The systemic contract

Contracts are often unnecessarily complex including a myriad of clauses, but mostly do not fit exchange transactions in inter-organizational relationships. While extant studies explicitly call for a middle-way type of contract that combines classical and relational contract rules, this has not yet been tested in an empirical setting. Thus, this study empirically measures and positions which contract rules achieve fit with exchange transactions in large project-based settings by deploying fuzzy-set qualitative comparative analysis of 23 cases. Our results provide two distinct but cumulative contributions. First, we contribute to theory with a conceptual framework for an effective systemic contract which bridges classical and relational contract theories and fits exchange transactions. Second, we offer one of the first comprehensive empirical examinations of the fit of contract rules with exchange transactions, showcasing that configurational analysis is a suitable method to study complex causality in operational problems. Practical and theoretical contributions are presented to extent and refines existing practices and thinking.

Keywords: *Contract complexity, contract rules, transaction fit, inter-organizational relationship, fuzzy-set QCA*

1. The need for a systemic contract

The use of contracts as safeguarding mechanisms to align economic incentives among partnering organizations in project-based settings has attracted considerable interest (Carey et al., 2011; Wagner and Bode, 2014). Large, project-based settings (prominent examples are the UK National Health Service's National Program for IT, programs funded by the European Union, the New York City's CityTime project) very often face problems in delivering on budget, time and to a contractually stipulated quality level (Bendoly et al., 2010; Scott-Young and Samson, 2008; Swink et al., 2006). Contracts governing these large project-based arrangements are often quite complex containing nested structures of rules (Barthélemy and Quélin, 2006). These complex contracts do quite often not fit exchange transactions, hence suffering from frequent renegotiations and weak implementation of activities (Turner, 2004; Williams, 1999).

Contract complexity is a common cause of failure for coordinating exchange transactions. Extant theory argues that a contract should include multiple sets of control rules greater than, or equal to the number of transaction risks, indirectly adopting a point of view in line with Ashby's (1958) 'law of requisite variety'. In order to control behavior within exchange transactions, there is, based on the law of requisite variety, only one choice – to increase the variety of regulation (i.e. more control rules and hence larger contracts, requiring more lawyers, more managers, more Key Performance Indicators and more meetings - Jiang, 2009). This leads to contracts which are often too complicated to be effective (e.g. Bosch-Rekveldt et al., 2011; Martinsuo and Ahola, 2010; Turner, 2004).

Extant contracting theory is polarized into two camps - the classical and the relational. It has been acknowledged that *neither classical nor relational contract rules fit transactions* (Argyres and Mayer, 2007; Reuer and Arino, 2007). For this reason, some sparse evidence has recently emerged that a middle-way contract may fit exchange transactions (Harrison, 2004; Poppo and Zenger, 2002; Zheng et al., 2008) but neither theory offers convincing indication of how to construct simpler and more effective contracts (Liu et al., 2009). Hence there is a need for further testing on the subtle, but important and under-explored, differences between contract rules (Cachon, 2003) and their combinations that fit exchange transactions (Schepker et al., 2013). To address this lacunae, we position the following overarching research question: *Which contract rule combinations create a systemic contract that fits exchange transactions in complex project-based*

arrangements? To answer this question, we categorized contract rules into three types (linkage-practical-emancipatory) across 23 projects and then measured how rules fit transactions deploying fuzzy-set comparative qualitative analysis (fsQCA).

This study answers previous calls for a middle-way contract and for empirically testing distinct types of contract rules in a fine-grained manner (Poppo and Zenger, 2002). This study offers two distinct but cumulative contributions. First, we offer one of the first comprehensive, empirical analyses of the fit to exchange transactions to different contract rules in complex project-based arrangements. The study offers empirical findings that reveal the contract rule combinations that reduce contract complexity and enhance fit with exchange transactions. In addition our results directly answer recent debates on whether classical and relational contract rules are complements or substitutes (Poppo and Zenger, 2002). This analysis refines and extents prior theory on contractual governance of complex transactions in the operations and project management arena (Prasad and Babbar, 2000). Second, based on our rich empirical findings, we propose a new theoretical concept; the *systemic contract* as a 'middle-way' contract that bridges classical and relational contract theories which, as suggested by extant studies, is necessary but has not yet been achieved. In addition, this study illustrates how configuration analysis is an appropriate method of analyzing causal complexity in contracts which is a method that, to the best of our knowledge, no other study on this topic has yet utilized.

The remainder of the paper is structured as follows: in the next section we review contract complexity and discuss the links and potential combinations between classical and relational contract rules (complements or substitutes) to achieve transaction fit. We then develop propositions to test the fit of contract rules and we present the background to our cases. In the analysis we measure and discuss the test results of our propositions. We conclude which rules combine for the design of a systemic contract and draw theoretical and practical implications.

2. Conceptual Background

2.1 Contract complexity in project-based arrangements and the lack of exchange transaction fit

Although in practice many contract types exist, including but not limited to cost-plus-incentive fee (CPIF), cost-plus-award fee (CPAF), cost plus fixed-fee (CPFF), fixed price (lump sum), and turnkey-unit price, they are all, in fact, typically complex. In other words, these contracts are 'composed of elaborate clauses or rules' mainly transferring risks through milestone-driven rules and risk management tools (Barthélemy and Quélin, 2006, p. 1776). Contracting is envisaged as top-down enforcement, where the contract is a recipe for controlling transaction complexity in terms of time, cost, resources, and flexibility (Jiang, 2009) according to the modularization of task and work division (Curlee and Gordon, 2011). Modularization leads to a multitude of rules based on transfer or sharing risk, goal alignment, penalties and incentives (Kwon et al., 2010; Marrewijk et al., 2008; Müller and Turner, 2005; Winch, 2010).

While contracts can help manage transactions to an extent, the efforts invested ex ante to pre-plan exchange transactions through multiple rules is also a cause of transaction complexity at the operational level. This is supported by research conducted by Bosch-Rekveldt et al. (2011), who found that the type of contract is the 6th (out of 40) most frequent source of complexity in exchange transactions and more specifically the source of several 'relational gaps' (Zandvliet, 2005). In order to overcome these gaps, more rules are added within the already complex contract, which in turn expand these relational gaps (Ng et al., 2009). In practice, the high levels of complexity in contracts make them too rigid to deal with change, posing immense difficulties on delivery (Remington, 2011) and raise the necessity for more flexible contractual agreements. Management problems arise from contract complexity (Curlee and Gordon, 2011), for instance: lengthy and frequent (re)negotiation and rewriting, asymmetric information and increase information production to compensate, inadequacies in enforcing rules and monitoring performance, leading to higher costs (Boeh, 2011), inefficient control (Kwon et al., 2010; Winch, 2010) conflicts and defensive behavior, or mismatch between norms (Müller and Turner, 2005). Thus, contracts are characterized by a lack of fit between rules and exchange transactions which is a vital theoretical and practical gap (Curlee and Gordon, 2011, 2008). We explore the theory about fit between contract rules and exchange transactions, next.

