



Master of Science in Public Administration – Urban Governance

Erasmus Universiteit Rotterdam

Addressing the low tendering performance of Dutch SMEs:

An analysis of demand-side conditions and success in public
procurement

Léon Bengsch - 586793lb@eur.nl

Supervisor: Dr. Dr. Lasse Gerrits

Second Reader: Dr. José Nederhand

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Abstract

Public procurement is a major instrument in public policy, granting governments substantial steering power. Beyond purely economic rationales, arguments and best practices for social and sustainable procurements have gained momentum in the past years. One such area for reaching wider policy objectives is the support of small and middle-sized enterprises (SMEs) through public procurement which are often found to be structurally disadvantaged in tendering. The literature has produced an interesting chunk of findings on the topic, identifying barriers such as limited buyer expertise, complicated processes, high risk aversion as well as lack of SME capabilities, yet few studies have engaged in combinatory research into success and failure patterns of SMEs. The thesis is embedded in such gap in the literature, investigating, by means of a qualitative comparative analysis (QCA), configurations of conditions on the demand or buyer side and their effect on the chances of SMEs. Findings suggest a positive effect of experience with SMEs in administrations combined with a tender design that is suitable for small businesses. Moreover, arguments in favor of capacity and expertise building on the demand side can be made based on the study results. Dissimilarly, the volume of a tender is not found to hamper SMEs chances. Based on the results, future academic inquiries are encouraged to deliver more evidence on the link between administrative culture and capacity. For public policy, the strong relationship between having experience with SMEs and higher chances for them, motivate strategies to cater to the comparative strengths of SMEs and undertake more efforts to level the playing field.

Keywords – public procurement, SME, tender design, administrative culture, administrative capacity

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1. Introduction

1.1 Research topic

In recent years, awareness in administration and research on the potential of public procurement to reach wider public policy objectives has increased (Flynn, 2015; Grandia, Meehan, 2017). Wider objectives refer to those policy goals that are not directly constitutive of the economic process of procurement, but are secondary goals of policymakers who seek to achieve socially and or economically sustainable outcomes using public procurement. One of those explicit goals is the strengthening of SMEs via procurements (OECD, 2019). Small and medium-sized enterprises represent 99% of all enterprises (Eurostat, 2015), yet only account for 29% of the above threshold; and 58% of the below threshold tenders won in the EU (PwC, 2014). Hence, it is the common conception that SMEs due to their sheer number in the population of businesses within economies should be more present in procurement bids and awarding (Loader, 2013; Flynn, 2018). Therefore, this work engages with the issue of limited success for SMEs in public procurement, setting the research focus on procurement in Dutch municipalities.

1.2 Problem statement

In the Netherlands, SMEs or companies with less than 250 employees (Pianoo, 2021) account for more than 60% of employment, which is slightly below the EU average, but above the average of sector productivity in terms of value creation. Data of the Small Business Act (SBA), the main pillar of the EU approach to support SMEs, highlights the need for further engagement of SMEs in the Netherlands (EU Commission, 2019). The progress report, reviewing the time frame from 2008 to 2019 displays generally improving conditions for small businesses in the Netherlands, with one exception. Public procurement and state aid for SMEs are attested a low performance. In numbers, with a rate of 15% vis a vis an EU average of 32% in 2017, the participation of companies in public procurement is extremely low, making the Netherlands the last ranking member of all EU-28 countries. Such observation becomes even more significant given the share of public procurements in the national GDP of 19.5% as well as the public procurements share in government spending of 45.8% in the Netherlands as they

represented the highest of all OECD countries in 2017 (OECD, 2019). Furthermore, Dutch tenders have had the sixth highest value of tender contracts of all EU member countries in 2014, accompanied by an average of 82% compared to the EU average of 71%, of contracts not containing any lots which is argued to reduce the chances vis a vis larger companies (PwC, 2014). Moreover, between 2017 and 2018 the share of SMEs winning a tender dropped significantly from 73% to 63% (EU Commission, 2019). Proactive policy of the Dutch government to address these major shortcomings are found in the program Better Procurement (Beter Aanbesteden), listing various areas of engagement to improve conditions (Pianoo, 2019). The progress of such new policy initiative is yet to be seen, the EU Commission thus far has complimented novel approaches to support start-ups and innovative partnerships, but contended that more comprehensive support for SMEs beyond the high-tech sector is required (EU Commission, 2019). For research this means that further inquiry into the hurdles for SME participation and success is needed. Therefore, investigating the dynamics of SMEs in the Dutch public procurement context appears a worthwhile undertaking.

1.3 Societal relevance

SMEs provide value added for local development as they usually have stronger ties to local economies than larger firms (Pickernell et al., 2011) and are a focus area of sustainable government practices (Walker, Preuss, 2008). Moreover, it is argued that strong SMEs are conducive to competitiveness in most markets (Albano, 2017; Caldwell et al., 2005), in turn supporting job creation and entrepreneurship (Flynn, 2018). The various national (Pianoo, 2019) and international approaches (OECD, 2019; EU Commission, 2019) are evidence to this belief that SMEs require targeted policy interventions in order to exploit their many benefits for society.

In sum, supporting SMEs means improving public policy on various levels. Based on the evident need to support SMEs in the Netherlands (EU Commission, 2019), investigating the conditions determining their success in public procurement is therefore a relevant contribution to the field of administration and as such to policy and society.

1.4 Academic relevance

Indeed, the need for supporting SMEs in public policy and in public procurement in particular is not a sudden realization (Flynn, 2018) and various research has been conducted in that regard (Loader, 2005; 2013; Flynn et al., 2015; Flynn, 2018; PwC, 2014; Hoekman, Tas, 2020). Study design and focal points of the studies differ greatly, yielding quite a large array of potential factors driving or inhibiting SME success in public procurement. Some scholars in that regard have surveyed factors of the demand side, the procurer (Flynn, 2018), while others have focused on the SME or supply side (Loader, 2005; Flynn et al., 2015). These studies have contributed greatly to the understanding of how SMEs and procurement entities as two distinct organizational types perceive and behave in procurement processes. On a macro level, research has investigated the relationship between policies and the participation of SMEs in public procurement (Hoekman, Tas, 2020) as well as the relationship between various single factors and SME success in tenders (PwC, 2014) both using large data sets on tenders on the EU level. Employing linear regression models, the two latter studies have carved out valuable and generalizable predictions on how certain factors determine success of SMEs. However, combinatorial research into how these factors inter-relate or more specifically condition each other appears to be scarce. For instance, there is, to my best knowledge, no evidence on the interaction between administrative factors in the form of a comprehensive multi-regression analysis. In line with this, Flynn et al. (2015) as well as Hoekman and Tas (2020) have argued for future inquiry into the characteristics and operational capacities of SMEs to enrich knowledge on the supply side actors. Furthermore, most studies appear to test predetermined factors on large datasets of tenders, but do not dissect the characteristics of tender cases in a way that enables deeper insight into which factors constitute success in specific cases.

Therefore, research on how characteristics of a tender determine whether SMEs fare well or bad in specific areas of procurement is a worthwhile undertaking. Again, examining various areas of procurement has been looked into, yet the evidence (PwC, 2014) is highly aggregated over the entire EU and rather descriptive because it does not explain why contracts for certain commodities or services are won less often by SMEs. Thus, there appears to be a gap in the literature with regard to how the plethora of factors inter-relates and more specifically conditions each other in various areas of procurement. Lastly, the academic literature has not

produced much evidence on SMEs in procurements in the Dutch economy, even less so on success conditions of tendering. To address this lack, the study aims to answer the question of how demand-side and tender specific characteristics as configurations of conditions impact the success of SMEs in public procurement in Dutch municipalities.

1.5 Research question

The research question then is: *Under which conditions do SMEs win tenders in local public procurement?*

The aim of this study is therefore to make a modest contribution to the field of public procurement studies as well as to deliver a focused research on the public domain of SMEs in the Dutch economic context.

1.6 Research outline

First, the research establishes the importance and relevance to study SMEs in public procurement and defines the research question by which the problem is assessed. Second, the pertinent literature is reviewed in order to theoretically ground the research and to design a sensical conceptual framework. Third, an appropriate method to answer the research question is chosen. In this work, a qualitative comparative analysis (QCA) is considered effective, as it captures the breadth of the cases under review as well as it enables the exploration of conditions as sets of causal factors instead of single variable effects. Fourth, the results are presented and discussed in order to fifth enable subsequent analysis of the conditions in the context of the theory. Lastly, conclusions of this research and academic as well as societal implications are drawn in order to give impulses for further academic study and policy improvements. The following chapter reviews the literature and constructs the conceptual framework.

2. Setting the stage

The theoretical framework first explains the context of public procurement in some detail before turning to the case of SMEs. After having established the basic concepts, the drivers and barriers of SME success in public procurement as evidenced by the literature are discussed. Based on these findings, a conceptual model is designed, organizing the identified drivers and barriers in subgroups in order to embed subsequent findings in a clear framework.

2.1 Context of public procurement

This section briefly illustrates the particularity of public procurement as a research topic and its development in governance arenas. Accountability, transparency, public value and competition (OECD, 2019) are key characteristics of public procurement to name only but a few concepts. Thus, public procurers have to, by virtue of the obligation to deliver value to citizen, follow very specific procedures. The main target herein is often aiming for a bid that is as low as possible, while still conforming to the stipulations of the contract in order to make the most out of every public Euro spent. Indeed, evidence showed that the price criterion was superior in the majority of procurements in a UK context (Patterson, Pinch, 2000). Other modes, that by now are formalized by EU directives, thus applying to the Single Market area, enrich the price criterion by quality, thereby fostering a price-quality assessment of the bids, and are commonly known as MEAT (most economically advantageous tender) (European Commission, 2017). Kim Loader in the academic context has differentiated between a traditionalist - more short-term vision on procurement and a modern form in which trust, knowledge sharing and longevity of relationships are important (Loader, 2005). Moreover, in policy circles decision makers have moved beyond the purely economic rationale underlying tender award decisions, thus procurement is increasingly seen as a strategic tool to steer wider societal objectives (Flynn et.al, 2015; Grandia, Meehan, 2017). In these policy arenas, procurement is increasingly tied to policies (Flynn, Davies, 2014) of innovation (Georghiou et al., 2014; Aschhoff, Sofka, 2009), sustainable economic growth, social inclusion (Sarter, 2015) and environmental sustainability (Roman, 2016; Yu et al., 2020). These policy fields are often subsumed under sustainable procurement, yet the conception lacks precision as all fields are surely relevant enough for

targeted inquiry. The following section introduces one of such policy areas, support of SMEs in public procurement, that touches upon both sustainable procurement and economic/competition policy.

2.2 The case for SMEs

SMEs are generally assumed beneficial to competition in the market (Albano, 2017; Flynn et al., 2015; Loader, 2013) as they extend the supplier base for public buyers in quantity and quality. While the quantitative argument is not without its issues, as larger number of bidders do not automatically increase competitive tendering in all scenarios (Albano, 2017), SMEs are found to bring in many qualities larger companies are said to lack at times. These range from better value for money, flexible work, personalized service, specialization and high service quality to even lower costs (Loader, 2005; Loader, 2013). In this context, public procurement has been identified as a key tool to harness these benefits, as awarding tenders to SMEs decreases the dependence of support of small firms and further increases diversity and potential quality of public services (Pickernell et al. 2011). Second, SMEs are considered beneficial to regional and local developments such as employment and competition, mostly due to their high level of geographic embeddedness and ties to local economic structures and have thus attracted the interest of economic geographers (Pickernell et al., 2011; Walker, Preuss, 2008). These considerations in turn must play a role for local procurement entities, seeking to improve service delivery on a local or regional level. Thirdly, the role of SMEs in matters of environmental sustainability is mentioned (Walker, Preuss, 2008). By far not all these studies have directly connected benefits of SME support to public procurement, yet making the link between these two practices does not appear a very long shot in the context of economic policymaking.

In sum, prudent procurement practices by public actors could realize gains from accelerated competition and thereby improve the value of public spending (Caldwell, et al., 2005). The next part briefly summarizes the considerations of the supply side, the SME, making a case for mutuality of interests of the public and private side.

