The Comparative Advantages of fsQCA and Regression Analysis for Moderately Large-N Analyses[1]

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Abstract

This paper contributes to the literature on comparative methods by assessing the strengths and weakness of regression analysis and fuzzy-set Qualitative Comparative Analysis (fsQCA) for studies with a moderately large-n (between 50 and 100). Moderately large-n studies are interesting in this respect, as a regression analysis can be conducted – although the degrees of freedom are too low to allow for very complex models – but a fsQCA analysis could too. Because of these methods' different epistemological foundations, the research questions they can answer vary too. As an empirical illustration for the comparison of fsQCA and regression analysis, I use a recent dataset (n = 53) that includes data on the conditions under which governments in Western democracies increase their spending on active labour market policies (ALMPs). The comparison demonstrates that has while each approach has merits for moderately large-n studies, fsQCA leads to a better understanding of the conditions under which the outcome occur.

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Introduction

In his 1970 article, the eminent comparativist Giovanni Sartori discussed what he saw as the dismal state of political science at the time, with the profession oscillating between two unsound extremes: unconscious thinking – which an overwhelming majority does – and overconscious thinking – done by a small minority (Sartori 1970: 1033).[2] Against this backdrop, Sartori called upon scholars to acquire training in (elementary) logic 'to steer a middle course between crude logical mishandling on the one hand, and logical perfectionism (and paralysis) on the other hand'. This would help scholars to get out of the "sea of naïveté" they were swimming in (idem). Although, to my knowledge, Sartori has not taken part in the debate on configurational comparative methods – that is to say Qualitative Comparative Analysis in its original crisp-set variant (csQCA), its fuzzy-set variant (fsQCA) or its multi-value variant (mvQCA) (see Rihoux & Ragin 2009) –, Sartori might very well like what he sees when he would examine the development of these methods over the past decade. In fact, researchers applying these techniques typically acknowledge their own "naïveté" and do the best they can to limit this as much as possible and instead be a conscious thinker walking the logical middle path.

The number of such "walkers" has risen exponentially in the last couple of years (see for a [non-exhaustive] list of discussions on and applications of configurational comparative methods, www.compasss.org). It was in the late 1980s when Charles Ragin brought Boolean algebra and set-theory to the social sciences with his excellent book on Qualitative Comparative Analysis (Ragin 1987). Notwithstanding some attention in the years following this publication (e.g. Lieberson 1991; Kangas 1994, and Ragin winning the 1988 Stein Rokkan Prize for Comparative Social Science Research), the real spur in attention started some years after Ragin's next book on fuzzy-sets (Ragin 2000). Configurational comparative methods can formalize case-oriented analysis and thereby offer tools to improve comparative research. These methods are particularly apt for identifying the necessary and/or sufficient (combinations of) conditions that bring about an outcome, like welfare state development or democratization. The goal here is to learn about the cases (e.g. welfare state development in Germany or Finland), not so much to draw causal inferences (see Ragin 2008; Rihoux & Ragin 2009; Wagemann & Schneider 2010).

In recent discussions on configurational comparative methods, scholars argue that these approaches are best applied next to another one (Ragin 2008: chapter 11; Schneider & Wagemann 2010: 400; see Rihoux 2006: 695-697). As Ragin and Rihoux (2004: 6) stress, scholars should not become 'QCA monomaniac'. This paper adds to this discussion by assess-

[2] For an interesting collection of Sartori's writings on concepts and methods and reactions on this work, see Collier and Gerring (2009).

ing the strengths and weaknesses of a configurational approach, fsQCA, and OLS regression analysis for moderately large-n studies (*n* between 50 and 100). Moderately large-n studies are particularly insightful in this respect since both fsQCA and regression analysis are plausible approaches for studies with such a number of cases. The *n* is high enough to estimate (simple) regression models. Still, the number of cases is not thus high that regression analysis seems the only – or perhaps the most logical – option;[3] fsQCA analysis could be a good alternative and/or complementary approach when the number of cases is moderately large.

To compare regression analysis and fsQCA analysis for moderately large-n studies, I make use of a recent dataset with a moderately large number of cases ($n = 53$) with which Vis (2010b) examines the conditions under which governments in Western democracies increase their spending on active labour market policies. Instead of using these data to arrive at substantive conclusions, this study employs these data to compare the two methodological approaches and reveal each ones merits and drawbacks. This comparison will show that for studies with a moderately large-n, fsQCA has much to offer but that the relatively large number of cases in a moderately large-n analysis also comes with the price that not all cases can be accounted for. Overall, the comparison suggests that combing a regression analysis and fsQCA in one study may help us to become even more conscious thinkers – without becoming over-conscious ones.

The paper has the following structure. The next section discusses the similarities and differences between regression analysis and fsQCA in general. The following two sections form the empirical core of the paper, by presenting the regression analysis and the fsQCA analysis of governments' increased spending on active labour market policies. The final section discusses the findings of the analyses and draws some conclusions.

Regression analysis versus fsQCA: Similarities and differences

To what extent are regression analysis and fsQCA analysis – and configurational comparative methods more generally – similar or different? Recent work indicates that epistemologically and ontologically, traditional quantitative approaches like regression analysis differ from configurational comparative methods (e.g. Rihoux & Ragin 2009; Mahoney 2010, but see Rohwer 2010 forthcoming: 6-7). In many respects, the basis of configurational approaches is what would typically be called "qualitative" (see Mahoney 2010: 122; Wagemann & Schneider 2010: 378-379) while that of regression analysis is "quantitative". Following the excellent overview of Mahoney & Goertz (2006), two topics are illustrative in this respect: the approaches to explanation and concepts of causality.

