Towards a Comparative Analysis of Democratic Innovations: Lessons from a pilot fs-QCA of Participatory Budgeting

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While there has been a proliferation of academic interest in ‘democratic innovations’, most empirical analysis tends to rely on single case studies. Very little attention has been given to either comparative analysis of innovations or the conditions under which they emerge and are sustained. Recent studies of participatory budgeting (PB) have begun to utilise cross-case analysis in an attempt to explain divergent outcomes (e.g. Sintomer et al 2005, Wampler 2007, Avritzer 2009). This paper argues that the comparative analysis of democratic innovations could be moved forward through the application of the relatively novel technique of fuzzy-set qualitative comparative analysis (fs/QCA) as developed by Ragin (2000, 2008). An indicative pilot study of a small number of PBs is offered to identify the potential (and pitfalls) of using fs/QCA to evaluate the conditions under which PB is institutionalised effectively.

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Introduction

This paper makes the case for a more systematic comparative turn in the study of democratic innovations, and specifically investigates the potential – and pitfalls – of fuzzy-set qualitative comparative analysis (fs/QCA) to take such work forward. To draw out the implications of this novel methodological approach for understanding the conditions for effective institutionalisation of democratic innovations, we apply fs/QCA to a pilot study of six contrasting cases of participatory budgeting (PB). While this is very much an indicative exercise in lieu of a forthcoming, more systematic medium-N analysis of PB, the study allows us to rehearse important elements of an fs/QCA, including population definition, calibration of conditions and presentation and interpretation of outputs. We make no apologies that parts of the paper are technical in nature, although we have sought to make the discussion as accessible as possible. If we are to make methodological advancements in the comparative study of democratic innovations, it is important to report all aspects of the process for the sake of transparency (c.f. Wagemann and Schneider 2007).

The case for the comparative analysis of democratic innovations

Even for those who retain faith in existing democratic institutions there is much evidence of a ‘democratic malaise’ (Dalton: 2004, Stoker: 2006) and an attending growing interest in democratic innovations that recast the relationship between political elites and citizens. Democratic innovations have been defined as “institutions that have been specifically designed to increase and deepen citizen participation in the political decision-making process” (Smith, 2009: 2). They are of interest because they can allow those who usually do not participate in political decisions to do so, thereby potentially improving the legitimacy of democratic institutions and systems.

While the evidence base on the practice of democratic innovations continues to grow, there is a need for a more systematic comparative turn. This is imperative if, for example, we are to better understand the conditions under which democratic innovations emerge and are sustained. And, since we are at an early stage of phenomenological development, comparative analysis is important in the inductive and abstractive process of conceptualisation of what types and kinds of cases are. As a natural consequence of researchers’ diverse knowledge and interests, a reasonable consensus of the scope of the study of the emerging field of ‘democratic innovations’ is yet to form, although a number of theorists have begun to offer definitions (Fung 2003; Smith 2009; Warren 2009).

Even though there are still definitional problems to resolve, we are witnessing the development of a vibrant programme of research on democratic innovations. While much of the work on democratic innovations tends to be case-based, it is arguably within the study of participatory budgeting (PB) that the most interesting examples of comparative work have begun to emerge. Early work tended to focus on single case studies of the paradigmatic Porto Alegre, detailing the conditions seen as crucial for its successful outcomes (Abers 2000; Baiocchi 2005). Further studies of individual cases in Brazil and beyond continue to dominate the literature, but significantly cross-case comparative analysis has begun to contribute to our knowledge of PB. Baiocchi’s single case study of Porto Alegre actually includes a comparative element: a ‘most-variant’ strategy of districts with different starting points (2005: 167). This allows him to show that experiences differ
within a city, but also that certain trends carry across localities despite potential barriers. Nylen (2003) and Wampler (2007) recognised the need to appraise other cases of PB in Brazil, in particular those where outcomes were less favourable.

Nylen (2003) was quick to show that the vast majority of publications on participatory budgeting focused on the paradigmatic successful cases such as, Porto Alegre. Where innovation itself identifies the population, it is naturally tempting to see negative cases (i.e. cases where innovation does not lead to intended outcomes) as ‘not innovative’, an issue that we will return to below.

Perhaps the finest example of a small to medium-n comparison is Wampler (2007), who compares cases of PB in eight Brazilian cities. He focuses on selecting cases with varying degrees of success in their efforts to deepen democracy, and explains conditions for their emergence, focusing on factors such as mayoral support, the role and health of civil society, mayor-legislative relations and financial health. Thus he identifies key influencing variables within a sample derived from a relatively controlled framework and population (Brazilian municipalities introducing PB) and tries to account for necessary conditions for deepening democracy.

Beyond Brazil, Goldfrank (2007) among others has compared PBs in other Latin American municipalities, while Talpin (2007), Rocke (2009) and others have compared European PBs. Rocke chooses a most-different strategy involving the selection of atypically weak, atypically strong and a typical PB case in each of three countries. This intra-unit (cross-country but within-type of innovation) design allows her to answer questions about how country-specific contexts and frames shape the diffusion of PB controlling for positive and negative cases (in terms of typicality and success). Talpin uses similar intra-unit comparison to investigate whether the educative and transformative effects of participation are similar across varying designs within-PB and across countries. Sintomer et al (2005, 2008, 2010) have made interesting developments in classification and hypothesis-testing/refinement across cases in Europe and beyond.

In the build-up of rich case study literature and the early development of a number of causal explanations for outcomes, an opportunity arises for a larger-N systematic cross-case comparison of PB processes that have been institutionalised in different parts of the world. But at this juncture, a comparison based on conventional statistical analysis is difficult to conceive for a number of reasons. First, it is not clear that we have enough cases on which to draw statistical significance — and for those cases that are available, it is not yet clear that they should all be classified as forms of PB. Second, case work and existing small-N comparisons suggest that causation is likely to be complex. Wampler, for example, suggests, “successful PB cases depend on a series of factors converging to support the delegation of authority” (2007: 159). Moreover, Peruzzotti has claimed that, “Democratic innovation is more likely to take place in a relatively grey area, where neither all of the significant variables promote change nor do all of them conspire against it,” (2009: 58).

Studies point towards conjunctural forms of explanation; that is the presence or absence of any influencing factors may work towards success or failure depending on the context of the
presence or absence of other causes\textsuperscript{1}. Traditional statistical methods focus on isolating the net-effects of a small number of variables over a large number of cases (Ragin, 2007: 177). They will struggle to adequately deal with the increasing number of potential configurations of explanatory variables acting in distinct directions.

We are then faced with a ‘problem’ familiar to any traditional comparative researcher. That is, when we wish to make context-sensitive comparisons we are faced with a situation where we have too many potentially significant variables and not enough cases. However, Berg-Schlosser and Cronqvist suggest that Qualitative Comparative Analysis (QCA) may offer a solution to this problem:

> Between the extremes of over-generalizing and “universalizing” macro-quantitative approaches, on the one hand, and purely individualizing case-oriented approaches, on the other, a meaningful “medium-range” social science can be built which, at the same time, has a higher explanatory power and a greater social and political relevance, (2005: 172).

PB appears ripe for a medium-N study which aims to advance the goals of both functional population definition (of what PB is) and robust causal analyses (of the combinations of effects that produce more or less successful cases).

**What is QCA and how would it be applied to PB?**

Ragin and others have worked to develop diversity-oriented configurational comparative methods. The underlying principle of all qualitative comparative analyses is that many of the social relationships we observe can be described using set-theoretic statements\textsuperscript{2}. In particular set-oriented thinking can help highlight relationships of necessary and sufficient causation in comparative case studies by observing subset-superset relationships\textsuperscript{3}. Moreover, Boolean algebra can be applied to set-theoretic statements in order to highlight conjunctural and alternative causation\textsuperscript{4}.

