**‘Three paths towards more encompassing occupational coverage in private-heavy pension systems’**

**Online Appendix**

**A) Ratios of private to public pension expenditure for all OECD countries**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***OECD Pensions at a Glance 2013*** | | | | ***OECD Factbook 2013*** | | | |
| Country | 2005 | Country | 2009 | Country | 2005 | Country | 2009 |
|  |  | Iceland | 2.13 | Iceland | 1.70 | Iceland | 3.76 |
| Iceland | 1.42 | ***Netherlands*** | ***1.10*** | ***Australia*** | ***1.12*** | ***Australia*** | ***1.31*** |
| ***Netherlands*** | ***1.06*** | ***Switzerland*** | ***0.92*** | ***Switzerland*** | ***0.78*** | ***Netherlands*** | ***0.76*** |
| ***Canada*** | ***1.03*** | ***Canada*** | ***0.81*** | ***Netherlands*** | ***0.70*** | ***Denmark*** | ***0.70*** |
| ***Switzerland*** | ***0.89*** | ***United Kingdom*** | ***0.74*** | ***Denmark*** | ***0.63*** | ***Canada*** | ***0.60*** |
| ***United Kingdom*** | ***0.86*** | ***Australia*** | ***0.59*** | ***United Kingdom*** | ***0.54*** | Korea | 0.52 |
| ***United States*** | ***0.63*** | ***United States*** | ***0.57*** | Korea | 0.53 | ***United Kingdom*** | ***0.52*** |
| ***Australia*** | ***0.56*** | ***Denmark*** | ***0.40*** | ***Canada*** | ***0.49*** | ***United States*** | ***0.43*** |
| ***Denmark*** | ***0.41*** | Chile | 0.38 | ***United States*** | ***0.48*** | ***New Zealand*** | ***0.40*** |
| Sweden | 0.28 | Japan | 0.30 | Israel | 0.33 | Chile | 0.37 |
| ***Ireland*** | ***0.25*** | Sweden | 0.30 | ***New Zealand*** | ***0.30*** | Israel | 0.34 |
| Chile | 0.22 | ***Ireland*** | ***0.21*** | Norway | 0.29 | Belgium | 0.33 |
| **OECD** | **0.21** | **OECD** | **0.21** | **OECD** | **0.24** | **OECD** | **0.28** |
| Belgium | 0.17 | Belgium | 0.14 | Belgium | 0.14 | Mexico | 0.23 |
| Norway | 0.12 | Norway | 0.12 | Sweden | 0.13 | Sweden | 0.16 |
| Italy | 0.10 | Italy | 0.10 | Portugal | 0.09 | Portugal | 0.08 |
| Luxembourg | 0.08 | Germany | 0.08 | Mexico | 0.08 | Finland | 0.07 |
| Germany | 0.07 | Luxembourg | 0.07 | Spain | 0.06 | Spain | 0.06 |
| Slovak Republic | 0.07 | Czech Republic | 0.06 | Hungary | 0.02 | Czech Republic | 0.05 |
| Portugal | 0.06 | Austria | 0.05 | Austria | 0.02 | France | 0.03 |
| Austria | 0.04 | Portugal | 0.04 | Italy | 0.01 | Germany | 0.03 |
| Greece | 0.04 | Slovak Republic | 0.04 | Luxembourg | 0.01 | Hungary | 0.02 |
| Czech Republic | 0.04 | Greece | 0.03 | Germany | 0.01 | Austria | 0.01 |
| Finland | 0.03 | Finland | 0.03 | Poland | 0.00 | Turkey | 0.01 |
| France | 0.03 | France | 0.02 | Turkey | 0.00 | Italy | 0.01 |
| Korea | 0.00 | Korea | 0.00 |  |  | Luxembourg | 0.01 |
|  |  |  |  |  |  | Estonia | 0.00 |
|  |  |  |  |  |  | Greece | 0.00 |
|  |  |  |  |  |  | Poland | 0.00 |
|  |  |  |  |  |  | Slovenia | 0.00 |

Missing data: *OECD Factbook 2013* has missing data for Chile 2005; Czech Republic 2005; Estonia 2005; Finland 2005; France 2005; Greece 2005; Ireland 2005, 2009; Japan 2005, 2009; Norway 2009; Slovak Republic 2005, 2009; Slovenia 2005; Switzerland 2009. *OECD Pensions at a Glance 2013* has missing data for Estonia 2005, 2009; Hungary 2005, 2009; Israel 2005, 2009; Japan 2005; Mexico 2005, 2009; New Zealand 2005, 2009; Poland 2005, 2009; Slovenia 2005, 2009; Spain 2005, 2009; Turkey 2005, 2009.

