Addressing the 'Qualitative' in fuzzy set Qualitative Comparative Analysis: The Generic Membership Evaluation Template

Abstract

Fuzzy set Qualitative Comparative Analysis (fsQCA) can help researchers to address causal complexity, especially in relation to the interactions between different conditions leading to the outcome in question. FsQCA helps investigate how alternative solutions (different configurations of conditions) make up the outcome, and considers the asymmetrical nature of social phenomena. An important challenge that researchers often face when they apply fsQCA to qualitative data is the lack of distinct and operationalizable anchor points for fuzzy set calibration. This study offers the Generic Membership Evaluation Template (GMET) to support the decision making about assigning fuzzy set values to conditions, and therefore improves the transparency of the qualitative calibration process. This paper aims to highlight why and how fsQCA can be carried out to obtain a more in-depth understanding of complex problems using qualitative data, to identify some core method issues involved in this analytical process, and to develop a conceptual and empirical framework that helps in managing some methodological issues, with special regard to the calibration process. For illustration of the method we scrutinize ways in which the customer firm can achieve attractiveness in the eyes of the supplier. Our study explores configurations leading to the Relational Attractiveness of the Customer (RAC) based on 28 in-depth interviews with senior managers on the supplier side. In the interest of methodological reflections and parsimony, it is assumed that the reader is familiar with the principles of fsQCA.

Highlights
- Qualitative data often lacks of distinct and operationalizable anchor points for fuzzy set calibration.
- This study critically reviews various qualitative fsQCA applications from a calibration perspective.
- We offer the Generic Membership Evaluation Template (GMET) to support the process of assigning fuzzy set membership values to cases using qualitative data.

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1. Introduction

The appeal of the method of fuzzy set Qualitative Comparative Analysis (fsQCA) is rooted in its ability to address causal complexity, through an integration and formalization of variable- and case-oriented approaches (Ragin, 2009), and by applying the equifinality principle (i.e. the same outcome is achievable through the combination of different conditions) (Rihoux & Ragin, 2009). We apply these methodological characteristics in the context of business relationships, as their complexity is multi-faceted, and comprises several important interrelated dimensions (Håkansson & Ford, 2002, Holmlund, 2004; Möller & Halinen, 1999). In many respects, relational phenomena can be characterized as the outcome of synergy mechanisms of the constituting elements (Slater & Narver, 1995; Forkmann et al., 2012). Some of the most studied constructs in business marketing such as trust (Morgan & Hunt, 1994), relationship performance (Palmatier et al., 2007), market orientation (Frösén et al., 2016) and relationship quality (Naudé & Buttle, 2000), are the outcomes of sets of interrelated conditions. Empirical research that entails efforts to address such complexity normally takes primarily either a variable-focused or case-oriented view. On the one hand, the variable-focused approach is mainly quantitative and tests direct and indirect net causal pathways based on the amount of variance in the dependent variable accounted for by the independent variables (Hair et al., 2005). On the other hand, qualitative research drawing on data from interviews, observations, and other documents places more emphasis on selecting relevant cases and subjects and then studying them in a more comprehensive way while paying attention to contextual details and dynamics (King & Horrocks, 2010).

There have been various attempts to apply fsQCA for the analysis of qualitative data. Despite the growing interest in configurational approaches, only a limited number of researchers use this data analysis method in the case of qualitative data, especially in the business marketing domain. This neglect of qualitative input data for fsQCA is arguably at odds with aims focused on theory-building or motivations to gain understanding of configurational patterns of research phenomena. This represents the starting point for this study. The *objective is to to elucidate methodological as well as procedural issues of this approach, in particular by showing a primarily qualitative application of fsQCA, and thereby to help researchers to effectively circumnavigate some potential pitfalls*. We identified problematic issues in relation to qualitative applications of fsQCA: some of the core issues are related to the choice of methods, i.e. in which cases to apply a configurational approach, and others are rooted in the research design. Finally, and most importantly for this study, despite fsQCA being an appropriate choice and the research design being well-thought through, researchers face difficulties with data categorization, and in assigning membership values in the set-theoretic analysis.

Set-theoretic intra-case categorization in qualitative research should meet the requirements of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). Therefore, while there is no such thing as a 'one best way' to manage the calibration process as part of fsQCA, this study provides a methodological contribution by offering a framework, the Generic Membership Evaluation Template (GMET) to introduce structure, rigor, and transparency (Dubois & Gibbert, 2010) to the calibration of qualitative data. The use of the GMET reflects the need for a more systemized methodological approach at the operational levels of the calibration process of qualitative data (more specifically, data categorization and membership evaluation) as well as addressing Ragin's (2006) call "*to make sense of the diversity of empirical cases in ways that resonate with the researcher's theoretical ideas about social phenomena*" (p. 310).

To illustrate the creation and use of the GMET, we use as the outcome the condition of Relational Attractiveness of the Customer[1] (RAC) (Tóth et al., 2015) as an example of a complex relational phenomenon to be explained by fsQCA. RAC refers to the attitude of the managers on the supplier side towards the customer firm; in particular it comprises an evaluation of the customer company's future attractiveness as a relational partner (Manstead, 1996), and therefore RAC is essential for developing and maintaining business relationships (Harris et al., 2003). RAC is an attitudinal and perception-based construct and as such, falls into the category of not having quantitative anchor points such as actual profits or frequency of communications. Consequently, the case of RAC is appropriate for demonstrating some methodological challenges where the indicators for the calibration based on qualitative data are not easily quantifiable. A total of 28 in-depth interviews were conducted with senior managers on the supplier side. These interviews provide the qualitative input data for the fsQCA analysis that results in four causal recipes for the presence of RAC, and two causal recipes for the absence of RAC. While different constructs and different sources of qualitative data could also have provided an appropriate way for demonstrating the use of the GMET, RAC is used in the present study as an illustrative exemplar.

2. Use of fsQCA to Analyze Qualitative Data: Methodological Considerations and Pitfalls

There are several reasons why fsQCA can serve as an appropriate tool to facilitate the analysis of qualitative data.[2] First, it is a powerful analytical approach to advance theory building as well as for testing existing theories. The combined case and variable-oriented approach of fsQCA produces configurations of conditions as typologies for complex theoretical statements

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[1] Conditions and outcomes are capitalized in the text to enable better readability.
[2] As the focus of the present study is on methodological reflections, and in the interest of parsimony, it is assumed that the reader is familiar with the principles of fsQCA. Good introductions to fsQCA are provided by Rihoux and Ragin (2008) and Ragin (2009), while Woodside and Baxter (2013) exemplify recent applications in the area of marketing.

that emerge as unique forms of theory building and testing (Fiss, 2011), which by offering alternative (equifinal) solutions to the previously presumed 'one recipe for success' mantra, fits well with in the Popperian philosophy of falsification (Popper, 2005 [1972]). The theory-building power of fsQCA is demonstrated, for example, by Crilly's (2011) mid-range theory in the context of stakeholder orientation, which uses a configurational approach that enables the linking of conditions of resource and institutional pressures, as well as organizational attributes at the level of empirical investigation. Secondly, fsQCA embraces the asymmetrical and non-linear nature of social phenomena: it is capable of exploring configurations of conditions not only for the outcome but also the absence of the outcome. The configurations for the absence of the outcome are normally not simply negations of the ones for the presence of the outcome, but they show asymmetric patterns instead. This mirrors real-life issues more than a primarily linear and symmetric approach (Woodside, 2013). The nonlinearity principle of fsQCA is well aligned with other qualitative methods, i.e. the changes in the conditions are not directly proportionate with changes in the outcome. Thirdly, QCA enables the analysis of necessary conditions that are by themselves causing the outcome, i.e. they are a superset of the occurrence of the outcome (Schneider & Wagemann, 2010). This investigation happens 'in kind' and not 'in degree' as part of fsQCA (compared to Necessary Condition Analysis (NCA); Dul, 2016), i.e. the analysis shows whether overall a condition is or is not necessary for the occurrence of an outcome, but it does not provide information about the necessity of a condition at different outcomes levels. Such an 'in kind' investigation of necessity might work with a qualitative approach that aims less at in degree explanations (as applied in Vis, 2010), yet NCA can provide a more fine-grained investigation of necessity even in these cases (Dul, 2015).

