9th Annual ESPAnet Conference

Sustainability and transformation

in European Social Policy

Valencia, 8-10 September 2011

Stream 16: Housing policy in crisis

Stream convenor: Sten-ÅkeStenberg (SOFI - The Swedish Institute for Social Research)

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Are there Housing Regimes in Europe? A Cluster Analysis of Housing and New Agenda for Policies

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Draft – not for quoting

Abstract

How does the cluster comparative analysis of housing regimes matter to understand housing dynamics and consider new approaches for policies? This paper discusses the relevance of the seminal Esping-Andersen's typology ideal-typical world of welfare capitalism in the context of housing. Despite housing being considered a cornerstone of welfare state in the golden years, it has gradually become wobbly. The unprecedented rise in house prices across Europe and the world after the mid 1990s, has forced families to expand their mortgage loans and consequently become more financially dependent of banks. After the 2008 subprime crisis, the persistent unemployment rate and economic downtown have given rise to an unprecedented foreclosure and homelessness. Privatization of housing, changes in market and financial speculation have gradually put tenants in a weaker position. How do European countries deal with these unprecedented housing changes? Have the social democrats' housing regimes resisted to market demands? How do recent Eastern communist countries deal with market rules? Do Mediterranean countries still have high rates of homeowners in the foreclosure era? Should housing-welfare state become a liberal trend? Does the European social model still remain in action? The subprime and economic crisis has made housing a new social risk – how do European welfare states deal with this challenge? This paper discusses the relevance of welfare regimes' argument through housing comparative analysis; it examines the recent extensive state of the art; and has developed a cluster analysis method with Eurostat database to identify European housing typologies. The results report latent variables that explain and compare housing clusters in Europe and examine the relevance housing context has in comparative social policy. Finally, we suggest that the present time, provides governments, scholars and practitioners with new paths to take action: the opportunity to pursue welfare restructuring.

Keywords: housing, comparative social policy, cluster analysis, welfare state.

Introduction

This paper examines the theoretical framework of housing with the assumption it became a welfare pillar after the Beveridge Report in 1942. The five giant evils (want, disease, ignorance, squalor and idleness) became a social policy sphere. Up till the 1970s European countries had invested a huge amount of financial resources to solve housing shortage. After that, two new trends occurred almost simultaneously: the need to solve housing shortage in the major European countries transformed it into a new market oriented trend; and the Southern countries with their late modernization and their welfare development. The welfare states developed in different ways concerning sizes, political orientations and distributional outcomes (Arts and Gelissen 2010). Patterns of welfare states emerged in the 1990s, after the Esping-Andersen's seminal book (1990), with three clusters. Namely: the social democratic one with Norway, Denmark, Sweden and Finland, reporting high levels of decomodification, cross-class solidarity and a system of generous benefits. The liberal model with Austria, France, German and Italy, showing evidence of low levels of decomodification and a strong preference for private welfare spending; and the conservative/continental one with United States, Canada and Australia, reporting a moderate degree of decomodification, low solidarity and preservation of traditional family structures (Arts and Gelissen 2010).

Housing has always been recognized as comprising a key aspect of everyday life, closely associated with security and with wealth and well-being, that is, housing has been one of the four major pillars of the welfare state, Kemeny (2001). The relationship between housing and the welfare state has been debated for many years, but the question retains its relevance and is still topical in an era of change, Malpass (2008).

This paper discusses the relevance of welfare regimes' argument through housing comparative analysis; it examines the recent extensive state of the art and has developed a cluster analysis method with Eurostat database to identify European housing typologies.

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Concerning research questions, within a framework of rapid economic and social changes, associated with several policy reforms, where does the social housing in European countries stand? Is there a homogeneous European social housing? If not, which of them are homogeneous? Is it possible to identify divergent scenarios for social housing sector in Eastern and Western Europe based on the housing attributes we display in Table1.

Theoretical Background

In this paper we explore the complex relationship of housing and welfare state. The change from mass to a residual social house, has promoted a vivid academic debate over three decades, but a more recent transformation - 2008 subprime crisis – has changed the focus to relevant issues such as social risks. Housing is generally considered one of the five social services (Hall 1952; Timmins 1996; Brown and Payne 1994; Glennerster 1995; Glennerster and Hills 1998; Gough 1979; Ginsburg, 1979; Ellison and Pierson 1998; Alcock 1996; Hill 2000).

The more highly developed welfare states, such as Sweden, have been associated with relatively low levels of homeownership, while those countries with residual welfare systems, such as the US and Australia, have high levels of homeownership, Malpass (2008). Normal rates of household formation will not return until unemployment levels return to close to normal rates, Painter (2010). The rates of homeownership among movers fell, which suggests that movers are more likely to become renters than owners.

The average size of the household has fallen sharply in every modernized country, Kobrin (1976); early explanations attributed this fall in size to the break-up of an extended family system which was said to have existed in the past in both the United States and Western Europe.

