Qualitative Comparative Analysis (QCA) in Public Policy Analysis: an Extensive Review

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Abstract

This article provides a first systematic review of the connection between public policy analysis and QCA (Qualitative Comparative Analysis) techniques, with an emphasis on the state-of-the-art in QCA empirical applications. QCA is first presented both as an approach and as a set of techniques (crisp-set, multi-value and fuzzy-set QCA), both of which feature specific characteristics. In a second section, it is argued that there is a preferential connection between QCA and public policy analysis: in terms of research design and also in terms of the actual goals and needs of policy-oriented research. Further, the bulk of the article contains an exhaustive survey of empirical applications published so far. To do so, a typology of applications is developed along two dimensions: the stages in the policy process (from agenda-setting and policy initiation to policy evaluation) and the level at which the 'cases' or units of analysis are empirically defined (from micro to macro). A total of 143 applications are surveyed, gathered in 16 clusters according to the two dimensions in the typology. For all these applications, the focus is laid on the concrete ways in which QCA has been exploited, with short indications on the research questions and research results. In conclusion, the achievements reached so far, as well as some remaining limitations, are discussed. Some of the most promising avenues for further research are also sketched, in terms of 'mixed' methods designs, causal mechanisms, 'casing strategies', and unexploited 'niches' both in terms of levels of analysis and stages of policy processes.

Zusammenfassung

Dieser Beitrag gibt einen ersten systematischen Überblick über Bezüge zwischen der Public Policy Analysis und Techniken der QCA (Qualitative Comparative Analysis) und betont dabei neuste empirische Ansätze der QCA. Zunächst wird QCA sowohl als Analysemethode als auch als Auswahl unterschiedlicher Techniken (Crisp-Set-, Multi-Value- und Fuzzy-Set-QCA) betrachtet, die sich jeweils durch spezifische Eigenschaften auszeichnen. In einem zweiten Abschnitt wird die Ansicht vertreten, dass eine bevorzugte Verbindung zwischen QCA und Public Policy Analysis existiert: In Bezug auf das Untersuchungsdesign sowie in Bezug auf aktuelle Ziele

und Bedürfnisse politikorientierter Forschung. Ferner bietet ein Grossteil des Beitrags einen gründlichen Überblick bislang vorgestellter empirischer Anwendungen von QCA. Zur Einordnung dieser Ansätze wird hierfür eine Typologie anhand zweier Dimensionen entwickelt: Einmal anhand der Stufen des politischen Prozesses (vom Agenda-Setting über Politikdurchführung bis zur Evaluation) sowie anhand der Stufen, auf denen „Fälle" bzw. Analyseeinheiten empirisch definiert werden (micro bis macro). Insgesamt werden 143 Ansätze untersucht und entsprechend der zwei Dimensionen dieser Typologie zu 16 Gruppen zusammengefasst. Bei allen untersuchten Publikationen steht hier die konkrete Anwendungsmethode von QCA im Vordergrund, gefolgt von kurzen Angaben zu den jeweils gestellten Forschungsfragen und den Forschungsergebnissen. Abschliessend werden bisherige Errungenschaften sowie bleibende Beschränkungen dieser Ansätze diskutiert. Ebenso erfolgt eine Skizzierung vielversprechender Ansatzpunkte in den Bereichen Methodendesign, kausale Mechanismen, Fallstrategien und noch unbesetzte Nischen hinsichtlich einzelner Analysekategorien sowie Stufen des politischen Prozesses.

Introduction

The goal of this article is provide a first systematic review of the connection between public policy analysis and QCA techniques, with a core emphasis on the state-of-the-art in QCA empirical applications[1]. First, we present QCA both as an approach and as a set of techniques (crisp-set, multi-value and fuzzy-set QCA), stressing their specific characteristics. In a second section, we argue that, in several ways, there exists a preferential connection between QCA and public policy analysis: in terms of research design and also in terms of the actual goals and needs of policy-oriented research.

Then, in the bulk of the article (sections 3 to 7), we provide an exhaustive survey of empirical applications published so far. To do so, we develop a typology of applications along two dimensions: the stages in the policy process (from agenda-setting and policy initiation to policy evaluation) and the level at which the 'cases' or units of analysis are empirically defined (from micro to macro). Finally, we wrap up this inventory by taking stock of what has been achieved so far. On that basis, we discuss some

remaining limitations as well as some of the most promising avenues for further developments.

Some precautionary notes must be made. To start with, this review is circumscribed to the field of *public* policy analysis, focusing on the action of public/state bodies with regards to concrete issues or societal demands – as indeed the domain of 'policy analysis' is much broader and could also encompass decision-making processes in private firms[2] and other non-public players (e.g. Gill & Saunders 1992). Further, the purpose of this article is to focus on the concrete ways in which QCA has been used in the field. This requires that we provide some short indications on the research questions and research results for most of the applications, and therefore quite large sections of the article are rather descriptive by nature. Finally, this article does not aim at surveying the numerous technical issues and innovations in QCA (see rather Wagemann & Schneider 2010a, 2010b; Schneider & Wagemann forthcoming; Rihoux & Ragin 2009). Neither does it aim to provide 'quantitative' information on all the surveyed applications (e.g. number of cases, number of condition variables, …) – this will be the purpose of a forthcoming article focusing on the broader population of QCA applications (Rihoux et.al. 2012 forthcoming).

1 QCA in a nutshell[3]

1.1 QCA as an approach

QCA designates both an approach and an umbrella term for three specific techniques. The whole approach, as well as the first technique (csQCA – crisp-set QCA, first referred to as QCA) was launched by Charles Ragin's seminal volume (1987). QCA is

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[2] There is also a growing number and diversity of QCA applications in management and organizational studies. For a review, see Marx, Cambré & Rihoux (2012 forthcoming) and Fiss, Cambré & Marx (2012 forthcoming).

[3] For a detailed presentation and further sources, see the textbook by Rihoux & Ragin (eds, 2009), as well as the forthcoming textbook by Schneider & Wagemann.

first and foremost of *comparative* nature – more precisely: it was initially geared towards multiple case-studies, in a small- or intermediate-N research design. It thus strives to meet two apparently contradicting goals: gathering in-depth insight in the different cases and capture the complexity of the cases (gaining 'intimacy' with the cases), but also producing some level of generalization (Ragin 1987). The whole intention of Ragin (1987, 1997) was to develop an original "synthetic strategy" as a middle way between the case-oriented (or 'qualitative'), and the variable-oriented (or 'quantitative') approaches, which would "integrate the best features of the case-oriented approach with the best features of the variable-oriented approach" (Ragin 1987: 84).¨

On the one hand, indeed, QCA embodies some key strengths of the case-oriented approach (Ragin 1987; Berg-Schlosser et.al. 2009). To start with, it is a holistic approach, in the sense that each individual case is considered as a complex whole which needs to be comprehended and which should not be forgotten in the course of the analysis. Thus, QCA is in essence a case-sensitive approach. Furthermore, QCA develops a conception of causality that leaves room for complexity. (Ragin 1987; Berg-Schlosser et.al. 2009): multiple conjunctural causation. This implies that: 1) most often, it is a combination of conditions (independent or "explanatory" variables) that eventually produces a phenomenon – the outcome (dependent variable, or phenomenon to be explained); 2) several different combinations of conditions may produce the same outcome; and 3) depending on the context, a given condition may very well have a different impact on the outcome. Thus different causal paths – each path being relevant, in a distinct way – may lead to the same outcome. As J.S. Mill, Ragin rejects any form of permanent causality since causality is context- and conjuncture-sensitive. Bottom line: by using QCA, the researcher is urged not to specify a single causal model that fits the data best, as one usually does with standard statistical techniques, but instead to "determine the number and character of the different causal models that exist among comparable cases" (Ragin 1987).

On the other hand, QCA indeed embodies some key strengths of the quantitative, or analytic-formalized approach. First, it al-

lows one to analyze more than just a handful of cases, which is seldom done in case-oriented studies. This is a key asset, as it opens up the possibility to produce generalizations. Moreover, its key operations rely on Boolean algebra and Set logic, and requires that each case be reduced to a series of variables (conditions and an outcome). Hence, it is an analytic approach, which allows replication (Berg-Schlosser et.al. 2009). This replicability enables other researchers to eventually corroborate or falsify the results of the analysis, a key condition for progress in scientific knowledge (Popper 1963). This being said, QCA is not radically analytic, as it leaves some room for the holistic dimension of phenomena. This is linked to another fundamental feature of QCA: it establishes Set connections, which are asymmetric by design, by contrast with correlational connections (and most other measures of associations on which mainstream statistics are based) which are symmetric by design (Ragin 2006, 2008). Indeed set-theoretic analysis, like qualitative research more generally, focuses on uniformities and near-uniformities – taking into consideration several combined properties of the 'cases' considered as whole configurations – and not on general patterns of association (Ragin 2008). Finally, the QCA algorithms allow one to identify (causal) regularities that are parsimonious, i.e. that can be expressed with the fewest possible conditions within the whole set of conditions that are considered in the analysis – though a maximum level of parsimony should not be pursued at all costs.

1.2 QCA as a set of techniques

QCA using conventional Boolean sets (i.e. variables can be coded only "0" or "1", and thus have to be dichotomized) was developed first, which is why the label "QCA" has been often used to name this first technique. However, the standard practice (following Schneider & Wagemann 2007, and Ragin & Rihoux 2009) is now to distinguish between three labels : (1) when referring to the original Boolean version of QCA, we use csQCA (where "cs" stands for "crisp set"); (2) when referring to the version that allows multiple-category conditions, we use mvQCA

(where "mv" stands for "multi-value"); (3) when referring to the fuzzy set version which also links Fuzzy Sets to truth table analysis, we use fsQCA (where "fs" stands for "fuzzy set").

The QCA protocol is similar all three techniques, with some specificities & enrichments for mvQCA and fsQCA (Rihoux & De Meur 2009; Cronqvist & Berg-Schlosser 2009; Ragin 2008; Ragin 2009a). The more formalized steps, based on the formal logic of Boolean or set-theoretic algebra and implemented by computer programs , aim at identifying so-called "prime implicants" in a truth table. The key philosophy of csQCA is to "[start] by assuming causal complexity and then [mount] an assault on that complexity" (Ragin 1987: x).

One must first produce a data table, in which each case displays a specific combination of conditions (expressed in terms of set-membership for all the conditions) and an outcome (also expressed in set-membership). The software then produces a truth table that displays the data as a list of configurations. A configuration is a given combination of some conditions and an outcome. A specific configuration may correspond to several observed cases, thereby producing a first step of synthesis of the data.

The key following step of the analysis is Boolean minimization – that is, reducing the long Boolean expression, which consists in the long description of the truth table, to the shortest possible expression (the minimal formula, which is the list of the prime implicants) that unveils the regularities in the data. It is then up to the researcher to interpret this minimal formula, possibly in terms of causality.

As a set of techniques, QCA can be used for at least five different purposes (De Meur and Rihoux 2002: 78-80; Berg-Schlosser et.al 2009). The most basic use is simply to summarize data, i.e. to describe cases in a synthetic way by producing a truth table, as a tool for data exploration and typology-building. This use is basic in the sense that it does not rely on a more elaborate, stepwise design of typology-building, such as recently developed by George and Bennett (2005). It can also be used to check coherence within the data: the detection of contradictions allows one to learn more about the individual cases. The third use is to

test existing theories or hypotheses, to corroborate or refute these theories or hypotheses – QCA is hence a particularly powerful tool for theory-testing (e.g. Sager 2004; Goertz & Mahoney 2004). Fourth, it can be used to test some new ideas or propositions formulated by the researcher, and not embodied in an existing theory; this can also be useful for data exploration. Finally, QCA allows one to elaborate new hypotheses or theories: the minimal formula ultimately obtained can be interpreted – i.e. confronted with the cases examined – and lead the researcher to formulate new segments of theory. This is probably why QCA is sometimes referred to as a kind of analytic induction (e.g. Hicks 1994) – it is indeed inductive, to the extent that it allows one to discover more through a dialogue with the data. However there is also a significant input of theory in QCA. For instance, the selection of variables that will be used in the analysis, and the way each variable is operationalized, must be theoretically informed (Berg-Schlosser & De Meur 2009). Arguably, though, a more inductive use of QCA raises more methodological difficulties than a simple, deductive theory-testing (Ebbinghaus 2005).

