Journal of International and Comparative Social Policy (2026), 1–14
doi:10.1017/ics.2026.10106

ARTICLE

Revisiting income-maintenance-based welfare regime classification: Japan in comparative perspective

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(Received 25 October 2025 UTC; revised 09 June 2026 UTC; accepted 28 July 2026 UTC)

Abstract

Esping-Andersen's (1990) *The Three Worlds of Welfare Capitalism* classified contemporary welfare states into three different regime types: liberal, conservative, and social-democratic. Although the welfare regime was used as a broad concept, the operationalisation largely focused on income maintenance programmes in his typology. Intellectual efforts have been invested in testing and expanding Esping-Andersen's typology. Within the welfare modelling business, Japan is one of the controversial cases, as it was included in both Esping-Andersen's typology and the East Asian welfare model. This paper provides an up-to-date classification of Esping-Andersen's typology using cluster analysis. The results show that the patterns of institutional features of income maintenance programmes in 18 OECD countries and 4 East Asian economies did not correspond to Esping-Andersen's (1990) prediction. Furthermore, this paper uses Japan as an analytical example to demonstrate that more caution is needed when applying the concept of welfare regime to analyse cash benefits.

Keywords: welfare regime; classification; typology; Japan

Introduction

Esping-Andersen's *Three Worlds of Welfare Capitalism*, published in 1990, has been identified as a path-breaking publication for the academic industry in modelling welfare states (Abrahamson, 1999; Powell and Barrientos, 2011). In this classic of welfare modelling, modern welfare states were divided into three welfare regimes: liberal, conservative, and social-democratic. It has been more than three decades since this typology was developed, and a number of studies have emerged to test, modify, and expand it. Although Esping-Andersen (1990) used the terms "welfare capitalism" and "welfare-state regimes" to reflect the complex relationship between the state and the economy, the operationalisation of his typology was largely concentrated on income maintenance programmes (see Section "Three types of welfare regimes").

Esping-Andersen (1999) argued that his three worlds typology remains consistent and valid. However, there were a few "hybrids" that challenged his influential classification (see Arts and Gelissen, 2002). As the only non-Western welfare state included in Esping-Andersen's (1990) analysis, Japan was one of the most controversial cases. In addition, Japan also shared similarities with its East Asian counterparts. There have been numerous intellectual attempts to classify the Japanese welfare state since the publication of Esping-Andersen's (1990) classification. On the one hand, following Esping-Andersen's (1990) typology, scholars classified Japan either as a liberal or a conservative welfare regime. Sometimes, Japan was conceived as a hybrid. On the other hand, Japan was regarded as a core member of the East Asian welfare model (see, e.g., Aspalter, 2023). Nonetheless, after 35 years of the publication of

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Esping-Andersen's (1990) typology, the puzzle of classifying the Japanese welfare state remained unsolved (see Powell et al., 2020).

Following Esping-Andersen's (1990) approach to operationalising welfare regimes and debates on classifying the Japanese welfare state, this study aims to revisit the income-maintenance-based welfare regime classification (see Section "Criteria and operationalisation" for more details) with reference to the case of Japan. This paper conducted cluster analyses, including both 18 OECD countries chosen by Esping-Andersen (1990) and 4 East Asian welfare systems (i.e., South Korea, Taiwan, Singapore, and Hong Kong), which were often regarded as core members in the East Asian welfare regime literature. Using the latest data on institutional features of income protection schemes in these welfare systems, cluster analysis was conducted to test Esping-Andersen's (1990) typology. The remainder of the paper is organised as follows: Section "Three types of welfare regimes" reviews Esping-Andersen's (1990) operationalisation and typology. Section "The East Asian welfare model" examines theoretical attempts to extend this typology to East Asia, while Section "The difficulties of classifying the Japanese welfare state" discusses the persistent difficulties of classifying Japan. Sections "Research Questions", "Methods", and "Criteria and operationalisation" outline the research questions, methods, and operationalisation. Section "Results" presents the results of the cluster analyses. Finally, Section "Discussion" discusses Japan as an analytical case and considers the broader implications for income-maintenance-based welfare regime classification.

Three types of welfare regimes

In contrast to earlier studies that used social expenditure as the main indicator of welfare-state development, Esping-Andersen (1990) proposed decommodification and stratification as two criteria to classify welfare states. Decommodification refers to the extent to which an individual can maintain a socially acceptable livelihood independently of market participation (pp. 21–22). It was operationalised by eligibility, income replacement, and protection against social risks (p. 47). Stratification captures the welfare state's effects on social status. Conservative stratification was characterised by corporatism and etatism; liberalism was featured by the means-tested benefits and a larger role for the private sector, while socialist principles included universalism and equality (pp. 69–73).

After calculating the scores of decommodification and stratification in 18 OECD countries using data in the 1980s, Esping-Andersen (1990) found consistent patterns between the two criteria. These welfare states clustered into three groups: Anglo-Saxon countries were classified as liberal welfare regimes. Strict means-tested assistance and limited levels of social benefits created a low level of decommodification and dualism between welfare recipients and the majority differentiated by the market. Western European countries were labelled as conservative welfare regimes due to the strong influence of the corporatist-statist legacy. In order to preserve status differentials, the entitlement to welfare was closely associated with status. As a result, conservative welfare regimes usually had a high level of stratification and an intermediate level of decommodification. Nordic countries were regarded as social democratic welfare regimes, in which welfare provision was based on the principles of universalism and citizenship. Citizens were included in a universal scheme with generous benefits. Therefore, the social democratic welfare regimes maximised decommodification and minimised stratification (pp. 26–28).

