Housing Affordability in Greece: Who's Being Left Out?

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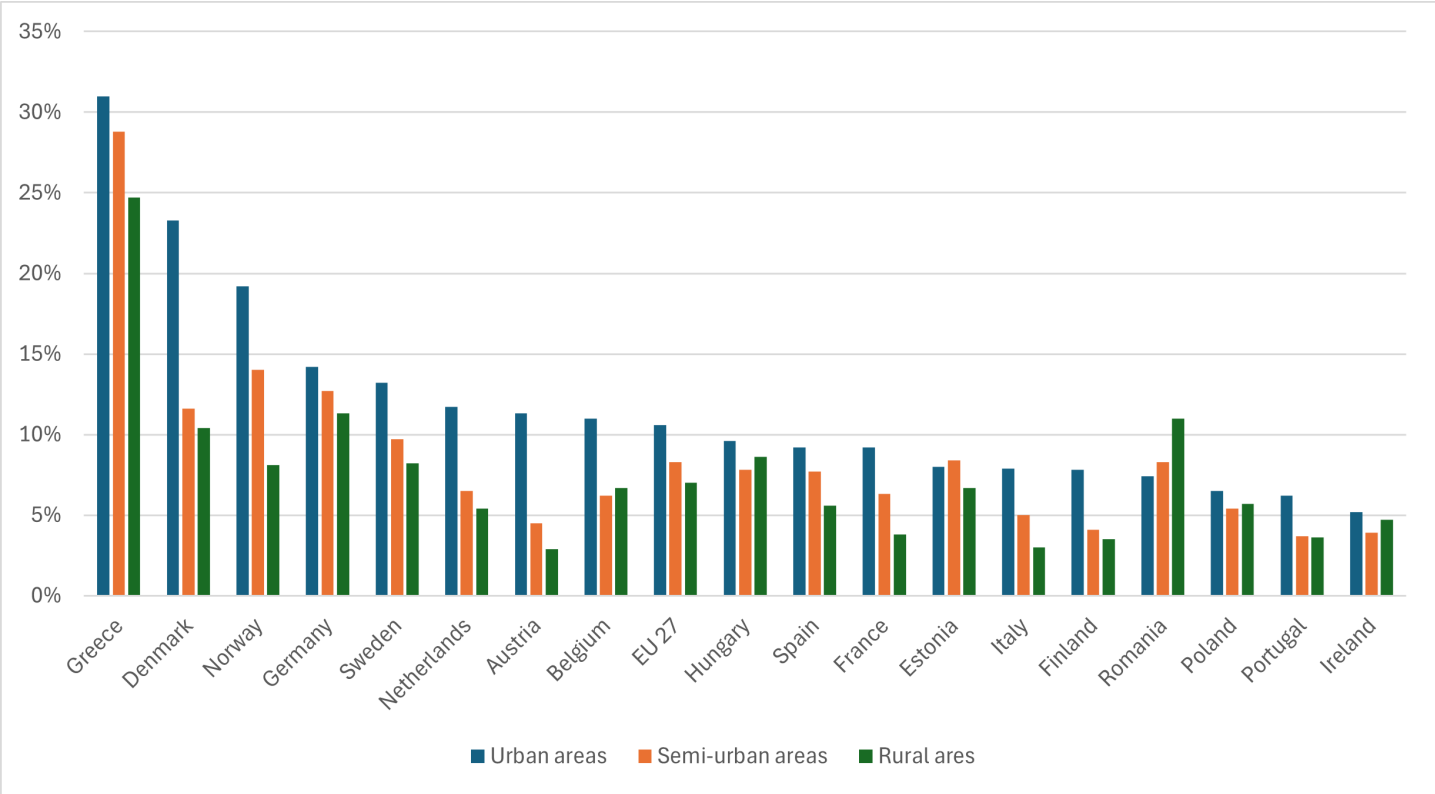
Research Question

In a Greek setting of high housing affordability constraints, who faces the largest difficulties when it comes to lack of affordable housing?