I define market-heavy pension systems as those where the ratio of private to public expenditure is higher than the OECD average, and focus on the eighteen mature welfare states included in The Three Worlds of Welfare Capitalism (Esping-Andersen, 1990) and commonly used in comparative welfare state research thereafter. Two OECD datasets provide figures for expenditure on private and public pension benefits as a percentage of GDP (OECD, 2013a, OECD, 2013b). The two datasets vary slightly in the private pension expenditure that they report. Since no clear reason is given for the differences in recorded private pension expenditure, I make use of both sources to identify my universe of cases. The table above expresses the data from each source as a ratio of private to public pension expenditure, for the two years for which both sets of information are available. For the purposes of this paper, the universe of private-heavy pension systems consists of those countries that on the basis of the available data have a ratio of private to public pension expenditure that is consistently higher than the OECD average. I therefore exclude Sweden, Norway and Belgium, in which the ratio of private to public expenditure is higher than the OECD average in only one of the two datasets, and Japan, where only one data point is available.

**B) Measurement and Calibration of Outcomes and Causal Conditions**

***Measurement and calibration of the reform outcome***

The outcome of interest is the development of more encompassing private pensions, understood as the extension of occupational pension coverage either through collective self-regulation or through top-down government regulation. Although top-down government regulation to increase the coverage of occupational pensions may take many forms, including mandating that employers simply provide access to an occupational pension, or that they enroll employees into an occupational pension scheme by default, I count as ‘encompassing’ only those reforms which also mandate that employers *make contributions* to the occupational pension scheme that their employees are compulsorily or by default enrolled in.

For each country-decade, I calibrate membership in the fuzzy-set *‘cases where private pensions have become significantly more encompassing’ or* ‘*encomp*’ for short. To do this I draw on a range of government reports and secondary sources, and construct a four value fuzzy-set, the coding scheme for which is summarized in Table 1 below.

In the absence of any regulation to extend private pension coverage, or where such regulation concerns only access and does not mandate an employer contribution, I allocate a fuzzy-set score of 0, and deem the case to be ‘fully out’ of the set of cases where private pensions have become significantly more encompassing. Cases where employer contributions have been extended to all or almost all of the workforce are counted as ‘fully in’ the set of cases where private pensions have become significantly more encompassing, and allocated a fuzzy-set score of 1, whether this extension results from collective agreements or from government regulation. Where access to an employer contribution falls significantly short of covering all of the workforce, whether due to compliance problems or because the extension of employer contributions is targeted to selected groups such as part-time workers or those on low incomes, I consider cases to be ‘more in than out’ of the set of cases where private pensions have become significantly more encompassing, and assign to them a fuzzy-set score of 0.67. Finally, where mandatory employer contributions have been extended only to a very small group of people, as in Switzerland in the 1990s, I assign a fuzzy-set membership score of 0.33, reflecting membership which is ‘more out than in’ the set of cases where private pensions have become significantly more encompassing. This four-value fuzzy-set may miss some subtle variations in the ‘encompassingness’ of private pensions. However it is as fine-grained as possible given the nature of the underlying data. The calibration of the outcome ‘*encomp’* is explained in detail for each country-decade in Box 1 below.

