Reduction of Employment Protection in Europe: A Comparative Fuzzy-Set Analysis

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Abstract

Since the middle of the 1980s many European countries have reduced the strictness of their employment protection mainly by relaxing it for temporary jobs. These countries are Belgium, Denmark, Germany, Greece, Italy, the Netherlands, Portugal, Spain and Sweden. The article explores the conditions of the reduction of employment protection and takes a closer look at the combination of causal factors. It uses fuzzy-set qualitative comparative analysis (fuzzy-set QCA).

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Keywords: employment protection, fuzzy-set QCA, political economy.

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1. Introduction

In a globalised world, structural change is essential if countries wish to preserve their competitive edge and reduce their unemployment. A major obstacle to structural change is employment protection. According to the OECD the summary indicator of the strictness of employment protection legislation (EPL) is relatively high in Europe with the exception of Denmark, Ireland, Switzerland and the United Kingdom.
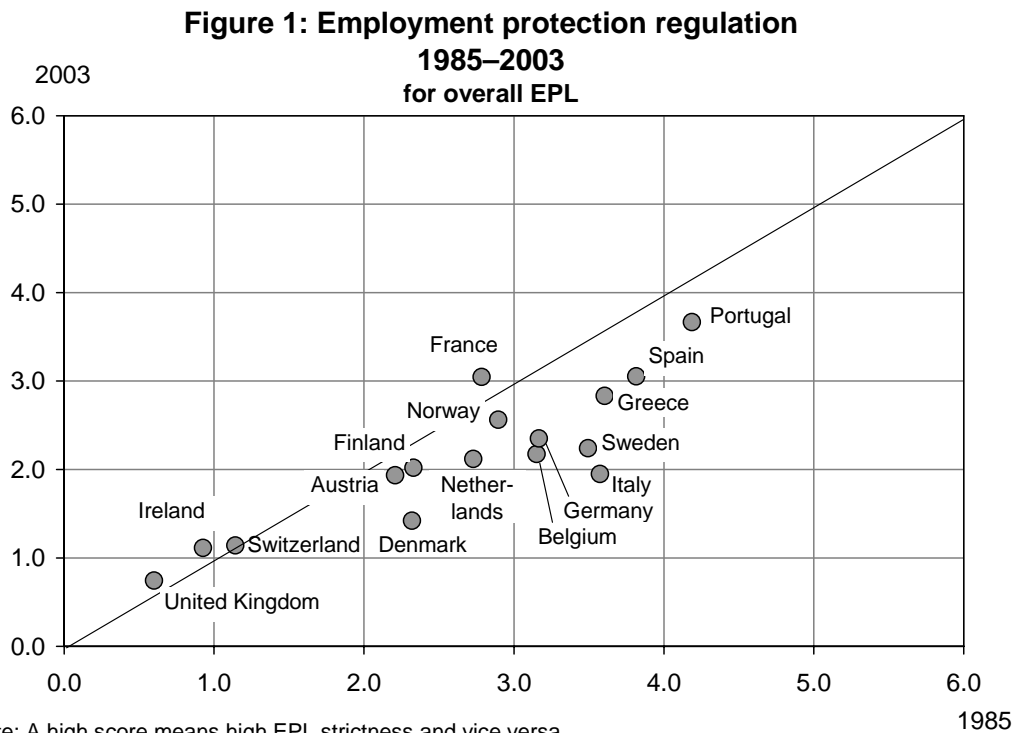
Since the middle of the 1980s many European countries have reduced the strictness of their EPL. These countries are Belgium, Denmark, Germany, Greece, Italy, the Netherlands, Portugal, Spain and Sweden (Figure 1). Governments, however, have pursued a selective approach. They have left existing provisions for permanent contracts practically unaltered (with the exceptions of Portugal and Spain) and only relaxed EPL for temporary jobs (Ochel et al. 2008).

In this article we explore the conditions of the reduction of overall EPL[1]. We include 16 European countries and consider the period from 1985 to 2003. We focus on the political power of incumbent employees to resist EPL reforms, the counterbalancing factors of the generosity of unemployment benefits and the activation of the unemployed, the strength of government to implement EPL reforms, the perception of the importance of employment flexibility by the population and the educational level of the population.

Most quantitative macro-comparative studies on this and similar issues have used regression as the analytical technique. We instead use fuzzy-set qualitative comparative analysis (fuzzy-set QCA).

[1] The overall EPL is composed of regular and temporary EPL.

Figure 1: Employment protection regulation 1985–2003
for overall EPL

2003

Note: A high score means high EPL strictness and vice versa.

Source: OECD, http://www.oecd.org/dataoecd/1/5/39069225.xls.

2. Fuzzy-set QCA

Fuzzy-set QCA is different in several respects from conventional statistical methods (Ragin 2000), and has obtained growing attention, especially in comparative research focused on country-level institutional conditions and categories of countries (Schneider and Wagemann 2006). The method was developed by Charles C. Ragin (1987) as an alternative to the commonly employed regression methods. Unlike regression analysis, fuzzy-set analysis provides analytical tools for comparing cases (e.g., countries) as configurations of qualitative attributes (e.g., institutions). Institutions are treated as sets and countries are viewed in terms of their multiple set membership to show their similarities and differences (Pajunen 2008). Whereas regression analysis assumes linear causation and estimates the average effect of a given variable net of all other variables, fuzzy-set analysis assumes that a given causal factor may be necessary or sufficient in combination with other causal factors (Ragin 2000).

Fuzzy-set QCA consists of specifying a model, of calibrating fuzzy-set scores and of an examination of a "truth table".

A model is understood in this context as a set of causal conditions. To generate the broadest range of solution sets, it is helpful to employ multiple models utilizing various combinations of the included causal conditions (Epstein et al. 2008, 74). The inclusion of causal conditions is based on theoretical and empirical research results on the conditions of EPL reduction.

Apart from model specification fuzzy-set QCA requires the calibration of fuzzy-set scores. Whereas the older variant of QCA (Ragin 1987) required a dichotomization of the variables based on Boolean algebra, the more recent variant (Ragin 2000) also allows values between the extremes of "0" and "1". The so-called "fuzzy-set scores" describe the degree of membership for a given case in the category which is formed by the variable.

When examining the truth table, fuzzy-set QCA builds on a combination of the original Boolean variant and fuzzy-set theory (Schneider and Wagemann 2004, 3). It can be applied in studies based on a small number of cases (Häge 2007). The method is based on set-theoretic relations and focuses on explicit connections between conditions. The key set theoretic relation in the study of causal complexity is the subset relation. As discussed in Ragin (2000), there are cases that sharing several causally relevant conditions uniformly exhibit the same outcome. These cases constitute a subset of instances of the outcome. The subset relation signals that a specific combination of causally relevant conditions may be interpreted as sufficient for the outcome. If there are other sets of cases sharing other causally relevant conditions and these cases also agree in displaying the outcome in question, then these combinations of conditions also may be interpreted as sufficient for the outcome (Ragin 2008b, 42). Fuzzy-set QCA thus allows us to identify multiple pathways to an outcome (Epstein et al. 2008).