Through exploring equifinal configurations, necessary conditions, and asymmetric as well as non-linear ways to achieve an outcome in question (as well as its negation), fsQCA demonstrates a considerable breadth of analysis, while maintaining an in-depth understanding

of the phenomenon. There are, however, limitations to using fsQCA. As Greckhamer et al. (2008) point out, fsQCA does not proof causal relationships between conditions and outcome and thus inferences about causal relationships are based on theory or other empirical research which inform the development of a nomological model. Another limitation is that the same conditions should appear across all the examined cases in order to investigate the configurations of these conditions. Less structured exploratory research, with flexible or no frameworks and which focuses primarily on discovery, seldom adheres to this assumption. There are also practical limitations in the number of conditions fsQCA is capable of handling in relation to the number of studied cases (see issues around limited diversity; Marx & Dusa, 2011).

Pitfalls using fsQCA with qualitative data may occur when these limitations are not taken into account. First, one of the more subtly concealed pitfalls is the tendency to assume that fsQCA is applicable in most research contexts. Several failed attempts of applying fsQCA to previously collected interview data as well as combining fsQCA and constructivist grounded theory exemplify this issue (Charmaz, 2014). In such cases analytical codes and categories are inductively developed from data and not through the use of pre-existing conceptualizations. In many of these cases the lack of a common set of conditions proved to be a major issue: some cases displayed some conditions but not others, and this hindered the exploration of configurational patterns across the cases. Secondly, sampling and data collection should be carefully planned. There exists no strict limitation in terms of the number of cases, yet inadequate sample size might have analytical trade-offs. As Vis (2012) points out, the goal in comparative research is to learn about the cases (e.g. welfare state development in specific countries) and not so much to draw causal inferences. Therefore, an intermediate number of cases (between 10 and 50) seems ideal for fsQCA with qualitative data. Marx (2010) proposes a ratio of conditions to cases ranging from 0.33 for small/medium-N to 0.20 for medium/large-

N, and an upper limit of seven or eight conditions. Maggetti and Levi-Faur (2013) confirm that this 'rule' applies both to crisp as well as fuzzy set QCA. The authors also provide a more extensive review on different errors (condition, systematic, random, model misspecification, and deviant case errors) generally applicable to most QCA studies (fuzzy/crisp; qualitative/quantitative). Finally, researchers lack guidelines on the calibration process of qualitative data as the parameters of calibration are often miss-specified (Maggetti & Levi-Faur, 2013). As Ragin (2000) states, the fuzzy-set is "*a fine-grained, pseudo continuous measure that has been carefully calibrated using substantive and theoretical knowledge relevant to set membership*" (p. 7); the calibration process is therefore a vital part of the analytical process. The Generic Membership Evaluation Template aims to introduce more transparency and structure to embed substantive and theoretical knowledge within the calibration process.

3. Epistemological Background of the Configurational Approach

The underpinning epistemological position of this study is *critical realism*, and hence it represents an open system view on reality (Ehret, 2013), where knowledge is fallible and theory-laden. Critical realism advocates complexity with a focus on outcomes, without the need to endure overly broad generalisations. While stating that the knowledge of reality is mediated by the researcher's perceptions, critical realism handles the social embeddedness and contextual nature of scientific inquiry: it acknowledges that social phenomena are meaningful but also that there is a real world out there, i.e. not everything is socially constructed. Sayer (2000) explains how conditions in different structures can produce events (outcomes) though causal mechanisms within a critical realist framework. This view of causation paves the way for a configurational approach. A critical realist view was found especially appropriate for case research (Easton, 2010). Braun and Clarke (2008) point out that in qualitative research thematic analysis is aligned with a critical realist approach because it both reflects on reality (through

the lenses of the researcher) and unravels the surface of reality (through identifying structural elements). However, the authors also emphasize the vital role that transparency plays in the explanations of the researcher's choices. Because of this configurational complexity, a realist research paradigm (Bhaskar, 1975) can be regarded as more appropriate than positivism or social constructionism when aiming to investigate social phenomenon such as the relational attractiveness of the customer through fsQCA. As such, by using fsQCA this study subscribes to, but also further clarifies methodologically, the perspective of critical realism *vis-a-vis* causality, in line with recent discussions in the social sciences (Olsen, 2004). Therefore, using realism as an epistemological background looks at the causal conditions, including their interplay, as parts of a 'given' reality, and allows for a more exploratory view of the relationships between them, as well as their effect on specific outcomes. In this context the term 'holistic manner' has been used to describe the analytical perspective according to which parts or drivers of a phenomenon are interconnected and explicable only in the context of the whole. This is rooted in the principles of Hegelian philosophy: the whole is more than the sum of its parts, and these parts are interdependent (Phillips, 1976). This holistic view about the interdependency of conditions fits well with the configurational approach of fsQCA.

4. Sampling and Data Collection

Depending on the type of research, fsQCA can involve different types of sampling procedures. Random and non-random sampling techniques can result in different levels of representativeness regarding the studied population, and the adequacy of the sample size used also depends on the type of research (Onwuegbuzie & Collins, 2007). The question of sampling frames within the QCA domain stems from the question of Ragin and Becker (1992) about 'what a case is a case of'. This requires the researcher to make decisions about the universe of

cases in the study and be cognizant of the potential limitations of the chosen sampling technique.

Random sampling presumes that selected cases are general representations of the sampling universe and requires deliberately heterogeneous samples of participants, because it endeavours to collect a sample with characteristics that are aligned with the characteristics of the entire population (Colquitt, 2008). Random sampling is commonly used for traditional survey methods and has a higher ability to generalize results compared to non-random sampling methods (Aguinis & Edwards, 2014). Quantitative applications of fsQCA often use random sampling, for example Huarng et al. (2015), Longest and Thoits (2012), and Olsen et al. (2010). However, as Greckhamer et al. (2013) point out, random sampling is not suitable for researchers predominantly interested in exploring the diversity of cases. The reason why random sampling might not be appropriate is that it may not represent the complete diversity of cases, i.e. some rather rare but theoretically (and practically) relevant configurations might not occur often in larger populations and therefore require a different approach to be identified. This sampling issue applies to qualitative and quantitative as well as well as to small and large-N studies. *Non-random sampling*, especially *purposive theoretical sampling* selects cases iteratively to develop theoretical knowledge (Glaesser & Cooper, 2011). In the context of fsQCA, this enables the examination of commonalities across the same outcome in cases more effectively by identifying the population of cases of theoretical interest (Greckhamer et al., 2013). In this present study we used purposive theoretical sampling, because we intend to examine cases that exhibit the phenomenon at hand in order to look for commonality (i.e. the presence or absence) of the outcome in the configurations of conditions across cases. In planning data collection, it should be taken into consideration that the number of conditions should not be too high compared to the sample size. Our sample size is within the suggested ratio interval suggested by Marx (2010). Even though we used single-source informants (the

unit-of-analysis being the managerial perception), in most cases it is desirable to have multiple sources of information over time, especially in an information rich context (Creswell, 1998).

5. Critical Aspects of Within-case fsQCA of Qualitative Data

The fsQCA analysis of qualitative data starts with the systematic analysis of each case (within-case analysis), followed by a between-case analysis that includes the construction of the truth table and the Boolean minimization of the configurations. The within-case analysis includes theoretical considerations that inform the analytical process, coding, confining membership categories for each condition, and the calibration. Considering that the process of the between-case analysis of qualitative data is very similar to the within-case analysis of quantitative data, this study focuses on the within-case phase of fsQCA, in line with the intended methodological contributions. The problems relating to this analytical phase are concerned with addressing clarity, as there exists some disagreement in the applied fsQCA literature regarding *how to produce membership values based on qualitative data*.

The significance of the problem is highlighted by previous research, in particular the seminal study addressing this methodological challenge by Basurto and Speer (2012), who endeavour to introduce a systematic and transparent procedure to help researchers transform qualitative data into fuzzy sets, including interview data and data from secondary sources. They suggest using multiple measures for each condition, and that each of these measures is associated with different anchor points. For example, they scrutinize the 'Participatory Governance Condition' by relying on measures of 'Frequency of Meetings' and 'Provision of Information' provided by different respondents. The 'Frequency of Meetings' measure has three anchor points: no meetings during the past year is associated with the value 0 (not a member of the set); six meetings with 0.5 (neither fully in nor fully out of the set), and twelve meetings or more with 1 (fully in in the set). Despite the structured approach, the calibration of cases per each

condition, especially in case of qualitative data, is normally not a linear process (regarding the setting of the anchor points, as well as with regard to assigning fuzzy values between the anchor points). Basurto and Speer (2012) encourage reviewing other important aspects, such as the interview situation, consistency of answers, and the potential availability of secondary data for triangulation. There is, however, considerable debate around this part of the qualitative calibration process for fsQCA.