QCA techniques are also particularly transparent, insofar as they force the user not only to make choices on his or her own (that is, the user decides, not the computer), but also to justify these choices. In the course of the procedure, at several stages, the researcher is confronted with arbitrations, which must be made in case-informed and/or theory-informed ways; Rihoux & Lobe (2009) discuss 15 such steps and arbitrations. Finally, QCA techniques allow one to consider phenomena that vary both qualitatively and quantitatively, as both can be operationalized in the conditions and outcome variables used for software treatment (Berg-Schlosser et.al. 2009).

2 A preferential connection between QCA and public policy analysis

From the lates 1990s onwards, an increasing number of social scientists – policy analysts among others – have been opting for multiple case-studies as a research strategy. This choice is based on the need to gather in-depth insight in the different cases and

capture the complexity of the cases, while still attempting to produce some level of generalization (Ragin 1987). This also coincides with a renewed interest in case-oriented research (e.g. Mahoney and Rueschemeyer 2003; George and Bennett 2005; Gerring 2004, 2007), and also in new attempts to engage in a more productive dialogue between the 'quantitative' and 'qualitative' empirical traditions (Brady and Collier 2004; Sprinz and Nahmias-Wolinsky 2004; Moses, Rihoux and Kittel 2005).

Such a strategy is particularly relevant in policy-related research, since many relevant objects – from the viewpoint of both scholars and policy practitioners – are 'naturally' limited in number: nation states or regions, different kinds of policies in different states, policy outputs and outcomes, policy programmes, policy styles, policy sectors, etc. These naturally limited or "small-N" (or "intermediate-N") populations are hence often especially relevant from a policy perspective (Rihoux & Grimm 2006). The overall strength of QCA in connection with this is that it offers some procedures to go beyond loose or not systematic ex-post comparison of the case study material typically gathered in the field of policy analysis.

To be more specific: De Meur, Rihoux & Varone (2004; see also Rihoux & Grimm 2006) suggest that QCA, in principle, could offer practical added value for policy analysis, in any sector (Rihoux 2007) in at least five ways. First, these techniques allow one to systematically compare policy programmes (see also Fishman 2000) in a "small-N" or "intermediate-N" design, with cross-national, cross-regional and cross-sector (policy domains) comparisons, typically within or across broad political entities or groups of countries (e.g. the European Union, the OECD, a given category of countries, etc.), but also for within-country comparisons (e.g. across states in the USA, across Länder in Germany, etc.) or within-region comparisons (e.g. between economic basins, municipalities, etc.).

Second, these techniques also allow one to test, both *ex post* and *ex ante*, alternative causal (policy intervention) models leading to a favorable/unfavorable policy output and favorable/unfavorable policy outcomes (on the distinction between outputs and outcomes, see Varone, Rihoux and Marx 2006). This

approach, in contrast with mainstream statistical and econometric tools, allows thus the identification of more than one unique path to a policy outcome: more than one combination of conditions may account for a result (see above). This is extremely useful in real-life policy practice, as experience shows that policy effectiveness is often dependent upon national/regional settings as well a upon sector-specific features, and that different cultural, political and administrative traditions often call for differentiated implementation schemes (Audretsch, Grimm and Wessner 2005).

Third, these techniques also allow one to engage in a systematic quasi-experimental design: for instance, this design enables the policy analyst or policy evaluator to examine under which conditions (or more precisely: under which combinations of conditions) a specific policy is effective or not. Fourth, these methods are very transparent; the policy analyst can easily modify the operationalization of the variables for further tests, include other variables, aggregate some proximate variables, etc. Thus it is also useful for pluralist/participative analysis. Fifth, these techniques are useful for the synthesis of existing qualitative analyses (i.e. "thick" case analyses), as well as for meta-analyses relying on either qualitative or quantitative data (Lee 2008[4]).

To this we add a sixth and last point: the set-relationship nature of QCA (see above) is also a core asset for policy-oriented analysis. By contrast with most quantitative techniques that produce results in terms of mean or general tendencies, QCA produces rather 'deterministic'[5] results – in the form of : "this given combination of conditions leads to the outcome (say: a policy success) in such and such cases; by contrast, this other given combination of conditions does not lead to the outcome (say: a policy failure) in such and such cases". Such results are very much in line with the goal-orientedness of policy analysis.

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[4] See this reference for a detailed review of three fsQCA applications in the field of social policy (Kvist 1999, Pennings 2005, Vis 2007) that are also discussed below.

[5] The deterministic nature of QCA can be relaxed in different ways, if the researcher prefers to also consider more probabilistic connections (Rihoux & Ragin 2009).

3 Mapping QCA-related work in public policy analysis

For a systematic review of the field, we have attempted to map all the existing publications resorting to QCA in the field of public policy analysis (as defined above), exploiting the data compiled in the COMPASSS international bibliographical database (http://www.compasss.org). Up to our knowledge, our list of references is quasi-exhautive. At the time of writing, the information was still incomplete for a limited number of references[6] (we could not yet gain access to the full-text version to consult the details of the QCA application, if applicable), which are thus not comprised in the following sections.

We also had to decide on whether or not to include some publications at the boundaries of public policy analysis, as defined above. Around 50 QCA applications of different types (cs, mv or fsQCA), most of which are quite recent, have not been included for different reasons: because (a) they focus more on political processes than *policies* in the strict sense (e.g. Eder 2010), or (b) they analyze whole political systems rather than more specific policy programmes or policy processes (e.g. Fink-Hafner & Hafner-Fink 2009, Schneider 2008, Gherghina 2009), or (c) they mostly focus on the 'low politics' (such as social movement mobilizations) which may eventually feed policy responses, but do not address the initiation of the policy itself (e.g. Gherghina & Jiglau 2011, McAdam et.al. 2010), or (d) they focus more on corporate than on political players and hence are less concerned with *public* policy (e.g. Schneider et.al. 2010), or (e) they focus on the global context in which policies might be developed, but do not address substantive policy processes as such (e.g. Lee 2009). Some policy-related fields were more difficult to arbitrate than others, one of them being conflict studies and International Relations, in which we chose to include those applications that dealt directly with state-initiated actions and responses (e.g. Loizides 2003, Suzuki & Loizides 2011) and not those which had broader focuses (e.g. Rihoux et.al. 2008, Chan 2003).

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[6] List of those references (A-Z) : Biggert (1997), Brucker (2009), Letnes (2008), Liebmann (2009), Moreira (2008) and Segura-Ubiergo (2007).

This has enabled us to identify 155 references, out of which 143 contain an empirical QCA application, from 1992 to mid-2011. These are mainly published references (journal articles, book chapters, monographs), complemented by a few references in other formats (e.g. working papers).

To order or classify these references, we have resorted to two classical distinctions. The first one is specific to public policy analysis: the policy process, which may be split analytically in 4 stages: (1) agenda-setting and policy initiation; (2) policy-making and policy design (in particular the choice of policy instruments); (3) policy implementation and its outputs; (4) policy evaluation. Naturally, we only resort to these 4 stages for means of classification, bearing in mind that the 'policy cycle' is much more complex than this simple sequence. The second distinction relates to the level of analysis – or more precisely and more simply the level at which the 'cases' (units of analysis) for the QCA, i.e. the rows in the data matrix – have been empirically defined: (1) micro, i.e. individuals and small groups; (2) meso, i.e. organizations; followed by three different macro levels: (3) at the local or subnational/regional level; (4) at the country level; (5) at the transnational level. Naturally, in many applications, those different levels are intertwined: the 'cases' might be defined at this or that macro level, but this or that condition in the model might be operatonalized at the meso or micro level. It should also be noted that the levels of analysis often do not simply equate with the 'cases' being defined. For instance, in the cross-national applications (category (3), the cases are often not the countries themselves as full systems, but given policy programmes, i.e. policy subsystems within national settings.

For each one of these two dimension, we have added respectively a fifth and sixth category, to encompass references which are *not* strictly speaking QCA applications with real-life data, but which explicitly relate to QCA and that given dimension, be it with more theoretical, methodological, research design or measurement considerations. Thus we obtain a 5 by 6 table with 30 cells (Table 1). In each cell, the references are presented in a chronological sequence. References in italics represent a 'second entry' – i.e. the reference does also correspond to the given cate-

gory, but not as a main entry. For instance: Peillon (1996) mainly analyses policy implementation at the country level (cell [16]), but also performs analyses on cases that are individuals (cell [13] as second entry).

Table 1 reveals some quite striking trends. In terms of policy-making stages, the bulk of the work has concentrated on policy design (N = 80) or policy implementation (N = 47), and much less so on policy initiation or policy evaluation. In terms of level of analysis, the broad majority of the literature has focused on cross-country analyses (N = 79), and within-country analyses (N = 44; typically: cross-region analysis within a given country). The most developed 'niche' so far is *cross-national policy design analyses* (cell [10]: N = 51), particularly in the field of welfare state studies where (cs)QCA was put on the agenda quite early on by a few contributions in an edited book by Janoski & Hicks (1994). By contrast, quite a few 'niches' have thus far not been exploited, such as the analysis of transnational dynamics of policy initiation (cell [6]) or cross-country policy evaluation (cell [22]).

