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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

Relationship Between Household Consumption and Disaggregated Wealth Components in OECD Countries: Panel Data Analysis for the Period 2010-2017

OECD Ülkelerinde Hanehalkı Tüketimi ile Ayrıştırılmış Servet Bileşenleri Arasındaki İlişki: 2010-2017 Dönemi İçin Panel Veri Analizi

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ABSTRACT

Understanding household consumption behaviour and its impact on macroeconomic performance has long played an important role in policymaking. This study examines the empirical relationship between consumption, financial wealth, and housing wealth in OECD countries from 2010 to 2017. This study used short and balanced panel data sets covering 28 OECD countries over an eight-year period. Although most empirical research on wealth's effects on consumption tends to focus on national borders, this study aims to assess the impact of these effects on an international scale and makes a valuable contribution to the existing literature in this area. Based on a thorough analysis of the relevant literature, it was decided that a consumption function based on the life-cycle hypothesis was very useful for this study. Based on this framework, three different panel data regression models were estimated, including one or more wealth components as explanatory variables. The results of the Hausman test show that random effect estimators can provide more effective estimates, while the Swamy test shows that heterogeneity in slope parameters should be taken into account. These tests indicate that the coefficients obtained using the augmented mean group estimator, which accounts for heterogeneity, are more reliable. The results show that marginal propensities to consume, calculated as the coefficient of elasticity, are 0.71 for disposable income, 0.04 for financial wealth, and 0.19 for housing wealth. These findings showed that housing wealth played a greater role than financial wealth in influencing OECD households' consumption during the period analyzed. The inclusion of housing market dynamics in the consumption function may boost the model's explanatory power, according to our findings revealing country-specific differences, but more research is required to confirm this.

Keywords: Life-Cycle hypothesis, Household consumption, Financial wealth effect, Housing wealth effect, Panel data analysis.

Jel Classification: D12, D15, E21

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ÖZ

Hanehalkı tüketim davranışını ve makroekonomik performans üzerindeki etkisini anlamak, ekonomi politikasının belirlenmesinde uzun süredir önemli bir rol oynamaktadır. Bu çalışma, 2010-2017 yılları arasında OECD ülkelerinde tüketim, finansal zenginlik ve konut serveti arasındaki ampirik ilişkiyi incelemektedir. Çalışmada, sekiz yıllık bir süre boyunca 28 OECD ülkesini kapsayan kısa ve dengeli panel veri setleri kullanılmıştır. Zenginliğin tüketim üzerindeki etkilerine ilişkin ampirik araştırmaların çoğu ulusal sınırlara odaklanma eğiliminde olsa da, çalışmamız bu etkilerin etkisini uluslararası ölçekte değerlendirmeyi ve bu alandaki mevcut literatüre değerli bir katkı sağlamayı amaçlamaktadır. İlgili literatürün kapsamlı bir analizine dayanarak yaşam döngüsü hipotezine dayalı tüketim fonksiyonunun bu çalışma için çok faydalı olacağına karar verilmiştir. Bu çerçeveye dayanarak, açıklayıcı değişkenler olarak bir veya daha fazla servet bileşeni dahil olmak üzere üç farklı panel veri regresyon modeli tahmin edilmiştir. Hausman testinin sonuçları, rastgele etki tahmincilerinin daha verimli tahminler sağlayabileceğini gösterirken, Swamy testi, eğim parametrelerindeki heterojenliği hesaba katma ihtiyacını göstermektedir. Bu testler, heterojenliği hesaba katan artırılmış ortalama grup tahmincisi kullanılarak elde edilen katsayıların daha güvenilir olduğunu göstermektedir. Sonuçlar, esneklik katsayısı olarak hesaplanan marjinal tüketim eğilimlerinin harcanabilir gelir için 0.71, finansal servet için 0.04 ve konut serveti için 0.19 olduğunu göstermektedir. Bu bulgular, analiz edilen dönemde OECD hanehalklarının tüketimini etkilemede konut servetinin finansal servetten daha büyük bir rol oynadığını göstermektedir. Ülkeye özgü farklılıkları ortaya koyan bulgularımıza göre, konut piyasası dinamiklerinin tüketim fonksiyonuna dahil edilmesi, modelin açıklayıcı gücünü artırabilir, ancak bunu doğrulamak için daha fazla araştırmaya ihtiyaç vardır.