The analysis of causal necessity is another important step in fuzzy-set QCA. This procedure looks at which individual factors may be necessary for the outcome to occur. If a theoretically relevant causal condition is necessary, then it is present in all instances of an outcome (Ragin 2000, 203ff.). That means that the membership score on the outcome is consistently lower than the membership score for the causal factor under consideration.

3. Determinants of employment protection

According to the theoretical literature interest groups, politicians (incl. the government), political institutions and social values have to be taken into account when analyzing the political economy of EPL reforms.

The main interest group relevant for EPL reforms are the incumbent employees and their unions who want to protect their jobs by a strict EPL. When the amount of rents that can be appropriated is large and concentrated, workers will better organize themselves and are more determined to oppose EPL reforms. Whereas workers fear being negatively affected by a reduction of the strictness of employment protection, the unemployed stand to benefit. Their chances of finding a job would increase. But workers have a higher propensity to dominate political decisions. They are politically better organized than the unemployed (Fernandez and Rodrik 1992, 1146).

We hypothesize that the resistance of incumbent workers to EPL reforms will be higher for EPL reforms for permanent jobs and lower for EPL reforms for temporary jobs ("reforms at the margin"). This is because incumbent workers are not directly affected by the latter reforms and potentially they are made better off indirectly. They can earn higher wages because labour market tightness increases due to the higher demand for temporary jobs. And if they lose their job they will benefit from the greater job finding probabilities of the unemployed (Saint-Paul 2000, 227-53). The resistance to EPL reforms at the margin should, however, not be negligible. Incumbent workers may recognise that two-tier systems could perhaps be used as an intermediate step towards a complete EPL reform that they are not in favour of. Reforms at the margin gradually build up a stock of workers with temporary contracts. These workers have different interests than those who hold a fixed contract. They can be used as a "political constituency" to support subsequent reforms of core labour market EPL that the government from the beginning may have intended to achieve (Saint-Paul 1996, chap. 11; Dewatripont and Roland 1992). The power of incumbent workers and their unions to resist EPL reforms can not be easily measured. In this article we use union density and collective bargaining coverage as proxies.

Apart from the strength of the trade union movement the strength of the labour movement may also be determined by the electoral strength of left-wing parties (Emmenegger 2009). Left-wing parties are generally supportive of strict job security regulations whereas conservative parties are not (Botero et al. 2004). Our fuzzy-set analysis, how-

ever did not confirm that strong left-wing parties were an obstacle to reducing the strictness of EPL and that strong conservative parties were a guarantee for reducing it.[2] This may be due to the fact that EPL reforms undertaken by a conservative government might be confronted by strong trade union opposition and demonstrations whereas a left-leaning government is perhaps more able to pre-emptively reduce opposition and avoid public protest from trade unions. This phenomenon is known as the "Nixon goes to China" thesis (Ross 2000, 27).

Policy-makers that favour lower EPL strictness can overcome insider resistance to EPL reforms by offering compensating transfers to losers from the reform. Lower dismissal protection may be less worrying to insiders if unemployment benefits become more generous. An activation of the unemployed that increases their reemployment chances may also reduce the resistance of incumbent workers to EPL reforms. According to Roland (2002), governments should follow a long-term, reliable policy of providing compensating transfers in order to be able to secure the political acceptance of EPL reforms by the losers. In this paper we measure the compensating transfers by the generosity of unemployment benefits. We use expenditure on active labour market policies as an indicator for the activation of the unemployed.

The stronger a government the easier it is for the government to implement EPL reforms. Strength of government is related to the number of independent branches of government (executive and legislative branches), the party composition of these branches, the role of the "judiciary" and "sub-federal entities" as players in the political system, etc. If the characteristics of the political system constrain the commitment of government to political change – as indicated by our "Political Constraints Index" – it will be difficult for governments to overcome resistance of incumbent workers to EPL. Broad coalition governments, for example, are considered to be an obstacle to EPL reforms (Alesina and Drazen 1992).

The political economic literature – as summarized above – has so far neglected the fact that the power of incumbent workers and the strength of government may be determined by more fundamental factors, like the prevailing social values. One of the social values that is directly associated to employment protection is the importance attributed to job security by the population. If good job security is considered to be unimportant (or if job

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[2] In a first calculation of the QCA-procedure we found out that left-wing parties have no influence on reducing the strictness of EPL. That's why we do not include the existence of strong left-wing parties in our set of conditions.

flexibility is considered to be important) then it will be relatively easy for a government to reduce the strictness of EPL.

The perception of employment protection may also be determined by the educational level of the population. Skilled workers may oppose a reduction of the strictness of employment protection to a lesser degree than low-skilled workers. They can expect to have better chances in the labour market when losing their job.

A further influential condition may have been the importance of trust[3] as measured by the World Value Survey. However this indicator proves not to have had an impact on the reduction of the strictness of EPL, as was the case for the existence of strong left-wing parties.

4. Calibration of fuzzy-set scores

The second step (after model specification) for analyzing the causes for a reduction of employment protection is to develop fuzzy-set scores. The function of fuzzy-set scores is to show the varying degree to which different cases belong to a set. According to Ragin (2007) fuzzy sets extend Boolean sets by permitting membership scores in the interval between 0 and 1. The basic idea behind fuzzy sets is to permit the scaling of membership scores and thus allow partial or fuzzy membership. A membership score of 1 indicates full membership in a set; scores close to 1 (e.g., 0.8 or 0.9) indicate strong but not quite full membership in a set; scores less than 0.5 but greater than 0 (e.g., 0.2 and 0.3) indicate that objects are more "out" than "in" a set, but still weak members of the set; a score of 0 indicates full non-membership in the set. The 0.5 score is known as the "cross-over point" because it indicates the point of maximum ambiguousness (fuzziness) in the assessment of whether a case is more "in" or "out" of a set.

Calibration is necessary because after calibration it is possible to decide whether the used variables match or conform to external standards (Ragin 2008a, 16). On the basis

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3 A high level of trust of the population could be helpful when a government tries to liberalise employment protection. Trust however, is a general category. It may refer to different groups of persons. With respect to the power of employees, trust can be associated with positive attitudes towards social cooperation. Strong trust may help to overcome collective action problems, thereby sustaining labour unions, and thus fostering resistance to EPL reforms. With respect to the perception of employers by workers, trust may lead to the following behaviour. If workers think that they are fairly treated by employers, they are less likely to demand employment protection. And if people trust politicians, governments may be in a stronger position to implement EPL reforms if they think them to be in the interest of the people.

of these standards, measurements are directly interpretable (Byrne 2002). Fuzzy-sets are calibrated using social knowledge, collective social scientific knowledge or the researchers' own accumulated knowledge, derived from the study of specific cases (Ragin 2008b).