2.2 Which types of contract rules fit transactions - classical or relational?

Complex contracts contain structures of rules which are 'sets of explicit or understood obligations, incentives, rewards and penalties stipulating conduct, action and behavior within particular activities in different situations' (Barthélemy and Quélin, 2006, p. 1776). Contract complexity is associated with high levels of nested, detailed rules regarding task description, contingency planning and communication (Argyres and Mayer, 2007). However, the theoretical basis for contractual complexity initially originated from a large and sophisticated body of work primarily produced by proponents of transaction cost economics, agency theory and law theorists, which were in pursuit of a complete and optimal contract. Such a 'classical' contract stipulates control rules for every possible type of opportunistic behavior and future contingency (complete) at the lowest transaction cost relative to outcome (optimal) (Lyons and Metha, 1997). This line of thinking implies that contracts need to be complex, i.e. including as many rules as needed to safeguard against possible future contingencies. Prior studies have positioned three main dimensions why complex contracts are inevitable (Eggleston et al., 2000): (i) the number of opportunistic behaviors it mitigates for (*prediction*); (ii) the degree in variability of payments for each party (*asset specificity*); and (iii) the cognitive load imposed on the parties in order to understand the contract. Eggleston et al. (2000) further state that in practice, contracts are actually not as complex as they should be, because the complexity in contracts does not actually match the complexity within transactions. Classical contracts are based on the ideal 'discreet transaction' that downplays informal transactions and unspecified risks therefore they are limited by bounded rationality (Kalkanci et al., 2013).

The technique for structuring classical contracts is the modular decomposition of transactions; standardized rules are written which specify the exchange between parties in much detail, in order to buffer or protect each party from inappropriate behavior (Smith, 2006). The contractual safeguards in terms of the number and level of specificity in the rules will increase as the risk of opportunistic behavior and exchange hazards increase (Heide, 1994; Macneil, 1978; Mesquita and Brush, 2008). In contrast to the logic of the discrete transaction, the argument in alliance and inter-organizational relationship studies is that previous long-term relations history ameliorates the partners' exposure to risk and opportunistic hazards (Kailnis and Mayer, 2004). The inefficiencies associated with negotiating, monitoring, and

enforcing complex contracts may be avoided by relying upon relational governance mechanisms (Banerjee and Duflo, 2000;; Dyer and Singh 1998; Joskow, 1987; Kailnis and Mayer, 2004), hence reducing complexity in rule structures (Argyres and Mayer, 2007). However, in reality relational contracts are still complex and highly detailed, because specificity in customized transactions increases the number of rules devised for it (Argyres and Mayer, 2007; Joskow, 1988). Similarly to classical contracts, the decomposition in relational contracts depends on the limited capacity of humans, i.e. bounded rationality, to understand the underlying problem to be solved (Nickerson and Zenger, 2004) leading to highly vague and heterogeneous rules. While relational rules provide more operational flexibility and offer partners different levels of control in their transactions than classical rules (Reuer and Arino, 2007), they still do not achieve transactional fit (Jiang, 2009).

From this synopsis we contend that neither classical nor relational rules achieve fit to exchange transactions (Argyres and Mayer, 2007; Reuer and Arino, 2007). We therefore explore what prior research has discovered regarding the link between classical and relational contract rules (complements or substitutes) – and how they may be combined to achieve fit.

2.3 Combination links between classical and relational contract rules: complements or substitutes?

Some studies have proposed that 'middle-way' or hybrid contracts may address the needs for balancing relationship-specific safeguarding, adaptation and control (Aulakh and Gençtürk, 2008; Kalkanci et al., 2013) and may ultimately be more complete (Ryall and Sampson, 2003) if they contain a combination of rules (Liu et al., 2009). However, other authors argued that hybrid contracts may be less effective because of the need of different environments in which they are most effective (Wuyts and Geyskens, 2005).

The effort to devise simpler, hybrid contracts requires knowledge about the link between classical and relational rules. Although this link has been a subject of recent debates, there have been only a few empirical studies comparing the properties of classical contracts vis-à-vis relational contracts (e.g. Carson et al., 2006; Luo, 2002). More widespread empirical efforts are hampered because of the fuzzy boundary along the continuum of implicit-explicit rules (Aulakh and Gençtürk, 2008), which have also led to inconclusive and often opposing findings with regards to whether these rules are complements or

substitutes. For instance, studies in the oil, film and software industries claim that relational contracting 'fills in' the incompleteness in classical contracts thereby leading to the broad consensus that relational and classical rules act as complements (e.g. Gopal and Koka, 2012; Gulati and Nickerson 2008; Hoetker and Mellewigt 2009; Zheng et al., 2008). On the other hand, work by Ghoshal and Moran (1996), and Rai et al. (2012) observed that reliance on controls decreases when levels of trust between parties increase, therefore relational and classical rules can be substitutes rather than complements. While Liu et al. (2009) claim that classical mechanisms are effective to control opportunism and relational mechanisms are more effective to improve relationships separately, Jiang (2009) found that complex transactions benefit significantly from relational mechanisms alone. Tiwana (2008) argued that classical and relational rules can operate as complements with respect to one transaction and as substitutes with respect to another. Banerjee and Duflo (2000) evidenced that partners' contact had no significant effects upon the choice of contractual form. Altogether, it appears that recent empirical work has not arrived at a consistent conclusion as to whether classical and relational rules act as complements or substitutes (Kailnis and Mayer, 2004). One of the main reasons for such lack of consensus depends on assumptions regarding symmetric benefits, the quality of the relationship and the risks of the transaction (Gopal and Koka (2012), assumptions that are not always justified.

The lack of consensus about the link between classical and relational rules raises disagreement about the way they can be combined within a contract. Prior empirical examples of how they can be combined are sparse, but offer some suggestions. For example, different contract types could be used in sequence during the phases of the transaction (Kailnis and Mayer, 2004). At the start of the contractual relationship, when exchange hazards are high, the use of classical contracts could successfully deter opportunism (Poppo and Zenger, 2002). Then, relational contracts may prove more useful during the implementation phases in order to facilitate adjustments caused by unpredictable contingencies (Macneil, 1978; Williamson, 1991). However in reality different modes of business are governed by either a classical or a relational contract, i.e. equity joint ventures and non-equity partnerships largely use relational contracts whilst licensing deploys classical contracts (Hagedoorn and Hesen, 2007). Hence extant literature does not offer conclusive empirical evidence as to whether and how this kind of combination can be achieved in a single contract structure.