Table 1 Indicators for Latent Class Models estimation

Indicators
Average household size
Distribution of households by household size
Distribution of population aged 18 and over by education level and age group
Distribution of population aged 18 and over by health status, age group and gender
Distribution of population aged 18 and over by occupation, income group and gender
Distribution of population aged 18 and over by p-t[1] or f-t[2] employment, income group and gender
Distribution of population by work intensity of the household
People living in households with very low work intensity by age and gender
People living in households with very low work intensity by most frequent activity status
People living in households with very low work intensity by income quintile and households type
People living in households with very low work intensity by education level
People living in households with very low work intensity by broad group of citizenship
P[3] living in households with very low work intensity by broad group of country of birth
Average number of rooms per person by tenure status and dwelling type from 2003
Average number of rooms per person by tenure status and dwelling type until 2001
Overcrowding rate by age, gender and poverty status - Total population
Overcrowding rate by household type - Total population
Overcrowding rate by tenure status - Total population
Overcrowding rate by degree of urbanization
Overcrowding rate by age, gender and poverty status - Population without single-person households
Housing cost overburden rate by age, gender and poverty status
Housing cost overburden rate by income quintile

Housing cost overburden rate by degree of urbanization
Housing cost overburden rate by household type
Median of the housing cost burden distribution by age, gender and poverty status
Median of the housing cost burden distribution by degree of urbanization

[1]part-time; [2]full-time

Some households are rich in housing, but poor in income and consumption. As housing is non-divisible with large adjustment costs, such mismatch can happen for both owner-occupiers and renters, Painter (2010); aging may mean the necessity to adjust the 'housing mix', for instance leaving an upper level apartment without a lift, or a house with a large garden, for a dwelling more adapted to reduced physical strength.

Housing consumption and saving choices can be analyzed in terms of expenditures (rents, user cost), and housing value (wealth), but considering that a home has many dimensions, they can also be analyzed in terms of tenure (own or rent), living arrangements (alone, with a spouse, with a child), type of dwelling (house, apartment), venue (close to or far from the children, north or south, in a city or in the country, etc.), whereby retirement and nursing homes are considered a type of tenure, living arrangement or dwelling, Laferrère (2005).

Income is significant for the poorest quintile of households whereby more income clearly facilitates moving. Although there are no significant differences between income groups in the overall rate of mobility, the poorest households have an income constraint on their mobility. That is, the greater the income, the more people move; however, they do not seem to have to move because of their poverty Armstrong and Hirabayashi (1956).

Variables were interacted with income quintiles (only the top quintile/location interaction is kept as the other interactions were non-significant). Living in a house rather than an apartment decreases the likelihood of moving and the effect is important: there is absolutely no sign here of leaving a house to move to a more comfortable apartment. Nonetheless, the reverse seems to happen, Laferrère (2005).

Despite some references on the importance of long-term affordability, researchers have not developed measures of lifetime income because of data constraints.

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The most commonly used measures of housing affordability are essentially short term indicators that compare current income with house prices or housing costs, Abeysinghe and Gu (2011). The affordability index, defined as the ratio of lifetime income to house price, reveals informative trends and cycles in housing affordability in both the public and the private sectors. Housing adjustments lead to a correction of the initial unbalance between the number of rooms and the number of occupants. However, a significant proportion of recently mobile retirees have improved the quality of their dwellings, Gobillon and Wolff (2011). From a theoretical point of view, individuals are likely to decrease their housing quality because of an income loss when retiring. However, they may also increase it to benefit from more housing comfort for leisure. A significantly higher level of poverty is found in the public-sector of urban rented households, and this finding cannot be accounted for entirely by socio-demographic differences, Nolan and Whelan (2000). Housing at the bottom end of the market (small second-hand terraced houses) appears to be more expensive in a city with a high proportion of small or high-density housing, Burton (2000)**.** The higher the proportion of lower - density, dwellings - detached and semi - detached houses-the lower the cost of the cheapest houses (to buy). However, this relationship with house values may not be attributable to density *per se*: there are no correlations with either net or gross density indicators. Mead (1970) argued that in societies where change is slow and imperceptible, knowledge and culture are passed on from older generation to younger one, there is less risk of exclusion. Given that in these traditional settings, she suggested, it is essential for older people to teach newcomers how to function in the society. In contrast, in modern societies where social and technological change is pervasive, it also is necessary for younger people to teach the old. If older people do not interact with and learn from younger people, they risk becoming increasingly excluded from contemporary social developments as they age through later life. Older people may not need or want to know everything that younger ones know, but acquiring some new knowledge is essential to avoid becoming marginalized in later life, Uhlenberg and Gierveld (2004).