Housing cost overburden rate across several EU countries



Source: Eurostat

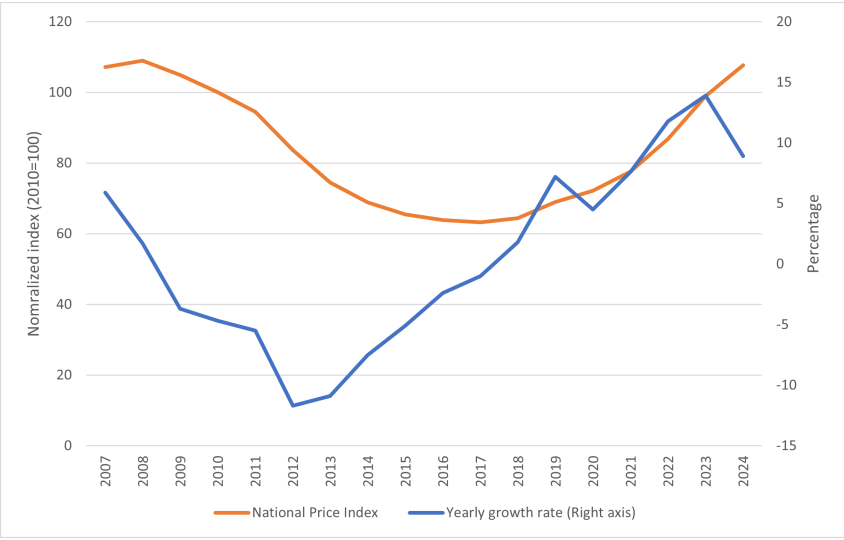
- The housing cost overburden rate measures the percentage of people living in households where housing costs exceed 40% of their disposable income

Importance

- Households allocate a significant proportion of their income to housing costs (Chambers et al., 2009, and Iacoviello, 2011)
- The presence of affordable housing allows households to adjust their consumption patterns (Anacker & Li 2019) and be more resilient against their obligations (McCord et al., 2011)
- The lack of affordable housing poses challenges not only to households but also to the financial stability (Gan & Hill, 2009, and Dorokh & Torluccio, 2011)
- Housing and Energy price increases, as well as tightening monetary policy, constrain household budgets, making access to affordable housing more difficult (Coskun, 2020; Biljanovska et al., 2023)
- Low-income households are more likely to face affordable housing challenges (Lens, 2018), contributing to rising income inequality

