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A COMPARATIVE TYPOLOGY OF PENSION REGIMES

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Abstract

This report presents an empirical typology of pension regimes in the European Union, the US, Canada, Australia and Norway. The categorisation is based on 34 quantitative and qualitative characteristics of the mandatory parts of the pension systems in these countries. The empirical analysis shows that Esping-Andersen's classical distinction between liberal, corporatist and social-democratic welfare regime types does not entirely hold in the case of pension systems.

The empirical traits of the various pension systems can be summarised on two main dimensions: the general level of pension provision and the existence of private schemes within the mandatory part of the pension system.

On these dimensions four clusters of countries, or pension regime types, have been identified empirically. Two of those are as one would theoretically expect: the corporatist group has rather high earnings-related pension benefits, while the liberal pension regime type provides a more basic, means-tested pension. However, two other clusters are not in line with the standard classification of welfare regimes. In the 'moderate pensions' cluster, the level of pension provision is lower than in the corporatist countries, but it surpasses the standards attained by countries with a liberal pension regime. In countries belonging to the 'mandatory private' cluster, the government obliges employees to participate in private pension schemes, which are generally funded and based on defined contributions. The pension level in this group is moderate or high.

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1. Introduction

In his classic work, entitled *The three worlds of welfare capitalism*, Esping-Andersen (1990) paid special attention to the various pension systems. A main issue in his discussion is the relationship between public and private pensions. In line with this overall analysis, Esping-Andersen defines three pension regime types: a corporatist state-dominant insurance system, a residualist system in which the state only provides a pension benefit to the most needy and a universalistic state-dominated system where population-wide social rights are prevailing. This classification of pension systems largely corresponds to Esping-Andersen's general typology of welfare regimes.

In later years the general three-fold division of Esping-Andersen has been debated widely, and many studies replicated the analyses making new classifications of countries focusing on specific aspects of the welfare systems (e.g. Bonoli, 1997; Korpi & Palme, 1998). Only a few studies, however, analyse the typical aspects of the pension systems (e.g. Shalev, 1996). This paper presents an empirical classification of the various pension systems in the European Union, the US, Canada, Australia and Norway. We aim to chart the qualitative differences between pension systems, thus showing the institutional gaps that exist between countries.

Of course, the various types may not be static. Welfare states and pension regimes may change, because policy actors may have to adapt them to developments in the economic, demographic and political context. Any classification of regime types should therefore be assessed in a dynamic framework. Therefore, this study also tries to include various measures that have been taken in pension policy over the last decade. The main question here is whether the various regimes choose different lines of policy; or whether there is a general path to resolve the ageing problem that countries have to cope with.

The paper is the result of a dedicated work package of the project on Adequacy of Old Age Income Maintenance in the European Union (AIM). The main issue in this project is the possible future trade-off between adequacy and sustainability of pension systems, given the emerging ageing problem in most EU member states. At stake in this paper is therefore not only a 'conceptual' grouping of countries; it is also meant as a starting point for the analysis of the future performance of the various systems. Among the member states, these systems probably differ with respect to the degree of development of public basic schemes (first pillar), occupational schemes (second pillar) and individual retirement provision (third pillar). Current pension systems within the EU also may vary by the degree of coverage and generosity of the various schemes. It also seems plausible member states will differ in the way they tackle the future. They may develop different strategies to cope with the budgetary consequences of an ageing population, and to guarantee adequate pensions for all.

The report presents the outcomes of work package 2 of the AIM-project, for which three research issues were defined:

- to analyse empirically the *current pension systems* in the EU at the level of 'regimes', and see how they relate to the general typology of welfare regimes;

- to analyse *recent pension reforms*. Some countries, such as Sweden, have reformed the pension system considerably, while others only made small adjustments (e.g. indexation mechanisms in the UK). This provides some information on the *developmental paths* countries are choosing; and

- to link current pension systems and developmental paths to the *demographic expectations*.

These issues are mainly handled in sections 4 and 5 of this paper. The theoretical status of regimes, previous empirical work and methodological issues are discussed in the preceding sections 2 and 3. In section 6 the results are summarised, and the possible relations to other aspects of the AIM project outlined.

2. Welfare regimes in theory[1]

There is a considerable literature on the different types of welfare states or 'regimes'. The concept refers to distinct types of coherent formal institutions (mainly in social security) which aim to realise certain collective goals.

Most Western countries saw a strong growth in their social security system during the post-World War II period. However, there is considerable variation in the way nations structure their arrangements. Such differences theoretically reflect the interplay of several factors. Esping-Andersen (1990: 105-138) points to historical context variables such as:

- economic and demographic developments (growth, wealth distribution, unemployment, number of older people);

- the power of political actors (the labour classes, employers' organisations, farmers, religious groups, the new middle classes, pensioners);

- political alliances which have been possible or impossible at certain crucial moments (for example, the Catholic-Socialist coalitions that created the national insurance system in the Netherlands in the 1950s may explain its 'hybrid' character); and

- the extension of welfare arrangements according to the previously existing institutional structure (path dependency).

Several authors have tried to summarise the main differences between countries in the form of a typology of welfare states or 'regimes'. The scheme employed by Titmuss (1974) became a classic. He distinguishes three 'ideal types'. In the *residual welfare* model, the individual or the social network to which he belongs (household, family, community) bears primary responsibility for the financial consequences of social risks. Only when this private coverage proves inadequate does the government step in. Benefits function as a social safety net, and are therefore minimal, temporary and accompanied by a means test to ascertain the inadequacy of the individual's own income and assets.

In Titmuss's *industrial achievement-performance* model, greater weight is accorded to government responsibility for income protection. Risks are covered in proportion to the individual's contribution to the collective labour productivity. Social policy ensues from economic policy, in which the operation of the free market dominates. State social security arrangements are supplementary to the social protection that is arranged through collective bargaining between employers and trade unions. Rights often depend on labour performance, employment history and occupational status.

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[1] Sections 2 and 3 are mostly based on Vrooman (forthcoming).

In the *institutional redistributive* model, social security is a means of expressing the collective responsibility for individual welfare. In a modern society the family and the market are no longer able to provide adequate and fair coverage of social risks. The government therefore has to adopt a redistributive approach. It provides benefits and provisions, with the needs of households as the key criterion for the attribution of rights and duties.

Esping-Andersen (1989, 1990, 1996, 1999) adopts a similar three-fold division. His central tenet is that three divergent welfare regimes can be identified, which differ in terms of:

a)   *De-commodification*, i.e. the degree to which individuals or families are able to achieve a socially acceptable living standard, independently of their participation in the market. The level, duration and accessibility of social provisions are important variables here.

b)   *Stratification*. In Esping-Andersen's theory this describes the way in which countries shape citizenship through the structuring of rights. Welfare states of the same size can aim at very different stratification effects. One system may try to sustain the existing hierarchy and status divisions; another may increase social differences, for instance through a polarisation of educational and labour market opportunities; while a third may aim to realise high minimum standards for every citizen, no matter what their background.

c)   *Post-industrial employment*. Welfare regime types diverge in the development of the 'post-industrial sector': social and personal services (the government sector, the 'fun industry' in hospitality, catering and tourism, cleaning work, etc.), and other forms of employment not directly related to the production of actual goods (management, marketing, lawyers, information and computer experts). Both the size and nature of post-industrial employment vary with different types of welfare regimes.

Esping-Andersen's typology of 'liberal',[2] 'social-democratic' and 'corporatist' regimes has been guiding much of the recent welfare state debate. Here in Europe, this shows most clearly in the policy discussion on the future of pension and social security. Is it inevitable that the enlarged EU will become more 'Anglo-Saxon' in its systems of social security and pensions, especially due to the impact of globalisation? Or should Europe re-invent its own policy traditions, and seek a new social model, which aims to take advantage of the best points of the traditions of the Rhineland and the Nordic countries?

According to Esping-Andersen, the Anglo-Saxon countries are the main representatives of the *liberal welfare regime*. This type has limited collective provisions, comparable with Titmuss's residual model. The target group is restricted to those in need, who are unable to meet their basic requirements in any other way. In order to keep this group small, strict access conditions are applied: benefit recipients must not be capable of work, and stringent means-testing is used to determine the level of need. The duration of benefits is limited to the period that the recipient is unable to work. The level of the benefit is meagre, tending to be more of a 'survival benefit' than an amount that would enable the recipient to play a full part in society. Apart from civil

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[2] Esping-Andersen uses the expression 'liberal' in a classical European sense, referring to a regime that maximises individual freedom and limits state intervention. This, of course, is completely at odds with its standard meaning in current American English, as Murray (1997: xii) points out: "The correct word for my view of the world is liberal (and) the writers of the nineteenth century who expounded on this view were called liberals (…) But words mean what people think they mean, and in the United States the unmodified term liberal now refers to the politics of an expansive government and the welfare state". Murray proposes 'libertarian' as an alternative. That concept, however, may be rather confusing as well – at least from a European perspective, in which it usually is associated with individualistic variants of anarchism. Throughout this paper the word 'liberal' is therefore adopted, in its classical meaning and in line with the Esping-Andersen nomenclature.

servant schemes, there are no separate collective provisions for specific occupational groups. Levies are low and the collective provision is funded from general resources (taxation). In contrast to this system, private provisions in the liberal welfare regime are relatively extensive – at least for those who have access to them. The middle and higher social classes have taken out separate insurance or enjoy employee benefits from their companies. The tax system generally encourages people to make private provision, through tax exemptions and tax allowances. Where a minimum wage exists at all it is low: so as not to interfere with the presumed operation of the pricing mechanism on the labour market, there is no interference in wage formation at the minimum level. The labour market participation rate of women, older people and disabled people is fairly high, because the low level of benefits and the absence of collective retirement schemes do not create a disincentive – if anything, the reverse. There is little collectively guaranteed employment, even for groups with poor labour market prospects. Post-industrial employment is extensive and lies largely outside the government sphere. A dual structure prevails: good post-industrial jobs for a large group of 'business professionals' (lawyers, consultants, personnel managers) and poor-quality 'junk jobs' which fall to the low-skilled (poorly paid jobs in sectors like catering, tourism, entertainment and cleaning work). In terms of stratification, the liberal welfare regime leads, according to Esping-Andersen (1990: 65) to "a curious mix of individual self-responsibility and dualism": a group at the bottom that is primarily dependent on stigmatising, means-tested public assistance; a middle class that mainly depends on social insurance; and a privileged group that buys the main provisions on the market.

The level of 'de-commodification' is low in the liberal welfare regime: it is difficult for people to achieve an acceptable standard of living if they do not have qualities with sufficient market value (or – in the case of pensioners – have not utilised those qualities in the past). The precise degree of de-commodification varies with the stringency of the means-testing and the level of benefits, however.

The countries of continental Europe and Japan are characterised by Esping-Andersen as *corporatist* welfare regimes. These often have an autocratic tradition: in the past, social insurance schemes were funded in order to generate direct loyalty on the part of the individual to the central state or monarchy. Under the auspices of the state, the system was designed to replicate the existing status and class differences, with an elevated position for civil servants personifying the state. Since the Catholic church was often jointly responsible for the development of the system, this type of welfare regime is often biased in favour of the traditional family structure, in line with the principles outlined in the encyclicals *Rerum Novarum* (1891) and *Quadrogesimo Anno* (1931).