Ragin shows that relationships of necessity and sufficiency between causal conditions\textsuperscript{5} and outcomes are set-theoretic. For necessity to be established the set of cases containing the outcome must be a subset of the set of cases displaying the cause. Similarly, for sufficiency to be established the set of cases containing the causal condition must be a subset of the cases displaying the outcome (c.f. Ragin, 2000: 214-217). Moreover, simple Boolean negation operations can also be used in tandem with the above to show how the absence of

\footnotesize{\textsuperscript{1}While statistical analysis can measure the effect of having more or less of one variable on another, configurational analysis investigates what combinations of conditions are necessary or sufficient to produce and outcome.}  
\footnotesize{\textsuperscript{2}This section draws heavily on Ragin and seeks to outline the most important aspects of QCA related to this research project. For book-length treatments of fsQCA methodology see Ragin (2008, 2000) Rihoux and Ragin (2007) and Smithson and Verkuilen (2006). Introducing vast new terminology to their audience is a particular dilemma for those writing on fuzzy sets.}  
\footnotesize{\textsuperscript{3}Ragin (2008) shows how correlational thinking can serve to mask these relationships.}  
\footnotesize{\textsuperscript{4}This is done by testing alternative conjunctions for relationships of necessity and sufficiency using Boolean logical operations such as ‘AND’ (the intersection of sets), and ‘OR’ (the union of sets).}  
\footnotesize{\textsuperscript{5}In Fuzzy sets we replace ‘variable’ with ‘condition’. It is incorrect to think of fuzzy set membership scores as variable because the researcher controls limits to the variation of values of the concept.}
a condition contributes to outcomes. These types of relations are often masked by correlation-focused analyses (Ragin 2007).

Pratchett et al (2009) offer a first attempt at using crisp-set QCA (Cs/QCA) — this is where a cases’ membership in a set can be either 0 (out) or 1 (in) — to try and uncover patterns of causation in PB outcomes. The strengths and weaknesses of crisp-set QCA lie in its simplicity and transparency. A simple example of a crisp set truth table is shown below.

Membership of cases (Porto Alegre, Rome, Belo Horizonte, Sevilla) in the sets of causal conditions (A,B,C,D) and outcome condition (Outcome) can be read easily. Moreover each row of the truth table can be read as a logical case (potential combination of causal conditions) for which we have an empirical example. A full truth table would include all possible combinations so that logical remainders (logical cases without empirical examples) can be dealt with transparently.

<table>
<thead>
<tr>
<th>Cases</th>
<th>Causal conditions</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Porto Alegre</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Rome</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Belo Horizonte</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Sevilla</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 1: Partial truth table example showing crisp membership in sets.

Truth tables are useful not only as a visual aid but they are the first step in collating data which can then be minimised to provide parsimonious explanations of relationships across the data. Minimisation allows us to systematically interrogate the explanatory conditions, reducing them to the simplest combinations possible. Let us take the last two cases (Belo Horizonte and Sevilla) in our truth table above. Here we have a positive outcome with two different combinations of variables (presence of a variable is denoted with a capital; absence with small case)

AbCd (Belo Horizonte)
AbCD (Sevilla)

The method of difference proposed initially by J.S. Mill suggests that if two cases produce the same outcome, but differ only in one explanatory variable, then the variable that distinguishes the two cases can be considered irrelevant and removed. This produces a simpler explanatory combination, namely:

AbC (solution 1)

We also see that the Porto Alegre case produces the outcome by the causal recipe

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6 This study is somewhat undermined by the overall research question that was structured by the interests of the Department for Communities and Local Government (CLG). That said, the study represents a first attempt to use cs/QCA as part of a systematic review of evidence, in particular, comparison of existing case materials.

7 Alternative notation is used by the computer programme fsQCA 2.5 used in the analysis below where ‘~’ preceding the letter denotes absence of a case rather than lower case and ‘*’ is used denotes intersection of sets.
AbcD

Given that we know the Sevilla case (AbCD) also produces the outcome we can minimise to the simple combination

AbD (solution 2)

It is unnecessary to introduce too much Boolean notation (see Ragin 1987; Caramani 2009). However, if these were to be the only two combinations of variables that produced the particular outcome (X), then we can state that

\[ X = AbC + AbD \]

or alternatively:

\[ X = Ab \ (C + D) \]

(where + denotes OR)

We can then state here that Boolean minimisation has uncovered that Ab (the presence of cause A and the absence of cause b in combination) is an INUS condition for the outcome given that it is present in both combinations, but on its own, not sufficient: it requires the presence of either C or D.

Cs/QCA, however, has been criticised for using such a crude dichotomous measurement. Dichotomisation of a variable is reasonable when there is a clear threshold of distinction between a score, which indicates the observation of an occurrence, and one that indicates its absence. But, PB is no different to many concepts in social sciences, in that although potential causes or outcomes can be observed in many cases of a given phenomena, the degree to which they occur varies. Fuzzy sets suggest a more sophisticated analysis is possible. In a fuzzy set a case can be ascribed a value between 1 and 0 depending on its degree of membership in a set. This allows comparative researchers to describe degrees of variation. Fuzzy sets are in some ways simply an expansion in sophistication of the crisp dichotomisation. Each case will still display a membership score either side of the crossover point (0.5) which is closest to its crisp set membership.

<table>
<thead>
<tr>
<th>Cases</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porto Alegre</td>
<td>0.8</td>
<td>0.4</td>
<td>0.3</td>
<td>0.6</td>
<td>0.7</td>
</tr>
<tr>
<td>Rome</td>
<td>0.3</td>
<td>0.9</td>
<td>0.2</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td>Belo Horizonte</td>
<td>0.6</td>
<td>0.1</td>
<td>0.9</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>Sevilla</td>
<td>0.7</td>
<td>0.1</td>
<td>0.7</td>
<td>0.7</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Table 2: Fuzzy truth table example showing fuzzy membership in sets.

Fuzzy-set scores begin to bridge the divide between qualitative and quantitative data. They allow variation in membership of a set but add qualitatively defined breakpoints that give

8 an insufficient but necessary part of an unnecessary but sufficient condition (see Mackie: 1988, Wagemann and Schneider, 2007: 6)

9 Fuzzy sets were adapted to social sciences by Smithson (1988) and Ragin (2000). They were previously developed for use in computer sciences by Zadeh (1965).
conceptual meaning to set membership which, in turn, begins to bridge the gap between formal and verbal logic (Ragin, 2000: 160). So, for example, if the outcome condition is understood as ‘citizen control in participatory decision making’, fuzzy-set scores allow us to represent the degree of control. Using Arnstein’s seminal article on the ‘ladder of participation’ (1969) we can see how fs/QCA analysis conceptualises a set of cases of ‘citizen control in participatory decision-making’, where cases that display full citizen control have full membership of the set, manipulatory designs are located fully out of the set, and a number of cases ranging up from consultation to partnership display partial membership in the set (see fig. 1 below).

![Figure 1: Creation of a fuzzy set based on Arnstein’s ‘ladder of participation’](image)

This represents a considerable advance for those who would wish to compare variation across cases without compromising the validity added by theoretical concept-models, potentially offering one way of bridging the ‘unhelpful divide’ between theory and practice in the study of democratic institutions (Smith 2009).

There is no conceptual difference in the way the Boolean operation (e.g. minimisation) described for crisp sets above are applied to fuzzy sets. But it does mean that more meaningful consistency and coverage scores can be calculated which give more nuanced explanations of the manner in which each causal formula explains the outcome.

