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The effect of house price changes on cohort consumption in Turkey

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ABSTRACT

This paper analyzes the relationship between house prices and household consumption in Turkey. We utilize twelve consecutive waves of the Turkish Statistical Institute (TURKSTAT) Household Budget Surveys (HBS) from 2003 to 2014. We construct a pseudo-panel data set using birth-year cohorts following Deaton (1985). We find that house price changes have a positive and significant effect on the growth of cohort consumption. Moreover, the effect of house price changes is stronger for home-owners and it intensifies as we move from young cohorts to old cohorts. We observe that there is a marginally significant and relatively weak relationship between the growth of cohort consumption and house price changes for tenants. However, our pooled sample set is restricted to young and middle-aged cohorts for tenants. In addition, we find that the rise of home-ownership ratio increases the growth of cohort consumption, while the spread of having outstanding housing debt depresses the growth of cohort consumption. Therefore, our empirical findings are in favor of the wealth channel argument.
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1. Introduction

This paper analyzes the effect of house price changes on household consumption in Turkey. The importance of housing market in the Turkish economy increased dramatically in the last decade. House sales showed remarkable increases and construction sector became the driving force of economic growth. Moreover, housing wealth is the major component of household wealth in Turkey as in many advanced and emerging market economies. Households tend to invest their savings in the housing market rather than financial markets. Thus, the effect of housing market developments on household consumption and saving behavior may have changed over time. More importantly, we can expect its effects to dominate household behavior in the next years as society ages and house prices continue to soar.

Previous empirical literature concentrates on the impact of ageing population on home-ownership rates and housing wealth accumulation in advanced economies (Chiuri and Jappelli, 2010; Angelini et al., 2014). Several papers analyze the effects of house price changes on monetary variables (Aoki et al., 2004; Iacoviello, 2005; Goodhart and Hofmann, 2008). Moreover, there is an extensive literature on the effect of house prices on household consumption (Attanasio and Weber, 1994; Iacoviello, 2004; Calcagno et al., 2009; Atalay et al., 2016; Cooper and Dynan, 2016). In particular, Campbell and Cocco (2007) examine the response of household consumption to house price changes using micro-economic data from Family Expenditure Survey (FES) in UK. They suggest that as population ages aggregate consumption becomes more responsive to house price changes since housing wealth is concentrated in the hands of old home-owners. They find that the effect of house prices on consumption is largest for old home-owners, while its effect is small and it is not statistically significant for young households and tenants. Thus, their empirical findings are consistent with the argument that house prices affect household consumption through wealth channel. However, Attanasio et al. (2009) analyze the relationship between house prices and consumption using a longer time span from FES in UK. They discover that the relationship between house prices and consumption is stronger for younger cohorts than older cohorts, which contradicts with the wealth channel argument. As a result, they suggest that common causality must be the most important factor, which links house prices and consumption.

We utilize twelve consecutive waves of the Turkish Statistical Institute (TURKSTAT) Household Budget Surveys (HBS) from 2003 to 2014. We construct a pseudo-panel data set using birth-year cohorts following Deaton (1985). We find that house price changes have a positive and significant effect on the growth of cohort consumption. Moreover, the effect of house price changes is

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stronger for home-owners and it intensifies as we move from young cohorts to old cohorts. We observe that there is a marginally significant and relatively weak relationship between the growth of cohort consumption and house price changes for tenants. However, our pooled sample set is restricted to young and middle-aged cohorts in the case of tenants. In addition, we find that the rise of home-ownership ratio increases the growth of cohort consumption, while having outstanding housing debt depresses the growth of cohort consumption. Thus, our empirical findings are in favor of the wealth channel argument.

The outline of the paper is as follows: Section 2 presents a simple theoretical model to analyze the effect of house prices on household consumption. Section 3 provides a descriptive analysis of the HBS and explains the formation of a pseudo-panel data set using birth-year cohorts. Section 4 presents the econometric results and Section 5 presents the robustness checks. Finally, section 6 concludes this paper with a brief summary of our empirical findings.