Apart from decommodification and stratification, Esping-Andersen also considered the welfare mix between the state, the market, and the family (p. 21). In liberal welfare regimes, the state encouraged the market in welfare provision by offering low levels of public welfare benefits and subsidising private welfare provision. In conservative welfare regimes, the state only functioned when the family failed. Social democratic welfare regimes minimised the role of the market and the family (pp. 26–28).

Nonetheless, Esping-Andersen's classification was not free from criticism. Arts and Gelissen (2002) noted that the typology was neither exhaustive nor exclusive (p. 138). On the one hand, the case selection was mainly Western Europe and North America without taking other welfare systems into account (see relevant discussion on East Asia in Section "The East Asian welfare model"). On the other hand, the

existence of hybrid cases challenged the robustness of Esping-Andersen's (1990) classification (see relevant discussion on Japan in Section "The difficulties of classifying the Japanese welfare state"). In addition, mistakes and misclassification were identified by the researchers who replicated his analysis (Bambra, 2006; Scruggs and Allan, 2006).

The East Asian welfare model

As mentioned above, Esping-Andersen (1990) only covered 18 advanced democracies in his classification. Although Japan was included, East Asia, regardless of its economic success, was largely omitted by Esping-Andersen (1990). This section briefly reviews intellectual attempts to expand the welfare modelling business to East Asia and its implications for the income-maintenance-based welfare regime classification. East Asian welfare systems were argued to be similar in terms of culture and developmental strategies.

The core of the culturalist explanation is Confucianism. Jones (1993) argued that East Asian welfare systems should be classified as a new cluster: The Confucian welfare state, where "conservative corporatism without (Western-style) worker participation; subsidiarity without the Church; solidarity without equality; laissez-faire without libertarianism: an alternative expression for all this might be 'household economy' welfare states - run in the style of a would-be traditional, Confucian, extended family" (Jones, 1993, p. 199).

Other researchers identified the similarities between East Asian welfare systems from the perspective of political economy. For example, Holliday (2000) argued that East Asian welfare systems belonged to the productivist world of welfare capitalism, whose key feature was "a growth-oriented state and subordination of all aspects of state policy, including social policy, to economic/industrial objectives" (p. 709). Aspalter (2001, 2006) emphasised the role of politics, such as conservative elites and democratic movements, in the development of welfare systems. The role of the state was a regulator instead of a provider (cf. Kwon, 1997, 1998). Although other scholars did not thoroughly develop a distinct world of welfare capitalism, they tended to explain the same theme from the perspective of economic development and nation-building (see, e.g., Goodman and Peng, 1996; White and Goodman, 1998; Peng and Wong, 2010).

Recent scholarly debate has been concentrated on whether the productivist nature of East Asian welfare states has changed (see Wilding, 2008; Choi, 2012; Nam, 2020; Yang and Kühner, 2020; Hong, 2022). Research using quantitative and set-theoretic methods tended to imply the divergence of East Asian welfare systems. Hudson and Kühner's (2011) fuzzy set ideal type analysis did not support a distinctive East Asian welfare model in terms of productivism. In a recent classification using the data of the mid-2010s offered by Yörük and his colleagues (2022), Japan was grouped as a populist welfare state (i.e., moderate benefits in all aspects) with Southern European countries and other newly emerged welfare states, while South Korea was classified as a neo-liberal welfare regime, similar to the United States. Different from Esping-Andersen's (1990) income-maintenance-based classification, the construction of the East Asian welfare model went beyond the scope of cash benefits and extended to the areas of social investment, family policy, and labour market policy. Nonetheless, as one of the key pillars of welfare systems, income maintenance programmes in East Asia might retain their characteristics. Aspalter (2023) highlighted that an important feature of the "pro-welfare conservative welfare regime" in East Asia was that the employment-based and occupational welfare schemes not only were able to minimise financial welfare commitments but also gained support from privileged groups when dealing with legitimacy for the authoritarian rule (pp. 43, 297–298). Following the literature reviewed in this section, it was expected that income maintenance programmes in East Asian economies might have lower levels of social expenditure and generosity when compared to their Western counterparts.

The difficulties of classifying the Japanese welfare state

Although Japan was included in Esping-Andersen's (1990) typology, it is worth noting that his classification of it has changed over time. There was only limited clarification on how hto Scruggs

and Tafoya (2022), the generosity of a welfare policy was measured by replacement rate, duration, condition, and coverage e classified the Japanese welfare state in Esping-Andersen's (1990) original typology. In terms of decommodification, Japan occupied the middle position within the cluster of conservative welfare regimes (p. 51). Regarding stratification, Japan denoted a strong degree of liberalism, a medium level of conservatism, and a low level of socialism (p. 74). Regarding the public–private mix in pension, Japan, along with Continental European countries, was placed in the group of corporative state-dominated insurance systems, in which status was an important element, social security was segregated and occupational, and the market only played a marginal role (p. 86). In an article discussing the classification of Japan, Esping-Andersen (1997) recognised that Japan seemed to combine elements of all three types of welfare regimes, but rejected the idea that Japan was a unique welfare state (p. 187). Nonetheless, he did not make a final judgement because the Japanese welfare state remained institutionally immature and unformed (p. 188).