If we take fs/QCA to be a promising method for a “medium-range” social science programme of research on PB, we are faced with a number of questions. First, what counts as a case of PB? Second, can we adequately define conditions – both causal and outcome? And third (and more practically), is there suitable case material available that provides enough insight into these conditions? While the process of conducting a QCA is both constructive and deductive, it is also iterative, allowing constant revision of theoretical assumptions and measurements. The researcher must be clear about theoretical

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These scores are roughly similar to measures of fit as understood in traditional research methods and will be further explained in the pilot analysis below.
assumptions involved in measurement, selections of cases, what choices they make in order to achieve a parsimonious description of empirical regularities, and interpretations of results (c.f. Rihoux and Lobe, 2009: 237).

In fs/QCA, case selection is inextricably intertwined with condition selection and calibration of sets. Unfortunately in a medium-n study we cannot gain intimate knowledge of cases at the same time or rate. The addition of new cases one by one is challenging, because it has consequences for both population definition and condition definition. New cases may present a variation in the unit of analysis significant enough to force the researcher to reconsider the population. On the other hand the understanding of how conditions are observed in new contexts may force the researcher to revaluate the calibration of conditions. While this iteration is time-intensive, its transparency in construction of the research is a key methodological advantage of fs/QCA.

Scope and population

Ideally the first step of a QCA, once a concept of investigation is decided upon, involves defining a domain or population of cases, drawing on existing theoretical knowledge. For this study, this involves defining what a case of participatory budgeting is – and what it is not. A number of challenges present themselves at this point. It may be that PB has not fully distinguished itself from other democratic innovations or indeed traditional or ongoing methods of participation and/or governance. The diffusion of PB beyond Porto Alegre and Brazil has been a highly differentiated process (Sintomer et al. 2008, 2010, Rocke 2009). It is difficult to know whether the adaptation of PB in new locations is a case of well thought out revision of a concept incorporating local knowledge, or a muddled end product of a unique variance in diffusion. Moreover there is plenty of debate as to whether programmes which call themselves PB in fact are PB, and whether analogous processes which prefer not to use the label are equally comparable.

The position of the Porto Alegre case as not just a poster case, but the archetype of PB is a challenge in many aspects of this research agenda. There is not much point in defining the population based on the best case. Many activists-come-researchers or theorists may not wish to concede any ground on the attractiveness of what ‘Participatory Budgeting’ was before the concept migrated and developed. However, PB has necessarily been implemented in different ways as it has been adapted to different contexts. On the other end of the scale it could be equally foolish to define cases based on minimal criteria. A plethora of programmes now called PB may be so based only on the perceived desirability of being seen to implement it.

A related dilemma for a QCA is that the incorporation of conditions in the definition of the domain limits the scope of the research and influences the selection of variables or

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11 In mainstream social scientific language conditions and calibration might be referred to as variables and measurement respectively. However, although related, they are quite different concepts. Conditions are sets into which cases have a degree of membership. Calibration is the process by which the membership in the set is formulated by defining full membership, full nonmembership and other degrees of membership. In other words connecting formal and verbal logic (Ragin: 2000).

12 This relates to the problem of distinguishing between scope conditions and influencing conditions (See Walker and Cohen: 1985)
conditions. Should different circumstances be treated as conditions affecting outcomes or do they in fact signify that some cases are examples of different phenomena? For example, is there a minimum of money available to spend which defines a case as belonging in the population of PBs, or is the amount of money available to spend an influencing condition with which we wish to explain the emergence and sustenance of PB programmes? In QCA the researcher cannot escape tough decisions on what is fully relevant, partially relevant or completely irrelevant over a medium-$N_{13}$ of cases. The discussion highlights the difficulty within such a comparative study of distinguishing variations in quality from variations in kinds of phenomena.

In large-$N$, variable-oriented research, the logic of case selection is to derive a sample of cases randomly from the population. In case-oriented research the strategy is more often to use tacit or supplementary knowledge to identify what might be substantively important cases for answering the given research question. As has been discussed, we are aiming towards a medium-$N$ study. Much of the inspiration for this study is based on collating and comparing the findings of the growing number of high-quality case research publications on PB.

Collecting information on cases and deciding which potential cases to include and exclude is difficult for a number of reasons. First, it is extremely time-intensive. Retaining the virtues of intimacy with cases in a medium-$n$ comparative study is the qualitative strength of QCA. However, it could take a lifetime of work for any researcher to do in-depth qualitative research with a medium-$n$ (see Bryan 2004 for the effort involved in a ‘lighter’ large-$N$ study of town meetings). Therefore we rely on secondary sources in an fs/QCA of this type. The difficulty here is that the literature will often, for reasons of space or intentions of a study, document the quirks of a particular case and not all its basic elements. This makes a simple review of case materials for the conditions for an fs/QCA difficult. Missing data is not a new concept to a social scientist; however some imputing-type techniques that we might consider tend to run against the grain of the importance QCA places on holism of the case and the presence/absence of only one condition in a combination (logical case). Therefore we have sought to complement existing secondary material with interviews with field researchers who carried out studies. This has three advantages. First, it enables us to access information on the specific conditions of interest when they are not in the original literature. Second, we can check our interpretation of the nature of conditions with a researcher familiar with the case. Third, we are able to engage the field researcher in the iterative process of refining our causal and outcome conditions – as well as the scope and population.

**Defining conditions**

Selecting causal conditions in any form of comparative research relies on hypotheses. The deductive element of QCA seeks to relate the conditions we feel most important in explaining an outcome and identify whether they act in the way we would expect across cases. In QCA this is combined with an inductive element as we learn more about how cases interact and reassess cases and conditions as we iterate across stages in the research.

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13 Medium-$N$ can refer to anything between 5 and 100 cases depending on the units of investigation and types of data and measures, but it most clearly applies to research involving 20 to 60 cases.
The growing literature on PB provides ample candidates for conditions. Many of the types of claims that Wampler (2007), Avritzer (2008), Talpin (2009) and others make about causal processes in PB are in fact either explicitly or implicitly claims about set-theoretic relationships of necessity and sufficiency. For example Wampler suggests that strong mayoral support combined with active civil society is necessary for the achievement of most successful participatory budgeting programmes (2007: 258). Note that this differs to a correlational claim that the stronger the mayoral support and civil society are, the better the PB will be. One of the challenges to scholars of the variable-oriented tradition who wish to define conditions in an fs/QCA is to switch to set-oriented thinking. Fuzzy sets are in fact variables “infused with theory” (Ragin, 2000: 6). This is because a fuzzy set disciplines the researcher to delineate with clear and precise knowledge and description the social phenomenon they seek to represent.

In almost any cross-case comparison the number of conditions must be kept low – a challenge in itself. QCA has an advantage over other techniques in that it is transparent about the simplifying assumptions it makes about logical remainders. It also allows the researcher to control for logical remainders to an extent by limiting the number of conditions used in the analysis. Logical cases grow exponentially with each increase in the number of conditions; thus an analysis of more than four or five conditions that seeks a parsimonious solution risks many assumptions about cases for which we have no real-world examples. Yet, looking at the growing literature, there are any number of conditions that may be important for explaining PB. These could include, for example, the fiscal independence of a polity, political independence, the governing philosophy of the political leadership, the health of civil society, the quality of deliberation at meetings, the role of the bureaucracy, etc.

A potential answer to dealing with the sheer range of conditions comes in the form of Boolean operations that allow us to logically construct conditions from the combinations of others. For example if we want to explain the outcome ‘improved democracy’, drawing on existing studies of PB we can make the case that this is present in a necessary combination of ‘citizen control’ AND ‘significant sums of money spent’. We would then calibrate set scores for cases on the aforementioned sets and compute the membership of their intersection (logical ‘AND’) to calibrate the set ‘improved democracy’. Similarly if we wish to conceive the influencing variable ‘favourable political climate’ we could suggest that this can be displayed through ‘high fiscal independence’ OR ‘high political independence’ OR ‘high bureaucratic capacity’. In this case we would calibrate the set ‘favourable political climate’ by first calibrating the three conditions independently and then computing the union.

