

# House Price Imbalances and Economic Performance in Albania

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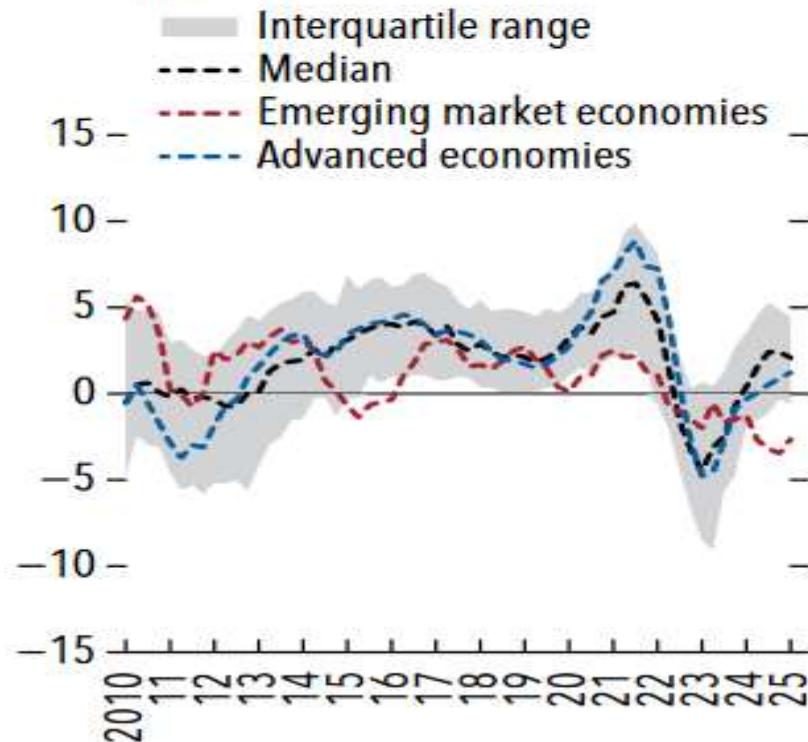
# Motivation

- Motivation of this paper is two-fold:
  - i. Shed light whether house prices are in line with economic fundamentals
  - ii. Assess the sensitivity of economic growth to house price imbalances

# I. Introduction

- Global residential real estate prices are entering a phase of uneven recovery;

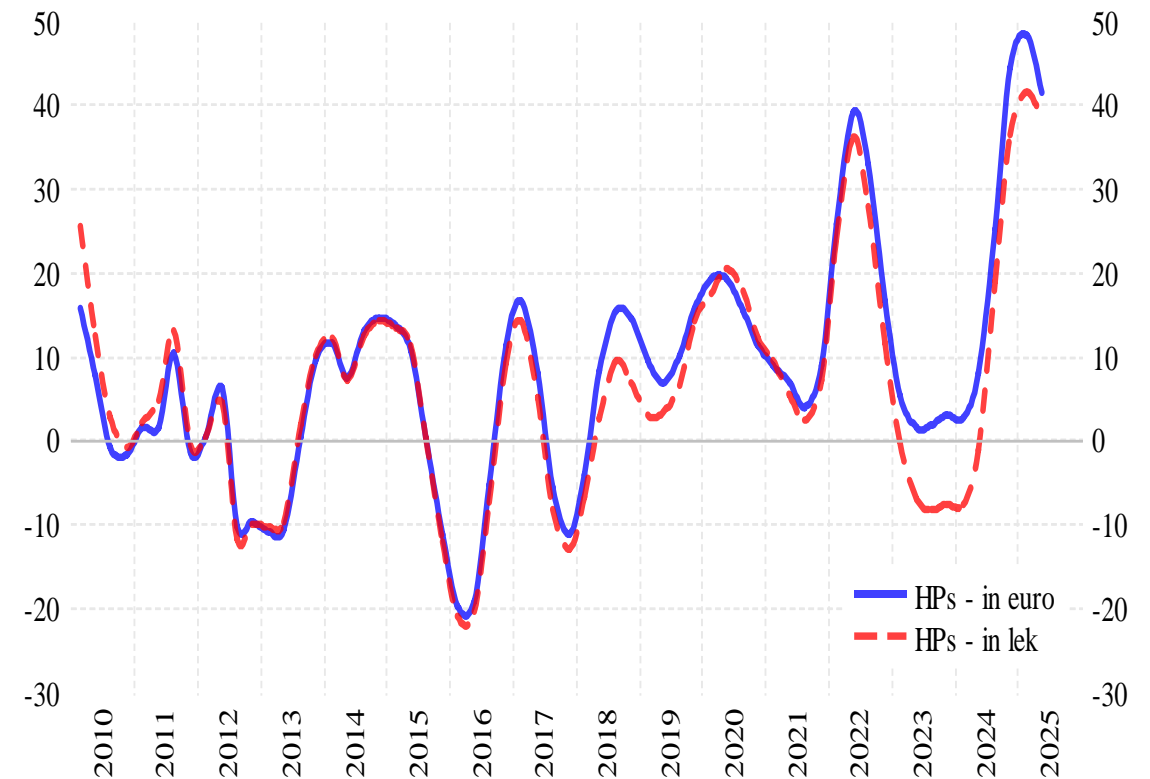
## 1. Year-over-Year Changes in Residential Property Prices (Percent)