Total applications : N = 143	Micro (indivi-duals / groups) [N = 2]	Meso (organi-zations) [N = 9]	Macro (local / subnational / within-country) [N = 44]	Macro (country) [N = 79]	Macro (transnational) [N = 9]	NA [not mainly empirical application] [N = 11]
NA [not mainly empirical application] [N = 3]	[25] Ragin 2006	[26]	[27]	[28]	[29]	[30] Rihoux & Grimm 2006a ; Byrne et.al. 2009
Policy evaluation [N = 6]	[19]	[20] [N= 1] Ledermann 2004	[21] [N= 5] Balthasar 2006 ; Befani & Sager 2006 ; Sager & Ledermann 2006a, 2006b ; Befani et.al. 2007	[22]	[23]	[24] Fishman 2000 ; Varone et.al. 2006
Policy im-plementation / policy out-puts [N = 47]	[13] [N= 1] *Peillon 1996* ; Blackman & Dunstan 2010	[14] [N= 1] Yamasaki & Spreitzer 2006	[15] [N= 15] Heikkila & Isett 2000 ; Heikkila 2001 ; Sager 2002 ; Heikkila 2004 ; Sager 2004, 2005, 2006 ; Ford et.al. 2005 ; Grimm 2006 ; Metelits & Weber 2008 ; Blatter et.al. 2009 ; Freitag & Schlicht 2009 ; Schlager & Heikkila 2009 ; Lam & Ostrom 2010 ; Sager & Andereggen 2011	[16] [N= 25] Peillon 1996 ; Boyer 2001 ; Loizides 2003 ; Nelson 2004, 2006 ; Kogut & Ragin 2006 ; Schimmelfennig 2006 ; Cronqvist & Berg-Schlosser 2006 ; Boyer 2007 ; Gross 2007 ; Vis et.al. 2007 ; Olsen & Nomura 2008, 2009 ; Dimitrova & Toshkov 2009 ; Di Lucia & Kronsell 2010 ; Hardmeier & Gross 2009 ; Ishida 2009a, 2009b ; Glatman-Freedman et.al. 2010 ; Haynes et.al. 2010 ; Kogut 2010 ; Svevo et.al. 2010 ; Suzuki & Loizides 2011 ; Vis et.al. 2012 ; Woldendorp et.al. 2012	[17] [N= 5] Kostadinova 2003 ; Stokke 2004, 2007 ; Sprinz & Kaan 2007 ; Stokke 2012	[18] Smithson & Verkuilen 2006 ; Chiappero-Martinetti 2006 ; Rihoux 2007 ; Baliamoune-Lutz 2009
Policy-making / policy design [N = 80]	[7] [N= 1] Blackman 2008	[8] [N= 5] Harkreader & Imershein 1999 ; Rubenzer 2008 ; Schütz 2008a, 2008b ; Castillo Ortiz 2011	[9] [N= 19] Rudel & Roper 1996 ; Ottitsch & Weiss 1998 ; 2000 ; Hyttinen et.al. 2000 ; Greenberg et.al. 2000 ; *Hellström 2001 ;* Kitchener et.al. 2002 ; Gran 2003 ; Kilburn 2004 ; Rudel 2005 ; Johnson 2006 ; Scouvart 2006 ; Scouvart et.al. 2007 ; Rudel 2007 ; Huntjens et.al ; 2008 ; Oestreicher et.al. 2009 ; Christmann 2010 ; Aubin & Varone 2011 ; Fischer 2011; Huntjens et.al. 2011	[10] [N= 51] Hicks 1994 ; Ragin 1994 ; Kangas 1994 ; Hicks et.al. 1995 ; Hellström 1996, 1998 ; Kvist 1999 ; Kittel et.al. 2000 ; Hellström & Rantala 2000 ; Hellström 2001 ; Blake & Adolino 2001 ; Gran & Aliberti 2003 ; Gran 2005 ; Pennings 2005 ; Raunio 2005 ; Kvist 2006 ; Varone et.al. 2006 ; Bleijenbergh & Roggeband 2007 ; Montpetit et.al. 2007 ; Maggetti 2007 ; Vis 2007 ; Yamasaki 2007 ; Kim & Lee 2008 ; Emmenegger 2008 ; Engeli 2008 ; Gran 2008 ; Vis 2008, 2009a, 2009b ; Aleman 2009 ; Jang 2009 ; Krause 2009 ; Ochel & Rohrwer 2009 ; Giugni & Yamasaki 2009 ; Yamasaki 2009 ; Maggetti 2009 ; Schwellnus et.al. 2009, Sivesind & Selle 2009 ; Fujita 2009 ; Avdagic 2010 ; Schwellnus et.al. 2010 ; McBride & Mazur 2010 ; Koole & Vis 2010 ; Emmenegger 2010a, 2010b, 2011 ; Samford 2010 ; Vis 2010, 2011 ; Kropf 2011 ; Engeli 2012	[11] [N= 4] Schimmelfennig et.al. 2006 ; *Huntjens et.al. 2008, 2011* ; Delreux 2009, 2011 ; Van der Maat 2011	[12] Levi-Faur 2006
Agenda-setting / poli-cy initiation [N = 10]	[1] *Amenta & Halfmann 2000 ; Amenta et.al. 2005*	[2] [N = 2] Cress & Snow 2000 ; Rihoux et.al. 2005	[3] [N= 5] Amenta et.al. 1992 ; Amenta & Poulsen 1996 ; Amenta & Halfmann 2000 ; Amenta et.al. 2005 ; McVeigh et.al. 2006	[4] [N= 3] Vanderborght & Yamasaki 2004 ; Vanderborght 2004 ; Badgett 2004	[5]	[6] Amenta 1998, 2003

Table 1 : mapping of QCA applications in public policy research, 1992-2011
[« N » in each cell = number of applications mainly located in that cell]

Two other facts, which are not so obvious from the observation of Table 1, deserve to be mentioned. On the one hand, only few applications were published before 2000. Conversely, from 2006 onwards, there has been a steady flow of published applications – especially during the last few years: about half of the applications so far have been published in 2008 or later. On the other hand, there is a clear predominance of two policy domains: socio-economic policies (about a half of all references, covering mainly welfare state, macroeconomic or health policy issues), and environmental policies broadly defined (about a quarter of the references, around different issues of natural resource management and forestry in particular). The remaining references are scattered across diverse policy domains, such as child protection (e.g. Svevo-Cianci et.al. 2010; Gran & Aliberti 2003), gender (e.g. Badgett 2004; McBride & Mazur 2010), EU institutions (e.g. Schimmelfennig et.al. 2006), foreign policy (Rubenzer 2008). Interestingly, too, only few references do not concentrate on one specific policy domain and rather conduct a cross-policy comparison such as Giugni & Yamasaki (2009) on the policy impact of different 'new social movements' or Fischer (2011) across 11 policy domains in Switzerland.

In the next four sections, we present an inventory of the applications, following the main policy-making stages, and for each one of these stages, progressing from micro-level to macro-level – following the sequence from [1] to [30] in Table 1. Insofar as possible, we also cluster together applications which fall within the same policy field and/or which complement each other.

4 Focus on agenda-setting and policy initiation

We have identified a total of 10 references in this field.

[2] At the meso level, Rihoux, Dumont & Dandoy (2005) seek to assess the direct effects of the media on the governmental agenda in terms of coalition agreements, but also their indirect effects through its impact on the elaboration of party electoral programmes. Their combination of csQCA and regression analyses on data covering several agendas in the Belgian context,

from 1990 to 2000, allows them to conclude that the media exert little direct impact on the governmental agenda, whereas some parties (especially opposition parties not taking part in the negotiations), often in combination, exert a strong influence in several issue domains. Also at the meso level, Cress & Snow (2000) examine the policy influence of social movement organisations (SMOs), through an analysis of the outcomes attained by 15 homeless social movement organizations (SMOs) active in 8 U.S. cities, based on ethnographic data. Their csQCA results highlight the importance of organizational viability and the rhetorical quality of diagnostic and prognostic frames for securing outcomes, the existence of a contingent relationship between tactics and political environment, and the existence of multiple pathways leading to movement outcome attainment.

[3] At the local level, McVeigh, Neblett & Shafiq (2006) examine mays through which SMOs and nonprofit organizations affect local communities in the agenda-setting process of 'hate crimes', using U.S. counties as cases. Their csQCA, combined with statistical techniques, allows them to identify 15 combinations of conditions that almost always result in reported hate crimes: civil rights activism, political opportunities, grievances, and multiorganizational fields combine in local settings to produce hate crime reporting with near certainty; in addition, the resourcefulness, heterogeneity, and funding sources of the nonprofit sector play a key role in determining whether hate crimes are brought on the agenda.

At the subnational level, Amenta, Carruthers & Zylan (1992) to uncover the determinants of policy successes and failures of the Townsend Movement (TM - a social movement seeking pension benefits for the aged) in the U.S. during the Great Depression. Their analysis is performed at the state level (in all 50 U.S. states), first through a multiple regression analysis, then through a csQCA. This allows them to identify different paths to policy influence, among which one predominant "mediation model" that necessitates the endorsement by the Democratic Party at the state level, combined with continuing support by both political and administrative gatekeepers. Amenta, Caren & Olasky (2005) readdress this topic to further elaborate a 'political mediation theo-

ry' of the policy impacts of social movements, with a more elaborate methods mix comprising pooled cross-sectional times-series analysis and fsQCA. Both analyses, enriched by the fsQCA analysis of the voting behavior of Senators (as in Amenta & Halfmann (2000) with csQCA) provide support for the main theoretical argument, as they demonstrate that the pension movement was directly influential on the policy outcomes.

Amenta & Poulsen (1996) pursue these analyses, with a broader focus on U.S. social spending at the end of the New Deal, in order to test a theory which integrates key insights of institutional and political theories of social policies. Their multiple regression analyses of the determinants of old-age assistance pensions and other benefits, at the state level (N = 50) provide some evidence of interactive effects between the determinants. Therefore they use csQCA, which provides strong support for the 'institutional politics' theory of public spending policy, further elaborated by Amenta (1998, 2003). Amenta & Halfmann (2000) also prolong this line of work, with a similar combination of methodologies, on the more precise issue of WPA (Work Projects Administration) wages. Besides the analysis of variations at the state level, they also analyze some key Senate roll-call votes at the federal level – the units of analyses ('cases') being the individual senators themselves. Altogether, their theoretical expectations are confirmed, as the csQCA of individual senators' political profiles shows the combined importance of Democratic affiliation and strong labor movements in their states.

[4] At the cross-national level, Vanderborght & Yamasaki (2004; see also Vanderborght 2004) examine the determinants of the political feasibility of an Unconditional Basic Income (UBI), through an analysis of 6 Western European countries in the 1980-2002 period. One of the main findings of their csQCA is that its public visibility is, surprisingly, negatively associated with the presence of the UBI on the political agenda. The authors also focus on a crucial methodological trap within (cs)QCA, the problem of 'contradictory simplifying assumptions', and on case- and theory-informed ways of solving this problem. Finally, Badgett (2004) aims to explain why 9 Western European countries have come to recognize same-sex partnerships (formal legal recogni-

tion of same-sex couples), while other countries with similar economic statuses, social histories, and religious traditions do not. Using both regression analysis and csQCA, she finds out that tolerant attitudes toward homosexuality, low religiosity, and high levels of cohabitation are the primary predictors of a country's legal recognition of same-sex partners – thus societal conditions play a much more important role than institutional ones.

5 Focus on policy-making and policy design

This field is much more developed in terms of applications – we have surveyed 80 references, i.e. more than half of the overall total of QCA applications in public policy research. To this we should also add, in terms of comparative research design issues in policy analysis, Levi-Faur's (2006) elaboration of four case-based comparative strategies, compatible with QCA, to be used in a stepwise and iterative model. He proposes to select cases that vary on at least two out of four levels of comparison (national, sectoral, international, and across time) and to systematically test hypotheses across levels.

[7] At the micro level, Blackman (2008) investigates how smoking cessation services could be more effectively targeted to tackle socioeconomic inequalities in health, using csQCA to exploit data from a large-N household interview survey. Operationalizing smoking prevalence as the outcome and various individual respondents' characteristics as conditions, his analyses indicate the particularly high influence of worklessness, as well as of a few other combinations of conditions. On that basis, he advocates more targeted policy responses focused on improving neighbourhoods and job opportunities, in combination with the timely provision of smoking cessation services.

[8] At the meso level, Harkreader & Imershein (1999) examine the conditions under which a state health-care agency can influence health-care market arrangements. Using the State of Florida as a case study, they examine records from Florida's legislative sessions between 1965 and 1993, focusing on 27 legislative initiatives to involve the state's health-care agencies in the health-care services market. Their csQCA results show that the cohesiveness

of state administrative agency and legislative leadership, as well as fragmented interests among health-care providers and fiscally legitimate policy positions from the state agencies and health-care providers, are crucial to facilitate or inhibit legislative policy initiatives for state action. In a similar vein, Schütz (2008a, 2008b) analyzes the reform of job placement and employment services within Germany, with a focus on the strategies, practices and the 'alignment process' of local employment agencies vis-à-vis the Federal Employment Agency. Using some interviews and survey material amongst the local agencies as empirical material, he exploits both csQCA and fsQCA to construct ideal-types of implementation models by the local employment agencies.

Also at the meso level, Rubenzer (2008) studies the mechanisms through which ethnic identity groups and their respective organizations are able to influence U.S. foreign policy toward their ancestral homelands. The results of his csQCA, testing 6 of the most widely cited criteria found in the literature on 10 cases of ethnic identity groups, indicate that only organizational strength and level of political activity are necessary conditions for successful influence. Finally, Castillo Ortiz (2011) analyses 24 decisions made by national Higher Courts capable of constitutional review with regards to EU Treaties during their processes of ratification in 11 EU member states. Testing an integrative model comprising both political and legal conditions with fsQCA, he shows that political considerations and the Courts' institutional interests play a major role in their decisions.

[9] At the local level, Johnson (2006) strives to explain how patterns of institutions and actors operate to produce change in the municipal charter in the USA. Relying on in-depth case studies followed by a csQCA, she finds out that specific groups, in particular minorities, property owners, farmers, and business, play a crucial role in the process. Also at the local level in the U.S., Kilburn (2004) studies the influence of city context on urban regimes across 14 cities. To explain variation across a regime typology, he tests components of market conditions and democratic conditions through csQCA, and shows that neither of these components is necessary or sufficient for supporting the emergence of a more progressive, as opposed to a developmental or

caretaker, regime. Instead, three combinations between the components of market and democratic conditions explain the presence of progressive regimes.