When talking about rental market one has to bear in mind that there are different types of landlords in each country. For example the Greek rental market, though small is almost entirely private (96%); similarly in Spain and Portugal, Bazyl (2009); in countries like Austria, Denmark, Finland, France or United Kingdom the rental market

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is much bigger, whereby almost half it is provided by a public landlord. In the case of Luxembourg and Netherlands currently all the rental market is provided by a public landlord (87%-89%).

Yielding to pressure from xenophobic political movements, governments have made a shift to the right on issues related to immigration. Public officials have not always treated refugees, migrants, or people released from prisons, asylums, or mental hospitals fairly, partly because this is a costly process which does not gain widespread political support. Substantial numbers of those at the bottom of the socio-economic ladder are now without shelter and jobs. Homelessness has been growing in large cities as a consequence of geopolitical and social changes, structural economic shifts, and rising unemployment and poverty, Daly (1996). Neither the public nor private sector has been able to keep up the pace with these events. The supply of affordable housing is constricted, maintenance is neglected, and the disparities between average citizens and those in the lowest socioeconomic quartile are increasing.

Crowding, refers to the occupancy of dwellings by households, Choldin (1978), and is typically measured in persons per room. If a dwelling is occupied beyond some standard, usually one person per room in the US, the household is considered to be crowded, but Chombart de Lauwe (1956) measured household crowding more precisely by measuring area per person within the dwelling, but this level of precision has not been attempted recently. It will be useful to identify the local factors that explain the marked variation in levels of residential crowding between locals, ethnic and racial groups. Restrictions on housing supply, housing affordability, low incomes, and immigrant concentrations are all possible explanations, Dowell, C. and Seong-Youn (1996).

Crowding must be considered an indicator of something important in urban sub communities, and a task for future research is to discover what it is. In many cities the neighborhoods with the highest levels of crowding are: black populations; those with poor incomes; with more children, than in other parts of the city. Presumably, at the neighborhood level crowding represents poverty, poor housing, and young families, Choldin (1978). Crowding appears to be a "leading indicator." In urban ecology, crowding apparently indicates the neighborhoods with the worst housing and the poorest families with children. Overcrowding is a highly complex problem, involving

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household structure, racial and ethnic diversity, housing availability, and consumer preferences, Dowell, C. and Seong-Youn (1996).

Data and Methods

Our most general point is to underscore the relevance of cluster models to diagnose profiles housing regimes in Europe.

In this study we used a dataset from Eurostat, and concerning data analysis methods we use Latent Class Analysis. In order to estimate Latent Class Models with maximum likelihood method, we shall use Expectation-Maximization algorithm, and information criteria BIC for model selection, Fonseca (2008). This methodology accommodates multiple attributes (including mixed case), provides parsimonious models that account for the relationships between these multiple attributes, and derives latent segments for customers' overall satisfaction, based on these attributes or indicators on technical and functional quality and corporate image. The use of LCM has become increasingly popular in marketing publications, for instance Wedel and Kamakura (1998), Dillon and Kumar (1994), and Bhatnagar and Ghose (2004). This approach to segmenting offers some advantages when compared with other such techniques: it identifies segments, and provides unbiased segments' membership estimates, Dillon and Kumar (1994); it provides means to selecting the best number of segments, McLachlan and Peel (2000); it is able to deal with different measurement levels, Vermunt and Magidson (2002); demographic and other covariates can be used for segment description, Magidson and Vermunt (2003); it allocates cases into segments based upon membership probabilities estimated directly from the model, instead of using an ad-hoc definition of ''distance'' (e.g., Euclidian distance), Bonilla and Huntington (2005).

Let $\underline{y}_i = (y_{ip})$ denote the vector representing the scores of the i the case for the pth segmentation base variable ($i = 1,\ldots,n$; $p = 1,\ldots,P$). We consider that the cases on which the attributes are measured arise from a population which we assume to be a mixture of S segments, in proportions λ_s (mixing proportions or relative segment sizes), $s = 1,\ldots,S$. The statistical probability density function of the vector $\underline{y}_i$, given that

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$\underline{y}_i$ comes from segment s, is represented by $f_s(\underline{y}_i \mid \underline{\theta}_s)$, with $\underline{\theta}_s$ representing the vector of unknown parameters associated with the specific chosen probability density function. Then the population density can be represented as a finite mixture of the densities $f_s(\underline{y}_i \mid \underline{\theta}_s)$ of S distinct segments, i.e.

