Is There a Trade-off between Housing and Pension System Generosity? Empirical Evidence from the Luxembourg Wealth Study

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Abstract

This study contributes to the discussion about the housing-pensions nexus. However, it aims to explore housing in the context of welfare provision from a different perspective. Unlike the vast majority of the previous studies, we do not focus on homeownership per se or housing deprivation as a dimension of poverty, but on the significance of housing wealth. Additionally, the presented analysis is based on the more comprehensive concept of pension generosity assessment which includes empirical replacement rates. The study employs micro-data from the Luxembourg Wealth Study (LWS) dataset. Using statistical analysis and multinomial logistic regression modelling we examine housing wealth patterns among elderly households with a special focus on the possible linkage between housing and pension system’s generosity. The results of cross-country comparisons imply that there are large country differences in terms of housing wealth accumulation. Analyses of the relationship between (average) pension system generosity and the (average) share of housing assets in total assets at the country level using aggregated values do not provide any evidence for the pensions-housing trade-off. However, when the level of aggregation is reduced, a different picture emerges. Especially when the households having very small or no housing assets relative to total assets are excluded, it becomes clearer that individuals receiving higher pension tend to differentiate their asset portfolio.

Keywords

housing, comparative studies, welfare provision, Luxembourg Wealth Study

Introduction

In the second half of the 20th century, homeownership rates increased considerably in most of the developed countries (Andrews & Caldera Sánchez, 2011; Castles, 1998). According to Andrews & Caldera Sánchez (2011) part of these changes can be attributed to the transformation of households’ characteristics, but this shift still remains to a large extent unexplained, which may point to public policy playing a role in that process. High homeownership finds its natural reflection in the housing wealth accumulation patterns at the household level. Housing assets can be considered as a key component of households’ wealth (see, e.g., Arrondel et al., 2016; Causa et al., 2019; Cowell et al., 2017).

There is some empirical evidence that homeownership, or more broadly housing wealth, has the potential to be a source of additional income, both in kind and in cash, in the old age, and this way it complements pension income and helps to maintain the standard of living (see, e.g., Doling & Elsinga, 2013; Toussaint, 2011; Toussaint & Elsinga, 2009). A considerable strain of the literature also points to the poverty-reducing effect of homeownership (Borg, 2015; Bravo et al., 2019; Dewilde &
Raeymaeckers, 2008; Doling & Ronald, 2010; Matel & Marcinkiewicz, 2020; Megyeri, 2018). Using housing equity as a source of income includes several strategies that elderly households can employ. They combine different forms of renting, selling, and reverse mortgage (Doling & Elsinga, 2013; Sendi et al., 2019). Studies that directly explore households’ views and opinions demonstrate that accumulation of housing wealth is often perceived as a part of a financial strategy regarding retirement, although there are noticeable cross-country differences in this respect (Hoekstra & Dol, 2021; Naumanen et al., 2012; Toussaint, 2011). Some survey studies investigating attitudes of households towards investment in housing equity show that housing assets are the preferred long-term saving vehicle as compared to private pension schemes (Clark, 2012). In this sense they can be viewed as competing alternatives.

The complex and multidimensional relationship between pensions and housing includes not only individual-level financial planning but also can be referenced to the macro (policy) level. Although the housing domain is not typically considered as a part of welfare policy area, there is no doubt that they are linked and housing plays a specific role in the welfare package, especially with reference to the elderly (Kemeny, 2001). As shown in the subsequent section of this paper, the nexus between housing and pensions has been the subject of academic debate for a few decades. However, it was never placed in the mainstream of the welfare and social policy literature and it is still an unexplored area. Moreover, it has been gaining more relevance as welfare state retrenchments in the area of pension policy, ongoing in many countries as a result of population ageing and the need for fiscal adjustments, tend to reduce welfare state generosity (OECD, 2013b, 2017). While the role of the state is diminished, self-provision and individual precaution with respect to retirement become more important.