Anahtar Kelimeler: Yaşam döngüsü hipotezi, Hanehalkı tüketimi, Finansal servet etkisi, Konut serveti etkisi, Panel veri analizi.

Jel Sınıflaması: D12, D15, E21

1. Introduction

Household consumption is both the primary determinant of individual living standards and the most important component of aggregate economic demand. Therefore, the study of household consumption behaviour and its impact on macroeconomic performance has been an important aspect of economic policy since the early stages of industrialisation and urbanisation. For the OECD as a whole, household consumption as a share of total gross domestic product (GDP) has averaged about 60.42% from 1995 to 2020. During this period, household consumption was 61.19% in 2003, compared with 59.72% in 1995. This ratio has shown a significant decline over the years, falling to 60.22% in 2007 and recovering quickly to peak at 61.36% in 2009. However, since then, it has steadily decreased and reached 58.37% in 2020. These breaks in 2003, 2007, and 2009 are characterised by the United States (US)-originated crises, especially the Dot-com (2000-2002) and the Great Recession (2007-2009). These data show that household consumption in the OECD area is broadly consistent with cyclical fluctuations and that its share of aggregate demand has gradually declined since 2009.

This study examines the relationship between household consumption and disaggregated wealth components, which consider the value of financial and housing assets, using panel data from 28 OECD countries[1] for the period 2010-2017. The theoretical framework of the analysis is based on the fundamental assumptions of the consumption function described by the life-cycle hypothesis(LCH) of Modigliani and Brumberg (1954). This framework defines consumption as a function of income and wealth, consistent with the results of this study. The importance of the LCH lies in its ability

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to reconcile conflicting results from earlier studies by Keynes (1936) and Kuznets (1946). These studies provide conflicting evidence about the impact of household consumption on the economy as a whole. This conflict has been an important source of motivation for more modern consumption theories, such as LCH, to solve the consumption puzzle.

Early studies on the relationship between wealth and consumption often analysed wealth in an aggregate fashion. In this context, earlier studies, such as Ando and Modigliani (1963), Modigliani (1971), Singh, Drost and Kumar (1978), and Cox and Jappelli (1993), have focused on the effect of the level of wealth, calculated as household net worth according to the National Accounting System (NAS), on consumption. However, this approach implies the assumption that the effects of different types of wealth on consumption are equal, which is not always the case (Berg & Bergström, 1995). More recent studies, such as Benjamin, Chinloy and Jud (2004), Bostic, Gabriel and Painter (2009), and Barrell, Costantini and Meco (2015), suggest that the components of wealth that explain the value of financial and housing assets may have different effects on consumption. However, empirical studies that examine the effects of different types of wealth on consumption tend to apply to a single country or a small group of countries. The main driving force behind this research is the insufficient exploration of the international dimension of the problem. Therefore, the aim of this study is to adapt the consumption function to the international arena and fill this gap in the literature. To this end, macroeconomic data calculated annually for 28 countries are analysed.

In this context, the next section of the paper continues with a literature review of previous empirical studies on the effects of housing and financial wealth on consumption. The next section presents the controversial hypotheses that have influenced the development of modern consumption theories and the theoretical assumptions of the life-cycle model. The subsequent sections of this paper will cover the data set and estimation method, followed by the empirical results and discussion, and finally, the conclusion.

2. Literature Review

The LCH, permanent income hypothesis (PIH), and life-cycle/permanent income hypothesis (LCH/PIH), as well as their combinations, have developed the empirical literature analysing consumption behaviour. Researchers frequently examine whether LCH/PIH aligns with consumption theory, which posits that individuals should plan their consumption based on the state of their resources throughout their lifetime. Moreover, the theoretical background of these studies can be traced to Hall (1978) 's study on consumer expectations regarding lifetime resources.