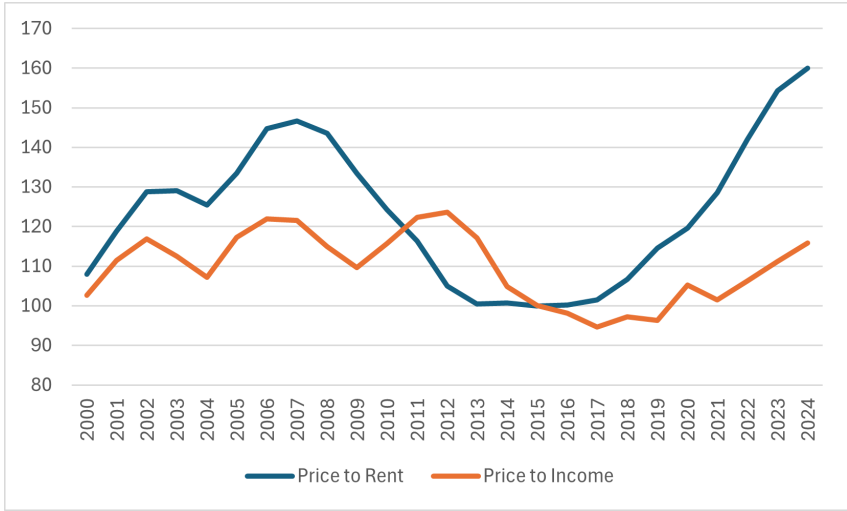
The Greek context

National House Price Index



Source: Bank of Greece

Price-to-rent, Price-to-income ratio

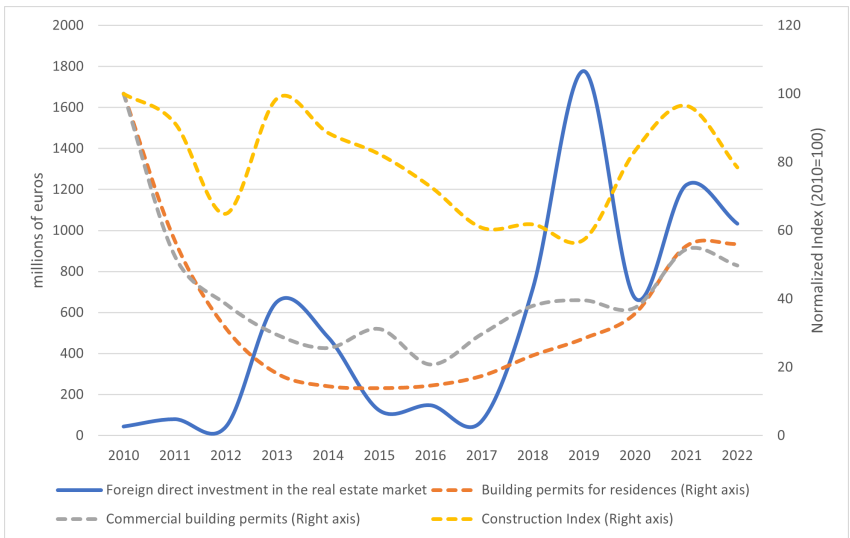


Source: Eurostat

- Housing prices are reaching all-time high - 2008 levels
- The Price-to-Rent ratio has already surpassed the all-time highs, but the price to income ratio is falling behind offering some signs of relief

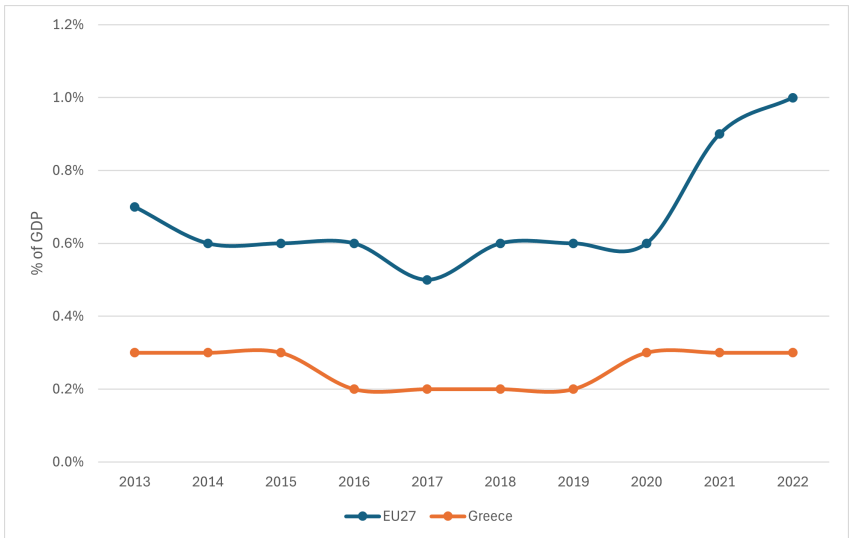
Price to Rent, Price to Income and Construction indices

FDI, construction indices



Source: OECD

Total general government expenditure



Source: ELSTAT, Eurostat

- FDI in real estate is growing - Construction indices are on a rather steadily growing state
- Greece historically on the low-end of government spending towards housing and community amenities

Objectives of the study

Construction of an affordability index on housing

We create a harmonized affordability index for both home-owners and renters at the national and prefecture level, with differentiation for the two largest urban centres of Athens and Thessaloniki

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Descriptive evidence on the most vulnerable households

What is the demographic and economic profile of Greek households that face the greatest difficulties in meeting their housing needs

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Descriptive evidence on the most vulnerable households

What is the demographic and economic profile of Greek households that face the greatest difficulties in meeting their housing needs

Empirical analysis of factors affecting housing affordability

Micro-econometric analysis using LOGISTIC regressions, to identify the confounding effects of the variables of interest

Relevant Literature

Capturing housing affordability with a single indicator is particularly difficult (Jewkes & Delgadillo, 2010), (Cai, 2017)

- The cost-to-income ratio (Eurostat, U.S. Department of Housing and Urban Development) is a key metric for assessing housing affordability
- Nelson et al., 2002, Fisher et al., 2009, among others argue that the above methodology fails to account for housing consumption choices

Factors contributing to housing affordability challenges

- Lower income levels (Kropczynski, 2012; Lens, 2018), renters (Anacker & Li, 2019), young, unmarried households with lower educational attainment (Zyed et al., 2016)
- House prices (Biljanovska et al., 2023), lending rates and financing conditions (Dorokh & Torluccio, 2011), tax incentives, land use regulations (Saiz, 2010), and the absence of social housing programs (Lee et al., 2022)

Data

The main source of data is the Household Finance and Consumption Survey in 2018, 2021.