Source: IMF's GFSR Report, October, 2025

- However, recent run-up in Albania's HPs suggests a different route from data in EMEs.

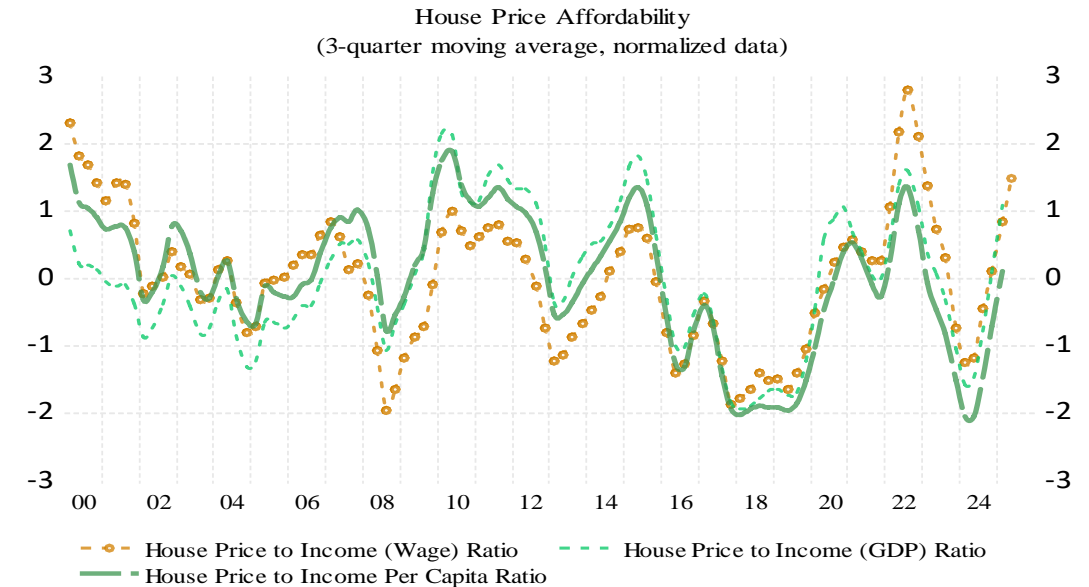
## Residential Prices in Albania (YoY changes, in percent)



Source: Author's calculations

# I. Introduction

- Does the recent run-up in HPs suggest any need to adjustment with income growth?
- Simple metrics of Price-to-Income and Price-to-Rent ratios raise concerns about possible exuberance of HPs in Albania.
- HP affordability (esp. as ratio to Average Wage) in 2025q2 is worrisome for future mortgage value, demand for RE loans, etc. as house market may be still navigating in uncharted waters;
- In terms of profitability, current return on investment in housing (rent/price) seems lower than its longer-term trend.