To shed light on the ambiguity in the extant fsQCA literature on the calibration process of qualitative data, we collected and reviewed 256 articles on Google Scholar, using the keywords 'interviews', 'in-depth interviews', 'fsQCA' and 'Qualitative Comparative Analysis'. We then selected only those that conducted empirical research using in-depth interviews, thereby eliminating those papers that only mentioned fsQCA as a potential future data analytic strategy for their research, or studied fsQCA only at a theoretical level without the use of empirical data. We identified only a handful of qualitative fsQCA applications (see Table 1), as the majority of the qualitative QCA studies chose crisp set over fuzzy set QCA, often without clear justification (e.g. Coverdill & Finlay, 1995; Rantala & Hellström, 2001; Marx & Van Hootegem, 2007). Ragin (2009) explicitly advises against the inappropriate use of crisp sets because of its lower standard of set-theoretic consistency. Unless the phenomena is categorical in nature (for example, member of an association or not; pregnant or not), researchers are strongly recommended to use fuzzy sets. We believe that the somewhat mechanistic approach of choosing crisp sets over fsQCA in the case of qualitative analysis is partly due to the ambiguity around how to carry out fuzzy set calibration with qualitative data.

Insert **Table 1** about here

Table 1 provides an overview of four critical aspects of the within-case analysis of fsQCA as applied in the articles identified: the way how theory informs the analysis; the coding process;

the construction of set-membership categories; and the calibration. We elaborate on each aspect of this framework below, with reflections on how this study addressed these methodological concerns.

A *theoretical framework* is first and most commonly used to identify causal and outcome conditions, i.e. to develop a nomological model (Schneider & Sadowski, 2010; Van der Heijden, 2015; Verweij et al., 2013). Secondly, some studies go further and pre-determine expected dimensions for the identified conditions (Basurto & Speer, 2012), which represents a more fine-grained perspective and informs the coding and calibration more extensively. Thirdly, theories can provide justification as to why the researchers decide to take a configurational view (Basurto, 2013; Wang, 2016). Finally, theories can support hypotheses or proposition development (Basurto, 2013).

The coding process in the studies reviewed is often somewhat opaque. It is not clear whether studies which did not report coding procedures skipped this step (Basurto, 2013; Schneider & Sadowski, 2010) in order to use only substantial case knowledge and overall impressions to perform the calibration. Explicit coding, however, provides the analytical process with rigor. In studies where coding was carried out, a systematic coding scheme was used (e.g. Van der Heijden, 2015). Crilly (2011) pays attention to both the coding of the conditions and their features (for example, legitimacy pressures). Basurto and Speer (2012) draw attention to the iterative nature of their coding process. In the present study, an initial coding scheme was applied based on the nomological model of Tóth et al. (2015), to identify the conditions. Template coding (King, 2004) was used in a flexible and iterative manner, which helped to execute the analysis in a more structured way compared to developing *a priori* coding. Open coding with line-by-line analysis might provide a more detailed view on the data, but researchers interested in a combination of case- and condition-oriented approaches, probably find template coding useful in practice, and aligned with the aims of a fsQCA study. Not having

any initial template might result in not being able to identify the same conditions across the cases. Greckhamer et al. (2013) also mention that during the analytical process there exists the opportunity for the replacement, addition or removal of conditions. We believe that researchers should be cognizant of the advantages of using a template for the coding (and the risks of not having one), but at the same time be prepared to make amendments to it, based on their in-depth understanding of the qualitative data.

The decision about set-membership categories usually varies between 4-value (Basurto & Speer, 2012; Van der Heijden, 2015; Verweij et al., 2013) and 6-value sets (Basurto, 2013), or sometimes a combination of the two (Crilly, 2011; Schneider & Sadowski, 2010). Often there are no explanations or descriptions offered regarding the fuzzy set value assessments. When it comes to constructing fuzzy sets, the researcher needs to be cognizant of, first, assessing *both qualitative (in kind) and quantitative (in degree) characteristics which should not be rankings or ordinal scales* (Ragin, 2009). The point of departure should always be *theoretical and substantial case knowledge about the universe of cases* and not the sample in a restrictive way. Secondly, *odd-number fuzzy sets* (e.g. 5-value sets) imply that there is a set 'in the middle' with maximum *ambiguity*, which is 'neither in nor out of the set'. Therefore, unless there are strong theoretical arguments against it, using fuzzy sets with even number value categories can avoid some membership-related ambiguity in the fsQCA procedure. Finally, the decision about which fuzzy sets should be used, i.e. four-, six-, or more, should be based on qualitative understanding and/or theoretical knowledge and considerations of which type of sets provides a better representation of empirical evidence. In the qualitative fsQCA applications reviewed, 4- and 6-value sets are deemed to be appropriate, especially where no additional sources (e.g. different types and sources of data) are available to create a more fine-grained specification. If using a 6-value set implies making artificial distinctions, the researcher should stay with a 4-value set. If the 4-value set appears to be constraining, the 6-value set should be chosen. Using

both 4- and 6-value fuzzy sets for different conditions within the same analysis is often suitable (Ragin, personal correspondence, August 2015).

The actual *calibration procedure* is described vaguely if at all in most of the studies reviewed. A characteristic approach is to refer to quantitative anchors (for example, frequency of meetings) and briefly mention that qualitative aspects were carefully considered but the reader is then left with little or no explanation about how this was done (Schneider & Sadowski, 2010; Verweij et al., 2013; Wang, 2016). With introducing a systematic logic into the within-case analysis, Basurto and Speer (2012) had made appreciable progress in this context; however, the fact that qualitative in-depth interviews seldom capture sufficient quantitative anchors remains largely disregarded. In fact, we argue that overly emphasizing the role of quantitative anchors in the calibration of qualitative data can be misleading. For example, in the example of Basurto and Speer (2012), could effective Participatory Governance be 'measured' based on the number of meetings, participants and amount of impact delivered by the participants? Even though the authors mention in passing that they take some qualitative aspects into consideration, how it is incorporated into the calibration process remains unclear. Through providing some suggestions on how to create qualitative anchors for the fuzzy set calibration with the help of the GMET, we advocate a structured balance between qualitative and quantitative anchors, where applicable. In cases where no or minimal quantifiable information is available, the GMET can help researchers to collect and structure relevant information as part of the calibration process.

6. Working with Qualitative Anchors: The Generic Membership Evaluation Template

The systematic review of empirical QCA studies using qualitative data highlights the importance of providing structure to the calibration process for the configurational analysis. Two core calibration strategies were explored in these studies. The first is the 'crispification',

i.e. the dichotomisation of data despite the complex nature of most social phenomena that seldom occur in dichotomies (Schneider & Wagemann, 2012). This act often forces an artificial simplification on to the analytical process that might result in higher consistency scores, as shown by Ragin (2009) but at the same time has significant disadvantages by losing interesting and relevant nuances of the data, which could have been better addressed with fsQCA than with csQCA.

The second strategy is the introduction of 'quantitative anchors' that seems to be somewhat more fine-tuned than a 'crispification', because quantitative anchors do not restrict the variation of social phenomena to the extent that dichotomization does. However, they do shift the qualitative data analysis towards focusing on synthetic measures that are not necessarily central to the in-depth understanding of the phenomenon. For example, focusing on the frequency of meetings and the amount of information delivered in order to operationalize the Participatory Governance condition (Basurto & Speer, 2012) might hinder a more in-depth understanding of the phenomenon such as the active nature of citizenship behavior, attitudes towards the state, transformative approaches of citizens, tendency towards hiding or publicizing power conflicts, internalization of dominant ideologies (Hickey & Mohan, 2004) or any other relevant dimensions, which might arise during the interviews.

We advocate and describe the GMET as a third way of fsQCA calibration of qualitative data that does not impose dichotomies on complex social phenomena when this is not necessary, and which embraces the qualitative nature of the research. The GMET is offered as a template (GMET, see Table 2) to study the dimensions of the condition in question as well as their specific characteristics. The example of the calibration via GMET is demonstrated for the Relational Fit condition of RAC. Each GMET indicates a case number (alternatively names of interviewees/companies) and the specification of what sort of membership is at stake (in the example: the membership in customer relationships with good relational fit). This is followed

by a brief overall case description with special regard to the condition studied. This is a reminder for the researcher about the relational context and some potential core issues and dimensions.