There are two methods of calibration:

• Direct method: This method concentrates on the three qualitative anchors that structure fuzzy-sets,

• Indirect method: This method uses regression techniques to estimate the degree of the set membership based on a six-value coding scheme.[4]

In our analysis we use the direct method.

The direct method, as mentioned above, uses three important qualitative anchors to structure calibration: the threshold for full-membership (fuzzy-score = 0.95), the threshold for full-non-membership (fuzzy-score = 0.05) and the cross-over point (fuzzy-score = 0.5). In a first step the researcher has to determine these three anchors. On the basis of these benchmarks the researcher is able "to transform the original ratio or interval-scale values into fuzzy membership scores, using transformations based on the log odds of full membership" (Ragin 2008a, 17).[5]

For our analysis it is important to code the causal conditions so that high membership scores should be linked to high performance. This means that all causal conditions are expected to contribute to a reduction of EPL only when they are present.

4.1 Fuzzy-set scores for the reduction of EPL

The outcome we analyze is the reduction of EPL. The term EPL refers both to regulations concerning hiring as well as firing. In the first instance, the relevant regulations concern the conditions under which temporary contracts (fixed-term contracts and temporary agency work) may be concluded that offer the possibility of circumventing the provisions of protection against dismissal within a regular employment relationship.

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[4] For further details on the indirect method, see Ragin 2008b.
[5] The procedure for calibrating fuzzy-set scores presented here is mathematically incapable of producing set membership scores of exactly 1.0 and 0.0. These two membership scores would correspond to positive and negative infinity, respectively, for the log of the odds. Instead, scores that are greater than 0.95 may be interpreted as full membership in the target set, and scores that are less 0.05 may be interpreted as full non-membership (Ragin 2008b, 185).

Regulations with respect to dismissal concern the individual termination of a regular employment relationship (collective dismissals are excluded here).

Understanding EPL in all its complexity involves the summing-up, interpretation and assessment of laws, ordinances and court decisions by experts. As a rule, assessments are made by assigning scores. Since EPL is typically multidimensional, the task of reducing it to quantitative indices is not simple. And if the indicators are aggregated to a composite indicator, the problem of weighting arises.

We use the overall OECD indicator of EPL strictness (version 1) as our output (OECD 2004). We measure changes in absolute terms: employment protection rate in 2003 minus employment protection rate 1985.

As mentioned above, fuzzy-set QCA requires the use of set theoretic variables. Hence, we translate the absolute change of employment protection into fuzzy-set scores. The first step is the determination of "good" employment protection change. Figure 2 shows the change of employment protection in all 16 countries. The sharpest decline was experienced in Italy (-1.63). The next best performer was Sweden (-1.25). Both countries were able to truly reduce the strictness of employment protection. We therefore draw the membership line around Italian and Swedish levels, setting their fuzzy-scores to "1". This signifies full membership in the set of strongest reduction of employment protection.

Figure 2: Employment protection change, 1985 to 2003

Employment
protection change,
2003 minus 1985
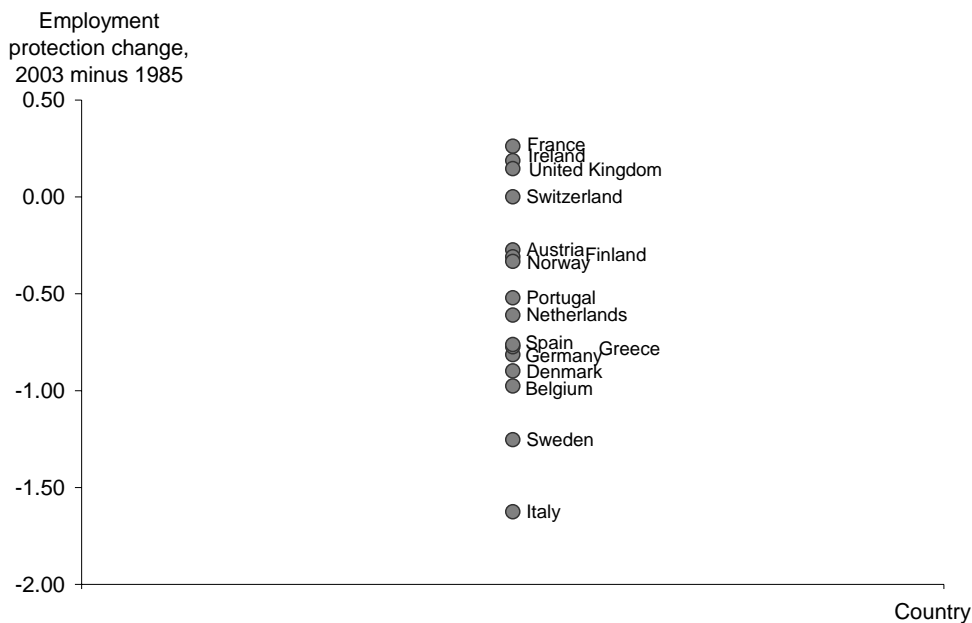
Source: Own calculations.

Similarly, at the other end of the distribution there were countries like France, Ireland and the United Kingdom (0.26, 0.19 and 0.15) which did not reduce but increased the strictness of employment protection. These countries are therefore designated fully out of the set and are coded zero.

The third anchor in determining fuzzy-scores is the cross-over point (0.5). This point separates cases that are more in the set than out from those that are more out than in (Epstein 2008, 71). The obvious breakpoint is between Portugal and Norway.

A simple rescaling of the values for the countries either fully in or fully out[6] captures this breakpoint and distributes these countries between the anchors. Figure 3 shows the fuzzy-set scores for the change of employment protection plotted against raw values.

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[6] The rescaling method is described in detail in Ragin (2008b).

Figure 3: Reduction of EPL fuzzy-set scores by reduction of EPL raw values (2003-1985)

Note: Raw values: EPL 2003 minus EPL 1985. For country abbreviations see Figure 4.
Source: Own calculations.

4.2 Fuzzy-set scores for causal conditions

Incumbent workers and their unions are not able to resist the reduction of EPL if they have little power. The *weakness of trade unions (WU)* is measured using data on trade union density and on collective bargaining coverage. The data on trade union density are from Visser (2006); the data on collective bargaining coverage are from Bassanini and Duval (2006)[7]. The mean of the annual trade union densities from 1985 to 2003 are transformed into fuzzy-set scores.[8] Countries with a low union density are attributed high fuzzy-set scores and vice versa. The same is true for countries with low collective bargaining coverage. The mean of both fuzzy-set scores is our fuzzy-set score for the weakness of trade unions (after having been rescaled with the direct method of calibration) (Table 1 and Figure 4).

Incumbent workers may be more willing to accept a reduction of EPL strictness if they are compensated. Compensation may take place via generous unemployment benefits.