Sustainability of House Prices in Albania, as of 2025q2				
Percent deviations from long-term averages				
		10-Year MA	15-Year MA	20-Year MA
Affordability	Price-to-Income (YNPC)	19.6	14.9	13.1
	Price-to-Income (Wage)	20.5	19.7	19.7
Profitability	Price-to-Rent	53.0	62.3	76.3
Source: Author's calculations				

# I. Introduction

- GFC provided strong evidence on the link btw real economy and financial sector;
- Since then, monitoring business and fin cycles, incl. housing mkt, has become important in maintaining economic stability;
- Housing mkt (the focus in this paper) affects real economy by influencing construction and employment (Caldera et al, 2013), private consumption (Carroll et al, 2011) and borrowing (Aoki et al, 2002);
- Thus, misalignments in house prices may amplify financial and business cycles, a.w.a. trigger a feedback effect from one to another;
- These effects are potentially dangerous if HP booms are financed by bank credit, thereby raising questions as to how CBs should lean against the wind.
- To investigate the economic reaction to house price imbalances we i) estimate HP deviations from its long-term determinants, and then ii) include possible misalignments into an economic growth modeling.

# II. A Glance at Related Literature

## II.1 Determinants of house prices

- Literature on relationship btw HPs and its eco-fin determinants was generally overlooked in academic research until GFC happened, revealing the determining role of housing in HH wealth;
- Traditional econometric methods have been applied to investigate HP determinants in the:
  - i. Short-term, via structural VAR models (e.g. Goodhart and Hofmann, 2008; Tsatsaronis and Zhu, 2004; Musso et al., 2011);
  - ii. Long-term, via cointegrating ECM models (e.g. Girouard et al., 2006; Egert and Mihaljek, 2008; Gattini and Hiebert, 2010; Geng, 2018).
- Ongoing revolution in artificial intelligence has shifted attention of econometricians to applications of Machine-Learning (ML) methods, particularly for forecasting purposes (e.g., Mora-Garcia et al.; Wang & Li; Park & Bae; Banerjee et al.; Kok et al.; Ceh et al.; Fan et al.; Ho et al.; Chatzidis; Alfaro-Navarro et al.; Hong; Hacievliyagil et al.).
- HP performance has been explained in these studies by employing a number of economic, financial and demographic indicators, a.w.a. institutional and structural factors.

# II. A Glance at Related Literature

## II.1 Determinants of house prices

- Survey by Duca et al reveals 1) conventional theories seem insufficient to explain housing mkt dynamics; 2) HP-to-Rent models not enough to capture variations in HPs; 3) Credit conditions are key driver of HP movements; 4) Land supply explain much of HP spatial variation; and 5) HP behavior during pandemic was different than in previous downturns.
- These findings caution against putting too much weight on interest rates and focus more on other macro-financial factors from both demand-side (e.g. income, wealth, fin. conditions) and supply-side (e.g. house availability) [Tsatsaronis & Zhu; Égert & Mihaljek; Agnello & Schuknecht; Cerutti, Dagher, & Dell’Ariccia].
- In Albania, a number of studies investigate housing mkt using linear traditional models: Yzeiraj constructs a “fundamental” HP index and finds prices overheated after 2006 and later entered a period of “correction” after 2012; Using VECM model, Suljoti finds HPs strongly linked to fin leverage and exch rate, but not so much with lending rates; Other studies focusing on HPI in Tirana find that most explanatory variables are consistent with hedonic pricing theory (Kraja et al), there is LR link with mortgage loans, LT lending rates and CCI (Marku et al) or remittances (Lleshaj & Korbi). Yet, others conclude it is difficult to find theoretically-relevant relationship with economic indicators (Koprencka et al) or their impact seems time-varying, esp. w.r.t. mortgage rates (Halili). Using LSTM network with a pool of variables, Vika and Vika (2023) find that GDP, rentals, cost of construction, bank lending and foreign purchases are some relevant indicators in predicting HPs in Albania from 2018 to 2022.