Insert **Table 2** about here

The GMET is tailored primarily for the analysis of qualitative data in cases where quantitative anchors are not available. It can be combined seamlessly with thematic coding and the template analysis for the codes, especially if the sample is small or medium-sized. The GMET should be applied to each case (in this research example for each interview) and to each condition and outcome using the following procedure. This procedure aims at offering some 'qualitative anchors' for the calibration.

Case specific knowledge in relation to the specific condition (see Table 2 example: Relational Fit) is summarized in the 'Overall Case Description from a [name of condition] Perspective' section of the template. This case description deliberately focuses on the interpretation of the case through the lenses of the condition under evaluation because such a synthesis informs the calibration. For the completion of the 'Dimensions' column (column #1, Table 2) it is necessary to revisit the original coding. The sub-codes of 'Relational Fit' are listed here with some context-specific descriptions (#2) highlighting variations within the condition to describe the breadth of data. The identified dimensions of the 'Relational Fit' condition for this case were: customer's opportunistic behaviour, trust issues, professional trust, frequent conflicts, company size difference, differences in organizational cultures, and changes in ownership. Even though the sub-codes of 'Relational Fit' are inherently different on a case-by-case basis, some common dimensions were synthesized. The dimensions identified can relate either positively or negatively to the membership in the set of 'customer relationships with a good

Relational Fit', which is specified in the 'Direction/Effect on Membership' (#3) column. For example, the appreciation of the partner's professionalism (while emphasizing the importance of the professionalism of the interviewee's company) is something that is positively associated with a good Relational Fit (positive valence), while blaming the customer for their opportunistic behavior and having frequent conflicts are contrarian to Relational Fit (negative valence). The valence-based approach to studying the effect of each dimension is informed by the evaluation of their intensity (#4). The dimensions differ in 'weight' or relative importance within the narrative of an interview or other source. The frequency of related phrases and words is often an indicator of intensity. The researcher, however, should reflect on questions about the interviewees' behavior (where it is applicable) such as: Did they put emphasis on a specific dimension? Did they repeat it in different forms? Did they become nervous, angry or emotional when talking about that dimension? Did the pace, strength of voice, or tone change due to the topic? Such contextual understanding is informed by the researcher's impressions and therefore has a subjective element, yet cases are always analyzed and interpreted based on the researcher's judgement (Alvesson & Deetz, 2000). The GMET provides a means to ensure transparency of the calibration by making the researcher's judgment about relative importance visible. In column #5 illustrative quotes are provided to enhance case-specific understanding. Even though this study focuses on the calibration of qualitative data, in case there is quantitative data available that can inform this process, it should be included in the Template along with a short description of how it influences the evaluation; furthermore, information from other sources (for example, based on data triangulation data where applicable) can also be included (see the row preceding set membership values).

The final evaluation of the membership of the case in the set of customer relationships with good Relational Fit, using a 6-value set, is indicated by a value between 1 and 0, and this evaluation is followed by an explanatory section, i.e. the 'Reason for fuzzy-set attribution

score'. Notably, 1 does not represent the maximum level and 0 the minimum level of a condition in a linear way, but these values represent to what extent the cases studied are members in the set of a phenomenon. 'Full membership' (1) would be indicated by a variety of intense positive (supporting) dimensions with no or negligible negative dimensions occurring in the case. 'Mostly but not fully in' (0.8) membership is indicated by intense (and/or various) positive dimensions with very few negative dimensions. The overall positive, supporting role of these dimensions towards the outcome is less explicit than in case of full membership. The 'more or less in' (0.6) membership can be described by mostly positive dimensions with some important negative dimensions. In case of the 'more or less out' (0.4) membership, negative dimensions override the positive ones (in variety/intensity) but still some important positive dimensions are present. The 'mostly but not fully out' (0.2) is represented by various/intense negative dimensions with very few positive dimensions that in volume and value cannot balance the negative ones. The 'fully out' (0) represents a case of the dominance of intense/various negative dimensions from the perspective of the condition under investigation. In case of a 4-value fuzzy set, the extreme points are the same but the two remaining categories are 'more in than out' (0.67) and 'more out than in' (0.33). The 'more in than out' category can be characterized by mostly but not exclusively positive dimensions, whereas the 'more out than in' value is best described by mostly but not exclusively negative dimensions in relation to the case's condition membership.

The rigour embedded in the GMET for qualitative calibration does not rely on following additional computational rules but on the structure with which the template helps to explore and systemize qualitative data and their comparison. The final evaluation of qualitative anchors is not automatic and requires the researcher's qualitative assessment, but the template enables a theory-informed decision-making that is aligned with an in-depth qualitative approach. For the purpose of the present research the GMET proved to be especially useful during the

discussion about coding and calibration between two coders, following the guidelines of Henik (2015).

7. Theoretical Framing and the Conditions

7.1 Nomological Model

The following outlines the nomological model underlying the present research. In order to build and develop customer relationships the supplier needs to assess the customer company as being attractive enough to do business with over time, i.e. in business markets attractiveness is relevant from both the customer's as well as from the supplier's perspective (Mortensen, 2012). Commitment is unlikely to be developed unless attractiveness is present (Håkansson, 1982; Halinen, 1997). However, until recently, the supplier's perspective on the customer firm has not been investigated in detail, and there exists a need to better understand what makes a customer attractive in the eyes of a supplier in order to foster further relational activities in the future. Thus, the core outcome concept is the relational attractiveness of the customer (RAC). For the purpose of this research we follow Tóth et al. (2015) in defining the phenomenon and the initial conceptualization of its drivers (condition). RAC is the *attitude of the manager at the supplier's side towards the customer firm, which incorporates previous experiences and future expectations with the supplier; therefore RAC incentivizes the supplier to maintain and/or to improve an existing business relationship with the customer by investing in the business relationship.* The conditions of RAC have been identified based on Social Exchange Theory (Hald et al., 2009; Thibaut & Kelley, 1959), because it provides a compelling explanation of how an actor decides to build or maintain relationships with other actors by assessing relational costs, benefits, and environmental conditions. During the analysis, this conceptualization and nomological model was further developed and refined as part of an 'abductive' process (Dubois & Gadde, 2002), i.e. we started with an incomplete set of

conditions that was modified through the data analysis.

The conditions identified as being relevant for achieving RAC are all based on the managerial perceptions from the supplier side. Some of them are related to relationship performance indicators as they stem from the managerial perception, such as Financial Rewards and Non-Financial Rewards, as well as Costs, while others incorporate norms and dynamics of the relational exchange (Relational Fit with customer and the Maturity of the relationship), or the consideration of the network context (Comparison Level of Alternatives) (see Figure 1).

Insert **Figure 1** about here

An overarching cost-benefit logic, borrowed from Social Exchange Theory, is a characteristic feature of research on customer attractiveness (Ellegaard & Ritter, 2006; Schiele et al., 2012). Applying Blau's (1964) definition of rewards within a for-profit exchange context, Financial Rewards are the elements of the relationship that have positive value in economic terms, i.e. the current Financial Rewards deriving from the relationship as perceived by the manager on the supplier side, as well as anticipated/expected financial rewards, both in volume and value terms. Emerson (1976) points out that when it comes to decision-making, the solution with higher expected rewards is more likely to be chosen. While not surprising, these considerations indicate the motivational power of rewards in relationship building. An overview about the rewards and other conditions of RAC is provided in Table 3.

Insert **Table 3** about here

A similar logic applies to Non-Financial Rewards as well. Non-Financial Rewards have various forms such as emotional satisfaction and other social rewards (Lambe et al., 2001) like referrals that can influence managerial decisions (Aarikka-Stenross & Makkonen, 2014), furthermore

being associated with a renowned brand (Bendixen et al., 2004) and other reputational benefits (Cook, 2005), as well as getting access to specific skills or knowledge (Hald et al., 2009) can be perceived as Non-Financial Rewards that increase attractiveness. For example, "*I would say market knowledge, this customer also sets trends in the market, so we can see where they go, see where the industry's going from that perspective*" (Managing Director; large chemical company, specialized in coatings and plastics, Company #19)

The Costs condition (Thibaut & Kelley, 1959; Das & Teng, 2002) does not refer exclusively to financial issues but to various costs of sustaining a relationship (including anticipated future costs). Therefore besides operational cost, Costs can include opportunity costs (Cook et al., 2013), time, energy invested, and emotional costs (Gassenheimer et al., 1998) of dealing with a difficult business partner. The considerations of costs are often relative, i.e. assessed in comparison to different customers (such as time and travelling costs): *"So we've got two dealers in [place A], so if I visit [place A], then I'm gone for a long time, overnight accommodation, travel costs. Whereas if I visit [another place B], I can do [place B] in a morning and be back in the office, it costs me X [less] in fuel."* (Senior Dealer Marketing Manager, large automotive company, Company #2).