This study contributes to the discussion about the housing-pensions nexus. However, it aims to explore housing in the context of welfare provision from a somewhat different perspective. Unlike the vast majority of the previous studies, we do not focus on homeownership per se or housing deprivation as a dimension of poverty, but on the significance of housing wealth. We investigate the trade-off between housing and pensions which can be summarized in one question: Are housing assets a more viable option and more attractive investment vehicle intended as a source of income in old age in countries where the pension system is less generous? Additionally, the presented analysis is based on the more comprehensive concept of pension generosity assessment which includes empirical replacement rates. As argued in the next section, previous housing studies tend to adopt a somewhat oversimplifying approach assuming that welfare state generosity can be captured solely via social spending. Our study employs micro-data from the Luxembourg Wealth Study (LWS) dataset. Using statistical analysis and multinomial logistic regression modelling, we examine housing wealth patterns among elderly households with a special focus on the possible linkage between housing and pension system generosity.

The paper is structured as follows. First, it introduces theoretical background and the advancements of the research on the housing-pensions nexus. Next, it elaborates on the empirical framework devoted to data analysis and operationalisation issues. The subsequent section reports the result of our empirical studies. The paper ends with synthetic conclusions.

**Related literature**

Although the idea that owning housing property, especially in old age, can contribute in many ways to the improvement in individual welfare seems to be reasonable, for a long time, housing issues were considered and explored separately from welfare state literature. The academic discussion about the possible trade-off between welfare provision and homeownership rates was actually started by Jim
Kemeny in the early 1980s (Kemeny, 1980, 1981). His studies provide some empirical evidence in favour of the hypothesis that in countries where homeownership rates are high, public welfare provision is poorly developed. However, this evidence can be considered as very limited due to the shortage of comparable and comprehensive statistical data for the 1960s and 1970s. Consequently, only few countries are covered and the statistics used are very general. Almost two decades later these findings were verified by Castles (1998), who introduced the term the ‘Really Big Trade-off’ to label this nexus. Castle’s study, using newer statistical data and a larger number of countries, confirms Kemeny’s hypothesis. As indicated, such results prove that ‘widespread homeownership may reduce the need for generous income maintenance for the aged’.

Although this relationship is observed at the macro level, it is rooted at the micro level: it refers to the function of housing equity as a saving vehicle. This role is especially stressed in the theoretical concept introduced by Sherraden (1991) called Asset-Based Welfare (ABW), which evolved later in Housing Asset-Based Welfare (HABW) (see e.g., Prabhakar, 2019). These concepts point to the potential of owning a property as a source of individuals’ income in kind and in cash in old age. Additionally, ABW and HABW result in policy implications that are related to some extent to the ‘Really Big Trade-off’, as they promote the idea of self-provision over generous social transfers.

Kemeny and Castles in their aforementioned studies refer to a broader context of the welfare state and they do not limit their analysis to the area of pensions, but there is no doubt that pensions are of the greatest relevance and are expected to play the leading role in the welfare-homeownership nexus. This nexus with a more specific focus on pensions, as opposed to the social policy area in general, is discussed in a study by Delfani et al. (2014). Based on an empirical study covering 22 countries, they argue that ‘the conclusion of a trade-off between the rate of home-ownership and spending on pensions often referred to in prior work is unlikely to hold universally’. They demonstrate that market characteristics play a key role with reference to the existence of a trade-off between pensions and housing. Namely, only in countries where both housing and pensions are highly commodified, such an inverse relationship between both domains can be observed. With regard to the young generation, Filandri & Bertolini (2016) find some empirical evidence using micro-level data that homeownership and pension generosity are correlated negatively. Fahey (2003) in his case study of Ireland explores two possible mechanisms linking housing and pensions. However, he finds no evidence that high house purchase costs make generous pensions unaffordable, as well as no empirical support of the explanation that high homeownership makes generous pensions unnecessary. As demonstrated by Černý et al. (2010), who refers to the macroeconomic level using an overlapping generations (OLG) modelling framework, pension reforms increase the demand for housing and contribute to the rise of real estate prices. According to their findings, such effects can be expected for reforms which result in the reduction of the generosity of state pensions, as well as in the rise in retirement age. Doling & Elsinga (2013), drawing on the EU-SILC estimates, quantify the actual potential of homeownership to act as a pension. They conclude that housing assets can contribute to maintaining the standard of living in old age by providing additional income in kind and in cash.