2.3 Why do SMEs bid?

Public contracts are very attractive to SMEs for multiple reasons. Firstly, they often offer stable demand and predictability via the high degree of formalization (Flynn, 2018; Loader, 2005). Secondly, these contracts yield reputational gains due to serving the government and promise certainty of payment (Flynn, 2015). In fact, a survey in the UK context found that the three major perceived benefits were certainty of payment, speedier payment and security over longer term (Loader, 2005). On another note, Gheorgiou et al suggested that SMEs benefit from government as customer, as the volumes and influence of the government enable marketization of new innovative products. (2014). Hence for SMEs, participation in public procurements yields quite a range of benefits that can be exploited. In this regard, as quoted from Flynn (2018, p. 424): *“What is good for SMEs is also good for economic competitiveness in terms of job creation, GDP growth and entrepreneurship (European Commission 2008). Having more SMEs bidding for public contracts is equally in the interests of public sector organizations.”*

Thus, public procurement practices should forcefully account for the role of SMEs, especially since their contribution to competition and quality of procurements as well as their role in the wider economy is known, but access to procurement continues to be restrictive (Loader, 2005; Flynn, 2018). The next section first discusses these restrictive factors and then turns to the drivers of SME success in public procurement.

2.4 Barriers and drivers for success of SMEs in public procurement

2.4.1 Barriers

Since public procurements are complex interactions in which at several stages of the process barriers for SMEs could arise, the following discussion deals with various levels of barriers, ranging from attitudes of officials to skill markers of firms and agencies and tendering itself. On the side of the procurer, high levels of risk aversion and inertia (Loader, 2013), limited professionalism (Loader, 2005; Flynn et al. 2015; Flynn, 2018) and conservative work attitude with regard to market engagement (Loader, 2005) are mentioned. Emphasizing the barriers on the procurer side for the Netherlands, the Dutch Public Procurement Expertise Center has argued that: *“Contracting authorities must also endeavour to reduce administrative burdens”*

(Pianoo, 2021). On the supply side, scholars have suggested a gap between the capability and the actual production capacity to fulfil a certain contract (Karjalainen, Kempainen, 2008; Loader, 2013). Moreover, in a comprehensive study, surveying barriers for SMEs, Loader found lack of access to approved supplier lists and lack of awareness of the opportunity of tenders as the two strongest inhibitors (Loader, 2005; see also Flynn et al., 2015). Evidencing the mismatch between public sector mentality and SME capacity, unclear qualification criteria and overly complicated requirements are found to reduce SME participation (Hoekman, Tas, 2020; Loader, 2015). Moreover, the scanning of available tenders and the preparation for bids requires resources and time, thus oftentimes placing SMEs at a disadvantage vis a vis larger firms that more easily concentrate workforce and money to that end (Flynn et al., 2015; Flynn, 2018; see Pittaway, Morrissey, 2004 for a comparison of large and small company purchasing behavior). Within the procurement process as such, hurdles SMEs might face are lengthy and complex process rules and requirements (Loader, 2005) reducing the perceived chance of success for SMEs. Lastly, Hoekman and Tas conducting an empirical study on EU-wide procurement data, find evidence for the common size argument stipulating lower SME participation for larger contract values (2020).

2.4.2 Drivers

Given the alleged benefits of fostering SMEs in public procurement, many supportive policies have emerged aiming to achieve a level playing field (Hoekman, Tas, 2020). These policies take the form of regulations on the EU level, as well as they find application in national and regional economic strategies. Strategies in this regard can further be divided into on the one hand active measures structurally favoring SMEs and facilitative measures on the other hand that aim for equalization of opportunities (Loader, 2013; Hoekman, Tas, 2020). The latter, less interventionist set of measures that is largely supported by EU regulations, calling for using MEAT (Hoekman, Tas, 2020), includes tailoring requirements for bidding to SMEs, easing the complexity of the procurement processes, and reducing the size of contracts into smaller lots (Albano, 2017; Hoekman, Tas, 2020; Loader, 2013). Within the tender process specifically there is some, yet non-significant evidence that open procedures provide SMEs with better chances of success than restricted and negotiated procedures (PwC, 2014). Connected to the bidding procedure and lots, the possibility of joint bidding might support SMEs in realizing potential to attain larger contracts (Albano, 2017). Furthermore, Loader argues that knowledge and skill

enhancement approaches benefit SMEs in participating more successfully (2013). The more preferential and positively discriminating measures include set-asides or quotas for SMEs (Loader, 2013; Hoekman, Tas, 2020); inclusion of sub-contracting obligation to SMEs for tender awardees (Loader, 2013) and price preferences (Hoekman, Tas, 2020). However, drivers and barriers are not strictly applicable in isolation and certain procurement measures might have interactions with other economic or administrative targets. The next part briefly taken on this ambiguity.

2.4.3 Accelerant or inhibitor: is it really that straightforward?

The identified drivers might have limitations as certain motions to level the playing field can have repercussions in competition and in the behavior of firms. Indeed, some studies, backed up by empirical evidence, attest rather an ambiguous picture when it comes to the effectiveness of the measures. For instance, Albano has, while put forward possible benefits of splitting contracts into smaller lots, contended that such strategy does not come without its risks. Split-up contracts can induce inefficiencies as they reduce synergetic effects arising when a firm needs to combine various resources to a final goal. Moreover, they can facilitate collusive behavior of firms getting together to bid for the lots in a coordinated way to increase the price of supply (2017). Hoekman and Tas, reviewing several studies on split-up contracts also find mixed evidence as to the overall effect on SME success (2020). Regarding the success of SME friendly policy, Flynn (2018), studying administrative characteristics on their impact on using SME support policy, found that experience with tendering does not make any such new policy use more likely. Interestingly, another study found that using for instance the SME-friendly MEAT criteria, is rather insignificant for the success of SMEs (PwC, 2014). Hoekman and Tas suggest that this is due to the actual issues on the SME side being resource capacity and not the tender specific requirements that are aimed to be improved by the MEAT (2020). Lastly, it is argued that fostering collaborative tendering or joint bidding might reify the issue of large contract sizes as SMEs are merely encouraged to join in on a bid, instead of making the bid more suitable to the SME per se (Loader, 2013). In sum, SME success in public procurement emerges as quite a complicated subject both for research and policymakers, making combinatory research even more crucial. The general trends are distilled from the ongoing discussion and are wrapped up in the following section.

2.4.4 Wrap up

Red threads in the literature on SME success in public procurement appear to be the skills, attitude and or choices of procuring authorities, such as experience, risk aversion, market conservatism, precise contract design and clear award criteria. The capacity of SMEs to call tender requirements is also mentioned, yet much of their chances are contingent on prior tender configuration and capacity on the demand side. Therefore, in this study the focus shall be set on the procurer side and investigate the interplay between several conditions regarding the procuring authority and the tender design on the success of SMEs in winning tenders. In the next part the theoretical basis for this study is constructed.

2.5 Conceptual framework

The plethora of drivers and barriers for SMEs in public procurement awarding suggests rather an interplay of various factors than clear-cut singular effects. This means that singular changes of a certain practice in procurement are likely to have repercussions on other practices as well as that single factors and theories only limitedly explain success and failure on their own (Flynn, Davis, 2014). Therefore, it appears wise to investigate drivers and barriers of success as conjunctions or configurations of factors, eliciting which sets of factors make success more likely. In order to do so, the factors distilled from literature are grouped into five conditions. These represent domains of the demand side, hence the procurer or the design of the tender itself, which potentially also confound each other. Eventually, such design enables a comparative analysis of the main factors of a public procurement process, while further providing insight of the interplay between the main dimensions.

Grouping conditions in thematic sets is not a novel approach to the study of SMEs in public procurement. In fact, Loader (2013), compiling literature on identified factors for SME success in public procurement, divides the literature in public sector environment; the procurement process; and small business capacity. Flynn (2018), surveying the procurer side on the implementation of SME friendly policy, uses a distinction between organizational and individual factors. The large-scale study of PwC (2014) examining EU-wide data distinguishes between country control variables, contextual variables and policy variables. In this work, the dimensions, relating to Loader's distinction (2013), shall be demand side conditions and

specific tender characteristics as administrations are suggested to crucially impact SME success because of their organizational culture as well as their capacity to design quality contracts and award criteria. Note that the policy dimension as seen in for instance the study of Hoekman and Tas (2020) and Flynn (2018) is not explicitly tested for in this study, because several conditions in this study link to or are derived from policy motions aiming to improve the situation for SMEs. The table below summarizes the main findings of the literature and divides factors in the dimension tender characteristics, administrative capacity and administrative culture, each containing some of the five conditions.

Table of conditions as evidenced by the literature:

Dimensions of SME success	Related evidence in the literature
Tender-specific characteristics	
Divided into lots	Hoekman, Tas, 2020; Loader, 2013; Albano, 2017
Size of contract	PwC, 2014; Hoekman, Tas, 2020
Administrative capacity	
opentender method - relying on general and legal concepts	Opentender, 2021
Award Criteria and contract design	Flynn, 2018; Loader, 2005; Hoekman, Tas, 2020; Loader, 2015
Administrative culture	
Inertia, risk aversion	Loader, 2005;2013; Flynn et al., 2015; Flynn, 2018

Table 1

Note that the sub-indicators in each dimension are not the set of conditions by which the cases in this study are assessed. That is because the method used in this work, the QCA which is explained in detail in section 3, is essentially a case-based method in which, even when following a theory-driven approach, case characteristics are key. To explain, the conditions expected to influence the success of SMEs are not discrete variables as usually known from regression analysis, but are conditions that are present, not present or present to a certain degree in a given case. Therefore, the sub-indicators listed here merely represent more detailed findings of the literature under review. The final set of conditions derives from the reality of the

case material determining which precise conditions are able to elicit the core dimensions of SME success in the context of this work. Table 2 below visualizes the conception of the three dimensions, followed by the introduction of the qualitative comparative analysis.

Conceptual model – Dimensions:

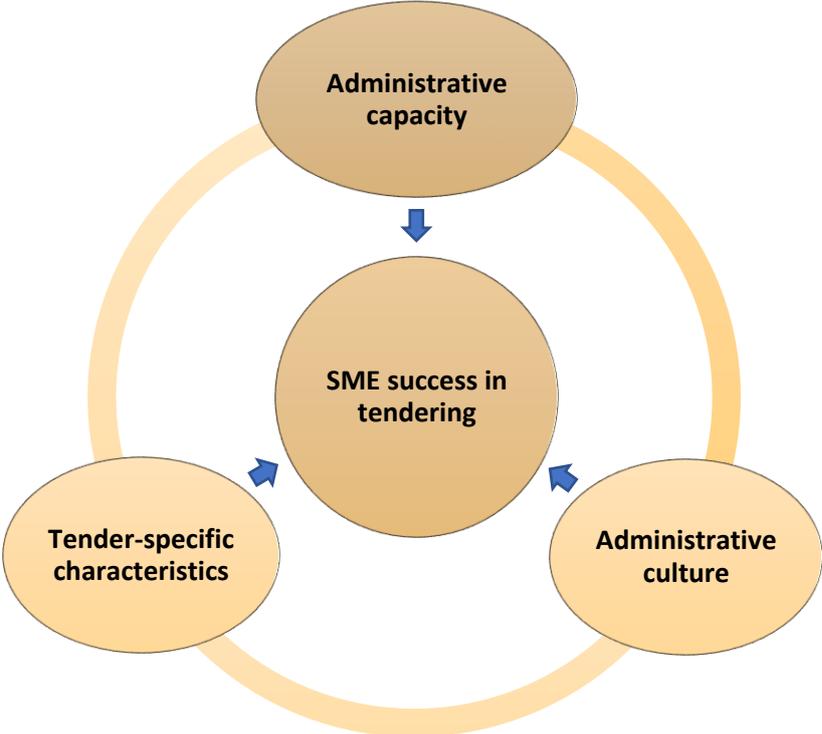


Table 2

3. Methodology

3.1 The QCA

This work aims to fill in the lack of combinatory analysis on public procurement. To that end, a qualitative comparative analysis (QCA) considering the interrelatedness of conditions is an adequate method to elicit what combinations of conditions account for success of SMEs. The QCA is a mixed method appropriate for medium to low n sample sizes (Berg-Schlosser et al., 2009) and is able to capture quite a number of qualitative elements, while producing quantifiable output. The QCA looks at sets, instead of on discrete variable effects. So, rather than what is the impact of condition X on outcome Y, it looks at whether certain conditions are present or not present or only present to a certain extent in a given case. Similarly, the outcome is not considered a typical dependent variable that is gauged by external factors, but a condition itself, which again can be present, not present or a degree thereof. Further, the outcome is a subset of the whole configuration conditions, thus called the outcome condition in which cases similarly have a set membership (Gerrits, Verweij, 2018).

Although the QCA is a case-based method in which each case is represented by a certain configuration of conditions, defining the conditions requires to make a choice between a case or theory-driven approach. Using the first approach, the researcher is strictly guided by the cases she observes and constructs conditions from systemized empirical findings of the cases (Gerrits, Verweij, 2018). The latter, theory-driven approach establishes a theoretical framework in which the cases are tested. The researcher in this scenario is still guided very much by cases, as the conditions are configurations explaining an outcome which is also an integral part of the cases. Together, as discussed above, such configuration represents a case in the sample, thus conditions as derived from theory are closely linked to the case as such (Gerrits, Verweij, 2018). The subsequent part narrows the scope of the study in order to make it operationalizable.