In contrast, the more recent empirical literature on the impact of wealth on consumption generally examined total household wealth by dividing it into two basic components: financial and housing wealth. These parameters were included in the consumption function to measure the sensitivity of consumption to both wealth components. Although empirical studies in the literature differ in purpose, scope, level of analysis, and methodology, they are important for shedding light on both the various assumptions of the LCH and differences across countries.

Table 1 summarises the results of empirical studies investigating the impact of disaggregated wealth components on consumption.

Table 1: Previous Estimates of Wealth's Effects Components on Consumption

Author(s)	Financial Wealth	Housing Wealth
Berg and Bergström (1995)	0.121**	0.098**
Benjamin et al. (2004)	0.023***	0.079***
Tse et al. (2007)	0.057***	0.154***
Chen et al. (2009)	–0.057	0.424***
Bostic et al. (2009)	0.021***	0.053***
Barrell et al. (2015)	0.024***	0.007**
Manuel and Rafael (2015)	0.449**	0.445**
Fereidouni and Tajaddini (2017)	0.073***	0.262***
Bottazzi et al. (2020)	0.088*	0.003***
Hu et al. (2020)	0.061***	0.002
Kontana and Fountas (2022)	0.044***	0.072***

Source: Authors.

The empirical results of the studies listed in Table 1 show how the impact of each type of wealth on consumption can vary depending on the period, geographical scope, or term structure (short-long). Berg and Bergström (1995), in their long-term analysis of the Swedish case, argued that financial wealth is positive and significant in explaining consumption, but the effect of housing wealth on consumption is questionable. Benjamin et al. (2004) showed that the impact of housing wealth on consumption was four times larger than that of financial wealth, focusing on US households' ability to access housing equity, especially through loans and refinancing, during the period 1995-2001. According to Tse, Man and Choy (2007), there was a significant long-run relationship between household consumption and changes in housing wealth in Hong Kong, especially after the 1997 Asian financial crisis, which was more pronounced than the effects of changes in financial wealth. Focusing on urban China at the macroeconomic level, Chen, Guo and Zhu (2009) argue that housing wealth is the primary factor that stabilises household consumption in the event of an unexpected economic shock, while the limited impact of financial wealth is largely due to the fact that the financial market in China is not yet mature enough. Bostic et al. (2009) show that housing wealth played a more important role than financial wealth in driving consumer behaviour in the US over the period 1989-2001, and that these changes in housing wealth may have significant effects on the overall economy. Barrell et al. (2015) comparatively analysed the effects of housing and financial wealth on consumption in Italy and the United Kingdom (UK), taking into account the 2008 financial crisis. In this context, the researchers found that the effect of housing wealth has become increasingly important over time in the United Kingdom, while the effect of financial wealth has become more pronounced in Italy. Navarro and de Frutos (2015) concluded that both types of wealth had a significant effect on household consumption in Spain over the period 1974-2011, but the effect of financial wealth was stronger compared to housing wealth. Fereidouni and Tajaddini (2017) suggest that over the period 1978-2012, the magnitude and direction of the impact of both housing wealth components on consumption in the US economy are associated with changes in consumer confidence. The study concludes that consumer confidence positively affects the relationship between housing wealth and consumption expenditures and negatively affects the relationship between financial wealth and consumption expenditures. Bottazzi, Trucchi and Wakefield (2020) , focusing on the effects of the 2008 financial crisis in Italy, found that losses in risky financial assets were the main determinants of the decline in household consumption and that these effects were stronger in low-worth or indebted households. Hu, Xu and Zhang (2020) found that in the period 2011-2015, the effect of financial wealth on consumption had a significant positive effect on the housing wealth of elderly households

in China. Kontana and Fountas (2022) observed that in the US, the effect of financial wealth shocks on consumption is larger than that on housing wealth in the short run, but this effect changes in favour of housing wealth in the long run. Each of these studies undoubtedly makes a significant contribution to a better understanding of the impact of different components of wealth on consumption. However, given the scope and level of analysis of these studies, the international dimension of the issue remains underexplored.