Several other applications also tackle the 'local' level, defined rather in terms of natural (v/s administrative) boundaries. First, Rudel (2005, 2007 ; see also Rudel & Roper 1996) analyzes trajectories of land-cover change in the tropics from the 1980s onwards. He performs separate csQCA analyses in 7 regions around the globe, covering about 80 countries, and mutually informs these with thick case studies of subnational deforestation processes within given countries (several cases per country). His results allow him to identify the key combinations of social, economic and environmental forces driving forest cover change within each region, and to propose appropriate policy directions for conserving biodiversity and promoting sustainable development. In the same field, Scouvart (2006 ; see also Scouvart et.al. 2007) studies multiple causal interactions characterizing deforestation in the Brazilian Amazon. Her csQCA based on 7 local case studies at three time periods reveals a limited number of decisive pathways; in particular, roads are often combined with biophysical conditions and the occurrence of extractive activities in the explanation of accelerated deforestation. Also on this topic of deforestation, Oestreicher et.al. (2009) strive to identify core conditions that shape the success or failure of a reduced deforestation scheme, so as to provide insights for policy planning. Drawing on interviews and secondary data on 9 Protected Areas (PAs) in Panama, their csQCA results illustrate that coupling surveillance measures with greater funding and strong governance are paramount to reducing deforestation. Alone, however, these factors are insufficient for forest protection. This leads them to argue that the appropriate conservation approaches are those that complement effective Surveillance with community participation and equitable benefit sharing.

In the neighboring field of natural resources management, Aubin & Varone (2011) analyze rivalries between competing users of water resources at the local level. They try to identify the conditions under which new users are successful in gaining access to the resource and in imposing a change of behavior on the

incumbent users, in an empirical study of 11 cases of local water rivalries in 4 water basins in Belgium and Switzerland. The csQCA results show that two main causal paths explain the success of a new user: either he/she activates a property right and negotiates a solution at no cost for the incumbents, or he/she activates a public policy that grants him a credible alternative to a negotiated agreement with the incumbents. On a linked topic, Huntjens et.al. (2008, 2011) analyze policy learning and its structural constraints with regards to river basin management, in a context of climatic hazards. They use mvQCA to compare 8 water management regimes corresponding to river basins in Africa, Asia and Europe, focusing on the relationship between regime characteristics and different levels of policy learning. The mvQCA results reveal that integrated cooperation structures in combination with advanced information management are the key factors leading towards higher levels of policy learning.

At the regional or subnational level, in the field of socioeconomic policies, Hyttinen, Niskanen & Ottitsch (2000) use both quantitative and QCA analyses to study the possibilities for employment and income generation in the border regions in the EU. After having performed quantitative analyses on a broad set of 106 regions, they use csQCA, on the basis of structured interviews, to examine in a more detailed way 11 rather similar regions, to test 14 hypotheses on factors facilitating regional development. The results show that the more important factors for success are linked with the adequate exploitation of local characteristics and human resources. Ottitsch & Weiss (1998, 2000) perform analyses on related topics, also using csQCA, with a specific focus on the outcomes of mountain forest policies in the EU.

At that same level, in the field of health policies, Greenberg, Mount & Brandon (2000) examine how the features of states' public health care delivery systems in the U.S. influence the inclusion of specific protections to include 'safety-net' providers in their networks in Medicaid-MCO (managed care organizations) contracts. The csQCA of 29 states indicates that inclusive policy arrangements necessitate state-wide decisions, as well as consumers' representation in the process. In that same field, Kitche-

ner, Beynon & Harrington (2002) strive to identify the factors that impede the expansion of a programme that seeks to expand the provision of home- and community-based services (HCBS). They focus the analysis on 5 'laggard states' which are also analyzed with in-depth case studies. The results of the csQCA model allow them to identify three causal paths to policy non-diffusion, with a core influence of state-level political conditions. In an adjacent field, Gran (2003) focuses on U.S.'s ' Charitable Choice Policy', i.e. the direct government funding of religious organizations for the purpose of carrying out government programs. He first offers an alternate framework to the public-private dichotomy, and then uses fsQCA to demonstrate the degree to which social services for abused children match ideal types in the 50 states in the U.S.. The results suggest that relationships between religious organizations and governments are essential to the provision of services to abused children.

Also at the subnational level, Christmann (2010) analyzes parliamentary processes concerning the recognition of religious communities in the Swiss cantons. Using an fsQCA, he shows that minority rights were instituted mostly in the context of total revisions of cantons' constitutions when there was no debate about a possible failure in the referendum. In contrast, restrictive recognition rules were passed when the threat of a popular vote had been discussed in the parliamentary debate, and Islam played a special role, but it only led to more restrictive rules when MPs feared that the people would refuse a proposition which would make the recognition of Muslim communities easier. In the Swiss context as well, but across various policy fields, Fischer (2011) examines 11 policy network structures, first by reconstructing them at a meso- and macro level with Social Network Analysis, and then by comparing them through a csQCA. The latter allows him to identify causal paths that lead to either a conflictual or a consensual policy network.

[10] Still with a focus on policy-making and policy design, there is an even larger number (51) of cross-country analyses. The largest number is to be found around welfare and socioeconomic policies.

In the field of welfare state policies, Hicks, Misra & Nah Ng (1995) analyze the consolidation of income-security programs in the late 19th and early 20th centuries, with a focus on the role of political institutions. The results of the csQCA on 15 industrialized countries allows them to identify three distinct routes to consolidation: a "Bismarckian" path, a "Lib-Lab" path, and a third path involving reforms by Catholic parties governing patriarchal, unitary states confronting working-class challenges. An over-arching finding is also that mobilization of the working class, regardless of the type of state institutions it had to confront, was a crucial factor. In a previous contribution, Hicks (1994) performs a quite similar csQCA on the same data, also including Japan as a 16th case, and discussing in detail how csQCA can be bridged with 'analytical induction', in particular through the re-formulation of hypotheses in the face of negative evidence. In the same vein, Kangas (1994) aims to explain the differential expansion of welfare state in Western democracies. He first conducts regression models, which he then confronts with findings from a csQCA and a cluster analysis (the latter being used to evaluate the existence of homogeneous welfare state clusters). His analyses cover 18 countries, and consider 3 political conditions: working-class mobilization and strength of left-wing parties, the power position of Christian democratic parties, and weak or divided political right. In conclusion, he is able to support each one of the 3 hypotheses with csQCA, but only to some extent, while some cases cannot be accounted for by the model (contradictory configurations). Likewise, Kittel, Obinger and Wagschal (2000) study the socio-economic and political-institutional determinants of the introduction of welfare state policies before 1945 (through csQCA) and of their expansion after 1960 (through regression analyses). For the csQCA part, they revisit the previous work by Hicks (1994) and Hicks, Misra & Nah Ng (1995) by enriching the model, especially by distinguishing two political conditions (degree of democracy and degree of federalism) and by fine-tuning the operationalization of some other conditions. They cover the cases of 17 OECD countries, and test three successive models, respectively for consolidation of the welfare state in the early 20's, the late 20's, and over the whole pre-1945 period. The

results show that the more political-institutional conditions come out consistently as core determinants for the consolidation of the welfare state. Around the same line of work, Pennings (2005) examines the conditions that influence the welfare mix in modern welfare states and the outcomes that result from it. His fsQCA results show that left governments, corporatism, economic openness and a high number of elderly are 'almost always' sufficient conditions for welfare state expansion, but that the underlying multiple-conjunctural causation pattern differs per time period. Further, retrenchment is found to be strongest in countries with highly expanded conditions, while the level of social spending is weakly related to the economic performance but hardly to the social performance of countries.

Also focusing on socioeconomic policy processes, Aleman (2009) strives to explain cooperation and 'social pacts' among unions, employers and state representatives in new democracies. Using fsQCA to analyze a dataset of 78 labor agreements in 18 new democracies in different continents from 1994 to 2004, he demonstrates that while left governments are typically associated with more labor market regulation, they are not sufficient for social pacts to emerge. Instead, protective labor market institutions and practices explain most instances of cooperation. Avdagic (2010) also analyses the conditions under which social pacts are elaborated, but with a focus on Western Europe and on the question of why concerted agreements were struck in some countries but not in others. Her fsQCA of 14 European countries reveals that Economic and Monetary Union–related pressures, or alternatively unemployment, were neither necessary nor sufficient for pacts to materialize. Rather, a high economic "problem load" appears to be causally relevant only when combined with particular political and institutional conditions, namely, the prevalence of electorally weak governments and/or an intermediate level of union centralization. On that basis, she further elaborates three distinct causal pathways to concerted agreements. Also with regards to employment policies, Ochel & Rohwer (2009) strive to explain why some European countries have reduced the strictness of their employment protection, while some others haven't. Their fsQCA on 16 countries allows them to identify different causal

pathways, in particular corresponding to Mediterranean countries (low policy contraints and high reemployment chances of the unemployed) and to Belgium and Denmark (highly skilled workforce, openness to job flexibility and generosity of unemployment benefits).

In a more focused way, Sivesind and Selle (2009) confront the assumption that, in the Nordic countries, voluntary and nonprofit organizations play a limited role in welfare service provision, through a comparative analysis of 13 highly industrialized countries with extensive welfare arrangements. The results of the fsQCA show that the consequences of public sector welfare spending on civil society welfare employment vary depending on other social conditions, depending on the type of setting (liberal v/s Nordic countries, in particular), that Nordic countries are not so different from some other European countries, and that the single factor of religious homogeneity often comes into play, alone or in conjunction with other factors, to explain the cross-country differences. In that same field, Vis (2008, 2009a, 2009b, 2010) aims to account for the cross-government variation in different types of 'unpopular' and 'not-unpopular' welfare state reforms. She bases her argument on 'prospect theory', which posits that individuals' risk-attitudes vary across the situation, or domain, in which they find themselves. The results of her fsQCA on 25 cabinets in 4 European countries demonstrate that the necessary condition for the 'unpopular' reforms is a deteriorating socio-economic situation, whilst for 'not-unpopular' reforms it is an improving political position. Both necessary conditions are only sufficient when combined with at least one other factor, which also differs across the two types of reform. In a more focused study, Vis (2011 forthcoming) examines the conditions under which governments increase spending on active labor market policies (ALMPs). On the basis of the data of 53 governments from 18 established democracies between 1985 and 2003, the fsQCA shows that there are different paths toward activation (with an improving socio-economic situation being needed in every path). Governments engage into ALMPs under decreasing unemployment combined with trade openness, or the absence of corporatism in the case of leftist governments, or the presence of

corporatism in the case of rightist governments. In yet another focused study, Koole & Vis (2010) aim to account for cross-country variations in spending on maternal employment supporting policies. They test the 'critical mass' hypothesis (i.e.: a critical mass of at least 15 per cent of women legislators is necessary for high levels of spending) with a fsQCA of the 55 governments from 12 OECD countries between 1980 and 2003, on the specific policy of parental leave benefits. The results show that the 'critical mass' condition is indeed necessary for high levels of spending, but that it is not sufficient, as corporatism, low economic openness, high economic growth and leftist partisanship or rightist partisanship are also important conditions. Also in the field of welfare state policies, Jang (2009) aims to explain cross-national variations in two major policies: income transfers and social care services. The csQCA of 11 OECD countries suggests that the causal combination of demographic ageing and local fiscal autonomy determines the between-policy variations.