There is another issue raised by this review. In order to find fit between rules and exchange transactions, we need to explore the use of all types of rules. In other words, are rules only either of a classical or a relational type? Could there be rules that may actually play a role in linking classical and relational rules? For example, Grandori and Furlotti (2006) have discovered what they label 'associative rules', multi-party decision - making rules that complement other rules. This argument is underlined by van Buuren et al. (2009) who argue that a contract should support two forms of rules: the conservative form, which reproduces and standardizes patterns of behavior to support the structure; and the dissipative form that allows the system to self-organize structure to meet new conditions. Our study considers a third type of rules, one that has not yet been, but which should be, part of proper contract analysis.

2.4 Positioning the initial research model and propositions

This section outlines the research problems and propositions for analysis. When we discussed the issues raised by complex project contracts, we asked *what kind of contract structure would fit transactions in projects*. Then we discussed how contract complexity emerges from classical and relational rules and the lack of fit between rules and transactions, we asked what is *the link between classical and relational contract rules (complements or substitutes) – and how we can combine them to achieve fit*. Finally we asked *what functions could the third set of rules play in achieving fit in a contract and how do they combine with classical and relational rules*. Therefore, this study seeks to identify (i) combinations of rules that fit transactions; and (ii) the links between rules that fit and we put forward the following propositions:

Proposition (1): Classical and relational rules are complements rather than substitutes.
This means that they both are either present or absent in the same configurations.

Proposition (2): Neither classical nor relational rules are, on their own, both necessary and sufficient to fit transactions. Only configurations with combinations of two (or three) types of rules are sufficient to fit transactions.

Proposition (3): Associative rules are present in all significant configurations that fit project activities.

Proposition (4): Issues relating to either contract time and/or project structures mediate within the results.

Figure 1 shows the connections between the three conditions and the outcome and the role of the propositions in a research model.

<Please insert Figure 1 about here>

In order to proceed with the case analysis, the following section explains the independent measures (contract rules) and defines the dependent measure (transaction fit). Then, the configurational set-theoretic analysis is put forward as the most suitable method to identify significant combinations of rules that will reveal the link between rules and fit with transactions and we explain the analytic procedure.

3. Method

3.1 Fuzzy-set qualitative comparative analysis: Identification of causal combinations

Our study has two unique characteristics. First, we analyze the (combinations of) rules that fit exchange transactions and observe their combinations. Based on common inference, we could assume that each set of rules should have effects on certain types of transactions. For example, classical rules would have an effect upon monitoring, evaluating and controlling risks and costs in transactions; relational rules should have an effect on interface transactions such as communication procedures, reporting processes and meetings. However, in practice there are consequences upon communication transactions from classical rules and relational rules might have effects upon costs and risks. Therefore it seems implausible to assume that every set of rules exerts a separate average effect on the observed cases. What seems more likely is that some *combination of rules* is necessary and/or sufficient in the cases observed. It is also possible that different equifinal combinations of rules lead to exchange transaction fit (Katz and Kahn, 1978: 30). Hence, it might be unlikely that a single combination explains fit. We cannot therefore attribute specific effects to a single cause or to a single combination of causes. This phenomenon is perplexing, and causality is complex. Causal complexity is the asymmetric, non-deterministic and non-linear entanglement among causes and effects which is characteristic in social systems (Goertz, 2006). We need a technique that measures different degrees of 'set membership', models consistently causal paths that lead to different and/or similar outcomes and in the process identifies multilevel asymmetry because different rules co-exist in contracts to various degrees and may combine in different ways to affect behavior.

Second, because qualitative (written and especially verbal) data formulations are largely set theoretic in nature (Fiss, 2007; Ragin 1987, 2009) we need to study cases as configurations and not as independent, analytically separate settings from which to acquire measurements. In this study, there is a need to establish generalizable patterns from a larger case sample (N=23), but we still need to analyze 'rich' data in order to acquire in-depth knowledge about causality among contract rules and project transactions.

For these reasons, only set theoretic configurational methods are well suited to the analysis of causal complexity and equifinality in our cases. Established quantitative methods, such as linear regression analysis, estimate the fitness of a single path to an outcome (Hair, 2010). For this reason, we chose an established method that combines 'the best features of the case-oriented approach with the best features of the variable-oriented approach' (Ragin, 1987: 84): qualitative comparative analysis (QCA). Fuzzy-set QCA is an exploratory/interpretive technique grounded in set theory and based on comparative analysis (Fiss, 2011, 2007; Ragin, 2008). As in other QCA methods, rather than analyzing the net effect of variables and understanding them as competing, fsQCA models model both causation and equifinality whilst they are able to deal with multilevel data structures in a straightforward way without requiring particular precautions (Ragin, 2000; Schneider and Wagemann, 2010). Fuzzy sets differ from other QCA techniques as they distinguish between relevant and irrelevant variation because they measure degrees of set membership on a continuous scale rather than on a binary scale (Ragin, 2008). Given the multiple ontological levels inherent to the actualization of contract rules and our sample size, fsQCA seems the appropriate method for the present inquiry.

In the next sections, we apply this method to our empirical data. In doing so, we follow established standards of the fsQCA process (analysis protocol), (Fiss, 2007, 2011; Grandori and Furnari, 2008). We define the measures and the context thereby making our analysis replicable by other researchers (Berg-Schlosser et al., 2008).

3.2 Fuzzy-set QCA analysis protocol

The fsQCA protocol is depicted in Figure 2. We commence with content analysis where values are attributed to variables and outcome from case evidence in a data frame. Then these values are calibrated into fuzzy set values with the identification of thresholds in the data frame measurements. We then calibrated an overall score in each of the three conditions using the degrees of membership of each condition in an ordinal scale (Ragin, 1987, 2000; 2008a: 86) that ranged from the *most significant in contract transaction* (1= full membership), *mostly significant* (0.67 = mostly in), the crossover point-*ambiguous* (0.50), *less significant* (0.33 = mostly out) and the *non-significant* (0 = full non-membership).

The second step is the choice of anchor values for necessity and sufficiency (consistency and coverage) in the analysis results. Causation based on necessary and sufficient conditions is particularly suitable for the present inquiry and fsQCA analyzes which conditions are necessary and sufficient for the outcome (Ragin, 1987, 2000, 2008a). A necessary condition is always present when the outcome occurs. The data frame is run under the fsQCA algorithm to calculate the necessary conditions and, if any found, we perform tests to verify the strength of their necessity.

The third step is to construct the truth table, where the calibrated data frame is turned into the configurations detected across investigated cases. We select the configurations that pass the consistency and coverage anchors and we test them to verify the strength of their sufficiency. We test these configurations to decide which conditions are sufficient when they are present in the combinations that lead to the outcome (Ragin, 2000, 2008). We select the complex solution instead of the parsimonious and the intermediate, as this is free from simplifying assumptions and counterfactuals.