[3] There are fsQCA analyses in the "traditional" large-n domain, including more than a 100 or even 1000 cases (see Rihoux et al. 2009: 174 for an overview).

Regarding approaches to explanation, qualitative scholars adopt a so-called "causes-of-effects" approach. The goal of this approach is to account for individual outcomes, such as revolutions, to explain meaningfully the (causal) patterns in the cases under study (Wagemann & Schneider 2010: 380). Cases in configurational approaches are conceived holistically as configurations of analytically relevant conditions (see Ragin 2008). Quantitative approaches follow an "effects-of-causes" approach, in which the goal is to estimate what is the average effect of one (or more) variables in a population of cases. As Rihoux et al. (2009: 171) state, it would make no sense in (fs)QCA to isolate 'the net, independent effect of [a] condition' since cases are conceived as configurations of conditions; it is not an individual condition that matters but the configuration of conditions that does. FsQCA thus fits closest with the causes-of-effects approach, as the aim is to reveal those (combinations of) conditions that bring about a particular outcome in specific cases.

Also in terms of concepts of causality, fsQCA fits the qualitative camp. Configurational approaches' concept of causality is rooted in set-theory, meaning that causal claims are primarily developed by means of sub-sets and supersets (Ragin 2008: chapters 1 & 2). The use of set-theory is what makes configurational approaches so appropriate for examining statements of necessity and/or sufficiency (see Ragin 2008: chapters 2, 6 & 7; Wagemann & Schneider 2010: 380ff). In this vein, scholars applying configurational methods often adopt the so-called INUS approach to causation, whereby 'an INUS cause is neither individually necessary nor individually sufficient for an outcome. Instead, it is one cause within a combination of causes that are jointly sufficient for an outcome' (Mahoney & Goertz 2006: 232). The set-theoretical approach differs substantially from the correlational approach to causation that quantitative scholars employ. Another difference is that fsQCA's concept of causality allows for multiple conjunctural causation. This means that, first, oftentimes a combination of conditions produces the outcome. For example, governments increase spending on active labour market policies when they are of leftist composition *and* when there is no corporatist system in place; leftist partisanship or the absence of corporatism on their own do not do the trick. Second, there can be more that one (combination of) condition(s) that generates the same outcome, an issue known as equifinality. For instance, the combination of leftist partisanship *and* the absence of corporatism as well as the absence of leftist partisanship *and* decreasing unemployment bring about activation. Third, depending on the context, an outcome may result from the presence of a condition or its absence. In the previous (fictitious) example, either the presence of leftist partisanship or its absence leads to higher expenditure on active labour market policies, depending on the context (another condition). Thereby configurational approaches relax a series of conventional quantitative assumptions: permanent causality, uniform causal effects, unit homogeneity, additivity and causal symmetry (Berg-Schlosser et al. 2009: 8-11). Table 1 gives a summary of some of the differences between re-

gression analysis and fsQCA.

--- Table 1 about here ---

If fsQCA and regression analysis differ on such core issues like approaches to explanation and concepts of causality, can they then be used in one study? A methodological purist, or sceptic for that matter, might argue *not* since regression analysis and fsQCA cannot answer the same research question since they test different hypotheses. A regression analysis tests if an individual variable (or interaction of variables) has a positive or negative significant effect on the dependent variable, net of the other variables. A configurational approach, conversely, tests if a condition (variable) is necessary and/or sufficient for the outcome or whether it is an INUS condition. However, a more pragmatic scholar might argue that these differences are a strength rather than a weakness since the different yet related hypotheses tested shed a distinct but hopefully complementary light on a research topic. In this paper, I take the latter, pragmatic approach.

Given their differences, it is no surprise that the conclusions drawn from a regression analysis and a configurational comparative analysis sometimes diverge. Regularly 'the empirical conclusion is that QCA-type techniques allow one to learn more out of the data' (Rihoux 2006: 696; Rihoux, Ragin, Yamasaki & Bol 2009: 170), thereby complementing rather than invalidating one another. A sequential approach to using the two approaches may therefore be most useful (cf. Rihoux et al. 2009: 171). Sequentially conducting a regression analysis and a configurational analysis (crisp-set QCA) is exactly what Amenta & Poulsen (1996) do in their moderately large-n study into the conditions affecting the public social provision in 48 American states in the 1930s. For Amenta & Poulsen, the strength of csQCA over regression analysis is mainly theoretical: their theory suggests that spending outcomes are the result of complex interactions that cannot be tested well with interaction terms in multiple regression because of too low degrees of freedom and/or multicollinearity. The interaction terms in the multiple regression analysis offer some first support for the importance of these combinations but are hindered by multicollinearity. The subsequent csQCA analysis provides strong evidence for Amenta & Poulsen's theoretical argument. Still, given the centrality of complex causality in their theory and the regression analysis' problem to unveil this, one cannot help but wonder whether the authors needed the multiple regression analysis in the first place. Another example of a moderately large-n study that conducts regression analysis in addition to csQCA is Ford et al.'s (2005) assessment of the relationship between health agencies' adherence to the recommendations of a specific report (the United State's Institute of Medicine) and changes in their populations' health. Different from Amenta & Poulsen and other studies employing regression analysis and configurational analysis, Ford and his col-

leagues test different hypotheses with regression analysis and with csQCA. Specifically, they first assess if assessment, assurance and policy development (individually) are significantly and positively related to improvements in health by a regression analysis of 50 American states. Subsequently, they test if and which of these three functions are individually sufficient for explaining health improvement and, finally, if these three together were necessary for such improvements. With this two-step design, Ford et al. provide a good example of how the strengths of regression analysis and the strength of csQCA can be combined.