# II. A Glance at Related Literature

## II.2 Economic Growth and House Price Performance

- Housing market can be linked to real economy via the:
  - i. Wealth channel: fluctuations in HPs affect HH wealth, which then transmits to HH consumption;
  - ii. Collateral channel: HPs are positively linked to collateral value of credit constrained individuals, thereby directly affecting their ability to borrow.
  - iii. Construction sector: housing investment is positively related to HP expectations due to profitability motives, affecting thus employment in the economy.
- Empirical evidence confirms the co-movement of HPs and GDP (e.g. Mian et al., 2015; Miller et al., 2009).



# III. Econometric Methodology: ARDL

- House prices and economic growth do not adjust instantaneously to their L-R equilibrium, but respond to S-R changes as well;
- If L-R relations are cointegrated, models should be estimated in an error-correction method.
- ARDL method as developed by Pesaran & Shin (1999) is employed to estimate coint. relations of house prices and economic growth with their determinants;
- Advantages of this approach are: i) it tests coint among variables irrespective of whether they are purely  $I(0)$ , purely  $I(1)$  or a mixture of both; ii) Coint. relationship can be estimated by LS in single reduced-form equation once lag length in the model is identified; iii) the test is relatively more efficient in short samples with limited number of observations;

# IV. House Price Modeling Framework: HP Determinants

- Imbalances in housing mkt can be detected by comparing HPs with rents (P/R);
- In the L-R equilibrium, P/R is determined by user cost of owning a house [ $uc \cdot P = R$ ]; where UC can be measured in terms of interest rates, property tax rate, depreciation, expected capital gains, risk premium of owning vs renting, etc.;
- In addition, HPs are modelled in empirical literature in relation to various theoretically-linked indicators pertaining to housing demand and supply;
- On demand-side, typical key factors include expected HP, income, housing loans rate, fin. wealth, demographic and labor market factors, expected return on housing, and other demand shifters such as location, state of house, or institutional factors;
- On supply-side, HPs are usu. taken to depend positively on profitability, which can in turn depend positively on HPs and negatively on real cost of construction.

# IV. House Price Modeling Framework: HP Determinants

- Assuming that housing mkt is in equilibrium (with demand equal to supply at all times), we use ARDL model to estimate HPs as a function of the following factors relevant to housing market in Albania's urban area:

$$\triangleright RHP = f(RHP_{t-p}, REN_{t-p}, RI2Y_{t-p}, Y_{t-p}, CRE_{t-p}, FIRE_{t-p}, POP_{t-p})$$

- RHP denotes house prices, CPI-deflated, in lek. Past HP performance is included as a measure of expected future capital gains;
- REN is house rental, CPI-deflated. Its movements relative to house prices can indicate departures from equilibrium in housing mkt;
- RI2Y is 2Yr gov. bond rate, CPI-deflated. It is used as a proxy for user cost (uc) of owning a house;
- Y is compensation of employees, CPI-deflated. It captures HH disposable income;
- CRE denotes bank lending for real estate (% of GDP). It should fluctuate in tandem with HPs (procyclical) and thus act to amplify HP boom-bust cycle;
- FIRE is real estate purchases by non-residents (% of GDP).
- POP is urban population.

## IV. House Price Modeling Framework: Data Availability Issues

- Economic data for analyzing movements in house prices is not always available for Albania at quarterly frequency for the full period under investigation;
- Most data series had to undergo certain manipulation in terms of interpolation from annual frequency or extrapolation in earlier periods by using supportive indicators.