**Box 1: Calibration of the outcome ‘*encomp*’**

|  |
| --- |
| ***Australia-1980 (AUS80), Australia-1990 (AUS90)* and *Australia-2000 (AUS00)***  In the 1986 *Accord Mark II* between the Australian Labor Party and the Australian Council of Trade Unions it was agreed that 3% of wages would be paid by employers in the form of superannuation contributions to covered workers. In the Australian context this meant most workers, as non-union members were also covered by union-negotiated collective agreements. However, in light of the compliance problems that restricted the access of a significant number of employees to this employer contribution leaving almost one third of private sector workers uncovered (Commonwealth Treasury of Australia, 2001: 81), I consider *the country-decade AUS80 to fall slightly short of full membership, and class it as ‘more in than out’ of the set of cases where private pensions have become significantly more encompassing*.  1992 saw the introduction of the Superannuation Guarantee. This made the employer contribution mandatory, and introduced a Superannuation Guarantee Charge for those employers who failed to comply. The mandatory contribution rate was to increase from three to six per cent of qualifying earnings on 1 July 1996, to eight per cent on 1 July 2000, and to nine per cent on 1 July 2002. Employees are not obliged to contribute to the Superannuation Guarantee scheme, but from 2003 low to middle income workers have been encouraged to do so by means of (capped) government co-contributions. The mandatory employer contribution covered all employees with the following technical exceptions: those earning less than AUD 450 per month (AUD 5,400 per year) before tax (around £230 per month or £2,710 per year) those under age 18 and working no more than 30 hours per week, those over age 70, those paid to do work of a domestic or private nature for 30 hours or less a week; non-residents paid for work done outside Australia; certain types of foreign executive; and those temporarily working in Australia for an overseas employer and covered by a bilateral superannuation agreement (ISSA/IOPS/OECD, 2008). *The country-decade of AUS90 therefore lies ‘fully in’ of the set ‘cases where private pensions have become significantly more encompassing’.*  After the Superannuation Guarantee, there were no further moves to make private pensions more encompassing through regulation, collective or otherwise, in Australia. *The country-decade of AUS00 therefore lies ‘fully out’ of the set ‘cases where private pensions have become significantly more encompassing’.*  ***Canada-1980 (CAN80), Canada-1990 (CAN90)* and *Canada-2000 (CAN00)***  The private pension system in Canada remains voluntary, as there were no moves to make private pensions more encompassing through regulation, collective or otherwise, over the past three decades (Baldwin, 2010, Myles, 2013). *The country-decades of CAN80 CAN90 and CAN00 therefore lie ‘fully out’ of the set ‘cases where private pensions have become significantly more encompassing’.*  ***Denmark-1980 (DEN80), Denmark-1990 (DEN90)* and *Denmark-2000 (DEN00)***  In Denmark, the 1991 collective bargaining round resulted in most trade unions introducing occupational pensions. In subsequent bargaining rounds occupational pensions became part of all collective agreements, and contributions gradually increased to around 9 per cent of qualifying wages. There was no legislation to secure occupational pension coverage for those wage earners who are not covered by a collective agreement, but the prevalence of collective agreements meant that most workers were covered (Green-Pedersen, 2006). *The country-decade of DEN90 therefore lies ‘fully in’ the set ‘cases where private pensions have become significantly more encompassing’.*  Since the collective self-regulation initiated in 1991 was the first move to make private pensions more encompassing (Green-Pedersen, 2006), and no further moves have been made since, *the country-decades of DEN80 and DEN00 therefore lie ‘fully out’ of the set ‘cases where private pensions have become significantly more encompassing’*.  ***Ireland-1980 (IRE80), Ireland-1990 (IRE90)* and *Ireland-2000 (IRE00)***  The private pension system in Ireland remains voluntary, as there were no moves to make private pensions more encompassing through regulation, collective or otherwise, over the past three decades (Schulze and Moran, 2006, Ireland, 2010). *The country-decades of IRE80 IRE90 and IRE00 therefore lie ‘fully out’ of the set ‘cases where private pensions have become significantly more encompassing’.*  ***Netherlands-1980 (NET80), Netherlands-1990 (NET90)* and *Netherlands-2000 (NET00)***  In the Netherlands, state regulation of the labour market introduced in the 1950s required that all benefits negotiated at the bargaining table be extended to non-union workers. This led very early on to supplementary private pensions that were quasi-universal, covering over ninety per cent of the working population, despite low union membership (Myles and Pierson, 2001:315).  No further moves were made to make private pensions more encompassing until 1994 when it was made illegal to exclude part-time workers from occupational pension schemes (Anderson, 2006). On account of this targeted extension of private pension coverage, *the country-decade NET90 is considered to lie ‘more in that out’ of the set of cases where private pensions have become significantly more encompassing.*  The absence of change until 1994 means that *the country-decade of NET80 lies ‘fully out’ of the set ‘cases where regulation has significantly extended private pension coverage’* and after the 1994 reform there were no further moves to make private pensions more encompassing through regulation, collective or otherwise. *The country-decade of NET00 therefore lies ‘fully out’ of the set ‘cases where regulation has significantly extended private pension coverage’.*  ***New Zealand-1980 (NZ80), New Zealand-1990 (NZ90)* and *New Zealand-2000 (NZ00)***  From 1 July 2007, employers have been legally required to automatically enrol all new permanent employees aged between 18 and 65 into a ‘KiwiSaver’ pension scheme. When KiwiSaver was first introduced in 2007, employer contributions were not mandatory, and employees could select a monthly contribution rate of four per cent or eight per cent of their gross earnings. But From 1 April 2008, all employers were required to contribute to an employee’s KiwiSaver account, starting with one per cent of an employee’s gross earnings in 2008 and increasing one per cent each year until the mandatory employer contribution reaches four per cent of gross earnings by 1 April 2011 (Collard and Moore, 2010). On account of the introduction of mandatory employer contributions to Kiwisaver schemes in 2008, *the country-decade of NZ90 lies ‘fully in’ the set ‘cases where private pensions have become significantly more encompassing’.*  Finally, the voluntary nature of private pension provision until 2008 means *the country-decades of NZ80 and NZ90 lie ‘fully out’ of the set ‘cases where regulation has significantly extended private pension coverage’.*  ***Switzerland-1980 (SWI80), Switzerland-1990 (SWI90)* and *Switzerland-2000 (SWI00)***  In *1982* the *Bundesgesetz uber die Berufliche Vorsorge* introduced mandatory employer and employee contributions to occupational pensions. Although the access threshold for compulsory contributions excluded many part-time workers, mostly women with children, this regulation extended access to occupational pension coverage and to an employer contribution in particular dramatically across the workforce (Bonoli, 2006), and on this basis *the country-decade SWI80 lies ‘fully in’ of the set ‘cases where private pensions have become significantly more encompassing’.*  In 1997 the *Verordnung uber die obligatorische berufliche Vorsorge von arbeitslosen personen* made it mandatory for unemployment insurance funds to deduct a contribution from unemployment benefits and make an ‘employer’s contribution’, thereby extending occupational pension provision to the unemployed. Since this was a minor reform targeting the extension of private pension coverage to a rather small group of people (Bonoli, 2006), *the country-decade SWI90 is considered to lie ‘more out than in’ the set of cases where private pensions have become significantly more encompassing.*  In 2003 the *1st BVG/LPP Revision* introduced improved occupational pension coverage for low-income earners and part-time employees (Bonoli, 2006). On account of this targeted extension of private pension coverage, *the country-decade SWI00 is considered to lie ‘more in than out’ of the set of cases where private pensions have become significantly more encompassing.*  ***United Kingdom-1980 (UK80), United Kingdom-1990 (UK90)* and *United Kingdom-2000 (UK00)***  In the UK private pensions remained voluntary throughout the 1980s and 1990s, which means *the country-decades of UK80 and UK90 lie ‘fully out’ of the set ‘cases where private pensions have become significantly more encompassing’.*  The 2008 Pensions Act introduced mandatory employer contributions of at least three per cent of ‘qualifying earnings’ (a band between £5,035 and £33,540 in 2006) into a qualifying workplace pension scheme. This covered all employees aged between 22 and State Pension age, earning over £5,035 per annum (in 2006/07 terms) and not already members of a qualifying scheme. Enrolment is automatic, and employees can opt out of pension saving if they wish (Thurley, 2011). On account of this introduction of mandatory employer contributions into workplace pension schemes, *the country decade of UK00 lies ‘fully in’ the set of cases where private pensions have become significantly more encompassing.*  ***United States-1980 (US80), United States-1990 (US90)* and *United States-2000 (US00)***  The private pension system in The US remains voluntary, as there were no moves to make private pensions more encompassing through regulation, collective or otherwise, over the past three decades. *The country-decades of US80 US90 and US00 therefore lie ‘fully out’ of the set ‘cases where private pensions have become significantly more encompassing’.* |

