Does Consultation Count for Corruption? The Causal Relations in the EU-28

Appendix 2 QCA Analyses

Data Preparation

The data set of the analysis is available as a csv file (Data.csv).

The analysis was conducted with the R packages 'QCA' (https://cran.r-project.org/web/packages/QCA/QCA.pdf) and 'SetMethods' (https://cran.r-project.org/web/packages/SetMethods/index.html). For the preparatory work, see the R script, lines 4-14.

There are no missing data in the dataset (line 19 of the R script). The data was explored with the help of the summary function (line 22). Skewness tests were performed, and the distribution of fuzzy values above and below the crossover point (lines 24-53) has been examined.

The results of the skewness tests are outlined below:

	Values < 0.5	Values > 0.5
Corr	0.50	0.50
Thickness	0.43	0.57
Access	0.46	0.54
Choice	0.54	0.46
Information	0.43	0.57
Soccap	0.50	0.50

Accordingly we conclude, there was no severe skewness problem in the data. All conditions and the outcome are good representatives of both the presence of the phenomenon and its absence. Thus, the R object for the subsequent analyses is created (lines 60-61).

Analysis of necessary conditions: Positive outcome

Following Schneider and Wagemann (2012: 278), we start from the analysis of necessity beginning with the single conditions (lines 64-66).

```
                inclN  RoN    covN
-----------------------------------
1  Thickness    0.671  0.570  0.540
2  Access       0.514  0.702  0.537
3  Choice       0.457  0.620  0.438
4  Information  0.514  0.625  0.480
5  SocCap       0.814  0.843  0.814
-----------------------------------
```

```
                  inclN  RoN    covN
-------------------------------------
1  ~ Thickness    0.586  0.879  0.774
2  ~ Access       0.800  0.798  0.767
3  ~ Choice       0.686  0.793  0.716
4  ~ Information  0.657  0.798  0.708
5  ~ SocCap       0.471  0.654  0.471
-------------------------------------
```

The analysis of the single conditions does not reveal any condition to be necessary, but it is notable that 'Soccap' has the highest consistency (= 'inclusion' in R) value. To see which other factors may potentially substitute for 'Soccap', we analyse for disjunctions.

Although our plan is to consider only those disjunctions which reach a consistency threshold of 0.9 (see the recommendation in Schneider and Wagemann 2012: 278), we set a minimum of 0.85 in order to see if there is any disjunction close to 0.9. We set the coverage and 'relevance' thresholds at 0.6, despite knowing that these thresholds are rather low. However, in this way, we can compare different disjunctions and take the decision about the necessity of the disjunction on the basis of the inspection of the XY plots. The 'relevance' parameter has been introduced by Schneider and Wagemann (2012: 233ff.) due to various shortcomings of the coverage parameter, especially in case of skewed data. Often (but not always), the relevance parameter is lower than coverage. The following seven disjunctions result.

```
                          inclN  RoN    covN
-------------------------------------------
1  ~THICKNESS+~ACCESS     0.857  0.763  0.759
2  ~THICKNESS+SOCCAP      0.857  0.738  0.741
3  ~ACCESS+~CHOICE        0.871  0.684  0.709
4  ~ACCESS+~INFORMATION   0.886  0.718  0.738
5  ~ACCESS+SOCCAP         0.929  0.667  0.722
6  ~CHOICE+SOCCAP         0.900  0.649  0.700
7  ~INFORMATION+SOCCAP    0.914  0.645  0.703
-------------------------------------------
```

For theoretical reasons (see the explanations in the article), we zoom-in on those disjunctions with 'Soccap' as one of the components since they indicate which elements of consultation might substitute for social capital in terms of necessity. Three of these disjunctions (#5, #6, and #7) also reach a consistency level of 0.9. A closer inspection of the XY plots for these three disjunctions (lines 71-82) shows that there is no serious problem of trivialness. Certainly, many cases cluster towards the right of the plot (which is quite obvious because of the logical 'OR' which connects the two factors), but there are still enough cases in the middle and left parts of the plot so that it is justified to say that these disjunctions are non-trivial necessary conditions.

[See Appendix QCA Graph 1 here]

[See Appendix QCA Graph 2 here]

[See Appendix QCA Graph 3 here]

In the subsequent analysis of sufficiency, all those remainder rows which contradict these statements of necessity (i.e., ~Soccap*Access, ~Soccap*Choice, ~Soccap*Information) are excluded from the minimization of the truth table. They are coded '0' in the outcome column of the truth table.