# IV. House Price Modeling Framework: ARDL Results

Table. ADF unit root test (Probabilities)

Null Hypothesis: Variable X has a unit root

Lag Length: (Automatic - based on SIC)

Sample: 1999Q1 2025Q2

Exogenous	Constant	Lags	Const & Trend	Lags
Levels				
RHP	0.97	2	0.16	1
REN	0.36	1	0.02	0
RI2Y	0.03	0	0.04	0
Y	1.00	0	0.99	0
CRE	0.81	0	0.95	0
FIRE	0.23	2	0.38	2
POP	0.29	4	0.79	4
1st differences				
RHP	0.00	1	0.00	1
REN	0.00	3	0.00	3
RI2Y	0.00	5	0.00	5
Y	0.00	2	0.02	2
CRE	0.00	0	0.00	0
FIRE	0.01	1	0.00	1
POP	0.28	4	0.44	4

# IV. House Price Modeling Framework: ARDL Results

Table. ARDL Parsimonious Model Results

ARDL(2,0,0,0,0,1) model. Dependent var.: ln(RHP)

Estimation sample: 1999q4-2025q1 (no. of obs. 102)

	Coefs	L-R Coefs	Diagnostic Tests	
ln(RHP(-1))	1.0988***		Adj. R2	0.976
ln(RHP(-2))	-0.4075***		S.E. of reg.	0.043
ln(REN)	0.0512	0.1660	Serial correl. (LM prob. F(4,88))	0.90
RI2Y	-0.0227	-0.0735	Heteroskedasticity (BPG prob. F(9,92))	0.44
ln(Y)	0.0868*	0.2700	Normality (JB prob.)	0.35
CRE	1.4333***	4.6450***		
FIRE	0.3966	1.2852	L-R Relationship Testing	
ln(POP)	-7.3075***		Bounds Test, F-stat. value	4.0265***
ln(POP(-1))	7.4453***	0.4464		
Constant	-1.7661	5.7232		

Error correction model:  $\Delta \ln(\text{RHP}) = -0.31 * \text{COINTEQ} + 0.41 * \Delta \ln(\text{RHP}(-1)) - 7.25 * \Delta \ln(\text{POP})$

# IV. House Price Modeling Framework: ARDL Results

- Cointegrating relation that defines long-run equilibrium of real house prices, ERHP:

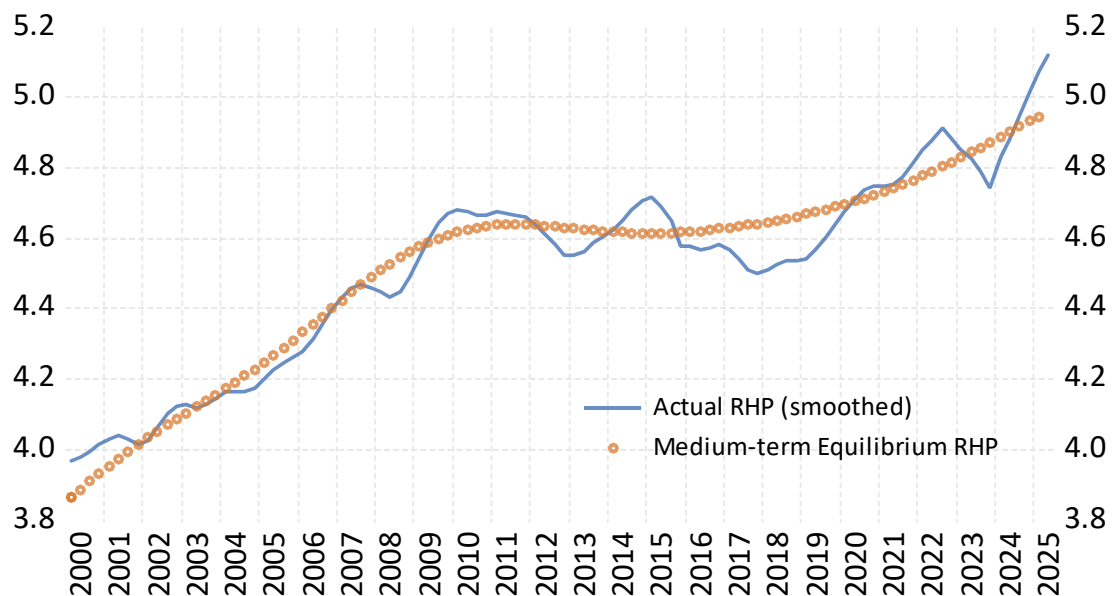
$$\text{ERHP} = 0.17 \cdot \ln(\text{REN}) - 0.07 \cdot \text{RI2Y} + 0.27 \cdot \ln(Y) + 4.65 \cdot \text{CRE} + 1.29 \cdot \text{FIRE} + 0.45 \cdot \ln(\text{POP}(-1))$$