In the field of pension policies, Ragin (1994) applies csQCA to explain the diversity of pension systems in advanced capitalist democracies. Considering 18 countries, he first establishes differences around 4 features of pension systems (outcome). Then, to explain these differences, he considers 7 conditions from a variety of theories. The results of the csQCA challenge the three-fold classification of welfare states (liberal, corporativistic, social democratic) as formulated by Esping-Andersen. In particular, the existence of the 'corporativistic' type is called into question. Ragin also confirms the causal link between the strength or weakness of Left parties (in particular in terms of cabinet participation) and the development of liberal v/s social democratic pension systems. In the process, Ragin also demonstrates how csQCA can exploit interval-scale variables, through the use of cluster analysis. On that same topic of pensions, Kim & Lee (2008) examine the employment and pension policies of 16 OECD countries, as responses to ageing. They first typify welfare policies, through cluster analysis, into four types (welfare-to-work, welfare emphasis, labour emphasis, market emphasis) based on the leniency of the pension system and active state intervention in employment security. Using these 4 types as the

outcome variable, the csQCA demonstrates (among other findings) that a strong degree of decommodification, a strong state ability and a strong union density are necessary conditions for welfare-to-work policies.

In another focused study linked to socio-economic policies, Emmenegger (2008, 2011) exploits fsQCA to examine the determinants of job security regulations in Western democracies. His results reveal three different paths to high levels of job security regulations, coïnciding respectively with Southern European state capitalist countries, Continental European managed capitalist countries with high levels of statism, and Nordic managed capitalist countries characterised by a high degree of non-market coordination. In linked pieces (2010a, 2010b), he uses some of this empirical material to demonstrate ways to analyze 'non-events' (in particular policy-related) – through the combined usage of fsQCA to identify notconsistent cases, process tracing to determine the relevant critical junctures and disciplined counterfactual theorizing to probe whether policy change was really a possibility in the first place. In another focused piece, Krause (2009) examines the determinants of macrobudgetary reforms in the direction of 'New Public Management'. He uses fsQCA to understand why only some countries followed the lead of early New Public Management reformers and adopted a strong macrobudgetary regime. His analysis on 22 countries shows that the variation can only be explained by a combination of external pressure due to fiscal stress and the preferences of officials, which in turn are shaped by organizational culture. On a neighboring topic, Blake & Adolino (2001) strive to explain U.S. exceptionalism in health policy, through the adoption of national health insurance (NHI) more generally. They use a csQCA to examine systematically several of the major propositions that emerge from the case study literature, on larger group of 20 advanced industrial democracies. The results offer considerable support for the 'veto points hypothesis' while still finding each of the conditions examined to be relevant in certain scenarios.

On yet another socio-economic policy field, Kvist (2006; see also 1999 for a first elaboration) shows how fuzzy sets can be used to perform a more precise operationalization of theoretical

concepts into analytical concepts. Using unemployment insurance and child family policies in 4 Scandinavian countries as test cases, he exemplifies these approaches by using fuzzy memberships indicating the orientation towards specific policy ideal types. Using longitudinal data, he is then able to identify changes in the policy orientation in the 1990s by identifying changes in the fuzzy membership sets, and to compare policy diversity across countries and over time. In another piece also using fuzzy sets for ideal type analysis, Vis (2007) examines whether or not welfare states changed radically from welfare towards workfare. Examining 16 advanced capitalist democracies (1985-2002), she shows that the prediction of no radical change holds for most countries, even if the prediction of radical change is supported fully only in Ireland and moderately in Denmark. She also identifies interesting patterns in six countries. Gran (2008) also uses Fuzzy Sets to re-examine the predominant typological frameworks of public–private organization of social policies, through a comparative analysis oc public-private organization of three welfare social policies and three social policies dealing with body control across 21 European countries. This enables him to establish that public–private organizations of social policies in Europe display limited diversity.

Finally, three last socio-economic policy design applications must be mentioned. First, Fujita (2009) examines the countries' frequency in the use of the quasi-judicial institution of 'dispute settlement' (DS) within the framework of the GATT/WTO. To test three major hypotheses explaining the resort to DS, he exploits both a regression analysis and a csQCA, and considers 18 cases of developed and liberal democratic countries, over 2 time periods (1980-1994 and 1995-2004), i.e. 36 cases. The results demonstrate that different combinations of conditions may lead to resort to DS, and validate overall the direction of the hypotheses. Fujita also demonstrates the added value of csQCA over various regression models with interaction terms, both using continuous and dichotomous condition variables. Second, Kropf (2011) uses fsQCA to analyze the impact of oil wealth and several control variables on economic growth of the non-oil sector (diversification) in the states of the Gulf Cooperation Council (GCC), as

part of a broader population of 182 cases (using regression analyses). Performing an fsQCA on different samples sizes (6, 7 and 25 oil exporting countries) and also considering case studies of some GCC states, she demonstrates that favorable institutional conditions play a central role, in particular the abolishment of traditional Islamic institutions. Third, Samford (2010) examines the determinants for very rapid trade liberalization in Latin American countries. Using fsQCA and short case studies to compare trade policy in 61 administrations, he finds that a key motivating factor for rapid trade opening is potential resistance from protected industry. He further identifies other enabling conditions, such as hyperinflation, devaluation, and an unconstrained executive which, in combination, are sufficient to account for a high percentage of rapid reform episodes.

In the neighboring field of child protection, Gran & Aliberti (2003) examine policy-making with a focus on the offices of children's ombudspersons. They use csQCA to determine why a national office of children's ombudsperson has or has not been established in 193 countries up to the year 2000. The results suggest that social policy innovation responds to need and is contingent on country wealth, but is mediated by either strong political rights or subscription to international treaties. In a further contribution, Gran (2005) develops the Children's Rights Index (CRI), an international measure of children's rights, and provides results on 190 countries. Then he employs both OLS regression analysis and csQCA to establish the explanatory power of legal institutions, human rights, country wealth, and demographic structures on levels of children's rights. In particular, csQCA proves useful for the examination of combinations of actors, interests, and resources associated with some theories of policy innovation. Results indicate that six quite quite contrasted paths lead to a high level of children's rights.

In the field of biopolitics, Montpetit, Varone & Rothmayr (2007) strive to explain more or less permissive or restrictive policy choices with regard to GMO (genetically modified organisms) and ART (assisted reproductive technology) policies. Their goal is to arbitrate between three main approaches to explain policy design: the policy network, country pattern and interna-

tionalization approaches. Nine advanced industrial countries are covered, times 2 policy sectors, i.e. a total of 18 cases. Eventually, the csQCA analysis yields new evidence, and in particular reveals that the absence of concentrated governance played out differently, encouraging permissiveness in the U.S. but restrictiveness in Switzerland. In a linked piece, Varone, Rothmayr and Montpetit (2006) focus on the permissiveness/restrictiveness of ART policies, comparing 9 EU countries as well as Canada and the USA. The purpose of the csQCA is to arbitrate between more actor-based or institution-based explanatory factors. The minimal formulae allow them to identify four policy 'designing processes', each of which combines in a specific way *both* actor-based and institution-based factors. In another linked piece, Engeli (2008, 2012 forthcoming) focuses on differences in the abortion and ART policies in France and Switzerland. She formulates 7 potential conditions pertaining to institutional factors and to the three main actors of the reproduction field (medical community, women's movements and pro-life movements) and tests her model with fsQCA. The results show that even if institutional settings exert no clear systematic impact, strong coherence within the medical community explains a great deal of the policy variations, in contrast to women's movements.

In the field of gender politics, McBride & Mazur (2010) examine how and to what end state-based institutions established to promote women's rights and gender equality (women's policy agencies - WPAs) can bring about the success of women's movements, originating outside the state, in penetrating policy arenas, changing processes of policy formation and representation, substantive policies as well as cultural representations. They test 'state feminist' theoretical propositions relating to WPAs and women's movements in 13 countries, across 5 different policy areas; from the 1970s the early 2000s, through descriptive and theory-building case studies, statistical analyses of a large N dataset, and csQCA. Through several csQCA analyses, they process database of 130 cases at the policy debate level, and produce many results that explain the successes and failures of WPAs, both procedurally and in terms of policy results. Bleijenbergh & Roggeband (2007) also analyse gender-related policy processes,

by studying the impact of feminist pressure and EU policies on national policy changes, such as the introduction or extension of public childcare provision, parental leave, and part-time work legislation. Performing a csQCA on six EU countries, they conclude that women's political pressure, especially through a national equality machinery, is a prerequisite for the emergence and extension of social-care policies. The crucial role played by national machineries in translating EU measures into national policies is also demonstrated through sequence analysis. Also in connection with EU affairs, Raunio (2005) aims to explain cross-national variation in the level of parliamentary scrutiny of governments in European affairs. His fsQCA results show that the strength of the Parliament emerges as the only necessary cause in producing tighter scrutiny, while the combination of a powerful legislature and a more Euro-sceptical public opinion is sufficient in bringing about higher levels of control over the government. Schwellnus, Balazs & Mikalayeva (2009) also scrutinize EU-related policy processes, with a focus on the formal adoption and sustainability of minority protection rules new EU member states. They perform an mvQCA across 4 countries (Poland, Romania, Estonia, Latvia), covering both pre- and post-accession phases and five minority protection related issue areas (nondiscrimination, language use, education, citizenship, integration of Roma), thereby obtaining 93 cases. The analyses indicate that two equifinal paths lead to positive change : a domestic one and one including external incentives as a necessary component. Overall, external (EU) incentives turn out to be less effective than assumed in overcoming domestic opposition, as they depend on pro-minority oriented governments to be consistently successful.

Quite a few applications also focus on environment-related policies. Hellström (1996, 1998) exploits csQCA to reanalyze case study research material on policy disputes between the forestry profession and its critics in 5 European countries and the USA. She strives to explain the intensity of the conflicts in the respective national contexts, by considering 4 conditions, linked to socio-economic, sector-specific and cultural factors. Her conclusion is that forestry conflicts intensify when forestry manage-

ment practices are rapidly changed by an isolated forestry profession, in conjunction with some background socioeconomic factors. Hellström (2001; see also Hellström & Rantala 2000) pursues and expands this line of work by also including subnational cases in the analysis (Minnesota and Pacific Northwest USA), and by constructing models of forestry conflict structures and conflict management strategies. The csQCA allows her to establish to what extent three different dimensions of conflict structures are linked to one another, and to identify which conflicts are best managed by more participatory or more institutional policy responses.

In the linked field of energy policies, Yamasaki (2007) aims to identify the factors and their mechanisms leading to major nuclear energy policy changes. She performs a csQCA of the instances of such changes in all 10 West European countries which have produced nuclear power at the commercial level, across the 1973-2007 period. Her results show that major policy changes can occur when anti-nuclear movements are un- or de-mobilized (contrary to common expectations), when the nuclear energy issue is highly institutionalized, and focusing events occur, either as confirmatory or root triggering factor. In a further contribution, Yamasaki (2009) examines more in-depth the policy impact of anti-nuclear movements. The csQCA performed on the same cases uncovers the mechanisms through which highly mobilized social movements may dampen the chance of major policy changes instead of promoting them. Yamasaki also exploits, as Peillon (1996, see below), the underused 'hypothesis-testing' function of QCA. Further, Giugni & Yamasaki (2009) reanalyze the data of a previous study (Giugni 2004) that had used a regression approach to time-series analysis to assess the policy impact of antinuclear, ecology, and peace movements in Italy, Switzerland and the USA. They use csQCA to re-test the two main hypotheses drawn from the 'joint-effect model' of social movement outcomes (need of powerful allies in the institutions and of a favorable public opinion; and need to address issues and policy domains that have a low degree of saliency). They also add a third hypothesis on the policy impact of social movements across

countries. The results largely confirm the explanatory power of the joint-effect model.

Finally, in terms of analyses that cut across policy domains, Maggetti (2007) examines the development of independent regulatory agencies (IRAs), with a focus on organizational, institutional, and political explanations for divergence of *de facto* independence from formal independence. Through a fsQCA, in a cross-national, cross-sectoral comparison of 16 Western European IRAs, he shows that formal independence is neither a necessary nor a sufficient condition for explaining variations in the *de facto* independence of IRAs. Other factors, such as the lifecycle of agencies, veto players, and European networks of agencies, exert a decisive impact. In a further piece (Maggetti 2009), he examines the role of IRAs in policy-making, focusing on 6 cases of revision of crucial laws related to the competencies of the investigated IRAs in the Netherlands, Sweden and Switzerland. He first uses the Actor-Process-Event Scheme (APES) method to obtain a synthetic measure of agencies' centrality in the course of each policy process, and then formulates 6 hypotheses to account for the centrality of agencies, which he eventually test through a two-step csQCA[7]. The results suggest that *de facto* independence from the political decision-makers is a necessary condition for the maximal centrality of agencies in policy-making, whilst non-professionalization of the legislature, combined with low independence from the regulatees, are jointly sufficient for explaining this outcome.