$$f(\underline{y}_i \mid \underline{\psi}) = \sum_{s=1}^{S} \lambda_s \prod_{p=1}^{P} f_s(\underline{y}_i \mid \underline{\theta}_s) \tag{1}$$

where $i = 1,\ldots,n$, $\lambda_s > 0$, $\sum_{s=1}^{S} \lambda_s = 1$, $\underline{\psi} = \{\underline{\lambda}, \Theta\}$, with $\underline{\lambda} = \{\lambda_1, \cdots, \lambda_{s-1}\}$, $\Theta = \{\underline{\theta}_1, \cdots, \underline{\theta}_s\}$, and $\underline{\psi}$ is the vector of all unknown parameters. The LCM estimation problem, simultaneously addresses the estimation of distributional parameters and classification of cases into segments, yielding mixing probabilities. The estimation process is typically directed to maximum likelihood using the *Expectation-maximization* (EM) algorithm, McLachlan and Peel (2000), Dempster, Laird and Rubin (1977). LCM naturally provides means for constituting a partition by means of assigning each case to the segment with the highest segment-membership probability, that is with $\underset{s=1,\ldots,S}{Max}\ \hat{\tau}_{is}$, where

$$\hat{\tau}_{is} = \frac{\hat{\lambda}_s^{(k)} f_s(\underline{y}_i \mid \hat{\theta}_s^{(k)})}{\sum_{j=1}^{S} \hat{\lambda}_j^{(k)} f_j(\underline{y}_i \mid \hat{\theta}_j^{(k)})} \tag{2}$$

In order to derive meaningful results from segmenting, the mixture model must be identifiable, that is, a unique maximum likelihood solution should exist, Bozdogan (1994). A goal of traditional LCM estimation is to determine the smallest number of latent segments S that is sufficient to explain the relationships observed among the variables of segmentation base variables. If the baseline model (S = 1) provides a good fit to the data, no LCM is needed since there is no relationship among the variables to be explained; thereafter, a model with S = 2 segments is then fitted to the data. This process continues by fitting successive LCM to the data, each time adding another

dimension by incrementing the number of segments by 1, until a parsimonious model is found that provides an adequate fit.

Results and Discussion

We start with 1-Cluster model, under the assumption that all countries are homogeneous, followed by models with two, three, and four clusters, under the hypothesis of heterogeneity. By using information criterion BIC (values displayed in Table 2), the 3-Cluster model was selected, because BIC was minimum, with parameters' estimates displayed in Table 3.

Table 2 Values of information criterion BIC

Model	LL	BIC
1-Cluster	-2029,56	4232,948
2-Cluster	-1841,78	4034,424
3-Cluster	-1741,19	**4010,272**
4-Cluster	-1660,49	4025,915

Table 3 Parameters' estimates

Relative size	Cluster1 (40%)	Cluster2 (36%)	Cluster3 (24%)
Clustering base variables			
Average household size (Source: SILC)			
2,000 - 2,200	**0,5957**	0,0000	0,4043
2,300 - 2,400	0,4947	0,0000	**0,5053**
2,500 - 2,600	0,1995	**0,8005**	0,0000
2,700 - 2,800	0,2827	**0,4286**	0,2888
2,900 - 2,900	0,4991	**0,5009**	0,0000
Distribution of households by household size (Source: SILC)			
16,00 - 18,90	**0,8000**	0,2000	0,0000
20,20 - 23,80	0,0000	**0,6000**	0,4000
24,10 - 28,90	0,2000	**0,8000**	0,0000
29,30 - 34,50	0,4000	0,2000	0,4000
35,70 - 46,10	0,6000	0,0000	0,4000
Distribution of population by work intensity of the household (Source: SILC)			
4,100 - 5,900	0,5000	0,5000	0,0000
6,000 - 6,600	0,5996	0,4004	0,0000
7,400 - 7,800	0,3333	0,5000	0,1667
7,900 – 9,000	0,4976	0,1667	0,3357
9,500 - 10,70	0,0000	0,2500	0,7500
Distribution of population aged 18 and over by education level and age group (Source: SILC)			
8,300 - 14,70	0,2000	0,8000	0,0000

16,00 - 19,40	0,4000	0,4000	0,2000
20,20 - 26,50	0,2000	0,4000	0,4000
27,10 - 31,60	0,2000	0,2000	0,6000
36,10 - 66,70	1,0000	0,0000	0,0000
Distribution of population aged 18 and over by health status, age group and gender (Source: SILC)			
3,700 - 14,60	0,4000	0,6000	0,0000
15,20 - 17,70	0,2000	0,8000	0,0000
18,70 – 23,00	0,4000	0,2000	0,4000
23,10 - 31,50	0,6000	0,2000	0,2000
32,00 - 48,70	0,4000	0,0000	0,6000
Distribution of population aged 18 and over by occupation, income group and gender (Source: SILC)			
1,400 - 4,700	0,5000	0,5000	0,0000
4,800 - 5,300	0,3333	0,5000	0,1667
5,500 - 6,800	0,6000	0,4000	0,0000
6,900 - 8,100	0,4000	0,4000	0,2000
9,400 - 15,90	0,2000	0,0000	0,8000
Distribution of population aged 18 and over by part-time or full-time employment, income group and			
60,10 - 78,40	0,2000	0,0000	0,8000
79,70 - 89,60	0,8000	0,0000	0,2000
90,30 - 91,90	0,4000	0,3982	0,2018
92,30 - 95,30	0,6000	0,4000	0,0000
95,90 - 97,10	0,0000	1,0000	0,0000
People living in households with very low work intensity by age and gender			
4,000 - 6,200	0,4000	0,6000	0,0000
6,300 - 6,700	0,3333	0,3333	0,3333
6,900 - 7,700	0,4282	0,5718	0,0000
8,200 - 8,500	0,5979	0,0000	0,4021
8,800 - 19,80	0,2000	0,2000	0,6000
People living in households with very low work intensity by most frequent activity status (population aged			
4,200 - 6,700	0,2000	0,8000	0,0000
6,900 - 7,500	0,5996	0,4004	0,0000
7,700 - 8,200	0,4979	0,3336	0,1684
8,900 - 9,700	0,5000	0,0000	0,5000
9,800 - 18,70	0,2000	0,2000	0,6000