Analysis of sufficient conditions: Positive outcome

The analysis of sufficient conditions for the positive outcome [which means perceptions of low corruption] starts from the construction of the truth table. The 'inclusion cut' it set at 1.0 in order to avoid the automatic declaration of truth table rows, which deviate from the perfect consistency value of 1, as sufficient (lines 89-91). The following truth table results:

```
  OUT: output value
    n: number of cases in configuration
 incl: sufficiency inclusion score
  PRI: proportional reduction in inconsistency
```

	THICKNESS	ACCESS	CHOICE	INFORMATION	SOCCAP	OUT	n	incl	PRI
4	0	0	0	1	1	1	1	1.000	1.000
10	0	1	0	0	1	1	1	1.000	1.000
18	1	0	0	0	1	1	1	1.000	1.000
20	1	0	0	1	1	1	1	1.000	1.000
2	0	0	0	0	1	0	4	0.963	0.929
12	0	1	0	1	1	0	1	0.917	0.500
16	0	1	1	1	1	0	1	0.867	0.600
25	1	1	0	0	0	0	2	0.867	0.714
28	1	1	0	1	1	0	1	0.857	0.333
23	1	0	1	1	0	0	1	0.850	0.250
32	1	1	1	1	1	0	2	0.800	0.545
1	0	0	0	0	0	0	3	0.789	0.429
22	1	0	1	0	1	0	1	0.765	0.429
7	0	0	1	1	0	0	1	0.727	0.000
31	1	1	1	1	0	0	7	0.400	0.040
3	0	0	0	1	0	?	0	-	-
5	0	0	1	0	0	?	0	-	-
6	0	0	1	0	1	?	0	-	-
8	0	0	1	1	1	?	0	-	-
9	0	1	0	0	0	?	0	-	-
11	0	1	0	1	0	?	0	-	-
13	0	1	1	0	0	?	0	-	-
14	0	1	1	0	1	?	0	-	-
15	0	1	1	1	0	?	0	-	-
17	1	0	0	0	0	?	0	-	-
19	1	0	0	1	0	?	0	-	-
21	1	0	1	0	0	?	0	-	-
24	1	0	1	1	1	?	0	-	-
26	1	1	0	0	1	?	0	-	-
27	1	1	0	1	0	?	0	-	-
29	1	1	1	0	0	?	0	-	-
30	1	1	1	0	1	?	0	-	-

The truth table rows #4, #10, #18 and #20 are included into minimization, since they show the perfect consistency value of 1.0. As for the other truth table rows, we do not only base our decision on the consistency value (which nevertheless is the most important indicator for sufficiency), but check every truth table row one-by-one. Our aim is to see whether its consistency value is based on a true logical contradiction (and should thus not be included into

minimization) or whether there are rather smaller deviances from perfect sufficiency (which still allow for an inclusion) (for this procedure, see Wagemann 2017: 16f.; similarly: Schneider and Wagemann 2012: 279). In such a procedure, it can happen occasionally that a truth table row with a higher raw consistency value is not included in the minimization, while a row with a lower raw consistency value instead is included. This takes into account the fundamental step of every QCA is to define truth table rows as sufficient or not. This decision "should not be an automatic procedure (which is, however, unfortunately an option in many software applications)" (Wagemann 2017: 17). Our procedure takes this into account.

Row #2 undergoes the first check, since its consistency value of 0.96 seems high enough (lines 93-97). The resulting XY plot shows that the only outlier case is Italy, with a membership of 0.4 in the condition (i.e., truth table row #2) and of 0.2 in the outcome. This is not a 'true contradiction' as Schneider and Wagemann (2012: 334) define it; it is rather an inconsistent irrelevant case, so that it is decided to accept row #2 into minimization. The truth table is modified accordingly (lines 98-100).

Row #12 also has a high consistency value of 0.92. However, the XY plot (produced through lines 103-107) shows that all cases (but one) are in the left part of the plot. Even more, all (but one) cases only have a membership of 0.2 or 0.0 in this condition. So, this condition hardly empirically exists. This is also the reason for its low PRI value (0.50) which suggests that the truth table row could also be considered as a sufficient condition for the absence of the outcome (Schneider and Wagemann 2012: 238ff.). (Indeed, as will become clear below, it will subsequently be used for the explanation of the absence of the outcome). This, and the fact that the only case which has a value > 0.5 in the condition (Malta) is a true contradiction (outcome = 0.4) do not permit the inclusion of row #12 in the minimization, despite its rather high consistency value. This follows our reflections detailed above. The truth table is not further modified.