We then discuss the necessary conditions and sufficient configurations, what they mean in our cases and what they reveal about the nature and fit to exchange transactions and how they link. All analytical procedures described hereafter were conducted using the R software package in combination with fsQCA 2.5 (Ragin and Davey, 2009). This software proceeds through each analytical moment stepwise, thereby ensuring transparency.

<Please insert Figure 2 about here>

3.3 Measures

There are two main issues in the identification of measures. First, it is that contract rules overlap and contract structures may mask the effects of particular contractual rules; therefore there is a need to code contractual rules into sets in a more systematic way (Argyres and Mayer, 2007). Prior work examined contract rules at rather coarse, global terms by assessing summary indicators such as the length of contract duration in supply agreements, number of contract pages or the degree of detail to which parties designed clauses in anticipation of contingencies (Joskow, 1987, 1988; Macneil, 1978; Rai et al., 2012). Therefore, Poppo and Zenger (2002) and Reuer and Arino (2007) have called for studies that examine particular provisions in contracts in order to really understand contract complexity. In contrast, some studies that have investigated individual provisions such as territorial restraints in licensing agreements (e.g. Mueller and Geithman, 1991), or up-front fees and royalty rates in franchising agreements (e.g. Lafontaine, 1992), have yielded important insights into these specific rules, yet they did not contribute to the middle-way contract. The second issue is the importance to examine the substitutive or complementary nature at a granular level, demonstrated by Tiwana (2010) who found that different rules can operate as complements with respect to one transaction and as substitutes with respect to another. This ambiguity suggests that a more fine-grained approach is required to examine at a nuanced level how rules interact with each other to affect a given outcome (Rai et al., 2012). We will therefore proceed to: (i) classify rules into sets using previous literature; and (ii) define the measurement of transaction fit.

3.3.1 Classification of contract rules in sets of causal conditions

Classical contract rules reveal details regarding task description, roles and/responsibilities, decision/control rights, dispute resolution, contingency planning and communication procedures to mitigate various exchange hazards (Argyres and Mayer, 2007). Most of the classical contract literature has focused on risk allocation, enforcement and supervision costs, moral hazard, and financial constraints (Macher and Boerner, 2012). Relational contracting replaced risk allocation rules under the classical approach with risk sharing rules (Speidel, 2000) which facilitate continuity and promote efficient adaptation (Bolton, Malmrose and Ouchi, 1994) where high levels of trust are necessary or mutual dependency is high (Marchington and Vincent, 2004). However, relational rules are either vague or weak as they are supported by non-legally enforceable sanctions (Barthélemy and Quélin, 2006), for instance,

revision clauses like the doctrine of excuse or internal dispute resolution and arbitration procedures (; Speidel, 2000; Scott, 2003).

Relational contracts also use alliance rules which are about the scope of collaboration as well as the division of labor by detailing partners' individual roles and responsibilities and lay out constraints and obligations external to the alliance (Reuer and Arino, 2007). For instance, before the alliance is operational, firms can limit information disclosure and during the transaction the contract may specify interaction with third parties or other divisions, alternative suppliers, or the court system. The rules can also specify the way in which the alliance will end, firms' claims on intellectual property, and possible limitations on firms' competitive and hiring practices through non-compete and non-solicitation agreements (Reuer and Arino, 2007). Another issue is the large number and variety of relational rules (Smets et al., 2013) and it is unclear which ones are more effective. For example, should we depend on ex ante partner selection (Liang and Parkhe, 1997) or the development of trust and commitment (Skarmeas et al., 2002)? Trying to measure the impact of such a volume of variables is quite taxing.

In this study, we include a third type of contract rule, the associative - or 'emancipatory' rules. Grandori and Furlotti (2006) have raised the issue of 'associative rules', a third type of rules specific for the design of a hybrid (or as they call it 'light') contract: in their studies they have found that the rules that always complement market and hierarchy rules seem to be multi-party democratic decision making rules (or rules specifying discretion of action). We therefore classified the above categories enlisting three sets: (i) control rules (i.e. cost and quality management controls, customer interaction rules, regulations about handling of supplier networks and interface management) which we call ***linkage conditions***; (ii) rules about integration and communication/interface activities, which we call ***practical conditions***; and (iii) associative rules that specify discretion of decision-making action and allow self-organization for partners to act autonomously which we call ***emancipatory conditions*** (see Table I for explanation).

<Please insert Table 1 about here>

3.3.2 Measurement of the conditions

Scores were attributed to each condition by scoring their frequency as defined by: (i) the emphasis placed in each individual contract on each set of rules; and (ii) contract rules actual use in exchange transactions. For example, we asked which rules were most common in each contract, what kind of importance each rule had in the smooth operating of transactions (e.g. interaction, information, involvement in decision making) and we measured how many rules were written about scope, quality, time and cost and targeted transactions such as communication, decision making and control. There are five types of rules in each set of rules (Table 1) so we measured frequency with maximum value 'five'. We then calibrated these measures into an overall fuzzy score in each of the three conditions using four value degree of membership in an ordinal scale (Ragin, 2009) that ranged from the *most significant* (1= full membership), *mostly significant* (0.67 = mostly in), the crossover point-*ambiguous* (0.50), *less significant* (0.33 = mostly out) and the *non-significant* (0 = full non-membership) (see in fsQCA protocol).

3.3.3 Defining fit between rules and transactions

The measurement of transaction fit has many facets. First, there are prior studies that measure the attributes of transactions. The basic premise is the 'dual alignment' principle, which states that key contract terms are designed according to transaction attributes to control the outcomes (Argyres and Mayer, 2007). There is a wide variation of transaction attributes such as bilateral dependency, appropriability, uncertainty, complexity (e.g. number of processes, flexibility, skills and resources), reputation, asset specificity, observability and verifiability (Argyres and Mayer, 2007; Jiang, 2009; Wang, 2002). Except from the fact that many transaction attributes are hard to define and measure, setting fine-grained operationalization of attributes prohibits the identification of their links. Moreover, even if all the necessary data were in hand, it is not clear how then to compare transactions in which different combinations of attributes are present (Oxley, 1997).

Similar to the 'attribute approach', a second stream of prior studies uses the 'process approach' and assesses compliance as a measurement. Compliance is defined as the extent to which individuals follow transaction mandates (Brandon-Jones and Carey, 2011). However the measurement of compliance is loosely defined (e.g. Lonsdale and Watson, 2007) and in any case, compliance to rules is not a precise

description of how rules fit transactions, as it is easy to pretend compliance in formal evaluation without doing so in reality.