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[7] Unfortunately there are no data on collective bargaining coverage available for Greece. On this account we use the same data for Greece as for Portugal.
[8] For all our causal conditions we calculate the fuzzy-set scores based on their means and the direct method of calibration mentioned above.

The *generosity of unemployment benefits (UB)* is measured by the OECD summary measure of benefit entitlements (OECD, Tax-Benefit-Models). This measure is defined as the average of gross unemployment benefit replacement rates for two earning levels, three family situations and three durations of unemployment. As a high unemployment benefit generosity (measured by the mean of the replacement rates from 1985 to 2003) supports the reduction of EPL strictness, it is attributed high fuzzy-set scores (Table 1 and Figure 4).

An *activation (AC)* of the unemployed, which increases their reemployment chances after having lost a job, may reduce the resistance of the incumbent workers to EPL reforms too. Activation is measured by the OECD public expenditure on active labour market policies as a percentage of GDP between 1985 and 2003. Countries with high percentages, on average, get high fuzzy-set scores and vice versa (Table 1 and Figure 4).

The intention of a government to implement EPL reforms may be restrained by the characteristics of the political system. For our measure *low policy constraints (PC)* we use the "Policy Constraints Index V" of Henisz (2000) and Wharton School (2006). It measures the extent to which a change in the preferences of any one actor of the political system leads to a change in government policy. Countries with a low level of policy constraints are attributed high fuzzy-set scores and vice versa (Table 1 and Figure 4).

The social value that we include in our analysis is the *importance of job flexibility (IS)* as seen by the population. This indicator is taken from the World Value Survey. We use the question: "How important is a good job security in a job?" If the population considers jobs security to be unimportant, which means that it considers job flexibility to be important, it will be relatively easy for a government to reduce the strictness of EPL. The equivalence to such an attitude is high fuzzy-set scores (Table 1 and Figure 4).[9]

The educational level of the population is measured by the *average years of schooling (SC)* of adults (aged 15+). Average years of schooling are the years of formal schooling received, on average, by adults over age 15. This indicator is taken from the Educational Database of the World Bank. If the educational level in a country is high, workers will more easily accept a reduction of EPL strictness. Therefore a high educational level is attributed high fuzzy-set scores (Table 1 and Figure 4).
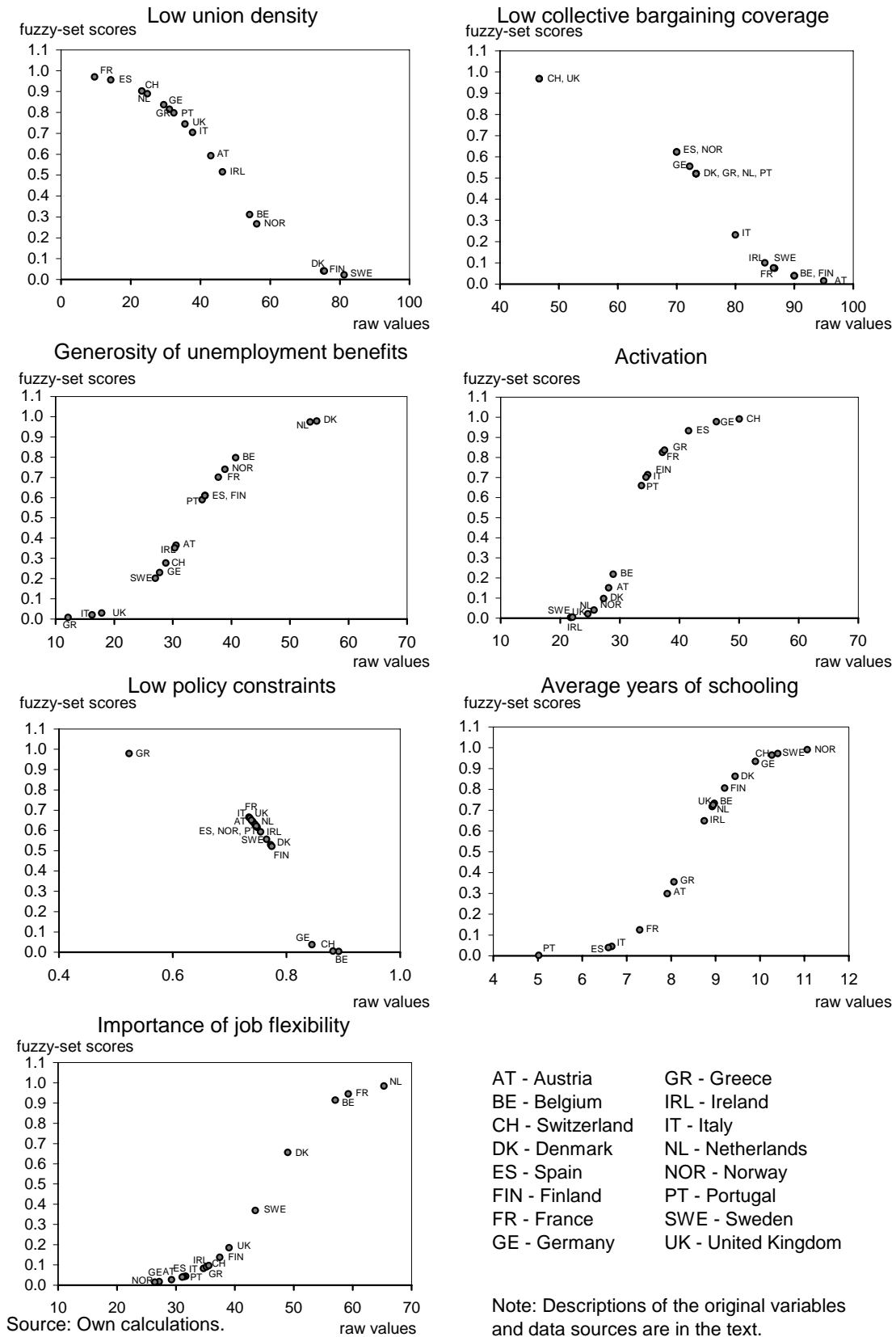
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[9] For the calculations of the mean for *importance of job flexibility* we just used the first answer-option in the survey.