Regression analysis versus fsQCA: Increased spending on ALMPs

In this section, I present the regression analysis and the fsQCA analysis of governments' increased spending on active labour market policies (ALMPs). Walking through each analysis will help to reveal the comparative advantages and disadvantages of each approach for moderately large-n studies.

Data

For the comparison of regression analysis and the fsQCA analysis, this study uses a recent dataset on the conditions under which governments increase spending on active labour market policies (ALMPs), such as job training and subsidized employment (Vis 2010b). The dataset contains data for 53 governments from 18 developed democracies between 1985 and 2003.[4] Hereby, these data add to the growing body of literature that examines the politics of active labour market policies. By now, the idea that benefits should be 'active' is widely supported among developed democracies. On the individual level, most people also prefer active programmes to passive ones (OECD 2006). Political parties from different sides of the political spectrum agree on the value of 'activation' too. For example, in the party manifestos for the 2010 Dutch national parliamentary elections the social democrats, Christian democrats as well as the conservative liberals underline the importance of labour market integration and activation. Given the typical support for ALMPs, how does one account for the variation in spending on these policies across countries and – perhaps even more interestingly – across governments?

Table A1 in the Web Appendix displays the data of the measure of activation, the dependent variable (in the regression analysis) and outcome (in the fsQCA analysis): the percentage point change in active labour market spending as a share of total labour market

4 The precise time period included depends on when a new cabinet entered office (either in or after 1985) and when a cabinet finished its period in office (around 2003).

spending, labelled $\Delta\frac{ALMP}{TLMP}$. This is the percentage point change per cabinet period in spending on ALMPs as a percentage of gross domestic product (GDP) divided by total labour market spending (that is, spending on ALMPs plus spending on the passive labour market policies unemployment compensation and early retirement) as a percentage of GDP, multiplied by 100 (see formula 1).

$$\Delta\frac{ALMP}{TLMP} = percentage\ point\ \Delta\ per\ cabinet\ in\ spending\ on\ \frac{ALMPs/GDP}{[\frac{ALMPs}{GDP}+\frac{PLMPs}{GDP}]} \times 100 \qquad (1)$$

The dataset excludes governments displaying less than one percentage point change because although such a small change could result from a political decision, it is likelier that it results from measurement error.[5] The changes in active spending as a share of total spending range from minus 12.2 percentage points under Aho 1 (Finland, 1991-1995) to plus 16.5 percentage points under Delamaruz (Switzerland, 1995-1999). The average change per cabinet (either plus or minus) is 6.2 percentage points. Interestingly, both increases and reductions are not limited to one period; both occur in the 1980s, 1990s and early 2000s alike. Moreover, and related, the share of active spending did not "automatically" rise after the OECD's and EU's recommendations in the mid-1990s, with some governments displaying even reductions in this period (e.g. Kohl 4 in Germany and Bolger 3 & Shipley 1 in New Zealand). This indicates that the variation across governments in activation is puzzling indeed.

The dataset also contains five causal conditions or independent variables: the change in unemployment and economic growth during the cabinet period (both capturing the socio-economic situation), the political colour of the cabinet, the degree of corporatism and the extent of trade openness. Theoretically, Vis (2010a) proposes that the socio-economic situation is (almost always) necessary for activation (H1). She argues that because of the high costs of ALMPs and their low electoral reward, if any, governments increase ALMP spending only under an improving socio-economic situation. While such an improving socio-economic situation is almost always necessary for activation, it is by itself not sufficient. Leftist partisanship, corporatism and openness are all expected to be INUS conditions for activation – individually not sufficient, but necessary components on combinations of conditions that are sufficient (though not necessary) for activation (H2). Moreover, Vis tests the hypothesis that it is the combination of leftist partisanship and openness that spurs activation (H3), as Bonoli

[5] Some other governments are also excluded or combined because they, for example, where in office for too short a period or where actually part of the previous government. See for the reasoning behind these decisions, Vis (2010b: Appendix). All cabinets are named according to their Prime Minister (PM). However, the Swiss cabinet actually has no PM or head of state but rotates its presidency annually. According to an unwritten agreement, cabinet ministers take turns serving as president of the confederation, with newer members waiting until seniors have served. For convenience, the PM serving first in a the cabinet period is used to name the respective cabinet.

(2008) argues. Similarly, Vis also assesses whether leftist partisanship combined with the absence of corporatism is sufficient for activation (H4), or the combination of leftist partisanship and increasing unemployment (H5) (cf. Rueda 2007).

In regression analysis, hypotheses involving statements of necessity and sufficiency cannot be tested directly (as they can in a fsQCA analysis). Therefore, the hypotheses I test in the regression analysis are the following: reductions in unemployment increase activation (H1) ; leftist partisanship, corporatism and openness have no direct significant effect on activation (H2), leftist partisanship conditioned on high openness increases activation (H3), leftist partisanship conditioned on the absence of corporatism increases activation (H4), and leftist partisanship conditioned on increasing unemployment increases activation (H5). The different approaches to explanation are apparent in the formulation of the hypotheses; while the fsQCA hypotheses concentrate on a necessary condition, INUS ones and sufficient combinations of conditions, the regression hypotheses focus on the average effect of individual variables or interactions. To facilitate the comparability, I have labelled the hypotheses referring to the same (combination of) conditions nonetheless the same.