A third set of prior studies turned to the measurement of performance to assess if rules 'fit'. Transaction performance in project management is usually evaluated in dimensions of time, cost, quality and scope targets. However, within the contracting literature, scholars have measured diverse and alternative dimensions of performance (Dixit, 2002) making it problematic due to three reasons. First, there is differential risk exposure between these dimensions; for example, strict cost controls may incentivize the partners to minimize costs by shirking on quality (Holmstrom and Milgrom, 1991). Second, measuring performance might favor those dimensions that are of key interest to the most powerful partner instead of those that are of interest to the most risk-exposed partner (Gopal and Koka, 2012; Rai et al., 2012). This is the case especially in contracts with public-government partners, where the risk is shifted to the contractor due to the political strength of the client (Romzek and Johnston, 2002). Finally, the measurement of performance is captured holistically, usually covering aspects of the whole exchange's costs, quality and vendor responsiveness (Poppo and Zenger, 2000: 715) or price and flexibility (Gulati and Nickerson, 2008: 695) which do not necessarily show clearly the effects of each rule.

Another difficulty in measuring performance is the problematic estimation of the value delivered or the benefit realized to the partners, especially in co-productive processes. Perspectives of value or benefit are subjective and so are the standards of service behavior and skills (Remington, 2011). Especially in public-private contracts, different partners will value a contract in different degrees and this will influence their propensity to act opportunistically (Lonsdale and Watson, 2007). The final problem in measuring performance comes from studies on efficiency. Prior empirical studies have often used reduced-form models of efficiency in transactions to assess fit (Drazin and Van de Ven, 1985) because they presume that competitive forces will make inefficient contracts obsolete (Argyres and Liebeskind, 1999; Arino et al., 2006). Studies like these have usually examined contracts with long-term transactions while transactions in projects are often short-term and involve parties with limited relational history.

We can observe that although studies have made the effort to consider the content of transactions (Arino et al., 2006; Hoetker and Mellawigt, 2006), the attribute, compliance and performance approaches could not capture fit between rules and transactions. A better definition of fit is the alignment of what the

rules stipulated (intention) with their successful application during project activities (actualization) that is if the rule was actualized as intended in real transaction. This means that every rule has to be evaluated according to how it affected the inter-organizational's activities. This measurement of fit has to do with people's evaluation or satisfaction of the effect of the rule on the transactions rather than the cost or the quality of the transactions, the attributes of the transactions, or the reported level of compliance to the rules. A similar approach has been adopted in studies that used satisfaction with governance rules (e.g. Rai et al. 2012). Satisfaction is a simple but well-defined measure of success that has been perceived as the best surrogate for capturing both cognitive and affective components in human activities (Grover et al., 1996). Therefore, in this study we decided that it is best to measure fit on the level of satisfaction with the rules in terms of how helpful or not they were within project transactions (Figure 1).

3.3.4 Measurement of fit

We measured fit according to the degree to which contract rules produced satisfactory effects on transactions. We asked about all types of exchange transactions, e.g. planning, execution, completion, payment, cancellation, disputes, etc. This line of questioning helped to determine whether benefits of each rule outweighed the costs, whether transactions were effectively supported or inhibited by rules and helped to assess partnering organizations' understanding of obligations and the effective administration of transactions. Satisfaction responses were measured on a Likert scale in the same ordinal scale as the calibration fuzzy scale: *most satisfaction* (1= full membership), *mostly satisfying* (0.67 = mostly in), *ambiguous* (0.50), *less satisfying* (0.33 = mostly out) and the *not satisfying* (0 = full non-membership).

4. Data Collection Setting

The empirical setting consists of 23 case studies (details in Table 2) which belonged to three large public-private programs: six large construction UK Public Private Partnerships (PPP), three European Public Health projects and 14 ICT EU projects. Overall, we conducted 132 semi-structured interviews and collected government reports and contracts to triangulate findings. Interviews are suitable instruments to capture the interviewees' evaluations of satisfactory transactions and the effects of rules and given that our

interviews address facts of high relevance to our subjects and the high level of agreement rate among interviewees from the same projects, we are confident with regard to the validity of our data collection method (Bryman, 2008). We arranged interviews with managers, technical personnel, administrative and medical professionals, project partners and other related stakeholders. We asked questions about their partnerships (covering the relationships from the bidding to contract termination), the transactions (operations during project duration) and contract rules and the links between them.

As QCA is optimally positioned to compare similar settings which have a few characteristic differences, we chose three programs which have the following similarities: (i) they were large scale with multiple diverse actors; (ii) they delivered public infrastructure (e.g. fixed assets, services or technology) and the level of dependency of the contractor upon the client was similar; (iii) they were procured and controlled by national and supranational public sector clients; and (iv) they were subjected to open tendering and rigorous selection and monitoring procedures as set out by EU legislation. The three programs had also two characteristic differences that make a difference for the level of complexity in the project contracts (see Figure 2): (i) one program was governed by a simple memorandum of agreement and the other two were governed by classical-complex, hybrid (classical-relational) highly complex contracts, thus there was a continuum in the levels of complexity in the contracts; and (ii) programs differed in their time span, ranging from 2 to 30 years. These differences are vital to elicit the potential impact of short versus long-term program spans on the effectiveness of contract forms. In the next section we give summaries concerning the three types of contracts, and we also provide an overview of the projects in table 2.

<Please insert Table 2 about here>

4.1 Contract types

4.1.1 Memorandums of agreement

The first contract type was a memorandum of agreement in an EU Public Health program called European Antimicrobial Resistance Surveillance System (EARSS) that aimed to develop a Europe-wide network of national ICT infrastructures collecting and analyzing epidemiological data. The goals of the

program were: (i) the recruitment of laboratories (expansion of network and use of protocols), (ii) the operation of national electronic networks (data collection and analysis) and (iii) electronic data submission.

The EU lacked the capability of enforcing public health legislation in member states; which made it impossible to coordinate implementation centrally or prescribe controls: '*The design phase was actually the one with the contract with the management people. It is not possible to plan or predict*' (Project Manager 1). National project managers were responsible for the operation of each national project and the promotion of the program to each member states' political echelons. The memorandum stated the final product and the collaborative activities the project managers were to conduct within EARSS, and the completion of certain thresholds, the scope such as achieving 25% coverage of total national laboratory population, 4 aggregate reports a year, quality and reliability of data collected by the national networks. These thresholds acted as *minimum critical specifications* (linkage conditions) and were in the form of flexible output targets. Project time and cost were constraining factors, but they were not the criteria used to evaluate and monitor the projects. The emphasis was on enough support in the form of technical tools, expertise and funding and that they had to collaborate and liaise with each other to share results at regular conferences.

4.1.2 Performance-based contracts

The second type of contract was a 'classical' performance-based contract, stipulating time, cost and scope specifications and specific administration and evaluation procedures. Although it has been clearly stated in EU Commission documents (e.g. COM(2003)226,OM(2003)112) that there was a need for a 'broad and systemic' approach to research policies, the implementation rationale was based on Framework Programs (FPs) that were top-down, rule-based instruments which embodied the rationale of managing the largest possible number of projects at the lowest possible cost. By standardizing contracts that (were thought to be) complete and optimal, the Commission kept the cost of program administration to a minimum. The FP had four thematic priorities, of which eHealth aimed to coordinate technology projects developing or deploying R&D for healthcare services. The programs run under eHealth were the Information Society Technologies (IST) and the Electronic Trans-European Networks (eTEN).