3. Theoretical Background of Consumer Behaviour

Consumption is recognised as both the main determinant of individual living standards and overall economic activity. Savings, on the other hand, refers to the portion of personal income that is not spent on consumption in a given period. Individual saving has traditionally been considered a socially beneficial and virtuous act because it is the source of the supply of capital, which is the main factor driving production for the economy as a whole. However, after the Great Depression of 1929, Keynes (1936) argued that the lack of aggregate demand caused by excessive saving could lead to lower levels of output and employment than the economy's real capacity. In this context, after the World War II, there was concern that high savings rates would exceed the need for capital and lead to economic stagnation.

Keynesian economics, which emphasises the consumption function as the determinant of aggregate demand, greatly influenced early studies of saving behaviour. The consumption function that Keynes formulated was based on what he called a "fundamental psychological law" and showed that an increase in income would lead to a positive change in consumption but smaller than an increase in income. Some empirical studies have challenged Keynes' view of simple consumption and saving behaviour by showing that despite a significant increase in per capita income in the late 1940s, the saving rate remained relatively stable and was more closely related to relative income. First, Kuznets (1946) found that the saving rate has not changed significantly since the mid-19th century, despite large increases in per capita income. This finding contradicts the traditional view that higher incomes lead to higher savings rates.

Brady and Friedman (1947) attempted to reconcile Kuznets' findings with data from household surveys that showed a strong relationship between saving and household income. This study showed that the saving rate was not determined by the absolute income level but rather by the income level relative to the aggregate average. These findings were an important inspiration for both Modigliani and Brumberg's (1954) LCH and Friedman's (1957) Permanent Income Hypothesis (PIH). The theoretical background of these ideas, which are highly influential in understanding the puzzle of consumption, is largely based on the theory of "Intertemporal Budget Constraint" proposed by (Fisher, 1930). Fisher's 1930 theory of "time preference" serves as the theoretical foundation for these concepts, which have been highly influential in understanding the consumption puzzle (Levacic & Rebmann, 2015).

3.1. The Life Cycle Hypothesis

The LCH model relies on simple assumptions to explain consumption behaviour. It assumes that individuals' lifetime resources are the sum of their initial wealth and income earned during their working years. In this case, consumers have the opportunity to allocate their lifetime resources to the rest of their lives as they wish. Consumers want to consume as smoothly as possible throughout

their lives, which is an important assumption. Equation 1 represents the consumption function of a typical consumer:

$$C = (1/T)W + (R/T)Y \tag{1}$$

where W and Y are the levels of wealth and income the individual wishes to achieve during his or her lifetime, T is the individual's remaining life, and R is the individual's expected future years of work. We expect the aggregate demand function to be nearly identical to the individual consumption function, assuming that equation 1 represents the consumption behaviour of all individuals in society. In this scenario, we can arrange the aggregate consumption function for an economy using Equation 2 (Modigliani, 1986):

$$C = \alpha W + \delta Y \tag{2}$$

where the parameters α and δ denote the marginal propensities to consume (MPC) arising from income and wealth, respectively.

4. Data Set and Estimation Method

All data used in this study were obtained from the OECD database. The dataset consists of the variables of expenditure, income, financial wealth, and housing wealth presented under the heading of household accounts. The data for all variables comprise a balanced and short panel data set with 8 years of observations for 28 OECD countries[2].

LCH estimates the parameters of the consumption function using the panel data regression model of equation 1. To remove the scale mismatch between variables and units and obtain a flexible interpretation of the predicted parameters, all variables were transformed logarithmically.

$$log(C)_{it} = \beta_0 + \beta_1 log(Y)_{it} + \beta_2 log(W)_{it} + u_{it} \tag{3}$$

where C is consumption expenditure, Y is disposable income, and w is total wealth, which is the sum of housing and financial assets. We constructed three panel data regression models (Eqs. 4, 5, and 6) by decomposing the wealth variable in Eq. 3 to account for the value of housing and financial assets.