The coverage provided by collective provisions in these welfare regimes is selective and hierarchical. Separate collective insurance schemes attribute rights and obligations, in accordance with the individual's social position. The access conditions are fairly strict and are based on actuarial principles: an actuarial relationship is established between the contributions paid (or the employment history) and the provisions to which the individual is entitled. Benefits may be paid for a long period, provided sufficient entitlement has been built up. The level of benefits is high and is generally a percentage of the previously earned income. The number of collective schemes is large, with civil servants enjoying a privileged position. The levies are fairly high, and schemes are usually funded through the payment of contributions. The 'familialism' of corporatist welfare regimes is reflected in the exclusion of non-working women from social insurance schemes, good family provisions which encourage full-time motherhood, and underdeveloped childcare facilities, which makes it hard to combine work and care tasks.

The predominance of collective social insurance schemes means the coverage offered by private provisions is limited. A high minimum wage operates on the labour market, which is fixed by

law or laid down in government-sanctioned collective labour agreements. The prevailing incentive structure results in a low labour market participation of women. The participation rate of older and disabled people is also limited: early exits from the labour market are stimulated through collective early retirement schemes, sometimes in the guise of attractive unemployment and disability regulations. There is little collectively guaranteed employment, with just a limited number of sheltered employment schemes. For a number of reasons, post-industrial employment is fairly underdeveloped. Corporatist regimes try to reduce the labour supply of women; the government sector – which potentially offers much work of this type – remains relatively small; and the high levies make the creation of low-paid work in the areas of social and personal services difficult.

In terms of stratification, corporatist welfare regimes often tend to reinforce traditional differences based on occupational status, lifestyle and gender. As a possible future scenario, Esping-Andersen presents a division between insiders and outsiders, with working people on the one hand and non-working women, young people, the elderly and the disabled on the other. The collective negotiations between employees and employers are focused in this scenario entirely on the interests of those in work; pay demands are set high at the expense of job opportunities for less productive workers and non-workers. Combined with the lack of employment incentives for women, this results in "a diminishing yet highly productive workforce supporting a growing but unproductive outsider population" (Esping-Andersen, 1990: 227).

The degree of de-commodification is generally higher than in liberal welfare states, but is largely concentrated among professionals with an adequate employment history. The precise extent of 'market-independence' depends on the replacement rate (the relative level of the replacement income) and the flexibility with which the actuarial principles – equivalence between contributions paid or employment history, and entitlements – are applied.

According to Esping-Andersen, the Scandinavian countries represent variants of the *social-democratic welfare regime*. The system aims to realise a high level of social protection for all inhabitants. Benefits and provisions are accredited at a level that corresponds to the wishes of the most critical among the new middle classes, and no distinction is drawn between the rights of the working class and those of the better-off. This is achieved through compulsory collective insurance schemes with earnings-related benefits. The most characteristic feature is the combination of welfare and work: employment plays a crucial role in this regime. It is an expensive system, which can only be sustained if there is a consistent commitment to full employment for both men and women. In order to be able to pay for the generous provisions, the number of benefit claimants must be limited and the number of taxpayers maximised. In the two other systems, economic inactivity by certain groups is accepted (housewives and early retirees in the corporatist welfare state; people who are unable to find a place in the market in the liberal variant).

The social-democratic regime type is universalistic: all inhabitants have access to collective provisions for a large number of social risks. In line with this, the entry conditions for benefits that bear no relation with the labour market (especially old age pensions) are not very rigorous: having lived in the country for a limited number of years may be sufficient to gain entitlements. On the other hand, applicants of working age may be subjected to rather strict tests on their job search behaviour, and can be forced to participate in intensive training programmes and 'workfare' schemes, especially for unemployment and social assistance benefits.

There are no strict limitations on the duration of rights. Benefits and provisions may be granted for as long as the social risk continues to manifest itself. The level of collective benefits is high, often being linked to the most recently earned wage. Where this is not the case, a high statutory minimum income is available, which is adequate to permit full participation in society. The universalistic nature of the social-democratic type is reflected in the absence of separate

collective provisions for specific occupational groups: everyone falls within the same schemes. Of course, financing this comprehensive welfare regime requires high contributions, which are usually collected through general taxation.

In the social-democratic regime the coverage offered by private provisions is low; the extensive collective arrangements make these unnecessary. In line with the good social provision, the minimum wage is high as well. There is however a commitment to wage moderation at the higher wage levels, because otherwise employment in the extensive government sector would become too expensive. The labour market participation of women is promoted through specific provisions (individual benefit entitlements, leave arrangements for performing care tasks, extensive childcare facilities). The high contributions are also a work incentive: only when both partners are gainfully employed can an adequate household income be generated. Older people and disabled workers are discouraged from leaving the labour market, because early retirement routes are restricted, and because of the activating labour market programmes. This leads to rather high participation rates in these groups.

A large part of the labour market is collectivised, through a sizeable government sector and sheltered employment programmes. The lion's share of the post-industrial jobs are to be found in welfare, social security, care and childcare organisations. Esping-Andersen (1990: 222) refers to this as "a social-welfare led post-industrial employment structure". The majority of the large number of women in the labour market are absorbed by this extensive collective sector, where they occupy mainly middle-ranking positions. There are few post-industrial jobs outside the government sector: the high wages rule out the creation of American-style 'junk jobs' (at least on the formal labour market).

Given its universalistic approach, the social-democratic welfare regime is designed to eliminate differences between groups of citizens. In practice, however, stratification effects may arise, because the level of benefits and provisions is constrained by cost considerations.

The same line of reasoning applies to de-commodification. In theory, the universalistic and generous design means the degree of market-independence under this system should be higher than in the corporate or liberal regimes. In practice, however, even within social-democratic regimes full de-commodification (e.g. through a high basic income for all inhabitants) is hard to achieve, because there are limits to the social security rights a nation can afford.

Esping-Andersen's 'three worlds of welfare capitalism' are mainly *ideal types*, although he does provide some empirical evidence. In practice, however, none of the three types will occur in a pure form. Corporatist countries, for example, usually have a safety net in the form of means-tested public assistance, covering those who are not, or no longer entitled to the occupational schemes. Schemes that are mainly universalistic sometimes contain insurance elements, with rights depending upon past labour experience or contributions; and countries adopting a 'residualist' approach may have collective pension schemes that exceed the subsistence level by quite a wide margin. This makes it important to analyse the empirical power of the typology.

3. Earlier empirical analyses of welfare regimes

What is interesting about the regime notion is that it gives a rather general description of fairly stable systems of formal institutions, and tries to link this to certain social conditions and collective outcomes (economic growth, labour participation, poverty, inequality). The empirical validity of Esping-Andersen's typology has been tested before, for instance by Kangas (1994), Ragin (1994), Shalev (1996, 2002), Bonoli (1997), Korpi & Palme (1998), Obinger & Wagschal (1998), Pitruzzelli (1999), Gough (2001), Hicks & Kenworthy (2003), and Saint-Arnaud & Bernard (2003). These studies mainly rely on cluster or factor analysis, techniques that are better suited to identify the similarities and differences between countries than the combination

of tabulation and regression methods originally used by Esping-Andersen. In their meta-analysis, Arts & Gelissen (2002: 153) summarise the results and conclude:

> Esping-Andersen's original three-worlds typology neither passes the empirical tests with flying colours, nor dismally fails them. The conclusion is, first, that his typology has at least some heuristic and descriptive value, but also that a case can be made for extending the number of welfare regimes to four, or even five. Second, these analyses show that a significant number of welfare states must be considered hybrid cases: no particular case can ever perfectly embody any particular ideal-type.

However, there are several reasons for doubting whether the previous empirical work provides an adequate test of Esping-Andersen's typology. The institutions that were included in the studies often did not cover the entire social security regime. For instance, Ragin (1994) and Shalev (1996) analysed pension benefits, Gough (2001) social assistance schemes, and Kangas (1994) focused on health insurance regulations, which hardly play a role in the original typology. Such partial analyses may be quite interesting in their own right, but of course cannot fully corroborate or rebut Esping-Andersen's typology.

A second problem concerns the limited number of indicators in these empirical studies. Bonoli's classification (1997) is an extreme example: he tested the validity of Esping-Andersen's typology by merely plotting two variables, gross social expenditure as a proportion of GDP, and the share of contributions in social security funding. But in other cases too, often only six to ten variables were analysed, which hardly does justice to the wealth of attributes Esping-Andersen associates with his regime types. This is not only a matter of data restrictions, but there is also a methodological issue at stake. Country comparisons tend to suffer from the 'small N'-problem. Goldthorpe (2000: 49) sketches it quite succinctly:

> Where individuals are the units, populations can be sampled so as to give Ns of several hundreds or thousands; but where nations are the units, N cannot rise much above one hundred even if all cases are taken, and is often far less. In applying techniques of multivariate analysis, serious difficulties therefore tend to be encountered in that N is not much greater than the total number of variables involved. Statistically, this means that there are too few degrees of freedom, that models become 'overdetermined', that intercorrelations among independent variables cannot be adequately dealt with, and that results may not be robust. Substantively, it means that *competing* explanations of the dependent variable may not be open to any decisive evaluation.

If one tries to analyse regime types using traditional cluster or factor analysis, not too many variables can be included due to the 'small N'-problem.

Shalev (2002) raises yet a third objection. Most empirical tests of the typology treat variables as if they were continuous phenomena: the size of the welfare state, the score on a de-commodification index, etc. Theoretically, however, it is important to search for meaningful distinctions in the formal institutions of countries, and whether it is possible to identify underlying general principles. From a methodological point of view, Shalev (2002: 30-31) considers the empirical analyses in *The three worlds of welfare capitalism* rather unsatisfactory:

> Esping-Andersen's first technique (tabular analysis) was unnecessarily 'soft', while the second (regression) is fundamentally in conflict with his analytical assumptions … No systematic test was carried out of whether his ensemble of welfare state regimes actually do 'hang together'; and if they do, whether countries cluster in three distinct subgroups on underlying policy dimensions … The empirical results are of questionable value, being based on regressions with 5 or 6 explanatory variables and only 18 cases. The key difficulty however is that asking whether political effects 'matter' after 'controlling for' other causes is a different and more banal question than what interested Esping-Andersen … [The regression approach] treats both policy and politics as continuous variables potentially scattered across the whole spectrum of potential variation – not as a limited number of

> qualitatively different configurations with distinct historical roots. [… Esping-Andersen]
> applied multiple regression as a blunt instrument for tapping gross differences between
> groups of countries, differences that arguably could have been more effectively conveyed
> by the use of tables and charts without the implication of constant linear effects across
> different contexts.

