

PIRAEUS BANK



**Greek Real Estate can thrive in a “Goldilocks”
economy**

Greek & Regional Economics Research (GREC) Team

Economic Research & Investment Strategy

July 2021



1 Putting the Real Estate Cycle into Context

2 Thinking in terms of Residential Real Estate Equilibrium

3 Thinking in terms of Commercial Real Estate Equilibrium



Οι Εξελίξεις στην Αγορά Ακινήτων

- Η πορεία της αγοράς ακινήτων κατά τη διάρκεια του 2020 αποτέλεσε έκπληξη ακόμα και για τον πιο αισιόδοξο οικονομικό αναλυτή, καθώς σε μια χρονιά ύφεσης, όπου το ΑΕΠ συρρικνώθηκε κατά 8%, οι τιμές οικιστικών ακινήτων αυξήθηκαν κατά 4.3% και οι τιμές επαγγελματικών ακινήτων κατά 1.2%. Εκ των υστέρων οι λόγοι αυτής της «αποσύνδεσης» μεταξύ μακροοικονομικών δεδομένων και τιμών ακινήτων είναι προφανείς. Μετά το αρχικό σοκ της ταχύτητας διασποράς της πανδημίας και του πρώτου κύματος κοινωνικής αποστασιοποίησης, η πλειοψηφία των ενδιαφερόμενων αγοραστών/επενδυτών συνειδητοποίησαν ότι η πανδημία του Covid-19 θα ήταν παροδική και η οικονομική δραστηριότητα θα επανερχόταν στα προ-covid επίπεδα.
- Όπως λοιπόν οι χρηματιστηριακοί αναλυτές στα μοντέλα δίκαιης αποτίμησης μετοχικών αξιών άρχισαν να χρησιμοποιούν τα προσδοκώμενα κέρδη του 2021 αντί για την κερδοφορία του 2020, έτσι με τρόπο ανάλογο, και οι επενδυτές στην αγορά ακινήτων, παρέκαμψαν τη πτώση του διαθέσιμου εισοδήματος (των νοικοκυριών) και της κερδοφορίας (των επιχειρήσεων) του 2020 και συνέχισαν να αποτιμούν την αγορά ακινήτων ως συνάρτηση των μακροχρόνιων προοπτικών της ελληνικής οικονομίας.
- Η προσέγγιση αυτή είχε τρεις άμεσες επιπτώσεις:
 1. Πρώτον, οι τιμές στην αγορά ακινήτων συνέχισαν και το 2020 να κινούνται ανοδικά παρά την πρωτοφανή οικονομική ύφεση υποστηριζόμενες από τις θετικές μακροχρόνιες προοπτικές της ελληνικής οικονομίας, καθώς και από διοικητικές αποφάσεις όπως η «χρυσή βίζα» και άλλα φορολογικά κίνητρα που αποσκοπούν στο να γίνει η ελληνική αγορά ακινήτων ελκυστική στο διεθνές επενδυτικό κοινό.
 2. Επιπρόσθετα, η συνδυαστική επίδραση του θετικού μακροοικονομικού περιβάλλοντος και του χαμηλού σημείου εκκίνησης (δεδομένου ότι την προηγούμενη δεκαετία οι τιμές των ακινήτων υποχώρησαν σωρευτικά περισσότερο από 44%) έχει ως αποτέλεσμα οι τιμές των ακινήτων (οικιστικά και επαγγελματικά) να δύνανται να συνεχίσουν να αυξάνονται βραχυπρόθεσμα κατά 6%. Μακροπρόθεσμα προβλέπουμε ρυθμό αύξησης και στις 2 κατηγορίες ακινήτων περί το 3%, παράλληλα με τον ρυθμό ονομαστικής μεγέθυνσης της ελληνικής οικονομίας.
 3. Ωστόσο, ο συνδυασμός της πτώσης διαθέσιμου εισοδήματος και κερδοφορίας και της αυξητικής πορείας των τιμών ακινήτων σημαίνει ότι, πρόσκαιρα τουλάχιστον, έως να επανέλθουμε στην ανάπτυξη, οι δείκτες αποτίμησης ακινήτων εμφανίζονται αυξητικοί.
- Επομένως, συμπεραίνουμε ότι ξεκινώντας από ένα πολύ χαμηλό επίπεδο, η ελληνική αγορά ακινήτων μπορεί να συνεχίζει να αναπτύσσεται παράλληλα με μια πολύ ισχυρή οικονομία για μια σειρά ετών. Εάν οι προβλέψεις μας τόσο για την ελληνική οικονομία, όσο και για την αγορά ακινήτων αποδειχθούν ορθές, η αγορά ακινήτων θα συγκλίνει με τα επίπεδα ισορροπίας ή «δίκαιης αποτίμησης» προς το 2027.