- Through primary data it is enhanced with information on:
  Location of the household at the Postal Code level
  Net incomes
  According to the location (assigning zoning price, commercial factor), and the size of the dwelling, we calculate ENFIA

▸ List of variables

The second main data source is micro-data on property price estimates, available from the Bank of Greece.

- We construct a quality-controlled hedonic estimation model to assign house prices to NUTS2 regions (Gourieroux & Laferrere, 2009; Hill et al., 2013) from 2015 onwards

$$\ln PS_{i,y,q} = \alpha_0 + \sum_{x=1}^{X} \beta_x X_{i,y,q} + \sum_{y=1}^{Y} \gamma_y Y_y + \sum_{q=1}^{Q=4} \delta_q Q_q + \varepsilon_{i,y,q} \qquad (1)$$

Housing affordability index

$$HAI_{i,w,r} = \frac{HC_{i,w,r}}{DInc_{i,w,r}} \tag{2}$$

where HAI is the affordability index for a household i, in the survey wave w, and in the geographic dimension (degree of urbanization, region) r. HC, and $DInc$ are the housing cost and disposable income of the household respectively

▸ Housing cost stats ▸ Disposable income stats

	Housing affordability index		Housing cost overburden rate	
	3rd wave	**4th wave**	**3rd wave**	**4th wave**
Country total	24,0%	24,5%	28,7%	30,9%
Urban areas	25,0%	25,5%	30,2%	32,2%
Semi-urban areas	24,6%	23,3%	29,4%	28,8%
Rural areas	20,4%	21,2%	23,7%	27,7%

- Affordability worsened in urban and rural areas from 2018 to 2021
- While housing affordability shows a slight increase, even a decrease in some regions, the housing cost overburden rate generally increases, possibly indicating an increase in income inequality due to access to housing ▸ Regions

Housing cost overburden rate across tenure status

Owners

	3rd Wave	4th Wave
Country Total	10.4%	15.3%
Urban Areas	10.3%	15.6%
Sub-urban Areas	11.9%	13.2%
Rural Areas	10.1%	15.7%

Renters

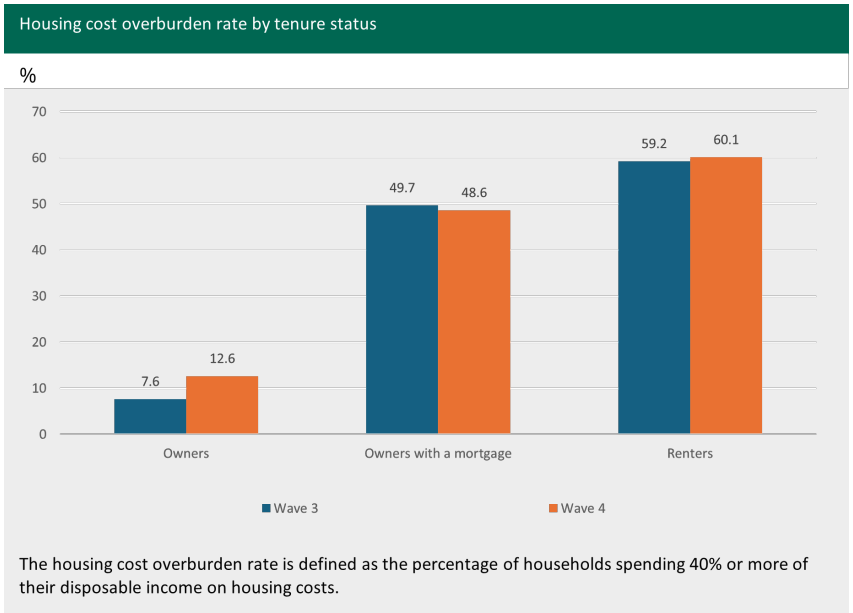
	3rd Wave	4th Wave
Country Total	59.2%	60.1%
Urban Areas	62.0%	62.0%
Sub-urban Areas	48.7%	55.7%
Rural Areas	44.8%	50.9%