Shalev also raises a number of objections to the Qualitative Comparative Analysis technique,
which Kangas (1994) and Ragin (1994) used in order to identify welfare regimes:

> QCA is a method intended to aid comparative analysis by identifying, with the help of
> formal criteria derived from Boolean algebra, case attributes that are invariably associated
> with particular outcomes …. The main weaknesses of QCA are the need to measure all
> variables dichotomously and its abandonment of probabilistic for deterministic
> generalizations. [… Ragin's and Kangas's] efforts were innovative but problematic. Each
> country was forced to fit into one regime, thereby predetermining an issue in need of
> empirical exploration. Serious practical problems arose. Kagan had difficulty finding the
> 'liberal' countries and Ragan was placed in the awkward position of having to assign one
> third of his countries to a 'spare' category which automatically excluded them from his
> analysis. Neither researcher capitalized on the potential strength of clustering and other
> multivariate techniques as mechanisms of data reduction to validate the underlying
> dimensions of the multiplicity of policy indicators that make up a 'regime' (Shalev 2002:
> 31-32).

Goldthorpe (2000: 51-52) criticises QCA in a more fundamental way:

> The fact that QCA remains a logical technique means that its results are far more exposed
> to major distortion, both by difficulties in the selection of independent variables and by the
> occurrence of error in data than are results derived from statistical techniques.

Shalev therefore advocates a combination of multi-dimensional scaling and factor analysis.
Other experimental techniques that have been suggested to analyse welfare regimes include
fuzzy set theory (Kvist, 1999; Ragin, 2000) and neural networks (Hagfors & Kangas, 2004).

3.1 Categorical principal component analysis

In line with this recommendation, we have used categorical principal component analysis
(CatPCA) in previous analyses of welfare regimes (Wildeboer Schut et al., 2001; Soede et al.,
2004). This technique combines optimal scaling with principal components analysis to analyse
the main dimensions of the dataset (cf. Gifi, 1990; and the CatPCA algorithm document[3]). It has
a number of advantages in comparison with standard principal component analysis.

Firstly, in contrast to linear PCA, CatPCA can handle variables of different analysis levels
(nominal, ordinal, and numerical) simultaneously. All categorical variables are rescaled by
assigning numerical quantifications to each specific category. In an alternating procedure, the
optimal category quantifications (and resulting component loadings) are calculated from the
initial object scores, after which the object scores are updated from the new scaled categories,
with the procedure being repeated until a convergence criterion is reached.

Secondly, as in classic PCA, the variables are reduced to a limited number of uncorrelated
dimensions by searching for linear combination(s) of variables which minimises the

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[3] CatPCA was formerly known as 'Princals' (Principal components analysis by alternating least squares).
The procedure is available through the 'Categories' module of the SPSS software package. Gifi (1990)
gives a more detailed description. The CatPCA algorithm document is available through the SPSS
support site (http://support.spss.com/tech/default.asp).

unexplained error in the data. CatPCA uses a broader optimisation function to calculate the solution: it maximises the average correlation of the variables with the dimensions.

A major advantage of CatPCA is that it can also handle the situation in which the number of variables exceeds the number of observations as it does not use the correlation matrix for scaling. Thus, CatPCA is not sensitive to the 'small *N*-problem' mentioned earlier. It can, however, be shown that a CatPCA solution is equivalent to standard PCA if the dataset contains interval variables only and if there are more observations than variables (Gifi, 1990: 167-168).

The CatPCA technique is especially suitable for testing Esping-Andersen's typology, because the number of theoretical dimensions he refers to is limited, and the indicators used in comparative welfare research mostly have an ordinal or nominal measurement level. If the underlying variables do indeed correlate as expected, it should not be too difficult to represent regime types adequately in a limited number of dimensions.

CatPCA produces optimal scaling of both countries and regime characteristics. Countries and regime traits that share many features will obtain more or less the same scores on the dimensions, whereas cases and categories with little in common will be positioned a long way apart. This makes it possible to identify the degree to which pension institutions empirically coincide, and to ascertain whether countries actually form distinct clusters. In the analysis we performed here, pension system characteristics were generally scaled at an ordinal level.

3.2 On worlds of welfare

The relationship between the 'institutional configuration' and the 'welfare production' was the key question in SCP's earlier project *On Worlds of Welfare* (Wildeboer Schut et al., 2001). The first question concerned the *actual existence of Esping-Andersen's typology.* Although he provided some circumstantial evidence, the distinction between 'liberal or Anglo-Saxon', 'social-democratic or Nordic', and 'corporatist, continental or conservative' regimes was largely theoretical. Moreover, Esping-Andersen originally did not allow for any within-regime variation. This implied, for instance, that Canada was treated as just as 'liberal' as the United States, and that the Netherlands was sometimes regarded as a variant of Sweden, but in other cases put firmly into the Franco-German side.

The second question related to the *collective results* of welfare types. Do liberal, social-democratic and corporatist countries differ in the degree of income redistribution, inequality, social welfare and poverty they produce?

In answering the first question, categorical principal components analysis allowed us to include over 50 quantitative variables, for 11 countries that theoretically belong to different regime types. The variables relate to the early 1990s, and included indicators for social security regulations (e.g. entry and duration conditions, replacement rates), funding, fiscal arrangements and labour market institutions.

Figure 1. Optimal scaling of 11 countries based on 54 welfare state characteristics
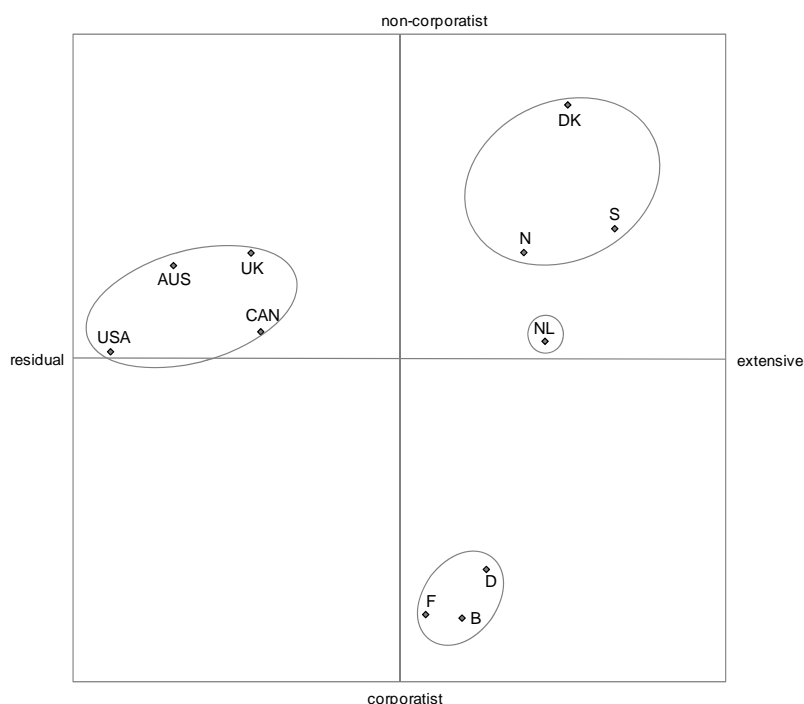
Source: Wildeboer Schut et al. (2001); as adapted in Vrooman (forthcoming).

The empirical results showed two dimensions. The first one of these is a distinction between residual and extensive system characteristics. Low scores on the x-axis generally indicate low benefits of limited duration, combined with strict entry regulation through means testing. As a corollary, the funding required in residualist regime types is low. On the labour market, residualism shows especially in limited maternity and parental leave arrangements.

The second dimension is mainly concerned with traits associated with corporatism:

• specific schemes for various occupational groups, corresponding to their social status (e.g. good provisions for civil servants);

• a strict link between past labour performance and benefit rights;

• mainly insurance-based, limited social assistance;

• good provisions for surviving dependents of employees;

• elaborate child benefit systems; and

• long, but largely unpaid maternity and paternal leave, combined with a low coverage of formal child care facilities in the 0-3 years age bracket.

Thus, Esping-Andersen's typology was corroborated by the empirical analysis. We indeed found a liberal cluster, with low scores on the first dimension, indicating residual welfare systems. The social-democratic and corporatist regimes are both rather extensive, but are split on the second dimension. Yet there are also some interesting qualifications to the theoretical typology:

– The corporatist and social-democratic regime-types are rather similar on the first and most important dimension: they are both rather extensive, although the social-democratic regimes

generally have the highest scores. The most important distinction, however, is between the liberal countries and the rest.

− There is some within-cluster differentiation:

- Within the liberal group, the US is the most pure specimen, closely followed by Australia. Canada and the UK, however, have more extensive systems and thus are less 'typical' for the liberal regime.

- Within the social-democratic group, Norway is less extensive than Denmark and Sweden.

- The corporatist group is rather homogeneous. Yet we see Germany is a bit more extensive and has a somewhat lower score on the corporatism dimension than France and Belgium.

− And of course, there is one major exception: the Netherlands does not fit in any of these clusters, but is scaled in between the Scandinavian and the other countries on the West-European continent. In his later work, by the way, Esping-Andersen has acknowledged this; he designated the Netherlands as a 'Janus-headed welfare regime', looking both to the North and to the neighbouring countries.

All in all, we found the three 'Worlds of welfare' theoretically predicted, but Canada, the UK and Norway do not fit in completely and the Netherlands not at all.

The second question in this project regarded the distributive outcomes these different regime types produce. This was tested on data from the Luxembourg Income Study relating to the early 1990s. The typology turned out to have some predictive value:

− *Redistribution* is lowest in the liberal states, but there is no systematic difference between the other two types. A corporatist state, Belgium, has the highest degree of redistribution. An explanation for the lack of differentiation between the social-democratic and corporatist groups is that redistribution not only depends on the fiscal rates – which are the highest in the social-democratic countries – but also on the volume of social security transfers. The high number of benefit recipients in the corporatist countries compensates for the somewhat lower tariffs, so that the degree of redistribution is more or less comparable.

− *Standardised inequality* according to several measures is highest in the liberal states. The corporatist and social-democratic regimes are not very far apart, but the Scandinavian countries come out as the most equal.

− *Social welfare* is defined as a trade-off between average income levels and inequality. We calculated two measures,[4] both of which showed a distinction between the US and Canada (highest social welfare) and the rest.

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[4] In Wildeboer Schut et al. (2001) two indicators of social welfare were calculated. In the first, social welfare is considered highest in the country which maximises the average income level, no matter how uneven the income is distributed. According to this criterion, the US and Canada come out highest, with no clear distinction between the other countries. The second indicator assumes social welfare is highest in a country that attains a certain balance between maximising per capita income and minimising income inequality. After weighting for the degree of 'inequality aversion', Canada has the highest social welfare; it changes places with the US because Canada is less unequal. The other countries again show no distinctions that correspond with the regime type, although the gap with the North American countries has become smaller.

− *Poverty* according to the EU criterion again shows a distinction between liberal countries (high poverty rates) on the one hand and the corporatist and social-democratic countries on the other. Canada shows less poverty than the other liberal countries, while France reaches somewhat higher levels within the European group. Other poverty measures (Dutch social minimum; national policy norms) show a less clear differentiation, however.

