturity of tail spend management can be answered for organizations. Also, tail spend management can be examined more objective, which will eventually lead to a healthier discussion of best practices for tail spend management. Another advantage of a maturity model for tail spend management is that organization who are on different levels of tail spend management can make use of it.

Thirdly, in contrast to the main question, the focus of the research is too much on solutions for tail spend, instead of the homogeneous purchasing situations. Nevertheless, purchasing situations are accounted for in both the research model, as well as in the theoretical framework. To elaborate more on solutions for tail spend, the theoretical framework can be used as an alternative for the traditional seven purchasing levers. However, the combination of, on the one hand, the seven

purchasing levers, and, on the other hand, the theoretical framework of this research, might lead to another interesting result. In other words, researchers might focus themselves on developing one framework for spend management in the future. This model also needs to be tested in practice, with, for example, qualitative data.

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## Appendix A: Results of systematic literature review on Scopus.

KEYWORDS	INITIAL HITS	HITS RELEVANT TO SUBJECT AREAS	LIMIT TO 2000-2021	ACCESSIBLE AND ASSESSED PAPERS	SEARCH KEY
<b>TAIL SPEND</b>	122	9	9	1	TITLE-ABS-KEY ( 'tail AND spend' ) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "DECI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) )
<b>LOW SPEND</b>	235	78	75	5	( TITLE-ABS-KEY ( 'low AND spend' ) AND TITLE-ABS-KEY ( sourcing OR procure* OR purchas* ) ) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) OR LIMIT-TO ( SUBJAREA , "DECI" ) )
<b>LOW VALUE ITEMS</b>	242	88	76	2	( TITLE-ABS-KEY ( 'low AND value AND items' ) AND TITLE-ABS-KEY ( sourcing OR procure* OR purchas* ) ) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "DECI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) )
<b>ROUTINE ITEMS</b>	87	19	15	2	( TITLE-ABS-KEY ( 'routine AND items' ) AND TITLE-ABS-KEY ( sourcing OR procure* OR purchas* ) ) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "DECI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) )
<b>PROJECT PROCUREMENT</b>	573	197	189	3	TITLE-ABS-KEY ( "project procure*" OR "project purchas*" OR "project sourc*" ) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "DECI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) )
<b>SPOT PROCUREMENT</b>	176	35	33	4	TITLE-ABS-KEY ( "spot procure*" OR "spot purchas*" OR "spot sourc*" ) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "DECI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) )

<b>SERVICE PROCURE MENT</b>	991	329	301	19	TITLE-ABS-KEY ( "service procure*" OR "service purchas*" OR "service sourc*" ) AND ( LIMIT-TO ( SUBJAREA , "BUSI" ) OR LIMIT-TO ( SUBJAREA , "ECON" ) OR LIMIT-TO ( SUBJAREA , "DECI" ) )
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## Appendix B: Questions for semi-structured interviews

### 1. Introduction

#### a. Explanation of research

- i. This research is focused on tail spend. Tail spend is a group of suppliers on which little is spent, relative to the total spend of an organization. Pareto's principle, or the 80/20 rule, states that 20% of a population is responsible for 80% of the phenomenon and vice versa. This rule, or principle, can also be applied to an organization's expenses; 20% of suppliers are responsible for 80% of expenditure. In general, organizations are focused on the first 20% of suppliers. Given the higher volume per supplier, it is easier to achieve a cost advantage in the first 20% of suppliers. However, companies can get a lot from the last 80% of the suppliers, who are still responsible for 20% of the spend. By managing this so-called tail spend, cost benefits can be achieved, and risks reduced. So far, little research has been done on tail spend. It is known that purchasing strategies and tactics become more effective if they are used in the right situation. Because tail spend is a heterogeneous group of suppliers, I research the different purchasing situations within tail spend, in order to distinguish between the large pool of suppliers that have to represent tail spend and thereby be able to better allocate strategies and tactics.