Table 2. Coding scheme for ‘*encomp’*

|  |  |  |
| --- | --- | --- |
| *Employer contributions extended to* | *Fuzzy-set score* | *Membership of the set ‘cases where private pensions have become significantly more encompassing’* |
| All or most of the workforce | 1 | Fully in |
| Selected groups | 0.67 | More in than out |
| Minor selected groups | 0.33 | More out than in |
| No new groups | 0 | Fully out |

***Measurement and calibration of causal conditions***

The conditions included in this analysis reflect the expectation that unions will push for mandatory employer contributions where there is no state earnings-related alternative, and that in the absence of institutional capacity for collective self-regulation, union demands for mandatory employer contributions to occupational pensions may produce results either when a strong left government is in power, or when a non-left government is in power as part of a package of cost-cutting reforms passed in ‘consensus’ political setting. The *first conditions to be included are therefore the absence of a significant earnings-related pension and left-party control of government,* measured and calibrated as follows:

*The absence of a significant earnings-related state pension (lo\_erel)*

To capture the existence and significance of the state earnings-related alternative I use OECD data on ‘the % contribution of public earnings-related pensions to average pension wealth’ to identify those private-heavy pension systems with negligible earnings-related state pensions, and assign to these countries full membership of the set *‘cases with no significant earnings-related state pension’*. On this basis Australia, Denmark, Ireland, the Netherlands and New Zealand score full set membership.

For those countries with non-negligible earnings-related state pensions, namely Canada, Switzerland, the UK and the US, I record for each decade the statutory replacement rate that accrues at average earnings from the earnings-related pension (Organisation for Economic Co-operation and Development, 2011, Office for National Statistics, 2011). The replacement rate data ranges from 10% in the UK in the 2000s to 32% in the US, and is presented in Table C4, the summary table at the end of this section. I use this data to construct a four-value fuzzy set as shown in Table 2 below.

Table 3. Coding scheme for *lo\_erel*

|  |  |  |
| --- | --- | --- |
| *Replacement rate* | *Fuzzy-set score* | *Membership of the set ‘cases with no significant earnings-related state pension’* |
| x = 0 | 1 | Fully in |
| 0 < x > 20 | 0.67 | More in than out |
| 20 ≤ x > 25 | 0.33 | More out than in |
| x ≥ 25 | 0 | Fully out |

I assign full non-membership of the set ‘cases with no significant earnings-related state pension’ if the replacement rate is more than or equal to 25%, as this was the replacement rate offered by the archetypical State Earnings Related Pension (SERPS) of the UK in the 1980s. On this basis, Canada, the US, and the UK in the 1980s score zero. The Social Security Act of 1986 reduced the SERPS accrual rate from 25 to 20%. To capture this reduction in the statutory replacement rate, I deem the UK in the 1990s to fall short of full non-membership, but to remain ‘more out than in’ the set of cases with no significant earnings-related pension. By this logic, I assign to it a fuzzy-set score of 0.33. Finally, I deem Switzerland and the UK in the 2000s to be ‘more in than out’ of the set of cases with no significant earnings-related pension and assign to them a fuzzy-set score of 0.67 on the grounds that they have an earnings-related pension, but the replacement rate that accrues at average earnings is below 20%.