Table 1: Fuzzy-set scores

	Strong reduction of overall EPL	Weakness of trade unions	Generosity of unemployment benefits	Activation	Low policy constraints	Importance of job flexi-bility	Average years of schooling
Austria	0.22	0.13	0.36	0.15	0.64	0.03	0.30
Belgium	0.89	0.04	0.80	0.22	0.00	0.91	0.73
Denmark	0.86	0.11	0.98	0.10	0.53	0.66	0.86
Finland	0.29	0.01	0.61	0.71	0.52	0.14	0.81
France	0.00	0.56	0.70	0.82	0.67	0.94	0.12
Germany	0.81	0.89	0.23	0.98	0.04	0.02	0.93
Greece	0.79	0.86	0.01	0.84	0.98	0.08	0.36
Ireland	0.00	0.13	0.35	0.00	0.59	0.09	0.65
Italy	0.99	0.42	0.02	0.70	0.66	0.04	0.04
Netherlands	0.68	0.90	0.97	0.02	0.63	0.98	0.72
Norway	0.34	0.37	0.74	0.04	0.62	0.01	0.99
Portugal	0.61	0.85	0.59	0.66	0.62	0.04	0.00
Spain	0.78	0.96	0.61	0.93	0.62	0.04	0.04
Sweden	0.95	0.01	0.20	0.00	0.56	0.37	0.97
Switzerland	0.02	0.99	0.28	0.99	0.01	0.10	0.96
United Kingdom	0.00	0.98	0.03	0.00	0.65	0.18	0.72

Source: Own calculations.

Figure 4: Causal condition fuzzy-set scores by raw values

Low union density
fuzzy-set scores

1.1
1.0 FR
0.9 ES CH
0.8 NL GE
GR PT
0.7 UK IT
0.6 AT
0.5 IRL
0.4
0.3 BE
0.2 NOR
0.1 DK FIN
0.0 SWE

0   20   40   60   80   100
raw values

Low collective bargaining coverage
fuzzy-set scores

1.1
1.0 CH, UK
0.9
0.8
0.7
0.6 ES, NOR
0.5 GE DK, GR, NL, PT
0.4
0.3
0.2 IT
0.1 IRL SWE
FR BE, FIN
0.0 AT

40   50   60   70   80   90   100
raw values

Generosity of unemployment benefits
fuzzy-set scores

1.1
1.0 NL DK
0.9
0.8 BE
0.7 NOR FR
0.6 PT ES, FIN
0.5
0.4 IRL AT
0.3 CH
0.2 SWE GE
0.1
0.0 IT UK
GR

10   20   30   40   50   60   70
raw values

Activation
fuzzy-set scores

1.1
1.0 GE CH
0.9 ES
0.8 GR FR
0.7 FIN IT
PT
0.6
0.5
0.4
0.3
0.2 BE
AT
0.1 DK
SWE UK NL NOR
0.0 IRL

10   20   30   40   50   60   70
raw values

Low policy constraints
fuzzy-set scores

1.1
1.0 GR
0.9
0.8
0.7 FR UK
IT NL
0.6 AT
ES, NOR, PT IRL
0.5 SWE DK
FIN
0.4
0.3
0.2
0.1 GE CH
0.0 BE

0.4   0.6   0.8   1.0
raw values

Average years of schooling
fuzzy-set scores

1.1
1.0 CH SWE NOR
0.9 GE
DK
0.8 FIN
0.7 UK BE
NL
0.6 IRL
0.5
0.4 GR
0.3 AT
0.2
0.1 FR
0.0 PT ES IT

4   5   6   7   8   9   10   11   12
raw values

Importance of job flexibility
fuzzy-set scores

1.1
1.0 NL
0.9 FR
BE
0.8
0.7 DK
0.6
0.5
0.4 SWE
0.3
0.2 UK
FIN
0.1 GE AT ES IT IRL CH GR
0.0 NOR PT

10   20   30   40   50   60   70
raw values

AT - Austria   GR - Greece
BE - Belgium   IRL - Ireland
CH - Switzerland   IT - Italy
DK - Denmark   NL - Netherlands
ES - Spain   NOR - Norway
FIN - Finland   PT - Portugal
FR - France   SWE - Sweden
GE - Germany   UK - United Kingdom

Source: Own calculations.

Note: Descriptions of the original variables and data sources are in the text.

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5. Analysis

After model specification and calibration, the next step is the examination of a "truth table". The truth table, according to Epstein et al. (2008, 74), is an analytic device that displays all logically possible combinations of causal conditions and indicates case distribution across these combinations.[10] In fuzzy-set QCA terminology these combinations are called configurations.

The truth table consists of 2^k rows (where k represents the number of causal conditions). The researcher must begin to develop a rule for classifying some configurations as relevant and others as irrelevant. This is based on the number of cases residing in each sector of the vector space defined by the causal conditions. It is accomplished in two steps:

1. by selecting a frequency threshold based on the number of cases with greater than 0.5 membership in each configuration[11] and
2. by distinguishing configurations that are consistent[12] subsets of the outcome from those that are not.[13,14]

Once this procedure has been accomplished, the fs/QCA program produces the truth table (Table 2). The "number" column denotes how many cases conform to the listed configuration. The "outcome" column tells us whether or not a particular causal configuration is treated as an instance of strong EPL reduction based on our pre-decided assumptions. If the outcome denotes a one, we know that this combination is a consistent sufficient condition for the outcome.

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[10] For conducting the fuzzy-set QCA we use the software program fs/QCA 2.0 (www.u.arizona.edu/-cragin/fsQCA/software.shtrnl).

[11] When the total N (number of cases) is relatively small, the frequency threshold should be 1 or 2. When the total N is large, a more substantial threshold should be used.

[12] The consistency ("Consist") score for a configuration is a measure of this subset relationship. It is thus a measure of the extent to which membership strength in the outcome set is consistently equal to or greater than membership in the causal configuration. For each configuration (row in the truth table), minimum membership scores (causal combination versus outcome) are added for all cases. This number is divided by the sum of all minimum membership scores in the causal combination. Formally, the calculation is: Consistency $(X_i < Y_i) = \Sigma$ (min $(X_i, Y_i)/ \Sigma (X_i)$. When membership in outcome Y is less than membership in causal configuration X, the numerator will be smaller than the denominator and the consistency score will decrease. Consistency scores range from 0 to 1, with 0 indicating no subset relationship and a score of 1 denoting a perfect subset relationship.

[13] Consistency values below 0.75 indicate substantial inconsistency.

[14] In our analysis we select a frequency threshold of 1 and a consistency threshold of 0.8.

Table 2: Truth table from analysis of all six causal conditions for the outcome "strong reduction of overall EPL"

Weakness of trade unions	Generosity of unemploy- ment benefits	Activation	Low policy constraints	Importance of job flexi- bility	Average years of schooling	Num- ber	Outcome: Strong reduction of overall EPL	Consist
1	0	1	1	0	0	1	1	0.972
1	1	1	1	0	0	2	1	0.963
0	0	1	1	0	0	1	1	0.957
0	1	0	0	1	1	1	1	0.886
0	1	0	1	1	1	1	1	0.828
1	1	0	1	1	1	1	0	0.789
0	1	1	1	0	1	1	0	0.713
0	0	0	1	0	1	2	0	0.684
0	1	0	1	0	1	1	0	0.657
1	0	1	0	0	1	2	0	0.602
0	0	0	1	0	0	1	0	0.575
1	0	0	1	0	1	1	0	0.462
1	1	1	1	1	0	1	0	0.356

Source: Own calculations.

