**Supplementary Material**

Beyond the limits of the productivist regime: capturing three decades of East Asian welfare development with fuzzy sets

**Selection of domains**

Protective welfare policies have long been the bedrock of comparative welfare research (Esping-Andersen, 1990; Kemeny, 2001) within and beyond the discourse on East Asia. *Old-age income protection (I)* has thereby become particularly important for research on East Asia due to rapid population ageing in the region (Fu & Hughes, 2009). Similarly, *passive labour market policy (L)* helps individuals to maintain their standard of living when formal employment is lost and has become of increased interest in the aftermath of 1997 Asian Financial crisis and – more recently – due to structural changes across East Asian economies and a slowing of traditionally high levels of economic growth (Packard & Nguyen, 2014). Finally, although often omitted in comparative welfare research, *housing (P)* has been an essential pillar of welfare in East Asia (Chang, 2004). Public housing, in particular, has been characterised as "the most direct government investment in expanding the overall supply of low-cost housing" and a basic safety net for families with a per capita income below the poverty line (Brhane et al., 2014).

The *Productivist Welfare Capitalism (PWC)* thesis has long argued that East Asia governments have prioritised investment into human capital, the support of labour market fluidity, and increases in labour supply over protective welfare policies (Holliday, 2000). *Education policy (E)* has been presented as a crucial tool for promoting economic competitiveness and sustaining social mobility across East Asia (Hudson and Kühner, 2011). Albeit a little more ambiguous, *health care (H)* has also featured heavily within the PWC theory and among those scholars, who have made a direct link between health standards and the aggregate productivity of comparative labour forces (Rudra, 2007). *Family policies (F)* arguably serve both productive and protective objectives (Thévenon & Solaz, 2013), but have become a more accessible tool to address familisation risks and gendered labour market outcomes across East Asia too (Yu et al., 2018).[[1]](#footnote-1) Maternity leave is commonly understood as an indispensable element of work-family reconciliation strategies, which plays a vital role in preserving the mother's and her newborn's health (Addati et al., 2014), and in incentivising women's labour market participation (Feng & Han, 2010; Cerise et al., 2013).

**Selection of indicators within domains**

The choice of empirical indicators is one of the most crucial parts of FSITA and should be linked closely to the chosen concepts. Different from other traditional research methods, FSITA allows researchers to combine both quantitative and qualitative indicators in order to measure the overall strength of social rights and service provision in each six of the welfare domains, respectively. **Table 1** lists all empirical indicators used for the subsequent set-theoretic analysis.

**Education policy**

Three fuzzy sets have been identified to create an image of the overall strength of education services. The first set, SPENDING on education, is measured as public education expenditure as a ratio of total public expenditure. This is a standard measure in the literature and also a direct indicator reflecting the importance of education for successive governments. Besides this quantitative indicator, two qualitative indicators were used to measure the outcomes of public education spending, namely the GENEROSITY and the ACCESSIBILITY of education services. The *duration* and the *cost* of compulsory education were used to examine the generosity of publicly-funded compulsory education (primary and secondary). Our third set is designed to measure the accessibility of tertiary education. There are two main reasons for using the empirical case knowledge rather than, e.g. statistical enrolment rates. First, the fact that a student does not participate in tertiary education maybe not due to a financial predicament; and second, there were significant missing data for some of our East Asian cases. We, therefore, use the *level of tuition fees* and the *availability of financial support* to determine fuzzy set thresholds.

**Health policy**

Three constitutive aspects were identified to measure the overall strength of existing health services. Similar to the domain of education, apart from the ratio of public health SPENDING, we used two additional outcome indicators: we measured Universality by the *coverage* rate of public health services, and affordability by *private health expenditure*s as a proportion of all health expenditures. All three indicators are common in the literature.

**Family policy**

For measuring the strength of family policy, we used three indicators according to the ILO Convention 183 on Maternity Protection (2000). The *net replacement rate* reflects the generosity of the income maintenance received in case of motherhood. Moreover, we include the duration of maternity leave *in total number of weeks*, and the accessibility of maternity protection measured by the *proportion of insured employees* as a share of the total employees).