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15 This is not to say that this claim cannot also be made.
16 For instance while height is a ratio variable with a fixed minimum and no meaningful maximum, ‘tall people’ is a set whose range must be defined by the researcher.
17 A logical remainder is a logical case (possible combination of conditions) for which there is no empirical example. Even in large-n studies that take interaction of conditions into account we can expect many of the logical cases not to display any empirical examples. Large-n studies until relatively recently have paid little attention to simplifying assumptions.
18 In a QCA if there are k conditions, there will be $2^k$ logical combinations of these conditions.
19 In the case of logical ‘AND’ this is done by taking the minimum membership value of the case across the sets that intersect.
(logical ‘OR’) of these set memberships. Here formal logic allows us to retain theoretical and complex information in a relatively open way.

Nevertheless problems arise in this strategy also. Often it is difficult to know to what extent these conditions influence each other. Although these constructions may help limit the number of final conditions in the analysis, introducing more conditions in this way still increases the risk that there are cross-condition relationships of feedback and process over time, something QCA is often ill-equipped to deal with. Like the other challenges outlined thus far, these can be seen in a more or less positive light depending on the researcher’s methodological perspective. At minimum, the above discussion shows that QCA disciplines the researcher to think far more about how the selection of conditions will affect the selection of cases, other conditions and the calibration of case scores on conditions. The act of performing QCA forces the researcher to be transparent about the assumptions they are making, which cases and conditions are most important and how they interact with one another. Even where a researcher must drop a case from the research because the condition most appropriate for its explanation cannot be included, the transparency in this act is a scientific advantage of the method.

**Thinking on conditions**

The ultimate aim of this study is to draw on a range of cases to explain the conditions under which PB is institutionalised effectively. The outcome condition (or in traditional statistical language – the dependent variable) we are aiming to evaluate is *citizen control of budgetary decision making*. We recognise that there are other outcomes that may be of interest to PB scholars, including redistribution of wealth, individual and group inclusion, education and budget literacy. We continue to collect relevant data on these potential outcomes and in time may create a more complex outcome condition that incorporates these conditions – or run separate analyses focused on these particular outcome conditions. However for this study we focus attention on how de facto citizen control of budgetary decision making is established, institutionalised and sustained.

Following a survey of the PB literature, pilot interviews with three experienced field researchers, and an iterative process of reflection on populations and existing theories of participative governance, we have identified a series of key influencing conditions that we take to be particularly relevant to understanding the institutionalisation and sustenance of PB (although further revisions are likely as new cases are added to the analysis!):

- favourable condition of civil society

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20 These combinations are used mainly as examples here. It will be up to a researcher’s case and theory knowledge to decide what relationship (‘AND’ or ‘OR’ or even other operation) best describes the connection between the more abstract set and the slightly more concrete sets.

21 Clearly, these seven conditions that we have selected do not cover all the causes which are reported (explicitly or implicitly) in studies of cases of PB. Further, if we change the outcome conditions, it is likely that other influencing conditions will become more central to explanations. To this end, one of the authors (Ryan) is constructing a more extensive database, cataloguing information on (currently) 47 conditions for over 82 potential cases. This approach allows us to build up and merge conditions using logical combinations where it seems appropriate as we correspondingly refine theory from the top down.
- participatory leadership
- degree of fiscal independence
- capacity to reorganise bureaucracy
- existence of other participative initiatives
- poverty
- democratic performance of governing system

Literature on Latin American cases in particular highlights the condition of civil society at the initiation of PB (Baiocchi 2005, Wampler 2007). Such studies focus on the extent to which a vibrancy and activism within civil society can generate organised pressure for PB from the bottom-up.

Latin American studies also emphasise the importance of the leadership strategy, a theme also seen in European cases (e.g. Rocke 2009). This combines concerns about the extent to which participation is ideologically central to governing parties, the degree of support for participation across the party and political spectrum, and the instrumental incentives for government to engage citizens in decision-making.

Where diffusion has occurred across vastly different political units with different capacities and functions, the question of the degree of fiscal independence available to instigators of participatory processes has arisen. In the early work on Brazilian cases, the fiscal autonomy of municipal mayors was frequently part of the explanation of successful implementation (Abers 2000).

The degree to which the bureaucracy can be reorganised is also related to differences in political systems. Here studies have pointed towards the way in which political leaders are able to restructure the administration (including the appointment of senior bureaucrats) to enable PB (Abers 2000; Baiocchi 2005). Bureaucracy can act as a brake or catalyst for participatory reforms.

Our fifth condition is currently the existence of other participatory initiatives in a locality. This could potentially have effects in both directions: PB has a lower impact because other avenues of engagement and participatory programmes are already existing or are more appropriate to context (Avritzer 2009); or the presence of other participatory initiatives may provide the underlying skill and capacities to enhance and sustain PB.

There are two other conditions that continue to compete for attention and which may well become part of the final analysis. The first condition relates to the degree of poverty. This may explain differences in implementation both within and across political systems. The second condition would capture the background democratic performance of the political system within which the PB is institutionalised. Both of these conditions would draw on existing data such as UNDP development data, Freedom House scores or similar.
Pilot Study: Calibration – What does it look like?

Since this is only an indicative pilot study aimed at illustrating the potential benefits of using fs/QCA methodology in the study of democratic innovations, the cases have been chosen to be somewhat representative of the sheer variety of cases and sources that any comparative study of this type must work with. The cases and sources are:

- Berlin-Lichtenberg (Rocke 2009, interview with Rocke 13/12/2010)
- Morsang-Sur-Orge (Talpin, 2007)
- Toronto Community Housing (Lerner and Van Wagner 2006, interview with Lerner 18/01/2011)
- Buenos Aires (Peruzzotti 2009, Rodgers 2010)
- Belo Horizonte (Wampler 2007, Avritzer 2009, interview with Wampler 16/03/2011)

While we take care to explain our decisions in constructing sets and selecting conditions, coding of raw material is provisional. Any guidance from researchers involved in documenting relevant casework, or those with information on the cases, is always welcome to enrich the analysis.

Calibration involves relating verbal and numerical data. Ideally calibration should be done after cases and conditions are selected. Calibration naturally follows condition selection in particular and is linked to the definition of sets. In many modern examples of fs/QCA, conditions are defined by converting a continuous variable into a fuzzy set. This has become more common in particular as quantitative researchers have become more familiar with fs/QCA techniques. In our case the conditions we wish to define are unlikely to have readymade indicators for such a conversion (with the exception of poverty and democratic performance). We define the degrees of membership within the set in particular in relation to three key breakpoints; full membership in the set (score of 1), non-membership of the set (score of 0) and neither more in nor more out of the set (score 0.5). Depending on how confident we are that we have detailed knowledge of different degrees of membership we can define other breakpoints for calibration which are linked to verbal statements, e.g. ‘more out than in’ (0.25) and ‘more in than out’ of a set (0.75) (Ragin 2000: 156).