The IST and eTEN contracts were to monitor the implementation of plans and to overcome inherent risks. There was a strict tendering process and there were consortium rules regarding the

composition of the teams and accountability rules resting on the managing partner who had no formal authority over the other partners. The responsibilities of the partners were divided into detailed modular work packages which were independent of each other in the eTEN projects (however there were more interdependencies in the IST projects). *"What needs to be done is highly analyzed in relevant documents of the contract signed (I refer to the work breakdown and the tasks). There is no magic formula however […]"* (IREMMA project manager). There were detailed forms and a structured procedure for periodic evaluation which allowed for notoriously difficult renegotiation processes in cases of change, inhibiting any alteration of initial projects plans. There were specific cost, time and scope specifications for evaluation. However all these prescriptions were not found useful by projects: *'On the other hand the nature of the work makes us self-reserved. …. A project manager could not be in a position to have sufficient in-depth knowledge so as to use the tools to accommodate the needs of the project. Sometimes a manager would do the opposite; in order to create the documents they "adjust" project tasks to fit the requirements of a proposal, contract, etc.'* (TELEREMEDY project manager).

4.1.3 Public Private Partnership contracts

There were two different types of PPP contracts for the construction and maintenance of hospitals, waste/training facilities and emergency services: (i) non-standard; and (ii) standard. In early PPP projects, partnering organizations jointly drew up non-standard 'output-based contracts' to govern long-term relationships of up to 30 years. Later PPP projects, such as the Hospital B project, used PPP standard version 3 as a template to then further engage in long-term (i.e. 3 years) contract negotiations. Because of the complexity and size of PPP projects, all contracts are governed both by EU and national regulations, prescribing a tight legal framework.

Because the supply arrangement between the individual NHS Trust and its private contractor was long-term and highly risky, an extensively bespoke contract was drafted to govern each relationship. Complexity was further exacerbated by the dynamic and volatile relationships between partnering organizations. For example, changing requirements regarding portering and cleaning services led to recurring contract renegotiations in two of the cases. PPP contracts included a large number of legal safeguards (linkage rules) covering areas such as performance measures, payment mechanisms, reporting

and information sharing routines, dispute resolution and termination processes. These contracts were pretty much 'highly complex', classical but incorporating bespoke, relational rules.

However, no matter how much time was spent in ex ante negotiation, the contract remained incomplete. The cases exhibited a great deal of post-contractual variation. For example, in Case 1 the Trust's former director mentioned *"[…] that is probably because the specifications were not robust. We went through about 438 contract variations. […] the biggest one was for £24 million, which was the Treatment Centre, but the cheapest one was £238 which was a socket in the office […]."* Similarly, in the Waste Management Case 2, the council's project manager described the continuous contract renegotiations that were necessary during the implementation phase. *"Now, of course, the project slowed down and we have to revise the contract. That is a very time consuming process and I wonder why we spent so much time upfront to negotiate the contract."*

5. Analysis

5.1 Calibrating raw data to fuzzy set membership values

The analysis of fuzzy sets does not use raw data. The measurements from case evidence have to be translated into fuzzy values through a procedure called calibration (see fsQCA protocol in the methods section). In this way we transform variables into sets: the explanatory and outcome variables have to be renamed and structured in set-theoretic terms (Ragin, 2000). By convention, the membership in a set should contribute to the occurrence of the outcome (e.g. Freitag and Schlicht, 2009). In the present analysis, all set conditions were constructed and labelled according to this rationale (see Table 1).

The process of getting from raw variable values in the data frame (Table 3) to condition set membership scores is referred to as calibration or fuzzification which is usually done through either of two procedures: direct assignment whereby fuzzy set membership scores are derived from benchmarks solely for full membership, full non-membership and the crossover point through the researcher's or another expert's judgment. The second is the method of transformational assignment where base variable values are mapped into the unit interval with the help of continuous R functions but where only minimal information is provided by the researcher. 'Transformational assignment is more sensitive to the variation within the data this is why we use it here for calibration' (Thiem and Duşa, 2013: 51, 55). This method is based on sorting cases into categories through the use of a regression estimation procedure to translate raw scores into fuzzy membership scores. The usual method for transformational assignment is by examining dispersion (including range and quintiles of conditions and measures of spread such as the standard deviation) depicted in histograms or the distribution of the conditions, including their central tendency (including mean, median and mode).

However, as illustrated in the raw data frame in table 4 and figures 3-5, in the histograms, box plots and scatter plots for each condition, we cannot find common thresholds of variation in the distribution of the conditions. There is therefore only one way to remain sensitive to the variation in each condition and this is by conducting cluster analysis to discover a four-value threshold variation for each condition individually. We used R software to establish thresholds through cluster analysis by using the measures for each condition from the data frame (Table 5). The calibrated values of each condition were then placed into the sets defined by the inclusion-anchor values for necessity and sufficiency used in fuzzy sets (Table 6). Fuzzy-set membership values larger than 0.67 are treated as full-set memberships (1), while values smaller than 0.33 are treated as full non-set membership (0).In the end the raw data frame was transformed into a calibrated data frame for analysis (Table 3 right).

After the three conditions and the outcome of each case are calibrated to fuzzy-set membership values (Table 7), further analysis in fsQCA requires the researcher to derive the truth table and discover necessary conditions and sufficient combinations.

<Please insert Tables 3-6 about here>

<Please insert Figures 3-5 about here>

5.2 Discovering necessary conditions

Causal analysis in fsQCA builds on the notion of necessary and sufficient conditions. Since procedures uncovering sufficient conditions cannot be relied on to also uncover necessary conditions, we analyze necessary and sufficient conditions separately, starting with the necessary conditions (Schneider and Wagemann, 2007: 112-116, 2010: 8- 9). Logically, necessary conditions are always present if the outcome is present - there must not be an instance where the outcome is present but the condition is absent (Schneider and Wagemann, 2007: 32-36). From this logic it follows that fuzzy-set membership values of necessary conditions are to be consistently equal to or higher than outcome membership values (Goertz, 2006). To test for necessary conditions, we applied the "necessary conditions" procedure provided by fsQCA 2.5 (Ragin and Davey, 2009) and in R, to the calibrated data frame (Table 3). By convention, a consistency threshold of at least 0.9 is required for indicating necessary conditions (Freitag and Schlicht, 2009: 62). The results in Figure 7 illustrate thus only two elements, the emancipatory condition and the LINKAGE+PRACTICAL configuration pass such a consistency threshold. These results confirm that overall only the presence of emancipatory conditions has a coverage cut-off high enough to indicate that it is significantly necessary. The other three combinations of conditions have been at far too low inclusion scores to indicate a possible relation to satisfaction and therefore these combinations are only trivially necessary. When we mention a condition in capital letters we mean its presence (1) in a measurement or configuration and with small letters we mean its absence (0).