#### b. Purpose of interviews -> in-depth research

#### c. Usage of data (transcribing + coding)

#### d. Storage of data (OneDrive)

#### e. Discarding data (audio will be discarded after transcribing, transcripts will be discarded when finishing the Master Thesis)

#### f. Consent (on audio)

#### g. Who are you? What organization do you work for? What is your function? What is your connection with purchasing?

### 2. Explaining theoretical framework

#### - Defining purchasing situations:

- o Definition: A Purchasing situation relates to the circumstances surrounding a purchase that can be defined by the quality of information and experience that the buyer has concerning the products and vendors available, as well as the effort it will take to make the purchase decision.

Question	Follow-up
2.1 Are you familiar with purchasing situations?	- Which? - Why?
2.2 How would you define purchasing situations in general?	- Why? - What is important?
2.3 Are you familiar with different dimensions for purchasing situations?	- Can you name the dimensions you can think of?
2.4 What purchasing situations are common for tail spend?	- Why?
2.5 Can you think of any challenges regarding tail spend?	- Why is this a challenge? - What is the cause of this challenge? - What is the consequence of this challenge?

2.6 Can you think of any solutions for these challenges?	- Can you explain why this is a solution? - How can this solution be implemented? - Is it possible that there is no solution at all? - Why?
2.7 Do you have anything to add to this interview which might be relevant for this research?	- why is this relevant?
2.8 Can you make a top 3 list of purchasing situations/challenges/solutions, ranked by importance for tail spend?	- why are these included in the top 3 list? - (mini statistic)

3. Questions about specific purchasing situations (in case of silence)

Question	Follow-up
3.1 What purchasing situations can you name from within the supplier-dimension?	-explain the situation -explain the link to the dimension
3.2 What purchasing situations can you name from within the commodity-dimension?	-explain the situation -explain the link to the dimension
3.3 What purchasing situations can you name from within the buying organization-dimension?	-explain the situation -explain the link to the dimension

4. Questions about specific challenges (in case of silence)

Question	Follow-up
4.1 What challenges can you name for each of the purchasing situations you named within the supplier-dimension?	-explain the challenge -explain the link to the dimension
4.2 What challenges can you name for each of the purchasing situations you named within the commodity-dimension?	-explain the challenge -explain the link to the dimension
4.3 What challenges can you name for each of the purchasing situations you named within the buying organization-dimension?	-explain the challenge -explain the link to the dimension

5. Questions about specific solutions (in case of silence)

Question	Follow-up
5.1 What solutions can you think of for each of the challenges you came up with within the supplier-dimension?	-explain the solution -explain the link to the dimension
5.2 What solutions can you think of for each of the challenges you came up with within the commodity-dimension?	-explain the situation -explain the link to the dimension
5.3 What solutions can you think of for each of the challenges you came up with within the buying organization-dimension?	-explain the solution -explain the link to the dimension

## Appendix C: transcriptions of interviews

*Due to its size, Appendix C is included in an apart attachment of this research.*

## Appendix D: Connected themes of dimensions for purchasing situations and challenges for tail spend: explained by underlying codes and quotations