All in all, the three worlds of welfare do not translate in a straightforward manner into collective outcomes. In terms of these distributional results, we do not see a three-fold distinction, but rather a dichotomy: liberal countries on the one hand (with Canada a bit apart), Nordic and Western European countries on the other (with France being somewhat of an exception).

3.3   Unequal welfare states

The project 'Unequal welfare states' (Soede et al., 2004) was a tender the European Commission awarded to SCP and the Centre for Research on Pensions and Welfare policies (CeRP), Italy. While the project built on the 'On Worlds of Welfare' study, it was more *future-oriented.* Three issues were at stake:

− What are the current regime types in the EU?

− How do these, for six typical countries, interact with the expected demographic and socio-economic trends 2000-2025 (household prognosis + socio-economic model)?

− What are the expected distributive results in 2025 (inequality, redistribution, poverty in different scenarios)?

The first question is the most important one for the AIM work programme. A similar CatPCA was performed as in the previous study. However:

− The number of countries was doubled: the EU-15, four new member states (NMSs), Norway and three reference points outside of Europe add up to a total of 23.

− The number of variables was increased to 85, especially by adding more characteristics on pension schemes.

− The data were more recent (around 2000).

The analyses led to the identification of the same three clusters as in the previous study:

− a *liberal* regime consisting of the US, the UK, Canada, Australia and Ireland;

− Finland is placed alongside Sweden and Denmark in the *social-democratic* group; and

− Austria and Luxembourg join Germany, France and Belgium in the *corporatist* cluster.

But two new clusters were also found. There is a Mediterranean group (Italy, Portugal, Spain and Greece), with a rather residual social security system but comparatively extensive pension schemes. Furthermore, the analysis suggests a 'new member state' cluster (Poland, Hungary, the Czech Republic and Slovakia), placed in between the Anglo-Saxon/Liberal and Mediterranean group. Once again, the Netherlands is a hybrid; Norway was already somewhat of an outlier in the previous analysis, but drops out of the social-democratic cluster more clearly here.

Figure 2. Optimal scaling of 23 countries based on 85 welfare state characteristics
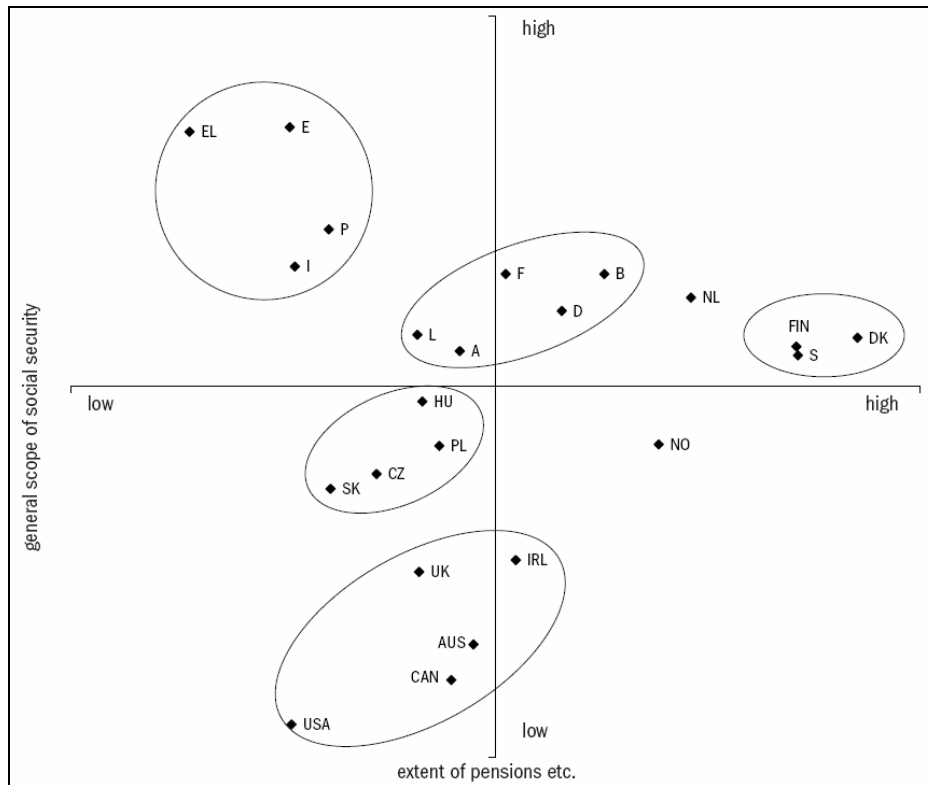
Source: Soede et al. (2004).

A very interesting point is the nature of the second dimension. The first one is more or less the same as in the previous analyses, indicating the 'scope' of the social security system. The second, however, no longer identifies 'corporatism', but mainly pension characteristics (plus some disability). This would suggest that pension systems do not correspond completely with the general welfare typology. This change in the content of the second dimension may be attributed to several factors: more countries, more pension variables, less corporatism variables and more recent data.

On the second dimension, the Mediterranean countries score highest, followed by the corporatist and the social-democratic groups. The scope of the pension system of the new member states is generally slightly below average. The liberal countries provide the lowest pensions, relatively speaking.

The results of this typology were a starting point for second phase of the project: the analysis of future poverty and income inequality in the European Union. A model and micro simulation method were developed for six 'typical' countries, representing a large share of the population of the old EU-15. This ensured sufficient institutional variety, although we unfortunately were not able to include a new member state due to lacking data. We selected the following countries: the UK (an example of the liberal regime), Denmark (social-democratic), Germany and France (corporatist), Italy (Mediterranean) and the Netherlands (hybrid).

The welfare regimes were used to develop an 'institutional reform scenario'. This assumes that countries will have qualitatively different policy responses to the ageing process, which will be path-dependent. A social-democratic regime, for instance, could respond by leaving basic income protection intact and take measures that are in line with their active labour market

policy. If they are forced to adapt their system, one would expect these countries to tackle future problems by, for instance, limiting the duration of unemployment benefit rather than its level.

The model and results of the micro simulation on ECHP-data indicate that such a 'Nordic' strategy may represent a good compromise between sustainability and distributive results. Focusing on increasing labour market participation limits the costs, and leads to comparatively low degrees of inequality and poverty in 2025.

However, the report also notes that such a strategy may not be enough for some member states: countries that face a strong ageing of their population, and where participation rates are already high, may have to take additional policy measures in order to keep the pension system sustainable.

4. Pension regimes re-examined

The main issue at stake here is to explore the current different pension systems in the European Union at the level of 'regimes', and see how they relate to the general typology of welfare regimes. Some 19 member states were included in the analysis, as well as four other countries (the US, Australia, Canada and Norway). The addition of the latter group is especially important for getting robust estimates of the traditional 'liberal' regime, as only two EU countries (the UK and Ireland) theoretically are expected to fall into this cluster. Six EU member states (Estonia, Latvia, Lithuania, Slovenia, Malta and Cyprus) had to be omitted from the analysis, due to limited data availability. Because Italy, Greece, Portugal and Spain are included, we can analyse whether there is a separate Mediterranean pension regime. Moreover, the inclusion of Poland, Hungary, the Czech Republic and Slovakia enables us to analyse the existence of distinct NMS/Eastern European pension regime.

A first question that arises in analysing pension systems concerns their demarcation. All countries have pension schemes that are mandatory for various groups of the population and for which the government is fully responsible for any deficits. However, in some countries the government obliges employers or employees to join in a private pension scheme, generally for the second-tier work-related pensions. Such pension plans are also included here, as these obligations are typically imposed to ensure an adequate pension for employees. Besides this, they may positively influence the future sustainability of the total pension system, as these schemes are generally funded.

For the classification 34 traits of the various pension schemes were gathered, focusing on both the first tier and the second tier. The objective of the first tier of pension systems is generally to prevent the elderly from falling into poverty. Four types may be distinguished: social assistance, separate targeted old-age income programmes, basic pension schemes and minimum pensions within earning-related plans (OECD, 2005). All of these are provided by the public sector and are mandatory. In basic pension schemes, the benefit is either flat-rate, or it depends on the years of citizenship or employment. In targeted plans, the benefits are paid to the needy, i.e. pensioners with a low income. The difference with the minimum-pension systems is that the targeted plans are separate schemes, whereas the minimum pensions are part of the earning-related schemes. To qualify for a minimum pension, the retiree generally has to have a minimum number of years of membership of the pension plan, which is not the case in the targeted plans.

Within the second tier, a distinction can be made between defined benefit-type pension plans (DB) and defined-contribution schemes (DC). In the former institutional arrangements, the amount a pensioner is to receive depends on the number of years of employment and previous earnings. Some schemes use the average earnings of the total employment history as the pension base, while others focus on the earnings during the final years of employment. In DC schemes,

the pension depends on the deposited contributions during the working career. Most DC schemes are funded, i.e. the contributions are invested in the stock market and serve as a security for future pensions. In some cases, like Italy, Poland and Sweden, there is a 'notional' DC system. The contributions are not invested in securities but are used to finance the pensions of the current recipients – a pay-as-you-go (PAYG) system. The contributions of the employees are only used as a calculation base for the accumulated pension rights.

For the descriptions of the pension schemes, various sources have been used. The systematic overviews provided by the International Social Security Association (ISSA, 2004), and the EU's MISSOC and MISSEEC databases contain detailed accounts of the institutional traits of social security and pension schemes. The indicators of the level of the pension benefit were mainly taken from the OECD study *Pensions at a Glance* (OECD, 2005). This contains among other things detailed information on replacement rates and the pension wealth of participants (the actuarial value of the accumulated pension rights of an average employee). For some countries additional literature has been used to check and to interpret the other descriptions (e.g. Vlachantoni, 2005; Simonovits, 2002). Together, the variables present a fairly complete picture of the pension systems in Europe. The sources and details of all indicators are listed in the Annex.

The systems featuring in this analysis are based on the situation in 2004-05, although some quantitative data (e.g. GDP expenditures) refer to 2001. In some cases the system has changed quite drastically in recent years (e.g. pension reforms in Sweden and Italy). In these cases, the new system characteristics have been taken into account. This gives the most adequate picture of the current state of affairs of the reform process in the various countries, and is more relevant in studying the future sustainability and adequacy of the pensions schemes. However, one should bear in mind that many pensioners are still receiving pensions based on the old regulations, and substantial groups of employees may be accruing old-type pension rights under transitional legislature. As the reforms often have not been fully implemented yet, for some countries the analysis, or parts of it, refers to the future rather than the current situation. The various reforms will be analysed in more detail in section 5.

For the CatPCA procedure, all characteristics have been classified in categories. Sometimes the coding of variables is straightforward (e.g. whether first tier-pensions are means-tested or not), but especially for quantitative variables it is more complicated. To classify these, cut-off points were chosen if natural distinctions occurred. Obviously the results of the CatPCA may be influenced by the selection of pension scheme features and cut-off points. However, sensitivity analysis showed the results to be stable. With different selections and classifications of the variables, only small changes were observed in the loadings of variables on the principal components and the country scores.