3.2 Defining the scope

Since public procurement is such a highly diverse field of inquiry, several areas of homogenization (Gerrits, Verweij, 2018) are chosen to deliver a more focused research. First, by limiting the study to procurement in one country, the Netherlands, the policy environment, defined by institutional, administrative and economic context (PwC, 2014) is kept relatively constant, making the cases more comparable. Second, a type of procurement authority is defined, allowing to keep more constant the scope with which the procurer purchases. To explain, in most countries there are several bodies on various levels of government engaging in procurements that can range from national bodies, to specialized central bodies combining demand (OECD, 2019), federal state level, regional and municipal bodies (TED, 2021). In this study, the municipal and in a few cases regional authorities are chosen. Third, the area of procurement activity is determined. Fourth, the necessary characteristics all cases are to fulfil are presented and the sampling method and its results are discussed. As a last step, the conditions are defined and calibrated for the QCA.

3.2.1 The procuring entity

Evidence suggests that centralized procurement is often more inefficient than lower-tier procurement (Petersen et al., 2020) and lowers the success rate of SMEs substantially (PwC, 2014). Therefore, the study investigates the procurement activity of municipal or regional governments, as such choice further enables to inquire on the local dimension of SME activity (Pickernell et al, 2011). In short, the municipal level is chosen as SME prevalence in contract awards is expected to be somewhat higher in the local sphere and because Dutch local authorities have substantial discretion in tendering (OECD, 2018), thus quite some variation among the cases can be expected.

3.2.2 The Cases

All cases are award notices from 2020, collected from TenderNed and Tender Europe Daily. Essentially, the cases are tenders that have already been finalized, meaning that there is an identifiable winner, yet in any case involving SME participation in the competition. Moreover, the cases shall be retrieved from a coherent set of procurement areas or CPV codes. The CPV codes are CPV 45, 70, 71, 90, thus representing tenders of the areas 45000000 - Construction work; 70000000 - Real estate services; 71000000 - Architectural,

construction, engineering and inspection services; 90000000 - Sewage, refuse, cleaning and environmental services. The reason for such choice is codes' tight link to urban area procurements, where most construction, engineering and real estate clusters. Moreover, public procurements on a national scale using similar CPV codes are more likely to include very big projects, disproportionally awarded to bigger companies. In total, there are thus three areas of homogenization, the Netherlands, the municipal scale and the CPV codes. Lastly, because its approach is combining qualitative with quantitative elements, the QCA deals with low to middle n sample sizes in order to allow a relatively in-depth case analysis, while also allowing some generalization across cases (Gerrits, Verweij, 2018). An overview of the criteria the cases have to fulfil to be in the scope of the research (Toshkov, 2016) are found in the table under a). The final choice of cases, representing the extension of the research are listed under b).

a) Criteria for case inclusion:

Criteria for intension	Dutch municipal/regional procurement	Area of procurement (CPV-code)	Time frame	SME participated in tender process	Tender awardee is known
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Table 3

b) Choice of cases

Case data is compiled from TED (Tender European Daily), TenderNed (Dutch e-procurement platform) and opentender Netherlands. In total, 28 unique cases in 2020 are chosen, making this study a low to medium sample size research. In light of the research question, the sampling process is oriented at the outcome condition as information on whether an SME was awarded the tender or not is essential. The tenders with unsuccessful SMEs, thus a non-SME awardee, are included only if they yield information on whether SMEs submitted a bid. Such decision is made in order to systematically exclude all cases where SMEs might not even have wanted to submit a bid, thus avoiding redundancy of the study results. Unfortunately, information on whether SMEs participated as a distinct group of firms is very scarce in the available datasets, despite the fact that it would be easy to publish such information. Further, the company names of the respective losing parties are not published. Hence, collection of the cases is done

manually, scanning the databases for exactly those cases that satisfy the needed characteristics as well as providing information on whether SMEs participated, while a non-SME was awarded the tender. Among these 28, 13 cases with a non-SME awardee are included of which three, given the lack of information, are only estimated to have had SME bidding. The estimation is done for cases with a high number of bidders and with one exception for tenders with moderate volumes. Reversely, for the cases with successful SMEs information abounds, thus enabling partial randomization of the cases.

Evidently, the QCA is a method that relies on qualitative insight into each case and requires variation in the condition, but in order to reduce cherry picking or selection bias the randomization appears wise. To that end, TenderNed data sets of 2020 are filtered on the relevant CPV codes and procuring authority and a set of 25 unique tender reference numbers are randomly pulled out the sample. Out of the remaining 25 cases, those 15 are chosen which have a SME winning the tender, as such a prefiltering is not possible with the available datasets. The next section introduces the five conditions to be tested for and lines out a few hypotheses on their potential interplay.

3.3 The conditions

The study seeks to elicit the combination of conditions that are conducive to the success of SMEs winning tenders in public procurement, for which a theory-driven approach is chosen. Conditions are thus constructed from findings in the literature and systematized in dimensions. The dimensions are, Administrative capacity; Administrative culture; Tender-specific characteristics. In order to streamline the study, empirical observations are added to the dimensions, yielding insightful extensions to the rather rough systemization. This is especially necessary as the literature on public procurement and SMEs in particular does not follow stringent theoretical underpinnings (Flynn, Davis, 2014; Roman, 2016). Below, first the mode of operationalization and expected relationships of the conditions are explained, followed then by the calibration of the data.

3.4 Operationalization

Having determined the criteria by which to include cases, the conceptual model is to be operationalized. To that end, five targeted conditions, capturing the three dimensions are established, bridging the gap from the case material to the research. Adequate conditions require a certain level of familiarity with the cases, thus empirics and availability of information play a crucial role in the operationalization (Gerrits, Verweij, 2018). Furthermore, some conditions essentially display one type of data, while others are aggregated over several data types. The conditions are listed from a) to e).

a) Administrative capacity

Capacity of the administration is defined by procurement expertise and employment of guidelines by the procuring authority. The condition directly mirrors the administrative capacity dimension since the degree to which the conditions are present in cases is assessed using the administrative capacity indicator from opentender Netherlands. The opentender methodology uses three indicators, administrative capacity, transparency and integrity to create a good procurement score for authorities, presenting the results for each indicator as well as an overall score. There is the temptation to use the wholesale option overall good procurement score, yet a more detailed assessment of the sub factors used per indicator reveals a plethora of factors not necessarily adequate for the study of SMEs in public procurement. Hence, only the administrative capacity sub-indicator is considered.

The factors used for the scores on this indicator are *Use of framework agreements, WTO regulations, Discrepancies in tender call and award, English language, Joint or centralized procurement and Electronic auctioning*. Arguably, these factors are quite general and legal in nature, for instance WTO regulations are either observed by the Netherlands or not, yet in any case not being at the discretion of single Municipalities. Therefore, this condition is treated as the standard set of expertise for procuring authorities. A first scan of the scores confirms the intuition, as most procuring authorities in the sample rank in a similar range. However, since there are other sub-factors such as discrepancies of tender calls and awards or centralized procurement which are at the discretion of authorities, the administrative capacity indicator is an adequate benchmark for gauging the capacity and expertise of the authorities in the sample. Linking to the literature, high scores of administrative capacity would suggest solid standards and expertise in tendering, reducing barriers for SMEs that often suffer from unclear

requirements, complicated processes (Hoekman, Tas, 2020; Loader, 2015) and lack of joint bidding opportunities (Albano, 2017).

b) SME History

Determining the effect of the procuring authorities' working culture requires a preconception of the culture in administrations as either conducive or not conducive to the success of SMEs. In the literature, rather the inhibiting factors of the culture are identified, which are for example inert approaches to procurement, red-tape and market conservatism (Loader, 2005;2013; Flynn et al., 2015; Flynn, 2018). A prudent indicator for the absence of such hurdles is a measure of the extent to which authorities directly engage SMEs in their procurements, as this percentage is low in most European countries, including the Netherlands (SBA, 2019). The level of engagement in this study is defined as the share of SMEs being awarded tenders in past procurements for each of the cases procuring authorities. In sum, findings pointing to the significance of the administrative culture would suggest the need to further sensitize purchasers to the case of SMEs. The main source for tender awards is Tender Europe Daily. However, in cases where information is limited, Tendered data is used to verify if there are other tenders that have not been registered with TED. In total, the 30 last tenders are considered, as this number enables maintaining the time frame 2020-to max. 2017 for the smallest municipalities with less procurement activity, while not moving too far beyond the time of the EU Commission report (2019). In doing so, it is possible to further make inferences as to whether the benchmark of 63% has changed since the EU Commission published its SBA Fact Sheet. Lastly, the willingness of procuring authorities to employ innovative and more reflected modes of procurement procedures is suggested to be increasing as expertise and capacities grow (Erridge, Greer, 2002), thus potentially linking the capacity dimension to the administrative culture.

c) Contract conditions

The contract conditions relate to two factors of a tender case, award criteria and (lack of) lots. Both these factors are extensively mentioned in the literature as major inhibitors to the chances of SMEs to win tenders (Flynn, 2018; Hoekman, Tas, 2020; Loader, 2013; Albano, 2017). Regarding the dimensions, contract conditions links to tender-specific information as they constitute a certain set-up of conditions. On the other hand, the award criteria and decision to split tenders into smaller lots is very much at the discretion of the procuring authority, thus

capacity and culture are also touched upon. In other words, the contract condition can be understood as the level of red tape on public procurements or more specifically as a marker for how burdensome (Borry, 2016) the contract for SMEs. As such, the contract condition is relatively close to administrative capacity, but is understood as a SME specific set of expertise, while the administrative capacity is treated as the standard procurement skill of the procurer. The data for this condition is retrieved from the official tender contract as awarded and the aggregation of the two factors is presented in the calibration section. In view of the theory, lack of information on award criteria or criteria focused largely on price are believed less beneficial for SMEs, while a focus on quality and an abundance of clear specifications are expected to support SME chances. Likewise, contracts with multiple lots are considered more conducive to the success of SME in tender awards.

d) Tender Volume

The fourth condition, tender volume has gained much attention in the literature, as it reflects the size argument (PwC, 2014), suggesting that large contract volumes categorically put SMEs at a disadvantage. Indeed, the evidence for this seems quite strong, as argued by Hoekman and Tas (2020). Therefore, testing for tender volumes as a single variable effect in a low sample size study is relatively little interesting. However, in a configurational research setting, the volume of a contract might reveal links with other factors, such as a better design of contracts for higher volumes. Indeed, high volumes might require precise award criteria and division into lots. Furthermore, it is imaginable that both high or low volumes could incite increased competition. Regarding the dimensions, tender volume on the one hand falls under tender characteristics as the discretion to amend volumes for authorities is low, thus strongly contingent on the nature of the product or service to be procured. On the other hand, if the condition is found to interact strongly with the design of the contract, together leading to the success of SMEs, arguments for enhanced need for administrative capacity in the form of expertise of balanced contract design or administrative culture in the form of pro-SME design can be made. Data on tender volumes are retrieved from the contract award notice.

e) Number of bids/competitiveness

The number of bids condition is a marker for the attractiveness of tenders as more bids are expected for tenders with tempting conditions. Similarly, the higher the number of bids the fiercer the competition around a tender. As such, bids are a prudent indicator for the intensity of competition among tenderers. Adding to that, a look to the data reveals interesting information on whether the final tender price differed from the initial estimation, further helping to gauge the intensity of competition. The logic at play would then suggest that a higher final price is linked to lower competition, while a lower price might be a result of price competition. Thus, two indicators from the case data are used to determine the level of competitiveness. Linking to the theory, competition around a tender is beneficial to consumers as the final price might be lower and the delivered quality higher. Also, competitive tendering is both believed beneficial to SMEs, as well as SMEs are considered conducive to competition (Albano, 2017). Hence, the condition arguably has some endogeneity with respect to other conditions gauging the attractiveness and accessibility of tenders for SMEs because a large number of bidders might be proof to good initial conditions or reversely a low number of bids could indicate bad conditions.

Next, similar to the volume of tenders, the procuring authorities can only take limited influence on the number of bids, thus the last condition more purely reflects the tender characteristics dimension. However, as mentioned, high numbers of bids are closely linked to how attractive a tender is. This, in turn, reflects the administrative ability to design tenders so as to increase the number of bidders and thereby the chances for a good value for money purchase, surely touching upon the administrative capacity dimension. The number of bids as well as the difference in final and estimated price, are published in the contract award notices.