Real Estate Outlook: What happened in 2020, what to look forward in the near future

- Somewhat surprisingly for most analysts, the real estate market registered a remarkable “decoupling” from economic activity during 2020. In retrospect, the real estate market reacted much like any other financial market last year. After an initial shock, most analysts realized that Covid-19 recession was going to be a transitory phenomenon and economic activity would, sooner rather than later, return to its previous trajectory. Hence, in the stock market analysts and brokers stopped using 12-month forward Earnings per Share(EPS) to value stocks. Instead they switched to using 24 month forward EPS in their valuation models to estimate the “fair value” of equities. The same reasoning was also applied to the real estate market. Market participants, by and large, side-stepped the 2020 decline in GDP and disposable income and based their valuations on their assessment of the long-term potential growth of the Greek real estate market. That valuation approach has had three direct implications:
 - a. First, given the positive outlook for the Greek real estate market, which is based partly on our “goldilocks” outlook and partly on structural reforms (such as “golden visa” and tax-base transfer for wealthy individuals) which aim on making the Greek real estate market more attractive to foreign investors, Greek real estate prices for both commercial and residential properties kept growing despite the decline in incomes and economic activity.
 - b. Furthermore, given the extremely positive prospects of the Greek economy, we project that the Greek real estate price indices (residential and commercial) can keep growing to the tune of 6% in the near future until they settle down to a less scorching – yet fully respectable – pace of 3% p.a. in the long-run.
 - c. Yet, the combination of the unavoidable decline in domestic incomes (especially on the corporate sector) with the robust real estate price acceleration means that temporarily, valuation metrics such as the affordability ratio will look elevated. Strong economic growth following the post-Covid return to normalcy will ameliorate this brief valuation bump.
- Overall , looking at the big picture, we anticipate that- starting from a low base- the Greek real estate market can grow hand-in-hand with a robust economy for a number of years. Under that scenario, Greek real estate prices could converge to our estimate of “fair” or “equilibrium” level no sooner than 2027.





(as of Jun. 21)	Economic Outlook, Baseline Scenario				
	2020 (a)	2021	2022	2023	2024
Real GDP (% change) ¹	-7.8	6.6	6.1	4.1	3.8
Unemployment rate (% of labour force)	16.3	16.3	15.2	12.5	11.0
Non-residential real estate prices (% change) ²	1.2	4.5	6.1	6.0	5.7
Residential real estate prices (% change)	4.3	5.7	6.4	5.7	5.0
General Government Primary Balance (% of GDP, ESA 2010)	-6.7	- 7.2	0.0	1.5 up to 2.0	1.5 up to 2.0

Note: 1) 2020 Real GDP (% change) is based on the average of the quarterly annual seasonally adjusted growth rates. 2) Bank of Greece Office Price Index





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2 Thinking in terms of Residential Real Estate Equilibrium

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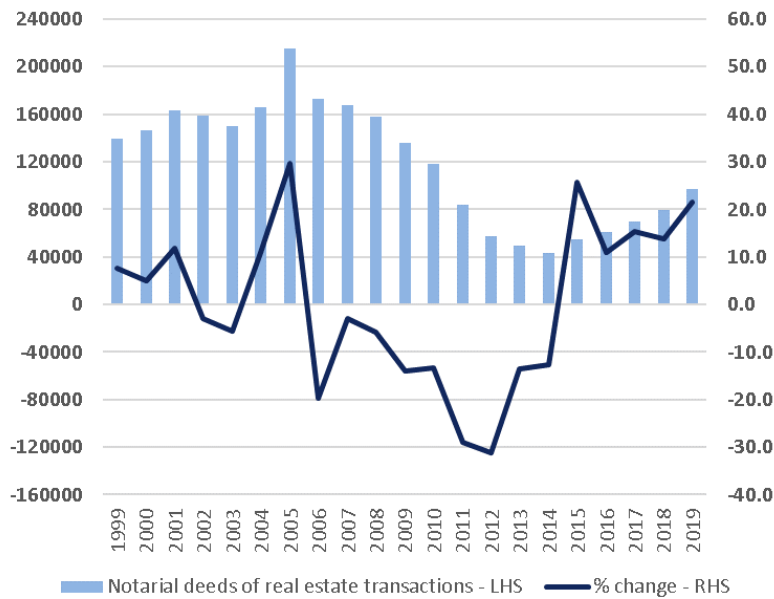