2. Theoretical background

According to the Permanent Income Theory consumption in each period is equal to a certain fraction of life-time wealth, which is in turn determined by interest rates, the ratio of financial wealth to total wealth and household tastes and preferences (Friedman, 1957; Modigliani, 1986). Here C is consumption, W is wealth, k is the pre-determined fraction of wealth that is consumed in each period, i is the nominal interest rate, ψ denotes the ratio of financial wealth to total wealth, which implies the role of liquidity constraints, and Z represents household tastes and preferences such as age, gender and family size. Lastly, h and t denote household and time, respectively (1).

$$C_t^h = k(i, \psi, Z) W_t^h \tag{1}$$

We follow Attanasio and Weber (1994), Campbell and Cocco (2007) and Attanasio et al. (2009) in the derivation of the econometric specifications. If we take the natural logarithm of equation (1), then we reach equation (2), which reveals the roles of explanatory variables explicitly. We assume that the nominal interest rate is the same for all households in the economy. We add house prices, P, to equation (2) to capture its effects on household consumption. Here Y is current income and ε is the residual term, which emerges from measurement error in consumption and also innovations to permanent income and transitory shocks to current income. Thus, we have to approach equation (2) as an approximation.

$$lnC_t^h = \alpha_t + \beta_1 lni_t + \beta_2 lnY_t^h + \beta_3 lnP_t^h + \varepsilon_t^h \tag{2}$$

Deaton and Paxson (2000) propose that cohort effects on household consumption can be determined by a simple linear model. We follow a similar approach to estimate the effect of house prices on household consumption.[1] A time-series of cross-sectional household surveys allows us to analyze average household consumption and income for different birth-year cohorts. If we take the averages of the natural logarithm of all variables in equation (2) for individuals, who are born in the same year, then we can write the natural logarithm of cohort consumption as a combination of economic variables (3). Here c denotes birth-year cohorts and the lines over the variables indicate weighted mean values. We assume that the nominal interest rate remains the same for all cohorts.

$$\overline{lnC_t^c} = \gamma_t + \delta_1 lni_t + \delta_2 \overline{lnY_t^c} + \delta_3 \overline{lnP_t^c} + \varepsilon_t^c \tag{3}$$

If we take the time difference of equation (3), then we reach a cohort consumption growth equation (4), which resembles to an empirically testable version of the well-known random-walk hypothesis, which is first proposed by Hall (1978).[2]

$$\Delta\overline{lnC_{t+1}^c} = \varrho_t + \vartheta_1 \Delta lni_{t+1} + \vartheta_2 \Delta\overline{lnY_{t+1}^c} + \vartheta_3 \Delta\overline{lnP_{t+1}^c} + \upsilon_{t+1}^c \tag{4}$$

Finally, we include social and demographic variables, which are denoted by matrix Z, in equation (5). The presence of Z in equation (5) allows us to capture the differences in cohort tastes and preferences.

$$\Delta\overline{lnC_{t+1}^c} = \varrho_t + \vartheta_1 \Delta lni_{t+1} + \vartheta_2 \Delta\overline{lnY_{t+1}^c} + \vartheta_3 \Delta\overline{lnP_{t+1}^c} + \vartheta_4 \overline{lnZ_{t+1}^c} + \upsilon_{t+1}^c \tag{5}$$

3. Data

HBS are defined as repeated cross-sectional surveys, which do not have a panel dimension. They provide detailed data on household disposable income and consumption expenditures from 2003 to 2014. Unfortunately, HBS indicate whether households live in urban regions or rural regions only from 2003 to 2013.[3] They provide information about participants' age, gender, education, occupation and employment sector. However, the surveys do not include information about households' geographical locations, except for the 2003 survey, which also has a significantly higher number of observations.

There are 116,959 household observations in the restricted pooled sample from 2003 till 2014. Households, which are composed of individuals, who are living together, and families, whose household head is unemployed or an unpaid family worker are removed from the pooled sample. Individuals that have a negative income level are excluded from the pooled sample. Individuals who were born before 1930 and after 1985 are also excluded from the pooled sample. In addition, the lowest and the highest 1% percentiles of housing wealth are trimmed to eliminate potential outliers from the sample set (Figure A1 and Figure A2). As a result, the final sample set is restricted to families, whose household head is between the ages of 20 and 73 in 2003 (Table 1).

In a seminal paper, Deaton (1985) suggests the use of cohorts from a time series of repeated cross-sectional surveys, when a genuine panel data set is not available. Deaton (1985, pg. 109) defines "cohort" as a group with fixed membership, of individuals which can be identified as they show up in the surveys. Cohorts can be constructed by focusing on a distinct and static feature, which is observed for all individuals or households such as gender or the birth year of the household head (Verbeek, 2008). In this paper, the cross-section dimension of HBS is large and the number of cohorts is assumed to be fixed. The sample set is separated into eleven cohorts using the birth-year intervals of household heads as the

[1] Previously, Demery and Duck (2006a and 2006b) followed the same approach to find the empirical importance of cohort effects on household income and consumption in the U.K. economy.

[2] Please see Flavin (1981), Hall and Mishkin (1982) and Campbell and Mankiw (1989).

[3] The definitions of rural and urban regions changed significantly after a recent law extended the jurisdictions of local governments. According to TURKSTAT the size of urban regions increased dramatically from 70% to 90% in 2014. For this reason, HBS 2014 does not provide information about rural and urban households.

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