$$log(C)_{it} = \alpha_0 + \alpha_1 log(\gamma)_{it} + \alpha_2 log(FW)_{it} + \gamma_t + \mu_i + u_{it} \tag{4}$$

$$log(C)_{it} = \beta_0 + \beta_1 log(\gamma)_{it} + \beta_2 log(HW)_{it} + \gamma_t + \mu_i + u_{it} \tag{5}$$

$$log(C)_{it} = \theta_0 + \theta_1 log(\gamma)_{it} + \theta_2 log(FW)_{it} + \theta_3 + log(HW)_{it} + \gamma_t + \mu_i + u_{it} \tag{6}$$

[2] Housing wealth data for Switzerland, Ireland and Türkiye are not available in the OECD database. Therefore, the regression model in equation 4, which includes only the financial wealth component in the consumption function, is analysed for all 28 countries. We limit the analysis of the other two models in equations 5 and 6, which include the housing wealth component, to 25 countries.

where FW and HW denote financial and housing wealth variables, respectively. γ and μ refer to unobservable time and unit effects, respectively.

5. Empirical Results and Discussion

In the context of panel data analysis, it is important to consider the existence of unobservable effects that vary or do not vary over time, specific to countries, and the relationship between these effects and explanatory variables to choose between appropriate estimation methods. Moulton and Randolph (1989) demonstrated the usefulness and effectiveness of the ANOVA F-test, especially when regression errors follow a normal distribution. By combining time series and cross-sectional data, Hausman and Taylor (1981) Likelihood Ratio (LR) test allows for the definition of these effects. The Lagrangian Multiplier (LM) test, proposed by Breusch and Pagan (1980), suggests that it is advantageous for limited data sets because it usually only requires least squares residuals and takes into account small sample characteristics. However, it is known that the LM test does not provide reliable results when there is autocorrelation in the model; in this case, the extended Lagrangian multiplier (ALM) test, which is resistant to autocorrelation, is recommended (Yerdelen Tatoğlu, 2013). On the other hand, Bottai (2003) proposed the Score test, which provides confidence intervals for the variance component of the random effect while considering its asymptotic properties.

Table 2: Testing for Unit and Time Effects

	Regression 1		Regression 2		Regression 3	
Test and Hypothesis	**Statistics**	**p-value**	**Statistics**	**p-value**	**Statistics**	**p-value**
ANOVA F-test						
H_0:μ_i=0	101.42	0.000	108.99	0.000	99.88	0.000
H_0: λ_i=0	0.29	0.958	0.44	0.879	0.28	0.962
LM (χ^2)						
H_0: σ^2_μ=0	584.07	0.000	662.25	0.000	583.27	0.000
ALM						
H_0: σ^2_μ=0	390.24	0.000	444.63	0.000	389.82	0.000
H_0: σ_μ=0	396.43	0.000	459.94	0.000	393.04	0.000
LR (χ^2)						
H_0: σ_λ=0	0.00	1.000	0.00	1.000	0.00	1.000
H_0: σ_μ=σ_λ=0	407.45	0.000	474.13	0.000	400.86	0.000
Score (χ^2)						
H_0: σ_μ=0	170000.00	0.000	190000.00	0.000	170000.00	0.000

In Table 2, we tested for the presence of both unit and time effects using the ANOVA F test, ALM, and LR test statistics. Only the LM and score tests were used to test for the presence of unit effects. The results show that only unit effects are significant in all three models, whereas time effects are not. Therefore, to choose between fixed- and random-effects models, it is necessary to examine the correlation between the explanatory variables in the model and the unobservable unit effects.

Table 3: Hausman Test Statistics

Model	Test Statistic	p-value
Regression 1	3.21	0.2012
Regression 2	2.17	0.3383
Regression 3	5.79	0.1225

Null Hypothesis: H0: Difference in coefficients is not systematic

In panel data analysis, Hausman (1978) introduced the Hausman test, which is a general specification test. The test statistics in Table 3 test the null hypothesis that there is no correlation between the unobservable unit effects and explanatory variables. This means that the difference between fixed and random effects is not significant, and the random effect method is more effective. The results demonstrate that it is impossible to reject the null hypothesis, indicating that the coefficients determined by the random-effects model are more accurate estimates.