**Old-age income protection policy**

In order to analyse old-age pension systems, several international organisations proposed different strategies, including the World Bank, the ILO and the IMF. Among these approaches, the World Bank's multi-pillar approach (Holzmann & Hinz, 2005; Pordes, 1994) is perhaps the most popular. Hence, a two-tier analysis was used in the fuzzy-set operation: a zero pillar set (universal pension scheme), and pillar-one and pillar-two sets (mandatory pension). We used crisp set analysis for measuring the existence of a zero pillar pension. For measuring the strength of mandatory pension programmes, two sub-indicators were used once again: we measured GENEROSITY by the *net replacement rate* of mandatory pension programmes; universality refers to the *coverage of all mandatory pension programmes* for workers, regardless of whether they are public or private.

**Public housing policy**

According to Hoekstra (2003: 60), housing decommodification is defined as "the extent to which households can provide their housing, independent of the income they acquire on the labour market". There is a considerable dearth of comparable data that would have allowed us to distinguish different levels of housing decommodification statistically. Therefore, we focussed our analysis solely on the strength of public rental housing. The calibration of the public rental housing set was entirely based on qualitative case knowledge, and considered *the extent to which the public rental housing sector was developed* in different East Asian in comparative perspective.

**Passive labour market policy (LMP)**

Unemployment benefit as a crucial part of passive LMP and protects individuals against the risk of job loss resulting in a period of job search. It plays an essential role in helping individuals to maintain their standard of living when formal employment is lost. Social rights in regards to the risk of unemployment has widely been used for the measurement of an individual's degree of decommodification in different societies (Esping-Andersen, 1990). In this research, therefore, the strength of passive LMP is measured as a combination of three fuzzy-sets: we measured *GENEROSITY* by the average *net replacement rate* (%) of unemployment benefits; *Coverage* by the *percentage of unemployed (%) that receive unemployment benefits*; and *Duration* by the *total number of weeks* that the unemployment benefit is paid.

**The reasoning behind the breakpoints for the sets**

The process of calibration is perhaps the most important part of any FSITA. The most significant issue is which criteria are used to determine fuzzy-set membership scores for each indicator within each domain. In other words, it is crucial to decide where the qualitative anchors ‘.00’, ‘.50’, and ‘1.00’ are located. In this research, sixteen criteria were used to measure the six policy fields. Moreover, 46 cut-off points were determined. **Table 2** summarises the rationale behind the choices of these qualitative anchors. Most of the anchors are selected based on either solid theoretical arguments or international conventions. In some cases, the average level of OECD or the EU countries was combined with case knowledge or solid theoretical arguments. Only three indicators are calibrated fully based on case knowledge.

Table 1 Empirical indicators and fuzzy set interval scores

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Domain*** | ***Indicator*** | ***Fully in the set***  ***1.00*** | ***Almost fully in the set***  ***0.83-0.99*** | ***Fairly in the set***  ***0.67-0.82*** | ***More or less in the set***  ***0.51-0.66*** | ***Neither in nor out of the set***  ***0.5*** | ***Fairly out of the set***  ***0.33-0.49*** | ***Mostly out of the set***  ***0.17-0.32*** | ***Almost fully out of the set***  ***0.01-0.16*** | ***Fully out of the set***  ***0.00*** |
| Education (E) | *Spending* measured by the ratio of public education expenditure in total public expenditure (%) | >20 |  |  |  | 15 |  |  |  | <10 |
| *Generosity* measured by the duration and cost of compulsory education | Twelve-year free education |  | Nine-year free education |  | Eight-year free education |  | Six-year free education |  | No free education |
| *Accessibility* measured by the affordability of higher education | Easy to afford/  unselective student loan,  Various financial aids available; easy for students with financial difficulties access to tertiary education | - | - | - | Moderate/  Relatively easy for students with financial difficulties access to tertiary education | - | - | - | Difficult to afford/  Very strict selective financial aids; hard for students with financial difficulties access to tertiary education |