One of the crucial issues for analysing the housing-pensions relationship is the choice of housing characteristics under investigation. The ‘ Really Big Trade-Off ’ hypothesis focuses solely on homeownership rates at the country level. However, such an approach may be considered quite narrow and does not show the full complexity of reality. As demonstrated by Wind et al. (2020) who analyse secondary property ownership in the European Union member states, its level is considerable, although there are large differences between countries in this respect. This also indicates that secondary property has the potential to affect an individual’s welfare position. Additionally, the ‘ ideology of mass homeownership’, which in many countries has taken the form of privileging
homeownership over tenancy, contributes to increasing wealth inequalities which also questions the housing asset-based welfare as a source of economic security (Arundel, 2017; Christophers, 2021).

When exploring the relationship between pension system generosity and housing, some conceptual and, consequently, methodological issues regarding pensions require a proper specification. They all are associated with a more general question of how to define welfare state generosity in the domain of pensions. In the previously mentioned Kemeny’s work (Kemeny, 1980), which discusses the area of social security in general, welfare is captured by government expenditures, tax revenues, but also by two types of benefit entitlements: unemployment benefits as a share of average weekly earnings, and state joint retirement pension schemes for married couples as a share of the average income. In Castles’s study (Castles, 1998) next to tax revenues and total government social protection expenditures, also the expenditures on pensions and public health are independently taken into account as indicators of ‘the degree of welfare state provision’. Such data selection can be considered as very narrow, which naturally results from the limitations in information availability for the investigated period which covered several decades starting from the 1960s. However, even some more recent studies exploring housing in the context of welfare provision employ social spending as % of GDP as the only measure of generosity and do not go beyond it (see, e.g., Filandri & Bertolini, 2016). Nevertheless, literature on the welfare state addresses in more detail the issues associated with the measurement of the scope of welfare provision. This allows relating more adequately to the term generosity. In welfare state studies it is often identified with the term decommodification (Scruggs, 2014). It has been widely disseminated by the ground-breaking study Three Worlds of Welfare Capitalism by Gösta Esping-Andersen, which defines welfare state decommodification level as ‘the degree to which individuals, or families, can uphold a socially acceptable standard of living independently of market participation’ (Esping-Andersen, 1990, p.37). In the original Esping-Andersen’s work, decommodification level for the domain of pensions is measured using eligibility rules, public pension coverage rates, as well as income replacement (with reference to minimum pension and standard pension, i.e., payable to a typical worker earning average wage for the entire working life) as a key criterion. Börsch-Supan (2006) identifies the size of welfare state measured by social expenditures with welfare state generosity. A different view is presented by Ferragina (2015) who indicates that in welfare state studies, data on spending reflect somewhat different information than income replacement - while social spending accounts for the size of the welfare state, entitlements and benefits more adequately represent the generosity of the welfare state. Green-Pedersen (2004) also points to the different theoretical perspectives associated with both types of information. However, despite these differences, to some extent both kinds of data are positively correlated (Ferragina, 2017; Lefèvre & Pestieau, 2006). In the welfare state retrenchment discussion, the differences between using information on social expenditures and replacement rates are often referred to as a ‘dependent variable problem’ (see, e.g., Clasen & Siegel, 2007; Green-Pedersen, 2004). Nonetheless, in the existing literature which addresses explicitly pension generosity issues, replacement rate seems to be the key indicator reflecting the analysed phenomenon (see, e.g., Kuitto et al., 2021; Sanchez-Romero & Prskawetz, 2020; Zohlnhöfer et al., 2013), although it is also not free from flaws (Wagner & Elder, 2020; Wenzelburger et al., 2013).