Table 3 Parameters' estimates (cont.)

Relative size	Cluster1 (40%)	Cluster2 (36%)	Cluster3 (24%)
People living in households with very low work intensity by income quintile and household type			
4,300 - 6,700	0,2000	0,8000	0,0000
6,800 - 7,300	0,5996	0,4004	0,0000
7,500 - 8,300	0,4997	0,3336	0,1667
8,800 - 9,600	0,5000	0,0000	0,5000
9,700 - 18,30	0,2000	0,2000	0,6000
People living in households with very low work intensity by education level (population aged 18 and over)			
4,300 - 6,400	0,2000	**0,8000**	0,0000
6,500 - 7,200	**0,8000**	0,2000	0,0000
7,400 - 8,000	0,1979	**0,6000**	0,2021
8,200 - 9,500	**0,6000**	0,0000	0,4000
9,600 - 18,20	0,2000	0,2000	**0,6000**
People living in households with very low work intensity by broad group of citizenship (population aged 18			
4,100 - 6,500	0,4000	**0,6000**	0,0000
6,600 - 7,500	0,4000	**0,6000**	0,0000

	Cluster1	Cluster2	Cluster3
7,700 - 8,300	0,3983	**0,3991**	0,2026
8,400 - 9,600	**0,6000**	0,0000	0,4000
10,30 - 19,30	0,2000	0,2000	**0,6000**

People living in households with very low work intensity by broad group of country of birth (population

	Cluster1	Cluster2	Cluster3
4,100 - 6,500	0,4000	**0,6000**	0,0000
6,600 - 7,500	0,4000	**0,6000**	0,0000
7,700 - 8,300	0,3983	**0,3991**	0,2026
8,400 - 9,600	**0,6000**	0,0000	0,4000
10,30 - 19,30	0,2000	0,2000	**0,6000**

Average number of rooms per person by tenure status and dwelling type from 2003 (Source: SILC)

	Cluster1	Cluster2	Cluster3
0,900 - 1,000	0,0000	**1,0000**	0,0000
1,100 - 1,300	0,0000	**0,8000**	0,2000
1,400 - 1,800	**0,8310**	0,0000	0,1690
1,900 - 1,900	**0,7460**	0,0000	0,2540
2,000 - 2,300	0,3972	0,0000	**0,6028**

Average number of rooms per person by tenure status and dwelling type until 2001 (Source: ECHP)

	Cluster1	Cluster2	Cluster3
Less than 1,1	0,0000	**1,0000**	0,0000
1,100 - 1,300	0,0000	**0,8000**	0,2000
1,400 - 1,800	**0,8310**	0,0000	0,1690
1,900 - 1,900	**0,7460**	0,0000	0,2540
2,000 - 2,300	0,3972	0,0000	**0,6028**

Overcrowding rate by age, gender and poverty status - Total population (Source: SILC)

	Cluster1	Cluster2	Cluster3
1,000 - 3,900	0,4000	0,0000	**0,6000**
4,000 - 7,800	**0,6000**	0,0000	0,4000
9,600 - 23,30	**1,0000**	0,0000	0,0000
25,00 - 47,00	0,0000	**0,8000**	0,2000
49,00 - 57,70	0,0000	**1,0000**	0,0000

Overcrowding rate by household type - Total population (Source: SILC)

	Cluster1	Cluster2	Cluster3
0,800 - 2,000	**0,5979**	0,0000	0,4021
2,300 - 9,600	**0,6000**	0,0000	0,4000
11,00 - 13,70	0,4000	0,2000	**0,4000**
17,00 - 20,20	0,4000	**0,6000**	0,0000
24,90 - 36,90	0,0000	**1,0000**	0,0000

Overcrowding rate by tenure status - Total population (Source: SILC)

	Cluster1	Cluster2	Cluster3
0,200 - 1,900	0,2500	**0,5000**	0,2500
2,000 - 5,100	0,3333	0,3333	**0,3333**
5,400 - 21,40	0,4000	0,2000	**0,4000**
23,50 - 36,50	**0,6000**	0,2000	0,2000
48,10 - 59,20	**0,4000**	0,6000	0,0000

Table 3 Parameters' estimates (cont.)