[11] Among the few, recent applications which tackle the transnational level, Schimmelfennig et.al. (2006) study the conditions, in particular in terms of strategic action in a community environment, that are conducive to the constitutionalization of the EU (extension of the powers of the European Parliament and of the institutionalization of human rights). They perform a csQCA of 66 constitutional decisions between 1951 and 2004

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[7] Two-step QCA, first developed by Schneider & Wagemann (2006), is a more elaborate form of model-building for QCA which distinguishes « remote » and « proximate » conditions. See Mannewitz (2011) for some further elaborations.

across different areas of parliamentary competence and human rights issues. The results corroborate their overall assumptions and suggest that salience and, more recently, coherence, are the most relevant conditions of EU constitutionalization. Also at the EU level, Delreux (2009, 2011) analyses the conditions under which an EU negotiator enjoys some degree of discretion vis-à-vis the member states during international environmental negotiations, following a principal-agent theory approach. His csQCA of 8 EU decision-making processes with regard to international negotiations leading to a multilateral environmental agreement indicates that the compellingness of the international negotiations explains the occurrence of discretion. However, to explain the occurrence of a higher degree of discretion, variables such as preference distributions, information asymmetries and institutional density also need to be taken into account.

Finally, at the transnational level beyond the EU, Van der Maat (2011) strives to explain why some territorial transgressions by a deviant state are not followed by intervention by capable members of the international community. Combining qualitative methods and fsQCA, he analyzes the 6 cases of Tibet, the Suez crisis, the 1967 six-day war, the Indonesian occupation of East Timor, the Moroccan occupation of the Western Sahara, and the 1989 Gulf crisis. The results show that the absence of high security costs to the hegemon, in combination with either strategically important security relations between the transgressor and the hegemon, or the absence of military and economic vulnerability, are generally necessary and sufficient for non-intervention.

6 Focus on policy implementation and policy outputs

Quite a number of applications (N = 47) focus on the policy outputs or policy outcomes, i.e. on the results of policy programmes.

[13] At the micro level, Blackman & Dunstan (2010) investigate the dynamics of health inequalities in England, using survey data from 15 deprived local authority areas in North West England. In order to explain differential rates of improvement in terms of premature mortality, they perform csQCA analyses. The results allow them to identify different core combinations of

conditions associated with diminishing mortality from circulatory diseases and cancer, respectively. These findings reveal the complexity of meeting health inequality targets with policy initiatives.

[14] At the meso level, Yamasaki & Spreitzer (2006) explore the potential of the combination of QCA with social network analysis (SNA) in Policy Output Analysis. This is applied a.o. on the example of the Swiss road transportation policy networks (1984 to 1996), where the cases are 12 different policy network configurations, along a two-dimensional typology. QCA is thus also exploited for typology-building. In conclusion, they argue that the combination of QCA and SNA could cover 'blind areas' in policy analysis, while also allowing more accurate comparative policy analyses and offering new visualization tools for the pragmatic necessity of policy makers.

[15] At the local level, Sager (2002, 2004, 2005) explains how different metropolitan institutional settings affect the quality of political negotiation processes and their subsequent policy decisions. Starting from the theoretical controversy of the two metropolitan reform traditions, two opposing ideal types of metropolitan government institutions are conceptualized: the public choice model and the neoprogressive model. The results of his csQCA of 9 decision cases in 4 Swiss urban areas substantiate the hypotheses derived from the neoprogressive model rather than the public choice model. In a further analysis (Sager 2006), he expands the scope to a meta-analysis of 17 case studies of integration of urban transport and land use policies in 10 Western European countries, with the focus placed on the institutional conditions for policy coordination in metropolitan areas. Once again, the csQCA results rather corroborate the neoprogressive model. Also at the local level, Grimm (2006) focuses on the relationship between entrepreneurship policy and economic growth in local activity basins. She first develops qualitative approaches to define the concept of `entrepreneurship policy´ more precisely and to explore whether a link exists between this policy and spatial growth. She then implements these approaches with csQCA to check if any of these approaches can be identified as a causal condition contributing to regional growth. The results, for respec-

tively three regions in the USA and in Germany, confirm causal links identified by other methodological approaches, but also reveal that some contextual factors are influencing some cases while others are unaffected. Still at the local level, in the field of development and water management policies, Lam & Ostrom (2010) examine the process and impact of an irrigation assistance project in Nepal in the mid-1980s. They analyze data obtained across 19 irrigation systems in the same river watershed, over three time periods, related to changes in system structure and performance over time. CsQCA is exploited to establish the configurational impact of core variables on the long-term improvement of irrigation performance. The results show that, unless farmers encourage local entrepreneurs and organize themselves, create their own rules or use sanctions, and augment their rules through collective action, infrastructure investment alone is not sufficient to achieve sustainable higher performance.

At the sub-state level, Sager & Andereggen (2011 forthcoming) conduct a two-step mvQCA on 17 transport policy cases in Switzerland. They strive to determine under which contextual conditions (5 'remote' conditions) and polity conditions (4 'proximate' conditions) a transport policy decision meets with a high level of acceptance. The results show that the influence of the polity conditions on the acceptance of transport projects is dependent, above all, on the federal or the financial context, while urbanization and the language region constitute less important contextual conditions. Also at the sub-state level, in another policy field, Freitag & Schlicht (2009) exploit fsQCA to examine how sub-national education systems affect the extent of social inequality in education within the German federal states. Testing a model with four conditions pertaining to the 16 regional education systems, they find out that well-developed early childhood education is necessary for a low degree of educational inequality. By contrast, educational inequality is not directly related to partisan and socioeconomic determinants.

In a further study at the state (sub-national) level, Ford et.al. (2005) use both csQCA and linear regression to investigate the relationship between state health agencies' adherence to the recommendations of the United State's Institute of Medicine and

changes in their populations' health. Using a holistic measure of change in a state population's health status as outcome variable, and relying on a variety of reports and survey material over 5 years, they demonstrate that state agencies that most completely adopt a public health model emphasizing assessment, assurance and policy development also display the most favorable scores on the outcome. In yet another analysis at the sub-state-level, following a cross-national design, Blatter et.al. (2009) use fsQCA to identify the preconditions for different types of international activities of regional governments in 6 European countries. Their results show that high economic interdependencies in combination with large financial capacities are in most cases sufficient for setting up many promotional offices abroad, and that a high level of policy autonomy in combination with strong competencies in foreign affairs is almost always sufficient for having a well-staffed office in Brussels. In contrast, partnerships with foreign political entities are not a result of a cultural causal configuration.

Also at the sub-state level, Heikkila (2004, 2001; see also Heikkila & Isett 2000) examines ways through which institutions governing water resources can affect the management of scarce water supplies, with a focus on the relationship between the scale of water management institutions and the use of the more ecologically friendly 'conjunctive water management' (CWM). She concentrates on a sample of 70 out of the 450 groundwater basins in California and tests two main theoretical models: the 'common-pool resources' model, and the contrasted 'public services industry' model, both through logit regression and csQCA. Eventually, she is able to triangulate the two analyses on some points (e.g. on the facilitating effect of special groundwater management districts). The csQCA also allows her to identify some other, distinct combinations of conditions leading to the implementation of CWM. Schlager & Heikkila (2009) pursue this line of work around institutional arrangements to manage a shared natural resource. They study 14 western interstate river 'compacts' (legal arrangements through which states allocate water from shared river systems) in the USA and try to identify the conditions under which compacts are likely to successfully address conflicts. Through a csQCA, they analyze 23 such conflicts, test-

ing two successive models on two sub-groups of cases, respectively with and without the intervention of a compact commission to address the conflict. This allow them to demonstrate that compact commission have been able to solve some conflicts under specific conditions, and that some sort of conflicts can only be addressed in alternative venues. From this, they derive several policy recommendations. In a neighbouring field, Metelits & Weber (2008) aim to evaluate policy outcomes by reassessing a case-based study on crop productivity and environmental sustainability outcomes in Water User Associations (WUAs) in Uzbekistan. Using detailed evidence for 7 cases of WUAs, they apply fsQCA to test an explanatory model towards improved crop production and increased environmental sustainability. The results allow them to refine the theory. In particular, the presence of strong formal institutions is a sufficient condition for increased environmental sustainability, even in cases where physical wealth is low; by contrast, informal institutions do not carry much causal weight.

[16] Quite many policy outcome QCA analyses have been conducted at the cross-national level, foremost on socio-economic topics. In this field, Olsen and Nomura (2008, 2009) strive to identify core factors that facilitate the success of poverty reduction policies in 82 countries worldwide – both developed and developing. In a first contribution (2008), they compare the results of standard econometric growth models (with cross-sectional regression analyses) with an fsQCA analysis, considering a total of 23 potential explanatory variables, to test a series of models over the 1992-2002 period. Their results allow them to identify more clearly the favorable role of women's labor force participation as well as that of state intervention, and to identify some sets of countries whose shared characteristics (core combinations of conditions) helped them to achieve poverty reduction. In a second study (2009), they perform both a csQCA and an fsQCA on that same dataset, examining in a more fine-grained way the issue of 'calibration' of the raw data into crisp- or fuzzy-set membership scores, and how it affects the results of the analyses – thus performing a 'sensitivity analysis' (as performed by Skaaning, 2007, in another field). The results confirm that both

fsQCA and csQCA analyses enable to demonstrate empirically, in contrast to standard regression analyses, that 'causal' conditions operate in conjunction, in different ways, to bring about poverty reduction. Thus, QCA brings more diversity in the results – and in the policy recommendations.

Also in the field of macroeconomic performance, Boyer (2001) conducts a comparative analysis of 21 OECD countries during the 1990s, so as to identify different 'growth regimes' which may lead to good performance. This analysis is also combined with a detailed study of the U.S. case, which appears to some as a 'model' based on labor market deregulation, venture capital and ICT-led growth. By contrast, the csQCA leads to the identification of at least two other successful configurations in terms of macroeconomic performance: social democratic countries which develop a cooperative approach to the knowledge based economy, and some other catching-up economies that use information technology as a method for leapfrogging. In a further piece, Boyer (2007) shifts the focus to the linkage between growth regimes and the efficiency of antipoverty policies. Reviewing country case studies, he posits that some features could be common to all successful experiments of efficient antipoverty policies, in the form of 'virtuous circles'. He then uses two methods to detect those common patterns : csQCA and national growth diagnosis, so as to help design accordingly economic policies. In these models, a special attention is devoted to the timing of policies and the role of policy regimes.

Adopting some complementary approaches, Kogut & Ragin (2006; see also Kogut 2010) first use csQCA to examine the determinants of the securitization of investments through secondary financial markets (in particular through GDP growth) across 49 countries worldwide. The analysis falsifies the simple hypothesis according to which Common or British Law systems would be the core factor. On the other hand, they also use csQCA for a 'prototype analysis', to determine the appropriate categories of nations that exhibit economic wealth, across a dataset of 20 countries over 27 years. Overall, high growth appears linked to consistently corporatist configurations, as well as to several 'mixed' configurations. In that same vein, Woldendorp, Vis & Keman

(2012 forthcoming) investigate the link between countries' institutional setting and their overall economic performance, operationalized as a combination of economic growth, employment and public debt indicators. They then conduct an fsQCA ideal-type analysis on 19 OECD countries between 1975 and 2005. The results reveal that the cross-country and cross-period variations in performance (which is quite high and allows them to distinguish 8 ideal-types) cannot be accounted for by the two key institutional features of corporatism and consensus democracy. They argue, in line with the suggestion of Schneider & Wagemann's (2006) in terms on '2-step fsQCA', that those factors could be considered as more 'remote' factors that are relatively stable over time, as opposed to more 'proximate' factors resulting from the actions of policy players. In a previous fsQCA ideal-type application on those same 19 countries between 1975 and 1999, Vis, Woldendorp & Keman (2007) focus on 'miraculous' economic performances at the country level. Their results show that that the distribution of miracles and other varieties of economic performance models is mixed and volatile, and suggest cross-national divergence.