Esping-Andersen (1999) finally stated that Japan should be assigned to the conservative welfare regime cluster (p. 92). He reiterated that no uniqueness could be observed: Japan manifested elements of liberal and conservative regimes, but the mixture did not grant a distinct world of welfare regime. In addition, the liberal side of the Japanese welfare state was "less liberal than appearances suggest," but conservative traits have been reinforced by the growing corporatist social insurance system and familism (p. 92). Occupational welfare was less liberal because it was a conservative and paternalistic practice (p. 91). Confucian teachings in Japan played similar roles as Catholic familism in Continental European countries (p. 82). In the preface of the Chinese edition of *Three Worlds of Welfare Capitalism*, Esping-Andersen indicated that East Asian welfare systems could be seen as either hybrids of his liberal and conservative welfare regimes or a fourth regime (Ku and Finer, 2007, p. 121). Esping-Andersen had trouble classifying Japan and did not give a clear answer when he was asked if there was a unique Japanese welfare state (Hayashi, 2006, as cited in Powell et al., 2020, p. 96).

Japan was often treated as a central case in the East Asian welfare model (see Section "The East Asian welfare model"). Nevertheless, scholars were cautious about the existence of a homogeneous East Asian welfare model (White and Goodman, 1998; Peng and Wong, 2010). For example, Holliday (2000) suggested three sub-categories in the productivist world of capitalism: facilitative, development-universalist, and development-particularist. Japan was regarded as a development-universalist welfare state, where social rights were limited to productive activity, and social stratification reinforced productive elements, but some universal programmes existed (p. 711).

Japan was classified or compared with reference to other theoretical frameworks than Esping-Andersen's categories and the East Asian welfare model, which further increased the difficulty of determining its classification. Three influential theoretical frameworks are covered in this section: the uniqueness of the Japanese welfare state, a fourth familial world, and the functional equivalent thesis.

The uniqueness thesis of the Japanese welfare state could be dated back to Vogel (1979), who praised the "security without entitlement" achieved by Japan. Nakagawa (1979) claimed that, in terms of life expectancy, the availability of medical resources, the burden on citizens, and actual income, Japan has achieved success and ranked higher than Western welfare states. Therefore, Japan should be regarded as a "welfare super-power" and even Sweden "must clearly relinquish its welfare crown in favour of Japan" (p. 10). These earlier accounts revealed some distinct features of the Japanese welfare state, such as good welfare outcomes without an expansive welfare state. Nevertheless, these analyses were not based on systematic comparisons between Japan and other industrialised countries. In addition, they did not address the differences and similarities between Japan and other East Asian welfare systems.

After the publication of Esping-Andersen's (1990) classification, a few Japanese scholars engaged in the debate of the welfare regime and concluded that the Japanese welfare state could not be placed into any existing welfare regimes. Takekawa (2009) argued that underlying logics of mainstream welfare regime typologies were "Swedocentrism, Eurocentrism, and ethnocentrism" (p. 79) because these theories considered every welfare state a derivation from the Swedish model, tended to label East Asian welfare systems without paying enough attention to their differences, and attributed the difference between East and West to culture (Takegawa, 2005, p. 171). To overcome these tendencies in welfare

state research, Takegawa (2009) proposed to include external factors that influence the development of the welfare state. He found that Japan and South Korea developed their own welfare states in different international circumstances, which resulted in divergence within East Asia. The Japanese welfare state was unique in terms of strong bureaucracy, high levels of public investment, and strong economic regulation, while social democratic politics was weak, social expenditure was low, and social regulation was weak (Takegawa, 2005). Miyamoto (2003) also challenged Esping-Andersen's typology because it could not explain the substitutional role of economic policy in the welfare state (see below). The concept of hybrid also undermined the explanatory power of the theory (p. 15). Miyamoto (2003) put Japan between East Asian developmental economies and European established welfare states because Japan developed its welfare system earlier than other East Asian countries (p. 16).

In addition to classifying Japan as a unique welfare state, it was suggested that Japan was characterised by strong familism, which assembled other Southern European welfare states. Shinkawa (2013) argued that Japan has a low level of de-commodification and de-familialisation (p. 177). The key differences between the familial regime and the conservative regime were smaller government spending and the absence of generous benefits in the former.

To explain the relatively low spending of social expenditure but relatively high redistributive effects in Japan, scholars have developed the functional equivalent thesis. For instance, Estévez-Abe (2008) and Miura (2012) offered a political-economic explanation where industrial policy and employment protection serve as a functional equivalent to social policy. Similarly, Yang (2020) followed the idea of functional equivalents and classified Japan as a "small welfare state" with South Korea and the United States. Kato (2018, 2020) suggested a new typology based on welfare provision and functional equivalents. He argued that the Japanese welfare state had high levels of employment security but low levels of social security.