<Please insert Table 7 about here>

5.3 Constructing the 'truth table' and tests for sufficient configurations

After discovering the necessary conditions we need to discover the combination of rules that are sufficient for a contract to fit transactions. We first need to discover 2^n combinations (n being the number of conditions) that are all the combinations of rules possible in any contract. We place them in a table called 'truth table' (see Table 8). The truth table exhibits all logically possible combinations of explanatory conditions and the outcome using a present (1) - absent (0) dichotomy and the inclusion measurements in each combination in all cases (Ragin, 1987, 2000, 2008b).

<Please insert Table 8 about here>

After the construction of the truth table we apply the Quine-McClusky algorithm minimization procedure to identify sufficient configurations. We have to specify which combinations in the truth table have high consistency indicators. This specification is done in two steps (Schneider and Wagemann, 2007: 225). First, we specify a minimum threshold for the number of cases providing empirical evidence per row. Given that the current truth table (Table 10) shows signs of limited diversity (rows 1,2,3 and 7 are not covered by empirical cases) and row 8 is covered only by a single case, only combinations with at least 0.6 inclusion of empirical cases is considered relevant. Second, we set a minimum consistency value that captures the extent to which the fuzzy-membership values of a combination correlate to the outcome (Ragin, 2006a: 292-299; Ragin and Davey, 2009). Combinations that fall below the consistency threshold are considered as failing to be sufficient. Our present analysis applies the consistency threshold (0.75) suggested by Ragin (2006a, 2008b).

To discover the combinations of conditions that are sufficient for positive fit we need to analyze the truth table combinations (Table 8) with a minimization procedure using the Quine-McCluskey algorithm which is the core function of the QCA software. Complex configurations are reduced in favor of logically equivalent but less-complex solution terms (Schneider and Wagemann, 2007: 64). For example, if two combinations in a truth table are identical except for one condition but result in the same outcome, this condition is considered to be irrelevant for the outcome. Hence, the algorithm deletes superfluous conditions. Since both combinations are now identical, they can be merged into a single expression. For a *sufficient condition* the outcome is always present if the condition is present - there must not be an instance where the condition is present but the outcome is absent (Schneider and Wagemann, 2007: 37-39). In the course of the minimization procedure, fsQCA produces three different solution types: the complex solution, which excludes logical remainders, counterfactuals and simplifying assumptions into the minimization procedure; the parsimonious solution uses all logical remainders without discrimination; and the intermediate solution incorporates logical remainders that seem more plausible. These solutions include some verification tests to make sure that these measurements are strong enough, based on measuring parameters of fit, contradictory simplifying assumptions and prime implicates. Ragin (2008a: 160-175) recommends relying on the intermediate solution; we are going to prefer the complex one for our discussion as it is the much most reliable and avoids counterfactuals. The results for sufficiency

analysis are displayed in Table 9. Specifically, we display the results for both complex, parsimonious and intermediate solutions and the diagnostic tests we conducted to guarantee validity.

<Please insert Table 9 about here>

6. Findings

The empirical results support most of the propositions that we initially positioned whilst one is partially supported. The general result is that the contracts which elicited the most satisfactory transactions combined emancipatory rules with either linkage or practical rules. Therefore, classical contracting (linkage rules) and relational contracting (practical rules) are both effective if they are combined with emancipatory rules. The contracts that did not contain these combinations (9 contracts) did not exhibit fit to exchange transactions. Two questions can be raised when considering these results: first, why are emancipatory conditions the ones that made the difference between an incomplete and a systemic contract, especially when we expected that some kind of combination between linkage and practical rules should have been the winning combination for a systemic contract? Second, are there any exogenous effects stemming from the exchange transaction context that have significant effect making these combinations preferable?

To address these questions we will first discuss the propositions (Table 10) and then what they mean in the exchange transaction context.

<Please insert Table 10 about here>

P(1): Linkage and practical rules are substitutes

Neither linkage nor practical conditions are necessary or sufficient to fit transactions in projects. Only emancipatory conditions are necessary for contracts to fit exchagne transactions. Only emancipatory conditions need to be included in a contract for it to become systemic. The fact that the combination of "linkage*practical" has not been found necessary or sufficient means that the rules do not actually complement each other. This is not to say that practical conditions should not be part of a classical contract or that a relational contract would not benefit for at least a minimum amount of linkage rules; it means that emphasis should not be misplaced in this combination but rather on a combination of one of them with emancipatory conditions. In this sense linkage and practical rules are substitutes – they take each other's position in successful combinations. From a complexity perspective, it makes sense that these combinations would work better. Control and communication rules cannot work together unless clear boundaries are set regarding decision making and local action. On the contrary, control rules have a better effect when coupled with action rules and so do communication rules.

P(2): Neither linkage nor practical conditions are, on their own, both necessary and sufficient to fit transactions. Only combinations of two or three types of rules are sufficient to fit project activities

While emancipatory conditions are both sufficient and necessary, in most projects combinations with emancipatory (associative rules) with either linkage or practical rules were sufficient for satisfactory transactions.

P(3): Emancipatory (associative) rules are present in all significant combinations that fit project activities

Emancipatory (associative) rules are present in all sufficient combinations but they are also necessary, a fact that elevates their significance for a systemic contract.

P(4): There are different contract structures that fit in different projects due to issues relating to either contract time and/or project structures

In order to understand what other issues in transactions influence the necessity and sufficiency of contract rules we need to discuss these results according to the type of contract and projects.

<Please insert Table 11 about here>

There was variability in the combinations of these rules that appear to depend on two other structural characteristics of these programs. The first characteristic is interdependence in transactions and the second is modularity between partners (Table 11). To make comparisons between the types of projects, data frames and the truth table need to be consulted. More specifically, when interdependencies are high or important within the EARSS projects, successful contracts included combinations of practical and emancipatory rules. Control had to be combined with emancipatory rules in contracts. These configurations show that there is an invert proportionate link between practical and linkage rules. The highly modular IST/eTEN projects, where self-adaptation and flexibility were important in transactions, relied more on their own personal networks or small teams rather than inter-project relationships so interdependence was low, so these contracts used more linkage and emancipatory rules that enhanced initiative to act locally. The PPP program, which had more variability in modularity and interdependence between projects, had a wider variety of successful combinations of contract rules: they still required less control rules; however emancipatory rules have to be combined with practical rules to be useful to these projects.