After the construction of the truth table, the "Standard Analyses", which is the recommended procedure, provides the user with the complex, intermediate and parsimonious solutions.[15] The output includes measures of coverage and consistency for each solution term and for the solution as a whole. "Consistency measures the degree to which membership in each solution term is a subset of the outcome" (Ragin 2008a, 86). In the simplest terms, low consistency means that there is no subset relation between a combination of case aspects and the outcome. As with the assessment of the consistency of truth table rows, scores closest to "1" represent the strongest connection (Epstein et al. 2008, 79).

"Coverage measures the proportion of memberships in the outcome that is explained by the complete solution" (Ragin 2008a, 86). Very low coverage scores indicate that even if a causal configuration is consistent with the outcome, it is substantively trivial. Coverage and consistency often are inversely related to one another, because very particular or exact explanations (which may be highly consistent) tend to be less representative.

Raw coverage" scores refer to the proportion of the outcome scores covered by an explanation by itself, while "unique coverage" refers to the proportion of outcome scores covered, net of that solution's coverage overlap with the other solutions identified (Epstein et al. 2008, 79-80).

6. Findings

In the following, we will present the results of the empirical analysis of the necessary and the sufficient conditions for the presence of a strong reduction of overall EPL.[16]

6.1 Necessary conditions for the outcome "strong reduction of overall EPL"

A condition can be considered as necessary when it is always present when the outcome is present. Schneider and Wagemann (2007; 213) recommend considering conditions to be necessary only if their consistency scores are very high. Table 3 displays the results of the analysis of the necessary conditions for the outcome "strong reduction of overall EPL". As the consistency scores are rather low, no condition can be considered necessary for the presence of a strong reduction of overall EPL.

Table 3: Analysis of the necessary conditions for the outcome "strong reduction of overall EPL"

Condition tested	Consistency	Coverage
WU	0.58	0.58
UB	0.65	0.59
AC	0.63	0.55
PC	0.64	0.64
IS	0.65	0.37
SC	0.58	0.65
Note: Capital letters indicate the presence of a concept, i.e. UB indicates a high generosity of unemployment benefits.		

Source: Own calculations.

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[15] In the complex solution all remainders are set to false. In the parsimonious solution any remainder is used that will help to generate a logically simpler solution, regardless of whether it constitutes an easy or a difficult counterfactual case. In the intermediate solution only remainders are allowed that are easy counterfactual cases. The designation of easy versus difficult is based on user-supplied information regarding the connection between each causal condition and the outcome. Counterfactuals or remainders are combinations of causal conditions which are never almost present in the empirical world. Remainders are configurations with no cases in the data set.

[16] See annex for the empirical analysis of the outcome "weak reduction of overall EPL"

6.2 Sufficient conditions for the outcome "strong reduction of overall EPL"

Whereas a cause is defined as necessary if it must be present for an outcome to occur, it is defined as sufficient if by itself it can produce a certain outcome. Table 4 displays the results of the analysis of the sufficient conditions for the outcome "strong EPL reduction". Two (intermediate) solutions lead to an EPL reduction:

   (a) A combination of a low educational level of the population and a preference for job security with low policy constraints for implementing EPL reforms and a strong activation of the unemployed, and

   (b) strong labour unions combined with a high educational level of the population, generous unemployment benefits and a population that considers job flexibility to be important.

The overall consistency of the solution is 0.95. This is a high consistency level and shows that our solution can explain the reduction of EPL strictness to a large extent. Solution (a) has a raw coverage of 0.37 and a unique coverage of 0.32. The consistency level accounts for 0.98. Solution (b) has a raw coverage of 0.24, a unique coverage of 0.19 and a consistency level of 0.90.

Table 4: Two causal pathways to "strong EPL reduction"

	Coverage		Consistency
	Raw	Unique	
(a) sc*PC*is*AC	0.37	0.32	0.98
(b) SC*wu*UB*IS	0.24	0.19	0.90
Solution coverage: 0.56 Solution consistency: 0.95			
Note: The frequency cutoff has been set at 1.00 and the consistency cutoff was 0.83.			

Source: Own calculations.

Figure 5 shows two scatterplots, each with fuzzy EPL reduction scores on the Y axis and one of the two solutions from Table 4 on the X axis. Every country is coded as its own fuzzy set for its membership in the two combinations of conditions. Each country's score in each combination is determined by its weakest membership in the conditions that constitute the configuration (for further details see Ragin 2007).[17] We recognize that most of the cases (countries) are located above the diagonal line. Perfect causal

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[17] The minimum membership score indicates the degree of membership of a case in a combination of sets. Its use follows "weakest link" reasoning. For example, if a country's membership in the set of poor countries is 0.7 and its membership in the set of democratic countries is 0.9, its membership in the set of countries that are both poor and democratic is the smaller of these two scores, 0.7. A score of 0.7 indicates that this case is more in than out of the intersection (Ragin 2007).

sufficiency (consistency = 1.00) would, however, be in evidence if every case were located above the diagonal. Only then would fuzzy-set scores of the outcome be higher than the fuzzy-set scores of the combinations of conditions. Consequently a condition can be considered as sufficient. That is the case for our two configurations. No country lies far below the line.

Figure 5: "Strong EPL reduction" by causal configurations
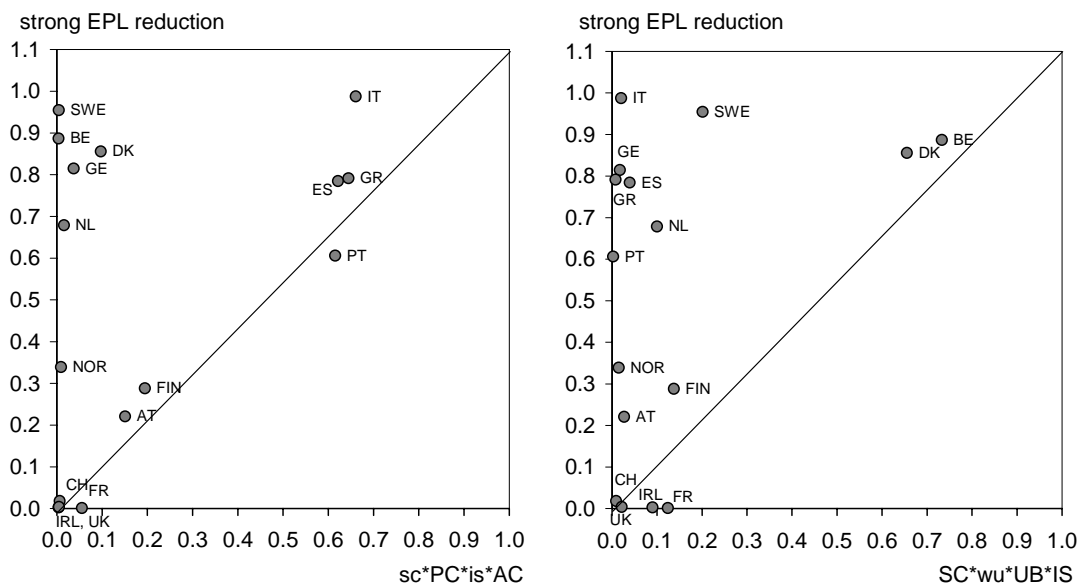
Note: For country abbreviations see Figure 4.
Source: Own calcualtions.