The difficulties of reaching a consensus on how to classify the Japanese welfare state were evidenced by the systematic review conducted by Powell et al. (2020). They found that only 3 out of 40 studies reached the same conclusion as Esping-Andersen (i.e., classifying Japan as a conservative welfare regime), 9 studies identified Japan as a liberal welfare regime, and 7 studies viewed Japan as a hybrid. In contrast, six studies classified Japan into a fourth regime, while nine studies used other theoretical frameworks to classify Japan. From what has been mentioned above, there were multiple classifications of the Japanese welfare state based on different perspectives. Even though we confined the scope to income-maintenance-based typology exemplified by Esping-Andersen (1990), an agreement still could not be reached. Nonetheless, it seems that the literature has some consensus about the income maintenance system in Japan. On the one hand, it was predicted that social expenditure (adjusted by demographics) and generosity remained low when compared to other developed countries. This is because the state was actively seeking alternatives from the family (Confucianism and familism) and labour market policy (function equivalent thesis) to provide welfare, which corresponded to the classification of liberal or conservative welfare regimes (or the hybrid of both regimes). On the other hand, in terms of institutional configurations of the income maintenance programmes, Japan shared similarities with conservative welfare regimes and other East Asian economies, featuring occupational programmes in the form of social insurance.

Research questions

Previous sections have reviewed Esping-Andersen's income-maintenance-based welfare regime typology and its expansion to explain the development of East Asian welfare systems. Japan was the only case included in both streams of typology, but the classification of this important case remains unsettled. Recent welfare regime research continues to revisit, refine, and reconstruct welfare state typologies in response to institutional change and new policy challenges (see above). Inspired by the literature, this paper has two main objectives.

First, this study contributes to that literature by reassessing Esping-Andersen's original income-maintenance-based operationalisation using contemporary data and evaluating its continuing analytical value. There is a consensus that Esping-Andersen's welfare regime typology is still a valid and reliable explanatory framework in welfare state research. Nonetheless, the data used by Esping-Andersen (1990) reflected the institutional characteristics of income maintenance systems in the 1980s. Although there were attempts to replicate or incorporate contemporary development (e.g., Bambra, 2006; Scruggs and Allan, 2006), the data used by these scholars mainly concentrated on the period of the 1980s and the 1990s. One of the most recent academic articles using quantitative methods is Danforth (2014). The data used in this research are from 1950 to 2000. Another recent quantitative research conducted by Yörük et al. (2022) made use of the original dataset, including the statistics from 1985 to 2015, but this analysis classified welfare states around the world, and therefore, it was less able to reveal the regime differences in the established welfare systems. There was little quantitative research on both East Asian welfare systems and OECD countries.

Second, Japan is an important lens to examine the income-maintenance-based typology. Despite extensive scholarly attention, the classification remains highly contested, with studies variously classifying it as liberal, conservative, hybrid, productivist, familial, and unique (cf. Powell et al., 2020). This persistent ambiguity makes Japan a particularly useful case for assessing the strengths and limitations of income-maintenance-based classification. After applying Esping-Andersen's (1990) operationalisation to the latest institutional data, this paper examines the classification of Japan and whether an income-maintenance-based approach can still provide a meaningful account of contemporary developments in the Japanese welfare state.

Methods

Following the literature, this paper aims at classifying the institutional features of income maintenance programmes in 18 OECD plus four East Asian welfare systems with a special focus on Japan. Cluster analysis was chosen to answer the first research question in this paper because cluster analysis was a robust quantitative method that could be used in classification. It was also the mainstream quantitative method in welfare regime typologies. The goal of cluster analysis was to identify patterns of data and facilitate new research questions and hypotheses. It could also simplify the data for communication or further analysis (Hennig, 2016, pp. 705–706).

There were various forms of cluster analysis. Two types of cluster analysis were widely applied in welfare regime typologies: K-means cluster analysis (e.g., Jensen, 2008) and hierarchical cluster analysis (HCA) (e.g., Obinger and Wagschal, 2001; Powell and Barrientos, 2004). Both types of cluster analysis were hard cluster analyses (a.k.a., crisp cluster analysis). However, to examine a contested case, soft cluster analysis (a.k.a., fuzzy cluster analysis [FCA]) was more suitable. This was because the membership of a certain object was determined by its degree of fitness in FCA, while hard cluster analyses referred to cluster analyses in which each member could only belong to one group. In FCA, a member could belong to multiple groups. FCA was usually interpreted as the probability of a given object in a certain group (Hennig and Meila, 2016, p. 3). As D'Urso (2016) noted, "the pivotal justification lies in the recognition of the vague nature of the cluster assignment task" (p. 548). In other words, in addition to identifying the best cluster, FCA could generate the second-best cluster (Everitt et al., 2011, p. 242). Compared to hard cluster analyses that only assign each data point to a category, the fuzzy logic incorporated in the FCA was particularly helpful in terms of investigating the goodness of fit. In a hard cluster analysis, a hybrid case with a 99% membership degree of the conservative welfare regime and 1% membership degree of the liberal welfare regime and another hybrid case with a 51% membership degree of the conservative welfare regime and 49% membership degree of the liberal welfare regime were classified as conservative. However, for a controversial case such as Japan, it is problematic to neglect this nuance. Therefore, it was also important to highlight the membership degree and the second-best cluster.