3.5 Calibration

In order to compare the collected cases in QCA, the case information needs to be uniformly converted into numerical data (Gerrits, Verweij, 2018). In QCA this is done via a process of calibration for every case, assigning set membership scores to each condition. These set memberships take values between 0 and 1, representing no membership at all and full membership in the condition. No and full membership thus is understood as presence or

absence of a case in a condition. Many studies using QCA rely on this binary 0;1 calibration or crisp set QCA, while others assign membership on a continuum between 0 and 1. The latter method called fuzzy set analysis (Ragin, Davey, 2016) essentially allows the researcher to decide on membership degrees given the breadth of information and complexity available, provided that thresholds can be motivated given the theory and available data (Gerrits, Verweij, 2018; Wagemann, Schneider, 2007). In this work, a fuzzy set QCA is chosen as various conditions arguably are difficult to conceptualize merely on a binary scale. For instance, while contract design could be thought of as binary beneficial or detrimental, assigning no administrative capacity or no history with SMEs at all, is hard to motivate and likely to nullify valuable information of the cases. Therefore, in line with relatively common QCA research (Gerrits, Verweij, 2018; Pappas, Woodside, 2021), a calibration using two extra thresholds is deemed appropriate. The result is a calibration with the four scores 0;0.33;0.67;1 or in words, fully out; rather out; rather in; fully in. An exception to the fuzzy set calibration is the outcome condition, simply calibrated as 0 if the SME did not win the tender and 1 if it did. An example with random values to visualize the case calibration is provided in the table below.

Example table - case calibration:

Conditions	Administrative capacity	SME history	Contract design	Tender Volume	Number of bids	Outcome condition: SME success
Case 1	0.33	0.67	0	0.33	1	1
Case 2...	0.67	1	1	0.67	0.33	0

Table 4

Furthermore, all conditions are calibrated in the same direction, meaning a 1 always constitutes best and a 0 worst chances or conditions for SMEs. Such choice was made in order retain a lean version of the data and to be able more easily spot mistakes and inconsistencies, despite the ability of the fsqca software to distinguish whether a condition’s presence or absence is supposed to contribute to the presence of the outcome (Ragin, Davey, 2016). The next 5 sections discuss and present the calibration for each condition. Note, a table providing an overview of the raw case data can be found in the appendix.

a) Good procurement score: administrative capacity

Although the range for the administrative capacity scores is from 0 to 100 on the opentender scoreboard, all cases in this study cluster between 15 and 40, thus displaying a quite unvaried distribution. The reason could be the method used by opentender using relatively broad categories that are widely considered important in procurement activity in the Dutch system. In short, the quite similar scores, as expected earlier, indicate strong reliance of the method on legal or other codified rules in public procurement in the Netherlands, allowing for little variation. However, the narrow clustering of the case scores suggests that the reported average score of 27 for the comparison group in the year 2020 is a prudent threshold for calibration. In order to confirm such threshold, the mean and median of the case scores are calculated yielding 28 and 27 respectively. Now, there is the cautionary note to not overly rely on mechanical distinctions of the data as QCA is to be fed with rich case information (Gerrits, Verweij, 2018). Yet, for administrative capacity the scores are fixed by the internal method used by opentender with the clear advantage that score of 27 of the comparison group is published. During data collection, some cases did not report any scores for the year 2020, thus the 2019 value is considered. Interestingly, the comparison group score 2019 was at 32, hence apparently dropped by 5 points between the two years. The calibration of the condition responds to this drop, making 27 the cross over point, but considering the score as a limited or rather out membership. Scores of 28 or above then constitute memberships of rather in and fully in, with 31 being the next threshold. On the lower tier, 24 is the threshold with any value below scoring a fully out membership for the administrative capacity condition. The calibration is presented in the table below.

Calibration – Administrative capacity:

Below 24	Fully out
24 until and including 27	Rather out
28 until and including 30	Rather in
31 and above	Fully in

Table 5

b) SME History

In 2018 63% of all tenders in the Netherlands were awarded to SMEs (SBA, 2019). Using this indication, for each case in this study, the procurement history of the Regional or Municipal Authority is reviewed and the last 30 tenders of that authority (or less if 30 are not available) are assessed on their ratio of SMEs winning tenders. For some procurers or more precisely the cases 9,16,18,22,23,25,28 there were not sufficient tenders in the selected time period, thus the ratio that could be identified is mathematically or artificially inflated to a ratio out of 30. Evidently, such operation is rather suboptimal, but since only case 16 and 18 with 10 or 7 tenders respectively display very low tender activity, with the five remaining outliers ranging between 17 to 29 identifiable cases, the data manipulation is defensible. Since the calibration relies on a secondary threshold, namely the EU Commission's assessment, the average values of the sample in this study are interesting markers for the research. The sample produces a mean of 70.3 and a median of 70. Such findings could suggest progress in SME success between 2018 and 2020, but could also be due to the case selection as the sample size of $n=28$ is fairly low. One indication for the progress assumption is provided by the EU Single Market Scoreboard (2021), displaying a slight increase in the share of SMEs winning tenders between 2018 to 2019, which appears relevant since for many procurers in this study data on procurement activity was retrieved from 2018 to 2021.

However, a limitation to the significance of this result is posed by the choice of procurement areas as core CPV codes are linked to slightly better chances for SMEs (PwC, 2014). One obvious other limitation is that bigger procurement authorities such as Amsterdam or Rotterdam easily procure 30 contracts over a few months or weeks, while others tender only a few times a year. In sum, it is not possible to infer generally more favourable conditions, but it might be cautiously contended that they at least did not worsen. The retrieved data is then calibrated so as to assign membership to the condition SME History. To that end, the identified mean and the 2018 mean are used as benchmarks for membership. That is, despite the cautionary note by Gerrits and Verweij (2018) to not overly rely on benchmarking via simple averages, the average of this condition represents a case-sensitive measure as it relates to a Netherlands wide benchmark, which gave rise to the EU Commission's advice to improve public procurement for SMEs in the Netherlands. The choice for mathematical averages is further motivated by the median value at 0.7, with 12 cases scoring below 0.7, 13 cases above and 3

cases at 0.7, thus suggesting a varied distribution of the cases. The slightly more complex reasoning for the assignment of membership is as follows:

1. Any value below the 2018 average of 0.63 cannot be considered as substantial membership, since the average of the cases in the sample is much higher at 0.7
2. Any value above 0.7 indicates a more than average SME-friendly procurement style given this data sample and the Dutch (0.63) and EU averages (57.3) of 2018 and therefore constitutes higher membership
3. Any value below 0.63, it follows, must be considered fully out of being a member to the condition as it indicates a deterioration of the 2018 value, that, given the data trend and average of 0.7 should not occur
4. Any value between 0.63 and 0.7 represents an ambiguous degree of membership as the reason for differences in between these values cannot be well determined. However, cases displaying such value are regarded rather out as they underscore the average of the data sample, therefore by any means not showing much progress since 2018.
5. Any value above 0.7, but below 0.8 constitutes some better degree of membership, but is not yet close to how high the percentage should be given the much higher numbers of SMEs vis a vis non -SMEs. These cases then are labelled rather in
6. Above 0.8, up until 1, cases begin to resemble the company population size in the Netherlands and are thus considered fully in

In sum, the calibration yields the following thresholds.

Calibration – SME History:

Below 0.63	Fully out
Between 0.63 and 0.69	Rather out
Between 0.7 and 0.8	Rather in
Above 0.8	Fully in

Table 6

c) Contract design (absence of red tape)

Contract design is the only composite condition, aggregating membership over the two sub factors award criteria and splitting of contracts into lots. Both factors are first discussed individually before they are assigned a single membership score.

1. Award criteria

Stating clear award criteria in terms price and quality is essential for SMEs. Furthermore, award on quality criteria or price-cost effectiveness as well as price preferences are considered more conducive to SMEs than a purely price-based award (Hoekman, Tas, 2020). Looking at the data, many cases in this study provide a breakdown on the percentages by which bids for tenders are assessed. Being helpful information for companies bidding for tenders, the study rules that if percentages are given, the cases are not labelled fully out. As quality criteria are considered more conducive than price (see for instance Hoekman, Tas, 2020), any indication of criteria with 75% or more designated to quality is labelled fully in. 50/50 quality price is the lower threshold for rather in, as well as rather in applies if specific quality criteria are given without percentages. Rather out are those cases which have quality criteria below 50%, but above 30% or those where only a mix of price and quality is mentioned but without percentage markers. Fully out then are cases with 70% or more for price criteria or cases only stating price criteria without percentages.

2. Lots

Examining the sample yields that 28,6% of tenders have lots. However, the Netherlands-wide percentage in 2018 was only 16,7% vis a vis a European average of 29,89% (SBA, 2019). The stark difference is unlikely to be only due to an improvement in the number of contracts with lots, as this would constitute almost a 200% increase between 2018 and 2020. Given the sample size, it is quite likely that some of this large difference accrues due to the case choice, biasing the average. However, the indication by the PwC study (2014) regarding the positive link between the *core* CPV codes and SME share in procurements in combination with the strong evidence on presence of lots in contracts and SME success (Albano, 2017; Hoekman, Tas, 2020; Loader, 2013), legitimize the cautious assumption that *core* CPV codes indeed represent a comparably favourable set of procurement contracts. In conclusion, given that lots are relatively rare it would indeed be unwise to make it a condition on its own and further it can

be questioned whether a fuzzy set calibration is appropriate for such condition. Therefore, the aggregation with award criteria uses lots on the binary scale 0 for no lots and 1 for lots.

3. Aggregation for contract design

Naturally, in order to calibrate both factors to one condition, the cases shall be looked at closely. If both have the same degree of membership, the final condition simply takes on the same. If both differ by two levels (e.g. fully out, rather in), the in-between degree is to be chosen, (rather out in this case). As a central benchmark, if there are lots in the tender case, the final condition cannot take any value below rather in. The scaling and thresholds for all eight logically possible combinations are found in the table below.

Calibration – Contract design:

Award Criteria=0 + Lots=0	Fully out
Award Criteria=0.33 + Lots=0	Fully out
Award Criteria=0 + Lots=1	Rather out
Award Criteria=0.66 + Lots=0	Rather out
Award Criteria=0.33 + Lots=1	Rather in
Award Criteria=1 + Lots=0	Rather in
Award Criteria=0.66 + Lots=1	Fully in
Award Criteria=1 + Lots=1	Fully in

Table 7

d) Tender volume

Tender volume is an indicator for the likelihood of an SME being successful (Hoekman, Tas, 2020). A PwC study (2014) revealed that in 2011 EU-wide tenders ranging from 30.000 to 300.000 were most likely to be won by a SME (PwC, 2014). For that reason, the mean tender volume or value does not constitute a prudent threshold in the context of such low n study, Instead, minding the distribution of SME awards across volumes as evidenced by the PwC study (2014), a choice is made to assign membership to a condition on the basis of how “proximate” the tender volume of a case is to the more optimal volumes. To explain, the 2014 study found volumes between 30 000 and 100 000; and 100 000 and 300 000 to yield the highest share of SMEs, 64% and 61% respectively, being awarded a tender. Thus, in this work, all volumes in the

combined range of 30 000 to 300 000 constitute full membership. The two adjacent volume groups 10 000 to 30 000 and 300 000 to 1 Million both showed 57% success and are assigned a rather-in membership. The same counts for volumes below 10 000 with still 55% success rate. Volumes between 1 and 5 Million are with 34% rather out, while cases above 5 Million with merely 21% success of SMEs are labelled fully out. The breakdown is displayed in the following table.

Calibration – Tender volume:

Above 5 Million	Fully out
Between 1 and 5 Million	Rather out
10 000 to 30 000; 300 000 to 1 Million; Below 10 000	Rather in
Between 30 000 and 300 000	Fully in

Table 8

e) Competition – number of bids

The level of competition is gauged mainly by the number of submissions for the tender cases. The calibration in this case neither relies only on the literature nor purely on the mean or median of the sample. Rather, thresholds are drawn according to the expected intensity of competition, further using, as mentioned, information where available on whether the final bid undercut or exceeded the original volume or value estimation. The idea is that a lower final bid indicates higher competition and reversely a higher final price less competition. Unfortunately, such information is only available for 5 out the 28 cases in the sample. Naturally then, 1 submission for a tender means competition is non-existent, thus cases are assigned a 0 membership in the condition. The other thresholds are loosely connected to the mean of 4.5, but only to the extent and under the provision of the final price not being higher than estimated. Thus, submission of more than 4 bids results in rather in or fully in for the membership of the cases, unless the final price was higher. Below, the thresholds for the competition condition are displayed.

Calibration – Number of bids:

1 Submission	Fully out
Between 2 and 3 Submissions	Rather out
Between 4 and 7 Submissions	Rather in
8 or more Submissions	Fully in

Table 9

The next chapter discusses the various steps taken in the analysis, and presents the results of the QCA.