Table 4: Testing deviations from assumption

	Regression 1		Regression 2		Regression 3	
Test Used	**Statistics**	**p-value**	**Statistics**	**p-value**	**Statistics**	**p-value**
Jarque-Bera Normality Test						
Normality of e_{it}	5.61	0.061	2.89	0.236	2.14	0.343
Normality of u_i	1.53	0.465	3.08	0.214	5.01	0.082
Levine, Brown, and Forsythe's heteroskedasticity test						
W0	3.64	0.000	3.30	0.000	3.51	0.000
W50	2.61	0.000	2.37	0.001	2.45	0.000
W10	3.64	0.000	3.30	0.000	3.51	0.000
Autocorrelation						
Bhargava et al. Durbin–Watson	0.88		0.85		0.87	
Baltagi–Wu LBI	1.33		1.34		1.33	
LM	668.01	0.000	588.76	0.000	5.52	0.019
ALM	5.76	0.016	5.49	0.019	589.60	0.000
Cross-sectional dependence						
Pesaran	10.68	0.000	7.81	0.000	8.80	0.000
Friedman	37.49	0.086	27.89	0.265	32.24	0.121
Frees	1.43		1.22		1.24	
Slope homogeneity			0.00			
Swamy S Test	15261.84	0.000	7240.83	0.000	9563.28	0.000

Table 4 examines the deviations from the basic assumption using different tests for the random-effects model. Alejo, Galvao, Montes-Rojas and Sosa-Escudero (2015) proposed the classical Jarque-Bera test and extended it to panel data to test the assumption of normality. The tests proposed by Levine, Brown, and Forsythe were used to test heteroscedasticity. W0 uses the test statistic calculated using one-way ANOVA for absolute deviations from the group mean; W50 uses the test statistic that uses the median instead of the mean in calculating absolute deviations; and W10 uses a 10% trimmed mean in calculating absolute deviations (Brown & Forsythe, 1974). To test for the presence of autocorrelation, the LM and ALM test statistics were used along with the Durbin-Watson and Baltagi-Wu tests proposed by Bhargava, Franzini and Narendranathan (1982). The tests proposed by Pesaran (2004), Friedman (1937), and Frees (1995) were used to test for

cross-sectional dependence. Finally, the S-test proposed by Swamy (1971) was used to test the homogeneity of the slope parameters.

The Jarque-Bera test statistics in Table 4 demonstrate that the error components, expressed as uit and μi, are normally distributed. All other relevant test results indicate that heteroskedasticity and autocorrelation exist in the random-effects model. The tests used to determine cross-sectional dependence yield conflicting results. While the results of the Pesaran test indicate that the model exhibits cross-sectional dependence, the Friedman and Frees test statistics indicate that there is no cross-sectional dependence. Finally, the Swamy S-test indicates that the slope parameters are heterogeneous.

We used the Pesaran CD test to test for the presence of individual cross-sectional dependence for all variables (Table 5). The results show that there is a cross-sectional dependence for all variables in all three models.

Table 5: Cross-Section Dependence on Pesaran CD

Variable	CD-test	p-value	corr	abs(corr)
Regression 1				
C	47.77	0.000	0.869	0.870
Y	46.89	0.000	0.853	0.871
FW	52.56	0.000	0.956	0.956
Regression 2				
C	42.43	0.000	0.866	0.868
Y	41.94	0.000	0.856	0.875
HW	33.91	0.000	0.692	0.750
Regression 3				
C	42.43	0.000	0.866	0.868
Y	41.94	0.000	0.856	0.875
FW	46.89	0.000	0.957	0.957
HW	33.91	0.000	0.692	0.750

Table 6 presents the results of Maximum Likelihood Estimation (MLE), Generalised Least Squares (GLS), and population averaged (PA) estimation results calculated using the random-effects model assuming that the slope parameters are homogeneous, and the results obtained using the augmented mean group (AMG) method considering the heterogeneity of the slope parameters. The results in Table 6 show that disposable income is the most important variable for consumption for all three models. The elasticity coefficients of income vary between 0.7 and 0.9.