In order to achieve attractiveness Trust is needed. Trust plays a vital role in exchange relationships and is created through reciprocal actions (Blau, 1964; Cropanzano & Mitchell, 2005). Trust increases when the company meets the expectations and agreed standards, and as a consequence the role of contracts becomes less important (Macaulay, 1963). Trust shapes the exchange relationship in a way that unpredictable opportunistic actions become less likely (Anderson, 1995) and conflict resolution more manageable (Anderson & Narus, 1990). This conceptualization of the Trust condition comprises both the interpersonal and inter-organizational levels as their synergy reflects on decisions and future behaviors (Zaheer et al., 1998). However, Molm and colleagues (2000) propose that "*trust is one aspect of a broader*

nexus of feelings toward a partner" (p. 1398), which implies that despite the core nature of Trust for sustaining relationships, it is presumably not encompassing enough to capture the relational variety of social exchanges. The same issue arose from coding of the interviews, which informed an extension of the initial Trust condition to the condition of Relational Fit using an inductive approach. Besides trust, the Relational Fit condition embodies a wider range of relational aspects, such as shared values and strategies (Mortensen et al., 2008), geographical proximity (Cantú, 2010), and similarities in ownership (for example, family or publically listed firms, Chrisman & Patel, 2012). Ethical considerations can also be part of the Relational Fit condition: *"Our values mean we wouldn't work with a business for example that acted immorally. It might be acting legally but we wouldn't work with a business that was more like you see on TV like a loan shark company."* (Managing Director, small human resource management firm, Company #1).

Another identified condition of RAC is Dependency, which was later extended by including the network perspective to the Comparison Level of Alternatives (CLA) condition. The discussion on Dependency in Social Exchange Theory dates back to Emerson's (1972) view on how power-dependency relationships influence relationship development. It is also addressed in the customer attractiveness literature (Mortensen, 2012; Hald, 2012). Young-Ybarra and Wiersema (1999) describe Dependency as an important social factor that evolves through heavy involvement in activities with a partner that can include various constraints. Up to a certain point Dependency has the character of a collective incentive and safeguard to maintain the relationship, beyond that point it can impair attractiveness. The issues that arise are, for example, economic constraints, reliance on partner's skills and knowledge, as well as constraints on strategic planning. In these situations, as Lambe and colleagues (2001) point out, third party involvement becomes desirable, because the more dependent party is interested in sharing some risks and responsibilities. Whether this actually happens depends largely on the

availability of alternatives (Schiele et al., 2012) and the company's level of information about them. The knowledge about potential alternatives (Thibaut & Kelley, 1959; Schiele et al., 2012) requires some level of embeddedness in business networks (Håkansson & Johanson, 1993). This network aspect of Dependency appeared as a characteristic in the empirical data as well, which motivated the extension of the originally posited Dependency condition into CLA. For CLA replaceability is an important aspect: "*They're a good sized customer so if we lost the business, to replace that would be very difficult elsewhere.*" (Managing Director; large chemical company, specialized in coatings and plastics, Company #19). Finally, the time perspective was introduced through the relationship Maturity condition. Attractiveness changes over time as the perceived maturity of the relationship can influence the intrinsic evaluation process of the customer's attractiveness (La Rocca et al., 2012; Ellegaard & Ritter, 2006). As emphasized by Hallén and colleagues (1991) "*social exchange processes are time-dependent*" (p. 35), and previous business episodes set expectations for future interactions. Jap and Ganesan (2000) suggest different categories to capture relational time: exploration, build-up, maturity, and decline. The Maturity of the relationship, however, is entirely based on the manager's perception and is not measured by the number of years or via other quantitative anchor-points. Some relationships may still be in the exploration phase after many years, while some others that are equally old are already regarded as mature relationships.

7.2 Sample and Data

Following the guidelines of Ragin (2000) about multiple sampling criteria, we identified two core steps of the sampling process: selection of companies and selection of managers within these companies. The *company-related criteria* were, first, that the case company should be a supplier firm to other businesses. Secondly, the case company should be an actor within a competitive market, excluding monopolistic supply relationships, because under monopolistic market conditions alternatives do not exist and the relational aspects are consequently different.

Thirdly, the contacted suppliers have a substantial proportion of both attractive and less attractive customer companies. *Manager-related sampling criteria* were, first, that the responding manager has sufficient knowledge about the customer company, which typically means direct contact with the particular customer firm (in line with a key informant approach; Phillips, 1981). Secondly, purposive sampling ensured that the manager has been involved in the decision-making process of developing, maintaining or terminating the customer relationship (Mitrega et al., 2012).

To reduce bias in potential overlaps between managerial views, the companies were contacted separately from each other (no snowball accumulation was used), based on a proprietary UK business list. The respondents were asked to select a particular business relationship to answer questions regarding RAC, without stipulating whether this relationship is more or less attractive. Data were collected from a single respondent per company that could potentially lead to common method bias (Chang et al., 2010). In the present research, however, the unit of analysis is the managerial perception about the attractiveness of the company and not something that can be indicated by scales, growth rates or number of partners; thus, common method bias is of less concern for such qualitative perceptual information. Table 4 shows the profiles of the supplier firms and the managers interviewed as well as basic information about the chosen customer company.

Insert **Table 4** about here

About one-third of the supplier companies are SMEs and two-thirds are larger companies (i.e. more than 250 employees). However, the size of the company was not a selection criterion, because there is no clear empirical evidence or theoretical reasoning suggesting that size of the supplier influences the perceived attractiveness of the customer firm. Nevertheless, dependencies in a market context can influence attractiveness (Schepis et al., 2014; Hald et al.,

2009; Emerson, 1972) and this network aspect is incorporated in the study via the Comparison Level of Alternatives (CLA) condition.

7.3 GMET-related decisions

In the present study Social Exchange Theory (SET) informed our understanding both in terms of the identification of conditions and their content as well as provided rationale to use fsQCA (i.e. the overarching nomological model is embedded in a SET rationale). For example, the Non-Financial Rewards condition was identified based on SET, and some of its dimensions derived from literature allowed for a more fine-grained understanding, in particular by distinguishing brand-related benefits (Bendixen et al., 2004) and reputational benefits (Cook, 2005) as well as rewards of effective knowledge-sharing (Hald et al., 2009). However, some further dimensions of Non-Financial Rewards, such as the value of recommendations, arose from empirical data analysis. The potential fit of such newly discovered dimensions were checked against the overarching theoretical framework.

Having an initial template helped in identifying the same conditions across the cases. The initial template consisted of the five conditions Trust, Dependency, Financial Rewards, Non-Financial Rewards, and Costs as well as the outcome condition relational attractiveness of the customer (RAC). As a result of the iterative coding process applied, the initial template was extended by the time perspective (Maturity condition). Two conditions (Trust and Dependency) were extended into the Relational Fit, and the Comparison Level of Alternatives conditions, in order to cover further relational aspects as well as the network perspective explored during the interviews.

We draw upon theoretical and substantial case knowledge about the universe of cases and not the sample in a restrictive way. This is why the option of mechanistic calibration was rejected and instead the GMET was applied. An important decision was the number of value sets used for RAC and each causal condition. 6-value fuzzy sets were applied to most conditions, because

these provided a relatively fine-grained specification without creating artificial differences. 4-value fuzzy sets were applied to the Maturity condition, and RAC as the outcome. Theory informed the 4-value decision of the 'membership in Mature Customer Relationships' set, because Jap and Ganesan (2000) proposed a four-group categorisation of relationship maturity that has previously been applied in the context of attractiveness (Baxter, 2012; Mortensen & Arlbjørn, 2012; Nollet et al., 2012). These Maturity categories were not applied in this study in a linear way but they informed the set-selection by creating qualitative breakpoints for a 4-value fuzzy set more clearly, compared to alternative fuzzy sets with higher numbers of categories. In most empirical RAC cases both 4- and 6-value fuzzy sets tended to be appropriate but there were cases where applying a 6-value fuzzy set would have required some artificial distinctions, especially between the 'mostly but not fully in' (0.8) and 'more or less in' (0.6) values. Assuming that the phenomenon of RAC belongs to the eyes of the beholder (Ellegaard & Ritter, 2006), it is worth considering the actual degrees of elaboration of RAC in the managerial narratives (i.e. the granularity the managers apply in their descriptions of RAC).