*Left party control of government (hi\_left)*

I include an indicator of partisanship using data from the Comparative Political Data Set (CPDS) on percentage of total cabinet posts held by non-left parties (Armingeon et al., 2011). According the CPDS, left parties are those classed as ‘Social Democratic’ or ‘left of Social Democratic’, and non-left parties consist of Liberal and Conservative parties, as well as centre right parties that favor a ‘moderate social amelioration in a location to the left of Conservative or Conservative neo-liberal parties’, in particular Christian Democratic or Catholic parties (CPDS codebook: 25).

Because my cases represent country-decades, a single case may contain more than one government and therefore a change in the partisanship indicator. I deal with this as follows: where there has been a reform, I use the % of total cabinet posts held by left parties in the year when the reform was passed (if in a particular decade there was more than one ‘encompassing’ reform, I take the average over any years when ‘encompassing’ reforms were passed). In decades where there was no ‘encompassing’ reform, I take the approach of averaging the % of total cabinet posts held by left parties over the decade. Following the logic behind the CPDS indicator, I calibrate membership in the fuzzy set ‘left parties are dominant’ by setting 66.6% as the anchor for full set membership, 33.3% as the anchor for full non membership, and 49.95% (the midpoint between 33.3 and 66.6) as the point of maximum ambiguity regarding set membership.

To capture the existence of institutional capacity for collective self-regulation I include the *condition of high union density*, while to capture the expectation that union demands may be met as part of a cost-cutting reform package in a context of corporatist interest representation and political fragmentation, I include conditions to capture *the presence of institutions associated with ‘consensus’ democracy (hi\_cons)* and the *presence of cost cutting reforms (cuts)*. The following subsections briefly describe the measurement and calibration of these remaining three causal conditions in turn. Tables 3 and 4 summarize the underlying data for each condition, and the crisp and fuzzy set scores that result from the calibration of this data.

### 

High union density (hi\_ud)

To capture the existence of institutional capacity for collective self-regulation I use a measure of union density from the *Comparative Political Data Set*. This choice of measure reflects the expectation that employer contributions to occupational pensions can be negotiated by organised labour, without making the unnecessarily restrictive assumption that only coordinated or centralized forms of bargaining can extend coverage. The drawback is that it does not capture the institutional capacity for collective self-regulation in countries where union membership is low but collective agreements are extended to non-union members. In this analysis, there are two such countries - the Netherlands, and Australia in 1990-1999 and 2000-2009 (Visser, 2015). However, in both cases, the coverage of occupational pensions is already extended to non-union members, so further extension of pension coverage relies primarily on the negotiation of new agreements. To calibrate membership in the fuzzy-set ‘high union density’ I use prominent gaps in this data to set the threshold for the point of maximum ambiguity at 41.25314, the threshold for full non-membership at 27.07272, and the threshold for full membership at 65.94003.

### 

Cost-cutting pension reforms (cuts)

For this condition I refer to my case knowledge. For each country-decade, I record full membership in the crisp set ‘cost cutting pension reforms’ where there has been one or more such reform. A full list of cost-cutting reforms is available on request.

Consensus democracy (hi\_cons)

Closely following Lijphart (2012), I proxy *the presence of institutions associated with ‘consensus’ democracy (hi\_cons)* using a composite indicator made up of the Hicks-Kenworthy indicator of corporatism (Kenworthy, 2003), and the 'effective number of parties' from the CPDS (Armingeon et al., 2011). The composite indicator closely proxies the ‘executive-parties’ dimension of Lijphart’s explanatory framework, since the effective number of parties in a political system is expected to be causally linked to all aspects of this dimension except for the level of corporatism (Lijphart, 2012: 170). Consensus democracies are also characterised by their federal rather than unitary structure. However, the ‘federal-unitary’ dimension is not significantly associated with differences in policy outcomes (Lijphart, 2012: 272), so I focus here on the ‘exectutive-parties’ dimension of democratic institutions. Consensus democracies are also characterised by their federal rather than unitary structure. However, the ‘federal-unitary’ dimension is not significantly associated with differences in policy outcomes (Lijphart, 2012: 272), so I focus here on the ‘exectutive-parties’ dimension of democratic institutions.

On ordering the data there is a very prominent gap between New Zealand in the 1920s and the Netherlands in the 1980s, and I use this to anchor the point of maximum ambiguity for set membership at 1.194. On this basis, the Netherlands, Switzerland and Denmark in all decades are more in than out of the set ‘high consensus’. Using two further gaps in the data, the anchors for full non-membership and full membership are set at 0.587 and 1.975 respectively.