To answer the first research question, this paper combined both HCA and FCA. The combination of two types of cluster analyses was not rare in welfare state typologies (e.g., Powell and Barrientos, 2004). HCA was visualised via dendrograms. FCA was used instead of the widely used K-means cluster analysis to reflect the membership. In addition to determining the number of clusters for the following FCA, the dendrogram generated by HCA was particularly helpful in identifying which other welfare states are similar to Japan (see Supplementary Appendix 1 for relevant algorithms and principles for interpretation).

Criteria and operationalisation

This paper chose old age and unemployment as two policy sectors to classify the Japanese welfare state. The rationale for only including indicators for income maintenance programmes was that the welfare state can be narrowly defined as one country's arrangement for income maintenance (Béland et al., 2021, p. 1). Furthermore, although Esping-Andersen (1990) suggested a broad understanding of welfare regimes, his operationalisation of de-commodification and stratification was mainly based on income maintenance programmes. Influenced by this tradition, several intellectual attempts to classify welfare states were confined to cash benefits (see e.g., Bambra, 2006; Scruggs and Allan, 2006, 2008; Yörük et al., 2022). More importantly, incorporating a wider range of policy sectors assumes the consistency between different welfare policies. This assumption was challenged by some scholars (e.g., Kasza's (2002, 2006) argument on the illusion of the welfare regime). Methodologically, risks could arise from compensation effects when including multiple policy sectors in quantitative analysis (Hudson and Kühner, 2010).

Indicators from four dimensions were used for classification. The first dimension was the financial input. Expenditure figures were largely applied as indicators in existing typologies (e.g., Powell and Barrientos, 2004; Jensen, 2008). It should be noted that, as Siegel (2007) argued, the expenditure approach can still generate insightful perspectives for examining welfare state dynamics, but "spending only" hardly reflects the landscape of the welfare state. To avoid the limitation of aggregated expenditure data, this paper used adjusted disaggregated expenditure for two income maintenance programmes (i.e., pension and unemployment) as indicators to measure the financial input.

The second dimension was the generosity, which corresponded to Esping-Andersen's (1990) decommodification. Decommodification measures the extent to which a person can live without relying on the labour market (Esping-Andersen, 1990). Welfare schemes with higher levels of decommodification were regarded as more generous. In addition, the operationalisation of the generosity of welfare policy was similar to decommodification. According (pp. 793–794). Esping-Andersen (1990) applied similar indicators to construct his decommodification index. Due to data availability, replacement rate and legal coverage were used in the analysis.

The third dimension was the integration/segmentation, which corresponded to corporatism used by Esping-Andersen (1990) when measuring the social stratification of welfare states. Corporatism was a characteristic of conservative welfare regimes. It was defined as "the segmentation of public pension programmes based upon major occupational categories" (Scruggs and Allan, 2008, p. 646). In contrast, the integration model was accompanied by universal and unified schemes, which were features of social democratic welfare regimes. Both corporatism and segmentation could be used to measure how cash benefits were distributed among different groups of people, but the idea of corporatism was based on occupation, while integration focused on the institutional features of the welfare system. This meant that all pension schemes were taken into consideration, even though they were not divided according to occupations.

The fourth dimension was the welfare mix. The welfare mix (i.e., welfare triangle or welfare diamond) was widely used in analysing welfare states (see, e.g., Powell and Barrientos, 2004; Abrahamson, 2011). There were several frameworks to capture the welfare mix. The first one was the public/private mix, which was used by Esping-Andersen (1990) in his welfare regime typology. Later, Esping-Andersen (1999) added family as a third dimension. A welfare triangle consisting of the state, the market, and the family could be identified. In this paper, the public/private division was used for classification, as the concept of de-familialisation largely fell into the realm of family policy rather than income maintenance.

Table 1. Criteria and operationalisation

Criteria	Operationalisation
Financial input	Public spending on old age, % of GDP (adjusted by the percentage of population ages 65 years and above) Public spending on unemployment, % of GDP (adjusted by unemployment rate)
Generosity	Legal coverage of compulsory old-age and unemployment schemes Replacement rate of old-age and unemployment benefits
Integration	Programme types of the public pension schemes Programme types of unemployment schemes
Welfare mix	Legal coverage of voluntary old-age and unemployment schemes

Ideally, private expenditure and the generosity of private pensions should be measured. Due to the diversity of pension systems across different welfare systems and the absence of comparable data, only the legal coverage of voluntary old-age and unemployment schemes was used as a second optimal measurement.

Table 1 below summarises all criteria and their operationalisation. Supplementary Appendix 2 contains details of operationalisation and data sources.