The Real Estate Sector is important

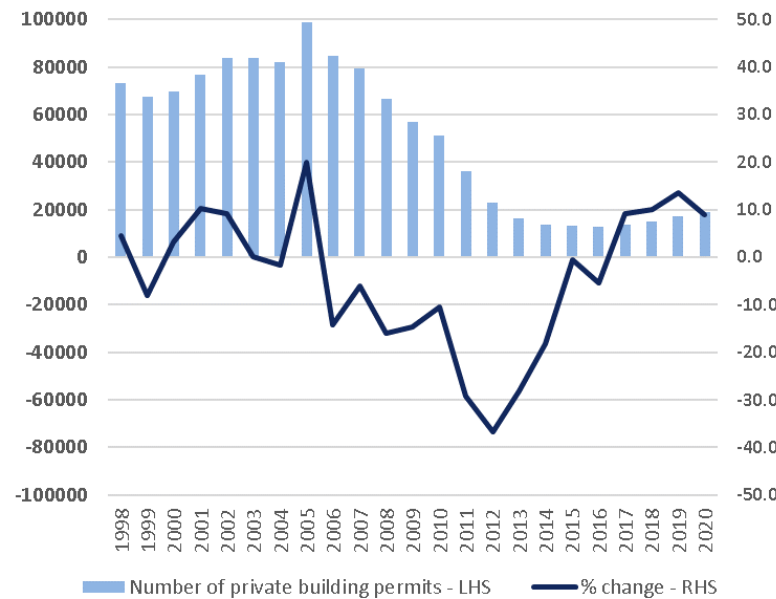
because it is tightly linked to both construction & credit expansion



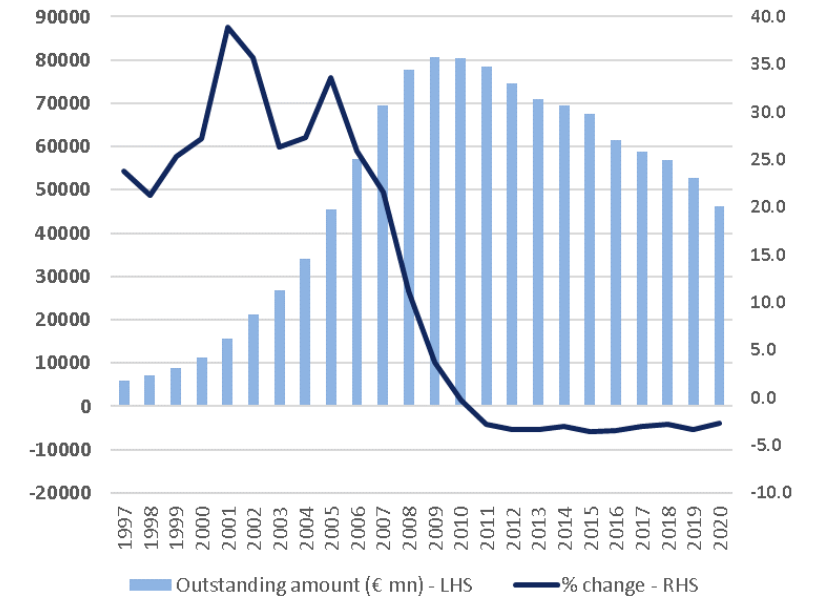
Notarial deeds of real estate transactions
(number & % growth rate)



Private building permits
(number & % growth rate)