The second column of Table 2 presents the measurement of the two dependent variables and the five independent variables; I return to the fuzzy-set calibration column when discussing the fsQCA analysis.

--- Table 2 about here ---

Regression analysis

An important assumption in regression analysis is that the observations are independent from one another. As the unit of analysis is a government, this assumption might be violated. This proves not to be the case. The Durbin-Watson test statistic for autocorrelation is 2.457, indicating that the errors of the 53 cabinets are uncorrelated and can therefore be treated as independent observations. There is no multicollinearity between the five variables, as the VIF scores are between 1.0 and 1.6. The full regression equation is:

$$\Delta \frac{ALMP}{TLMP} = \beta_0 + \beta_1 gov\_left + \beta_2 openness + \beta_3 corporatism + \beta_4 unemployment + \beta_5 growth + \beta_5 interaction + \varepsilon$$

To test the effect of the three interaction variables (gov_left*openness, gov_left*corporatism, and gov_left*unemployment), I run four models: a baseline model without the interaction variables and three regression analyses that include one interaction at the time. With 53 cases, there are not enough cases to warrant the inclusion of more than one interaction per

model. Also the more interactions per model, the higher multicollinearity becomes. Table 3 presents the results of the analyses.

--- Table 3 about here ---

The results of the regression analyses are straightforward. In all four models, unemployment reaches statistical significance in the expected, negative direction. The lower is the level of unemployment, the more governments activate. This finding supports Vis' hypothesis of the relevance of a sound socio-economic situation (H1). The other factor to capture this situation, growth, has a significant, positive bearing on activation in models 2 & 4, but fails to reaches significance in the other two models. As hypothesized (H2), leftist partisanship, corporatism and openness have no significant effect on activation. Leftist partisanship and openness do have the expected sign (positive), while effect of corporatism varies across the models (negative in three models and positive when the interaction between leftist partisanship and corporatism is included). With respect to the interaction terms, only the interaction between leftist partisanship and unemployment seems significant, though it requires calculation of the conditional effect of the interaction to be sure of this statement (Brambor et al. 2006) – an issue I turn to in the next version of the paper. The positive effect thus far supports Rueda's (2007) expectation. Overall, the regression analyses find that the higher the change in the level of unemployment during a cabinet period, the lower the change in spending on ALMPs as a share of total labour market spending; the other variables (economic growth, partisanship, corporatism and openness) have no overall significant influence.

FsQCA analysis

To what extent do the findings of the fsQCA analysis corroborate those of the regression analysis? Are where do they differ? Before we can answer these questions, we first need to transform the raw data – as used in the regression analysis – into fuzzy-sets, the so-called calibration process (Ragin 2008: chapters 4 & 5, see Vis 2010a: chapter 2). A fuzzy-set is a '(…) a fine-grained, [pseudo] continuous measure that has been carefully calibrated using substantive and theoretical knowledge relevant to set membership' (Ragin 2000: 7). While it is still uncommon in the social sciences to use calibrated measures, the use of such measures is routine practice in fields such as chemistry, astronomy, and physics (Ragin 2008: chapter 4). In many applications, uncalibrated measures are inferior to calibrated ones. An uncalibrated measure for temperature, for example, only indicates if an object has a higher temperature than another object or than the average object; it does not tell us if the object is hot or cold. Similarly, an uncalibrated measure of democracy makes clear that a particular coun-

try is more democratic than another or than the average country, but does not inform us whether a country is in fact democratic. Calibration is particularly relevant when one condition shapes the context for other conditions. Knowledge of the phase shifts can help the calibration process. For example, water changes form at 0°C (from liquid into solid) and at 100°C (from liquid and quiet into liquid and bubbly). Although form changes occur less frequently in the social sciences, phase shifts are abound. One finds them, for instance, in scope conditions. Only when a particular threshold is achieved, for instance a particular level of per capita income, does a relationship hold. Because of the practice of calibrating in fuzzy-set logic, this approach's measurement practice fits both qualitative researchers' interest in interpreting variation (that is, identifying relevant and irrelevant variation) and quantitative researchers' interest in precisely placing cases relative to one another (Ragin 2008: 74ff). It allows for combining the best of both worlds.

For calibrating fuzzy-sets, the researcher establishes when a case is 'fully in' a set (1), 'fully out' of it (0) and when it is 'neither in nor out' of the set (the so-called cross-over point) (.5) using external criteria, in particular theoretical and substantive knowledge (Ragin 2000: 169; 2008: chapter 4 and 5). The third column in Table 2 displays the fuzzy-set calibration for the outcome and the conditions (for more information on the coding decisions, see Vis 2010b).

For the analysis, I use the fsQCA 2.5 software (available at www.compasss.org). The so-called truth table algorithm transforms the fuzzy-set membership scores into a truth table, which lists all logically possible combinations of causal conditions and each configuration's empirical outcome (Ragin 2008: chapter 7). The algorithm uses the direct link between the truth table rows and the corners of the property space, that is the multidimensional space including all logically possible combinations of causal conditions (configurations). This paper's property space has 2^5 (GROWTH, UNEM, LEFT, CORP, OPEN) (=32) corners (the configurations). The truth table, available upon request, reveals nine logical remainders, that is, configurations with no empirical observations. This finding means that the variation in the data is limited, as not all possible configurations are observed empirically. However, the degree of limitedness is fairly low since over 70 per cent of the configurations are observed empirically.