Table 4. Summary table of underlying data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Case | Replacement rate  accruing from the  earnings-related  state pension, at  average earnings | Percentage of total cabinet seats held by left parties | Union Density | Composite indicator of consensus |
| *AUS80* | 0 | 100 | 45 | 0.674637 |
| *AUS90* | 0 | 100 | 33 | 0.669824 |
| *AUS20* | 0 | 20 | 21 | 0.674086 |
| *CAN80* | 25 | 0 | 35 | 0.401059 |
| *CAN90* | 25 | 0 | 34 | 0.466894 |
| *CAN20* | 25 | 0 | 30 | 0.522023 |
| *DEN80* | 0 | 26 | 78 | 2.162932 |
| *DEN90* | 0 | 51 | 76 | 2.031595 |
| *DEN20* | 0 | 14 | 72 | 2.103760 |
| *IRE80* | 0 | 11 | 60 | 0.528301 |
| *IRE90* | 0 | 19 | 52 | 0.619149 |
| *IRE20* | 0 | 3 | 38 | 0.612483 |
| *NET80* | 0 | 3 | 29 | 1.677232 |
| *NET90* | 0 | 44 | 25 | 1.919338 |
| *NET20* | 0 | 20 | 21 | 1.882844 |
| *NZ80* | 0 | 54 | 59 | 0.562025 |
| *NZ90* | 0 | 8 | 31 | 0.659246 |
| *NZ20* | 0 | 100 | 21 | 0.710255 |
| *SWI80* | 16 | 28 | 25 | 1.818799 |
| *SWI90*  *SWI20*  *UK80* | 16  16  25 | 28  28  0 | 23  19  46 | 1.895931  1.800307  0.506270 |
| *UK90* | 20 | 26 | 35 | 0.517256 |
| *UK20* | 10 | 100 | 29 | 0.556262 |
| *US80* | 32 | 0 | 18 | 0.337832 |
| *US90* | 32 | 0 | 14 | 0.343406 |
| *US20* | 32 | 0 | 12 | 0.346254 |

Table 5. Summary table of crisp and fuzzy set scores

| *Case* | *Univ* | *lo\_erel* | *hi\_left* | *hi\_ud* | *cuts* | *hi\_cons* |
| --- | --- | --- | --- | --- | --- | --- |
| *AUS80* | 0.67 | 1 | 0.96 | 0.62 | 1 | 0.07 |
| *AUS90* | 1 | 1 | 1 | 0.16 | 1 | 0.07 |
| *AUS20* | 0 | 1 | 0.01 | 0.01 | 0 | 0.07 |
| *CAN80* | 0 | 0 | 0 | 0.21 | 1 | 0.02 |
| *CAN90* | 0 | 0 | 0 | 0.18 | 1 | 0.03 |
| *CAN20* | 0 | 0 | 0 | 0.09 | 0 | 0.03 |
| *DEN80* | 0 | 1 | 0.02 | 0.99 | 0 | 0.98 |
| *DEN90* | 1 | 1 | 0.56 | 0.99 | 1 | 0.96 |
| *DEN20* | 0 | 1 | 0 | 0.98 | 1 | 0.97 |
| *IRE80* | 0 | 1 | 0 | 0.91 | 0 | 0.04 |
| *IRE90* | 0 | 1 | 0 | 0.79 | 1 | 0.06 |
| *IRE20*  *NET80* | 0  0 | 1  1 | 0  0 | 0.32  0.07 | 0  0 | 0.05  0.86 |
| *NET90* | 0.67 | 1 | 0.29 | 0.03 | 1 | 0.94 |
| *NET20* | 0 | 1 | 0.01 | 0.01 | 0 | 0.93 |
| *NZ80* | 0 | 1 | 0.69 | 0.89 | 1 | 0.04 |
| *NZ90* | 0 | 1 | 0 | 0.10 | 1 | 0.07 |
| *NZ20* | 1 | 1 | 1 | 0.01 | 0 | 0.08 |
| *SWI80* | 1 | 0.67 | 0.02 | 0.03 | 1 | 0.92 |
| *SWI90* | 0.33 | 0.67 | 0.02 | 0.02 | 1 | 0.94 |
| *SWI20*  *UK80*  *UK90* | 0.67  0  0 | 0.67  0  0.33 | 0.02  0  0.01 | 0.01  0.65  0.20 | 1  1  1 | 0.91  0.03  0.03 |
| *UK20* | 1 | 0.67 | 1 | 0.07 | 1 | 0.04 |
| *US80* | 0 | 0 | 0 | 0.01 | 1 | 0.01 |
| *US90* | 0 | 0 | 0 | 0.00 | 1 | 0.01 |
| *US20* | 0 | 0 | 0 | 0.00 | 0 | 0.01 |

**D) Necessary Conditions**

The table below shows the results of the analysis of necessary conditions for the extension of private pension coverage. The parameter of consistency measures the degree to which the empirical information is in line with the statement of necessity. The closer the consistency score is to unity, the more perfect the subset relationship and the stronger the evidence supporting the statement of necessity. The consistency scores for all conditions are significantly lower than the threshold of 0.9 usually recommended to support a statement of necessity (Schneider and Wagemann, 2012: 143). For this reason, I do not interpret any of the conditions as necessary for the extension of private pension coverage.