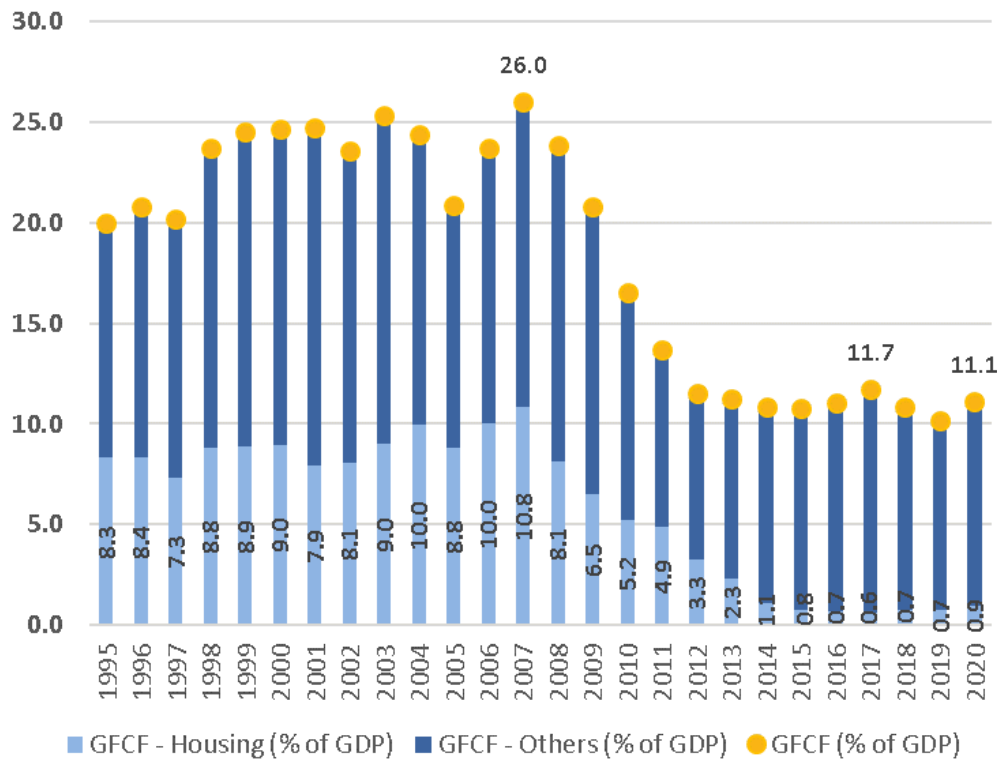
Mortgage loans
(outstanding amount & % growth rate)



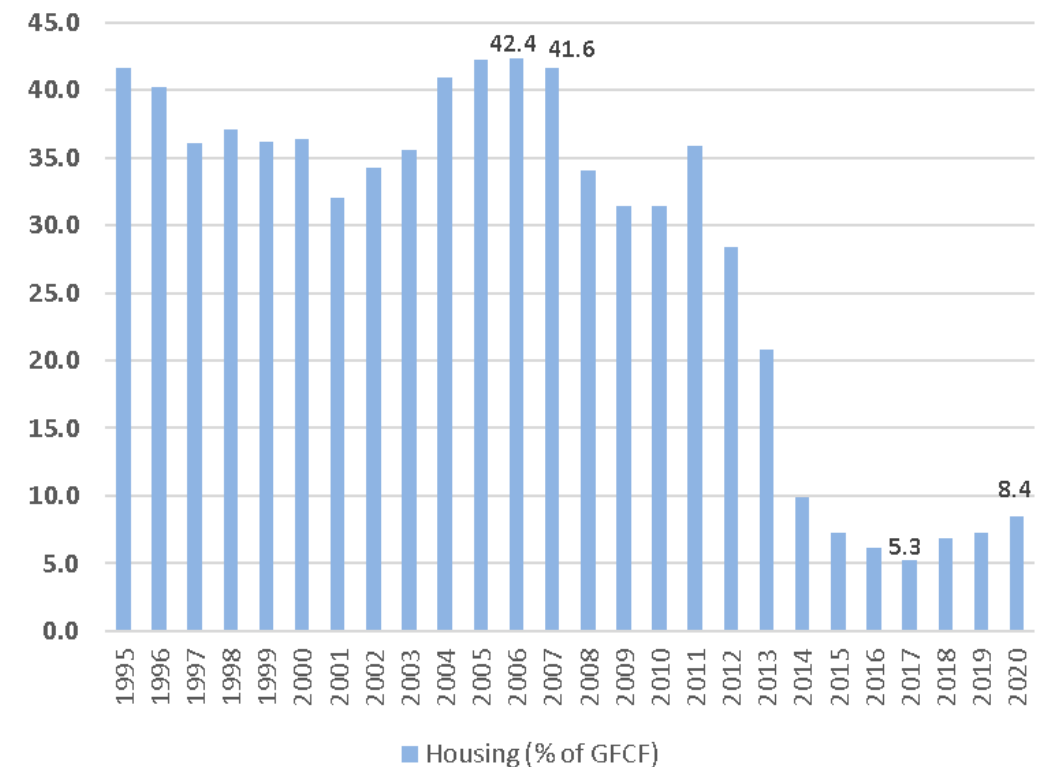
Hence, it's fair to say that until its collapse real estate / construction was one of the key driving forces of economic activity