Therefore, the study shows that control and local action should be moderated in highly modular transactions with not very interdependent partners, whilst communication and local action is more important in projects where partners depend more on each other to collaborate but still need flexible local action due to high modularity in transactions. The contract period can affect the contract when it impacts the interdependencies and modularity in the projects. When transactions change according to circumstances, their attributes change as well and longer-term contracts are characterized by this fact. In addition, with long-term projects like PPPs which have modularized their transactions using the contract, they end up with higher variability in contract types, so the overall interdependencies become lower and their modularity becomes higher, affecting the sufficient rule combinations.

7. Discussion and Conclusions

7.1 Fitting contract rules to exchange transactions

In our study we discovered which types of hybrid rule structures achieved satisfactory fit to exchange transactions. The reason why these simpler contracts were more successful was not just because they provided fewer controls to comply with, but because they provided a combination of rules that acted as platforms for swift decision making and autonomous actions which enabled adaptable responses to contingencies. The main empirical finding is, contrary to our expectation, that classical and relational rules are substitutes and that in order to fit exchange transactions, either type should combine with associative rules.

In our analysis, an interesting interplay between rules emerges. The role of control rules in these contracts allowed transactions to work concurrently, however their extensive use in contracts actually increased complexity in exchange transactions and created inflexible actions. Relational rules were important to balance this inflexibility because they prevented project parts from becoming increasingly modularized and remote from each other. However, relational rules did not actually decrease contract complexity and therefore they did not ameliorate inflexible action. At this point, some unsuccessful classical IST/FP and relational PPP contracts introduced more control or practical rules. Instead, successful IST/FP and PPP contracts included one of two combinations: one where minimum critical specifications as classical -control (linkage) rules were combined with emancipatory rules and one where relational (practical) rules were combined with emancipatory rules. Transferring more autonomy to parties in exchange transactions through associative rules in order to increase flexible local actions solved this problem, but at the same time it introduced instability because it decreased control over local parts. Relational rules were useful at this point in keeping the project owners informed of local decisions and actions. Striking the right balance in contract structure might not be a simple task. This point needs further investigation as the root cause of this phenomenon lays in the link regarding risk and devolution in contract rules, which is linked to modularity and interdependence within complex settings.

The relation between risk and devolution is at the heart of the systemic contract which does not depend on risk aversion (classical), risk sharing (relational) but instead relies on 'risk dispersion'

(associative) through the management of contingency. The systemic contract is a customized combination of rules that fit interdependencies and modularity in exchange transactions, rather than the time and cost of exchange transactions. The systemic contract does not contain elaborate clauses or rules (Barthélemy and Quélin, 2006) since only a limited range of pre-specified control rules are needed, they do not emphasize the transfer of risks through milestone-driven objectives (Curlee and Gordon, 2011) and they do not predict, prevent or punish opportunistic behavior or depend on trust or other (vague) forms of informal control regulating relationships (Baker et al., 2002; Klein et al., 2005; Poppo and Zenger, 2002). The focus of the systemic contract is to direct activities towards desirable goals through alternative routes of action, providing platforms so that decision making, problem solving and actions are flexible enough to deal with contingency in exchange transactions. In other words, the systemic contract dictates or controls behavior only to a certain extent (therefore this contract is by definition *incomplete* - Lyons and Metha, 1997) and then creates platforms that enable flexible action, and thus 'directs away' undesirable behavior.

7.2 The systemic contract

The findings from this study extend and refine extant theory by analyzing fit of rules to exchange transactions and illustrating links between contract rules, positioning a 'systemic contract' as a solution to the either-or mentality between both classical and relational types of contracting (Harrison, 2004; Zheng et al., 2008). We add to existing empirical studies considering classical vis-à-vis relational contracts (Carson et al., 2006; Luo, 2002; Poppo and Zenger, 2002) by identifying links between the rules of each contract type. The final theoretical contribution is to provide an application of the set-theoretic method configurational analysis that can combine cross patterns among cases and inductive case analysis, to explore causal complexity between contract rules and exchange transactions. In the process we offer one of the first comprehensive empirical examinations of the effectiveness of contract rules and propose rule combinations that can be the basis for a middle-way *systemic contract*, allowing for contractual fit to exchange transactions.

An additional theoretical contribution derived from our study is that the systemic contract refutes the idea of internalized complexity stemming from the contract structure (Ashby, 1958; Eggleston et al., 2000). In fact, we would go as far as to suggest that contracts should not include all types of rules and that

they should be simple enough to include the rules that suit the priorities and characteristics of exchange transactions and enable mutually dependent actors to act around collective problems. If contracts do not provide this balance of rules, then the implementation of rules will be resisted at the level of operations (Luhmann, 1996). Therefore, the middle-way 'systemic contract' substitutes the idea of a complete and optimal contract into one that is flexible and enabling, directing evolutionary action, not just control.

7.3 Limitations and further research avenues

Our study offers one of the first comprehensive empirical examinations, contributing to our understanding of the functionality of contract rules. However, we acknowledge the study's limitations, some of which will serve as stimulus for future work. First, the shift into configuration analysis through fuzzy QCA is a research strategy that envisages management as a practice which works under different conditions of order. Future studies exploring complexity in transactions need to test other types of contract and its impact on exchange transaction fit. Second, our sample consists of mainly public-private project-based arrangements that offer a suitable context in which to study contract complexity. Future studies should investigate these concepts in different operational and project-based contexts with various degrees of interdependence and modularity in exchange transactions, all of which influence degrees of contractual complexity. Whilst there is no apparent reason why the findings in our study would not hold in other contexts, further studies should test if this is the case and replicate our findings.

7.4 Managerial implications

The application of the systemic contract may have a positive effect for managers working with large procurement or project arrangements. The systemic contracts were more successful not just because they provided fewer controls to comply with, but because they provided a combination of rules that acted as platforms for swift decision making and autonomous action which enabled adaptable responses to contingencies. Organizations need to carefully consider the use of control rules in these contracts as their extensive use in contracts actually increases complexity in exchange transactions and create inflexible action. The application of relational rules is important to balance this inflexibility because they prevented the project parts from becoming increasingly modularized and remote from each other. Successful

procurement and project arrangements exhibited governance through contracts including one of two combinations: (i) minimum critical specifications as classical -control (linkage) rules were combined with emancipatory rules; and (ii) relational (practical) rules were combined with emancipatory rules. The identification of the links between contract rules can help managers decide how to set the direction for exchange transactions with the help of contractual governance.

In response to the calls for more effective contract governance of exchange transactions, this study has theoretically and empirically examined the fit of contract rules to exchange transactions. The study deployed a multiple case study design to reconcile the needs for deductively testing theoretical propositions with the need to base measurements on rich empirical data. The empirical findings are unique in the sense that they prove that assumptions about combinations might be slightly different in practice and we position further research avenues which will help to offer more fine grained analysis that will lead to better contractual governance of operations, informed by practice.

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