Relative size	Cluster1 (40%)	Cluster2 (36%)	Cluster3 (24%)
Overcrowding rate by degree of urbanization - Total population (Source: SILC)			
1,000 - 5,200	**0,6000**	0,0000	0,4000
5,700 - 11,20	0,4000	0,0000	**0,6000**
14,30 - 26,80	**1,0000**	0,0000	0,0000
29,00 - 49,30	0,0000	**0,8000**	0,2000
55,60 - 60,20	0,0000	**1,0000**	0,0000
Overcrowding rate by age, gender and poverty status - Population without single-person households			
1,000 - 3,300	**0,7500**	0,0000	0,2500
3,800 - 8,100	0,3333	0,0000	**0,6667**
8,800 - 25,90	**1,0000**	0,0000	0,0000
26,00 - 48,90	0,0000	**0,8000**	0,2000
51,40 - 60,10	0,0000	**1,0000**	0,0000

Housing cost overburden rate by age, gender and poverty status (Source: SILC)			
2,500 - 3,900	**0,8000**	0,2000	0,0000
4,100 - 6,300	**0,6000**	0,2000	0,2000
7,200 - 8,700	0,2000	**0,6000**	0,2000
8,900 - 10,90	0,4000	**0,6000**	0,0000
13,20 - 24,40	0,0000	0,2000	**0,8000**
Housing cost overburden rate by income quintile (Source: SILC)			
8,600 - 14,70	**0,8000**	0,2000	0,0000
14,90 - 20,30	**0,6000**	0,2000	0,2000
24,30 - 29,10	0,2000	**0,8000**	0,0000
29,40 - 35,30	0,2000	**0,4000**	0,4000
38,70 - 67,10	0,2000	0,2000	**0,6000**
Housing cost overburden rate by tenure status (Source: SILC)			
0,800 - 2,400	**0,8000**	0,0000	0,2000
2,500 - 4,600	**0,6000**	0,2000	0,2000
6,000 - 9,300	0,4000	**0,6000**	0,0000
10,10 - 12,20	0,0000	0,3982	**0,6018**
14,60 - 32,30	0,2000	**0,6000**	0,2000
Housing cost overburden rate by degree of urbanization (Source: SILC)			
2,800 - 4,800	**0,7996**	0,2004	0,0000
5,400 - 7,300	0,3996	**0,4004**	0,2000
8,100 - 9,300	0,4000	**0,6000**	0,0000
10,30 - 12,70	0,2000	**0,6000**	0,2000
14,20 - 30,40	0,2000	0,0000	**0,8000**
Housing cost overburden rate by household type (Source: SILC)			
7,200 - 11,50	**0,8000**	0,0000	0,2000
11,90 – 17,00	**0,8000**	0,2000	0,0000
17,60 - 25,50	0,2000	**0,6000**	0,2000
29,40 – 31,00	0,0000	**0,8000**	0,2000
31,80 - 56,50	0,2000	0,2000	**0,6000**
Median of the housing cost burden distribution by age, gender and poverty status (Source: SILC)			
6,700 - 11,10	**0,6000**	0,2000	0,2000
11,40 - 12,30	**0,8000**	0,2000	0,0000
12,90 - 15,70	0,4000	**0,4000**	0,2000
17,10 - 19,90	0,2000	**0,8000**	0,0000
20,30 - 29,90	0,0000	0,2000	**0,8000**
Median of the housing cost burden distribution by degree of urbanization (Source: SILC)			
6,800 - 11,90	**0,6000**	0,2000	0,2000
12,00 - 13,60	**0,8000**	0,2000	0,0000
14,50 - 17,00	0,3316	**0,5000**	0,1684
18,30 - 20,20	0,0000	**1,0000**	0,0000
20,90 - 31,60	0,2000	0,0000	**0,8000**

Table 3 displays the parameters' estimates of ordinary probabilities belonging to cluster 1, cluster 2 and cluster 3, 0.40, 0.36 and 0.24, respectively, and of conditional probabilities. For instance, 0.5957, 0.0000 and 0.4043, are the probabilities that *Average household size* takes values between 2.000 and 2.200, given that housing belongs to Cluster 1, 2 or 3. Because the highest conditional probability is in cluster 1, this category is classified in cluster 1 (see table 3).

Table 4 displays the clusters' composition: the countries belonging to each cluster in accordance with the clustering base variables.