In a connected field, Nelson (2004, 2006) examines institutional linkages between different types of social security programs in 18 welfare states in the early 1990s, so as to analyze the determinants of cross-national variations in the level of minimum income protection. The results of OLS-regression, csQCA and fsQCA analyses show that the most important condition is the degree to which social insurance provides income security, which supports the middle-class inclusion hypothesis on institutional dependencies between different tiers of the social security system. With another take on the topic, Peillon (1996) investigates the factors associated with the legitimacy of selected social programmes in 5 European countries, as tapped by the ISSP survey on the level of support for the welfare state, conducted among citizens. His csQCA reveals, among other things, that the provision of services, rather than financial transfers, generates support among citizens. In terms of methodological elaboration, Peillon is the first to explicitly use the "intersection" function of csQCA on real-life data – in particular by computing where some csQCA

minimal formulas 'cross' some hypotheses based on the literature (pp. 187-189).

In another application in the field of social policies, Haynes et.al. (2010) examine, at the country level, whether there is an association between levels of expenditure on long-term care and the availability of family contacts. Their csQCA on a group of 12 OECD countries across different continents shows that there is indeed a link between higher levels of family contact (measured through survey evidence) and lower levels of expenditure on long-term care, but that some cases defy this relationship, as they display government care policies that seek to promote informal social care through the family contact that continues to be available. In a neighbouring field, Hardmeier and Gross (2009 ; see also Gross 2007) exploit mvQCA to identify pathways leading to a successful family policy. Their analysis of the regulation in family policies in 16 European countries allows them to establish that structures typical of the breadwinner model can still be found in almost all the countries examined, and that these have a crucial effect on the birth rate. Their results also enable to demonstrate that, along with child care supply and comprehensive female participation in the labour market, accompanying measures in family policy, especially financial support, are key factors in the increase of birth rates. Rather focusing on measurement issues of policy outcomes, Ishida (2009a, 2009b) exploits fsQCA to reconstruct the Human Development Index (HDI) in order to better tap the individuals' subjective evaluation in the respective countries – considering that the HDI has been initially conceived as a sort of fuzzy index (as demonstrated by Baliamoune-Lutz 2009, Smithson & Verkuilen 2006, & Chiappero-Martinetti 2006). Using some sub-indices of HDI as conditions and subjective evaluation indices as the outcome, he then tests two ways to reconstruct the HDI to reflect a subjective evaluation index. Finally, he discusses the performance and potential usability of each version of the reconstructed HDI.

The other cross-country applications focusing on policy outcomes are diverse in terms of policy domains. First, Loizides (2003) strives to explain outcomes of 'confrontational policies' in Greece and Turkey (1983-2003), through an analysis of 39

cases of crises between majority Greeks or Turks with either their minorities or neighbors. After some preliminary csQCA tests which allow him to dismiss some theoretical models, he performs a csQCA on a combination of two theories: the diversionary theory of war and the security dilemma theory. His results show that both theories are quasi-sufficient explanations of confrontational policies. A number of anomalous cases however beg further examination and suggest the need for a complementary third perspective emphasizing ideational factors and learning experience. In a prolongation of that study, Suzuki & Loizides (2011) examine the unfolding of interstate crisis escalation among two conflictual dyads, namely Greece/Turkey and India/Pakistan, using dataset of 12 interstate crises involving the two dyads from 1987 to 2002. Their csQCA demonstrates that both the security dilemma and diversionary theory explain crisis escalation, although the latter covers more cases. In both dyads, nuclear weapons and regional organizations have, through different combinations of conditions, shaped the boundaries of possible escalatory action.

Further, Schimmelfennig (2006) examines the conditions under which governments in Eastern Europe have complied with the political demands of European regional organizations, with regards to the core norms of the emerging pan-European liberal international community (e.g. democracy, minority rights, …). To explain the (non-)effectivenesss of these efforts, he tests the social learning model and the external incentives model through a csQCA of 42 issue-specific configurations in 9 Eastern European countries. His results show that a credible perspective of EU and/or NATO accession combined with low political adaptation costs for the target governments is a sufficient condition for compliance (external incentives model). However, in the final phase of accession negotiations, a positive identification with the West proves sufficient as well, even when compliance threatens the survival of the government (social learning model). In another EU-related application, Di Lucia & Kronsell (2010) study policy implementation in multi-level governance systems, throught the case of transport biofuels and of the EU biofuel directive that features a disappointing implementation record. They probe a set

of implementation hypotheses in a csQCA, covering 10 EU member states between 2003 and 2006. The findings show, in agreement with previous studies, that implementation of the EU biofuels policy is more likely when favorable conditions are present. Non-implementation, on the other hand, is explained by a dichotomy between the unable and the unwilling, as the lack of willingness exposes to failure even the fittest national system. Also around the topic of the implementation of EU rules, Dimitrova and Toshkov (2009) use csQCA to test conjectures on determinants of the transposition rates of EU law in the EU member states. Their analysis of 8 cases covering two directives shows that strong administrative co-ordination of EU affairs leads to smaller transposition deficits in the aggregate, but that for highly salient directives that trigger opposition from political actors outside the executive, administrative co-ordination cannot help.

In another policy field, Svevo-Cianci, Hart & Rubinson (2010) aim to identify which United Nations Convention on the Rights of the Child (CRC) recommended child protection (CP) measures are most important in establishing a basic level of child protection in 42 countries, and to assess whether these measures were necessary or sufficient to achieve effective basic child protection in developing and industrialized countries. The csQCA, based on expert questionnaires data, indicate that a strong CP infrastructure (legislation plus services), combined with at least one information-based intervention support program, are crucial to attain effectiveness.

Finally, Cronqvist & Berg-Schlosser (2006) examine the causes in the differences of HIV prevalence rate between Sub-Saharan African countries. While regression tests and factor analysis show that the religious context and colonial history have had a strong impact on the spread of HIV, the popular thesis, according to which high education prevents high HIV prevalence rates, is invalidated. In countries with a high HIV prevalence rate, they perform an mvQCA which allows them to find connections between the mortality rate and the increase of the prevalence rate, as well as between the economical structure and the increase of the prevalence rate, which is of interest for further HIV prevention policies. Also related to Africa and to health pol-

icies, Glatman-Freedman et.al. (2010) examine the factors affecting the successful or less successful introduction of new vaccines across 35 African countries. Using both statistical analyses (One Way ANOVA and correlation analysis) and csQCA, they discover that good country-level governance is the single most important factor for the successful early introduction of new vaccines into poor African nations.

[17] As for still not numerous transnational or supranational applications, Stokke (2004, 2007) uses csQCA to process case studies on shaming as a strategy for improving the effectiveness of international regimes for marine living resources management, across 10 cases in 3 regions (Barents Sea, NorthWest Atlantic, and Antartic). Among other findings, the csQCA shows that the violation of commitments is not central in the success of shaming, whereas the existence of a scientific basis stands out as a necessary condition, and also as a sufficient condition if the desired behavioral adaptation of the stakeholders who are being shamed is not inconvenient. In a prolongation of this work, Stokke (2012 forthcoming) focuses more specifically on the Barents Sea region and, through fsQCA, establishes that two causal conditions, malignancy and collaboration, are highly important in shaping the effectiveness of international regimes, but that their effects depend crucially on other conditions. Success on the cognitional aspect of resource management (forecast accuracy) is only reliable if scientists incorporate ecosystem information when developing their stock forecasts, which the regime helps them in achieving, and even then only if ecosystem disturbances are modest. Similarly, regulatory success (adoption of measures reflecting the best available knowledge) is reliable only when malignancy is low, and only if the partly regime-driven state of knowledge is strong or if collaborative regulation is reinforced by urgency. By contrast, behavioral failure (substantial quota overfishing) is a reliable outcome if malignancy is high and is not counteracted by either high obligation or intensive shaming by the other party. Finally, reliable behavioral success requires low malignancy, high determinacy and bindingness of regime rules, and strong systems for fisher-report verification.

On a linked topic, Sprinz & Kaan (2007) seek to probe which design features account for highly effective international environmental regimes, and which are more persistently associated with ineffective regimes. They process a dataset of 23 international environmental treaty regimes and 92 sub-regimes, focusing on 4 potential explanatory factors (enforcement, compliance-monitoring, legalization, and knowledge) both through cross-sectional statistical procedures and fsQCA. First results of the latter indicate that strong legalization, as well as low enforcement, are necessary conditions for regime effectiveness.

Finally, Kostadinova (2003) analyzes the European Commission's (EC) opinions on applicant countries and examines the conditions for being invited to start negotiations for EU membership. Through a csQCA on 15 country cases as seen from the EC (therefore the transnational nature of her cases), she demonstrates that satisfaction of the political requirements, jointly with the presence of a functioning market economy are necessary, but not sufficient, conditions for being in the first wave of expansion. In addition, a country has had to show progress in either its capacity to meet the other obligations of membership or its ability to withstand the competitive pressures within the Union. With respect to the second wave of negotiations, she shows that the only necessary condition is meeting the political criteria. Finally, the factor which determines which countries were invited to join the EU in 2004 is the presence of the necessary administrative structures.

7 Focus on policy evaluation

This strand of applications is, so far, less diversified, and has been developed chiefly through a specific team of scholars.

[20] [21] Mostly at the subnational level, Befani, Sager and Ledermann elaborate ways to feed QCA into a 'Realistic Evaluation' perspective. A first empirical application is developed by Ledermann (2004, also 2011) on 12 cases of external evaluations of developmental aid projects supported by Swiss funds. In a more refined empirical application (Befani & Sager 2006; Sager & Ledermann 2006a, 2006b; Befani, Ledermann & Sager 2007), they exploit a study from the evaluation of the Swiss Environ-

mental Impact Assessment (EIA), in which three types of different outcomes are evaluated. Following the realist paradigm, initial assumptions are made on which Context-Mechanism-Outcome (CMO) configurations explain the different types of policy results. The propositions stemming from these assumptions are then translated into a set of Boolean variables, and a csQCA model is then constructed. The csQCA, performed on 15 case studies across Switzerland, produces core combinations of conditions which are, in turn, used to refine the initial assumptions (on which mechanisms were activated in which contexts to achieve which outcomes). The theory refinement made possible by QCA covers both directions on the abstraction to specification scale: downward, it offers more elaborate configurations able to account for a certain outcome; upward, it aggregates relatively specific elements into more abstract ones ('realist synthesis'). They finally argue that QCA has the potential to expand the scope and possibilities of Realistic Evaluation, both as an instrument of theory refinement and as a tool to handle realist synthesis when the number of cases is relatively high.

In another vein, Balthasar (2006) analyses the influence of the institutional distance between evaluators and evaluees on the utilization of policy evaluations. He uses csQCA to perform a meta-analysis of 10 case studies in the Swiss context, which involve evaluations that were carried out in different institutional contexts. This analysis is complemented by a larger-N statistical analysis on the whole population of ca. 300 evaluations in Switzerland (Balthasar 2009). His csQCA results indicate that, under certain conditions, the institutional distance between evaluators and evaluees has no influence on the use of evaluations. In particular, formative objectives can be achieved quite independently of distance.