- Estimated parameters reveal that in the long run:
  - 1% rise in rents may cause an increase in HPs by 0.2%;
  - 1pp rise in interest rate may bring about a decrease of 0.1% in HPs;
  - 1% rise in compensation of employees leads to 0.27% in HPs;
  - if stock of CRE to GDP rises 1pp, HPs could rise by 4.6%;
  - if inflows of FIRE (as ratio of GDP) jump by 1%, HPs might go up by 1.3%;
- Although not stat. sig., HP reaction to int. rate in Albania (0.074%) is higher than what is estimated for a panel of 20 European countries (0.005%) in paper by Cuestas et al. (2021);
- On the other hand, HP response to compensation of employees is shown relatively low in Albania (0.3%), or one-fourth of that estimated in European countries (in Cuestas et al.)

## IV. House Price Modeling Framework: L-R cointegration and HP Imbalances

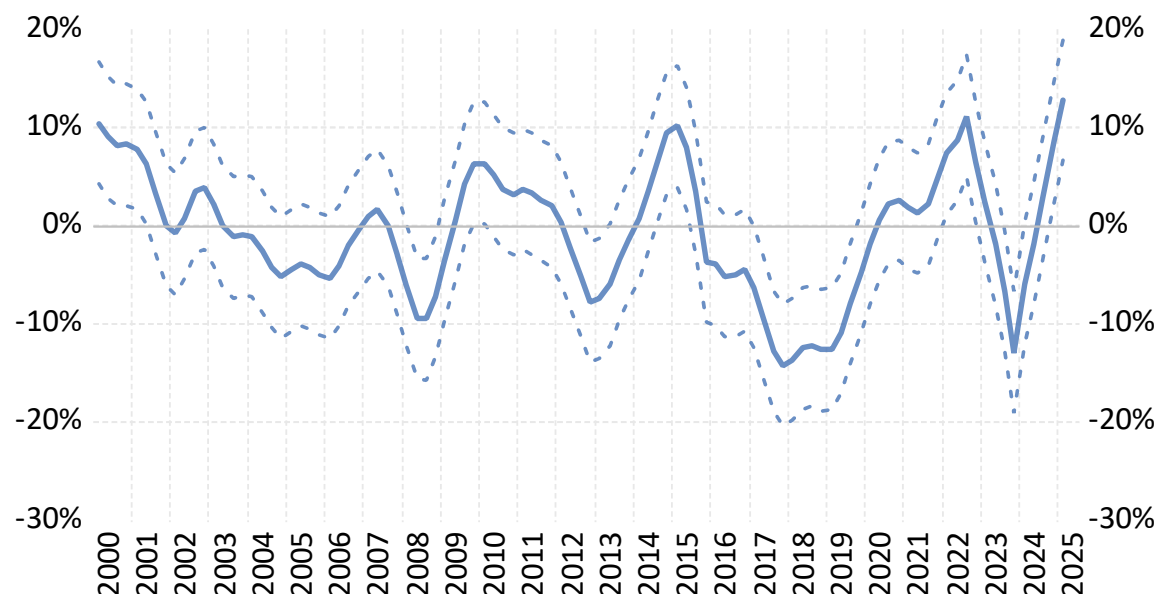
- ARDL results suggest HP developments have in general been in line with fundamentals;
- RHP seem particularly undervalued btw 2017-2019, while episodes of overvaluation (such as in early 2015 and mid-2022) have been short-lived;
- Interestingly, HP misalignments do not show any strong positive relation to business cycles.