After having reviewed the truth table, we logically minimize the table using Boolean algebra to reveal the combinations of causal conditions that are sufficient for producing the outcome (Ragin 2008: chapter 7). The researcher needs to decide what to do with the logical remainders. The most complex solution arrives if no so-called simplifying assumptions are employed, that is when the positive cases are set 'true' and all other cases 'false'. Simplifying assumptions are statements about the hypothetical outcome of the logical remainders. The most parsimonious solution of fsQCA is attained if the positive cases are set 'true', the negative cases 'false', and the remainders 'don't care'. I employ the most complex solution, as that

is the most conservative approach, and report the results of the most parsimonious solution in a note.

In set-theoretical logic, logical AND (*) refers to intersection of sets and logical OR (+) to the combination of sets. Moreover, capitals indicate the presence of a condition and lower-cases its absence. The fsQCA analysis finds that there are four routes, or causal recipes, towards activation (ACT):[6] 1) decreasing unemployment combined with leftist government and the absence of corporatism OR 2) decreasing unemployment combined with the presence of corporatism and with leftist government OR 3) decreasing unemployment combined with the presence of openness and with improving economic growth OR 4) the presence of corporatism combined with the presence of openness and with the presence of economic growth and with a leftist government. Table 4 presents the results in fuzzy-set notation.

--- Table 4 about here ---

The coverage of the full solution is .74; the consistency is .91.[7] Consistency indicates the degree to which the sub-set relationship holds for sufficiency. Coverage gives an indication of the degree to which cases correspond to the (combination of) conditions. This result this in 91 per cent suffices to bring about increased spending on ALMPs, covering 74 per cent of the cases.

The fsQCA findings indicate that without an improving socio-economic situation, in the form of a reduction in unemployment and/or improving economic growth, governments will not increase active spending. In all but one of the paths, a decreasing level of unemployment is needed for activation. Consequently, an improving socio-economic situation is thus almost always a necessary condition – as hypothesized (H1). Decreasing unemployment is only sufficient for activation in combination with other conditions (the presence of openness and leftist government *or* the absence of corporatism and leftist government *or* the presence of openness and improving economic growth). As expected (H2), leftist partisanship, corporatism and openness are thus INUS conditions. The results of the fsQCA analysis also offer some support for Bonoli's hypothesis that the combination of leftist partisanship and openness fosters activation. Specifically, in two of the four paths, the combination of leftist partisan-

[6] There is a fifth path towards activation, unem*open*CORP*RIGHT. I exclude this path from the fsQCA result since the unique coverage is only .009. This indicates that, rounded, zero cases have membership to only this path.

[7] The most parsimonious solution is unem*LEFT + GROWTH*LEFT + unem*open*CORP + unem*GROWTH*OPEN (coverage: .75, consistency: .89). The intermediate solution, involving easy counterfactuals for the logical remainders (in this case that a case should be out of the set of unemployment for displaying the outcome and in the set of growth, see Ragin 2008: chapter 9), is identical to the complex solution displayed in the main text. This is probably due to the relatively low number of logical remainders.

ship and openness is part of a larger combination of conditions that is sufficient for activation. Having only a leftist government and openness is thus not enough. The same applies to Rueda's expectation of a positive effect of leftist partisanship and the absence of corporatism (H5). One of the paths displays this combination, but again another condition is needed to have a combination of conditions that is sufficient for activation. Moreover, one of the other paths invalidates Rueda's hypothesis, since also the presence of corporatism and leftist partisanship – and other conditions – brings about activation. Finally, the fsQCA analysis contradicts Rueda's other hypothesis of an effect of increasing unemployment and leftist partisanship (H5). Instead, the analysis shows that it is the reduction of unemployment that matters (combined with leftist partisanship and/or other conditions). Interesting, this is the only point where we see a clear difference between the findings of the regression analysis and the fsQCA analysis. While the (preliminary) model including the interaction between leftist partisanship and unemployment revealed a positive effect for unemployment, the fsQCA analysis finds that the reduction of unemployment is relevant. Still, given that I have not yet calculated the conditional effect of the interaction term, we cannot exclude the possibility that the conditional effect is in line with the fsQCA results.

Overall, the results of the two approaches certainly prove more complementary than conflicting, as the absence of unemployment entered in each of the causal paths of the fsQCA analysis. This suggests that low unemployment is an important condition that comes close to being necessary for activation. The fsQCA analysis showed that the effect of corporatism could go either way, as both the presence *and* the absence of this condition enter in a (different) causal path. In a regression analysis, such a pattern would amount in a non-significant finding (as it also did). A low correlation between variables – as in the case of corporatism – does not exclude the existence of a necessary and/or sufficient relationship (see Mahoney 2004: 18-19).

Comparative advantages?