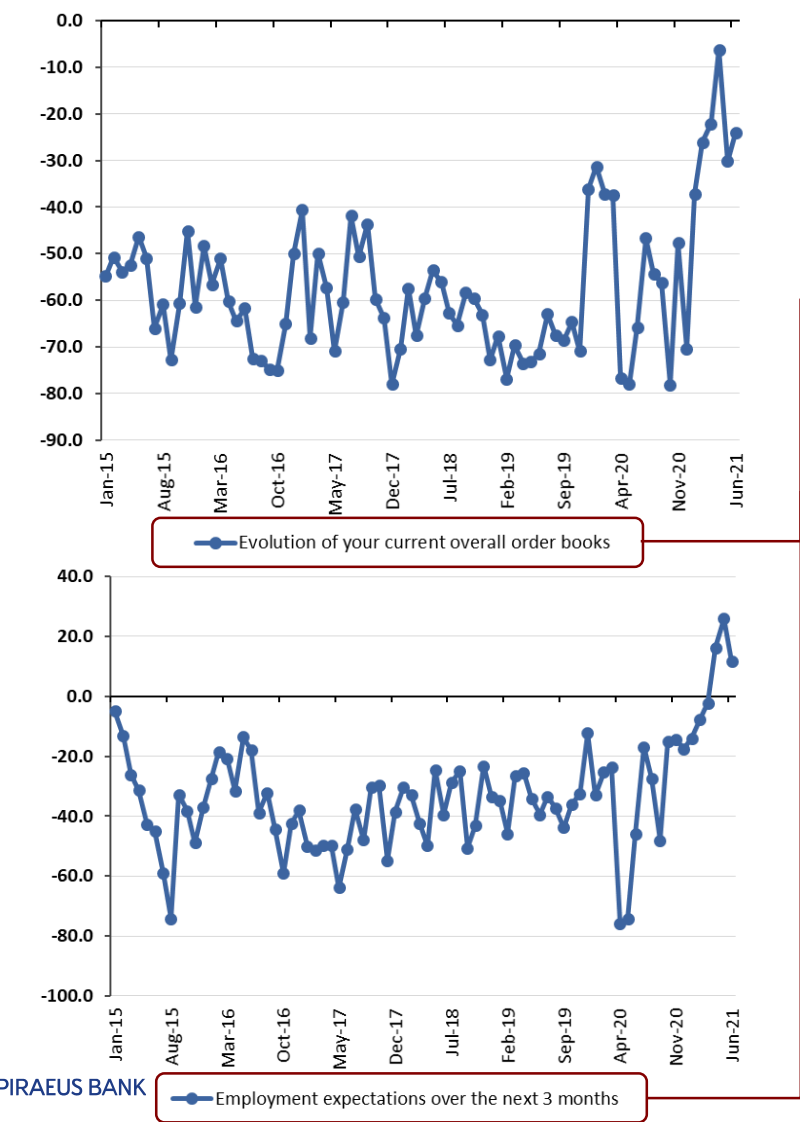
**Gross Fixed Capital Formation Decomposition
by Asset** (% of GDP, current prices)