**Empirical framework**

This research largely draws on data from Luxembourg Wealth Study (LWS), which is a cross-national household survey conducted periodically. It collects information on household wealth, labour market activity, incomes including public and private transfers, consumption expenditures, as well as some behavioural factors. Our empirical study covers wave X comprising years 2016-2017. The following
countries are included: Austria, Germany, Estonia, Spain, Finland, Greece, Italy, Luxembourg, Norway, Slovakia, Slovenia, the United Kingdom\(^1\).

As in LWS surveys country sample sizes vary significantly (from 1.6 thous. households in Luxembourg to 244 thous. in Norway) and they are not equally proportional to the country population sizes, data employed in this study is weighted using normalised household weight. It ensures representativeness of the total country household population and additionally is normalised to the population size of 10,000 by country. Such weighting is recommended for multi-country analyses where each country is intended to have the same weight. This way the results are not biased by significant disproportions in country populations and country sample sizes.

Our empirical analysis is conducted for elderly households which receive pension income. For the purpose of this study, they are identified as households that meet two conditions jointly: 1) they are composed solely of individuals aged 65 and above, and 2) a household head reports labour force status retired. As a consequence of such a definition, we do not explore the entire population of the elderly, but only those who run their households, while we exclude from the analysis, for example, multigenerational families, where adult children cohabitate with their elderly parents. This results from the structure of wealth statistics which are presented as aggregates for the household level and do not allow to separate assets accumulated by younger and older household members.

This study aims to examine housing wealth accumulation patterns with reference to the elderly people in a cross-country framework to answer the question of whether these patterns can be explained by differences in pension system generosity. To examine this possible nexus, both phenomena are operationalised using two variables: housing assets to total assets and empirical replacement rate.

*Housing assets to total assets* at the household level is expressed by the market value of the principal residence and other real estate owned by household members, given in relative terms as a percentage share of total assets (both, financial and non-financial). This enables evaluating the importance of housing wealth as compared to the total household assets. Mortgage debt is not accounted for in this formula, because the study aims at exploring wealth accumulation preferences in terms of investment vehicles rather than estimating household net worth. Nevertheless, older households rarely have unpaid mortgage debt (OECD, 2013a). Additionally, for further analysis, this variable is referenced to the thresholds 25%, 50% and 75% to distinguish between four categories: low share (housing assets to total assets between 0 and 25%), low medium share (25-50%), high medium share (50-75%), and high share (75-100%).

To proxy pension system generosity, we estimate *empirical replacement rate*. As mentioned in the previous section, income replacement is a standard measure of pension generosity. However, if referring to *benefit entitlements*, such an indicator usually reflects the current pension arrangements and applies to a modelled case of a typical working individual earning an average wage (therefore is labelled theoretical replacement rate). In this study, we focus on the individuals (households) who are already retired and receive pension benefit. Thus, it can be argued that the actual (empirical) replacement rates are a more comprehensive and suitable measure. It approximates pension income relative to labour income much better than theoretical replacement rate which refers to a unified, modelled case. For the purpose of this study, the *empirical replacement rate* is defined as a ratio between a household head’s individual pension income and country-specific average wage in the economy. In addition, if a household head’s partner also receives pension income, her or his

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1 Greece and Luxembourg did not participate in LWS X wave, therefore the data for these countries is obtained from the survey conducted for 2018 (XI wave).
replacement rate is calculated likewise, and the empirical replacement rate is given as a mean of both individual replacement rates. Pension income in the numerator of the formula includes public contributory and non-contributory pensions, as well as private occupational and individual pensions, if applicable. The denominator of the ratio employs OECD statistics concerning annual average wages reported for the year in accordance with the time of LWS survey in each country under investigation. The empirical replacement rate calculated in this manner, contrary to the standard individual replacement ratio based on longitudinal data, does not require information on individual income from the past (before retirement), but it refers to the average remuneration in a particular country. Thus, such an indicator reflects the level of individual pension income expressed relative to the current average labour income. It can be identified as empirical actual cross-sectional family-based replacement rate combining the individual and average level of aggregation (see Borella & Fornero, 2009). In defining income replacement, our approach is similar to that adopted by Gran (1997) who employs Luxembourg Income Study microdata to analyse particular components of incomes of the elderly also expressed relative to the national average.