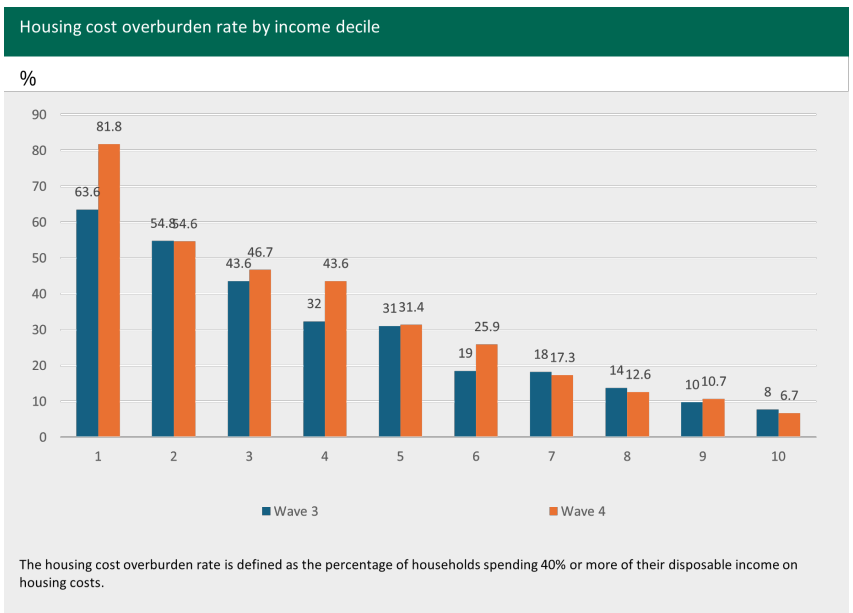
Home-ownership essentially offers a protection against increased rental prices

Most owner-occupation is not through mortgage lending, so that households are burdened with the mortgage payments

Affordability declines as owner-occupied housing declines as well over the years

Some decriptive evidence





Overburden issues are observed for:

- More than half of households aged 30 and under
- About half of unemployed households
- Unmarried, single-parent households
- In 2021, median households spent a disproportionately higher share of their disposable income on housing, but not due to increased housing consumption or becoming owner-occupiers with mortgages
- Endogeneity

Empirical Methodology

$$\text{NAFF}_i = \alpha + \sum_{h=1}^{H} \beta_h H_i + \gamma \ln PS_n + \sum_{m=1}^{M} \delta_m M_{p,w} + \sum_{w=1}^{2} \gamma_w Y_w + \sum_{n=1}^{N} \delta_n N_n + \varepsilon_i \tag{3}$$

- Where $NAFF$ equals 1 when access to housing for household i is considered unaffordable $HAI \geq 0.4$
- H is a vector of household characteristics
- $lnPS$ is the estimates of property prices at the prefecture level n
- The vector of variables M refers to the macroeconomic level variables, at the regional level p
- Annual and prefecture dummy variables are also used to control for cross-sectional variation
- The weighted regression residuals are checked for heteroskedasticity and spatial autocorrelation