The CatPCA resulted in two main dimensions, which have been slightly rotated in order to enhance their interpretability.[5] The first dimension relates to the 'generosity' of the pension systems in terms of total pension wealth, average replacement rate and the target achievements of the pensions system. The second dimension mostly relates to the existence of private schemes within the mandatory system. Pension systems scoring high on this dimension generally have

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[5] In the CatPCA procedure it is possible to vary the number of dimensions. For this analysis, two dimensions turned out to be enough to represent the dataset adequately. The eigenvalue of the first dimension is 0.28 and the eigenvalue of the second dimension is 0.15, resulting in a total fit of 0.43. A supplementary analysis was also carried out using five dimensions. The eigenvalues of dimensions 3-5 were 0.11, 0.09 and 0.07, respectively. This analysis did not produce new substantive insights, as the same clustering resulted from the first two dimensions, while the latter three dimensions were not clearly interpretable on the basis of the component loadings.

one or more funded mandatory schemes in the second tier, which are run privately. Such schemes are often based on defined contribution.

We will discuss the underlying principal components more extensively below. First, however, Figure 3 presents the country scores on these two dimensions.

The right-hand side of the picture shows countries with relatively generous pension benefits, with Italy and Hungary coming up highest. On the left-hand side one finds by contrast the countries with relatively meagre pensions within the mandatory system. Ireland, for instance, only provides a means-tested, flat-rate basic pension. The countries on top of the graph are characterised by the existence of private arrangements within the mandatory pension system. Australia is an example; here employees are obliged to participate in a mandatory occupation pension, which is funded and based on defined contributions.

Four country clusters can be observed. In the lower right corner of the picture, nine countries are present. Soede et al. (2004) classified four of these as Mediterranean regimes: Italy, Greece, Portugal and Spain. Four others were previously labelled as corporatist: Germany, France, Austria and Luxembourg. The ninth country, Finland, was regarded as representative of the social-democratic type.

Since these countries are characterized by a relatively high protection for pensioners and the mandatory schemes are fully public, this may be considered mainly to be a *corporatist* pension regime type. In contrast to our former study, no separate Mediterranean cluster is found in the present analysis.

Figure 3. Scaling of 23 countries based on 34 pension system characteristics
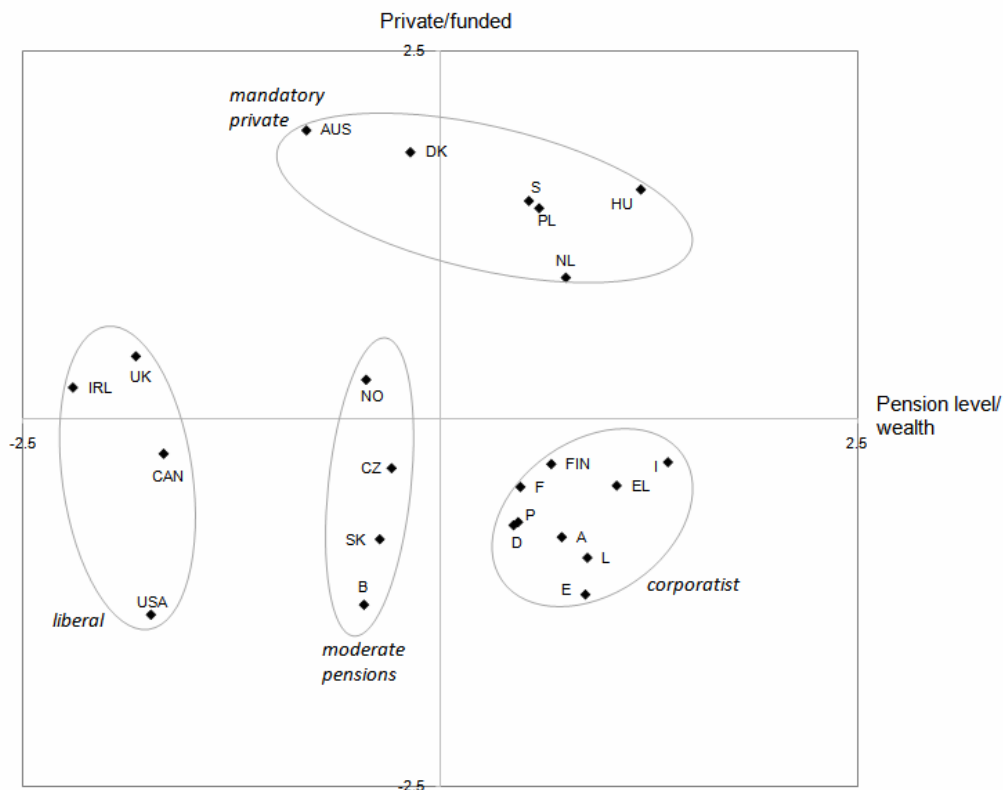
Source: SCP.

The United Kingdom, Ireland, Canada and the US have low scores on the first dimension. These countries provide relatively meagre pensions focusing on the poor, and therefore the pension regime may be considered as a *liberal* type. Here, the pension provision for employees is primarily left to the market. This does not mean that the average total pension benefit (public and market) of employees is necessarily low; but the collectively guaranteed part is small.

In between these two clusters, a '*moderate* pensions' group may be discerned, consisting of Slovakia, the Czech Republic, Belgium and Norway. The average pension benefit with respect to average earnings is slightly below the EU average and the pension provision is fully public. This cluster contains countries from different backgrounds. The Czech Republic and Slovakia differ from the two other former state socialist countries (Hungary and Poland) in the sense they had not yet implemented a drastic reform towards a more private pension system at the time the institutional data were collected. The public nature of the Czech and Slovak pension provision shows in their lower score on the second dimension.

Belgium also falls into the 'moderate pensions' cluster, and therefore drops out of the corporatist group to which it belongs in the previous welfare regime typologies. In comparison to the countries in the corporatist pension cluster, Belgium provides a relatively meagre pension for the average production worker. Moreover, in order to receive a full pension, a rather long accumulation period is required. As a consequence, pension wealth is generally less than in the corporatist group, although it generally exceeds the level of the countries belonging to the liberal pension cluster.

In line with the empirical typologies discussed earlier, Norway deviates from the other Nordic countries. Compared to Sweden and Denmark, the Norwegian pension system scores lower on pension levels (e.g. modest replacement rates) and has not an elaborate mandatory private scheme. This causes Norway to fall into the rather mixed 'moderate pensions' cluster.

The fourth cluster is characterised by a private/funded part within the mandatory system, which is generally a DC system. We call it the '*mandatory* private' cluster. In these countries (a considerable part of) the second-tier pension schemes are private and funded. These countries score high on the second dimension and can be characterised as a separate cluster, containing six countries (Sweden, Denmark, the Netherlands, Australia, Poland and Hungary). In the previous analyses, these countries belonged to different clusters (social-democratic, liberal, Eastern European and hybrid); the wide dispersion on the first dimension reflects this. For the Netherlands private schemes in the pension provision are a longstanding tradition, whereas in Denmark, Poland, Hungary and Sweden, such schemes were started or enlarged in the last two decades. As a result, in these countries the pension provision for the elderly currently mainly depends on the old public pension system; but over the next decades these private arrangements probably will become more important.

4.1 Pension benefit traits and pension wealth

The component loadings of the 34 variables in the analysis allow us to describe the various clusters in more detail. If the direction of a variable's component loadings on both dimensions points to a specific cluster, then it is a characteristic feature of the regime type. Figure 4 shows the component loadings of 11 variables that are related to pension benefits traits and the pension wealth of an average pensioner.

These variables mainly load on the first dimension. This concerns the target level of the pension scheme as a percentage of previous earnings, the estimated average pension wealth of a

production worker (calculated for both men and women),[6] a relatively high or even absent maximum pension, the estimated average pension level, the net replacement rate, and the expenditures on the public old age system as a percentage of GDP. The graph also shows that the difference in the net replacement of low and high production workers correlates negatively with the first dimension. This reflects the fact that the mandatory pension systems in countries on the left side of the picture (mostly belonging to the liberal regime type) only provide a rather elemental pension. This leads to comparatively high replacement rate for people with a low income in these countries, whereas the higher income groups attain less favourable replacement rates. This difference is less marked in countries with higher scores on the first dimension.

Figure 4. Pension benefit traits and pension wealth (component loadings)
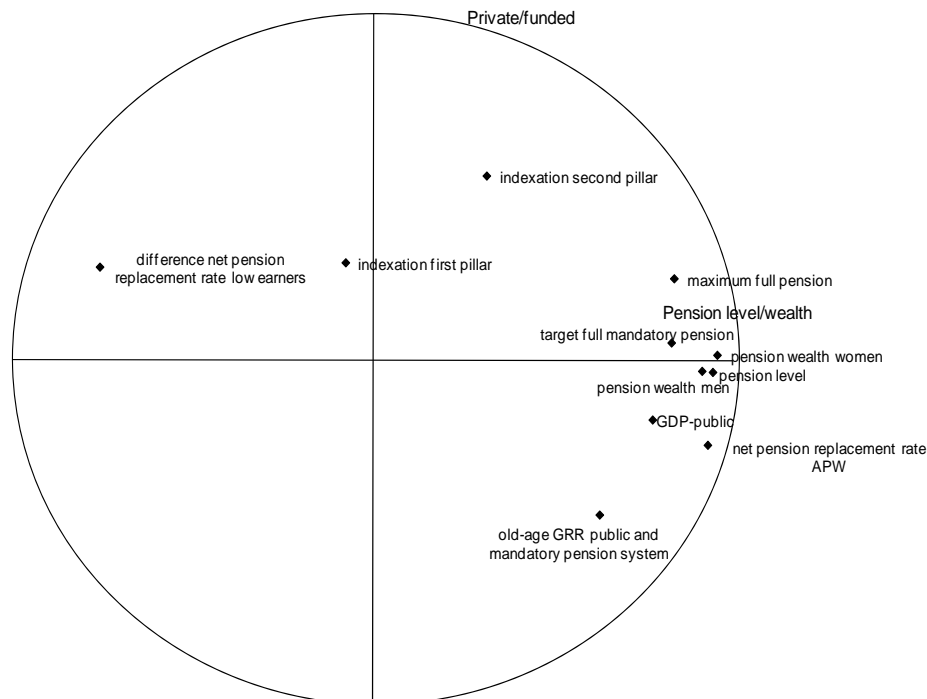
Source: SCP.

The countries in the corporatist cluster generally provide a relatively high pension benefit. The average pension level lies between 70-80% of earnings in 5 out of 9 countries. In Germany and France the level is somewhat lower, whereas Greece and Luxembourg attain a slightly higher level.

These actual pension levels correlate with the target level of the pension plans. In most countries belonging to this regime type, the pension schemes aim at a replacement rate between 65 and 75% of average wages.

The pension wealth in the corporatist group is rather high. This shows especially in Greece, Spain, Italy, Luxembourg and Finland, where the pension wealth of men is over 11% of average

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[6] The average pension wealth equals the estimated actuarial value of the pension entitlement of the production worker with a full employment history, calculated as the multiple of economy-wide average earnings. The pension wealth is calculated for various earnings levels and averaged according to the distribution of earnings (OECD, 2005). The pension wealth is determined by the pension level, the pension age and life expectancy.

earnings. Not surprisingly, expenditures in terms of GDP are substantial in the corporatist group. In Greece, Italy, Germany, France and Portugal expenditures on public old age provisions are well over 10% of GDP in 2001 (SOCX, 2005).