Three methods of calibration are typically used in fsa\QCA. The most frequent and most straightforward in terms of understanding (but not necessarily implementation) involves drawing on rich qualitative descriptions in already existing casework. Where depth and quality of information allow, cases are ascribed membership values in the sets (each representing a condition). In our pilot study cases, membership in sets takes one of eight values corresponding to the following logical verbal statements:

---

22 Although there are nine values, the crossover point (value 0.5) is the point of maximum ambiguity of membership in a set. A tempting error of logic would be to assume that a case could have a membership score ‘halfway’ in the set. The verbal logic which ascribes to a membership of 0.5 in a set would be that a case is ‘neither more in nor more out’ of the set. Ascribing a case such a score places it in a logical limbo and removes
1.0 - ‘Fully in’ the set
0.83 - ‘mostly but not fully in’
0.67 - ‘more or less in’
0.52 - ‘marginally more in’
0.48 - ‘marginally more out’
0.33 - ‘more or less out’
0.17 - ‘mostly but not fully out’
0 - ‘fully out’

The first and most critical step is to define what constitutes full membership in the set, full non-membership, and the point of maximum ambiguity in membership. Nevertheless, coding cases is an informative, inductive process. There is interplay here between case-knowledge and theoretical understanding.

Let us use the example of the set ‘participatory leadership strategy’. Full membership is where the instigator/overseer of PB is ideologically committed to participatory politics and to implementing PB. Thus full non-membership is where the instigator/overseer of PB is not ideologically committed to participatory politics and is actively trying to derail or revoke participatory practices. We might say to the best of our ability that the point of maximum ambiguity (or crossover point) is represented by the instigator/overseer of PB being committed to participatory politics only to the extent that it fits in with other ideological or material goals. Support for PB is present but limited and fragmented across the governing ranks. Given our tacit case knowledge we might then feel that there is enough evidence in the secondary literature and interviews to warrant relatively fine-grained fuzzy sets for the purposes of a more nuanced analysis.

We can say that Porto Alegre would get a fuzzy membership of 1 in this set as PB was the flagship of an explicit participatory philosophy of the instigating party. The PT proposed a programme specifically designed to involve lower socio-economic groups in public policy-making venues (Wampler, 2007: 5), to give civil society organisations an input in making the rules of PB and to increase budget transparency (ibid: 126). In comparison, we know that in Berlin we have a mayor committed to participation at the district level but there is a question as to whether this justifies similar membership given that the district mayor is not the only driving force in such a federal system (Rocke: 2009). In Buenos Aires there was brief enthusiasm from those in power but that this was based on contingent circumstances.

---

23 An example of some of the raw information extracted from sources to code for this condition is given in Appendix. In order to be transparent, this example was not chosen as that with the best provided data. It is fairly representative of the type of information being used to calibrate in this way, and shows visually that some cases have greater or lesser information depending on data available to the researcher thusfar (remembering that differentiated quality of information across cases is common to comparative small-n research strategies). Our hope is that data will improve as we continue to interview field researchers.
For our purpose it is useful to visualise the cases on what we term fuzzy-maps (see fig. 2 below) so that we can make confident judgements that the numerical values we ascribe cases make sense both in relation to the verbal definitions of key breakpoints above, and our more tacit knowledge of the cases themselves and how they relate on the condition. Interplay then takes place where the researcher must refine the statements of calibration above in light of the information thrown up by the cases when the difficult (and perhaps ‘dirty’) process of coding takes place. Where we find cases with important differences on the degree to which they display the condition too close together, this may signal a need to consider redefining full membership. We could do this for instance by adding the caveat that the instigator/overseer of PB is ideologically committed to participatory politics and to implementing PB and is willing to take risky political decisions to uphold this commitment and recode the cases accordingly. What we seek is that the definitions of membership values will eventually make sense such that membership in the set is clearly calibrated to the theoretical meaning of the condition which we wish to test.

![Fuzzy set diagram](image-url)

Fig 2. A ‘fuzzy-map’ for cases membership in the condition ‘participatory leadership strategy’.

This process of calibration highlights the extent to which iteration is central to QCA in seeking both theoretical clarity and robust measurement for comparison. Measurements, scales and populations are not ‘given’ as they are often seen to be in traditional quantitative research strategies (Ragin 2000). Yet measures can still be constructed which are comparable across cases and conditions. These can allow the use of Boolean algebraic operations to uncover relationships of necessity and sufficiency between conditions and outcomes across cases. And as new cases are added, we are often forced into reassessing the nature of membership of particular sets. This is nothing new as quantitative scholars
have for years been looking at how concepts travel and can be meaningfully quantified across contexts. Nevertheless, by allowing these considerations at the level of medium-N QCA seems to provide an alternative location for robust research on the spectrum of trade-offs between complexity and generalisability in social and political research. It is not clear, therefore, that the epistemological authority of QCA should be any less than that of more established methods (see Rihoux and Lobe: 2007).

The second method of calibration we use is merely an expansion of the first. It uses algebraic combinations to combine sets of conditions to create more nuanced conditions – the logical ‘AND’ (focusing on case membership of the intersection of two or more sets) and logical ‘OR’ (focusing on case membership in the union of two or more sets) that we introduced earlier. As such, various combinations of multiple sets can be combined to form a single more complex set using simple algebraic logic.

For example, we calculate the set ‘fiscal independence’ (fiscalind) from two other sets, namely ‘independent spending capacity’ (indspend) and ‘independent fundraising capacity’ (indfund) using fuzzy ‘AND’. In verbal language what we are theorising is that for a municipality to be fiscally independent it must have both independence in its spending decisions and its ability to raise funds.

<table>
<thead>
<tr>
<th>caselid</th>
<th>indspend</th>
<th>indfund</th>
<th>fiscalind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porto Alegre</td>
<td>0.83</td>
<td>0.83</td>
<td>0.83</td>
</tr>
<tr>
<td>Belin-Lichtenberg</td>
<td>0.48</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>Marsang-Sur Orge</td>
<td>0.33</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>Toronto Community Housing Corporation</td>
<td>1.00</td>
<td>0.33</td>
<td>0.33</td>
</tr>
<tr>
<td>Buenos Aires</td>
<td>0.83</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>Belo Horizonte</td>
<td>0.83</td>
<td>0.83</td>
<td>0.83</td>
</tr>
</tbody>
</table>

Table 1 shows set membership of the six pilot study cases in ‘indspend’ and ‘indfund’ as calibrated using the first method and ‘fiscalind’ as calibrated using the intersection of sets (logical ‘AND’).

A third method not used in this pilot study, but likely to be used in future incarnations of the research, is known as the direct method of calibration (Ragin 2008: 104). This method is more complicated but less difficult to implement. It involves taking a proxy indicator variable for the condition we wish to analyse and, based on qualitative knowledge of the concept and its relevance to the investigation, selecting the value above and below which variation is no longer meaningful – in other words full membership and full non-membership. We also choose the value of maximum ambiguity between in or out of the set. A computer program then converts the values for cases from the variable into set memberships using estimates of the log of the odds of full membership (c.f. ibid: 87).

An example relevant to the study of PB could involve the calibration of the set ‘equal municipalities’ from the cities’ gini coefficients. We specify a Gini coefficient of 0.55 as full

24 Computing of case memberships and analysis presented here was produced using fsQCA 2.5 available as a freeware download from http://www.u.arizona.edu/~cragin/fsQCA/software.shtml
25 Much work is being done currently in the field of QCA on improving the robustness of the conversion to fuzzy sets memberships of such variables (e.g. Thiem, 2010).
26 Our theoretical justification for investigating the effect of equality would rest on investigating whether PB is more likely to be successfully institutionalised in municipalities where redistribution has been historically
membership in the set of unequal municipalities, .4 as the crossover point and .2 as full membership, and then use a function in fsQCA2.5 to compute fuzzy set membership in the conditions See Ragin (2008: 104).