4. Results

In order to conduct the QCA, the fsqca software (Ragin, Davey, 2016) is used, as it provides the researcher with a quite straightforward way to enter the data and step-by step run the analysis (Ragin, Davey 2016). First, the statistical means of the conditions are retrieved, so as to detect whether there are strong outliers among the conditions, potentially indicating skewed calibration to very high or low membership degrees. Second, the necessary conditions are examined as they help to model the configurations of conditions leading to the success of SMEs. Necessary in the context of the QCA in this study means conditions that necessarily need to display high membership for the outcome condition to be present. As a last process, sufficiency of the conditions is tested for by means of producing and minimizing a truth table displaying the configurations that lead or do not lead to the outcome.

4.1 Descriptive Statistics

Variable	Mean	Std. Dev.	Minimum	Maximum	N Cases	Missing
Admin	0.5232143	0.3619595	0	1	28	0
SMEHistory	0.5007143	0.3734294	0	1	28	0
Contract	0.4525	0.3595794	0	1	28	0
TenderVol	0.5353571	0.3822255	0	1	28	0
Bids	0.6196429	0.2643115	0	1	28	0
SMEwon	0.5357143	0.4987229	0	1	28	0

Table 10

With mean values ranging from 0.45 to 0.62 the conditions display quite some variation in their degrees of membership, yet all are relatively close to the arithmetic mean of 0.5. The number of bids competition with its value of 0.61 could however mean that the condition is skewed somewhat to higher membership of the cases. In the following the necessary conditions are examined.

4.2 Necessary conditions

Analysis of Necessary Conditions

Outcome variable: SMEwon

Conditions tested:

	Consistency	Coverage
Admin	0.554667	0.567918
SMEHistory	0.668000	0.714693
Contract	0.556000	0.658248
TenderVol	0.443333	0.443629
Bids	0.600667	0.519308
Admin+SMEHistory	0.779333	0.648724
Admin+Contract	0.778000	0.625402
SMEHistory+Contract	0.756667	0.641968
Contract+TenderVol	0.711333	0.533233
TenderVol+Bids	0.645333	0.467859
Contract+Bids	0.756667	0.566650

Table 11

4.2.1 Consistency

For the test of necessity each condition is at first assessed individually. Consistency then refers to the percentage by which the condition is present in the outcome and is read as follows. In 55% of the cases where the outcome is present administrative capacity has high membership, similarly in 67% of the cases the condition SME history scores high. Overall, the individual conditions as retrieved from the table display rather medium percentages in their consistency values and the lowest value is reached by tender volume with only 44%. The encircled configurations on the bottom of the table however have higher consistency values. The + sign here denotes the expression "in about 78% of the cases where the outcome is present administrative capacity **or** (+) SME history is present". The configurations or unions (Gerrits, Verweij, 2018) tested for are chosen upon their expected relationship in terms of conditionality to each other. For instance, administrative capacity or SME history both relate to the underlying characteristics of the procuring authority and could be substitute conditions (for an elaboration on substitute conditions see, Ragin, Davey 2016) if both have high membership. As seen in the table, the presence of the contract condition as a marker for conducive contract design for SMEs displays also percentages above 75% when tested for in union with administrative capacity or SME history, which is quite intuitive given that capable or SME experienced

administrations also know how to set up contracts suiting SMEs making it another possible substitute. Hence, where administrative capacity or contract design or conversely SME history or contract design have high membership values, the outcome is present in 75%-78% or 21-22/28 of the cases. Lastly, either contract design or number of bids are further conceived of to be possible substitutes as well-designed contracts might be endogenous to attractive tenders in the sense that accessible contracts cause more bids. Indeed, their union (+) reports a value of 0.75. In conclusion, these a or b configurations are included in the analysis as it is worthwhile to inquire whether substitutability of two conditions, regarded as theoretically closely connected, leads to necessity.

4.2.2 Coverage

The second column produced in the table shows the coverage percentages that read as: "in 71% of the cases in which SME history has a high degree of membership, SMEs win a tender. Thus, unlike the consistency that asks in how many cases where the outcome is present the condition is present too, the coverage asks in how many cases where the condition displays high membership is the outcome present (Gerrits, Verweij, 2018). Comparing the scores for each variable yields some interesting insights. First, for the administrative capacity condition there is basically no difference observed, while SME history remains with 71% the strongest single explanatory condition. The contract design condition has a higher coverage than consistency, meaning in 65% of the cases in which contract design is beneficial, SMEs are successful. Tender volume remains the lowest scoring condition, while the level of competition as denoted by the number of bids reduces from a 60% consistency to a 51% coverage value, therefore high competition is necessary for SME success in just above half the cases. For the conditions tested in configuration the values drop by about 10 to 15% respectively, yet retaining the ranking between them. One minor exception is the configuration of either administrative capacity/contract design or SME history/contract design as the consistency of admin + contract is with about 0.78 higher than 0.76 consistency of SME history + contract, but the coverage is marginally lower by about 0.015 points.

In sum, SME history appears to be a necessary condition reaching the 70% threshold (Pappas, Woodside, 2021). This is also reflected in the configurational checks with SME history or administrative capacity or with contract design. Lastly, the union contract design or bids is

despite a relatively low consistency value, a potential candidate for an important condition. The following part entails the test for sufficiency and discusses the results.

4.3 Sufficient conditions

Testing for sufficiency requires a thorough step by step process. First, the truth table is created displaying all logical configurations. Second, the resulting configurations need to be defined for their effect on the outcome, requiring the researcher to define a sensible threshold for inclusion and then minimisation. Thirdly, the results are presented and discussed. The following section deals with the first “clean-up” of the truth table, offering multiple pathways for sorting the configurations of conditions.

4.3.1 Logical remainders

In this study, there are 32 possible rows or 32 unique configurations because 5 ($2^5=32$) conditions are included. The 28 cases are distributed over 17 rows, leaving 15 empty or not observed. Such phenomenon is called logical remainders. The reasons for its occurrence can vary. First, with $n=28$ the number of cases is lower than the 32 possible configurations, thus there are four arithmetic logical remainders in this study (Schneider, Wagemann, 2012). Second, cases can cluster in the same truth table row if they display similar values in their conditions, thereby increasing the number of remainders (Gerrits, Verweij, 2018). In this study, rows #1,#2,#3,#7,#11,#13,#16#,#17 have more than one case. Row #1 even has four and row #17 has three. The number of logical remainders due to clustering increases by one for each row with two cases, by two for each row with three cases and by three for four cases per row. This study counts eight rows with more than one, one row displaying two and one row three extra cases, totalling $6*1 + 1*2 + 1*3 = 11$ logical remainders. Together with the four arithmetic logical remainders the 15 empty rows are covered. In sum, all logical remainders can be explained given the number of arithmetic and clustered remainders. As a next step, it is worthwhile to devote some attention to the empty configurations, so as to gain insight into why certain configurations are not observed.

4.3.2 The empty rows

Common reasons for empty rows are that they impossibly exist in the real world or that they are logically well possible but simply not observed given the choice of cases in this study (Schneider, Wagemann, 2012). The latter possibility might yield valuable information for the analysis as the strength of certain configurations and conditions can be confirmed or questioned given the empty rows. A few observations appear particularly important.

Empty truth table rows #18-#32:

Admin	SMEHistory	Contract	TenderVol	Bids	number	SMEwon	cases	raw consist.	PRI consist.	SYM consist
1	0	0	0	0	0	0 (100%)	cases			
0	1	0	0	0	0	0 (100%)	cases			
0	0	1	0	0	0	0 (100%)	cases			
1	0	1	0	0	0	0 (100%)	cases			
0	1	1	0	0	0	0 (100%)	cases			
1	0	0	1	0	0	0 (100%)	cases			
0	1	0	1	0	0	0 (100%)	cases			
0	0	1	1	0	0	0 (100%)	cases			
0	1	1	1	0	0	0 (100%)	cases			
1	1	1	1	0	0	0 (100%)	cases			
1	0	0	0	1	0	0 (100%)	cases			
0	0	1	0	1	0	0 (100%)	cases			
1	1	1	0	1	0	0 (100%)	cases			
0	0	1	1	1	0	0 (100%)	cases			
1	0	1	1	1	0	0 (100%)	cases			

Table 12

Presence of only one of the first three conditions thus only administrative capacity, only SME history or only contract design in absence of all other conditions is not observed as indicated by the rows #18, #19, #20. Reversely, the two conditions tender volume and bids are observed as singularly present in configuration row #15 and #16 as seen in the table 15 below, yet these display very low consistency values and do not lead to the outcome. Overall the observation that neither condition is sufficient by itself for the outcome to occur further underlines the results of the necessary conditions test, finding only SME history as a necessary single condition. Another take away from the empty rows is that of all the possible five configurations that feature four, hence most of the five conditions the two non-observed configurations are the ones missing either SME history or bids. The other three configurations featuring four conditions are observed. The fact that SME history as the only absentee condition is not

observed in any empty row is an argument in favour of its importance for the occurrence of the outcome. The absence of bids is interesting, because all the other four conditions are initially considered more conducive to SMEs. That is, the number of bids is rather a marker of the intensity of competition of a tender, not necessarily favouring SMEs the same straightforward way it is expected from for instance beneficial contract design or administrative capacity. However, number of bids as evidenced by the descriptive statistics of the QCA has the highest calibrated mean value of 0.62, thus making it slightly more likely to be present in configurations and conversely less likely to feature strongly among the non-observed. Also, the sample size of $n=28$ might be too small to capture certain configurations that in larger samples could well feature the outcome. Lastly, impossible conditions do not seem to be an issue in this study, as all configurations could logically materialize in the real world.

In conclusion, the logical remainders do not yield problematic configurations and can be explained given the arithmetic and cluster logics. The analysis of the empty rows however gives away the interesting observation that presence of the four most strongly connected conditions to the outcome is, contrary to expectation not observed. The next section explains how the truth table is further minimised.

4.3.3 Truth table minimisation

In order to carry out the analysis of sufficiency, the empty rows are deleted from the analysis. The 17 remaining configurations, in a next step, need to be defined on their effect on the outcome SMEwon. The underlying logic at play here is that high raw or PRI consistency values (Pappas, Woodside, 2021), suggest the presence of the outcome condition. The literature differs on the exact threshold, some suggest 0.75 (Rihoux & Ragin, 2009) as the cut-off point, others argue any consistency value below 0.7 should be regarded with caution (Gerrits, Verweij, 2018; Wagemann, Schneider, 2007). In fact, however, Gerrits and Verweij (2018) contend that due to the case-sensitive nature of the QCA any such threshold needs to follow sensical choices given the case material instead of being strictly introduced at a fixed cut-off value. In this study, the threshold is determined by first ordering the consistency values in a descending order and second by investigating whether the type of consistency value, raw or PRI differ from each other. The latter turns out to not be the case in this study. Another decision the researcher needs to make is to decide how many cases need to be present in a configuration to be included, so as to increase explanatory power of the conditions (Pappas, Woodside, 2021). In

this study, one case suffices as the frequency cut-off, because the sample size of n=28 is fairly small. Pappas and Woodside (2021) in their study set the number of necessary cases at 3 as their study contains n=582 cases. As n=28 is still far off such high sample sizes, the choice for 1 case as the minimum appears defensible.

Truth table with observed configurations:

Admin	SMEHistory	Contract	TenderVol	Bids	number	SMEwon	cases	raw consist.	PRI consist.	SYM consist
0	1	1	0	1	4		cases	1	1	1
1	1	1	0	0	2		cases	1	1	1
0	1	1	1	1	2		cases	0.900602	0.900602	0.900602
1	1	0	0	0	1		cases	0.889262	0.889262	0.889262
1	1	0	0	1	1		cases	0.889262	0.889262	0.889262
0	1	0	0	1	1		cases	0.875472	0.875472	0.875472
1	0	1	1	0	2		cases	0.712446	0.712446	0.712446
0	1	0	1	1	1		cases	0.700906	0.700906	0.700906
1	0	0	1	1	1		cases	0.667506	0.667506	0.667506
1	0	1	0	1	1		cases	0.598187	0.598187	0.598187
0	0	0	0	0	2		cases	0.582915	0.582915	0.582915
1	1	0	1	1	1		cases	0.581864	0.581864	0.581864
1	1	1	1	1	2		cases	0.535963	0.535963	0.535963
1	1	0	1	0	1		cases	0.498489	0.498489	0.498489
0	0	0	1	0	1		cases	0.453297	0.453297	0.453297
0	0	0	0	1	2		cases	0.426724	0.426724	0.426724
0	0	0	1	1	3		cases	0.39759	0.39759	0.39759

Table 13

The rows #1 to #6 display high consistency values above 0.8, each containing one or more cases featuring the outcome condition SMEwon. These rows are therefore assigned a 1 in the column SMEwon. From row #6 to #7 consistency takes a dive from about 0.88 to 0.71, suggesting a sensible cut off point (Gerrits, Verweij, 2018; Ragin, Davey, 2016). The truth table including the threshold is presented below, followed by the discussion of the results.