As for row #16 with a consistency of 0.87 (production of the XY plot: lines 111-115), there are some deviant cases, but they all are irrelevant, since they all have a membership value in the condition of 0.2 and in the outcome of 0.0. The PRI value is also a bit low, but there is one positive case in the right-hand side of the plot and above the diagonal, namely the UK. As the article shows, including row #16 in the minimization will produce an own explanatory path which is a direct consequence of the uniqueness of the UK case as it is visible from this graph.

We include the row and to change the truth values of the outcome accordingly (lines 116-118).

The plot on row #25 which has the same consistency value as row #16 (0.87), but a higher PRI value (0.71), is especially interesting. There are no deviant cases to the left of the x = 0.5 line. The only true logical contradiction is Latvia (condition = 0.6, outcome = 0.2), but, different from Malta in row #12, there is also an onlier on the right-hand side of the plot, namely Portugal (condition = 0.6, outcome = 0.6). So, there are reasons not to include this row into minimization (namely, the deviant Latvian case) as well as for including it (a generally high consistency value, and Portugal as an onlier case). Indeed, both variants are subsequently produced. In the article, the decision is to include this row into minimization, since it represents the only sufficient configuration of conditions with social capital being absent. The truth table is changed accordingly (lines 126-129). Nevertheless, the analysis is subsequently repeated, without row #25 (see below), also as a robustness test.

No other truth table row is inspected, not only because raw consistency values continuously decrease but also since the very low PRI values suggest that simultaneous subset relations (Schneider and Wagemann 2012: 237ff.) could complicate the situation and that no clear statement is possible.

Apart from row #12, which was not included into minimization for the reasons given above, this results in a raw consistency threshold ("inclusion cut") of approximately 0.86.

Independent of the subsequent analysis (i.e., with or without row #25), the logical remainders which would contradict the finding on the necessary disjunctions (see above) are excluded from minimization. This concerns all those remainders which show the combinations ~Soccap*Access (rows #9, #11, #13, #15, #27 and #29), ~Soccap*Choice (rows #5, #13, #21 and #29) and ~Soccap*Information (rows #3, #11, #15, #19 and #27). These are subsequently excluded (lines 132-143).

The truth table to be minimized looks as follows. It only contains seven true remainder rows.

```
OUT: output value
    n: number of cases in configuration
 incl: sufficiency inclusion score
  PRI: proportional reduction in inconsistency
```

	THICKNESS	ACCESS	CHOICE	INFORMATION	SOCCAP	OUT	n	incl	PRI
4	0	0	0	1	1	1	1	1.000	1.000
10	0	1	0	0	1	1	1	1.000	1.000
18	1	0	0	0	1	1	1	1.000	1.000
20	1	0	0	1	1	1	1	1.000	1.000
2	0	0	0	0	1	1	4	0.963	0.929
12	0	1	0	1	1	0	1	0.917	0.500
16	0	1	1	1	1	1	1	0.867	0.600
25	1	1	0	0	0	1	2	0.867	0.714
28	1	1	0	1	1	0	1	0.857	0.333
23	1	0	1	1	0	0	1	0.850	0.250
32	1	1	1	1	1	0	2	0.800	0.545
1	0	0	0	0	0	0	3	0.789	0.429
22	1	0	1	0	1	0	1	0.765	0.429
7	0	0	1	1	0	0	1	0.727	0.000
31	1	1	1	1	0	0	7	0.400	0.040
3	0	0	0	1	0	0	0	-	-
5	0	0	1	0	0	0	0	-	-
6	0	0	1	0	1	?	0	-	-
8	0	0	1	1	1	?	0	-	-
9	0	1	0	0	0	0	0	-	-
11	0	1	0	1	0	0	0	-	-
13	0	1	1	0	0	0	0	-	-
14	0	1	1	0	1	?	0	-	-
15	0	1	1	1	0	0	0	-	-
17	1	0	0	0	0	?	0	-	-
19	1	0	0	1	0	0	0	-	-
21	1	0	1	0	0	0	0	-	-
24	1	0	1	1	1	?	0	-	-
26	1	1	0	0	1	?	0	-	-
27	1	1	0	1	0	0	0	-	-
29	1	1	1	0	0	0	0	-	-
30	1	1	1	0	1	?	0	-	-

For the so-called intermediate solution, following the expectations detailed in the article, we assume that ‘access’, ‘choice’, and ‘information’ have a positive effect on corruption. We do not make any assumptions about ‘thickness’ and ‘social capital’.