<table>
<thead>
<tr>
<th>caseid</th>
<th>gini</th>
<th>equality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porto Alegre</td>
<td>0.611</td>
<td>0.39</td>
</tr>
<tr>
<td>Berlin-Lichtenberg</td>
<td>0.27</td>
<td>0.12</td>
</tr>
<tr>
<td>Moutang Su Orge</td>
<td>0.28</td>
<td>0.14</td>
</tr>
<tr>
<td>Toronto Community Housing Corporation</td>
<td>0.403</td>
<td>0.51</td>
</tr>
<tr>
<td>Buenos Aires</td>
<td>0.52</td>
<td>0.32</td>
</tr>
<tr>
<td>Belo Horizonte</td>
<td>0.61</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Table 2 Gini coefficients and membership in the fuzzy set ‘equality’ for the six cases in the pilot study.

**Pilot Study: Analysis and explanation**

We present first a truth table displaying set membership of cases in fifteen conditions calibrated using the first method outlined above (with the exception of the unoperationalised Gini coefficients).

Key to set names: is – ability to make spending decisions independent of interference, if – ability to raise funds independent of interference, pl – participatory political leadership, aa – ability to appoint administrators, cha – administration was changed, iocs – independent and organised civil society, csd – civil society demand for participation, hp – a history of political participation innovations, cp – current and concurrent participation programmes in the municipality, gini coefficient, cr – control by participants over rules, ci – control by participants over implementation, ca – control by participants over agenda-setting, cd – control by participants over final decisions, nc – the absence of cooption.

uneven. Gini coefficients used here are 0.52 for BA, 0.61 for BH, 0.611 for PA, 0.403 for Toronto (obtained from UN-HABITAT 2008 report ‘State of the world’s cities 2010/2011: Bridging the Urban Divide, Washington, DC: UN-HABITAT). We were only able to obtain national figures for France 0.28 and Germany .27, but feel able to use them here because the main intention of this study is to indicate the usefulness of the method.
As explained above for the purposes of any analysis in QCA we should select four or five key variables whose relationship with the outcome across cases we want to explain. For this indicative analysis we will focus on four influencing conditions:

- fiscal independence (fi)
- participatory leadership (pl)
- civil society demand (csd)
- freedom to appoint senior administrators (faa)

and their relationship with the outcome:

- citizen control of participatory decision making (outcc)

To reiterate, the analysis that follows is only indicative. More work needs to be undertaken on calibrating conditions (including combining conditions) and more cases added. The aim of the analysis is to illustrate what might be possible if fs\QCA is applied to the evaluation of PB. A more systematic medium-N analysis is in preparation.

A concise truth table showing only the conditions used in the pilot analysis is produced below.

<table>
<thead>
<tr>
<th>caseid</th>
<th>pl</th>
<th>faa</th>
<th>csd</th>
<th>fi</th>
<th>outcc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porto Alegre</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0.83</td>
<td>1</td>
</tr>
<tr>
<td>Berlin-Lichtenberg</td>
<td>0.83</td>
<td>0.33</td>
<td>0.48</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>Morsang-Sur-Orge</td>
<td>0.83</td>
<td>0.33</td>
<td>0.33</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>Toronto Community Housing Corporation</td>
<td>0</td>
<td>0.17</td>
<td>0.33</td>
<td>0.33</td>
<td>0.83</td>
</tr>
<tr>
<td>Buenos Aires</td>
<td>0.48</td>
<td>1</td>
<td>0.48</td>
<td>0.17</td>
<td>0.52</td>
</tr>
<tr>
<td>Belo Horizonte</td>
<td>0.67</td>
<td>1</td>
<td>0.83</td>
<td>0.83</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Table 4: Concise fuzzy truth table for pilot analysis.

---

27 This outcome set is the intersection of the sets ‘control by participants over agenda-setting’ (ca) and ‘control by participants over decision-making’ (cd) for whom case membership values are depicted in Table 3.
In the first step of the analysis we test for necessary conditions to produce the outcome.

**Analysis of Necessary Conditions**

Outcome variable: outcc

<table>
<thead>
<tr>
<th>Conditions tested</th>
<th>Consistency</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>pl</td>
<td>0.725552</td>
<td>0.603675</td>
</tr>
<tr>
<td>~pl</td>
<td>0.637224</td>
<td>0.922374</td>
</tr>
<tr>
<td>faa</td>
<td>0.791798</td>
<td>0.655352</td>
</tr>
<tr>
<td>~faa</td>
<td>0.369085</td>
<td>0.539171</td>
</tr>
<tr>
<td>csd</td>
<td>0.829653</td>
<td>0.762319</td>
</tr>
<tr>
<td>~csd</td>
<td>0.536278</td>
<td>0.666667</td>
</tr>
<tr>
<td>fi</td>
<td>0.678233</td>
<td>0.860000</td>
</tr>
<tr>
<td>~fi</td>
<td>0.589905</td>
<td>0.534286</td>
</tr>
</tbody>
</table>

**Table 5: Analysis of necessary conditions for the outcome ‘citizen control in participatory decision-making’**.

The consistency measures show the consistency to which the conditions follow the fuzzy subset relation of necessity with the outcome. In a study of only six cases we would require a very high consistency (probably 1) to make any robust claims about necessary conditions (as more cases are added, this demanding threshold can be allowed to drop slightly). Testing for the presence of the outcome first we see that no condition has a consistent relationship of necessity with the outcome set above 0.83. Civil society demand comes closest. We can investigate this further by mapping the cases graphically on a fuzzy X/Y plot (see below). We see that two cases, TCHC and Buenos Aires (marginally) break with the necessity relationship. If this were a necessary condition we would see all cases dotted below the diagonal.

![Fuzzy X/Y plot](image)

**Fig 3** A fuzzy X/Y plot where membership of cases in the outcome ‘citizen control in participatory decision-making’ is plotted against membership of cases in the explanatory condition ‘civil society demand’.

---

28 This is a somewhat basic explanation. We do not have sufficient space here to explain the consistency measure for our audience and refer them to Ragin: 2008 for a detailed explanation.
QCA requires us to always test for both relationships with the outcome and the negation of the outcome because causal symmetry is not assumed (unlike in traditional variable oriented research) 29.

Analysis of Necessary Conditions

Outcome variable: ~outcc

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Consistency</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>pl</td>
<td>0.939929</td>
<td>0.698163</td>
</tr>
<tr>
<td>~pl</td>
<td>0.466431</td>
<td>0.602740</td>
</tr>
<tr>
<td>faa</td>
<td>0.646643</td>
<td>0.477807</td>
</tr>
<tr>
<td>~faa</td>
<td>0.533569</td>
<td>0.695853</td>
</tr>
<tr>
<td>csd</td>
<td>0.699647</td>
<td>0.573913</td>
</tr>
<tr>
<td>~csd</td>
<td>0.710247</td>
<td>0.788235</td>
</tr>
<tr>
<td>fi</td>
<td>0.424028</td>
<td>0.480000</td>
</tr>
<tr>
<td>~fi</td>
<td>0.876325</td>
<td>0.708571</td>
</tr>
</tbody>
</table>

Table 6: Analysis of necessary conditions for the outcome ‘absence of citizen control in participatory decision-making’.

In testing for the absence of citizen control in participatory budgeting we find a rather interesting result that suggests participatory leadership is almost consistently necessary for the outcome. This is counterintuitive and requires again investigating the x/y plot. While the set membership in the outcome is almost constantly less than or equal to the cause this does not apply (marginally) to TCHC. Furthermore, if we look more closely, the Porto Alegre case has very full membership in the causal condition and very low membership in the outcome. Logically we can say that such a case tells us little about the outcome in real terms. This is why we calculate coverage scores. The Porto Alegre case significantly lowers the coverage score of this necessary relationship and we can imagine that an analysis of a larger number of cases is likely to bear this out further.

Membership in the negation of the outcome (no citizen control) can be easily calculated by subtracting membership in the set citizen control from 1. This negation operation is one of the cornerstones of fuzzy logic.