In contrast, the liberal cluster has rather low replacement rates, and pension wealth is limited here. In all four countries representing this type, public pension schemes provide a flat-rate pension, or a pension that is lower than 50% of average earnings. Moreover, the pension benefit or pension base may not exceed a certain maximum level in these countries. The average pension wealth is below 7 times the average earnings.

The 'moderate pensions' and the 'mandatory private' clusters are in between the liberal and the corporatist regimes with respect to these items. However, the indexation of pension schemes is generally more extensive in the 'mandatory private' countries than elsewhere.

4.2   Organisation and structure of pension systems

Figure 5 shows the component loadings of 13 variables related to the organisation and structure of the various pension systems. A number of these have a high positive correlation with the second dimension: the existence of a defined contribution scheme, the presence of a funded scheme and having a private segment within the mandatory system. According to OECD (2005), these schemes contribute more than 30% of the total pension promised in most countries of the 'mandatory private' cluster. Denmark is the exception here, as the private schemes contributes only 8% to the total pension promise. Apart from the Netherlands, all countries in this cluster have DC-based schemes. Pension schemes are often funded in this cluster.

Figure 5. Organisation and structure of the pension system (component loadings)
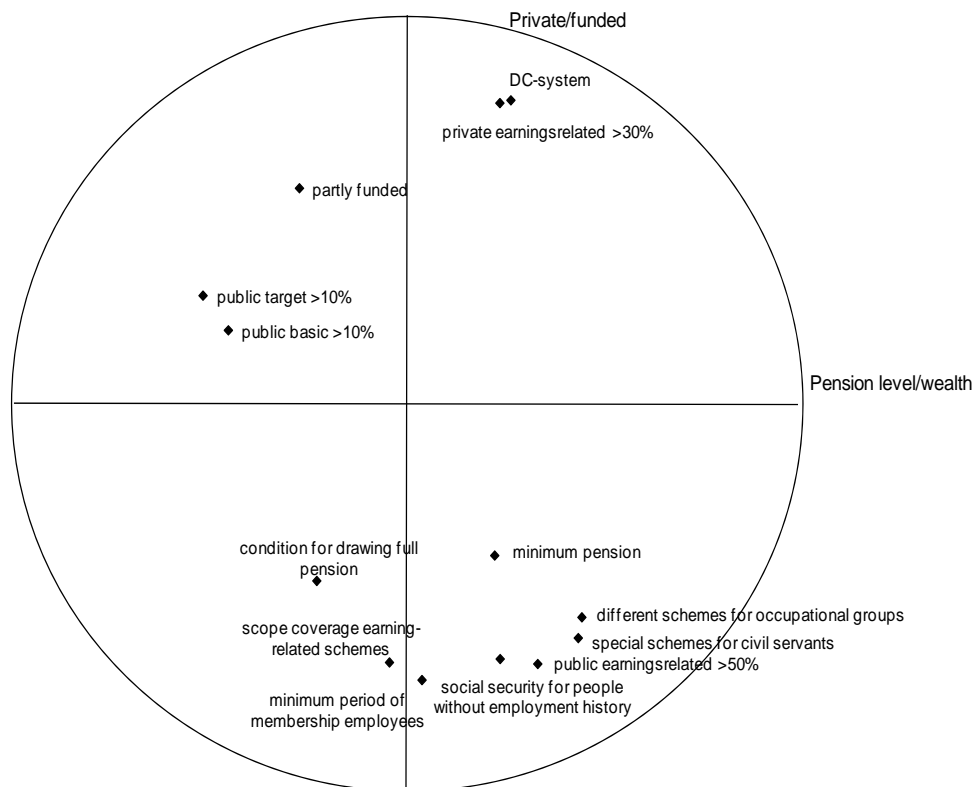
Source: SCP.

The 'mandatory private' cluster is negatively correlated with two variables in the bottom left-hand corner of the graph. In this group no conditions in terms of a minimum membership period are applied, in contrast to most other countries. Moreover, the earnings-related schemes apply only to employees in the 'mandatory private' group (with the exception of Sweden, where self-employed are covered as well).

The bottom right-hand corner shows variables that are associated positively with the corporatist cluster. Here the public earnings-related system provides more than 50% of the average pension promise. This is also the case for the 'moderate pension' cluster, but in the liberal and 'mandatory private', the percentage is almost always below 50 (Hungary and the US being the exception). The latter regimes generally provide a targeted pension or a basic pension, with the purpose to limit poverty among people with no or an inadequate earnings-related pension. In the corporatist countries, this problem is usually solved by guaranteeing a minimum pension within the earnings-related schemes. The elderly without an employment history generally depend on social assistance.

Other characteristic features of the corporatist regime type are the fragmentation of occupational pension schemes over many different professional groups, and the existence of separate – and rather favourable – schemes for civil servants.

4.3   Retirement age and labour participation

The component loadings of 10 variables relating to the retirement age and labour (Figure 6) are closer to the origin, implying that the correlation with specific country clusters is less marked in the previous sets of variables.

The participation rates of men between 55 and 64 years of age correlate negatively with the first dimension, and slightly positively with the second dimension. The same holds for the participation of older men (65+), but the correlation is equally strong on both dimensions.

This indicates the high participation rates in the liberal and the mandatory private clusters. In all countries belonging to these groups (with the exception of the Netherlands), the participation rate of 65+ males is more than 6%. The 55-64 age groups has a high participation rate in all countries with a liberal regime (over 60%), but the mandatory private cluster is more heterogeneous in this respect. Hungary and Poland have rather low participation rates in this group (below 40%), whereas in Sweden and Denmark it is over 65%. This may be due to the transitional state of the Hungarian and Polish pension systems. Both countries have had major pension reforms during the last decade, but this does not yet show in the relative level of the participation rates.

In contrast, participation rates in the corporatist countries are rather low. For the elderly above 65 years of age, these generally lie below 6% (6 out of 9 countries), for the 55-64 year age group these usually are less than 60% (7 out of 9 countries).

The four countries in the 'moderate pensions' group have quite diverse participation rates. For instance, in Norway 10% of the 65+ group participates, but it is less than 3% in Belgium and Slovakia.

Figure 6. Retirement age and labour participation (component loadings)
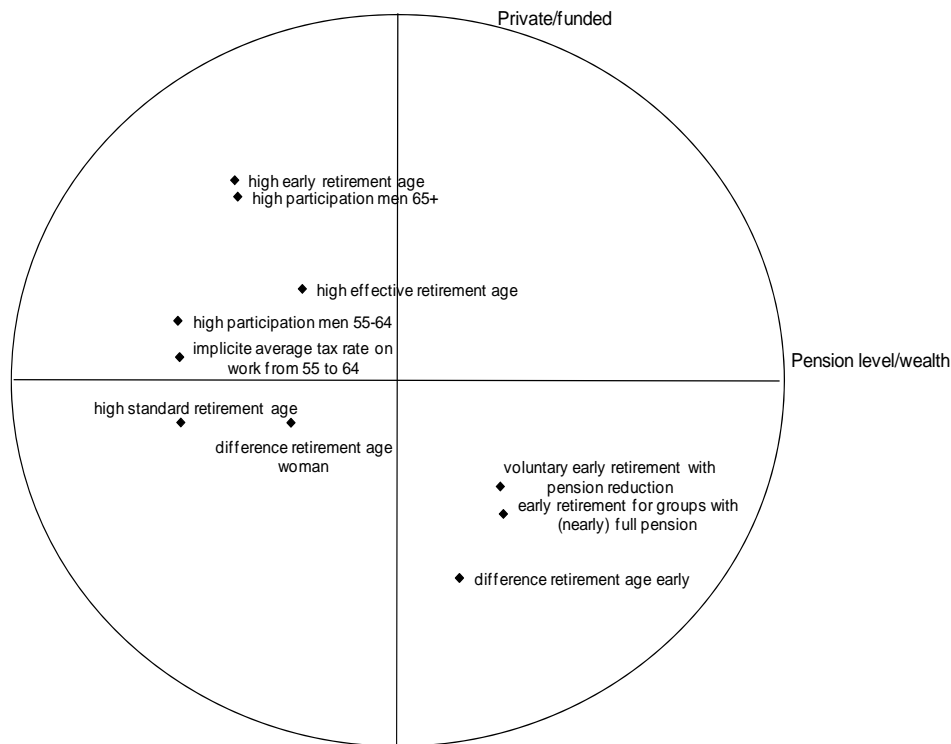
Source: SCP.

Participation rates correlate with the retirement ages of the various pension regimes. The high formal pension age in the liberal group (e.g. 66 in Ireland, 67 in the US) results in a negative correlation with the first dimension. Special schemes for early retirement, on the other hand, are a characteristic feature of the corporatist regime type, where people with a full employment history often may resign earlier from the labour market. As a result, retirement age including early retirement arrangements is considerably lower in the corporatist cluster. The same holds for the actual empirical retirement age.

## 5. Ageing and pension reforms

All countries analysed in the previous section face an ageing population, which may make the sustainability of the pension schemes a problematic issue in the near future. Many countries have been anticipating this by pursuing pension reforms, such as changes in benefit rates, higher retirement ages and reconsidering the indexation mechanism. As there is no single measure that will solve all sustainability problems for all countries, different choices are possible. As mentioned in the first sections of this paper, a certain degree of path dependency is likely here. Countries tend to stick to their system due to transition costs, both in organisational and social terms. Policy-makers and the population at large tend to regard the current system as a 'natural' state of affairs, which makes it difficult for them to envisage a pension system that implies serious deviations from the prevailing scheme. And of course, different generations have diverging interests, which in a democratic society makes it hard to create broad public support for major reforms. Some of these issues will be elaborated in this section, which addresses the second and third research question of the project.

5.1 Differences in the future ageing process

The need for pension reforms may differ between countries because the demographic strain they probably are going to experience will vary. This can be analysed by adding some demographic indicators to the CatPCA procedure. This does not influence the primary solution discussed above, because the procedure only calculates the correlation of the additional variables with the given principal components. The details and sources of these extra features are listed in the Annex.

Three indicators were used to analyse the relationship between the various pension systems and the future ageing process: the old age dependency ratio of 2005, the change in this dependency rate and the phasing of the ageing process. The change in the dependency rate has been calculated by taking the ratio of the projected dependency ratio in 2050 and the 2005 rate. The phasing of the ageing process is a dummy-variable: countries in which the relative change in the dependency ratio is higher in the period 2025-50 than in the period 2000-25 are regarded as 'late-ageing', and the others are 'early-ageing'. Figure 7 shows the relation between these indicators and the CatPCA dimensions.