Truth table with consistency cut-off:

Admin	SMEHistory	Contract	TenderVol	Bids	number	SMEwon	cases	raw consist.	PRI consist.	SYM consist
0	1	1	0	1	4	1	cases	1	1	1
1	1	1	0	0	2	1	cases	1	1	1
0	1	1	1	1	2	1	cases	0.900602	0.900602	0.900602
1	1	0	0	0	1	1	cases	0.889262	0.889262	0.889262
1	1	0	0	1	1	1	cases	0.889262	0.889262	0.889262
0	1	0	0	1	1	1	cases	0.875472	0.875472	0.875472
1	0	1	1	0	2	0	cases	0.712446	0.712446	0.712446
0	1	0	1	1	1	0	cases	0.700906	0.700906	0.700906
1	0	0	1	1	1	0	cases	0.667506	0.667506	0.667506
1	0	1	0	1	1	0	cases	0.598187	0.598187	0.598187
0	0	0	0	0	2	0	cases	0.582915	0.582915	0.582915
1	1	0	1	1	1	0	cases	0.581864	0.581864	0.581864
1	1	1	1	1	2	0	cases	0.535963	0.535963	0.535963
1	1	0	1	0	1	0	cases	0.498489	0.498489	0.498489
0	0	0	1	0	1	0	cases	0.453297	0.453297	0.453297
0	0	0	0	1	2	0	cases	0.426724	0.426724	0.426724
0	0	0	1	1	3	0	cases	0.39759	0.39759	0.39759

Threshold

Table 14

When fed with a sorted truth table, the fsqca software produces three results per analysis. These need to be briefly discussed in order to define their respective roles in this study. The subsequent discussion lines out the common arguments of the debate and concludes with the core choice, the complex solution, for this work.

4.4 Solution formulas

QCA is a method under constant development. Unlike most applications of common statistical methods, the interpretation and classification of the results especially remain a topic for debate (Schneider, Wagemann, 2007). Central to this debate is the question which of the three solution formulas should be considered as the key result. Some argue that while all solutions formulas are to be publicized, the researcher is free to choose which solution to focus her attention on (Schneider, Wagemann, 2007). Others suggest to follow the internal logic of the solutions. The latter argument centres around the composition of the solution formulas, holding that the complex solution is the least simplified solution, while the parsimonious and the intermediate solution are more simplified and set a focus on the core solutions. In fact, some researchers reject the complex solution as too little focused and impractical (Pappas, Woodside, 2021) as it excludes all counterfactuals that still could contribute to a simpler solution (Ragin, Davey, 2016), while others express their preference for its potential to better capture complexity

(Gerrits, Verweij, 2018). Eventually however, any decision to interpret the results by means of either solution needs to be motivated by the study material at hand. That means, it must be possible to read solution formulas in a way that makes sense given both the cases and the theory used to construct the study (Gerrits, Verweij, 2018). The following subchapter illustrates the three solution types and discusses the results, before turning to the interpretation of the solution formulas.

a) Complex Solution

```

--- COMPLEX SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.875472

              raw      unique
              coverage  coverage  consistency
-----
Admin*SMEHistory*~TenderVol*~Bids      0.288      0.068      0.929032
SMEHistory*~Contract*~TenderVol*Bids    0.221333    0.0453334    0.909589
~Admin*SMEHistory*Contract*Bids        0.334      0.18      0.938202
solution coverage: 0.535333
solution consistency: 0.924051

```

b) Parsimonious Solution

```

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.875472

              raw      unique
              coverage  coverage  consistency
-----
SMEHistory*~TenderVol      0.468      0.223333    0.955102
~Admin*Contract            0.334      0.0893334    0.752252
solution coverage: 0.557333
solution consistency: 0.808511

```

c) Intermediate Solution

```

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1
consistency cutoff: 0.875472
Assumptions:
Admin (present)
SMEHistory (present)
Contract (present)
TenderVol (present)
Bids (present)

              raw      unique
              coverage  coverage  consistency
-----
Admin*SMEHistory*~TenderVol      0.332667    0.09      0.93797
SMEHistory*~TenderVol*Bids      0.378      0.0226666    0.945
~Admin*SMEHistory*Contract*Bids  0.334      0.0893334    0.938202
solution coverage: 0.557333
solution consistency: 0.926829

```

Table 15

4.5 Model and solution fit

On a first note, the threshold employed for consistency proves to reduce ambiguity as the software does not report tied conditions. Such tied conditions essentially are a sign of ambiguity among possible solutions formulas and require making informed choices on which solution is to be regarded more fitting in the context of the study (Ragin, Davey, 2016). Since this, however, is not the case in the study at hand, the threshold chosen appears quite solid. Furthermore, the overall solution consistency, representing how consistent the different pathways are with the outcome (Ragin, Davey, 2016), is with 0.92 quite high. Thus, membership in the solution formulas is a subset of the outcome in nearly all instances. The solution coverage capturing the degree to which the pathways of the complex solution account for the occurrence of the outcome (Pappas, Woodside, 2021) reaches about 0.54. That means, a little more than half of the membership in the outcome is covered by membership in the three pathways of the complex solution, which is an intermediate score and comparable with the R^2 value in regression analyses (Gerrits, Verweij, 2018). A reason for the solution coverage being only intermediate might lie with the high consistency cut-off point chosen for analysis, as only 11, thus relatively few cases of the whole sample, are captured in the rows #1 to #6. Overall however, the model appears to reach a good consistency and steers clear of large ambiguities in the solution terms as confirmed by the lack of tied conditions. Having determined the model fit of the complex solution, the next subsection turns to the discussion of the three pathways.

4.6 Solution pathways

The first interesting observation is the fact that no condition alone suffices for the presence of the outcome. Thus, for the most part similar to the analysis of necessary conditions, only combinations of conditions account for SME tender awards. Further, as can be seen in all three solution formulas of the complex solution, a good track record with awarding tenders to SMEs is present in each pathway to the outcome, confirming the key role for the condition as suggested by prior analyses. However, the conditions conjoining it in configurations differ across the formulas. The first pathway features administrative capacity with SME history and both the absences of beneficial tender volume and competition. Such finding points to a positive link between two of the three administrative conditions, contract conditions miss in this case, and suggest that they suffice for SMEs to win if volumes and competitiveness of

tenders are non-beneficial. In other words, tenders with rather high volumes, for which there are few competitors tend to be won by SMEs if the contracting authority has general expertise in procurement and a good track record with SMEs. The second pathway further underlines the strength of a positive history with SMEs, featuring the condition in absence of good contract conditions and conducive volumes, but with the presence of higher competition. In short, the latter solution suggests a good chance for SMEs in the situation where competition is high, if the track record of the procurer remains good. Interesting here is the continuous absence of beneficial volumes and the absence of good contract conditions, indicating SMEs win despite these shortcomings if the procurer is familiar with SMEs and where competition is high. The last pathway provides an insightful addition to the other two, holding that in tenders where the procurer lacks standard expertise, a good track record, a conducive contract design and higher competition suffice for the outcome to occur. In conclusion, each solution requires a track record with SMEs on the procurer side, in combination with either high competition, procurement expertise or if expertise is missing, both good contracts and competition. The following subsection classifies the conditions featuring in the pathways and preliminarily ranks them by importance.

4.6.1 INUS conditions

Since neither condition alone suffices for the outcome to occur, all conditions featured in the formulas are INUS conditions, themselves insufficient, but necessary in conjunction with other conditions for the outcome to occur (Gerrits, Verweij, 2018). The most straightforward INUS condition is SME history, as it is a necessary part for each of the three pathways. Next, the Bids or competition condition is necessary too in all pathways, twice by presence and once by absence. Tender Volume features as absent in two formulas, making it a relatively strong negative INUS condition. Lastly, contract design and administrative capacity each appear twice, once as absent once as present, but never together absent or together present in any pathway. They are weak INUS conditions, both requiring the conjunction with SME history. Contract design additionally occurs only in absence of administrative capacity. Below, the concepts of equifinality and multi-finality are discussed and the different pathways are examined on their explanatory strength.

4.6.2 Equifinality and multi-finality

Equifinality refers to the possibility that multiple and different configurations can lead to similar outcomes (Gerrits, Verweij, 2018). In this work, equifinality is confirmed, as three different pathways in the complex solution lead, with only marginally differing consistency values, all to the success of SMEs in public procurement. The consistency values of each solution formula are 0.93; 0.91; 0.94. Now, in order to rank the solutions, the measure of raw coverage is a key determinant as it displays the degree to which the outcome is explained by each pathway (Gerrits, Verweij, 2018). The results yield that the pathway (3) ~Admin*SMEHistory*Contract*Bids with a coverage of 0.33 has the most explanatory power, then followed by the first displayed term (1) Admin*SMEHistory*~TenderVol*~Bids with 0.29. With a raw coverage of 0.22 the last in the ranking is the solution formula (2) SMEHistory*~Contract*~TenderVol*Bids, suggesting that the presence of contract design, rather than its absence accounts for the outcome. The reverse appears to be true for administrative capacity, as the solution formula reaches a slightly higher coverage when it is absent. Indeed, taking a look at the parsimonious solution, serving only as an auxiliary here, shows that one pathway featured is contract design in the absence of administrative capacity. Therefore, it can be assumed that a good contract design, especially in conjunction with SME history leads to the success of SMEs. The level of competition represented by Bids remains relatively ambiguous across the pathways, but is present twice. A last measure to define the solution formulas' importance is unique coverage, indicating how much of the outcome is explained by each single pathway. Here the ordering of the three solution formulas with 0.07; 0.05 and 0.18 is the same as for the raw coverage, yet with an even starker difference between the strongest explanatory pathway 3 and the next strongest 1. Also, the consistency value for pathway 3 is by a small margin the highest among the three, thus making it the most plausible solution formula for explaining SME success in this study.

Multi-finality

In order to subject the conditions and their conjunctions to further scrutiny, a check for multi-finality is conducted. Multi-finality essentially just means that similar conditions can cause differing outcomes depending on their conjunction with other conditions (Gerrits, Verweij, 2018). Retrieving such information requires reversing the analysis of sufficiency, thus switching the outcome condition to negative. The complex solution is regarded in this case so as to retain

comparability. The results yield four pathways leading to the absence of the outcome. However, only the first of these solutions reaches with 0.69 a consistency close to 0.7, while the other three range from 0.4 to 0.5, thus displaying high ambiguity (Pappas, Woodside, 2021). The first solution formula features the conjunction $\sim\text{Admin}^*\sim\text{SMEHistory}^*\sim\text{Contract}$ with a raw coverage of almost 0.5, rejecting multi-finality for SME history clearly given its strong positive position in the main analysis. For administrative capacity and contract design the pathway suggests that rather their presence and not their absence accounts for the outcome. However, the most plausible solution formula in the main analysis (3) $\sim\text{Admin}^*\text{SMEHistory}^*\text{Contract}^*\text{Bids}$ as leading to the outcome, suggests that the absence of administrative capacity might, in conjunction with especially the presence of the contract condition and Bids, well lead to the outcome. An overview of the ranking of the formulas as well as a classification of the conditions is presented in the table below. The ranking of the conditions and solution formulas are read from top to bottom for each column separately, thus range from more significant to less significant. The next chapter then analyses the findings in the wider context of the study.

Overview conditions and solution formulas:

INUS conditions <i>not solely sufficient, but necessary for sufficient configurations</i>	Equifinality <i>configurations leading to the outcome</i>	Multi-finality <i>conditions possibly leading to both the outcome and its negation</i>
SME History	$\sim\text{Admin}^*\text{SMEHistory}^*\text{Contract}^*\text{Bids}$	Administrative Capacity (very weakly)
Number of Bids	$\text{Admin}^*\text{SMEHistory}^*\sim\text{TenderVol}^*\sim\text{Bids}$	
$\sim\text{Tender Volume}$	$\text{SMEHistory}^*\sim\text{Contract}^*\sim\text{TenderVol}^*\text{Bids}$	
Contract Design		
Administrative Capacity		

Table 16

5. Analysis

5.1 Remarks and limitations

Before diving into the analysis, a few limitation and remarks need to be discussed. The sample size of 28 tender cases is, despite being in line with common QCA applications, relatively low. Therefore, making strong causal inferences based on these cases are difficult. Moreover, the general opinion among QCA scholars is that for the cases, in order to assess them qualitatively, a substantial amount of specific information is to be collected (Gerrits, Verweij, 2018). In this study, the cases are collected and analysed cautiously, yet the data chosen to construct the five conditions is quite thin in some cases. In particular, the administrative capacity condition is directly transferred from opentender Nederland, taking on the external method's subcategories and potential raw data manipulations, potentially reducing the explanatory power of the conditions for the specific cases under review in this work (Gerrits, Verweij, 2018). Further, the condition tender volume is calibrated on the basis of a PwC study on SME success in different volume brackets, using data from 2011 across the entire EU. The direct applicability to the cases of 2020, the Netherlands, Municipalities and especially the CPV codes used, can thus be contested. Nevertheless, the patterns as elicited by the checks for necessity and sufficiency reveal insightful and workable correlations between conditions and the case material.