29
Fig 4 A fuzzy X/Y plot where membership of cases in the outcome ‘absence of citizen control in participatory decision-making’ is plotted against membership of cases in the explanatory condition ‘participatory leadership’.

We turn finally to the analysis of sufficient conditions. The sufficiency analysis is often the most interesting in QCA because it allows us to use combinatorial mathematics to ascertain how conditions behave when combined in cases. The first step in the analysis involves creating a crisp truth table from the fuzzy data. When using fuzzy sets no case exhibits full membership in any of the different logical combinations, nevertheless, logically they will have greater than 0.5 memberships in only one. The number column in the table below shows the number of cases having greater than 0.5 memberships in the corner of the vector space represented by that logical combination. This clearly shows the degree to which (unsurprisingly) logical remainders play a part in our pilot study. The ‘raw consist’ column shows the consistency to which this combination displays the fuzzy subset relation for sufficiency.

<table>
<thead>
<tr>
<th>pl</th>
<th>faa</th>
<th>cod</th>
<th>fi</th>
<th>number</th>
<th>outcome</th>
<th>raw consist.</th>
<th>FRI consist.</th>
<th>product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>(93%)</td>
<td>0.295714</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>(66%)</td>
<td>0.905473</td>
<td>0.012725</td>
<td>0.70606</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>(83%)</td>
<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>(100%)</td>
<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>(100%)</td>
<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>(100%)</td>
<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>(100%)</td>
<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>(100%)</td>
<td>1.000000</td>
<td>-1.4NDIND0</td>
<td>-1.4NDIND0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>(100%)</td>
<td>1.000000</td>
<td>-1.4NDIND0</td>
<td>-1.4NDIND0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>(100%)</td>
<td>1.000000</td>
<td>-1.4NDIND0</td>
<td>-1.4NDIND0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>(100%)</td>
<td>1.000000</td>
<td>-1.4NDIND0</td>
<td>-1.4NDIND0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>(100%)</td>
<td>1.000000</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>(100%)</td>
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</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>(100%)</td>
<td>1.000000</td>
<td>-1.4NDIND0</td>
<td>-1.4NDIND0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>(100%)</td>
<td>0.785714</td>
<td>0.000000</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

Table 7: Truth table showing fuzzy membership in the corners of the vector space for each logical combination and consistency of the fuzzy subset relation for sufficiency.

The second stage of the analysis involves minimizing the data to solutions. At this point it is necessary to decide on the threshold for sufficiency. Depending on quality of data and numbers and types of cases this could range from 0.75 to 0.85 or higher (Ragin 2000, 2005: 11). Here we take a consistency threshold of 0.85 and code the outcome as in table 8.

<table>
<thead>
<tr>
<th>pl</th>
<th>faa</th>
<th>cod</th>
<th>fi</th>
<th>number</th>
<th>outcome</th>
<th>raw consist.</th>
<th>PRI consist.</th>
<th>product</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>1.000000</td>
<td>1.000000</td>
<td>1.000000</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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</tbody>
</table>

Table 8 Cases coded for analysis with a consistency threshold of 0.85

---

30 Note that we do not analyse for combinations of conditions in necessary condition analysis because logically if any condition is found to be necessary it is as a necessary part of any necessary combination.

31 This process is described in more detail in Ragin (2005).

21
The final step before interpretation of results is to minimise the data into solutions. In a standard analysis we are offered three solutions. The first is the most complex solution where no assumptions about logical remainders are made. The second is a most parsimonious solution where the computer programme makes assumptions about remainders which lead to the least complex solution. Finally the third is termed the intermediate solution. This minimises the complex solution, to the extent that the researcher provides information about the direction causal conditions would be expected to act in counterfactuals for which they have reasonable grounds to make assumptions (sometimes called easy counterfactuals)\textsuperscript{32}.

--- COMPLEX SOLUTION ---

<table>
<thead>
<tr>
<th>raw coverage</th>
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</tr>
</thead>
<tbody>
<tr>
<td>~fi<em>~pl</em>~csd</td>
<td>0.536278</td>
<td>0.321767</td>
</tr>
<tr>
<td>fi<em>faa</em>pl*csd</td>
<td>0.574133</td>
<td>0.359621</td>
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</tbody>
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solution coverage: 0.895899
solution consistency: 0.937294

Cases with greater than 0.5 membership in term ~fi*~pl*~csd: Toronto Community Housing Corporation (0.67,0.83),
Buenos Aires (0.52,0.52)
Cases with greater than 0.5 membership in term fi*faa*pl*csd: Porto Alegre (0.83,1),
Belo Horizonte (0.67,0.48)

--- PARSIMONIOUS SOLUTION ---

<table>
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<th>consistency</th>
</tr>
</thead>
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<td>~pl</td>
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<td>0.157729</td>
</tr>
<tr>
<td>fi</td>
<td>0.678233</td>
<td>0.000000</td>
</tr>
<tr>
<td>faa</td>
<td>0.791798</td>
<td>0.000000</td>
</tr>
<tr>
<td>csd</td>
<td>0.829653</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

\textsuperscript{32} In the notation used in fsQCA 2.5 the ~ signs signifies absence of the condition which it precedes.
Cases with greater than 0.5 membership in term ~pl: Toronto Community Housing Corporation (1,0.83),
Buenos Aires (0.52,0.52)
Cases with greater than 0.5 membership in term fi: Porto Alegre (0.83,1),
Belo Horizonte (0.83,0.48)
Cases with greater than 0.5 membership in term faa: Porto Alegre (1,1),
Buenos Aires (1,0.52), Belo Horizonte (1,0.48)
Cases with greater than 0.5 membership in term csd: Porto Alegre (1,1),
Belo Horizonte (0.83,0.48)

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.905473
Assumptions:
csd (present)
pl (present)
faa (present)
fi (present)

<table>
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solution coverage: 0.946372
solution consistency: 0.852273

Cases with greater than 0.5 membership in term ~pl: Toronto Community Housing Corporation (1,0.83),
Buenos Aires (0.52,0.52)
Cases with greater than 0.5 membership in term csd*faa*fi: Porto Alegre (0.83,1),
Belo Horizonte (0.83,0.48)

Table 9 Showing sufficiency analysis solutions for outcome ‘Citizen control in participatory decision-making’

Analysis of sufficient conditions: In the most complex solution (with no assumptions made about counterfactual cases) we are presented with two solutions (combinations of
conditions that are sufficient to produce the outcome across cases). The solution can be written as:

\(~\text{fi} \cdot \text{pl} \cdot \text{csd} + \text{fi} \cdot \text{faa} \cdot \text{pl} \cdot \text{csd} \rightarrow \text{Outcc}\)

(where ‘~’ represents absence of a cause and ‘→’ implies ‘is sufficient for’)

The first solution suggests that the absence of fiscal independence, political leadership and civil society demand is sufficient to produce citizen control in budgetary decision making. This again may seem counterintuitive, but when we go back to the cases we see that this closely reflects accounts of both Buenos Aires and TCHC. For example Lerner and Van Wagner say of Canadian PBs that, “In general, participatory budgeting emerged when staff were passionate and prepared, politicians were looking the other way, community members were demanding, and budget funds were scarce,” (2006: 15). If in a medium-N study we again found similar results in the necessity or sufficiency analysis it might force us to think about whether conditions are missing from our model or need refinement. An obvious candidate currently absent from this pilot analysis is a condition that captures the extent to which the bureaucracy is supportive of PB (not just the freedom to appoint senior administrators). Further, it might make more sense theoretically to suggest that it is not an absence of participatory leadership per se but rather de-politicisation of the process that is the positive contributor to outcomes. Again, this would need to be tested.