The AMG test statistics calculated for regressions 1 and 2 show that the effect of both wealth components on consumption is significant, but the effect of housing wealth on consumption is significantly greater than that of financial wealth. The AMG test statistics calculated for regressions 1 and 2 show that the impact of both wealth components on consumption is significant, but the impact of housing wealth on consumption is significantly greater than that of financial wealth. However, the AMG test statistics calculated for Eq. (3) indicate that only the effect of the housing wealth component on consumption is significant. The column σw in Table 6 represents the coefficient estimates of the effects of common factors obtained using the AMG estimator. The results show that common factors have a significant impact on all three regression models. Finally, Table 7 presents

the individual AMG forecast results for each country. The results in Table 7 similarly reveal that income is the most dominant factor explaining changes in consumption in most countries. Coefficient estimates of financial and housing wealth variables confirm that these effects vary greatly by country. We assume that these individual differences naturally emerge from the internal dynamics of each country's financial and housing markets.

Table 6: Random Effects and AMG Test Results

Dependent Variable	Explanatory Variables			Other Statistics						
C	Y	FW	HW	σ_μ	σ_u	ρ	LR $\chi^2(2)$	R^2	Wald $\chi^2(3)$	σ_w
Regression 1										
MLE	0.8512***	0.0373***		0.069	0.018	0.935	666.43			
GLS	0.8512***	0.0373***		0.069	0.018	0.935		0.949	4109.63	
PA	0.8512***	0.0373***							4165.44	
AMG	0.7650***	0.0436*							690.39	0.8855***
Regression 2										
MLE	0.9527***		0.0101	0.068	0.018	0.934	594.74			
GLS	0.9542***		0.0089	0.066	0.018	0.93		0.945	3657.21	
PA	0.9527***		0.0101						3715.15	
AMG	0.7061***		0.1907***						327.04	0.9965***
Regression 3										
MLE	0.9069***	0.0222*	0.0024	0.068	0.018	0.935	598.52			
GLS	0.9075***	0.0221*	0.002	0.067	0.018	0.934		0.951	3714.23	
PA	0.9069***	0.0222*	0.0024						3791.08	
AMG	0.7067***	0.0057	0.2400***						373.13	0.9146***

Note: * p<0.05; ** p<0.01; *** p<0.001.