Results

At the preliminary stage of the presented empirical analysis, we estimate some country-level statistics for our key housing and pension variables, i.e., housing assets to total assets and empirical replacement rate (see Table 1). As indicated in the previous section, they apply to the elderly households receiving pension benefit. For a more complete outlook, some additional information is included. Namely, we present homeownership rates calculated also on the basis of the LWS microdata comprising the selected sample of elderly households. Moreover, we also compare these micro-level estimates to the macro-level information on pension spending as a share of GDP as an alternative indicator of pension generosity, often referenced in the previous studies. Considering that pension spending is strongly influenced by the size of the elderly population relative to the working-age population, also the adjusted pension expenditure is presented, which is more suitable for cross-country comparisons (Chybalski, 2013). It is defined as the ratio between pension expenditure (% GDP) and old-age dependency ratio (ODR, the proportion of population aged 65+ to the population aged 20-65). Although it cannot be interpreted directly, in comparative analysis its higher values imply greater pension generosity.

The results presented in Table 1 indicate that there are large disproportions between countries with reference to both, average levels of housing assets and average empirical replacement rates. Countries where pensioners’ households report the lowest mean level of housing assets in total assets are: Austria, the United Kingdom, and Germany. The highest levels are shown for Greece, Slovenia, and Slovakia. These figures hardly converge with the mean empirical replacement rates reported for particular countries. The lowest income replacement in average terms is estimated for the United Kingdom, Slovenia, and Estonia, while the highest is for Greece, Luxembourg, and Norway. It is worth noting that in the case of housing assets, mean values are generally smaller than medians, which may imply that households reporting greater share than the mean value prevail. In the case of replacement rates, the situation is reversed – medians are smaller than means. It can be concluded that more than half of the households declare smaller (relative) pension benefits than the mean value.
Table 1. Housing and pensions statistics by country

<table>
<thead>
<tr>
<th>Country</th>
<th>Housing assets to total assets (%)</th>
<th>Empirical replacement rate (%)</th>
<th>Homeownership rate (%)</th>
<th>Old-age pension expenditure (%)</th>
<th>Old-age pension expenditure (%) adjusted by ODR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>Std. Deviation</td>
<td>Mean</td>
<td>Median</td>
</tr>
<tr>
<td>Austria</td>
<td>39.1</td>
<td>0.0</td>
<td>42.1</td>
<td>53.9</td>
<td>49.3</td>
</tr>
<tr>
<td>Germany</td>
<td>51.3</td>
<td>68.9</td>
<td>41.7</td>
<td>48.1</td>
<td>42.9</td>
</tr>
<tr>
<td>Estonia</td>
<td>61.6</td>
<td>76.4</td>
<td>37.7</td>
<td>32.6</td>
<td>31.0</td>
</tr>
<tr>
<td>Spain</td>
<td>72.5</td>
<td>85.5</td>
<td>31.8</td>
<td>53.3</td>
<td>44.5</td>
</tr>
<tr>
<td>Finland</td>
<td>62.4</td>
<td>76.9</td>
<td>36.0</td>
<td>51.1</td>
<td>46.0</td>
</tr>
<tr>
<td>Greece</td>
<td>81.4</td>
<td>94.7</td>
<td>30.4</td>
<td>62.2</td>
<td>56.1</td>
</tr>
<tr>
<td>Italy</td>
<td>64.2</td>
<td>81.1</td>
<td>36.1</td>
<td>55.6</td>
<td>47.7</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>75.7</td>
<td>87.6</td>
<td>28.9</td>
<td>62.6</td>
<td>58.3</td>
</tr>
<tr>
<td>Norway</td>
<td>61.6</td>
<td>73.4</td>
<td>33.5</td>
<td>56.0</td>
<td>52.5</td>
</tr>
<tr>
<td>Slovenia</td>
<td>81.7</td>
<td>95.1</td>
<td>29.9</td>
<td>26.5</td>
<td>25.9</td>
</tr>
<tr>
<td>Slovakia</td>
<td>84.9</td>
<td>94.3</td>
<td>26.2</td>
<td>40.2</td>
<td>38.4</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>50.4</td>
<td>61.9</td>
<td>32.5</td>
<td>19.3</td>
<td>10.4</td>
</tr>
</tbody>
</table>