Results

Cluster analyses based on different linkage methods generated different results. After removing unsatisfactory classifications, only nine cluster results (in which seven results from HCA and two from FCA) were retained. The only relatively clear pattern is that both HCA and FCA supported $k = 2$ as the best cluster solution, as manifested by the average silhouette score (see Supplementary Appendix 1). This was also reinforced by the robustness check using a slightly different dataset (see Supplementary Appendix 4). The cluster results implied that the institutional features of income maintenance programmes in OECD and East Asian welfare systems did not correspond to Esping-Andersen's (1990) three groups of welfare regimes. Australia, New Zealand, Hong Kong, and Singapore were often classified together, with the exception of $k = 2$ in single linkage, in which Singapore alone was treated as an outlier. A few characteristics shared by the members in this group can be observed from the data: the financial input and generosity remained relatively lower when compared to other cases. The peculiarities of Singapore were the absence of social assistance programmes and the existence of a provident fund for old-age pension. These features were not observed in any other selected OECD or East Asian welfare systems.

On the one hand, it seems that this group was similar to the liberal welfare regime suggested by Esping-Andersen (1990) in terms of their financial input and generosity, and both New Zealand and Australia were classified as liberal welfare regimes. Nonetheless, except for the Central Provident Fund in Singapore, the institutional designs of the old-age pension and unemployment programmes were less distinctive than those of others. Furthermore, the archetype of the liberal welfare regime (e.g., the USA) was not included in this group. On the other hand, no clear pattern of the other 18 cases included in this analysis could be identified, as liberal, conservative, and social democratic welfare regimes were mixed together into a group. This instability of the cluster results was also supported by relatively low levels of silhouette scores.

The results also discovered that the income maintenance programmes in the East Asian welfare systems did not share enough similarities to form a distinct group when compared to their Western counterparts. Nevertheless, this does not mean that the East Asian welfare model did not exist. As reviewed in Section "The East Asian welfare model," the major features of East Asian welfare regimes identified by scholars were their familism and productivism, which were not captured by the indicators included in the analysis. Regarding Japan, similar to the prediction of the literature, there was no consensus on the classification of the income maintenance system in Japan. Table 2 reveals the similarity

Table 2. Similarities between Japan and other welfare systems

	Out of 9 CA results	Similarity	Out of 7 HCA results	Out of 2 FCA results	Welfare regime[a]
CHE	9	Very high	7	2	Liberal
TWN	8	High	7	1	East Asian
NLD	8	High	7	1	Social democratic
AUT	7	High	6	1	Conservative
BEL	7	High	6	1	Conservative
DEU	7	High	6	1	Conservative
KOR	7	High	6	1	East Asian
USA	7	High	6	1	Liberal
NOR	6	Relatively high	5	1	Social democratic
CAN	6	Relatively high	5	1	Liberal
DNK	6	Relatively high	5	1	Social democratic
FIN	6	Relatively high	5	1	Conservative
FRA	6	Relatively high	5	1	Conservative
GBR	6	Relatively high	5	1	Liberal
ITA	6	Relatively high	5	1	Conservative
SWE	6	Relatively high	5	1	Social democratic
IRL	6	Relatively high	5	1	Liberal
AUS	1	Very low	1	0	Liberal
HKG	1	Very low	1	0	East Asian
NZL	1	Very low	1	0	Liberal
SGP	0	No similarity	0	0	East Asian

Note: CA, cluster analysis; FCA, fuzzy cluster analysis; HCA, hierarchical cluster analysis.
[a]The classification of 18 OECD countries is based on Esping-Andersen (1990).

between Japan and other welfare systems based on the results of both types of cluster analyses. Based on the result, it seems that Japan was similar to those of other European/Western countries, especially Switzerland, as a liberal-conservative welfare regime, in which a low level of spending combined with status maintenance mechanisms (Bonoli and Kato, 2004). However, the result that Japan was the most similar to Switzerland was based on two FCA, where the silhouette scores remained relatively low and close to the 0.25 boundary of no substantial structure (Kaufman and Rousseeuw, 2005, p. 88) (see Supplementary Appendix 1). The robustness check generated similar results, but in addition to Switzerland, Japan also shared similarities with Norway (see Supplementary Appendix 4). This implied that the similarity between Japan and Switzerland was weak and unstable.

Due to this unclear classification, it is necessary to compare some of the key indicators of the income maintenance systems in Japan to those of other welfare systems. Figure 1 presents the financial input measured by adjusted public expenditure on old-age pension and unemployment. The adjusted public expenditure on old-age pension in Japan remained lower than that in Western welfare states, except for Ireland. In terms of unemployment, although the figure stayed lower than the average, the differences