Making these assumptions produces an intermediate solution which is equal to the conservative solution. While all three solutions (also the ‘most parsimonious solution’) represent in the same way those truth table rows for which we have sufficient empirical information, they differ with regard to their assumptions for the logical remainders. Regarding the conservative solution, no assumptions are made (Schneider and Wagemann 2012: 324); it

(and in our case also the intermediate solution, which is identical to the conservative one) is *only* based on the available empirical information. Since the goal of our analysis is to look at existing cases when interpreting the solution paths, relying on a strategy which emphasizes empirically observable cases over counterfactuals, we choose the conservative and intermediate strategies, respectively.

While the conservative = intermediate solution is given in the article (note that the results of these two solution types do not differ no matter if 'row dominance' is set 'true' or 'false'), this is the result for the most parsimonious solution (lines 147-160):

```
                                  inclS  PRI    covS   covU
-----------------------------------------------------------
1  ~THICKNESS*CHOICE*SOCCAP       0.882  0.667  0.214  0.071
2  THICKNESS*~CHOICE*~INFORMATION 0.893  0.786  0.357  0.029
3  ~ACCESS*~CHOICE*SOCCAP         0.976  0.957  0.571  0.071
4  ~CHOICE*~INFORMATION*SOCCAP    0.972  0.952  0.500  0.014
-----------------------------------------------------------
                                  0.891  0.818  0.700
```

Its paths are a bit simpler than the ones in the solution given in the article (paths #1 and #2 have three and not five components, path #4 has three and not four components, and path #3 is equal in all solutions), the consistency value is slightly lower (0.89 compared to 0.91), and the coverage value slightly higher (0.70 instead of 0.69). The simplifying assumptions concern no fewer than five logical remainders (rows #6, #8, #14, #17 and #26). Setting 'row dominance' to 'false' gives six different models. Yet, note that the most parsimonious solution is not used for substantial interpretation (and a decision between the six models would require precisely such a theoretical argumentation, so that we do not follow up on this.

As for the four paths of the solution for sufficiency, XY plots are provided (lines 163-183):

[See Appendix QCA Graph 4 here]

[See Appendix QCA Graph 5 here]

[See Appendix QCA Graph 6 here]

[See Appendix QCA Graph 7 here]

The country cases which are covered by each path are visible from the single plots and are mentioned (and discussed) in the article. An overall plot (inserted in the article) shows the final solution (lines 185-189).

When instead not accepting row #25 into minimization (this variant is only shortly treated in the article), the conservative and the intermediate solution again coincide (lines 193-210):

```
                                                  inclS  PRI    covS   covU
-----------------------------------------------------------------------------
1  ~ACCESS*~CHOICE*SOCCAP                         0.976  0.957  0.571  0.171
2  ~THICKNESS*~CHOICE*~INFORMATION*SOCCAP         0.966  0.938  0.400  0.014
3  ~THICKNESS*ACCESS*CHOICE*INFORMATION*SOCCAP    0.867  0.600  0.186  0.057
-----------------------------------------------------------------------------
                                                  0.939  0.897  0.657
```

The solution is equal to the one produced before, with path 4 (which represents row #25) missing. Consequently, the overall parameters change as well as the unique coverage for the first path (now 0.17 instead of the previous 0.13).

The most parsimonious solution (again with row dominance, since no interpretation is aimed at) is:

```
                                 inclS  PRI    covS   covU
-----------------------------------------------------------
1  ~THICKNESS*CHOICE*SOCCAP      0.882  0.667  0.214  0.071
2  ~ACCESS*~CHOICE*SOCCAP        0.976  0.957  0.571  0.071
3  ~CHOICE*~INFORMATION*SOCCAP   0.972  0.952  0.500  0.014
-----------------------------------------------------------
                                 0.940  0.897  0.671
```

Also in this analysis, there is one fewer path and the parameters obviously also change.[1]

<u>Analysis of necessary conditions: Negative outcome</u>

For the negative outcome [which means perceptions of high corruption], we followed the same steps as before. We start again from the analysis of necessity, with the single conditions and their complements first (lines 225-228).

```
-----------------------------------
1  Thickness    0.829  0.646  0.667
2  Access       0.757  0.839  0.791
3  Choice       0.729  0.753  0.699
```

[1] With the help of the R script (lines 213-219), an XY plot of the overall solution can be produced for the conservative = intermediate solution.

```
4  Information  0.729  0.730  0.680
5  SocCap       0.471  0.654  0.471
-----------------------------------

                  inclN  RoN    covN
-------------------------------------
1  ~ Thickness    0.429  0.791  0.566
2  ~ Access       0.557  0.663  0.534
3  ~ Choice       0.414  0.658  0.433
4  ~ Information  0.443  0.688  0.477
5  ~ SocCap       0.814  0.843  0.814
-------------------------------------
```

No single condition or their complement is identified as necessary.