#	Connected theme (dimensions X challenges)	Code which explains connection	Example from interviews
1	supplier X supplier	Supplier not willing to invest in relationship.	"They won't jump through hoops for you to improve a delivery or anything like that."
2	market situation with supplier	Bargaining power buyer vs. supplier.	"Purchasing always is: what is the power of the buying party against the selling party."
3	agreement with supplier	No preferred payment terms.	"Payment terms aren't as good as if, you know, spending quite a lot of money with a supplier."
4	agreement with contract management	Ineffective contract management	"people buy outside of the contracts I agree upon with parties. So that becomes tail spend."
5	agreement with invoicing	Expensive invoicing process.	"But then again, for tail spend there are no conditions agreed upon that suppliers should be accepting digital invoicing."
6	needs with contract management	Relationship with tail spend suppliers outside of procurement.	"Because what often happened is we also have a technical department, right? And they want to pump for a machine and they want a nice tool to, you know. One maintenance guy could say 'I want to use a tacker from De Walt'. Another guy could say 'no, it should be Makita', and other guys say no I work with Hitachi, another one Panasonic. So before you know it, you have five different suppliers of tools that could have been just one."
7	needs with invoicing	Expensive invoicing process.	"So that's a large number of very low invoices. And we have a lot of people who order digitally. We have seen during the pandemic that our Bol.com spend is growing a lot. And we really don't want to buy at Bol.com, because it's not beneficial for our own suppliers in our own villages. But it is hard to tackle those things, because everyone has to realize that we have to buy locally and that an invoice is costing €40"
8	needs with internal organization	Conflicting interests between departments.	"What we see is of course, based on the fact that we have done 84 mergers and acquisitions, is that people are used to buy the things themselves. What they are doing is, they are looking mostly in the neighbourhood, or mostly with suppliers that they are acquainted with."
9	buying organization with contract management	Paperwork of setting up account for supplier.	"However, every single purchase for (organization) needs to be in the procurement system, and because of that they need to add a new vendor and adding a new vendor is not easy because you need their tax number. You need their location. You need to have all sorts of Chamber of Commerce or registration numbers and that kind of stuff."
10	buying organization with internal organization	Lack of interest for tackling tail spend.	"Because if a company doesn't see the problem, then they probably make enough margin to not care about tail end spend right? So at a certain point I also tried to address and be aggressive on tail end spend. But I saw that the organization didn't saw the needs to address it. So then you're pulling a dead horse as Dutch people would say. So you might want to watch out for that."
11	buying organization with capacity	Capacity within procurement department.	"We don't have the capacity to manage all suppliers."
12	risk with uncertainty regarding tail spend	Uncertainty about the return on investment regarding tail spend.	"It's like putting efforts into a problem that you don't know how big it is. If you put too much effort in it and you find out that the problem was not that big."
13	strategy/decision making with internal organization	Lack of focus on low spend volumes.	"So if there is no strategic plan, concerning procurement, in my opinion, that's always a major major problem."
14	strategy/decision making with capacity	Capacity within procurement department.	"So my assignment was: how can we tackle this tail end spend of say 10 or no, it was even more, €40 million. How can we tackle that tail end spend, but not hire a single person?"

## Appendix E: Connected themes of challenges for tail spend and solutions for tail spend: explained by underlying codes and quotations

#	Connected theme (challenges x solutions)	Code which explains connection	Example from interviews
1	supplier with supplier management	Using the relationship of your own preferred supplier.	"We may have a within our supply base. This, uh, somebody else that deals with that company already, so we could ask in the UK, for example, we we've done a lot of work with companies called Cromwell, and if we're talking engineering spares, so Cromwell and Eric's and we're quite. Good customers to them? Uh, and quite important, and they may already deal with that supplier, so it may be that they spend hundreds of thousands of euros with them and we spend €500 say we may be able to speak to our Excel cromolyn say, right? OK, we've got this product. Can you deal with it? We buy it from supplier A? Oh yes, we already know they may come back. Say yes, we already deal with them so we would speak to them and try and develop it and they may have a better relationship with that supply."
2	supplier with contract management	Registering each supplier selection process	"To have a really solid argument to choose for suppliers. That's really backed up and that's saved and we can look at it at a later stage. Uh, that's not done for the tail spend and that can be a solution."
3	supplier with outsourcing	Outsourcing management of specific product groups to experts.	"We try to profit from their volume, which they can have four different organizations, like (company). Who have a contract with Meetings Selects to be able to go and meet, to have meetings between colleagues and all parties on almost every location in the Netherlands. And they handle the invoicing, they handle the contracting with every specific individual location."
4	contract management with contract management	Contract management with communication	"If we make a new agreement with the supplier and stating: this is now our preferred supplier and inform the people who could have context with that, they know, hey, I cannot go to every supplier again. This is now the preferred supplier. There is a contract in place with the conditions of the supplier. And that helps."
5	contract management with outsourcing	Outsourcing contract management of tail spend suppliers.	"The name is Le Cedre. It's an external purchasing team. But you don't put the order to Le Cedre, but you put the order to the same supplier of the automatic door. But the price is negotiated by Le Cedre. So for example, for when I pay €1000 per door, with this is part €500 if I use the contract of Le Cedre. I pay contribution to Le Cedre. For example, I pay €100 per month to Le Cedre, and I have the possibility to work with the better prices of Le Cedre. You understand, so I have an agreement or contract with Le Cedre. Yes. This subscription is very low because for me, a buyer, it's €250. But I have the authorization to use the contract between Le Cedre and for example, Kone, the supplier for the automatic door. So previously I worked directly with Kone, and don't have a good price due to low volume. But due to the agreement with Le Cedre, I have a better price with Kone. And they make a new order with Kone with a better price. Due to the fact that we don't have big volume or don't have time to negotiate this small spend"
6	contract management with software	Purchase2Pay software.	"Financial settlement, contract management and supplier management, linked in one system."
7	contract management with internal processes	Easily accessible catalogues for purchases outside procurement department.	"What we are doing now in Coupa, is to make punch out catalogues, that people can easily find the articles they need, categorized by their definition."