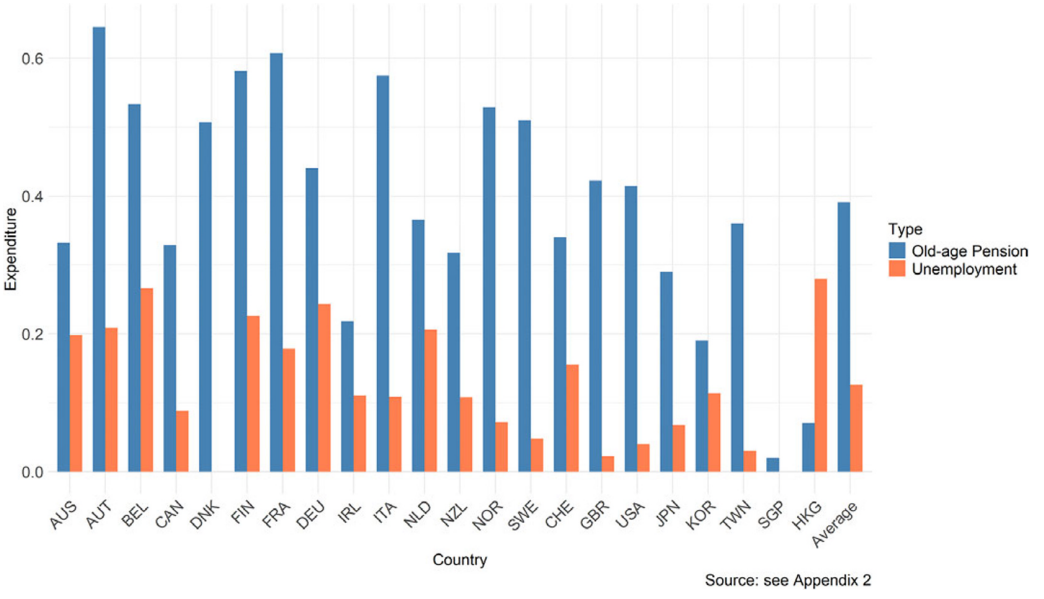


Figure 1. Adjusted public expenditure of old-age pension and unemployment in 22 welfare systems (% of GDP, 2019 or latest available).

between Japan and the West in unemployment were less distinctive. When compared with East Asian neighbours, the expenditure patterns of Japan were more similar to those of Korea and Taiwan, but different from Hong Kong and Singapore.

As Figure 2 illustrates, no distinct pattern emerges when analysing generosity via replacement rates. In Japan, the replacement rates for old-age pensions and unemployment benefits were 32.4% and 55.0%, respectively. Notably, the pension replacement rate was significantly below the average of 48.8%, ranking

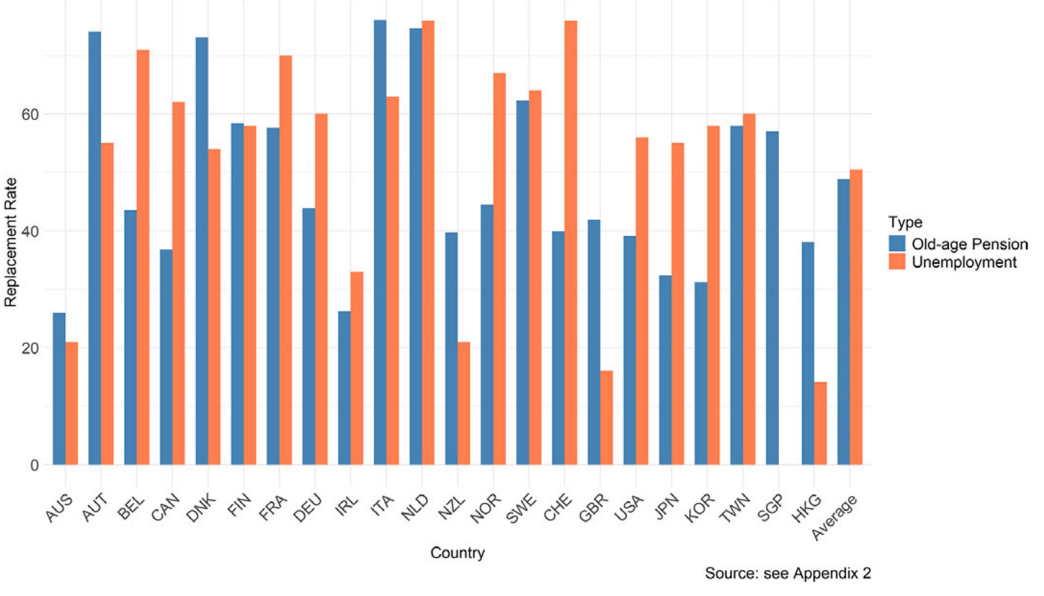


Figure 2. Replacement rates of old-age pension and unemployment in 22 welfare systems (%, 2019 or latest available).

as the fourth lowest among the 22 welfare systems examined. Conversely, the unemployment benefit replacement rate was slightly above the average of 50.5%. Overall, the generosity of income maintenance programmes in Japan appeared relatively low, ranking 16th out of 22. Japan was very close to Korea if only measured by generosity, but few similarities can be observed between Japan and other East Asian welfare systems.

In terms of institutional design, the old-age pension in Japan consisted of the Employees' Pension Insurance Programmes (EPI) and the National Pension Programme (NP). The EPI was an earnings-related pension that mainly covered employees. Both employees and employers contributed to the fund. In contrast, the NP was a flat-rate pension covering all citizens. The government contributed 50% of the cost of the pension benefits. Combining contributory flat-rate and contributory earnings-related pension schemes was not rare in advanced welfare systems. Among 22 cases included in this analysis, Taiwan, the United Kingdom, and Switzerland had both types of pension schemes. Nevertheless, other formats of pension provision (i.e., non-contributory means-tested, non-contributory universal, provident funds, mandatory occupational pension, and individual accounts) were absent in Japan, which is a unique feature.