Figure 7. Component loadings of variables related to the future ageing process
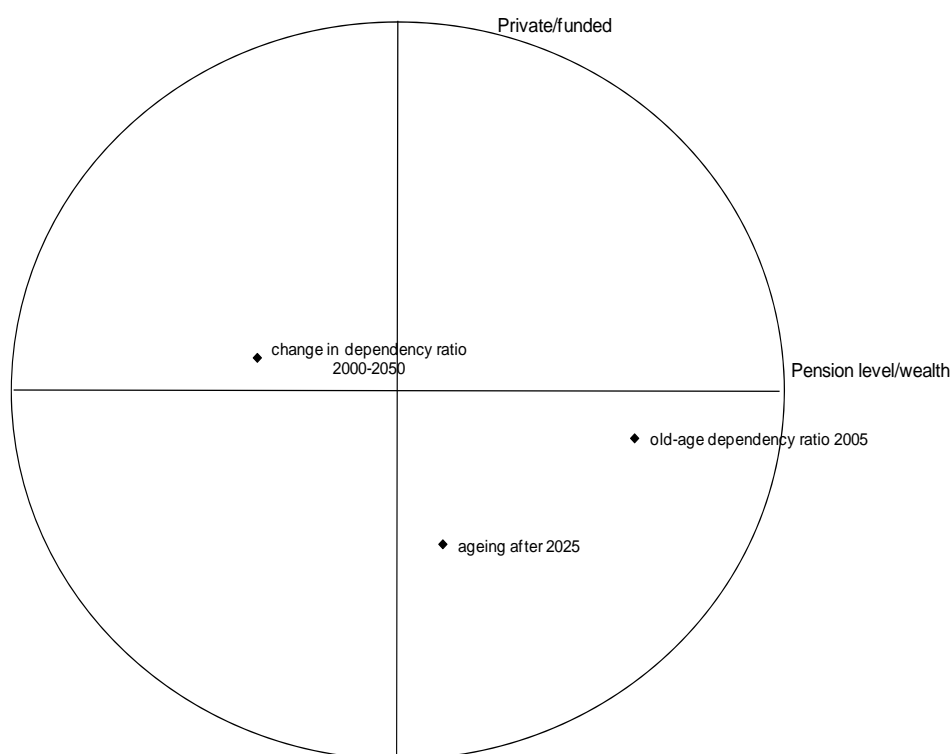
Source: SCP.

The analysis shows that in 2005 countries with higher pension levels generally have the more aged populations. In a majority of the countries belonging to the corporatist cluster (5 out of 9), the old age dependency rate was over 25% that year. In the liberal countries it was 21% or less.

While the demographic starting point of countries with a relative lower pension promise currently is rather favourable, the future ageing process is expected to be more severe here. Especially in Ireland, the United States and Australia the dependency rate will increase by more

than 150%. The same holds for two countries in the 'moderate pensions' group, the Czech Republic and Slovakia. However, it should be noted that a doubling of the old-age dependency ratio in countries with relative low pension levels (such as the liberal group) could be less problematic in terms of sustainability than a smaller change in the dependency ratio in countries with currently high pension levels.

The phasing indicator correlates negatively with the second dimension: the presence of the private schemes within the mandatory system. In other words, most countries belonging to the 'mandatory private' pension group face a comparatively early ageing problem (before 2025). This could explain why some of these countries – especially Poland, Denmark and Sweden – implemented major pension reforms over the last decade. The ageing problem is looming sooner, so these countries had to take measures in the short term.

5.2 Recent reform differences (1990-2005)

The analysis of the demographic situation shows the ageing processes to differ between clusters. However, as stated in the introduction, at stake in this report are the different paths countries choose to solve their ageing problems. To explore this issue, we gathered information on the major reforms from all countries over the last 15 years. These were classified into seven typical measures:
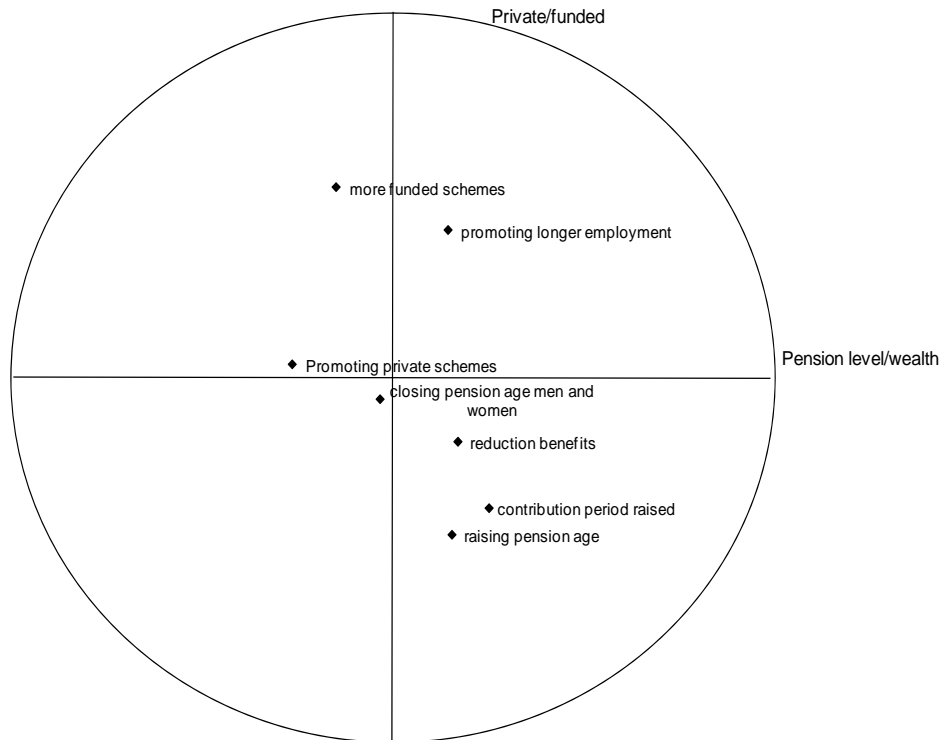
- raising the pension age for men,

- closing the gap in pension age between men and women,

- reduction of benefits,

- raising the contribution period,

- promoting longer employment,

- providing more funded schemes or greater reliance on funded schemes and

- promoting private schemes.

Some countries raised (or will rise) the standard retirement age for men, others only adjust the pension age for women. A reduction of the benefits can be accomplished by a change from wage-indexation to price-indexation or by lowering the accrual rate of the schemes. Various countries decided to increase the minimum contribution period for a pension or the standard contribution period for a full pension. Longer employment can be promoted by adjusting the age limit for early retirement or by adjusting the reduction rate in case of voluntary early retirement. Some countries introduced a funded scheme in their private system. Others promoted private schemes by adjusting the tax concessions.

The first four measures can be regarded as measures that reduce the pension wealth of employees. The other three focus on changes in the labour market or the structure of the pension system. This classification was used in the OECD report *Retirement Income Systems: The Reform Process across OECD countries* (OECD, 1998, Table 14). We updated this with measures taken in more recent years. For this purpose, we used information from the *International Reform Monitor (*Bertelsmann, 2006), *International Social Security Agency* (ISSA, 2004), OECD studies (OECD, 2002, 2005), and the databases from the EU (MISSOC and MISSEEC). Besides these, some additional literature was consulted, which, in combination, gives a rather complete picture of the more important reforms from 1990. Although it is hard to track all measures and classify them, we are confident that we have a good idea of the developmental paths that have been chosen so far.

The reform variables were added to the CatPCA-analysis in the same way as the demographic variables. Thus, the solution is not altered by the addition of these supplementary variables. Figure 8 shows the component loadings.

Figure 8. Component loadings of variables related to pension reforms (1990-2005)

Source: SCP.

A first conclusion emerging from this graph is that the three measures 'raising the pension age', 'reducing pension benefits' and 'raising the contribution period' are positively correlated with the pension wealth and negatively with the 'private/funded' dimension. These measures are therefore related to the corporatist cluster. The measures can be characterised by an adjustment of the current system, which lowers the pension promise leading to a more sustainable pension system. For instance, Austria increased the pension age of their early retirement scheme, and Spain phased out an earlier pension scheme with a lower pension age. In addition, all countries from this cluster took measures to reduce pension benefits. Belgium adjusted the revaluation coefficient of the pension benefit, while France changed the base period for the pensions. Germany decided to lower its target replacement rate from 70% to 64%. The same holds for the adjustment of the minimal contribution period. Portugal decided to increase this period from 10 to 15 years. The same measure was taken by Belgium and Greece. France adjusted the contribution period for a full pension from 37.5 to 40 years.

But countries belonging to other clusters also adjusted their pension benefits and pension age, although they introduced less reforms, comparatively speaking. The United States decided to raise the pension age from 65 to 67, and the Czech Republic also opted for a higher pension age. Canada, Norway and the United Kingdom also took measures which reduce the pension benefit levels, but not to the same extent as the corporatist countries did.

A special topic is the difference in pension age between men and women. In various countries in the European Union, women may retire earlier than men. In most of these countries, this gap is closed by rising the pension age of women. Figure 6 showed this gap between the pension ages to be slightly negatively correlated to both dimensions. The same applies to measures that aim to close the gap.

Another conclusion is that countries in the 'mandatory private' group have more often taken measures to introduce (or enlarge) the funded part in their mandatory system. This implies that this group partly came into existence rather recently, especially where the major reforms in Poland and Hungary are concerned.

6. Conclusions and discussion

This report presents an empirical typology of the various pension systems in 19 EU countries, the US, Canada, Australia and Norway. The categorisation is based on 34 quantitative and qualitative characteristics of the mandatory parts of the pension systems using Categorical Principal Components Analysis. The results demonstrate that Esping-Andersen's standard division into liberal, corporatist and social-democratic welfare regimes does not fit completely for pension systems.

The empirical analysis showed two aspects of the pension systems to be distinctive: the average pension level or wealth of the pension schemes; and the division between a public and a private scheme in the mandatory system. These dimensions separate the analysed countries into four clusters.

The first cluster consists of nine countries: the *corporatist* pension regime. Four of these countries were already classified as corporatist in our previous study, *Unequal Welfare States*: Germany, France, Austria and Luxembourg. Where pensions are concerned, Greece, Portugal and Spain now also belong to the corporatist group, so a typical Mediterranean pension cluster did not emerge from the current analysis. Finland also belongs to this group.

In the corporatist pension regime, the state dominates in the provision of pensions. There is a relatively high pension promise which is fully provided by the state with a PAYG-system. This is in line with Esping-Andersen's account of corporatist regimes, although Finland is a notable exception in the pension field. This was, however, already mentioned by Esping-Andersen (1990).

The target of the pension schemes in the corporate cluster is relatively high in comparison with the other clusters. As most schemes are earnings-related, there is little difference in the relative pension wealth of low-earners and high-earners. As a result, the expenditure on pensions is relatively high in terms of GDP. Furthermore, these countries often have special arrangements for employees with a full contribution period through which they can make use of early retirement. As a result, the labour market participation rates of the elderly are rather low. Another typical feature of these countries is the presence of many different occupation-related schemes. Elderly persons without any employment history have to depend on social assistance.