Cases above the diagonal line should be located close to the diagonal line. If this were the case, a perfect correspondence between cause and outcome would exist and the reduction of EPL would be explained quite well by the relevant solution. Germany clearly does not conform to this criterion in configuration (a), which is the best solution for Germany (see below). Sweden clearly does not conform in configuration (b), which is the best solution for this country.[18]

The scatterplots show us that configuration (a) fits best to Austria, Finland, Greece, Italy, Portugal and Spain. They get higher scores for configuration (a) than for configuration (b). For the Mediterranean countries the scores in configuration (a) are quite high,

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[18] Germany and Sweden have high memberships in the outcome due to factors that are outside the scope of our property space. They are not "errors". Rather they are simply cases that display high membership in the outcome due to the operation of causal conditions not included in our property space.

which implies that the degree of membership in this configuration is high.[19] This is not the case for Austria and Finland.[20] The Mediterranean countries are characterized by rigidities. The average years of schooling are relatively low. This may be one of the reasons why workers fear that they cannot find a new job with an adequate remuneration when losing their job. That is why they are not in favour of labour market flexibility. A reduction of the strictness of EPL was only possible because public expenditures on active labour market policy were relatively high and policy constraints to oppose EPL reforms quite low (Table 5).

Table 5: Sufficient conditions for the outcome "strong EPL reduction" by country

	Countries
(a) sc*PC*is*AC	Austria, Finland, Greece, Italy, Portugal, Spain
(b) SC*wu*UB*IS	Belgium, Denmark, France, Ireland, Netherlands, United Kingdom
Note: It has been shown in the text that the above-mentioned conditions cannot be considered as sufficient for some countries. Germany and Sweden are not covered by their best solution. These countries are therefore excluded from this compilation. Furthermore, Norway and Switzerland reach their highest scores for both solutions. There is no single solution which suits best to them. That is why they are not included either.	

Source: Own calculations.

Configuration (b) appears likely to have been the key to a reduction of EPL in more flexible countries like Belgium, Denmark, France, Ireland, Netherlands and the United Kingdom. They receive higher scores for configuration (b) than for configuration (a). Especially for Belgium and Denmark which experienced a strong reduction of the strictness of EPL since 1985 these scores are quite high. This implies a high degree of membership in configuration (b). The unions, although being strong, did not oppose a reduction of EPL effectively. Insider resistance to EPL reforms has been overcome by offering high unemployment benefits. The educational level of the population is high. This seems to have been one of the reasons for the high importance attributed to job flexibility. What concerns France, Ireland, Netherlands and the United Kingdom, the degree of membership in configuration (b) was low. In the case of the Netherlands, which – different from the other three countries - experienced a reduction of the strictness of EPL

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[19] To define the best solution for each country we used the maximum of a case's membership across the two solution terms: sc*PC*is*AC and SC*wu*UB*IS.

[20] Note that when membership in the causal combination is high, membership in the outcome also must be high. However, the reverse does not have to be true. That is, the fact that there are cases with relatively low membership in the causal combination but substantial membership in the outcome is not problematic from the viewpoint of set theory because the expectation is that there may be several different causal conditions or combinations of causal conditions capable of generating high membership in the outcome. Cases with low scores in the causal condition or combination of conditions but high scores in the outcome indicate the operation of alternate causal conditions or alternate combinations of causal conditions (Ragin 2007).

other conditions than those included in our model seem to have had an impact on EPL reforms.

7. Conclusions

Since the mid-1980s European countries have reduced the strictness of EPL. Fuzzy-set qualitative comparative analysis, used in this article, allows us to identify multiple pathways to this outcome. It has been shown that in the Mediterranean countries Greece, Italy, Portugal and Spain the population is not so much in favour of labour market flexibility and not so skilled as in other European countries. Governments nevertheless were successful in realizing EPL reforms because they did not face policy constraints and because they increased the reemployment chances of the unemployed by activating them. Thereby they reduced the resistance of the incumbent workers to EPL reforms.

In Denmark and Belgium the situation was different. The workforce is quite skilled and attributed high importance to job flexibility. The generosity of the unemployment benefits allowed them to endure a certain period of unemployment. Resistance against a reduction of EPL strictness was therefore low.

The overall consistency of the solution is at 0.95. This is a high consistency level and shows that our solution can explain the reduction of EPL strictness to a large extent. The solution coverage is however at only 0.56.

Our analysis has limitations. It most probably suffers from the neglect of variables in our model. Furthermore fuzzy-set QCA is faced with the small-N problem. With a relatively small number of cases (16), only a limited number of causal conditions have been included in our analysis. Only part of all logically possible combinations of causal conditions relevant to our argument have been taken into consideration. Hence, we have attained results that should not be used mechanically but only with the application of theoretical and case knowledge.

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ANNEX

A. Analysis for the outcome "weak reduction of overall EPL"

A1. Truth table

For the analysis of the outcome "weak reduction of overall EPL" it is again necessary to generate a truth table (Table A1). The truth table is based on the fuzzy-set scores from Table 1.

Table A1: Truth table from analysis of all six causal conditions for the outcome "weak reduction of overall EPL"

Weakness of trade unions	Generosity of unemployment benefits	Activation	Low policy constraints	Importance of job flexibility	Average years of schooling	Number	Outcome: Weak reduction of overall EPL	Consist
0	1	1	1	0	1	1	1	0.99
1	1	1	1	1	0	1	1	0.99
1	0	0	1	0	1	1	1	0.98
0	0	0	1	0	0	1	1	0.86
0	1	0	1	0	1	1	1	0.84
0	0	0	1	0	1	2	0	0.77
1	1	0	1	1	1	1	0	0.72
1	0	1	0	0	1	2	0	0.68
1	1	1	1	0	0	2	0	0.63
0	0	1	1	0	0	1	0	0.60
0	1	0	1	1	1	1	0	0.59
1	0	1	1	0	0	1	0	0.52
0	1	0	0	1	1	1	0	0.45

Source: Own calculations.

A2. Necessary conditions for the outcome "weak reduction of overall EPL"

The results of the analysis of the necessary conditions for the outcome "weak reduction of overall EPL" are shown in Table A2. All consistency scores are below 0.79 and cannot be considered as a necessary condition for the outcome "weak reduction of overall EPL".