Table 6. Analysis of necessary conditions for the outcome ‘extension of private pension coverage’

|  |  |  |
| --- | --- | --- |
| *Condition tested* | *Consistency* | *Coverage* |
| lo\_erel | 0.609868 | 0.665741 |
| hi\_left | 0.071211 | 0.247788 |
| hi\_ud | 0.345880 | 0.814371 |
| cuts | 0.593082 | 0.647778 |
| hi\_cons | 0.286877 | 0.615049 |

**E) Directional assumptions for the Intermediate Solution**

As is standard practice, the ‘intermediate’ solution forms the centre of discussion in this paper. The intermediate solution makes theoretically guided (‘directional’) assumptions about whether logically possible combinations of conditions for which there is no corresponding empirical case (‘logical remainders’) would contribute to the outcome if they did exist. It then uses these assumptions to inform the logical minimization process which summarizes the information contained in the truth table, generating solution terms that are usually simpler than the ‘conservative’ solution which makes no assumptions about logical remainders, and more meaningful than the ‘parsimonious’ solution which assumes that all logical remainders would contribute to the outcome.

The directional assumptions follow directly from the discussion of conditions in Section III. I assume that the absence of a significant earnings-related pension contributes to bringing about more encompassing private pensions, but I make no directional assumptions for the other four conditions since their contribution to the outcome is expected to vary with the presence or absence of other conditions. The ‘parsimonious’ and ‘conservative’ solutions are presented below.

**F) Solution Tables**

The parameter of consistency expresses the strength of empirical evidence supporting the statement of sufficiency, with scores closer to unity reflecting stronger evidence. The parameter of raw consistency shows the consistency of a single truth table row. The parameter of raw coverage can be intuitively understood to express the proportion of cases that are covered by a particular sufficient path, while the parameter of unique coverage expresses the proportion of cases belonging *only* to that path (for more details on QCA ‘parameters of fit’ see Schneider and Wagemann, 2012: chapters 5-7).

Table 7. Analysis of sufficient conditions for the outcome ‘extension of private pension coverage’, conservative solution

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Solution | lo\_erel\*hi\_left\*~hi\_ud\*  ~hi\_cons + | lo\_erel\*cuts\*hi\_cons\*~hi\_left\*~  hi\_ud + | lo\_erel\*cuts\*hi\_cons\*hi\_left  \*hi\_ud → | encomp |  |
| Single country coverage | AUS 90, NZ20,UK00 | SWI80, SWI90, SWI00, NET90 | DEN90 |  |  |
| Consistency | 0.951456 | 0.796610 | 0.942529 |  |  |
| Raw Coverage | 0.400545 | 0.320163 | 0.111717 |  |  |
| Unique Coverage | 0.358311 | 0.320452 | 0.074932 |  |  |
| Solution consistency: 0.890796; Solution coverage: 0.777929 | | | | | |

Frequency cut-off: 1.000000; Consistency cut-off: 0.796610

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Solution | hi\_left\*~hi\_ud + | | lo\_erel\*cuts\*hi\_cons\*~hi\_left\*~hi\_ud + | hi\_left\*hi\_cons | | → encomp | |  |
| Single country coverage | AUS 90, NZ00,UK00 | SWI80, SWI90, SWI00, NET90 | | | DEN90 | |  |  |
| Consistency | 0.958904 | 0.658786 | | | 0.928571 | |  |  |
| Raw Coverage | 0.476839 | 0.378747 | | | 0.159401 | |  |  |
| Unique Coverage | 0.392371 | 0.305177 | | | 0.074932 | |  |  |
| Solution consistency: 0.802296; Solution coverage: 0.856948 | | | | | | | | |

Table 8. Analysis of sufficient conditions for the outcome ‘extension of private pension coverage’, parsimonious solution

Frequency cut-off: 1.000000; Consistency cut-off: 0.796610

Table 9. Analysis of sufficient conditions for the outcome ‘no extension of private pension coverage’, intermediate solution

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Solution | ~hi\_left\* ~hi\_cons | + | ~hi\_left\*~cuts | → encomp |
| Single country coverage | AUS00, CAN80, CAN90, CAN00, IRE80, IRE90, IRE00, NZ90, UK80, UK90, US80, US90, US00 |  | AUS00, CAN00, DEN80, IRE80, IRE00, NET80, NET00, US00 |  |
| Consistency | 0.991071 |  | 1.000000 |  |
| Raw Coverage | 0.677518 |  | 0.404883 |  |
| Unique Coverage | 0.421668 |  | 0.149034 |  |
| Solution consistency: 0.992669; Solution coverage: 0.826551 | | | | |