Actual and Equilibrium RHP (in natural logs)



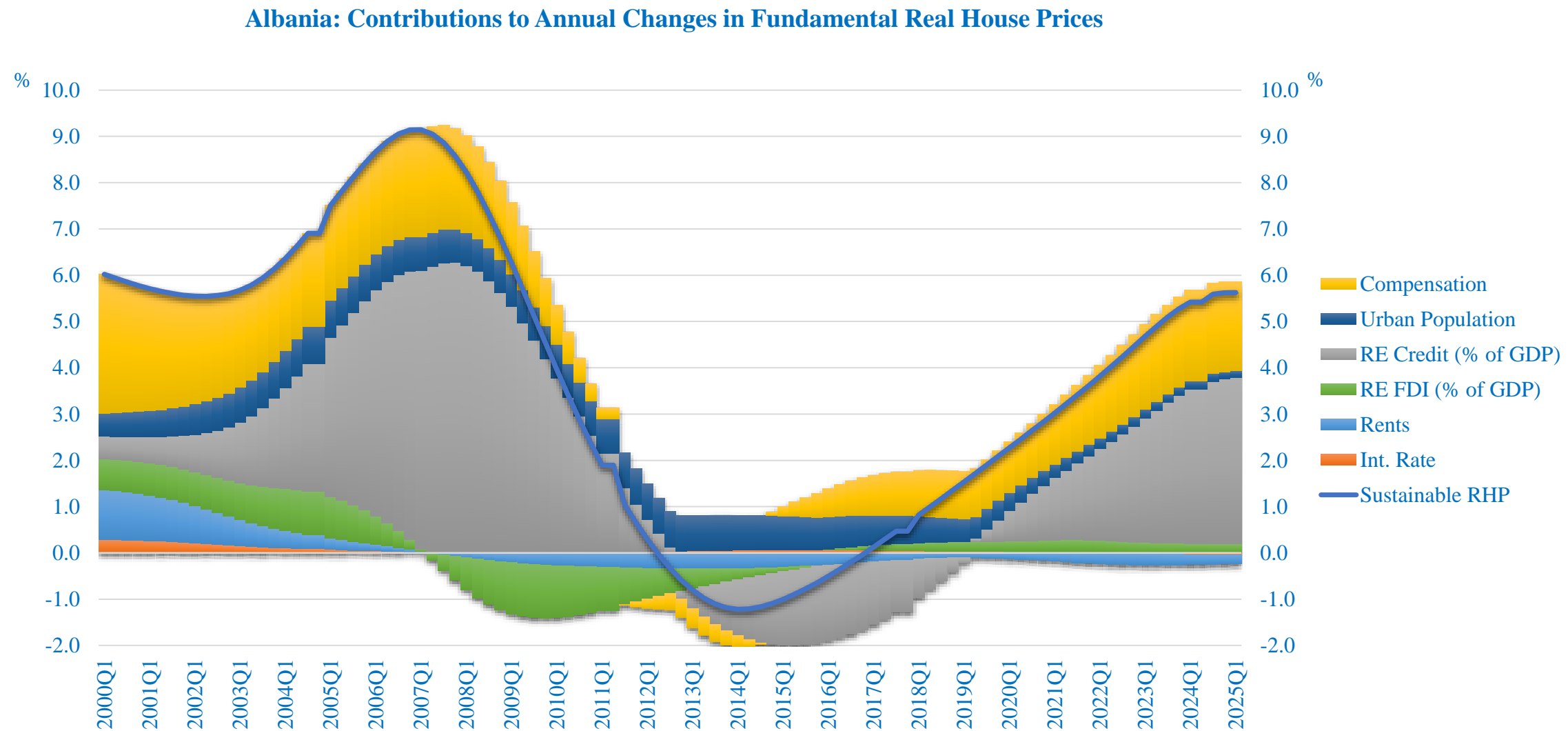
Note: Equilibrium RHP is generated using HP filtered values of fundamentals