8	contract management with company regulations	Procurement department only authorised to add new supplier.	"In (organization) it is defined: only procurement can make commercial decisions about the supply chain. No other person within (organization) can select a supplier."
9	invoicing with outsourcing	Outsourcing invoicing process.	"Another solution could be, there also parties, I don't have a specific example, of which the core business is just too act like the principle of a postal box. So you buy a good, you define a delivery address, which is your own organization, but the invoice always goes to this organization who does service the invoice."
10	invoicing with software	Implementing digital invoicing system.	"Because we are now going to work with purchase orders, which will automatically match. We do 40,000 invoices at (organization). And we do 32,000 of those invoices, and therefore orders, with less than 10% of the suppliers."
11	invoicing with internal processes	Define categories for reimbursement to avoid invoicing and adding new suppliers.	"Well, the last solution, and that's a more realistic one, is that you define some categories for which your own employees have to buy the goods themselves. Well, uh 'declareren', I don't know the English word. As an individual, you get a refund on your pay check."
12	invoicing with company regulations	Putting restrictions on purchasing	"So if you stick to those rules and, on the other hand, you also define that all suppliers of a certain business unit go through procurement, then you have a structure which determines whether you will have those 800 suppliers back in your supply base in five years' time."
13	internal organization with internal processes	Enhancing internal communication.	"Yes, you should do this together with the communication department, which also manages the intranet. To see how you can make clear, if for example people order office supplies, people can click on the site of 'purchase office supplies', that they can click through to the supplier's site, so that they see which supplier you do business with."
14	internal organization with company strategy	Aligning activities in organization with strategy.	"And procurement, the spend should be aligned to your overall strategy, mission and vision. That is very important, that procurement is fully aligned. Then we are talking about all spend in fact."
15	internal organization with defining tail spend	Divide tail spend in compliant and non-compliant tail spend.	"Understand the why. Accept it to a certain extent. I think maybe there is like a conflict. And the question is, where is tail spend non compliant? Because you will have like compliant tail spend, which is OK, and non compliant."
16	capacity with outsourcing	Outsourcing management of specific product groups to experts.	"We have introduced a company called Pimm, and Pimm is covering all those kind of gifts; cakes, flowers, presents, wines, things like that. Those are the most common. If you look to Pimm, Pimm is a large company that is doing a lot of these indirect tail spend. And discovering that, we are using it now. We are merging that also into Germany and Belgium. And those kind of companies helped me with the tail spend. Because they send me once a month a bill through Coupa. And then I've got everything what they have bought. And then I've a multiplier of articles in just one bill."
17	capacity with company strategy	Capacity within procurement department.	"It depends also on the time you want to spend at changing things here. And that is also why we have the Pareto analysis saying, hey this is important and then based on what? So time is always a challenge."
18	capacity with business case	Provide insights on potential cost savings (business case).	"So the ideal way to solve it is putting 20% of your time and solving 80% of the problem. So that would be most of the first part, right."
19	uncertainty regarding tail spend with defining tail spend	Divide tail spend in compliant and non-compliant tail spend.	"Then you have to discuss with the internal organization to organize the why. And then those are, I would say, the limits of the organization. That's that's the thing you have to accept and organize it. I'm sure that in many organizations the amount of

			suppliers in tail spend exceeds that agreement. And that's the thing to fight.”
20	uncertainty regarding tail spend with business case	Knowing the return on investment regarding tail spend.	“And to convert the process improvements and the processes into euros, because that is what a management team looks at.”