Source: own calculations based on LWS data and Eurostat statistics (Pension expenditure data for 2017, ODR data for 2017)
As a supplement to the information given in Table 1, correlation analysis is performed to identify some patterns. The results are presented in Table 2. To account for both the linear and non-linear relationship, it reports Pearson correlation coefficients as well as Spearman rho coefficients. With reference to the linkage between pension generosity and housing wealth, one can observe very weak or no relationship. Neither mean empirical replacement rate nor pension spending correspond with housing assets to total assets. If – as in the previous studies – only homeownership rate and old-age pension expenditure are considered, one can identify a moderate negative correlation, which would imply an inverse relationship. However, such results obtained for a very limited number of countries should be interpreted with great caution.

### Table 2. Correlation coefficients

<table>
<thead>
<tr>
<th></th>
<th>Housing assets to total assets (mean)</th>
<th>Empirical replacement rate (mean)</th>
<th>Homeownership rate</th>
<th>Old-age pension expenditure (% GDP)</th>
<th>Old-age pension expenditure (% GDP) adjusted by ODR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing assets to total assets (mean)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empirical replacement rate (mean)</td>
<td>0.09 (0.11)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homeownership rate</td>
<td>0.91 (0.91)</td>
<td>-0.08 (0.18)</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old-age pension expenditure (% GDP)</td>
<td>-0.19 (-0.18)</td>
<td>0.28 (0.21)</td>
<td>-0.31 (-0.47)</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Old-age pension expenditure (% GDP) adjusted by ODR</td>
<td>-0.14 (-0.15)</td>
<td>0.30 (0.17)</td>
<td>-0.28 (-0.29)</td>
<td>0.87 (0.81)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note: figures represent Pearson correlation coefficients and Spearman rho coefficients (in brackets).

Source: own calculations based on LWS data and Eurostat statistics (Pension expenditure data for 2017, ODR data for 2017)

As indicated in Table 2, the housing assets to total assets variable is highly correlated with homeownership rate in the sample of 12 analysed countries. However, as the former variable includes mean values, further exploration of this relationship is justified. Therefore, Figure 1 presents the distribution of elderly households in terms of four categories of the housing assets to total assets variable as defined in the previous section. The corresponding homeownership rate is also displayed. As demonstrated, there is a considerable country diversity with reference to the share of households reporting different levels of housing wealth. The most homogenous countries with a great prevalence of households with the highest share of housing assets are Slovenia, Greece and Slovakia. On the opposite side, there are the United Kingdom, Austria and Germany, where the differences in the proportions of households belonging to different categories are not so pronounced. Nevertheless, the presented estimates reveal that the homeownership rate is the most significantly (negatively) correlated with the proportion of households representing the smallest (or no) share of housing assets in total assets. Percentages of households belonging to both medium categories, i.e., low medium share and high medium share, do not seem to relate in any way with the homeownership rate.
Figure 1. Percentage of pensioners’ households representing different levels of the share of housing assets in total assets
Source: own calculations based on LWS data

The correlation analysis conducted for housing assets to total assets and empirical replacement rate does not confirm that there is any relationship between the two variables. However, such results can be regarded as quite rough, because they refer solely to the aggregated, mean values. To ensure a more comprehensive outlook, a more detailed study is presented in Figure 2. The country samples are split into four categories of households (each representing a different level of housing asset to total assets), and further compared in terms of mean empirical replacement rate. A fairly clear pattern can be distinguished for all the countries. Namely, the results suggest that there is some linkage between both variables, and such a relationship can be identified as an inverted U shape. Households having a small share of housing assets in total assets on average also have the lowest replacement rates. Likewise, households having the greatest share of housing assets in total assets receive smaller relative pension benefits than households belonging to both medium categories. Presumably, these two categories (low medium and high medium) include households that are most affluent, both in terms of wealth and income. If one disregards the first category, which as indicated previously corresponds mostly to non-homeowners, the level of housing assets to total assets and the empirical replacement rate appear to be negatively associated – the higher the replacement rate, the lower (relative) housing wealth level.
To investigate the relationship between housing wealth and pension system generosity more comprehensively, i.e., using multivariate framework, we employ a multinomial logit model. As compared to our previous analyses presented in this section, it allows for accounting for differences in household characteristics when exploring the nexus between housing and the pension system. Multinomial logistic regression is suitable for nominal-scale dependent variables. It includes a series of binomial logit models, whose number is one less than the number of categories of the dependent variable. The omitted category is the referential one.