Table 7:AMG Test Results at the Country Level

	Regression 1			Regression 2			Regression 3			
Country	Y	FW	σ_w	Y	HW	σ_w	Y	FW	HW	σ_w
Austria	0.2060*	0.0970**	0.2943***	0.4076***	0.3253***	1.4476***	0.3528*	0.0553	0.3570*	1.4048***
Belgium	0.1018***	0.0587**	0.1679***	0.9727***	0.0046	0.8015***	0.7589***	0.1508**	0.0252	1.0597***
Canada	0.3070**	0.118	0.4063***	0.6048***	0.1191	1.1309***	0.5982	0.05	0.0935	1.1588***
Switzerland	0.0906***	0.0364***	0.2335**							
Czechıa	0.0880***	0.0496	0.2778***	0.6951***	0.1554	1.0968***	0.6678***	-0.0042	0.2272	1.0830***
Germany	0.3630**	0.1797	0.6429***	0.4305	0.2455	2.0527***	0.5275**	-0.2690**	0.6099***	1.5655***
Denmark	0.2091***	0.0398	0.3484	0.8675***	-0.0634	0.4851	0.8748***	-0.0918	0.1641	0.4591
Spain	0.0937***	0.0211*	0.4699	1.2796***	-0.1734	-0.2924	1.0412***	0.0323	-0.0585	0.1085
Estonia	0.0298***	0.0095***	0.1925	0.4195***	0.6907***	1.7455***	0.7074***	0.1562***	-0.2312	-0.3158
Finland	0.2019***	0.0601	0.7856	1.2019***	-0.1038	0.9389*	1.3179***	0.0609	-0.2083	1.2329
France	0.3500***	0.122	0.3523	0.8424***	-0.0534	0.7885***	1.0894**	-0.1062	-0.001	0.5357
UK	0.4237*	0.1922	0.9667	0.9747***	0.2437	0.959	0.8655*	0.0747	0.2221	0.6959
Greece	0.0632***	0.0111**	0.4496***	0.7907***	0.3715**	2.0329***	0.7162***	0.0363***	0.1788	1.6522***
Hungary	0.2812***	0.0818**	0.6030*	1.0457	-0.0885	0.056	0.9271**	-0.2280***	1.1004**	0.7116
Ireland	0.1538***	0.0279	0.7129							
Italy	0.0911***	0.0290*	0.3436	1.2140***	-0.1464	0.4901	1.1793***	-0.0198	-0.0365	0.5614
Lithuania	0.9517	0.4764	1.0843	-0.0229	1.0029***	2.0580***	-0.4476	0.1759	1.1158***	1.9273**
Luxembourg	0.1842*	0.0847	0.8982	0.0117	0.3758	1.6357	0.1855	0.0635	0.2283	1.4472
Latvia	0.6962	0.2496	1.6683*	0.6307***	0.3422***	-0.9476	0.5562	0.0221	0.3323***	-0.8562
Netherlands	0.2698***	0.0500*	0.5906	0.5831*	0.1574	0.5599	1.0133***	-0.0834	0.2054	0.6647
Norway	0.278	0.1349	0.8891	0.3079	0.2428	0.4196	0.4073	0.1709	-0.0189	1.2869
Poland	0.4128**	0.169	0.6937**	0.8939***	-0.035	1.8189***	1.4323**	-0.3833	0.3282	1.3511
Portugal	0.2353***	0.1002	0.6693	0.8262***	0.176	0.9393*	0.4631	0.1394	0.2813*	0.8135
Slovakia	0.4713	0.1547	0.7769	0.8394***	0.6907**	2.2429***	0.5490**	0.1586**	0.6269***	2.0004***
Slovenia	0.0998***	0.0424	0.3123***	0.7595***	-0.0092	1.0609***	0.8184***	-0.0529	0.1773	0.8372**
Sweden	0.1288***	0.0302**	0.4327**	0.4105***	0.0962**	0.9317**	0.3778***	0.0598	0.0398	1.0138**
Türkiye	0.0584***	0.0439***	0.5696*							
US	0.1331***	0.0528*	0.3512	0.6650***	0.1998***	0.4599***	0.6893***	-0.0257	0.2405***	0.4658***

Note: * p<0.05; ** p<0.01; *** p<0.001.

6. Conclusion

This study examines the impact of household wealth components on consumption by considering the value of financial and housing assets in OECD countries over the period 2010-2017. In this context, three types of panel regression models, each with different degrees of freedom, were estimated based on the consumption function described in the LCH framework. The basic specification tests used for the panel data models demonstrate that the random-effects model, where there are one-way unit effects for all three models, can provide more efficient predictions. Finally, the variability in slope parameters indicates that the AMG method is the most suitable approach for estimating the models.

The AMG statistics calculated for the variables in Eq. (1) show that the effect of the financial wealth variable on consumption is much smaller than that of disposable income, but these effects may still be significant. The AMG statistics for regressions 2 and 3 clearly show that the housing wealth variable is the most dominant parameter affecting consumption after disposable income. Finally, according to the AMG results, the effect of unobservable common factors on consumption was statistically significant at the full panel level or at different countries' levels.

The results show that panel data analysis is a useful estimation method for extending the consumption function described in the context of LCH internationally. However, we think that more research and discussion is needed on which forecasting procedures can produce more reliable results. This paper estimates the MPC from housing wealth across the OECD for the period 2010-2017 to be 0.19 to 0.024. The MPC from financial wealth is approximately 0.04 according to the results of regression 1. These coefficient values are closer to the empirical findings of Fereidouni and Tajaddini (2017) and Tse et al. (2007). However, in this study, it can be seen that the numerical values and significance levels of the coefficients estimated using homogeneous and heterogeneous models differ significantly. Based on these findings, we believe that the results calculated using the AMG estimator, which also accounts for heterogeneity in the consumption model, will make an important econometric contribution to the empirical literature on this subject.

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