The disjunctions are subsequently analyzed (lines 230-231). The minimum values for the parameters (analysis of disjunctions) are set, as before, to 0.85 for consistency / inclusion, to 0.6 for coverage, and to 0.6 for relevance. The result is as follows; no other disjunctions fulfill these criteria:

```
                           inclN  RoN    covN
---------------------------------------------
1  ACCESS+~SOCCAP          0.929  0.707  0.747
2  CHOICE+~SOCCAP          0.929  0.627  0.699
---------------------------------------------
```

Two disjunctions are identified to be necessary. The two corresponding XY plots do not suggest any problems with regard to trivialness (lines 233-240). As before, there are a number of cases towards the right of the plot but still together with a certain number of cases in the middle and to the left of the plots.

[See Appendix QCA Graph 8 here]

[See Appendix QCA Graph 9 here]

As before, it is decided not to accept any remainder rows into minimization which contradict the two statements on (disjunct) necessity.

Analysis of sufficient conditions: Negative outcome

As with the positive outcome, the initial truth table for the analysis of sufficiency is constructed with only the perfectly consistent truth table rows having a truth value of 1.0 (lines 246-248). As before, a subsequent one-by-one check should indicate whether other truth table rows still represent sufficient conditions. The preliminary truth table looks as follows:

```
  OUT: output value
    n: number of cases in configuration
 incl: sufficiency inclusion score
  PRI: proportional reduction in inconsistency

     THICKNESS ACCESS CHOICE INFORMATION SOCCAP   OUT    n  incl  PRI
 7       0       0      1         1        0       1     1  1.000 1.000
31       1       1      1         1        0       0     7  0.975 0.960
23       1       0      1         1        0       0     1  0.950 0.750
28       1       1      0         1        1       0     1  0.929 0.667
12       0       1      0         1        1       0     1  0.917 0.500
22       1       0      1         0        1       0     1  0.824 0.571
16       0       1      1         1        1       0     1  0.800 0.400
20       1       0      0         1        1       0     1  0.800 0.000
 1       0       0      0         0        0       0     3  0.789 0.429
 4       0       0      0         1        1       0     1  0.786 0.000
32       1       1      1         1        1       0     2  0.760 0.455
25       1       1      0         0        0       0     2  0.667 0.286
10       0       1      0         0        1       0     1  0.636 0.000
18       1       0      0         0        1       0     1  0.591 0.000
 2       0       0      0         0        1       0     4  0.519 0.071
 3       0       0      0         1        0       ?     0    -     -
 5       0       0      1         0        0       ?     0    -     -
 6       0       0      1         0        1       ?     0    -     -
 8       0       0      1         1        1       ?     0    -     -
 9       0       1      0         0        0       ?     0    -     -
11       0       1      0         1        0       ?     0    -     -
13       0       1      1         0        0       ?     0    -     -
14       0       1      1         0        1       ?     0    -     -
15       0       1      1         1        0       ?     0    -     -
17       1       0      0         0        0       ?     0    -     -
19       1       0      0         1        0       ?     0    -     -
21       1       0      1         0        0       ?     0    -     -
24       1       0      1         1        1       ?     0    -     -
26       1       1      0         0        1       ?     0    -     -
27       1       1      0         1        0       ?     0    -     -
29       1       1      1         0        0       ?     0    -     -
30       1       1      1         0        1       ?     0    -     -
```

Only row #7 can be included in the minimization by default. More careful decisions have to be taken about every other truth table row.

Starting from row #31 (lines 250-255), we observe that its deviance from perfect consistency is only due to an irrelevant inconsistent case, namely Finland, which has a membership value of 0.2 in the condition and of 0.0 in the outcome. All other cases, above all those seven which are attributed to this truth table row, are onliers. Therefore, there is absolutely no problem to include this row in the minimization. The truth table is adjusted accordingly (lines 256-258).

Plotting row #23 (lines 260-265), we see instead that the only case with a membership of > 0.5 in this truth table row, namely Estonia, is a true logical contradiction. Therefore, row #23 is not included into minimization, following our thoughts noted above that raw consistency values alone cannot be the only reason for the decision on sufficiency, above all in case of true logical contradictions.