Frequency cut-off: 1.000000; Consistency cut-off: 0.951872

Assumptions: lo\_erel (present)

Cases in bold are uniquely covered by the relevant solution term

Table 10. Analysis of sufficient conditions for the outcome ‘no extension of private pension coverage’, conservative solution

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Solution | ~hi\_left\*~hi\_ud\*~hi\_cons + | lo\_erel\* ~cuts\* hi\_left + | cuts\* ~hi\_cons\* ~hi\_left | → encomp |  |
| Single country coverage | AUS00, CAN80, CAN90, CAN00, IRE00, NZ90, UK90, US80, US90, US00 | AUS00, DEN80, IRE80, IRE00, NET80, NET00 | CAN80, CAN90, IRE90, NZ90, UK80, UK90, US80, US90 |  |  |
| Consistency | 0.991089 | 1.000000 | 0.985731 |  |  |
| Raw Coverage | 0.509156 | 0.303154 | 0.421668 |  |  |
| Unique Coverage | 0.096643 | 0.205494 | 0.106816 |  |  |
| Solution consistency: 0.992624; Solution coverage: 0.821465 | | | | | |

Frequency cut-off: 1.000000; Consistency cut-off: 0.951872

Table 11. Analysis of sufficient conditions for the outcome ‘no extension of private pension coverage’, parsimonious solution

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Solution | ~hi\_left\* ~hi\_cons + | ~cuts\* ~hi\_left + | ~cuts\* hi\_cons | → encomp |  |
| Single country coverage | AUS00, CAN80, CAN90, CAN00, IRE80, IRE90, IRE00, NZ90, UK80, UK90, US80, US90, US00 | AUS00, CAN00, DEN80, IRE80, IRE00, NET80, NET00, US00 | DEN80, NET80, NET90 |  |  |
| Consistency | 0.991071 | 1.000000 | 0.973770 |  |  |
| Raw Coverage | 0.677518 | 0.404883 | 0.151068 |  |  |
| Unique Coverage | 0.421668 | 0.019837 | 0.000000 |  |  |
| Solution consistency: 0.987842; Solution coverage: 0.826551 | | | | | |

Frequency cut-off: 1.000000; Consistency cut-off: 0.951872

G) Truth Tables

Truth tables summarize all the empirical evidence gathered for the QCA. Each column of the truth table denotes a different QCA set. Each row represents one of the logically possible combinations for sufficiency between the conditions included in the QCA.

Truth Table for ‘encomp’

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| lo\_erel2 | cuts2 | hi\_left | hi\_cons | hi\_ud | number | fuzzy\_univ2 | raw consist. | PRI consist. | SYM consist |
| 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0.968421 | 0.968421 | 1 |
| 1 | 1 | 1 | 0 | 0 | 2 | 1 | 0.943925 | 0.929825 | 0.82449 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.942529 | 0.932432 | 0.863158 |
| 1 | 1 | 0 | 1 | 0 | 4 | 1 | 0.79661 | 0.693878 | 0.703593 |
| 1 | 1 | 1 | 0 | 1 | 2 | 0 | 0.580838 | 0.453125 | 0.713235 |
| 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0.311765 | 0.286585 | 0.898305 |
| 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0.160428 | 0.054217 | 0.588235 |
| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0.083333 | 0.046667 | 0.684211 |
| 0 | 1 | 0 | 0 | 0 | 5 | 0 | 0.047521 | 0.017058 | 0.605263 |
| 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0.045802 | 0.023437 | 0.666667 |
| 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |  |
| 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |  |
| 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 |  |
| 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |  |
| 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |  |

Truth Table for ‘~encomp’

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| lo\_erel2 | cuts2 | hi\_left | hi\_cons | hi\_ud | number | ~fuzzy\_univ2 | raw consist. | PRI consist. | SYM consist |
| 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 1 | 0 | 2 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 | 5 | 1 | 0.983471 | 0.982942 | 0.96945 |
| 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0.977099 | 0.976563 | 0.977099 |
| 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0.955128 | 0.953333 | 0.96129 |
| 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0.951872 | 0.945783 | 0.894472 |
| 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0.723529 | 0.713415 | 0.953488 |
| 1 | 1 | 1 | 0 | 1 | 2 | 0 | 0.652695 | 0.546875 | 0.736486 |
| 1 | 1 | 0 | 1 | 0 | 4 | 0 | 0.525424 | 0.285714 | 0.610236 |
| 1 | 1 | 1 | 0 | 0 | 2 | 0 | 0.257009 | 0.070175 | 0.561224 |
| 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0.206897 | 0.067568 | 0.580645 |
| 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0.031579 | 0.031579 | 1 |

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