Table 4 Clusters

Clusters	Countries
Cluster 1	Belgium; Denmark; Greece; Spain; France; Italy; Netherlands; Austria; Finland; Sweden; United Kingdom
Cluster 2	Bulgaria; Czech Republic; Latvia; Lithuania; Hungary; Poland; Romania; Slovenia; Slovakia
Cluster 3	Ireland; Cyprus; Lithuania; Luxembourg; Malta; Portugal

Based on the conditional probabilities of table 3 we can profile countries by clustering the base variables to obtain the clusters' profile that is displayed in table 5.

Table 5 Profile of countries

Clustering base variables	Belgium; Greece; Denmark; Spain; France; Italy; Netherlands; Austria; Finland; Sweden; United Kingdom	Bulgaria; Czech Republic; Latvia; Lithuania; Hungary; Poland; Romania; Slovenia; Slovakia	Ireland; Cyprus; Luxembourg; Malta; Portugal
Average household size (Source: SILC)	2 - 2,20	2,50 - 2,90	2,30 - 2,40
Distribution of households by household size (Source: SILC)	16 - 18,90	20,20-28,90	29,30-46,10
Distribution of population by work intensity of the household (Source: SILC)	4,1-6,6	7,40 - 7,80	7,90-10,7
Distribution of population aged 18 and older by education level and age group (Source: SILC)	36,10 -66,70	8,30-19,40	20,20-31,60
Distribution of population aged 18 and older by health status, age group and gender (Source: SILC)	18,70 -31,50	3,70 -17,70	32 - 48,70
Distribution of population aged 18 and older by occupation, income group and gender (Source: SILC)	5,50 - 8,10	1,4 - 5,3	9,40 - 15,90

Distribution of population aged 18 and older by part-time or full-time employment, income group and gender (Source: SILC)	79,70 - 95,30	95,90 - 97,10	60,10 - 78,40
People living in households with very low work intensity by age and gender	8,20 - 8,50	4 - 7,7	8,80 - 19,80
People living in households with very low work intensity by most frequent activity status (population aged 18 and older)	6,90 - 9,70	4,20 - 6,70	9,80 - 18,70
People living in households with very low work intensity by income quintile and household type	6,80 - 9,60	4,30 - 6,70	9,70 - 18,30
People living in households with very low work intensity by education level (population aged 18 and older)	6,50 - 7,20; 8,20 - 9,50	4,30 - 6,40; 7,40 – 8	9,60 - 18,20
People living in households with very low work intensity by broad group of citizenship (population aged 18 and older)	8,40 - 9,60	4,10 - 8,3	10,30 - 19,30
People living in households with very low work intensity by broad group of country of birth (population aged 18 and older)	8,40 - 9,60	4,10 - 8,3	10,30 - 19,30

Our analysis of the housing profiles is conducive to five different findings. First, they provide the first demonstration that the theoretical perspective of welfare models do not fit with housing regimes, despite the cluster methodology being a coherent with the three different clusters of European countries concerning housing. Second, the housing's hybrid dimension has a twofold focus: service (accommodation) and a capital asset (Fahey and Norris 2010). However, the focus on the market dimension after the 1970s has resulted in a shift from the housing's relevance to social policy to that of investment. Third, the exploratory findings suggest that until the 1990 housing could be explained welfare regimes, the Nordic countries presents a relatively homogeneous characteristics more than Mediterranean or conservative ones. Fourth, the change in property status, aligned with the current socio-economic scenario, has given rise to a different housing context. Tenants that become landlords with the aid of bank loans have become seriously affected by the ongoing unemployment rates. Finally, we argue

that although arguments needs more expanded analyze and research, our findings underscore of explaining variables such as at risk of poverty and social exclusion.

Table 5 Profile of countries (cont.)

Clustering base variables	Belgium; Greece; Denmark; Spain; France; Italy; Netherlands; Austria; Finland; Sweden; United Kingdom	Bulgaria; Czech Republic; Latvia; Lithuania; Hungary; Poland; Romania; Slovenia; Slovakia	Ireland; Cyprus; Luxembourg; Malta; Portugal
Average number of rooms per person by tenure status and dwelling type from 2003 (Source: SILC)	1,40 - 1,90	0,9 – 1,30	2,00 - 2,30
Average number of rooms per person by tenure status and dwelling type until 2001 (Source: ECHP)	1,40 - 1,90	0,1 - 1,30	2 - 2,30
Overcrowding rate by age, gender and poverty status - Total population (Source: SILC)	4 - 23,30	25 - 57,70	1 - 3,90
Overcrowding rate by household type - Total population (Source: SILC)	0,8 - 9,60	17 - 36,90	11 - 13,70
Overcrowding rate by tenure status - Total population (Source: SILC)	23,5 - 59,20	0,20 - 1,90	2 - 21,40
Overcrowding rate by degree of urbanisation - Total population (Source: SILC)	1 - 5,20; 14,30 - 26,80	29 - 60,20	5,70 - 11,20
Overcrowding rate by age, gender and poverty status - Population without single-person households (Source: SILC)	1 - 3,30; 8,80 - 25,90	29 - 60,20	3,80 - 8,10
Housing cost overburden rate by age, gender and poverty status (Source: SILC)	2,5 - 6,30	7,2 - 10,90	13,20 - 24,40
Housing cost overburden rate by income quintile (Source: SILC)	8,6 - 20,30	24,30 - 35,30	38,70 - 67,10
Housing cost overburden rate by tenure status (Source: SILC)	0,8 - 4,60	6 - 9,30; 14,60 - 32,30	10,10 - 12,20
Housing cost overburden rate by degree of urbanization (Source: SILC)	2,80 - 4,80	5,4 - 12,70	14,20 - 30,40
Housing cost overburden rate by household type (Source: SILC)	7,2 - 17	17,60 - 31	31,80 - 56,50