What can we take from the comparison of the regression analysis and the fsQCA analysis of the conditions under which government activate? What do the analyses teach us with respect to these approaches' strengths and weaknesses for moderately large-n studies? A first advantage of configurational methods for studies with a moderately large-n is the possibility of addressing multiple conjunctural causation. This is particularly important when it is likely, or theorized, that there are more ways than one to bring about the outcome or that the causal conditions combine in complex ways. In regression analysis, there is a limit to the number of interaction effects that can be included in one analysis, which lies in a typical moderately large-n study around one. This means that complex theoretical arguments might be hard to

test or be even un-testable. In this paper's empirical example, we have seen that the five hypotheses, including three with interactions, could not be tested simultaneously. A second advantage of configurational comparative methods for studies of all kind of *n*'s that also became apparent in this paper is the possibility of identifying the combinations of multiple causes. In regression analysis, the interpretation on an interaction consisting of more than two variables is challenging – to say the least (Braumoeller 2004). Here, if an outcome (dependent variable) occurs and the given cause (independent variable) does not, it counts as negative evidence for the strength of that causal relationship (Epstein, Duerr, Kenworthy & Ragin 2008: 68). This means that a factor that influences the outcome in only a subset of cases – but some cases nonetheless – becomes invisible in regression analysis; in fact, it only inflates variance and deflates coefficients. Configurational comparative methods, contrarily, can identify the causal patterns that differ across subsets of cases, allowing more complex causal narratives to be found. The results of the fsQCA analysis also revealed that the idea of causality differs from a traditional quantitative approach. The different paths identified fit nicely with the notion of equifinality, that is the notion that there are more, but only a few, roads to Rome. The findings also display conjunctural causation: the idea that it are not so much individual variables that affect the outcome but conjunctions of conditions that do. Moreover, the fsQCA results indicates that causality is not symmetric in the sense that if the presence of a condition (or a high score) leads to the presence of the outcome, its absence (a low score) produces the absence of the outcome.

An important strength of regression analysis over fsQCA is that it allows for assessing the average effect of a variable. This possibility is particularly relevant if the scholar's theory emphasizes a particular factor and he or she want to estimate how large the net impact of this variable on the dependent variable is. With the recently developed coverage and consistency measures (Ragin 2008: chapter 3), configurational approaches have an option to assess the empirical relevance of results. However, these measures focus on the empirical relevance and set-theoretical importance of the separate paths ("causal recipes") to the outcome and the overall solution and cannot tell what an individual condition's contribution is.

All in all, the results of the fsQCA analysis were (much) more detailed, with no less than four causal paths emerging from the analysis that each consist of at least two conditions. This supports Ragin's (2008: 177) argument that when it comes to analyzing causal complexity, configurational comparative methods trump traditional quantitative approaches, or what Ragin labels net-effects thinking. To be fair to regression analysis, note that also the fsQCA analysis could not account for all 53 cases. For one, there were cases that did activate yet had no membership to one of the paths (Rocard 1 et al., Lubbers 3, Guterres 2, Felber, Bildt 1, Kok 2, Reagan 2, Bolger 2). Inspection of the deviating cases suggests that there is no (single) factor that these cases share, such as period in office, type of government, that can explain

this variation. The cases also do not group together in any meaningful way; there is simply no pattern to detect. Theoretically, it is possible to delve into the details of these cases using primary or secondary literature to identify what are the conditions under which each specific case pursued activation. Practically, however, with eight cases, such an endeavour would probably mean going (much) over the typical maximum article length. Moreover, the fsQCA analysis reveals that two governments should have pursued activation, because of their membership to at least one of the paths, but did not (Dehaene 2 and Lipponen 2). To understand the conditions under which governments pursue activation or not fully, one also needs to study these two cases; making the number of cases to examine in more detail ten. The larger the number of cases in a fsQCA analysis, the larger the number of such cases may be. Consequently, providing an account of (all) these cases might not be possible. This is the price to pay for conducting a fsQCA analysis with a moderately large-*n*.

Discussion

This paper has shown that both fsQCA and regression analysis have something to offer for moderately large-n studies. Regarding the former, one has to accept that with such an *n*, being able to account for *all* cases is likely difficult. While most scholars using regression analysis would probably be quite or even very happy when they can explain almost 80 per cent of the variation in their dependent variable (depending on the type of regression analysis pursued of course), for someone interested in the actual cases, a failure to account for the outcome of 20 per cent of them is disappointing – to say the least. With a higher number of cases, the fsQCA analysis paints more of the broad picture. From a qualitative perspective, this is a price to pay indeed. However, it may be one worth paying since an advantage of a moderately large-n is that complementing the results with a regression analysis becomes an option. This allows for different yet complementary hypotheses to be tested within one study and generates more insights into a research topic.

Summing up, this paper has tried to contribute to the recent literature of comparative methods by examining the strengths and weakness of regression analysis and fsQCA analysis for studies with a moderately large-n. Despite the increased attention for the combination of configurational approaches with more traditional statistical or case-oriented techniques, most focus has so far been on studies with a large-n or an intermediate-n. Since a moderately large-n study has some specific features, making it neither a perfect candidate for a statistical analysis nor for a configurational comparative method, this new angle is a contribution to the literature. In fact, many research topics are excellent candidates for a moderately large-n analysis. Examples include comparisons of the states of the United States, government behaviour over a period of time in developed democracies, political parties in parliamentary

democracies, protests is a substantial number of countries, etcetera. Conducting fsQCA analysis and regression analysis in one analysis and thereby testing different yet related hypotheses therefore has something to offer for moderately large-n studies. Adding a configurational approach to a regression analysis helps to uncover patterns in the empirical data that otherwise would have remained hidden. Making use of the (set-theoretical) logic underlying fsQCA and a traditional quantitative approach like regression analysis thus seems an excellent way (to stay) out of the "sea of naïveté" Sartori warned us for four decades ago.