Table 1 Empirical indicators and fuzzy set interval scores, Cont.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Domain*** | ***Indicator*** | ***Fully in the set***  ***1.00*** | ***Almost fully in the set***  ***0.83-0.99*** | ***Fairly in the set***  ***0.67-0.82*** | ***More or less in the set***  ***0.51-0.66*** | ***Neither in nor out of the set***  ***0.5*** | ***Fairly out of the set***  ***0.33-0.49*** | ***Mostly out of the set***  ***0.17-0.32*** | ***Almost fully out of the set***  ***0.01-0.16*** | ***Fully out of the set***  ***0.00*** |
| Health (H) | *Spending* measured by the proportion of public health expenditure in total public expenditure (%) | >14 |  |  |  | 10 |  |  |  | <6.9 |
| *Universality* measured by the coverage of public health services (%) | >80 |  |  |  | 50 |  |  |  | <20 |
| *Affordability* measured by the percentage of private expenditure (% of total health expenditure) | <31 |  |  |  | 35 |  |  |  | >52 |
| Family (F) | *Generosity* measured by net replacement rate of maternity leave (%) | >75 |  |  |  | 66 |  |  |  | <20 |
| *Duration* in weeks | >24 |  |  |  | 18 |  |  |  | <14 |
| *Accessibility* measured by the proportion of insured employees (% of total employees) | 100 |  |  |  | 50 |  |  |  | 0 |

Table 1 Empirical indicators and fuzzy set interval scores, Cont.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Domain*** | ***Indicator*** | | ***Fully in the set***  ***1.00*** | ***Almost fully in the set***  ***0.83-0.99*** | ***Fairly in the set***  ***0.67-0.82*** | ***More or less in the set***  ***0.51-0.66*** | ***Neither in nor out of the set***  ***0.5*** | ***Fairly out of the set***  ***0.33-0.49*** | ***Mostly out of the set***  ***0.17-0.32*** | ***Almost fully out of the set***  ***0.01-0.16*** | ***Fully out of the set***  ***0.00*** |
| Old-Age Income Protection (I) | *zero PILLAR pension* | Pension programmes | With zero pillar pension |  |  |  |  |  |  |  | No zero-pillar pension |
| *Mandatory pension* | *Generosity* measured by average net replacement rate (%) | >75  High |  |  |  | 50  Medium |  |  |  | <20  Low |
| *Universality* of old-age pension (%) | Universal  83 |  |  |  | Selective  50 |  |  |  | Residual  <10 |
| Public Housing (P) | *Public rental policy* | | With well- developed public rental housing |  |  |  | With public rental housing, but under-developed |  |  |  | Without any public rental policy |
| Passive Labour Market Policy (L) | *Generosity* measured by average net replacement rate (%) | | >75 |  |  |  | 50 |  |  |  | <20 |
| *Coverage* measured as the percentage of unemployed (%) | | 73 |  |  |  | 50 |  |  |  | <10 |
| *Duration* measured in total weeks paid | | 14.8 |  |  |  | 13 |  |  |  | 0 |

Table 2 Summary of the reasoning behind the breakpoints for the sets

|  |  |  |
| --- | --- | --- |
| ***Domain*** | ***Indicator*** | ***Rationale for choices of qualitative anchors*** |
| Education (E) | *Spending* measured by the ratio of public education expenditure in total public expenditure (%) | Following Hudson and Kühner's (2009), education as one of the five most important aspects of social policy should account about one-fifth of public welfare spending. However, compared with other social aspects, education spending is significantly lower. During the last two decades, the education spending of the OECD average has never reached 20%. Therefore, in this research, 20% was set as the 'fully-in' point, with 15% as 'cross-over' point and 10% as 'fully-out' point. |
| *Generosity* measured by the duration and cost of compulsory education | The cross over point is set based on the average world level (nine-year compulsory education) according to the World Bank (2012). ‘Fully-in' is set at the most extended duration within the cases, which is twelve years. The ‘fully-out' point was set as no free compulsory education. |
| *Accessibility* measured by the affordability of higher education | The cut-off points are set entirely based on case knowledge. Easy to afford tuition fees with unselective student loan and various financial aids was set as ‘fully-in' point. Moderate tuition fees with fairly strict selective financial aid were set as the 'cross-over' point. Difficult to afford tuition fees with very strict selective financial aid were set as the ‘fully-out' point. |
| Health (H) | *Spending* measured by the proportion of public health expenditure in total public expenditure (%) | The cut-off points are set based on the average share of government spending on health across the world. According to a WHO (2011) report, the average share of public spending on health across the world was between 7% and 14% from 2000 to 2007. So the 'fully-in' point for this thesis was set at 14%, the 'fully-out' point at 6.9% and the 'cross-over' point at 10%. |
| *Universality* measured by the coverage of public health services (%) | There is no theoretical guideline for setting the breakpoints of this set. We use a relatively high cut-off point of 80% to emphasize the importance of public health care service. 50% is set as 'cross-over point' in accordance with other coverage sets in this research. Moreover, 10% is 'fully-out' of the set. |
| *Affordability* measured by the percentage of private expenditure (% of total health expenditure) | The cut-off points are set based on the ratio of private health expenditure in countries at different income level. According to the WHO World Health Report 2006 (WHO, 2006), the ratio of private health expenditure is higher in poorer countries than in more affluent countries. The 'fully-in' point was set at 31% which is the average share of private health expenditure in high-income countries; the 'fully-out' point at 52% which is the average share of low-income countries; and the 'cross-over' point at 40% which is about the average level of high and low income countries (WHO, 2006). |