In contrast to the corporatist cluster, the *liberal* regime type (to which the UK, Ireland, Canada and the US belong) provides rather meagre pension benefits. As in the corporatist countries, the mandatory pension provision is fully carried out by the government, but at a more basic level. The pension provision is generally flat-rate and targeted to the poor. As a result, low earners attain higher replacement rates than high-earner. In contrast to corporatist countries, the pension age in the liberal systems is relatively high and early retirement arrangements are not the norm. This results in rather high effective pension ages and labour participation rates, which

subsequently translates into relatively low implicit average tax rates on labour for elderly between 55 and 64 years of age.

A third cluster consists of Belgium, the Czech Republic, Slovakia and Norway. The average pension benefit of the mandatory system is modest here, and the system is run by the government on a PAYG-basis. This cluster has been identified as the *'modest pensions'* regime type. The cluster is rather hybrid if one compares it with our previous empirical typology of welfare regimes in general. There the Czech Republic and Slovakia belonged to the New Member State regimes, Belgium was denoted as corporatist, and Norway was a hybrid. The features of this cluster are rather similar to the corporatist group, but pension levels are lower and the pension ages relatively higher.

The last cluster is probably the most interesting one. This *'mandatory* private' cluster consists of Australia, Sweden, Denmark, the Netherlands, Poland and Hungary. All of these countries have one or more private schemes in which employees are obliged by the central government to participate. Such schemes are generally funded and based on defined contribution. The importance of the private schemes differs; in Australia about 55% of the pension promise relates to the private scheme, whereas in Denmark it is 8%. In a similar way the total pension promise varies within this group. The average total pension promise in Hungary is comparable to that of the corporatist cluster, whereas the Australian pensions are more in line with the liberal countries. On average, the pension age and participation rates are rather high in these countries. The scope of the earnings-related pension system is often limited to the employees.

An analysis of the demographic context of these regime types shows that the corporatist countries, with currently high pension levels, have the more aged populations in 2005. The demographic starting point of countries with a relative lower pension promise (the liberal group) is better, but their old age dependency ratio is expected to increase markedly in the future.

Countries facing the ageing problem rather early (before 2025) generally belong to the 'mandatory private' group. Since Poland, Denmark and Sweden introduced major reforms in their pension systems over the last decades, this may have been some form of anticipatory behaviour on behalf of policy-makers.

Pension reforms that reduce the pension wealth of employees (raising the pension age or required period of contribution, reduction of benefits) are characteristic for the corporatist regime type. Countries belonging to the liberal cluster made similar adjustments recently, but to a lesser extent.

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Annex 1. Description of variables in empirical analysis

Feature	Classification	Source	Component loading	
			Comp 1	Comp 2
Related to pension benefit and pension wealth				
GDP-public (2001)	1' < 6%' 2'6% - 8%' 3'8% - 10%' 4'>10% '	SOCX (2005)	0.78	-0.17
target level full mandatory pension	1'DC-system' 2'DB: Less than 50% wages or flat rate' 3'DB: 50-65% wages' 4'DB: 65-75% wages' 5'DB: >75% wages'	ISSA (2004)	0.83	0.05
maximum full pension	1'Yes, low' 2'Yes, high' 3'None'	ISSA (2004)	0.84	0.24
old-age GRR public and mandatory pension system	1' < 50%' 2'50% - 70%' 3'70% - 100%' 4'>100%'	OECD (1998)	0.63	-0.45
pension level	1 '< 40%' 2 '40-50%' 3 '50-70%' 4 '70-80%' 5 '>80%'	OECD (2005)	0.94	-0.03
pension wealth men	1 '<7%' 2 '7-8%' 3 '8-11%' 4 '>11%'	OECD (2005)	0.91	-0.03
pension wealth women	1 '<7%' 2 '7-8%' 3 '8-11%' 4 '>11%'	OECD (2005)	0.96	0.01
indexation first pillar	1 'Prices' 2 'Combination' 3 'Wages'	OECD (2005)	-0.08	0.28
indexation second pillar	1 'Prices' 2 'Combination' 3 ' Wages'	OECD (2005)	0.32	0.53
net pension replacement rate APW	1 '<50%' 2 '50-60%' 3 '60-70%' 4 '70-80%' 5 '>80%'	OECD (2005)	0.93	-0.25
difference net pension replacement rate low earners	1 'No difference or neg' 2 '1-20%' 3'20-40%' 4'40% or higher'	OECD (2005)	-0.76	0.27
Organisation and proportion of the tiers				
different schemes for occupational groups	1'Not' 2'Moderate' 3'Frequent'	Missoc (2004)	0.45	-0.55
special schemes for civil servants	1'Not' 2'Moderate' 3'Frequent'	Missoc (2004)	0.44	-0.60
social security for people without employment history	1'High pension' 2'High, means tested pension' 3'Low pension' 4'Low, means tested pension' 5'Social security'	Missoc (2004)	0.24	-0.66
scope coverage earning-related schemes	1'(Almost) all working population' 2'All salaried workers and assimilated categories' 3'Only special groups' 4'Some private sector employees'	ISSA (2004)	-0.04	-0.67
funding	1 ' PAYG' 2'(Partial) funded' '	MISSOC /MISSEEC (2005)	-0.27	0.56

Feature	Classification	Source	Component loading	
			Comp 1	Comp 2
minimum period of membership employees	1'No minimum period' 2'Less than 5 years' 3'More than 5 years'	ISSA (2004)	0.04	-0.71
minimum pension	1'No minimum ' 2'Yes, low' 3'Yes, high'	ISSA (2004)	0.22	-0.39
condition for drawing full pension	1'< 40 years' 2'40 or more years'	ISSA (2004)	-0.23	-0.46
DC system	1 'No DC' 2 'DC'	ISSA (2004)	0.27	0.78
public earnings-related >50%	1 'Public DB DC < 50%' 2 'Public DB DC > 50%'	OECD (2005)	0.33	-0.67
public target >10%	1 'Targeted < 10%' 2 'Targeted > 10%'	OECD (2005)	-0.52	0.28
private earnings related >30%	1 'Private pens < 30%' 2 'Private > 30%'	OECD (2005)	0.24	0.78
public basic >10%	1 Basic pens < 10%' 2 'Basic pensions > 10%'	OECD (2005)	-0.46	0.19
Participation and pension age				
participation men 65+ (2002)	1' < 3%' 2'3% - 6%' 3'6% -10%' 4'>10% '	Eurostat (2004)	-0.42	0.50
participation men 55-64 (2002)	1' < 40%' 2'40% - 50%' 3'50% - 60%' 4'60% - 65%' 5'>65% '	Eurostat (2004)	-0.57	0.16
standard retirement age	1'64 or less' 2'65 years' 3'66 or higher'	OECD (2005)	-0.57	-0.11
early retirement age	1'Below 59 years' 2'60 years' 3'61 to 64 years' 4'65 years' 5 '66 years or higher'	OECD (2005)	-0.43	0.55
difference retirement age early	1'No difference' 2'1 to 4 years below' 3'More than 5 years below'	OECD (2005)	0.16	-0.54
difference retirement age woman	1'Same as men' 2'1 to 3 years lower than men' 3'4 or more years higher than men'	ISSA (2004)	-0.28	-0.11
effective retirement age	1'< 60 years' 2'60- 62.5 years' 3'> 62.5 years'	OECD (2002)	-0.25	0.25
implicit average tax rate on work from 55 to 64	1' < 25%' 2'25% - 40%' 3'>40% '	OECD (1998)	-0.57	0.06
early retirement for groups with (nearly) full pension	1'No ' 2'Yes'	ISSA (2004)	0.28	-0.36
voluntary early retirement with pension reduction	1'No ' 2'Yes'	ISSA (2004)/ MISSOC (2005)	0.27	-0.29

Feature	Classification	Source	Component loading	
			Comp 1	Comp 2
Ageing				
old-age dependency ratio 2005	1 'Low aged (<20%)' 2 'Moderate (20-25%)' 3 'Grey society (25%-)'	Eurostat (2006) UN (2006)	0.62	-0.13
change in dependency ratio 2000-2050	1 'Small ageing (<100%)' 2 'Moderate ageing (100-150%)' 3'Severe ageing (150%<)'	Eurostat (2006) UN (2006)	-0.37	0.09
ageing after 2025	1 'Early ageing' 2' Late ageing'	Eurostat (2006) UN (2006)	0.12	-0.42
Reforms				
period ageing	1'No measures' 2'Raising pension age'	various sources	0.16	-0.43
closing pension age men and women	1'No measures' 2'Closing pension age men and women '	various sources	-0.03	-0.06
promoting longer employment	1'No measures' 2'Promoting longer employment'	various sources	0.15	0.40
reduction benefits	1'No measures' 2'Reduction benefits'	various sources	0.17	-0.18
contribution period raised	1'No measures' 2'Contribution period'	various sources	0.25	-0.36
more funded schemes	1'No measures' 2'More funded schemes'	various sources	-0.15	0.52
promoting private schemes	1'No measures' 2'Promoting private schemes'	various sources	-0.27	0.04

About AIM (Adequacy & Sustainability of Old-Age Income Maintenance)

T he AIM project aims at providing a strengthened conceptual and scientific basis for assessing the capacity of European pension systems to deliver adequate old age income maintenance in a context of low fertility and steadily increasing life expectancy. The main focus is on the capacity of social security systems to contribute to preventing poverty among the old and elderly and more generally to enable persons to take all appropriate measures to ensure stable or "desired" distribution of income over the full life cycle. In addition it will explore and examine the capacity of pension systems to attain broad social objectives with respect to inter- and intra generational solidarity.

Furthermore it will examine the capacity of pension systems to allow workers to change job or to move temporarily out of the labour market and to adapt career patterns without losing vesting of pensions rights. The project will also address the specific challenges with respect to providing appropriate old age income for women.

A general objective of the research project is to clearly identify and analyse the potential trade-offs between certain social policy objectives and overall stability of public debt.

AIM is financed under the 6th EU Research Framework Programme. It started in May 2005 and includes partners from both the old and new EU member states.

Participating institutes

- Centre for European Policy Studies, CEPS, Belgium, coordinator
- Federal Planning Bureau, FPB, Belgium
- Deutsches Institut für Wirtschafsforschung (German Institute for Economic Research), DIW, Germany
- Elinkeinoelämän tutkimuslaitos, (Research Institute of the Finnish Economy), ETLA, Finland
- Fundación de Estudios de Economía Aplicada , FEDEA, Spain
- Social and Cultural Planning Office, SCP, Netherlands
- Instituto di Studi e Analisi Economica (Institute for Studies and Economic Analysis), ISAE, Italy
- National Institute for Economic and Social Research, NIESR, United Kingdom
- Centrum Analiz Spolleczno-Ekonomicznych (Center for Social and Economic Research), CASE, Poland
- Tarsadalomkutatasi Informatikai Egyesules (TARKI Social Research Informatics Centre), TARKI, Hungary
- Centre for Research on Pensions and Welfare Policies, CeRP, Italy
- Institute for Economic Research, IER, Slovak Republic
- Inštitut za ekonomska raziskovanja (Institute for economic research), IER, Slovenia