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Demographics, human capital, and the demand for housing

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ABSTRACT

This paper investigates how the demand for residential real estate depends on age and other demographic characteristics at the household level. Based on a detailed cross-sectional survey of English households, it finds that housing demand is significantly determined by a household's human capital, and that housing demand generally increases with age. After retirement it declines, but only to a small extent. High education levels, good health, and high income will increase a household's demand for housing even when households age. These results are relevant for countries that experience population shrinkage, but where total housing demand could still grow in the future despite stagnating household numbers and aging populations. The paper further shows that changes in demographics lead to very heterogeneous demand responses for different housing attributes, providing information regarding the future qualitative demand for housing.

1. Introduction

Demographic change is a key challenge for many industrialized countries. To give some brief examples, the United Nations Population Division, 2012 estimates that Russia will have lost 24% of its current population by the year 2050. For Bulgaria, the expected decline in total population is 35% in the same period. On a regional level, population changes are even more pronounced. The German federal state of Thuringia, for example, has already been losing 1% of its population annually for a number of years (Thüringer Landesamt für Statistik, 2008). Beside the rapid changes in total population numbers, societies will age dramatically. In South Korea, for instance, the median age is increasing three years every five years and the share of inhabitants older than 60 years will increase from 14% now to 42% in 2050 (UNPD, 2012). International demographic dynamics dwarf the so-called baby bust in the US.

So these are big issues, and they are likely to have a substantial impact on housing markets worldwide. Nevertheless, the literature studying demographics and housing markets is small, especially outside of the US. This paper provides new evidence regarding the effect of an aging society on the demand for housing. It does this on the basis of a high-quality micro-dataset for England, which is very rich in terms of household characteristics and the quality of the dwellings they occupy.

The first to study the possible effects of demographic changes on housing demand and house prices were Mankiw and Weil (1989), who modeled the per-capita quantity of housing demand as a function of age. Analyzing 1970 census data for the US, they found demand for housing to be very low for residents younger than 20 years, to shoot up for 20–35 years-olds, and to decline constantly thereafter. Furthermore, they created a time series of housing demand and regressed it against the aggregated housing quantity (represented by the net stock of residential capital). This revealed no significant dependency, but they did find that real house prices depended on demand as defined by their model. Mankiw and Weil concluded that

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the ageing baby-boom generations move out of the high-demand age classes would drive total demand down and result in a sharp drop in house prices.

Criticism of this paper came from many directions: Peek and Wilcox (1991) investigated the movements of house price indices and found that real after-tax interest rates and construction costs were the main determinants of price swings. Demographic variables like income and age were significant but did not have the importance suggested by Mankiw and Weil. Hendershott's (Hendershott, 1991) main point of critique was the lack of predictive power of the Mankiw and Weil models for the 1970s and 1980s, making their predictions for the 1990s unreliable. In addition, he criticized the negative time trend in their basic equation, which accounts for most of the predicted price decline Mankiw and Weil had explained by demographics.

Engelhardt and Poterba (1991) applied the Mankiw and Weil approach to data for Canada. They observed an age-housing demand relationship similar to the one Mankiw and Weil found for the US, but Canadian house prices were not determined by the derived demand variable.

Green and Hendershott (1996) propelled the debate to the next level. It followed Mankiw and Weil in linking per capita housing expenditures and demographic information based on cross-sectional data from the 1980 census. The methodology, however, advanced in two aspects: first, Green and Hendershott controlled for the quantity *and* quality of housing services a household consumes in a hedonic framework and estimated marginal prices for each hedonic characteristic of a dwelling. Second, they regressed each marginal price against the demographic variables of the household. These innovations made it possible to keep the quantity of housing services consumed constant (by defining a constant quality house) *and* to explicitly link these prices to the demographic profile. Green and Hendershott found that demand for housing does not decline with age, but rather that education and income determine the quantity of housing services consumed. This implies that Mankiw and Weil underestimated the housing services the baby-boom generation would demand in the future by not controlling for the fact that younger generations enjoyed a better education and accumulated more wealth than their predecessors.

Given the tectonic shifts in global demographics, it is surprising how few studies have researched the effect of demographics on housing markets in Europe and Asia. For Japan, Ohtake and Shintani (1996) find that demographic change has a significant effect on house prices through the short-run adjustment process in the housing market. Ermisch (1996) establishes a link between age (among other demographic variables) and the level of housing services demanded in six British agglomerations. Lee et al. (2001) find evidence that demographics do explain the amount of housing services demanded in Austria. Neuteboom and Brounen (2007) predict Dutch housing demand to increase with household age. Lindh and Malmberg (2008) show that the populations age structure is related to residential construction in Sweden and other OECD countries.

The most recent paper in this literature is Takáts (2012), who found a significant link between population growth rates and house prices, using a macroeconomic panel for 22 advanced economies for the years 1970 through 2010. His paper showed that when the population grows by 1%, real house prices move up by the same rate. An increase in the share of the elderly in a society is associated with lower house price growth. The underlying economic model is elegant, but the author measures all housing units and all households with the same yardstick. Differences in housing characteristics and heterogeneity in the residents' demographic profiles are not considered. Given the past rise in education levels, shrinking household sizes, and both longer and healthier lives, a household-level analysis of demographic trends on housing demand will provide additional insights in housing demand in *changing* societies.

This paper extends the existing literature in three directions: first, it refines the existing methodology and models the demographic dynamics more carefully. We separate *life cycle variables*, which change according to the household's position in the life cycle, from *cohort variables*, which do not change with age. Instead of allowing every demographic variable to vary (like Mankiw and Weil, 1989), or keeping all demographics constant (like Green and Hendershott, 1996) we explicitly consider only the change in the life cycle variables like income or household size over time. This leads to a more robust projection of housing demand.

Second, a very detailed micro-dataset provides information on the hedonic attributes of a representative share of English residential real estate in combination with extensive demographic information on the respective households. The majority of earlier studies utilized publicly available census data which are easy to analyze and allow for very large and representative samples, but which offer only very basic information on the physical attributes of dwellings.[1] Fortunately, our data set offers rich information on the physical characteristics of individual homes, their interior and exterior condition, energy efficiency, the local environment, and the attitudes of the inhabiting households towards their residence as well as similarly detailed information on the household's demographic profile. Overall, more than 900 variables are coded in the data set, of which approximately two thirds are relating to the dwelling, and one third to the household. Our paper shows that changes in demographics lead to very heterogeneous demand responses for different housing attributes. Disregarding these differences and assuming all households to have homogeneous and static preferences – and all dwellings to be the same – is an oversimplification that may lead to biased estimation results.

Third, using English data gives us the opportunity to analyze an environment different from the US. This international perspective is crucial since demographic changes in the United States are, although important, not as pressing as the more severe developments in Europe and Asia.

[1] Green and Hendershott (1996), for instance, had to restrict their analysis to 18 hedonic variables of housing quality, including 8 regional dummies.