Table 2 Summary of the reasoning behind the breakpoints for the sets, Cont.

|  |  |  |
| --- | --- | --- |
| ***Domain*** | ***Indicator*** | ***Rationale for choices of qualitative anchors*** |
| Family (F) | *Generosity* measured by net replacement rate of maternity leave (%) | The ILO Convention No. 183 suggests that cash benefit should be equal at least two-thirds of a woman's previous earnings. Hence, 66% was set as 'cross-over point'. The 'fully-in' point was set at 75% based on Asher's (1998) finding that the replacement rate of around 75% is considered adequate for financial security for a middle-income earner. The 'fully-out' point was set at 20% based on the strategy of Vis (2008) that 20% is the minimum net replacement rate for an individual to remain the same standard of living. |
|  | *Duration* in weeks | According to the ILO Convention No.183, maternity leave should be no less than fourteen weeks (the ILO recommendation is eighteen weeks). Moreover, the UNICEF (2013) suggested that six months (equal to twenty-four weeks) of maternity leave could encourage breastfeeding, healthier children and health-care savings. Therefore, the 'fully-out' point of the duration set was set at fourteen weeks, the 'fully-in' point at twenty-four weeks and the 'cross-over' point at eighteen weeks. |
|  | *Accessibility* measured by the proportion of insured employees (% of total employees) | As with the accessibility set of the education service, case knowledge was used for calibration. The 'fully-in' point was set as no requirement for accessing the benefit. The 'cross-over' point was set as covered by all female employees. Moreover, rigorous requirements for accessing the benefit were set as 'fully out' of the set |
| Old-Age Income Protection (I) | *zero PILLAR pension* | Cases with basic zero-pillar pensions were scored as 'fully in' the set and those without are scored as 'fully out'. |
|  | *Generosity* measured by average net replacement rate (%) | The strategy of 'fully-in' and 'fully-out' points is the same as the net replacement of maternity benefits set, with fully-in point is 75% and 'fully-out' point is 20%. The 'cross-over' point was set as 50% based on the ILO's Social Security (Minimum Standard) Convention (ILO, 1952). |
|  | *Universality* of old-age pension (%) | Setting the cut-off points is difficult as there is no official guideline. In this research, the cut-off points are set mainly in accordance with the pension coverage in OECD countries. The fully-in point was set at the OECD average, which is 83% in 2005 (OECD, 2012). The 'cross-over' point of the set is 50% based on the ILO's Social Security (Minimum Standard) Convention (ILO, 1952). The fully-out point was set at 10%. |

Table 2 Summary of the reasoning behind the breakpoints for the sets, Cont.