[24] Finally, in a more generic way, Varone, Rihoux & Marx (2006) discuss how QCA can contribute to facing up key challenges for policy evaluation. They identify four challenges: linking policy interventions to outcomes and identifying causal mechanisms which link interventions to outcomes; identifying a 'net effect' of policy intervention and purge out the confounding factors; answering the 'what if'-question (i.e. generate counter-

factual evidence); and triangulating evidence. They argue that QCA offers some specific answers to these challenges, as it allows for a three-way comparison: a cross-case analysis, a within-case analysis, and a comparison between empirical reality and theoretical ideal types. They also discuss how QCA could deal with the contradictions/uniqueness trade-off (too few v/s too many conditions), to further develop the use of QCA in policy evaluation.

Conclusion: the state of the field – and the next steps

In this conclusion – which will, naturally, remain open due to the relatively recent nature of QCA and its current further developments and expected innovations – we first aim to take stock of what has been achieved so far. On that basis, we discuss some main avenues for further developments.

With regards to the strengths and assets in the field so far, one should first mention the research results. The application of QCA techniques (csQCA, mvQCA, fsQCA) to public policy analysis topics has begun to develop a 'niche' which has, so far, yielded quite an amount of useful empirical results. In a significant number of instances, it has also enriched the theories and models in the field. Hence QCA has proven useful to feed the "dialogue between ideas and evidence" (Ragin 1987). For instance, as Befani, Ledermann & Sager (2006) state it with regards to evaluation research specifically, QCA, in connection with other policy analysis tools, can produce empirically well-grounded context-sensitive evidence on policy instruments. Indeed the QCA results, in the form of core combinations of conditions, are both quite easy to grasp once they are translated verbally (from the perspective of policy practitioners and policy-makers) and quite complex due to their combinational nature (from the perspective of policy analysts).

Also noticeable is the fact that some of those applications have made their way to top-tier generalist journals – clearly more so in the sociology journals in the 1990s and the turn of 2000 (e.g. Amenta et.al. (1992) in *American Journal of Sociology*, or Amenta & Halfmann (2000) in *American Sociological Review*),

but since then quite a number of well-ranked political science or policy analysis journals have also become receptive (e.g. *European Journal of Public Policy*, *European Journal of Political Research*, *Mobilization*, *Regulation and Governance*, *Evaluation*, *West European Politics*, …).

Further, it should be noted that a large proportion of such applications are not single-method (i.e. solely relying on QCA) – they combine, or confront, or enrich QCA with at least one other method or approach. On the one hand, many applications triangulate, or exploit in complementary ways, both statistical analyses (mainly regression analyses of different types) and QCA. On the other hand, many applications are "case-oriented" and rely on thick case studies – a rejoinder to the call to exploit QCA to add leverage to comparative case studies (Rihoux & Lobe 2009; Byrne, Olsen & Duggan 2009). This case-informed QCA work takes many forms, e.g. through the exploitation of interviews (Hyttinen et.al. 2000), in-depth cases studies (Kitchener et.al. 2002), sequence analyse (Bleijenbergh & Roggeband 2007), etc.

Another obvious point is that QCA applications in the field have by now become quite diverse in their scope, both in terms of policy domains, of stage of the policy-making process, and of level of analysis. Some sub-fields are however much better covered than others – especially analyses: (a) on socioeconomic (in particular welfare state) or environmental policies; (b) focusing on policy design or policy outputs; (c) with cases being defined at the country level, or at the local or subnational level. In terms of number of cases, the bulk of applications also remains within the usual range for (cs)QCA as it was initially developed by C. ragin, i.e. between 7-8 and 25-30 cases. This is probably due to the fact that most applications are conducted at the macro level (typically: countries) where the number of cases is 'naturally' limited. However there are a few exceptions to this standard practice, with some larger-N analyses, e.g. Aleman (2009 – 78 cases), Rudel (2005 – 80 countries comprising sub-national cases), Olsen & Nomura (2009 – 82 cases); Sprinz & Kaan (2007 – 92 cases), Schwellnus et.al. (2009 – 93 cases), McBride & Mazur (2010 – 130 cases), Gran (2005 – 190 cases) and Gran & Aliberti (2003 – 193 cases).

Next, the largest share of applications so far have followed a rather 'inductive' or 'soft theoretical' approach – i.e.: either QCA was used to test a series of conjectures or proposals (translated into conditions), or to test a theory translated into a series of separate conditions, out of which eventually some configurational results emerged. Only few applications have more fully exploited the configurational and set-theoretic nature of QCA, which can be done it at least two ways. On the one hand, 'configurational' theories or hypotheses can be tested as such – including some 'upstream' causal or configurational statements linking the conditions in the model – as first applied by Amenta, Caren & Olasky (2005; see above) and advocated a.o. by Yamasaki & Rihoux (2009: 128-129). On the other hand, QCA applications can be (and should be, insofar as possible) explicitly based on set-theoretic relations for causal analysis (in terms of necessity and sufficiency – with the recently introduced procedures in the QCA protocol; see Schneider & Wagemann, forthcoming) rather than 'simply' examining paths leading to an outcome. Some examples of more set-theoretically informed uses of QCA, as well as uses comprising some upstream configurational statements in the field of policy analysis, are those of Maggetti (2007) and Blatter et.al. (2009). To this we should add an original exploitation of QCA, particularly in its fuzzy sets variant, to conduct ideal-type analysis (e.g. Kvist 2006, Vis 2007, Gran 2008, Vis, Woldendorp & Keman 2012).

More generally, in a more diffuse way probably, many existing applications demonstrate the added value of looking differently at policy-relevant data. Ragin (2006) illustrates this by concentrating on research which does not study the policy process *per se* (i.e. directly linked to a given policy program), but which is relevant for the policy process as its empirical conclusions has a strong influence in terms of policy advocacy. He focuses on the *Bell Curve Debate* on social inequalities in the U.S. and opposes the 'net-effect' thinking in the Bell Curve Debate, which underlies much social science thinking. In the discussion on social inequalities, it is known that these inequalities do intersect and reinforce each other. Thus, does it really make sense to separate these to analyze their effect on the studied outcome? Using fsQCA to

perform a re-analysis of the Bell Curve Data, Ragin demonstrates that there is much more to be found when one takes into account the fundamentally configurational nature of policy-relevant phenomena, which cannot be grasped with standard statistical procedures. Hence QCA, due to its set-theoretic nature, can be a powerful tool to formulate policy recommendations on the basis of results obtained through the QCA minimization procedure – in fact quite a number of QCA applications lead to the formulation of policy recommendations (e.g. Olsen & Nomura 2008, 2009, Schlager & Heikkila 2009, Blackman 2008).

What can we then suggest in terms of future developments, to further strengthen and diversify the contribution of QCA to public policy analysis? In fact the question could also be inverted: what can the field of public policy analysis bring to the further developments in the QCA tools? Indeed this field constitutes a very challenging niche in terms of comparative design and methodology, both for scholarly and more applied work.

Our first suggestion is that it makes much sense to keep the 'methods mix' open and inventive, and to pursue the exploitation of different approaches and their corresponding methods, such as statistical approaches, QCA and other more case-oriented approaches (see also Rihoux et.al. 2009: 170-172). Indeed, those different methods "(…) rather than mutually exclusive, (…) are alternative or parallel research options for expanding our understanding of social reality." (Kangas 1994: 362) – and obviously each one of them (including QCA) displays its distinctive strengths and limitations. In some situations, it would also be useful to engage into 'mixed methods designs' proper, i.e. a more ambitious or integrated way to articulate different methodologies – and bringing in QCA in the 'mix'. Following this rather open and pragmatic view (i.e.: the choice of the right 'mix' depends on the research questions, the type of data, the practical constraints, …), another technique akin to QCA could be inserted in the mix: MSDO/MDSO (Most Similar, Different Outcome / Most Different, Similar Outcome). Among other things, it can be used as a prior step before using QCA, so as to take into account many potential explanatory variables which are grouped into categories, producing a reduction in complexity. In fact MSDO/MDSO has

already been applied in the field of policy-making processes in the European Union institutions (Bursens 1997, 1999; De Meur, Bursens & Gottcheiner 2006). Incidentally, within the QCA toolbox itself, the multi-value version (mvQCA) has so far seldom been exploited in the field of public policy analysis (some exceptions are Huntjens et.al. 2011; Cronqvist & Berg-Schlosser 2006, Schwellnus et.al. 2009, Sager & Anereggen 2011, Hardmeier & Gross 2009). It would deserve to be used in quite a diversity of settings, as it brings some flexibility to the user if he/she wants to exploit the analytic power of the 'crisp' variant of QCA.

Our second suggestion, which has already been taken on board in quite a number of applications, is to move beyond 'simple' macrocomparative designs. This can be done in at least four ways. The first avenue is to conduct more focused comparative analyses, in particular on specific policy programmes (e.g. Peillon 1996), or on specific policy arrangements (e.g. Schlager & Heikkila 2009) or procedures (e.g. Befani, Ledermann & Sager 2007). Second, rather than simply testing hypotheses derived from theoretical models, one can attempt to go more in-depth into the 'causal mechanisms' in their most common meaning (i.e. "pathways or processes by which an effect is produced"; Gerring 2009: 4; see also Hedström & Ylikoski 2010), as has been done for instance by Yamasaki (2009) and Delreux (2009, 2011). Indeed QCA techniques, as such, only enable one to identify the core ingredients (the core combinations of conditions), not the recipe as such – this is the task of the researcher (Ragin & Rihoux 2004), which necessitates one form or another of qualitative 'return to the cases' to interpret the QCA results, in particular in terms of causal mechanisms or 'causal chain narratives'. There is obviously a rejoinder between this core preoccupation of QCA and the 'process tracing' approach, as demonstrated by Emmenegger's (2010a, 2010b) applications. It is also useful to exploit QCA, beyond the quest for core combinations of conditions, to identify 'special' or 'puzzling' cases that would deserve further qualitative analysis. Indeed, to better understand policy processes, and probably also to discover new ways of achieving bet-

ter policies, puzzling cases often yield much more interesting information that 'normal' cases conforming to hypothesized trends.

Next and quite crucially, more refined 'casing' strategies (Ragin 2009b; Rihoux & Lobe 2009) can be developed and applied – one of the core questions being: what is the correct level at which the cases should be defined empirically for policy-oriented comparative analysis? One way to proceed is to articulate the local, subnational and national levels (e.g. Hellström 1996, 1998, 2001). Another way is to move away from obvious (or more convenient?) case boundaries – from obvious administrative or political-institutional boundaries (e.g. municipalities, districts, states, countries) to boundaries that are more directly relevant in the policy field in question. For instance, in environmental or natural resources-related policies, cases may equate with ecosystems or water or river basins (e.g. Aubin & Varone 2011). Fourth and last but not least, one can develop more elaborate models, beyond the 'simple' listing of logically equivalent conditions leading to an outcome of interest. Gladly, some first steps have already been made in this direction, through the construction of 'two-step' QCA models distinguishing 'remote' v/s 'proximate' conditions (e.g. Maggetti 2009; Sager & Andereggen 2011) – this makes a lot of sense in policy-oriented research (see e.g. Scharpf 2000).

Our fourth suggestion stems more directly from the mapping of the applications as presented in Table 1. There is still a broad untapped potential for applications, specifically in two areas. On the one hand, there are still very few applications where cases are examined (and defined) at the meso or micro levels – doing so, incidentally, would also contribute to making progress in the identification of 'causal mechanisms' understood rather as "micro-level (microfoundational) explanations for a causal phenomenon" (Gerring 2009: 4). On the other hand, there is still a lot more to be done, in terms of QCA applications, at both extremities of the policy-making cycle, namely agenda-setting and policy evaluation.

To sum up: our contention, both through our survey of the work conducted so far and in our further suggestions, is that QCA as an approach, as well as the QCA techniques, have begun

to demonstrate that they constitute valuable tools for 'evidence-based' policy analysis and policy-making (e.g. Huntjens et.al. 2011, Befani & Sager 2006). More specifically, they enable one to bridge 'fact-finding' work (which so far has been dominated by quantitative/statistical work) and in-depth case- and complexity-oriented work focused on "how-questions" – both of which make much sense in public policy analysis and should be seen as complementary rather than opposed.

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