Median of the housing cost burden distribution by age, gender and poverty status (Source: SILC)	6,7 - 12,30	12,90 - 19,90	20,30 - 29,90
Median of the housing cost burden distribution by degree of urbanization (Source: SILC)	6,80 – 13,60	14,50 - 20,20	20,90 - 31,60

Legend: SILC Statistics on Income and Living Conditions

The primary conclusion to be derived from table 5 is that cluster 1 comprises all of Esping-Andersen's welfare regimes (social democratic, conservative/Continental and liberal). The second cluster shows the Eastern countries - a result of the communist regime- discussed by different authors several times in literature, and the third cluster is composed by variables that points to the Risk Welfare State. Are the data and its analysis wrong? Or do the data and its analysis diagnose an emergent and relevant housing cluster? After examining of all variables of this cluster thoroughly, we have obtained important and significant findings that need a continuous investigation. Moreover, the nature of the variables in each cluster differs. The first one is not very significant. The second one includes all variables that show a social risk: poverty and exclusion, as well as a housing cost overburden in different social groups. We need to add a final note: the data are mainly from 2001 to 2003, the present situation is worse in terms of these explanatory variables. The social risks have become higher: Ireland and Portugal belong to the third cluster, which have both required the IMF's intervention. The findings reinforce the housing effect in 2008.

Before the mid 1970s the housing market was characterized by full employment and a regulated mortgage industry, in this period housing was considered a cornerstone of welfare state. The end of full employment, the deregulation of the housing market and a residual social renting sector transformed the situation and it has gradually become wobbly pillar.

European Commission highlighted that housing deprivation is one of the most extreme examples of poverty and social exclusion in contemporary society. According Eurostat (2011) in 2009, 6.0% of the EU population suffered from severe housing deprivation. This situation is particularly severe in Romania (28.6 %), but also in Bulgaria and Latvia. Iceland, Norway and Switzerland, this rate was below 3 %.

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Cyprus, the Netherlands, Finland and Norway the rate represented less than 1% of the population.

The data show that housing became an overburdening cost (the total cost of housing exceeds 40 % of their income). In 2009 for 12.2% of the EU population housing was an overburdening cost. It was the highest in Denmark (24.4 %), Germany (23.6 %) and Greece (22.2%). On the other hand, in Cyprus it was less than 4 %, the same in France, Malta, Luxembourg and Slovenia (Eurostat 2011).

The 2008 subprime crisis, the persistent unemployment rates and economic downtown have given rise to an unprecedented foreclosure and homelessness. Privatization of housing, changes in the market and financial speculation have gradually put tenants in weaker position. The housing context demonstrates how welfare state has changed over the past two decades. This paper has highlighted some evidence and reasons for a new interpretation of the housing-welfare state relationship with implications that call for a new policy agenda.

Conclusions and Policy Implications

By analysing the dynamics of the housing data and welfare state, this study provides leverage to understand the transformation of social risks, namely housing cost overburden rate and very low work intensity that occurred since the beginning of 2000s. Findings suggest that, despite the exploratory perspective of this research, there is a preponderant need to continue this research through a theoretical and practical analysis. In addition, this study considers that housing must be an European social policy concern, but the differences between these three clusters shows that each group of countries has specific problems that demands a different social policy response by Europe. Results disconfirm the clusters regimes in application to the housing field.

Findings report important effects on variables of exclusion, unemployment, explosion of high mortgage rates, and these effects are stronger than any welfare qualitative or quantitative explanation – it overcomes geographical, historical, social and cultural boundaries and presents a menace to families, economies and state. With this scenario the cluster analysis of housing confirms a new and urgent agenda for

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policies in Europe and in the world. With this overview, comparative social policy is a suitable framework for global responses with local dimension.

Results suggest a new trend to housing – it will have to become a hob welfare pillar in 21 century, a way of reduce the domino effect so as to not burst real estate bubble. Our In interested point that arose from the data collected in 2001 to 2003 is how it apparently foresaw the consequences of the 2008 crisis. Housing has become a as a new social risk. Our model examines relevant trends in housing with great impact on policies.

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