|  |  |  |
| --- | --- | --- |
| ***Domain*** | ***Indicator*** | ***Rationale for choices of qualitative anchors*** |
| Public Housing (P) | *Public rental policy* | Cases are calibrated entirely based on empirical knowledge. A well-developed public rental housing sector was set as 'fully in' the set. The 'cross-over point' was set as underdeveloped public rental housing policy, and the 'fully-out' point of the set was set as no public rental housing policy. |
| Passive LMP (L) | *Generosity* measured by average net replacement rate (%) | Following the same strategy as for the pension replacement rate, the 'fully-out' point was set at 20%, and the 75% net replacement rate was regarded as the 'fully-in' point. 50% was set as the 'cross-over' point. |
| *Coverage* measured as the percentage of unemployed (%) | Similar to the coverage of old-age income protection set, for the fully-in and fully-out points, there are no formal guidelines. OECD unemployment benefit coverage was used as the benchmark. The 'fully-in' point was set at 73% in accordance with the average coverage of 27 EU member states in 2010. Moreover, the 'fully-out' point was set at 10%. The 'cross-over' point of the set was 50% based on the ILO's Social Security (Minimum Standard) Convention (ILO, 1952) which indicates that unemployment benefit should cover not less than 50% of all employees. |
| *Duration* measured in total weeks paid | According to the ILO convention (ILO, 1952), the minimum duration should be thirteen weeks within a twelve-month period. So thirteen weeks was set as the 'cross-over' point of duration. The 'fully-in' point of duration was set in accordance with the average unemployment benefit period in the 27 EU countries, which is 14.8 weeks in 2010. The 'fully-out' was set as no unemployment benefits. |

**Robustness of findings**

The robustness of FsITA analysis has been debated by scholars, who point towards the process of calibration as potentially introducing bias into the analysis (Krogslund et al., 2015). Cases around the margin of membership/non-membership (‘.50') need to be considered with extra care, particularly when the minimum principle is used to combine marginal fuzzy-set scores. This is because of marginal membership scores, e.g. ‘.51' or ‘.49', may lead to very different results of combined sets, and therefore ideal-type membership to welfare models and sub-models.

There are few marginal scores in our analysis, that may affect our final results. The share of public spending on education of Korea in 2010 was 15%, which is right at the theoretically defined cross-over point of the set. In this case, Korea was given a score of ‘.51' (‘more or less in'), because the actual share of spending was slightly higher than 15% and not reflected in our data due to a rounding error. For China in 2016, most provinces had more than 18 weeks of maternity leave, which means the DURATION score was adjusted upwards to ‘.55' (‘more or less in') to avoid any cross-over issues. As previously discussed, the same score – ‘.55' - ‘more or less in' – was assigned for the family policy set in Japan (2016) due to the expansion of parental leave, which is not otherwise reflected in our data. Finally, marginal scores ‘.49' for both old age pension protection in Korea (2000) and passive LMP in China (2010 and 2016) are due to actual coverage rates falling just below the theoretically defined crossover point of membership of the UNIVERSALITY and COVERAGE sets, respectively. No further adjustments were made in both instances and all cases where located as ‘more or less out' of the respective sets, accordingly.

**Fuzzy set scores and overall level of change**

**China's welfare development trajectory, 1990-2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Domain* | *Indicators* | *Fuzzy set scores* | | | | *Overall change of intersection*  *1990-2016* |
| *1990* | *2000* | *2010* | *2016* |
| Education | Spending | **.93** | .66 | .35 | .49 | .75 (In) 🡪 .45 (Out) |
| Generosity | **.75** | .67 | .82 | .82 |
| Accessibility | **1.00** | .40 | .45 | .45 |
| Health | Spending | .98 | .02 | .23 | .23 | .13 (Out) 🡪 .23 (Out) |
| Universality | 1.00 | .10 | 1.00 | 1.00 |
| Affordability | .13 | .00 | .10 | .23 |
| Family | Generosity | 1.00 | 1.00 | 1.00 | **1.00** | .53 (In) 🡪 .72 (In) |
| Duration | .00 | .02 | .05 | **.55** |
| Accessibility | .60 | .60 | .60 | **.60** |
| Old-age | Basic pension | .00 | .00 | .00 | **1.00** | A close up of a logo  Description automatically generated.00 (Out) 🡪 .80 (In) |
| Generosity | .85 | .75 | .80 | **.80** |
| Universality | .09 | .15 | .27 | **.97** |
| Public housing | Policy | **1.00** | .34 | .41 | .48 | 1.00 (In) 🡪 .48 (Out) |
| Passive LMP | Generosity | 1.00 | .83 | .83 | .83 | .13 (Out) 🡪 .49 (Out) |
| Duration | 1.00 | 1.00 | 1.00 | 1.00 |
| Coverage | .13 | .44 | .49 | .49 |