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Table 1 Regression analysis versus configurational comparative methods

	Regression analysis	**Configurational comparative methods**
Approach to explanation	Assesses the net or average effect of a variable on the outcome; "effects-of-causes" approach	Accounting for the outcome by means of causal configurations (combinations of causes); "causes-of-effects" approach
	Allows for formal estimation of the magnitude of the impact of a cause	Allows for formal estimation of the magnitude of impact of (the combination of) a cause(s) by means of coverage or consistency measures
Concept of causation	Tendential or correlational relationships; probability/statistical theory	Necessary and/or sufficient (deterministic) causal relationships
Equifinality	Plays no role	Core concept; a few paths to the same outcome

Source: Own composition based on Mahoney & Goertz (2006) and Kenworthy & Hicks (2008: 7, table 1.1).

Table 2 Measurement and fuzzy-set calibration of the outcome and conditions

Dep. var./outcome	Measurement	Fuzzy-set calibration
Activation		
$\Delta \frac{ALMP}{TLMP}$	Change per cabinet period in spending on ALMPs as a share of total spending on labour market policies (Armingeon et al. 2008).	Based on substantive knowledge of the cases, deriving from among others Cox (1998), Huber and Stephens (2001), Clasen (2005) and the OECD Employment Outlooks (various years), the qualitative breakpoints *0* and *1* are placed at -15 and +15. I set the qualitative breakpoint *.5*, at 0. The calibration procedure is as follows. First, all raw data below or above the qualitative breakpoints, that is <-15 and >+15, are recoded as follows (see Ragin 2006): lowest through -15, new value -15; 15 through highest, new value 15. The new minimum and maximum are -15 and +15. Then, the fuzzy-set is computed by taking these transformed raw data and subtracting the lower limit (here: -15) from each score and then dividing the result by the upper limit minus the lower limit, here: 15 - - 15 = 30. In formula: fuzzy-set score = [transformed raw data – lower limit]/[upper limit – lower limit].[8]
Independent variables/Conditions		
Socio-economic situation		
Unemployment	Change in the level of unemployment during the cabinet period (Armingeon et al. 2008, own calculations).	Fuzzy-set score 1.00 unem > 5 .83 2.5 < unem ≤ 5 .67 0 < unem ≤ 2.5 .50 0 .33 -2.5 < unem < 0 .17 -5 < unem ≤ -2.5 0 unem ≤ -5
Economic growth	Change in the level of economic growth during the cabinet period (Armingeon et al. 2008, own calculations).	Idem as unemployment.

Contd/

[8] This procedure is similar to the *direct method of calibration* (Ragin 2008: chapter 5), which is integrated in the fuzzy-set software (fsQCA 2.5, available at www.compasss.org). Although this latter method is preferred over the one adopted here, the direct method cannot deal with negative raw data. Since Vis' data include positive as well as negative scores for the outcome, I cannot use the direct method. Fortunately, a cross-validation between the direct method and the approach taken here – on a different outcome that includes only positive scores – reveals that the results are almost identical, with differences up to about .05 only.

Table 2 continued

Independent variables/Conditions			
Leftist partisanship	Social democratic and other leftist parties as a percentage of total cabinet posts (Armingeon et al. 2008).	Fuzzy-set score 1.00 .87 .67 .55 .45 .33 .17 0	 Gov_left = 0 0 < gov_left ≤ 33.3 33.3 < gov_left < 50.0 Gov_left = 50, with right-wing parties receiving most of the votes Gov_left = 50, with left-wing parties receiving most of the votes 50 < gov_left ≤ 66.6 66.6 < gov_left < 100 Gov_left = 100
Corporatism	The degree of coordination of wage setting coordination as measured by the Kenworthy (2001) index.	Fully out the set CORP (0): 1 on the Kenworthy (2001) index. Countries that score '1' on the Kenworthy index have fragmented wage coordination, which is confined largely to individual firms or plants, and have no corporatist system. Fully in the set CORP (1): 5 on the Kenworthy-index. Countries that score '5' on the Kenworthy index have centralized coordinated wage bargaining by peak confederation(s) or government imposition of a wage schedule/freeze, with a peace obligation, which is typically corporatist. The corporatism variable is recoded into a continuous variable, using the same procedure as for the outcome (see outcome).	
Openness	Total trade in current prices (sum of import and export) as a percentage of GDP (Armingeon et al. 2008).	Fully out the set OPEN (0): 0 per cent. An economy scoring 0 percent on openness is completely closed, having no import or export relations with other countries. Fully in the set OPEN (1): 100 per cent, as that means that a country's trade relations with other countries are so extensive that they (more than) match that country's GDP. The in-between scores are calculated using the same procedure as for CORP and the outcome.	

Table 3 OLS regression of the change in spending on ALMPs as a share of TLMPs

	Model 1 (Baseline)	**Model 2 (H3)**	**Model 3 (H4)**	**Model 4 (H5)**
Constant	-.862	-3.220	-1.453	.064
	(3.047)	(4.497)	(3.650)	(2.630)
Leftist partisanship	.030	.087	.048	.026
	(.027)	(.084)	(.064)	(.023)
Openness	.006	.048	.007	.010
	(.045)	(.075)	(.045)	(.039)
Corporatism	-.076	-.104	.119	-.179
	(1.066)	(1.072)	(1.255)	(.917)
Unemployment	-.457***	-.481***	-.458***	-2.095***
	(.160)	(.164)	(.162)	(.415)
Growth	.567	.603*	.560	.918***
	(.349)	(.354)	(.353)	(.311)
Left*openness [a]		.000		
		(.001)		
Left*corporatism [a]			-.006	
			(.021)	
Left*unemployment [a]				.019***
				(.004)
N	53	53	53	53
R^2	.240	.249	.242	.450

[a] In the next version of the paper, I will calculate the conditional effects of the interaction terms (cf. Brambor et al. 2006).