As opposed to the previous analyses conducted within this study, the model refers strictly to the micro-level and does not include any aggregated variables or country-level mean values. *Housing assets to total assets* is the dependent variable. Each household in the sample is assigned to one of the four categories. We assume *low share* to be a referential category. In line with the aim of the analysis, the key explanatory variable is the *empirical replacement rate* calculated for every household included in the sample as described in the Empirical framework section. Unlike in some previous studies that employ micro-level regression modelling for analysing the housing-pensions nexus (e.g., Dewilde & Raeymaeckers, 2008; Filandri & Bertolini, 2016), in the presented model we include individual (household-level) pension generosity estimates, not the country-level pension spending or the country average replacement rate.

As control variables, some socio-economic and demographic characteristics are covered. They comprise information on the age, gender, and education level of the household head, which are typical differentiating factors in terms of saving behaviour. Additionally, the model controls for *labour income* (dummy variable) representing households active in the labour market that receive labour income in
addition to pension. Another dummy variable used in the analysis is *living with a partner* to distinguish between single and couple households. To account for a country background, a country dummy is also included in the model.

The results presented in Table 3 generally confirm the findings formulated based on bivariate analysis conducted for the pair of variables *housing assets to total assets* and *empirical replacement rate* presented in Figure 2. That is, the estimated odds ratios indicate that in each of the three models, the chances of a household to have greater housing assets, relative to the reference category, are higher when pension replacement rates are also higher. This would imply a positive impact of pension generosity on the probability to have a greater share of housing wealth in every model. However, the interpretation is more complex. What is most important, the odds ratios associated with replacement rates are smaller in each subsequent model (but still remain greater than 1). Thus, as compared to the *low share* category, the probability of the inclusion to *low medium share, high medium share* and *high share* categories as a result of the increase in the *empirical replacement rate* by one unit in fact becomes lower in higher categories. The respective chances of households, expressed by odds ratios, are greater by 2.7% and 2.2% to have *low medium share* and *high medium share*, and only by 1.3% to have a *high share* in comparison to the referential category. Consequently, if households that have housing assets below 25% of the total assets (non-homeowners in majority) are disregarded, an inverse relationship between pension generosity and housing wealth can be identified within the three remaining housing categories.

The estimates of the other parameters associated with control variables lead to some additional findings, which generally are in line with the expectations. Lower levels of education of the household head decrease the chances to have a higher share of housing wealth as compared to the reference category. However, whereas this impact is stronger for the *low medium share* and *high medium share* categories, the reduction in chances is smaller for the *high share* category. The possible explanation is that the last category of housing assets comprises relatively less wealthy households, for which housing wealth is the sole or predominating wealth component. Also, older age is negatively associated with the chances for inclusion in categories higher than *low share*, except for *high medium share*, where the estimated coefficient is insignificant. Female household heads have smaller chances to report a *low medium share* of housing assets, but greater chances to have *high share*, as compared to the *low share*. Coupled households and households that receive additional labour income also have greater chances to be included in higher housing asset categories.
Table 3. Multinomial logistic regression modelling