**Hong Kong’s** **welfare development trajectory, 1990-2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Domain* | *Indicators* | *Fuzzy set scores* | | | | *Overall change of intersection*  *1990-2016* |
| *1990* | *2000* | *2010* | *2016* |
| Education | Spending | **.75** | **.91** | **.91** | **.73** | .75 (In) 🡪 .73 (In) |
| Generosity | **.82** | **.82** | **1.00** | **1.00** |
| Accessibility | **.83** | **1.00** | **1.00** | **1.00** |
| Health | Spending | .35 | .76 | .84 | .91 | .01 (Out) 🡪 .07 (Out) |
| Universality | 1.00 | 1.00 | 1.00 | 1.00 |
| Affordability | .01 | .17 | .07 | .07 |
| Family | Generosity | .99 | .99 | .99 | .99 | .46 (Out) 🡪 .46 (Out) |
| Duration | .00 | .00 | .00 | .00 |
| Accessibility | .40 | .40 | .40 | .40 |
| Old-age | Basic pension | 1.00 | 1.00 | 1.00 | 1.00 | .00 (Out) 🡪 .28 (Out) |
| Generosity | .00 | .28 | .28 | .28 |
| Universality | .05 | .92 | .92 | .92 |
| Public housing | Policy | **1.00** | **1.00** | **1.00** | **1.00** | 1.00 (In) 🡪 1.00 (In) |
| Passive LMP | Generosity | .00 | .00 | .00 | .00 | .00 (Out) 🡪 .00 (Out) |
| Duration | .05 | .05 | .05 | .05 |
| Coverage | .00 | .00 | .00 | .00 |

**Japan’s welfare development trajectory, 1990-2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Domain* | *Indicators* | *Fuzzy set scores* | | | | *Overall change of intersection*  *1990-2016* |
| *1990* | *2000* | *2010* | *2016* |
| Education | Spending | .65 | .29 | .00 | .00 | .00 (Out) 🡪 .00 (Out) |
| Generosity | .82 | .82 | .82 | .82 |
| Accessibility | .00 | .17 | .23 | .45 |
| Health | Spending | **1.00** | **1.00** | **1.00** | **1.00** | 1.00 (In) 🡪 1.00 (In) |
| Universality | **1.00** | **1.00** | **1.00** | **1.00** |
| Affordability | **1.00** | **1.00** | **1.00** | **1.00** |
| Family | Generosity | .41 | .41 | .58 | .58 | .00 (Out) 🡪 0.55 (In) |
| Duration | .05 | .05 | .05 | .05 |
| Accessibility | .00 | .70 | .70 | .70 |
| Old-age | Basic pension | 1.00 | 1.00 | 1.00 | 1.00 | .35 (Out) 🡪 .33 (Out) |
| Generosity | .35 | .35 | .33 | .33 |
| Universality | .98 | .98 | .98 | .98 |
| Public housing | Policy | **.53** | .39 | .36 | .45 | .53 (In) 🡪 .45 (Out) |
| Passive LMP | Generosity | .00 | .48 | .48 | .48 | .00 (Out) 🡪 .13 (Out) |
| Duration | .49 | .49 | .49 | .49 |
| Coverage | .25 | .19 | .13 | .13 |

**Korea’s welfare development trajectory, 1990-2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Domain* | *Indicators* | *Fuzzy set scores* | | | | *The overall change of intersection*  *1990-2016* |
| *1990* | *2000* | *2010* | *2016* |
| Education | Spending | .76 | .54 | **.51** | **.54** | .15 (Out) 🡪 .54 (In) |
| Generosity | .32 | .32 | **.75** | **.82** |
| Accessibility | .15 | .51 | **.85** | **.85** |
| Health | Spending | .06 | .11 | .78 | .90 | .04 (Out) 🡪 .26 (Out) |
| Universality | 1.00 | 1.00 | 1.00 | 1.00 |
| Affordability | .04 | .13 | .30 | .26 |
| Family | Generosity | **1.00** | **1.00** | **1.00** | **1.00** | .57 (In) 🡪 .57 (In) |
| Duration | **.00** | **.00** | **.02** | **.02** |
| Accessibility | **.70** | **.70** | **.70** | **.70** |
| Old-age | Basic pension | .00 | .00 | 1.00 | 1.00 | .00 (Out) 🡪 .46 (Out) |
| Generosity | .60 | .60 | .46 | .46 |
| Universality | .15 | .49 | .94 | .94 |
| Public housing | Policy | .37 | .45 | **.55** | **.60** | .37 (Out) 🡪 .60 (In) |
| Passive LMP | Generosity | .00 | 1.00 | 1.00 | 1.00 | .00 (Out) 🡪 .48 (Out) |
| Duration | .05 | .49 | .49 | .49 |
| Coverage | .00 | .21 | .46 | .48 |