The second of the possible causal paths confirms what much of the comparative work on PB thus far has suggested: all of the conditions we have selected are independent necessary parts of an unnecessary but sufficient path to the outcome. In this pilot both solutions cover the outcome to a similar degree, but we might expect that with the addition of further cases this second solution would have higher coverage (but this cannot be confirmed until the work is carried out!).

The ‘parsimonious solution’ makes all assumptions about the outcome in counterfactual cases which will lead to the most parsimonious solution. It can be represented thus:

\(~\text{pl} + \text{fi} + \text{faa} + \text{csd} \rightarrow \text{Outcc}\)

We see that even where the consistency of the relationship for these conditions is quite high, their unique coverage (the extent to which this set covers the outcome set independent of others) is quite low (ranging from 0 to 0.158). The parsimonious solution of course lacks theoretical insight and rigour but can alert the researcher to possible reasons to make new assumptions about counterfactual cases.

For the intermediate solution we are able to insert directional expectations into the model: in counterfactual cases we would expect our conditions when present to contribute causally towards the outcome. Again this assumption can be debated but the point for now is that it allows us to deal with counterfactual cases transparently. The intermediate solution reads as follows:

\(~\text{pl} + \text{csd} \cdot \text{faa} \cdot \text{fi} \rightarrow \text{Outcc}\)
The intermediate solution is often the most interesting and the one most likely to be debated among researchers interested in the findings. In this limited pilot study the intermediate solution is two-fold. First, the absence of participatory leadership remains. The second path is a combination of civil society demand, fiscal autonomy and capacity to appoint senior administrators. Again, as outlined above, it is this solution that will likely lead to a regular return to cases and recalibration and/or adding/removing conditions to improve the model as our understanding of causal conditions improves.

We present the sufficiency analysis for the negation of the outcome as good practice but do not engage in an interpretive discussion at this point as that is superfluous to the overall aims of the paper.

--- COMPLEX SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.966667

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<td>0.409894</td>
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</tr>
</tbody>
</table>

solution coverage: 0.710247
solution consistency: 0.980488

Cases with greater than 0.5 membership in term pl*~faa*~csd*~fi: Morsang-Sur-Orge (0.67,0.83), Berlin-Lichtenberg (0.52,0.83)
Cases with greater than 0.5 membership in term ~pl*faa*~csd*~fi: Buenos Aires (0.52,0.48)

--- PARSIMONIOUS SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.966667

<table>
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<th>consistency</th>
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<tr>
<td>~pl*faa</td>
<td>0.466431</td>
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solution coverage: 0.932862
solution consistency: 0.835443
Cases with greater than 0.5 membership in term pla~fi: Berlin-Lichtenberg (0.83, 0.83), Morsang-Sur-Orge (0.83, 0.83)
Cases with greater than 0.5 membership in term pla~csd: Morsang-Sur-Orge (0.67, 0.83), Berlin-Lichtenberg (0.52, 0.83)
Cases with greater than 0.5 membership in term pla~faa: Berlin-Lichtenberg (0.67, 0.83), Morsang-Sur-Orge (0.67, 0.83)
Cases with greater than 0.5 membership in term faa~fi: Buenos Aires (0.83, 0.48)
Cases with greater than 0.5 membership in term faa~csd: Buenos Aires (0.52, 0.48)
Cases with greater than 0.5 membership in term ~pla: Buenos Aires (0.52, 0.48)

--- INTERMEDIATE SOLUTION ---
frequency cutoff: 1.000000
consistency cutoff: 0.966667
Assumptions:
~fi (absent)
~csd (absent)
~faa (absent)
~pl (absent)

<table>
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<th>consistency</th>
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</thead>
<tbody>
<tr>
<td>~fi<em>~csd</em>faa*~pl</td>
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</tr>
<tr>
<td>~fi<em>~csd</em>~faa*pl</td>
<td>0.420495</td>
<td>0.300353</td>
</tr>
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</table>

solution coverage: 0.710247
solution consistency: 0.980488

Cases with greater than 0.5 membership in term ~fi*~csd*faa*~pl: Buenos Aires (0.52, 0.48)
Cases with greater than 0.5 membership in term ~fi*~csd*~faa*pl: Morsang-Sur-Orge (0.67, 0.83), Berlin-Lichtenberg (0.52, 0.83)

Table 10 Showing sufficiency analysis solutions for outcome ‘No citizen control’

Conclusion: Opportunities and pitfalls

We make no apology that this is primarily a methodological paper that may feel, on first inspection, out of place given the current trajectory of work on democratic innovations. The aim of the paper has been to consider the importance of a more systematic comparative turn in the analysis of democratic innovations, particularly if we are to begin to better understand the conditions under which democratic innovations emerge and are sustained. In particular the paper has sought to investigate the potential of using fsQCA for a medium-N study of PB. What lessons can be learned from our work to date?
The paper presents only a pilot of a more extensive fs\QCA analysis of PB based on at least 20 to 30 cases which will come in the near future. The purpose of this paper then is to assess the adequacy of such a technique for dealing with the analysis of the conditions that explain the emergence and sustenance of PB. Proponents of fuzzy-set techniques extol their virtue in incorporating the best of quantitative and qualitative strategies. However, it is also possible that they incorporate some of their worst aspects. It may be that in trying to merge the poles of social scientific research we end up falling between two stools. There are certainly a number of drawbacks to using the method. It is time-intensive and iterative, and this can be frustrating. Moreover it is often limited to static combinations of conditions and perhaps its claims to withstanding the loss of complex knowledge in minimisation are overblown.

However, there are scientific advantages of the method. QCA is a practical method for testing set-theoretic relationships among social phenomena. More than just a method for testing hypothesis, fs\QCA can teach the researcher about their subject in a methodologically unique way. Undertaking QCA focuses not only on explaining cause and effect, but also the meaning of theory and concepts themselves too often taken as given. It forces the researcher to be transparent about the assumptions made.

Some might still argue that it is an inappropriate method for studying a phenomenon like participatory budgeting. The cross-cultural nature of the implementation of PB suggests that we will have too many variables and not enough cases to make meaningful comparisons. Application of QCA, however, arguably provides more promise than statistical analysis for comparing across medium-n cases because it does not assume that causes act the same way in different contexts. A criticism might also be made that in relatively young phenomena like democratic innovations, where theory is still developing and the direction of causation is unclear, tests of static relationships could be misleading. While there is some truth in this, QCA is an iterative process which provides the opportunity when analyses are made to re-evaluate theory and refine it. Even after an analysis is performed researchers must make decisions based on the consistency and coverage of set relations about what may be missing from their theory, whether to add or remove explanatory conditions etc. The method still has promise for the scientifically-conscious social researcher.

There have already been a small number of valuable comparative studies in the field of democratic innovations. For most of these which take the unit of analysis at the level of a municipality, they are still constrained by small-n design and therefore selection strategies must guide the research question to a degree. These more common, in-depth case studies will continue to be valuable, not only as good examplars of what is possible democratically, but also so that comparativists remain attentive to complexity of cases. There is likely to continue to be a division of labour where those wishing to compare on a higher rung of the ladder of abstraction will need to rely on secondary sources (good in-depth case work). Comparativists should be warned that there will be trade-offs between controlling for conditions and saying something interesting. A focus on clarity on trade-offs in the level of investigation and the relationships between populations, characteristics and conditions can allow the field of inquiry to develop in a coherent manner. Medium-N comparisons made possible by techniques such as fs\QCA can play a role in aiding the contextualisation of cases, classification of types and hypothesis-refinement which will guide this work.
The desire to understand the conditions under which democratic innovations are institutionalised effectively makes comparative analysis highly relevant and provides surer grounds to make normative claims and recommendations. The growing number of cases which have recurring elements opens up the vital question as to how democratic innovations are sustained or decline and terminate.

References