Real House Price Misalignment (+/- standard deviation)





# IV. House Price Modeling Framework: Which factors matter the most?



# V. House Prices and Economic Growth Linkage

- In line with literature on finance and economic growth (see for e.g. King and Levine, 1993; Hasan et al, 2009; Rousseau and Wachtel, 2011; Beck et al, 2014) we estimate a growth model that consists of the following:
  - Real GDP per capita (YPC);
  - Human capital, captured by school enrollment in tertiary education (EDUT);
  - GFCF as proxy for investment (INV), as ratio to GDP;
  - Economic openness (OPN), defined as ratio of trade to GDP;
  - HP misalignment (MISAL), calculated as real house prices divided by their estimated fundament values.
- Again, ARDL method is hired to estimate the short-run and long-run relation between GDP and explanatory variables.

# V. House Prices and Economic Growth Linkage: ARDL Results

Table. Economic Growth Model Results

Parsimonious ARDL(1,2,0,0,0) model. Dependent var.: ln(GDP)

Estimation sample: 2002q3-2025q1 (no. of obs. 91)

	Coefs	L-R Coefs	<i>Diagnostic Tests</i>	
ln(YPC(-1))	0.897***		Adj. R <sup>2</sup>	0.99
EDUT	0.129	0.013	S.E. of reg.	0.006
EDUT(-1)	-0.386**		Serial correl. (LM prob. F(2,80))	0.29
EDUT(-2)	0.258***		Heteroskedas. (BPG prob. F(8,82))	0.26
Invest./GDP	0.127***	1.239***	Normality (JB prob.)	0.52
Trade/GDP	0.083***	0.809***		
Misalignment	-0.010	-0.099		
Constant	1.186***			
Trend	0.001***		<i>L-R Relationship Testing</i>	
			Bounds Test, F-stat. value	15.5***
			t-statistic	-4.3**

ECM:  $\Delta \ln(\text{YPC}) = \mathbf{-0.10*ECT} + 0.13*\Delta(\text{EDUT}(-1)) - 0.26*\Delta(\text{EDUT}(-1)) + 1.186 + 0.001*\text{Trend}$

## V. House Prices and Economic Growth Linkage: ARDL Results

- Error correction term is negative and significant, confirming the cointegrating relation among the variables and their causality effect on economic growth [coef -0.1 suggests that economic deviations from equilibrium will vanish in about 2.5 years];
- The long-run coefs that define the cointegrating relation of real GDP are:

$$\text{EGDP} = 0.01*\text{EDUT} + 1.24*\text{INV} + 0.81*\text{OPN} - 0.10*\text{MISAL}$$

- High education and investments have positive impact on long-term growth in Albania (although estimated size of EDUT is relatively sensitive);
- Trade openness also shows positive and significant impact on economic growth, thus contributing to improvements in current account balance in Albania [this is contrary to findings by Cuestas et al. (2020 and 2021) for European countries];
- Negative parameter for Misalignment (-0.10) implies that HPs above the equilibrium level could be perceived as excessive indebtedness and thus could lead to slower long-run growth [the impact is similar to that estimated for other European countries (-0.12)];
- Hwv, absence of Misal at the parsimonious ECM dynamics suggests that HP imbalances may not be of significant consequence on current economic growth [different trials revealed sign of coef remained negative, but its size was smaller than in the long run equation].

# Concluding remarks

- This study investigates HP developments by delving into economic, financial and demographic determinants of HPs and tries to draw policy implications.
- Although HPs appear to be generally in line with its “sustainable” levels as derived from ARDL cointegration method, fear about a potential price correction necessitates a rigorous monitoring and understanding of the key factors influencing the risks of housing price decline.
- HP imbalances appear to hamper economic growth in the longer run, but neither amplifying nor weakening it in the short term.
- Albanian current economic and financial situation appears relatively strong and resilient, gov. institutions should be attentive to residential market trends and its related economic fundamentals in order to ensure the stability of both housing and finance.