**Singapore’s welfare development trajectory, 1990-2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Domain* | *Indicators* | *Fuzzy set scores* | | | | *The overall change of intersection*  *1990-2016* |
| *1990* | *2000* | *2010* | *2016* |
| Education | Spending | **.95** | **.97** | **.97** | **.83** | .73 (In) 🡪 .78 (In) |
| Generosity | **.73** | **.73** | **.78** | **.78** |
| Accessibility | **.98** | **1.00** | **1.00** | **1.00** |
| Health | Spending | .27 | .05 | .23 | .95 | .08 (Out) 🡪 .15 (Out) |
| Universality | 1.00 | 1.00 | 1.00 | 1.00 |
| Affordability | .08 | .00 | .02 | .15 |
| Family | Generosity | 1.00 | 1.00 | 1.00 | **1.00** | .40 (Out) 🡪 .58 (In) |
| Duration | .00 | .01 | .19 | **.19** |
| Accessibility | .20 | .30 | .45 | **.55** |
| Old-age | Basic pension | .00 | .00 | .00 | .00 | .00 (Out) 🡪 .00 (Out) |
| Generosity | .00 | .00 | .00 | .00 |
| Universality | .76 | .76 | .76 | .76 |
| Public housing | Policy | **1.00** | **1.00** | **1.00** | **1.00** | 1.00 (In) 🡪 1.00 (In) |
| Passive LMP | Generosity | .00 | .00 | .00 | .00 | .00 (Out) 🡪 .00 (Out) |
| Duration | .49 | .05 | .05 | .05 |
| Coverage | .00 | .00 | .00 | .00 |

**Taiwan’s welfare development trajectory, 1990-2016**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Domain* | *Indicators* | *Fuzzy set scores* | | | | *The overall change of intersection*  *1990-2016* |
| *1990* | *2000* | *2010* | *2016* |
| Education | Spending | **.84** | **.85** | **.95** | **.98** | .51 (In) 🡪 .72 (In) |
| Generosity | **.82** | **.82** | **.82** | **1.00** |
| Accessibility | **.51** | **.62** | **.72** | **.72** |
| Health | Spending | .02 | .00 | .00 | .00 | .05 (Out) 🡪 .41 (Out) |
| Universality | .64 | 1.00 | 1.00 | 1.00 |
| Affordability | .05 | .45 | .35 | .41 |
| Family | Generosity | 1.00 | 1.00 | 1.00 | 1.00 | .48 (Out) 🡪 .48 (Out) |
| Duration | .00 | .00 | .00 | .00 |
| Accessibility | .43 | .43 | .43 | .43 |
| Old-age | Basic pension | .00 | .00 | **1.00** | **1.00** | .00 (Out) 🡪 .70 (In) |
| Generosity | .56 | .56 | **.70** | **.70** |
| Universality | .97 | .97 | **.97** | **.97** |
| Public housing | Policy | .00 | .00 | .10 | .30 | .00 (Out) 🡪 .30 (Out) |
| Passive LMP | Generosity | .00 | **.60** | **.60** | **.60** | .00 (Out) 🡪 .60 (In) |
| Duration | .05 | **1.00** | **1.00** | **1.00** |
| Coverage | .00 | **.76** | **.76** | **.76** |

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1. Many studies have shown that childcare provision has a positive impact on female participation in developed countries. However, there is a dearth of comparable data on childcare provision in the East Asian context. In this article, therefore, we focus on maternity leave. [↑](#footnote-ref-1)