Notes: *p<.1, **p<.05, ***p < .01. Standard errors between parentheses.

Table 4 Results from the fsQCA analysis

	Path 1	**Path 2**	**Path 3**	**Path 4**	
	unem*corp*LEFT +	unem*OPEN*LEFT +	unem*OPEN*GROWTH +	CORP*OPEN*GROWTH*LEFT	→ ACT
Cases	Keating 2&3; Jospin1; G.Márquez 2; Blair1	Blair 1; Persson 1&2; Carlsson 2&1; Guterres 1; H.Brundtland 3 et al.; Jospin 1; Lipponen 2; Lipponen 1; N.Rasmussen 1, N.Rasmussen 2&3; N.Rasmussen 4; Dehaene 2	Klima 1; Dehaene 2; N.Rasmussen 1, N.Rasmussen 2&3; N.Rasmussen 4; Lipponen 1; Jospin 1; Lubbers 2; Kok 1; H.Brundtland 3etal.; C.e.Silva 1; Aznar 1; Persson 1&2; Delamaruz; Thatcher 2	H.Brundtland 3 et al.; Lipponen 1; N.Rasmussen 4; Dehaene 2; Dehaene 1	
Raw coverage	.33	.42	.63	.34	
Unique cover-age	.03	.03	.14	.02	
Consistency	.96	.92	.93	.94	

Notes: Raw coverage indicates the proportion of cases covered by the particular path; unique coverage is the proportion of cases covered by that path only; consistency indicates that degree to which a configuration (path) is sufficient for the outcome. The cases listed below each path are the ones with membership to that path (i.e. > .5).

Web appendix

Table 2 Activation per government

Government	Period in office	Country	Change in active spending in total spending
Keating 2 & 3	12/91-03/96	Australia	10.78
Howard 1	03/96-10/96		-6.86
Klima 1	01/97-02/00	Austria	6.74
Dehaene 1	03/92-06/95	Belgium	.67
Dehaene 2	06/95-07/99		-1.64
Verhofstadt 1	07/99-07/03		-2.73
Mulroney 2	12/88-11/93	Canada	-1.05
Schlüter 4	06/88-1/90	Denmark	-.38
N.Rasmussen 1	01/93-09/94		1.37
N.Rasmussen 2 & 3	09/94-03/98		.6
N.Rasmussen 4	03/98-11/01		3.99
Holkeri 1	04/87-04/91	Finland	8.91
Aho 1	04/91-4/95		-12.24
Lipponen 1	04/95-04/99		6.17
Lipponen 2	04/99-04/03		-4.81
Jospin 1	06/97-05/02	France	2.5
Kohl 2	01/87-11/90	Germany	2.11
Kohl 3	12/90-10/94		-10.88
Kohl 4	11/94-09/98		-1.13
Haughey 4 & Reynolds 1	07/89-01/93	Ireland	-7.41
Reynolds 2	01/93-12/94		4.52
Lubbers 2	05/86-11/89	Netherlands	3.36
Lubbers 3	11/89-08/94		1.38
Kok 1	08/94-08/98		3.02
Kok 2	08/98-05/02		6.15
Lange 2	08/87-11/90	New Zealand	-8.91
Bolger 2	11/93-12/96		2.29
Bolger 3 & Shipley 1	12/96-08/98		-4.74
H. Brundtland 2	05/86-10/89	Norway	-10.2
H. Brundtland 4 et al.	11/90-10/96		13.05
Bondevik 1	10/97-03/00		-1.36
Stoltenberg 1	03/00-10/01		.38
Cavaco e Silva 1	11/85-08/87	Portugal	4.09
Cavaco e Silva 3	10/91-10/95		-14.8
Guterres 1	10/95-10/99		6.81
Guterres 2	10/99-04/02		4.73
Barroso 1	04/02-07/04		-3.8
González Márquez 2	07/86-12/89	Spain	7.71
González Márquez 3	12/89-07/93		-10.94
Aznar 1	04/96-04/00		13.64
Carlsson 2 & 1	03/86-02/90	Sweden	1.63
Carlsson 3	02/90-10/91		-5.87
Bildt 1	10/91-10/94		.69

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Table A1 continued

Government	Period in office	Country	Change in active spending in total spending
Persson 1 & 2	03/96-09/02		9.97
Stich	12/87-12/91	Switzerland	-14.4
Felber	12/91-12/95		4.74
Delamuraz	12/95-12/99		16.53
Ogi	12/99-12/03		-.09
Thatcher 2	06/83-06/87	UK	11.39
Thatcher 3 &Major 1	06/87-04/92		-13.6
Blair 1	05/97-06/01		8.96
Reagan 2	01/85-01/89	US	11.32
G.H.W. Bush	01/89-01/93		-11.6

Sources: Armingeon et al. (2008); Woldendorp et al. (2000); recent years collected by author from different sources.

Notes: Only those years are included in which the government was office for more than half a year. For coding decisions of cabinets removed or combined with other cabinets, see Vis (2010b).