8. Between-case Analysis and Findings

8.1. Truth Table and Boolean Analytical Basis

The information from the calibrated dataset (i.e. fuzzy values were identified based on qualitative data by case for the conditions and the outcome using the GMET) is summarized in the truth table by sorting cases into 2^k logically possible combinations (truth table rows), where k is the number of conditions – in this study this means 64 (2^6) theoretical combinations. After constructing the truth table, Fiss (2011) describes logical minimization, and the production of simplified combinations based on Boolean algebra. The general purpose of the minimization process is to simplify the information in the truth table by dropping logically redundant conditions (Rohlfing, 2012) and producing the formula for sufficiency (Schneider &

Wagemann, 2012). The minimization process includes two main stages: first, limiting the analysis to only those rows in the truth table that have a minimum number of cases (in this study at least one case). Logical remainders are configurations (i.e. lines in the truth table) which are logically possible but have no empirical observations and depend on the researcher's decision whether to include any of these cases based on theoretical reasoning (Fritzsche, 2013). In this study, only empirically observed configurations were included and others were treated as remainders. Secondly, minimum consistency levels for solutions are considered. The consistency cut-off for the configurations in the truth table was set at 0.9 (there is an ongoing discussion about the lowest acceptable threshold, which is often set at 0.75, but generally speaking the higher consistency the better; Schneider & Wagemann, 2010). The truth table rows were reduced to simplified combinations based on Boolean algebra (Rihoux & Ragin, 2009) that resulted in the solution formula with multiple paths (equifinality).

8.2. Analysis and Results

A condition is *necessary* if whenever the outcome is present, the condition is also present. But there can be cases that are members of the condition but not the outcome (Schneider & Wagemann, 2010), therefore the analysis of necessary conditions assesses the consistency with which instances of the outcome displaying the causal condition tend to be necessary (Ragin, 2008). A minimum level of a 0.9 consistency is suggested for the analysis of necessary conditions (Fiss, 2007; Ragin, 2008). None of the conditions in this study exceeded the consistency level of 0.9, therefore no necessary condition was identified.

A condition is *sufficient* whenever the condition is present and the outcome is present too, or more generally speaking the condition can be regarded as sufficient if, across the cases, set membership in it is lower than or equal to each case's membership in the outcome (Schneider & Wagemann, 2012). The *raw coverage* is the percentage of all cases' set membership in the outcome and is covered by a single path. *Unique coverage* shows the percentage of all cases'

set membership in the outcome uniquely covered by a single path (Ragin, 2008). Table 5 shows the results of the fsQCA: four solutions for the presence of RAC (High RAC) and two solutions for the absence of RAC (Not-High RAC). For the interpretation of the solution tables the format published by Ragin and Fiss (2008) is applied. The black circles indicate the presence of a condition; circles with 'X' indicate the absence, while large circles indicate core conditions, whereas small ones are peripheral conditions.

8.2.1. Configurations for RAC and for the Absence of RAC

There are four sufficient configurations for RAC that all pass the minimum threshold of consistency. This applies to the overall solution consistency as well. In terms of coverage, the solutions account for 70 percent of membership in the group achieving RAC, which represents a high coverage value (comparable to the R^2 variance explained indicator of variable-based analysis; Schneider & Grofman, 2006). There are two solutions offered for relationships that are not Mature (1b and 1c), one for Mature relationships (1d) and for one solution Maturity does not matter. Also, there are different solutions provided for high CLA (1b and 1d), low CLA (1a; more specifically in cases with low membership in customer relationships with high CLA), and also there is one solution (1b) where it does not matter whether CLA is high or low.

Insert **Table 5** about here

For the absence of RAC two solutions were identified. In the case of 2a maturity does not matter but the CLA is low, whereas in 2b CLA does not matter but the relationship is less Mature. The solution consistency for the absence of RAC is high with a value of 0.94, with a reasonable coverage of 52 percent. Although no necessary conditions are identified, the absence of Costs (i.e. low membership levels in the customer relationship with high Costs) for RAC, the absence of Relational Fit (low membership level in the customer relationship with good Relational Fit) and the absence of Financial Rewards (low membership level in the

customer relationship with high Financial Rewards) for the absence of RAC are all relatively close to the necessity threshold. It is arguable that these therefore represent necessary conditions in a practical sense (Olsen, 2009). The analysis of core and peripheral conditions shows that the absence of Maturity, the presence of Non-financial Rewards and of Relational Fit are core conditions for RAC (and in solution 1b the absence of Financial Rewards is a core condition besides the presence of Non-financial Rewards), and that all conditions are peripheral (i.e. less essential as part of the configuration for causing the presence of the outcome). For the absence of RAC, the absence of Non-financial Rewards and the presence of Costs proved to be core conditions.

The Boolean formula represents the briefest way of describing a functionally complete logic system (Kabanets & Cai, 2000). The Boolean formula for the four configurations leading to RAC is:[3]

$$\sim COS * [RELF * FR * (NFR * \sim CLA + \sim MAT * \sim NFR) + CLA * (MAT * RELF + \sim MAT * \sim FR * NFR)]$$
$$\rightarrow RAC$$

The simplified formula shows that besides the absence of Costs there are more alternative ways to achieve attractiveness: either a combination of Relational Fit, Financial Rewards and some other conditions, or CLA and Relational Fit (if it is a more Mature relationship) or CLA and Non-Financial Rewards (even when Financial Rewards are absent, but the relationship is not a Mature one). The second Boolean formula shows that a common trait to achieve the absence of RAC is when managing the relationship is expensive (Costs), it does not result in major Financial or Non-Financial Rewards, and the Relational Fit is not very good:

$$COS * \sim FR * \sim NFR * \sim RELF * (\sim CLA + \sim MAT) \rightarrow \sim RAC$$

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[3] "~" indicates the absence of a condition, "*" is the "logical and", and "+" is the "logical or", while the abbreviations are as follows: MAT maturity, FR financial rewards, NFR non-financial rewards, COS costs, and CLA comparison level of alternatives.

8.2.2. *Configurations for Very High RAC*

The analysis of extreme outcomes is demonstrated by Fiss (2011). Such an analysis explores how Very High RAC can be achieved, thereby extending the understanding of drivers of RAC. This requires recalibration in terms of assigning new values to cases in relation to the RAC condition with an anchor-point for Very High RAC that is different to RAC. For example, a case where the customer firm was somewhat attractive (membership of RAC "more in than out", but close to "neither in nor out") has set membership of "more out than in" when the analysis relates to the membership in Very High RAC. The previous calibration of other conditions, however, remains unchanged. Table 6 shows the results of the fuzzy set QCA analysis of Very High RAC, with only one sufficient configuration existing, showing a reasonably high raw coverage (47 percent).

Insert **Table 6** about here

Not surprisingly, Very High RAC can only be achieved through the combination of Financial as well as Non-Financial Benefits, the absence of Costs, low CLA, and good Relational Fit. However, these conditions were combined with low Relationship Maturity, i.e. at early stages of the relationship customers could achieve extreme levels of attractiveness while such an extreme outcome could not be replicated in more mature relationships. Furthermore, a sensitivity analysis was carried out by checking configurations at different consistency levels (0.75, 0.80, 0.90) but only minor changes were observed regarding neutral permutations that occur and the specific number of solutions, while the interpretation of the results remained substantively the same (Fiss, 2011). Therefore, the results of the fsQCA based on qualitative data are robust.

9. Discussion and Conclusions

This study applies fsQCA to the analysis of qualitative data and introduces as its main methodological contribution the Generic Membership Evaluation Template to bring more clarity to the calibration process that often lacks quantitative anchor-points. Through the systematic review of previous fsQCA studies using qualitative data, we identify some practices, issues and suggestion about how theory can inform the analytical process, ways of coding, construction of set-membership categories and the calibration process. We thereby sensitize researchers to some of the common pitfalls of using fsQCA for the analysis of qualitative data. Theory can inform fsQCA, and especially the use of the GMET in various ways: through identification of conditions, the dimensions of these conditions, and the relationships between them. If a configurational logic is posited at a theoretical level, this could provide a good rationale for applying fsQCA empirically to investigate the phenomenon. Also, theories can support hypothesis and proposition-development, although exploratory qualitative research might not require such statements to test at all. For the coding process we recommend using a template based on previous literature and make changes to the template along the way if needed, as part of an abductive process of juxtaposing a conceptual framework (the GMETs for each condition and outcome) with the empirical data. Some of the conditions might need further development, some conditions might need to be eliminated, or new conditions are needed. Without an initial template, however, there is a considerable risk of not being able to find the same conditions in each case that can make fsQCA more difficult if not impossible.