The unemployment benefits were funded based on the social insurance principle. All employees were covered mandatorily, with voluntary coverage for companies with fewer than five regular employees in some industries (e.g., agriculture and fishery). From this perspective, the unemployment schemes in Japan were similar to those in Taiwan and Korea, where only contributory schemes based on social insurance existed. Switzerland was also close to Japan, as the unemployment schemes were based on social insurance with separation payment. The majority of the Western welfare states included in this analysis combined both contributory and non-contributory schemes, except New Zealand and Australia, where only non-contributory schemes existed.

Discussion

The cluster analysis generated an unclear picture of income maintenance programmes in 18 OECD countries and 4 East Asian welfare systems. Although this study mainly focused on income maintenance programmes, there are a few important implications for comparative welfare state research.

First, the cluster results revealed that income maintenance programmes in advanced welfare systems nowadays do not follow the same pattern identified by Esping-Andersen's (1990) original framework in the 1980s. There are a few possible explanations for this unclear picture of income maintenance programmes. (1) The most radical explanation is that the concept of welfare regime becomes out-of-date and unable to capture modern welfare states due to convergence, especially in income maintenance programmes. It should be noted that the cluster analysis in this paper did not involve longitudinal data. Hence, it was not able to test whether there was a convergence among established welfare states directly. Nonetheless, there was an academic consensus on the divergence of welfare states at least in the past, which was evidenced by the appearance of the welfare modelling business. Considering this, it is possible that this blurred picture revealed by the latest data can be attributed to the convergence thesis of welfare states. (2) Since this analysis only focused on cash benefits, another explanation is that welfare regimes still hold their empirical validity, but this is no longer able to be manifested by institutional features of income maintenance programmes as it was in Esping-Andersen's (1990) framework. (3) The unclear classification might also be attributed to the methodology. Features not captured by this analysis (e.g., outcome) or the same concepts but operationalised differently might distinguish income maintenance programmes. Inherent limitations of cluster analysis, such as the compensation effect (Hudson and Kühner, 2010), can also impact the results. It is worth noting that this analysis is highly data-driven, and hence, its conclusion was bound by the availability and quality of the data. Efforts have been made to maintain the consistency of the data in order to increase the robustness of this analysis.

Regarding East Asia, the institutional features of income maintenance programmes in the region did not share strong enough similarities to be distinguished from their European/Western counterparts. In all classifications, five East Asian welfare systems (i.e., Japan, South Korea, Taiwan, Singapore, and Hong

Kong) were classified into different groups. It should be noted that the cluster analysis did not address the defining features of the East Asian welfare model as mentioned in Section "The East Asian welfare model," because indicators to measure these features (e.g., social investment and the reliance on family; see Lee and Ku, 2007) are less directly relevant to income maintenance programmes. Hence, the statistical results in this study did not reject the East Asian welfare model. Similarly, the results did not support or oppose the functional equivalent thesis explicitly, as indicators largely fell into the realm of family policy and broader economic/industrial policies rather than the institutional features of the income maintenance programme. Nonetheless, the blurred boundaries between the income maintenance programmes in East Asian and Western established welfare systems might imply that the distinctiveness of East Asian welfare regimes derived from productivism/developmentalism and familism may not be observable within income maintenance programmes. Whether these features of the Japanese/East Asian welfare system remain distinctive from other welfare systems deserves further research that incorporates more welfare policy sectors.

Second, a deeper examination of the income maintenance programmes in Japan revealed that more caution was needed when applying welfare regime categories (e.g., liberal, conservative, and social democratic) to analyse the income maintenance programmes across advanced welfare systems. Corresponding to the literature, the relatively low level of financial input and generosity with the Bismarckian style of social insurance in terms of institutional designs demonstrated the hybrid features (of liberal and conservative welfare regimes) of the Japanese income maintenance programmes. Hence, these labels still retain their analytical value in analysing income maintenance programmes in specific welfare states (e.g., as an anchor to analyse path dependence). Nonetheless, extra examination is needed before claiming that the classification of welfare regimes is consistent with the classification of income maintenance programmes in advanced economies.

Conclusion

As the only case included by Esping-Andersen's (1990) framework and East Asia welfare model, the classification of Japan has been debated for decades. This paper contributes to the welfare modelling business by utilising the latest data and fuzzy cluster analysis to address the complexity of classifying income maintenance programmes in developed welfare systems. The results showed that the boundaries between income maintenance programmes were not clear using the latest data.

After examining the controversial case of Japan, this paper identifies a tension between the classification of income maintenance programmes and broader welfare regimes. The paper argues that it might still be useful to use the concept of welfare regimes to analyse income maintenance programmes in specific contexts, but it should be avoided to assume that the classification of welfare regimes (a concept including multiple policy sectors) remains largely similar to the classification of income maintenance programmes (cf. Kasza, 2002, 2006), as it was in the era of Esping-Andersen (1990).

Supplementary material. The supplementary material for this article can be found at http://doi.org/10.1017/ics.2026.10106.

Disclosure statement. The author declares no conflicts of interest.

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Cite this article: Lin H (2026) Revisiting income-maintenance-based welfare regime classification: Japan in comparative perspective. *Journal of International and Comparative Social Policy,* 1–14. https://doi.org/10.1017/ics.2026.10106