▸ Variable Statistics

Empirical Results - Average marginal effects

Variable	(1)	(2)	(3)	(4)	(5)
30 to 54 years old	-0.141***	-0.053*	-0.052*	-0.029	-0.028
	(0.031)	(0.030)	(0.029)	(0.034)	(0.031)
55 to 84 years old	-0.259***	-0.069**	-0.070**	-0.071*	-0.066*
	(0.038)	(0.035)	(0.035)	(0.037)	(0.035)
85 years and older	-0.236***	-0.002	0.007	-0.010	0.005
	(0.059)	(0.059)	(0.059)	(0.059)	(0.057)
Self-employed	-0.063***	-0.011	-0.009	0.004	0.004
	(0.023)	(0.021)	(0.021)	(0.020)	(0.020)
Retired	-0.096***	-0.031	-0.024	0.005	0.008
	(0.027)	(0.024)	(0.024)	(0.022)	(0.021)
Unemployed	0.171***	0.147***	0.150***	0.151***	0.154***
	(0.029)	(0.026)	(0.026)	(0.024)	(0.024)
Owner with mortgage		0.441***	0.445***	0.448***	0.456***
		(0.032)	(0.031)	(0.032)	(0.030)
Renter		0.410***	0.412***	0.363***	0.373***
		(0.021)	(0.021)	(0.028)	(0.027)
Ln (Property Prices per Prefecture)			0.054*	0.093***	0.072**
			(0.031)	(0.029)	(0.035)
Observations	5,365	4,758	4,758	3,842	3,842
Dummies	No	No	No	No	Yes
F-statistic	27.40	41.60	41.87	25.61	17.74

Note: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Homeownership with a mortgage and renting stand out no matter the model

Unemployed, and smaller households are significantly more likely to have unaffordable housing

The average marginal effect of a 1% increase in prices, according to model (3), increases the probability of lack of affordable housing by about 4.5%

Auxiliary findings

- Tenure status remains the most important variable in terms of size and significance across many sub-sample regressions
- Increased energy costs for 2021 increased the overburden ratio for home-owners
- Variation in renter affordability by degree of urbanization (higher coefficient in urban areas)
- Regional differences, but reduced reliability due to smaller sample

Conclusion

- The study analyses the ability of domestic households to meet their housing needs at a time of rising property prices, while government spending on housing falls short of other EU countries
- Housing affordability worsened from 2018 to 2021, even for home-owners, due to increased energy costs
- Heterogeneity by region, with the issue being more profound in large urban centres
  Households that are renters spend much more of their disposable income on housing
- Today, prices and rents still on the rise, affordability continues to decline
- Policy implications include, among others:
  - Assist fragile households via subsidized renting, jump start social housing
  - Normalize the housing market via rental protection schemes, digitize and re-instate vacant housing

Thank you for your attention!

Appendix

Literature List

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Structure of housing cost and disposable income variables

Component	Source	Level
Housing Cost		
First Residence Mortgage Installment (1)	HFCS	Monthly (Converted to Annual)
Rent Installment (3)	HFCS	Monthly (Converted to Annual)
Cost of Utility Services (electricity, water, natural gas, telephone, internet, and television) (1,2,3)	HFCS	Monthly (Converted to Annual)
Fiscal Fees (ENFIA) (1,2)	Bank of Greece	Annual (Authors' Estimates)
Disposable Income		
Salaried Employees	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Self-employed	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Public Pensions	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Private Pensions	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Unemployment Benefit	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Other Income Sub-categories:		
Income from Regular Private Transfers	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Financial Assistance from Relatives and Friends	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Gross Income from Property Rentals	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Gross Income from Financial Investments	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Gross Income from Private Business other than Self-employment	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)
Gross Income from Other Sources	HFCS – Bank of Greece	Monthly, converted to annual (Gross, converted to Net)

back

Annual household housing costs by tenure, region and wave of the HFCS base, in €

	3rd Wave - 2018				4th Wave - 2021			
	Renters		Owners		Renters		Owners	
Region	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
Country Total	5.029	4.800	3.246	2.694	5.967	5.568	3.778	3.239
Athens	5.056	4.800	3.216	2.678	6.579	6.336	3.890	3.277
East Macedonia and Thrace	4.595	4.800	3.435	2.744	5.236	5.040	3.347	2.727
Attica	5.381	5.400	3.069	2.612	5.929	6.000	3.746	3.229
North Aegean	4.256	4.260	2.607	2.503	5.114	4.800	2.875	2.639
West Greece	4.466	4.440	3.620	2.757	5.138	4.800	3.376	2.779
West Macedonia	4.517	3.600	3.839	3.226	4.885	4.656	3.200	2.637
Epirus	4.919	4.800	2.831	2.244	5.548	5.400	3.244	2.669
Thessaly	5.462	5.040	3.791	2.730	5.706	5.400	4.041	3.348
Thessaloniki	5.096	5.160	3.209	3.030	6.188	6.000	4.053	3.339
Ionian Islands	5.070	4.440	2.447	2.170	5.758	5.520	3.586	2.838
Central Macedonia	4.455	4.200	3.075	2.619	5.125	4.800	3.290	2.728
Crete	5.123	4.920	3.459	3.269	6.141	5.705	5.006	3.989
South Aegean	5.709	6.000	3.043	2.678	5.708	5.352	4.242	3.698
Peloponnese	4.973	4.800	2.983	2.578	6.201	6.000	3.657	3.260
Central Greece	5.405	5.760	3.009	2.613	5.585	5.400	3.513	2.705