For the identification of set membership categories even numbers are normally more favorable, because the ambiguity around 'neither in, nor out' of membership can be avoided this way. 4- and 6-value fuzzy sets tend to be highly appropriate where exclusively qualitative data was available without quantitative anchors. Different types of fuzzy sets can be combined within the same study, but crisp sets are not recommended unless the phenomenon is dichotomous in

nature. The calibration is the most 'fuzzy' part of qualitative fsQCA studies. Many authors choose crisp sets instead of developing a rationale for fuzzy calibration, or they apply quantitative anchors where applicable. We introduce the GMET that helps to identify some qualitative anchors by considering different dimensions of a condition, as well as the intensity and the negative/positive valence of these dimensions in respect to the outcome and their context. The template can include quantitative anchors as well but aims primarily at the calibration of qualitative data. Besides these methodological benefits, the template can increase the transparency of the calibration process and as such provides a way to increase the rigour when using qualitative input data in fsQCA. Using GMET can also be combined with more quantitative applications of fsQCA, for example, for the analysis of additional interviews conducted to decide about calibration principles in case large quantitative datasets. These additional interviews serve a similar role than the ones often used for pre-testing measurement instruments (an fsQCA example for the latter is Ordanini et al., 2014). Researchers have adopted different calibration practices that are deemed legitimate and useful – this study offers a potential way for these purposes focusing primarily on qualitative data. We demonstrate how using a template such as GMET can support empirical evidence informed decision-making about which membership values to assign to cases as part of a set-theoretic analysis.

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Figure 1 Conceptual Model of the RAC Conditions

Causal Conditions:
Costs-Rewards Considerations
- Rewards:
  Financial Rewards
  Non-Financial Rewards
- Costs

RAC

Causal Condition:
Network Perspective
- Comparison Level of
  Alternatives, evolved
  from the condition
  Dependency

Causal Conditions:
Relational Characteristics
- Relational Fit, evolved
  from the condition
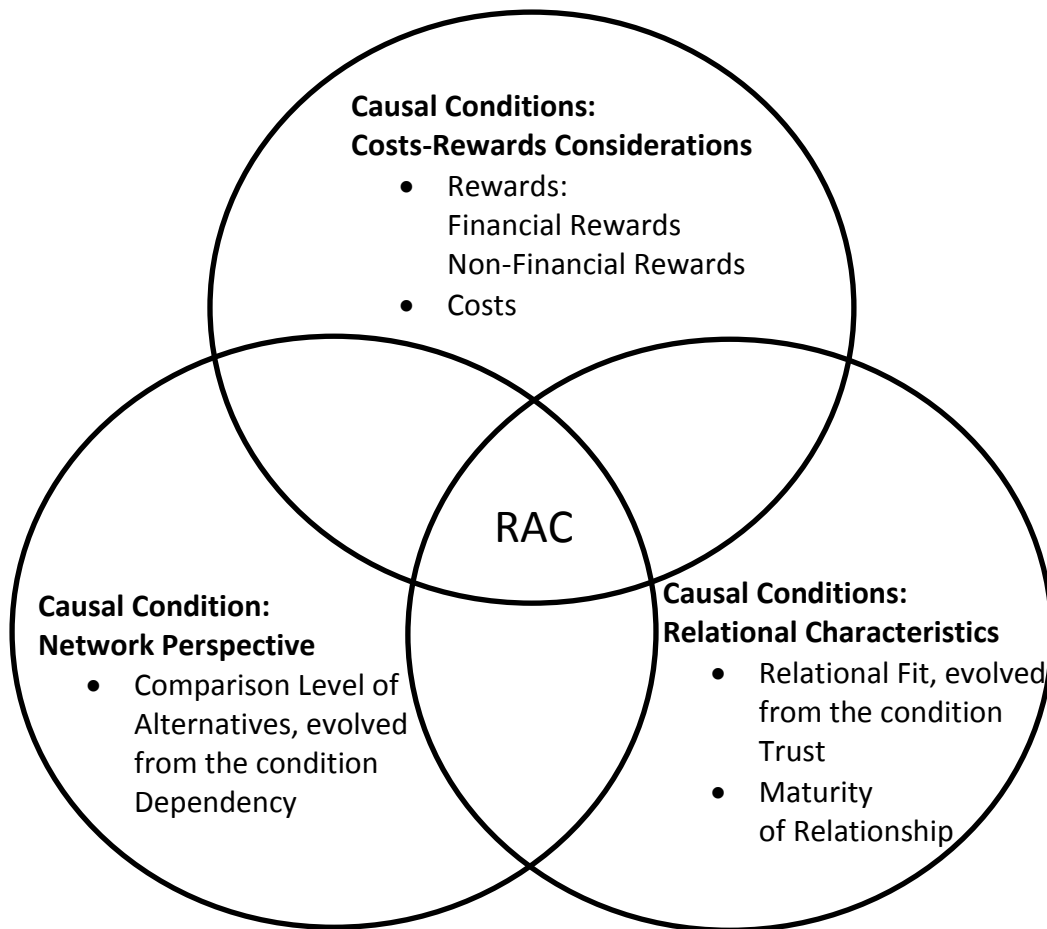 Trust
- Maturity
  of Relationship

Table 1 FsQCA articles using qualitative data

Article	Context	How theory is applied?	Coding process	Decision about set-membership categories	Calibration
Basurto (2013)	Biodiversity conservation in Costa Rica.	Theoretical background is used to highlight interaction between the conditions in the context of the research.	n.a.	6-value sets are applied, the decision is not explained.	Mainly based on quantitative anchors. It is noted that "special care was given to ensure that similar values on the Likert scale from different respondents could be compared" (p. 578), which increases ambiguity.
Basurto & Speer (2012)	The responsiveness of Guatemalan local governments.	Theory is used for hypothesis articulation, the identification of conditions as well as some dimensions of these conditions.	Iterative coding. It is unclear whether template had been used for the analysis.	4-value sets based on substantive case knowledge and the detailed nature of data.	Primarily based on quantitative anchors, for example frequencies.
Crilly (2011)	Stakeholder orientation in the multinational enterprise.	The emphasis is on linking different levels of analysis, i.e. resource pressures, institutional pressures and organizational attributes.	'Features' and 'drivers' are identified as dimensions and antecedents of local and global legitimacy pressures conditions. Coding is not elaborated but appears to embrace diversity of the conditions.	Considers 4-value and 6-value sets, with the final choice of the 4-value sets. Describes membership sets as scales.	Based on substantive case knowledge and illustrative examples. Membership categories are typologies of situations, in which current status and future intentions are embedded (e.g. stakeholder orientation condition).
Schneider & Sadowski (2010)	Governance configurations and academic outcomes of PhD education.	Literature is applied to the identification of conditions but less for the content-description of these conditions (i.e. not as guidance for coding).	n.a.	Combination of 4- and 6-value fuzzy sets. Reasons of this choice are not explained.	Based on quantitative anchors where applicable. Qualitative aspects are not explained.
Van der Heijden (2015)	Voluntary environmental programs and their governance.	Identification of activities, the identified conditions are based on these activities.	Systematic coding scheme is applied.	4-value fuzzy sets, decision not explained.	Based on degrees of presence and absence, i.e. 1 fully presence, 0.67 partially presence, 0.33 partially absence, 0 fully absent.
Verweij et al. (2013)	Governance networks of Dutch spatial planning projects.	Theory is applied to identify conditions.	Not really coding but categorisation of cases along identified key characteristics.	4-value fuzzy sets, decision not explained.	Quantitative anchors (e.g. number of conflicts) but also qualitative aspects, such as the intensity of these conflicts.
Wang (2016)	Neighbour governance networks in Beijing.	Theory is used for the identification of the conditions and justification of a configurational approach.	No coding, interviews provide overall impressions that are analyzed along with other types of data.	Continuous fuzzy sets but the process is not explained.	Based on a combination of qualitative, quantitative and social network analysis data. Only network measures are explained.