Other noteworthy remarks relate to the case material and the study areas that have not been covered in this work. First, a limitation is posed by the focus of the study, as it solely looks at the award stage in public procurements. Thus, further research could inquire on the barriers SMEs face during earlier process stages, such as for instance finding tenders and applying for them. Second, the four CPV codes 45,070,71,90 do not capture the full breadth of municipal procurement and only relate to infrastructural and real estate works. Wholesale inferences on the procurement behaviour of municipal authorities must therefore be treated with caution. Thirdly, SMEs, defined as companies with less than 250 employees are surely not a homogenous group and a subgroup analysis, investigating break-downs of firm size might be worthwhile (see Flynn et al., 2015 for a theoretical discussion; or the PwC study, 2014 for EU-wide evidence). Lastly, as discussed in the section on solution formulas, by making the choice for reporting and analysing the complex solution, the parsimonious solution which is

considered yielding the most causality is largely left out. The study thus is exposed to potential critique contesting the retainment of complexity at the expense of not achieving more causality (Pappas, Woodside, 2021). However, the parsimonious results strongly resemble especially the more significant solution formulas of the complex solution and the study ensures the core findings of the different solution types are not analysed contradictorily. The next part discusses the three pathways of the complex in the context of this research.

5.2 Analysis and dimensionality of findings

a) The tailored path

The most plausible solution formula of the complex solution ~Admin*SMEHistory*Contract*Bids backs up the assumption that a pro SME culture in administrations is crucial. Furthermore, the second formula of the parsimonious solution ~Admin*Contract underlines the conjunction contract conditions and absence of administrative capacity. Therefore, low scores of general procurement expertise, it seems, can be balanced out by both these other conditions. Evidently, absence of membership in the condition administrative capacity does not mean the procurer is fully unable to engage in any procurements, rather it means the authority lacks adherence to some general expertise markers, making it somewhat less skilled.

The apparent strong relationship between SME history and facilitative contract design then suggests those authorities with a good track record also design contracts more in favor of SMEs. Hence, the administrative culture dimension as such matters a great deal and appears to lead to gains in pro SME procurement capacity in the form of better contract design (Loader, 2005; 2013; Flynn, 2018). The most ideal situation for SMEs thus is to deal with a procuring authority with a good track record with small companies, suitable contract conditions and an overall competitive situation. The latter is evidenced by the presence of Bids in the solution formula. The explanation for this might be relatively simple: A procuring authority that is familiar with working with SMEs, designs a new tender with clear and quality focused award criteria, as well as potentially splits up the contract in lots. Consequently, burdens for SMEs are reduced and therefore more companies are enabled and incentivized to submit their bids. On

a brief note, more bidders naturally reduce the mathematical chance for an individual company to win. Moreover, pro SME contract design does not mean contracts are drawn up against big companies, rather the condition aims to explain the effects of reducing administrative burdens as generally more companies might feel they have a chance at fulfilling the requirements. Hence, competition indeed appears to be increased by better access for SMEs (Albano, 2017).

The fact that the absence of general procurement expertise can still lead to SME success can be explained by culture > capacity, but could also be due to the external method used to construct the administrative capacity condition. In fact, expertise in the form of employing "*Use of framework agreements, WTO regulations, Discrepancies in tender call and award, English language, Joint or centralized procurement and Electronic auctioning*" resonate quite a lot with necessary factors for large scale or even international procurements and thus might be more important to larger companies. That is, big companies usually experience more scrutiny and often bid for very large contracts, making expertise on the side of the public business partner to observe regulations and good practices disproportionately more important. Indeed, the test for multi-finality reveals at least ambiguity of the latter condition vis a vis SME success, albeit not confirming it clearly as a multi-final condition. On a final note, it can be contended that the administrative culture dimension takes a prominent role in this study, as a positive attitude toward SMEs apparently improves the capacity and willingness to design tenders in their favor. In short, culture → capacity is observed, confirming Erridge and Greer in their assumption that attitudes and skills condition each other in public procurement practices (2002).

b) The influence of administration

The second most plausible pathway explaining SME success, Admin*SMEHistory*~TenderVol*~Bids, features administrative capacity in conjunction with a good SME track record. These two suffice for the success of SMEs if the tender volume and competition are absent and thus suboptimal. In the context of the study, this reflects the situation where a procurer is often awarding to SMEs and has substantial procurement expertise, yet where the tenders have high volume and where there is limited competition. The two latter absentees rather suggest bad conditions for SMEs as reduced competition might be conditioned by high volumes, supposedly crowding out smaller companies (Hoekman, Tas, 2020). In fact, a correlation between absence of beneficial volumes and reduced competition can be assumed. So, what does this tell us? First, it tells us that when contract design is not

even featured in the pathway and volumes are non-optimal, hence when the overall contract is not designed in a conducive way, SMEs still win tenders. Second, it tells us that this is even the case when competition is reduced, which partially might be a result of such deficient contracts. And third, it proves that the combination of administrative capacity and a pro SME culture lead to SME success even in such a situation. In other words, the culture (Loader, 2005; 2013) and capacity dimension (Flynn, 2018; Hoekman, Tas, 2020; Loader, 2005) in the form of general expertise, both need to be present when the tender characteristics dimension is deficient toward SMEs due to in this case large tender volumes. To conclude, the tenders included in this pathway are likely to be large specific contracts, purchased by expert authorities with a tendency to award to SMEs, the latter in turn potentially specialized in delivering on such large contracts.

c) The unlikely competition

The third pathway with the lowest explanatory power $SMEHistory^* \sim Contract^* \sim TenderVol^* Bids$ is rather an odd candidate in the study, but confirms very strongly the good track record as being key to SME success. Indeed, bad contract conditions and impractical volumes are rather not expected to feature with high competition, yet that is the case for this pathway. A possible explanation for this observation is the track record of administrations of awarding tenders to SMEs as causing a generally positive signalling effect on SMEs to submit numerous bids or alternatively as a proof of good relationships between procurer and specific SMEs. Due to the research focus on administrations that does not elicit characteristics of specific companies and strength of relationships between companies and procuring authorities, such factors cannot be observed in this study. In the next part, a particular focus on SME history is set, as it appears as the single strongest explanatory condition, albeit not a sufficient one by itself.

5.3 The SME – an attractive business partner

Although, the QCA is configurational research method, the strong results for SME history merit a brief discussion of the condition. To do so, the public procurement landscape with regard to SME involvement needs to be dissected. Only 15% of all businesses in the Netherlands, compared to a 32% EU average, participate in tendering and the proportion of bids from SMEs is at 71.6 percent. That means that only 10.74% of SMEs in the Netherlands bid for public

tenders, which is about half the rate of the EU average (SBA, 2019). Compared to the business population of SMEs around 98-99% of all companies in the EU depending on the country (PwC, 2014), such number appears quite low. In fact, the EU single market scoreboard (2021) reports that high SME participation must become the norm given their share in the business population.

The strong link between procuring authorities' track record with SMEs and tender awards to SMEs, points to high satisfaction with SMEs in municipal public works. Such satisfaction might be due to factors as established by Loader, contending that SMEs provide the procurer with high service quality, personalized services and flexibility (2005; 2013). Dissimilarly, the assumption that SMEs often support geographically tight networks of local firms and municipalities, marked by high levels of trust and exchange, appears not to be confirmed (Pickernell et al., 2011) as the average distance of the SMEs winning the tenders is more than 50km to the procuring authority. Such distance arguably is not in direct proximity in a country as small as the Netherlands. In addition, the non-SME winning companies in the study sample are marginally closer to their procuring municipalities, further rejecting an intricate local to local small business connection in this study. However, note that frequency of how often a certain SME might supply to a certain municipality is an unobserved factor in this study, thus Pickernell et al.'s (2011) argument revolving around local as well as general trust relationships, cannot be discarded entirely given such finding.

A direct implication of the apparent satisfaction with SMEs, as seen by the positive effect of frequent SME awarding, is the opportunity to strengthen small businesses further by encouraging and facilitating them to compete in public jobs. Connected to that, the fact that less businesses in the Netherlands than in the EU average, be they small or big, participate in tendering is, besides being generally worrisome, a potential indication for high specialization of SMEs in the Netherlands. The results of this study thus might have been influenced by a relatively small cohort of smaller businesses specialized in public works and must therefore not be analysed isolated from the Dutch context. In short, while satisfaction with SMEs is an interesting finding, the low participation across the landscape remains a reason for continuous efforts to include more companies by lowering entry thresholds and incentives. The generally positive impact of experience with SMEs is a good selling point to that end. In order now to apply the insights gained from analysing the conjunctions to the case material,

the areas of procurement are woven into the analysis. On a brief note, the case material is analysed comparing the CPV codes, rather than dissected on a case-by-case basis in order to draw more general inferences (see for a discussion Gerrits, Verweij, 2018).

5.4 The CPV codes

Investigating the four CPV codes 45; 70; 71; 90 included in this study, reveals a concentration of tender cases with the CPV code 45 as featuring those conditions found to lead to the success of SME. In numerical terms, among the 11 cases above the cut-off point, 8 have the CPV code 45, a distribution of 72%, while the distribution of the CPV 45 over the whole sample is 50%. It can therefore be assumed that primary construction provides somewhat better conditions for SMEs than real estate services, architectural and engineering services or refuse, sewage and cleaning services in the context of municipal public procurement. Moreover, as only 3 cases with other CPV codes than 45 are included above the cut-off point, targeted inquiry into their dynamics appears little fruitful. Therefore, only the CPV 45 is discussed in detail in the following.

The first row contains four cases with the CPV 45, all with the same configuration and at a consistency of 1. All these cases feature SME history, contract design and competition, while administrative capacity and tender volume are absent, hence the cases resemble the solution formula (3) $\sim \text{Admin} * \text{SMEHistory} * \text{Contract} * \text{Bids}$. For that reason, in particular the "tailored pathway" appears to explain the success of SMEs in construction tenders, leading to the assumptions that construction tenders are quite competitive and that procurers might not have that much expertise given the absence of administrative capacity. However, the latter assumption remains somewhat weak, because the pathway "influence of administration" or $\text{Admin} * \text{SMEHistory} * \sim \text{TenderVol} * \sim \text{Bids}$ still captures quite some CPV 45 cases featuring administrative capacity and leading to SME success. On the other hand, the procuring authorities strongly appear to have positive experience with SMEs and seem to design tenders in clear terms regarding award criteria (Hoekman, Tas, 2020; Flynn, 2018) as well as disproportionately more often split the contracts into lots (Albano, 2017; Loader, 2013). Therefore construction, more than real estate or architectural services for instance, provides a procurement arena with better chances for smaller companies, at least when the purchaser is a municipal authority. Several factors might explain this. Note however that due to the limited

case material and the research focus, the study is unable to confirm these factors empirically, hence the short discussion below merely represents a possible extension for similar research.

First, SMEs in the construction sector might be more specialized in supplying to the public than real estate services, engineering and architecture firms, hence attributing more public procurement experience to construction SMEs. That is, because construction companies are by default heavily involved in basic infrastructure, architects, real estate and maintenance companies as well as engineers might have a more secondary role in such projects. However, the argument does not hold for sewage services as these expectably quite often cater to public authorities directly. A second explanation for the prevalence of construction companies, somewhat connected to specialization, might be the over-proportionate employment of physical, thus capital-intensive assets, motivating construction companies to search for trusted buyers and secure payment, a trait especially expected from the public sector (Loader, 2005). Conversely, such assumed intricate relationship between public buyers and construction companies could motivate authorities to work with construction SMEs as they are found to be well-trusted and high-quality partners (Loader, 2005; 2013).

In conclusion, SMEs engaged in construction activities tend to win public contracts more often than other SMEs involved in municipal infrastructure- and planning related works. Possible explanations are, first the concentration of construction companies in public works and second high levels of specialization as well as third high incentives to tender. In the following, the trends of the analysis are wrapped up and implications for policy and research are drawn.

5.5 Wrap up analysis

The main findings of this work are summarized in two subsections. The first part provides an overview of the implications that can be drawn for academia, while the second part delivers practical insights for SME and public procurement related policy.