back

Annual disposable household income by region and wave of the HFCS base, in Euros

Region	3rd Wave - 2018		4th Wave - 2021	
	Mean	Median	Mean	Median
Country Total	14.681	13.039	16.573	14.400
Athens	15.058	12.792	18.671	16.800
East Macedonia and Thrace	14.132	12.285	15.058	13.219
Attica	13.936	12.505	16.361	14.196
North Aegean	12.873	11.451	15.064	13.300
West Greece	14.254	13.538	15.248	15.000
West Macedonia	13.872	12.251	13.390	12.399
Epirus	13.902	11.612	13.840	12.343
Thessaly	16.713	15.069	17.441	15.624
Thessaloniki	14.526	12.701	16.098	13.802
Ionian Islands	13.461	11.880	15.792	14.000
Central Macedonia	12.444	10.910	15.593	13.864
Crete	17.701	15.469	17.666	15.142
South Aegean	12.886	11.928	17.378	13.344
Peloponnese	14.899	13.920	16.579	12.416
Central Greece	15.076	13.880	18.678	16.009

back

Descriptive statistics of explanatory variables

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Demographic Variables					
Age Group	6,121	2.418	0.659	1	4
Marital Status	6,121	0.596	0.491	0	1
Employment Status	5,365	2.137	1.091	1	4
Education Level	6,121	2.768	1.032	1	4
Household Size	6,121	3.208	1.531	1	6
Housing Status and Expectations					
Housing Status	5,448	1.539	0.834	1	3
Income Expectations	5,897	1.765	0.473	1	3
Property Price Expectations	4,864	1.908	0.603	1	3
Financial Variables					
Stocks/Bonds	6,121	0.009	0.097	0	1
Credit Balance	6,121	0.055	0.228	0	1
Consumer Loan	6,121	0.055	0.228	0	1
Credit Refusal	6,121	0.014	0.118	0	1
Property Prices					
Logarithm of property price per sq.m. (per Prefecture, NUTS3)	6,121	6.886	0.274	6.217	7.555
Macroeconomic Variables					
Logarithm of per capita GDP (NUTS2)	6,121	9.701	0.272	9.278	10.056
Unemployment Rate (NUTS2)	6,121	17.451	2.491	14.914	19.896

back

Regional Housing affordability index

Housing Affordability and Housing Cost Burden Indices by Region

	Housing Affordability Index		Housing Cost Burden Rate	
	3rd Wave	**4th Wave**	**3rd Wave**	**4th Wave**
South Aegean	30,0%	29,4%	28,0%	45,7%
Epirus	25,9%	31,4%	34,8%	38,0%
Attica	24,4%	25,4%	24,0%	35,4%
Thessaloniki	28,0%	30,6%	35,4%	35,0%
Central Macedonia	25,5%	23,1%	30,5%	34,6%
Crete	21,4%	27,3%	22,2%	32,5%
Thessaly	22,5%	24,5%	23,5%	32,2%
Eastern Macedonia and Thrace	25,2%	21,7%	36,1%	31,1%
Ionian Islands	23,8%	26,0%	24,2%	31,1%
Peloponnese	20,5%	26,4%	24,6%	29,5%
Athens	22,0%	23,0%	27,7%	28,2%
Western Greece	23,8%	21,7%	31,8%	28,0%
Western Macedonia	31,0%	23,8%	45,7%	24,0%
Central Greece	20,5%	18,9%	21,5%	23,4%
North Aegean	23,9%	22,6%	28,7%	23,0%

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