<table>
<thead>
<tr>
<th></th>
<th>housing assets in total assets: low medium share</th>
<th>housing assets in total assets: high medium share</th>
<th>housing assets in total assets: high share</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Exp(B)</td>
<td>Std. Error</td>
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<tr>
<td>Intercept</td>
<td>0.572</td>
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<td>0.175</td>
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<td>replacement rate</td>
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<td>1.027</td>
<td>0.001</td>
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<tr>
<td>age</td>
<td>-0.023</td>
<td>0.977</td>
<td>0.005</td>
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<tr>
<td>gender (female=1)</td>
<td>-0.493</td>
<td>0.611</td>
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<td>labour income</td>
<td>0.762</td>
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</table>
R² Cox & Snell         | 0.240     |         |            |      |          |         |            |      |          |         |            |      |
R² Nagelkerke         | 0.270     |         |            |      |          |         |            |      |          |         |            |      |
R² McFadden           | 0.125     |         |            |      |          |         |            |      |          |         |            |      |
Source: own calculations based on LWS data
Conclusions

Our study attempts to identify some patterns concerning wealth accumulation preferences among elderly households. We pose a question whether these patterns can be associated with pension generosity measured by the level of income replacement. This can be referenced to the discussion on the ‘Really Big Trade-Off’ hypothesis. Whereas originally it refers solely to country-level indicators, the evidence provided in this study is based to a great extent on the microdata. However, we use them in both, aggregated (country level) and disaggregated (individual) forms. This way, the analysis combines macro- and micro-level approaches, which can be considered as an advantage leading to more comprehensive findings (Dewilde & Raeymaeckers, 2008; Kittel, 2006).

The study employs mainly microdata on elderly retired households from the Luxembourg Wealth Study comprising the period 2016-2017 and covering 12 European countries. The results of cross-country comparisons imply that there are large differences between countries in terms of housing wealth accumulation. Quite opposite patterns can be observed for familialistic welfare states – represented by Mediterranean countries and CEE countries such as Slovakia, Greece, Slovenia - and representatives of liberal and conservative welfare states such as the United Kingdom, Austria and Germany. An analysis of the relationship between (average) pension system generosity and the (average) share of housing assets in total assets at the country level using aggregated values does not provide any evidence for the pensions-housing trade-off. However, when the level of aggregation is reduced, a somewhat different picture emerges. Especially when the households having very small or no housing assets relative to total assets are excluded, it becomes clearer that individuals receiving higher pension tend to differentiate their asset portfolio. A possible explanation for this result could be that housing equity becomes less attractive as its role of old-age security is limited by pension generosity. And vice versa, households receiving smaller pension could give more importance to housing property as a more stable investment vehicle. It should be noted that wealth accumulation is realised in the long-term perspective. So, the current wealth components owned by the elderly are to a large extent the effect of choices made in the distant past. Similarly, expectations as to the adequacy of future pension benefits can shape the saving behaviour and portfolio choices of households over the whole working life.

The findings of the presented study have some methodological implications. Namely, we demonstrate that homeownership as a general category does not allow to explain the whole complexity of tenure. The reason is the binomial nature of homeownership as it is limited to the owner versus non-owner dichotomy. However, homeowners differ significantly in terms of housing wealth due to such circumstances as owning secondary property or differences in property value. In an analysis of the housing-pensions trade-off, the inclusion of housing assets reveals different information than homeownership. Another crucial issue associated with exploring the housing-pensions relationship is how to refer to pensions. It is a conceptual problem that naturally carries some serious methodological implications. As elaborated in the paper, a macro-level indicator, such as the ratio of pension spending to GDP, often used in similar studies, can be regarded as an oversimplified proxy of pension generosity. Empirical replacement rates, which we incorporate in this study, correspond more accurately with this notion.

The question about the trade-off between pensions and housing becomes even more interesting in the context of the current trends in housing regarding the generation of young adults as well as the changes in the labour market. As argued by Arundel & Doling (2017) based on an in-depth analysis of 29 European countries, after the financial crisis ‘the likelihood of a return to an era of widespread homeownership growth starkly decreased’, which is also a consequence of labour insecurity associated with a more precarious labour market. The latter phenomenon shall at the same time result in a
reduced adequacy of pension benefits in the future. The expected repercussions for the welfare of the elderly set the directions for further studies.

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References