5.5.1 Academic

As suggested by the large effect of SME track records and the importance to design tenders in favour for SMEs, the cultural dimension in administrations appears as the most crucial for the success of SMEs. In particular the conjunction of expertise and culture is confirmed (Erridge, Greer, 2002), predominantly as the process culture → capacity in administrations. The

directionality of the process is the reverse of what Erridge and Greer (2002) suggested, as they found gains in administrative culture to follow gains in expertise. While their findings are not contested as such, an implication of this work is that skills in administrations might in fact be better developed if experience with more sustainable procurement practices are already present. It follows, the positive link between more experience with SMEs and more tender awards to SMEs presents a good opportunity for authorities too, as they might benefit from fiercer competition among tenderers by create a level-playing field. In sum, the two dimensions administrative capacity and culture appear highly linked, which could motivate further research in their interplay. The tender specific dimension as represented by the volume and the competition, and, partially the contract design, is found to not be a standalone factor, thus not sufficient on its own. In fact, the latter dimension appears to hold relatively little influence over whether an SME is awarded a tender or not, because capable and SME-experienced procurers continue to award to SMEs even if the tender characteristics would suggest otherwise. In particular, tender volumes appear to not really matter for success disconfirming Hoekman and Tas (2020) and the PwC study (2014) in the context of this study. Therefore, the numerous studies (Flynn et al., 2015; Hoekman, Tas, 2020; PwC, 2014) searching for single tender-specific factors as conducive or detrimental to the success of SMEs might have partially omitted the importance of demand side capacities and behaviour.

5.5.2 Practical

In line with Albano (2017), competition is found generally beneficial for SMEs. Practically speaking, competition seems to be hampered by high volumes as some relationship between lower competition and higher volume of tenders is confirmed. Therefore, breaking up contracts into lots (Hoekman, Tas, 2020; Loader, 2013) remains a sensible measure to induce competition, especially in light of the finding that SME friendly contract design, in this work partially constructed by a lot or no lot dichotomy, is found conducive to SME success. However, splitting contracts into lots appears to be more difficult to roll out in each and every tender given the distinct needs of demanded services and works. Stating clear award criteria on the other hand must become the norm as already demanded by the EU and national governments (EU Commission, 2019; Pianoo, 2019). In sum, SME focused policy in the form of creating incentives or rules for conducive contract design remains important. Engaging authorities to that end could be facilitated by the high trust authorities appear to have with working with SMEs as they

display a strong tendency to award them tenders again. Therefore, framing SME friendly policy around trust and quality of supply (Loader, 2005) seems a good way forward. For the supply side, the assumption that local SMEs have better relationships with procurers (Pickernell et al., 2011), is not confirmed, thus some potential to further integrate local SMEs with strong ties to the local economy appears to remain untapped but must, if addressed, do so safeguarding competitive tendering (Albano, 2017). In other words, it must not categorically exclude external bidders. Lastly, SMEs in the construction sector appear to have somewhat better chances than those in other infrastructure related fields. Moreover, based on the general belief that small companies value the certainty of contract fulfilments by public buyers (Loader, 2005), particularly small companies in other capital-intensive industries might also be incentivized to work with public partners. In conclusion, practical implications arising from this study resolve around the continuous need to further level the playing field for SMEs and do so first and foremost by addressing the buyers' attitudes and tender contract design rules.

6. Conclusion

The study aims to elicit the "*configuration of conditions under which SMEs are being awarded tenders in public procurement*". The research question is motivated by the identified mismatch between the share of SMEs in the population of companies and their share in public contracting. Based on this, the academic and societal relevance of this work are constructed. For academia, a lack of configurational research into SMEs in public procurements is identified, while the societal relevance of the study resolves around the alleged benefits of strengthening SMEs. In order then to address the research question, first the motivation to engage in procurements for both the buyer and the SME supply side is highlighted. Second, the pertinent literature is reviewed on the barriers and drivers impacting SMEs in public procurement. From these identified factors, a conceptual framework is designed, aiming to capture the three main dimensions administrative culture, administrative capacity and tender specific characteristics. The method chosen in this work is the qualitative comparative analysis (QCA), which is qualified to dissect data into configurations of conditions and investigate their effect on the outcome under review.

The case material is a sample of 28 tender cases in the Netherlands in 2020, for which the procurer is a municipality and for which the type of tender is infrastructure related. Hence, the study focus is set on urban infrastructure procurement cases and SMEs. The results reveal a strong relationship between the administrative culture or rather the experience of awarding tenders to SMEs and SMEs winning tenders again. Furthermore, a conjunction of capacity and cultural factors is observed, suggesting for SMEs to be more successful, procuring authorities should develop their expertise not only generally but focused on the needs of SMEs. Interestingly, tender characteristics such as volumes are not found to hamper SMEs chances. A subsequent analysis of the cases in terms of their geographical links and their procurement types, defined by infrastructure related Common Procurement Vocabulary (CPV) codes, shows little support for the argument that geographical proximity is a prevalent factor in the case of SMEs, yet suggests that construction related procurements provide better chances than other procurement types included in the study.

The implications drawn from these findings motivate further research into the intricate relationship between administrative capacity and culture, as well as they advocate for future configurational as opposed to single factor research on SMEs in public procurement. On the practical side, the apparent positive experience with SMEs dominates the policy implications, raising strong arguments for levelling the playing field for SMEs by harnessing their comparative strengths vis a vis larger companies and by creating incentives and regulations for clear and understandable tenders, ultimately reducing the red tape and disadvantages SMEs face in public procurement.

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B: Appendix

- a) Description of tables 1-17
 1. Table of conditions as evidenced by the literature
 2. Conceptual model – Dimensions
 3. Criteria for case inclusion
 4. Example table - Case calibration
 5. Calibration - Administrative capacity
 6. Calibration – SME History
 7. Calibration – Contract design
 8. Calibration – Award criteria
 9. Calibration – Number of bids
 10. Descriptive statistics
 11. Analysis of necessary conditions
 12. Empty truth table rows #18-#32
 13. Truth table with observed configurations
 14. Truth table with consistency cut-off
 15. Complex, parsimonious and intermediate solution
 16. Overview conditions and solution formulas

b) Raw data table for QCA

	Condition	Admin. Capacity	Admin. Culture			Tender characteristics		Outcome
Cases		Good procurement score (comparison group: 27)	SME History - Share of SMEs among last 30 tenders	Award criteria	Lots/group of operators	Tender volume (in Euro)	Number of Bids	SME yes/no
1	Gemeente Oldambt - CPV 71	Admin: 15	16/30	price	no	1	3	no
2	Gemeente Meierijstad - CPV 71	Admin: 35	26/30	100% quality	no	180 000	7	no
3	Waterschap Rivierenland - CPV 90	Admin: 32	28/30	90% quality; 10% price		4 200 000	6	no
4	Gemeente Amsterdam Ingenieursbureau - CPV 71	Admin: 29	21/30	price-quality equal	no	300 000	11	no
5	Gemeente Haarlem - CPV 71	Admin: 27	17/30	price		7 1	9	no
6	Gemeente Rotterdam CPV 70	Admin: 26	19/30	price	no	224 000	4	no
7	Provincie Zuid-Holland - CPV 45	Admin: 22	16/30	60% quality; 40% price	no	2 578 000	7	no
8	Provincie Gelderland - CPV 45	Admin: 29	14/30	quality (4 indicators)	no	15 900 000	8	no
9	Gemeente Veldhoven - CPV 70	Admin: 31	12/20	75% quality; 25% price	no	488 763 (lower than estimation)	3	no

10	Gemeente Almere - CPV 45	Admin: 27	19/30	price	no	800 000	5	no
11	Gemeente Roermond - CPV 45	Admin: 27	23/30	80% quality; 20% price	no	1 721 000 (lower than estimated)	4	yes
12	Gemeente Amsterdam Ingenieurs bureau - CPV 45	Admin: 29	21/30	price	no	2 042 934	7	yes
13	Gemeente Oude IJsselstreek - CPV 90	Absence of 2020 data; 2019 - Admin: 37 (32 comparison group)	17/30	95% quality; 5% price	no	360 000	2	yes
14	Gemeente Delft - CPV 71	Admin: 25	28/30	75% quality; 25% price	2 - group of economic operators	170 000	6	yes
15	Gemeente Utrecht - CPV 45	Admin: 27	22/30	50% quality; 50% price	no	6 796 379	4	yes
16	Gemeente Soest - CPV 90	Admin: 20	5/10 5	70% quality; 30% price	no	810 873 (higher than estimation)	4	no
17	Veiligheids regio Gelderland-Zuid - CPV 70	Admin: 36	23/30	price	no	273 573	1	no
18	Gemeente Nuenen - CPV 45	Admin: 20	4/7	price	no	267 918	7	no
19	Gemeente Amsterdam Ingenieurs bureau - CPV - 45	Admin: 29	21/30	3 indicated quality criteria, no weighting	3 lots, lot 1 won by SME + non SME	3 500 000	2	yes

20	Gemeente Gorinchem - CPV 45	Admin: 24 (25comp)	26/30	lowest price for cost-efficiency	3 lots, lot 1 won by SME	4 360 592 (lower than estimation)	4	yes
21	Gemeente Ede - CPV 45	Admin: 27	24/30	80% quality; 20% price	2 lots won by the same SME	1	7	yes
22	Gemeente Weststellingwerf - CPV 45	Absence of 2020 data; 2019 - Admin 36 (32 comparison group)	12/18	price	2 lots won by the same SME	199 500	27	yes
23	Gemeente Schiedam - CPV 45	Admin: 26	13/17	4 indicated quality criteria and 1 price criterion	no	2 010 000	5	yes
24	Gemeente Rotterdam - CPV 45	Admin: 26	19/30	price (no further indication)	no	2 520 000	2	yes
25	Gemeente Zuidplas - CPV 45 & 71	Absence of 2020 data; 2019 - Admin 38 (32 comparison group)	23/27	price/quality	no	4 274 000	3	yes
26	Gemeente Westland - CPV 71	Admin 20	24/30	90% quality; 10% price	no	325 000	4	yes
27	Gemeente Roermond - CPV 71	Admin: 27	23/30	60% quality; 40% price	no	54 910	8	yes
28	Gemeente Altena - CPV 90	Admin: 35	24/29	price/quality	4 lots (3 won by one SME, 1 lot by another SME)	1	2	yes

c) Calibrated Data for QCA

CaseID	Admin	SMEHistory	Contract	TenderVol	Bids	SMEwon
GemeenteOlda... CPV71	0	0	0	0	0.33	0
GemeenteMeier... CPV71	1	1	0.67	1	0.67	0
WaterschapRivi... CPV90	1	1	1	1	1	0
GemeenteAmst... CPV71	0.67	0.67	0.33	1	1	0
GemeenteHaarl... CPV71	0.33	0	0.33	0	1	0
GemeenteRotte... CPV70	0.33	0.33	0	1	0.67	0
ProvincieZuid- Holland-CPV45	0	0	0.33	0.33	0.67	0
ProvincieGelder... CPV45	0.67	0	0.67	0	1	0
GemeenteVeldh... CPV70	1	0	0.67	0.67	0.33	0
GemeenteAlme... CPV45	0.33	0.33	0	0.67	0.67	0
GemeenteRoer... CPV45	0.33	0.67	0.67	0.33	0.67	1
GemeenteAmst... CPV45	0.67	0.67	0	0.33	0.67	1
GemeenteOude... CPV90	1	0	0.67	0.67	0.33	1
GemeenteDelft- CPV71	0.33	1	1	1	0.67	1
GemeenteUtrec... CPV45	0.33	0.67	0.33	0	0.67	1
GemeenteSoest- CPV90	0	0	0.33	0.67	0.33	0
Veiligheidsregi... Zuid-CPV70	1	0.67	0	1	0	0
GemeenteNuen... CPV45	0	0	0	1	0.67	0
GemeenteAmst... CPV45	0.67	0.67	1	0.33	0.33	1
GemeenteGorin... CPV45	0.33	1	1	0.33	0.67	1
GemeenteEde- CPV45	0.33	0.67	1	0	0.67	1
GemeenteWest... CPV45	1	0.33	0.33	1	1	1
GemeenteSchie... CPV45	0.33	0.67	0.67	0.33	0.67	1
GemeenteRotte... CPV45	0.33	0.33	0	0.33	0.33	1
GemeenteZuid... CPV45&71	1	1	0	0.33	0.33	1
GemeenteWestl... CPV71	0	0.67	0.67	0.67	0.67	1
GemeenteRoer... CPV71	0.33	0.67	0.33	1	1	1
GemeenteAltena- CPV90	1	1	0.67	0	0.33	1