The next row, in the sequence of raw consistency values, is row #28. Checking it (lines 268-273) shows that – again – Finland is the only inconsistent case, but it is irrelevant (membership in the condition = 0.2, in the outcome = 0.0). The only case with a membership in the condition > 0.5 is Spain, and this is an onlier. Therefore, row #28 is included into minimization, and the truth table is adjusted accordingly (lines 274-276).

Row #12 is subsequently examined (lines 278-283). Again, we are faced with the same low PRI value as in the analysis of the positive outcome (see above), but – different from before – the country case with a membership in the condition of > 0.5, Malta, is a consistent case. This (and the fact that row #12 was not included into minimization before) is taken as the reason to include row #12 into the analysis of the negative outcome and to adjust the truth table (lines 284-286).

In the consequence, this means that all truth table rows with a raw consistency value above 0.9 (indeed, the value is anywhere in between 0.824 and 0.917) are used for minimization, apart from row #23, for the reasons given above.

Given the drastically decreasing raw consistency values, associated with low PRI values, no other truth table row is inspected. In a further step, those logical remainders are excluded which contradict the statement of (disjunctive) necessity made before. The combination ~Access*Soccap would contradict the necessary disjunction (Access + ~Soccap) and can be found in the remainder rows #6, #8 and #24. The combination ~Choice*Soccap would contradict the disjunction (Choice + ~Soccap) and can be found in remainder row #26. These

rows are excluded from logical minimization (lines 289-294). Strictly speaking, this step is superfluous, since – as was the case with the solution for the positive outcome – the conservative solution is going to be produced for which no assumptions are used anyway. Nevertheless, the truth table itself *is* already the product and the result of the analysis, so that the representation of the complete truth table, with the exclusion of incoherent remainders, is appropriate.

Following this, the final truth table looks like this:

```
  OUT: output value
    n: number of cases in configuration
 incl: sufficiency inclusion score
  PRI: proportional reduction in inconsistency
```

	THICKNESS	ACCESS	CHOICE	INFORMATION	SOCCAP	OUT	n	incl	PRI
7	0	0	1	1	0	1	1	1.000	1.000
31	1	1	1	1	0	1	7	0.975	0.960
23	1	0	1	1	0	0	1	0.950	0.750
28	1	1	0	1	1	1	1	0.929	0.667
12	0	1	0	1	1	1	1	0.917	0.500
22	1	0	1	0	1	0	1	0.824	0.571
16	0	1	1	1	1	0	1	0.800	0.400
20	1	0	0	1	1	0	1	0.800	0.000
1	0	0	0	0	0	0	3	0.789	0.429
4	0	0	0	1	1	0	1	0.786	0.000
32	1	1	1	1	1	0	2	0.760	0.455
25	1	1	0	0	0	0	2	0.667	0.286
10	0	1	0	0	1	0	1	0.636	0.000
18	1	0	0	0	1	0	1	0.591	0.000
2	0	0	0	0	1	0	4	0.519	0.071
3	0	0	0	1	0	?	0	-	-
5	0	0	1	0	0	?	0	-	-
6	0	0	1	0	1	0	0	-	-
8	0	0	1	1	1	0	0	-	-
9	0	1	0	0	0	?	0	-	-
11	0	1	0	1	0	?	0	-	-
13	0	1	1	0	0	?	0	-	-
14	0	1	1	0	1	?	0	-	-
15	0	1	1	1	0	?	0	-	-
17	1	0	0	0	0	?	0	-	-
19	1	0	0	1	0	?	0	-	-
21	1	0	1	0	0	?	0	-	-
24	1	0	1	1	1	0	0	-	-
26	1	1	0	0	1	0	0	-	-
27	1	1	0	1	0	?	0	-	-
29	1	1	1	0	0	?	0	-	-
30	1	1	1	0	1	?	0	-	-

Given that the conservative solution (equal to the intermediate solution) was chosen above, since the formulation of directional expectations appeared to be complicated for the negative outcome, and since the emphasis of this analysis is on case-based interpretation for which

more detailed and more complex solutions seem to be more appropriate than parsimonious solutions, only the conservative solution is produced (lines 298-300). The conservative solution is shown and discussed in the article. Three paths result, for which XY plots are produced (lines 303-318).

[See Appendix QCA Graph 10 here]

[See Appendix QCA Graph 11 here]

[See Appendix QCA Graph 12 here]

A final plot (contained in the article) then shows all the paths of the sufficiency analysis of the complement (lines 320-324).