Table A2: Analysis of necessary conditions for the outcome "weak reduction of overall EPL"

Condition tested	Consistency	Coverage
wu	0.55	0.55
ub	0.66	0.61
ac	0.66	0.58
pc	0.61	0.62
is	0.79	0.54
sc	0.50	0.58
Note: Small letters indicate the absence of a concept, i.e. ub indicates little generosity of unemployment benefits.		

Source: Own calculations.

A3. Sufficient conditions for the outcome "weak reduction of overall EPL"

Table A3 displays the results of the analysis of the sufficient conditions for the outcome "weak EPL reduction". Five (intermediate) solutions lead to the absence of an EPL reduction:

(a) A combination of low average schooling and high importance attributed to job flexibility,

(b) Strong trade unions combined with high unemployment benefits and a preference for job security,

(c) Weak trade unions combined with low unemployment benefits, a preference for job security and a lack of activation,

(d) Low average schooling combined with low unemployment benefits and a lack of activation,

(e) Low average schooling combined with strong trade unions and a lack of activation.

The overall consistency of the solution is 0.87.

Table A3: Five causal pathways to "weak EPL reduction"

	Coverage		Consistency
	Raw	Unique	
(a) sc*IS	0.27	0.12	0.92
(b) wu*UB*is	0.34	0.12	0.88
(c) WU*ub*is*ac	0.27	0.07	0.87
(d) sc*ub*ac	0.32	-0.00	0.87
(e) sc*wu*ac	0.28	0.01	0.83
Solution coverage: 0.68 Solution consistency: 0.87			
Note: The frequency cutoff has been set at 1.00 and the consistency cutoff was 0.84.			

Source: Own calculations.

Figure A1 shows five scatterplots, each with fuzzy-set scores for the absence of EPL reduction on the Y axis and one of the five solutions from Table A3 on the X axis. We recognize that most of the cases are located above the diagonal line. But there are some exceptions: Belgium (configurations (a) and (e)), Denmark (configuration (b)), Sweden (configuration (b)), Italy (configurations (c), (d) and (e)). In these cases the conditions cannot be considered as sufficient.

Cases above the diagonal line should be located close to the diagonal line. Ireland and Switzerland clearly do not conform to this criterion in any of the configurations. The United Kingdom does not for configurations (a), (b), (d) and (e), Austria not for configurations (a) and (c), Norway not for configurations (a), (d) and (e), Finland not for configurations (a), (c), (d) and (e) and France not for configurations (b), (c), (d) and (e). In these cases the conditions cannot be considered as sufficient either. The stability of the strictness of EPL cannot be explained well by the absence of the conditions that have been included in our model.

Figure A1: "Weak EPL reduction" by causal configurations

AT - Austria
BE - Belgium
CH - Switzerland
DK - Denmark
ES - Spain
FIN - Finland
FR - France
GE - Germany

GR - Greece
IRL - Ireland
IT - Italy
NL - Netherlands
NOR - Norway
PT - Portugal
SWE - Sweden
UK - United Kingdom
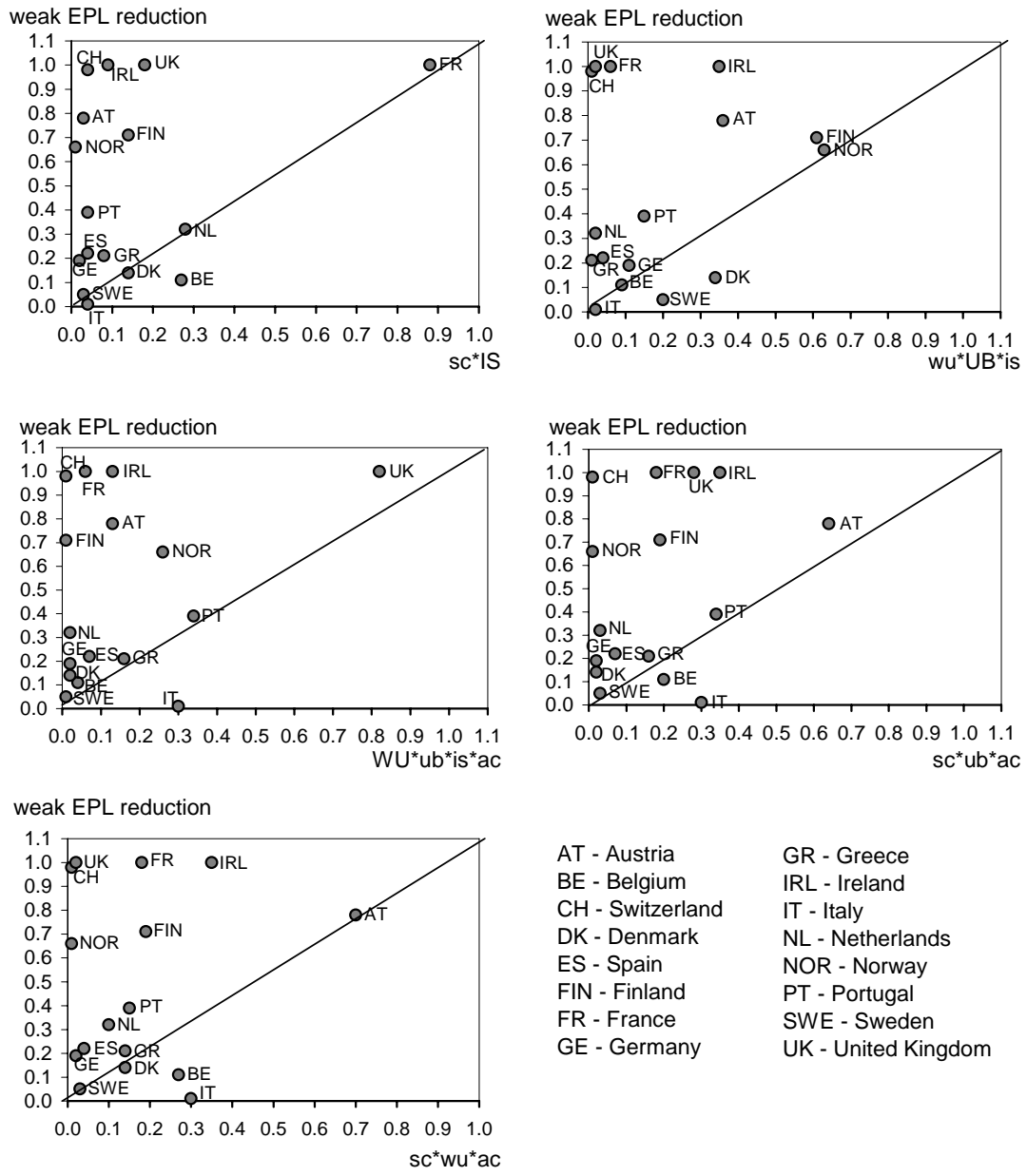
Source: Own calculations.

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