Table 2 Generic Membership Evaluation Template (GMET) for the Relational Fit Condition

Generic Membership Evaluation Template (GMET)				Case number:
Membership in the set of 'Customer Relationships with good Relational Fit'				
Overall Case Description from a Relational Fit Perspective	A sustainable but very difficult relationship with various problems at an inter-personal level (e.g. hidden agendas) as well as differences in corporate communication style (e.g. negotiations). The Customer`s professional qualities are highly valued but power games around branding issues and ownership create a distrustful atmosphere with regular conflicts.			
Dimensions #1	**Context-specific Description #2**	**Direction /Effect on Membership #3**	**Intensity /Relative Importance #4**	**Illustrative Quote(s) #5**
Customer's opportunistic behavior	Branding issues and problems with information sharing	Negative	Medium /High	"…they are more interested in their brand than in our brand"
Trust issues (inter-organizational level)	No trust, contact person is described as intelligent but very opiniated and argumentative	Negative	Moderate	"I don't trust them. (…) [Our company] doesn`t trust them."
Professional trust	There is trust in the abilities and skills of the customer	Positive	Medium	"They are a good organization, they are professional, they make profits…"
Frequent conflicts	Even minor problems end up in conflicts	Negative	High	"There's always going to be conflict, but the conflict is always exaggerated when we`re dealing with them. (…) Any potential discrepancy, argument, interaction, always end up in conflict with them."
Difference in size of organizations	Organizational inertia deriving from size	Negative / Neutral	Low	"Because they are relatively small, they can move a lot quicker than we move."
Differences in organizational cultures	Different negotiation styles (difficulties)	Negative	Moderate	"[Customer] is supporting the contact person`s argumentative behavior."

	and lack of the sense of collaboration			
Changes in ownership	The holding company behind the Customer became part of a company where Supplier bought a 40% stake	Negative	High /Medium	"…when the tail tries to wag the dog… they are trying to wag us. They are telling us what we should be doing, and what products we should have, that type of thing.""
Supporting quantitative data	n.a.			
Set Membership in 6-Value Fuzzy Set	**0.2 ('mostly but not fully out')**			
Reason for fuzzy-set attribution score	Various negative dimensions of the condition can be identified (some with articulate intense criticism, e.g. frequent conflicts) demonstrate that this case is 'mostly but not fully out' of the set of 'Good Relational Fit with the Customer'. Even though a positive dimension (professional trust) is present, this cannot balance the relative weight and importance of the dimensions with negative valence. The presence of this positive dimension is the reason why the fuzzy-set attribution score is not 'fully out' in this specific case.			

Note: The examples are presented for demonstration purposes and are not exhaustive. This example shows a case with "relatively low" membership in "Customer Relationships with Good Relational Fit".

Qualitative anchors: Meanings attached to fuzzy values

1   Overall intense and various positive dimensions

0.8 Intense or various positive dimensions with very few negative dimensions

0.6 Mostly positive dimensions with some (important) negative dimensions

0.4 Mostly negative dimensions with some (important) positive dimensions

0.2 Intense or various negative dimensions with very few positive dimensions

0   Overall intense and various negative dimensions

Note: The examples presents the evaluations for a 6-value fuzzy set.

Table 3 Conditions, their operational definitions and theoretical background

Conditions of RAC		Operational Definition of Condition	Source
Rewards	Financial	Current and expected financial benefits of the relationship with the Customer	Blau, 1964; Thibaut and Kelley, 1959; Lambe et al., 2001; Emerson, 1976
	Non-Financial	Current and expected non-financial benefits of the relationship with the Customer, such as reputational benefits, and benefits related to branding, knowledge sharing, networking, recommendations/referrals	
Costs		Current and expected costs of managing the relationship as well as operational costs.	Blau, 1964; Thibaut and Kelley, 1959; Das & Teng, 2002; Molm, 1991
Comparison Level of Alternatives (CLA)		The Comparison Level of Alternatives reflects on the perception and knowledge of the availability of potential alternatives that broadens the relationship-specific dependency aspect with a contextual network perspective.	Partly literature (Blau, 1964; Cook and Rice, 2003; Thibaut and Kelley, 1959; Emerson, 1962; Lambe et al., 2001) and partly based on emerged coding.
Relational Fit		The perceived fit at a relational level between Customer and Supplier, including different relational aspects such as trust, communication frequency and intensity, geographical proximity, similarities and differences between organizational cultures and relational fit at the level of inter-personal relationships.	Starting point was trust (Copranzo et al., 2005; Molm et al., 2000) informed by emerging coding. Some aspects of Relational Fit were identified based on previous literature and then in data (e.g. shared values and strategies, Mortensen et al., 2008), some derived from data (e.g. geographical proximity, transparency)
Relationship Maturity		The relationship maturity describes the perceived maturity of the relationship from the Supplier`s perspective. The relationship maturity condition is not based on a linear measure that means that the actual length of the relation does not directly indicate the relationship maturity and the different maturity categories do not necessary follow a step-by-step linear sequence. For example, a once declining relationship may change into a build-up phase or a new relationship can reach the declining phase without reaching maturity.	Ellegaard and Ritter (2006) suggest that attractiveness may differ in different stages of business relationships. For the maturity categories Jap and Ganesan (2000) is applied.

Table 4 Position and industry background of interviewees/suppliers and the chosen customer firm

#Case	Position of Manager (Supplier Side)	Industry of Supplier	Size of Supplier	Industry of Customer	Size of Customer
1	Managing Director	human resource management	small	social enterprise	large
2	Senior Dealer Marketing Manager	automotive	large	automotive dealer	medium
3	Head of Strategic Marketing	manufacturing (equipment for energy sector)	large	tool hire	large
4	Director of Sales	hospitality	large	financial services	large
5	Managing Director	storage management	medium	corporate relocations	medium
6	Managing Director / Customer Experience & Complaints Executive	financial services	large	football	large
7	Managing Director	accountancy systems	medium	NGO	large
8	Managing Director	confectionery	small	food retail	large
9	Vice President of Technology	cloud & technology services	medium	charity	large
10	Product Lifecycle Executive Manager	engineering & electronics	large	wind farm	large
11	Program Director	education	large	governmental	large
12	Managing Director	architecture design	small	construction	medium
13	Customer Director	consumer goods	large	food retail	large
14	Domestic Retail Director	water & waste water	large	consumer goods	large
15	Indirect Channel Executive Sales Manager	petrochemicals	large	oil products distributor	large
16	UK & Ireland Sales Director	heavy equipment (for construction)	large	construction	medium
17	Sales Director	recycling	large	financial services	large
18	Market Intelligence Director	information technology equipment & services	large	governmental	medium
19	Managing Director	coatings & plastics	large	automotive pigment supplier	large
20	Customer and Partner Experience Director	software & online services	large	multichannel retail	large
21	Managing Director	courier delivery services	large	office stationary	large
22	Commercial Support and Planning Director	baking	large	food retail	large
23	UK Business Director	telecommunication	large	home retail	large
24	Senior Team Leader and Communication Executive	advertising	medium	transportation	large
25	Managing Director	consultancy	small	NGO	medium
26	Managing Director	event management	small	media	small
27	Sales Director	logistics	medium	retirement homes	medium
28	Managing Director	electronic equipment	large	multichannel retail	large

Note: Size of Supplier/Customer is classified by the number of employees, according to UK governmental guidelines (www.gov.uk): small company is defined as a business below 50 employees, medium between 50 and 250 employees and large 250 employees and above.

Table 5 Overview of Solutions for RAC

| | Relational Attractiveness of the Customer (RAC) | | | | | |
| | Presence | | | | Absence | |
	1a	1b	1c	1d	2a	2b
Maturity		⊗	⊗	●		⊗
Financial Rewards	●	⊗	●		⊗	⊗
Non-Financial Rewards	⬤	⬤	⊗		⊗	⊗
Costs	⊗	⊗	⊗	⊗	⬤	⬤
CLA	⊗	●		●	⊗	
Relational Fit	⬤		⬤	⬤	⊗	⊗
Consistency	0.89	0.95	0.95	0.94	0.93	0.95
Raw coverage	0.52	0.36	0.36	0.48	0.43	0.36
Unique coverage	0.10	0.03	0.02	0.07	0.16	0.08
Solution coverage		0.70			0.52	
Solution consistency		0.87			0.94	

Note: black circles indicate the presence of the conditions; circles with "x" indicate the absence; large circles indicate core conditions; small circles indicate peripheral conditions.

Table 6 Overview of Solutions for Very High RAC

	Very High RAC
	1
Maturity	⊗
Financial Rewards	●
Non-Financial Rewards	●
Costs	⊗
CLA	⊗
Relational Fit	●
Consistency	0.93
Raw coverage	0.47
Unique coverage	0.47
Solution coverage	0.47
Solution consistency	0.93

Note: black circles indicate the presence of the conditions; circles with "x" indicate the absence; large circles indicate core conditions; small circles indicate peripheral conditions.