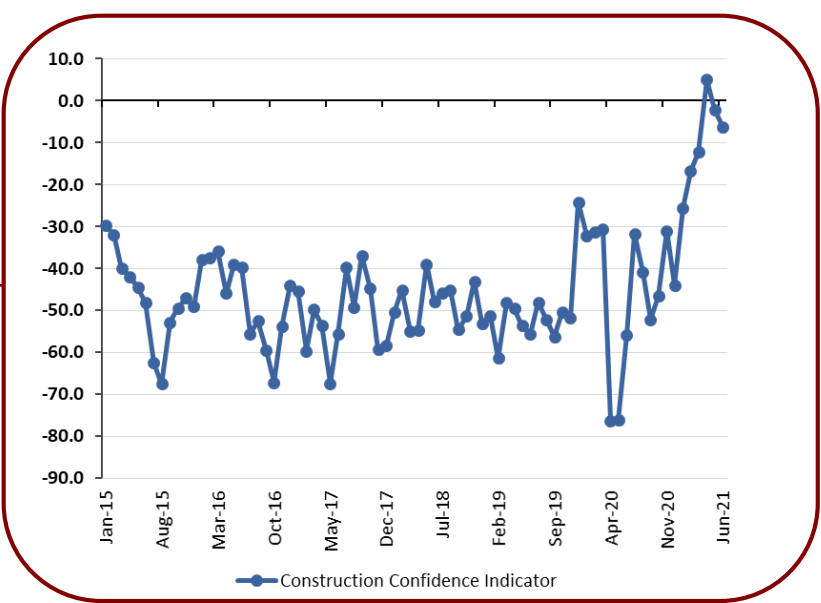
GFCF: Housing
(% of total GFCF, current prices)



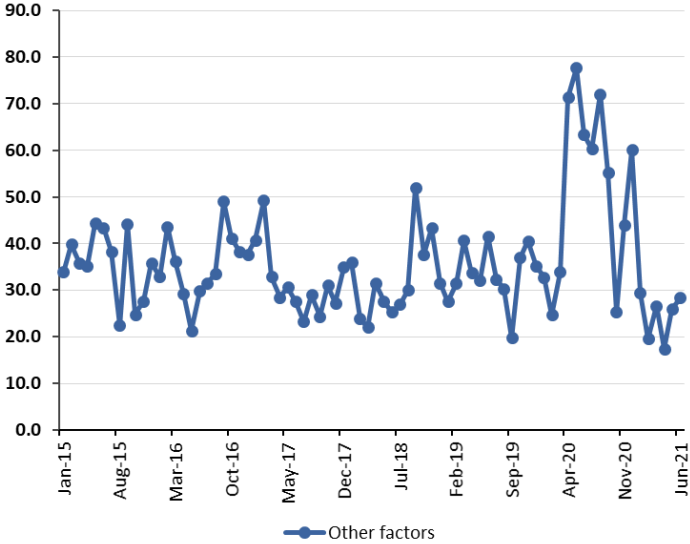
Construction Sector: Confidence Indicator affected by COVID only for the duration of the 1st lockdown



Construction Confidence Indicator



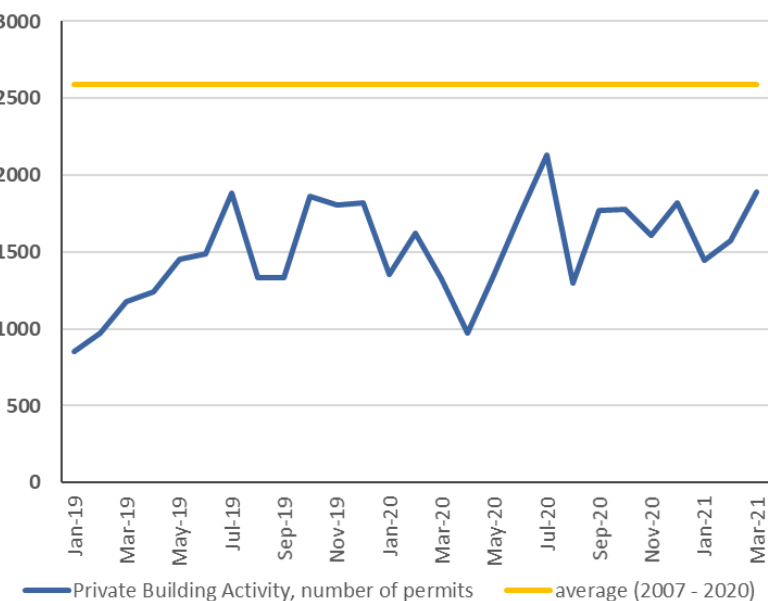
Other factors currently limiting building activity
(excl. Insufficient demand, Weather conditions, Shortage of labour force, Shortage of material and/or equipment)



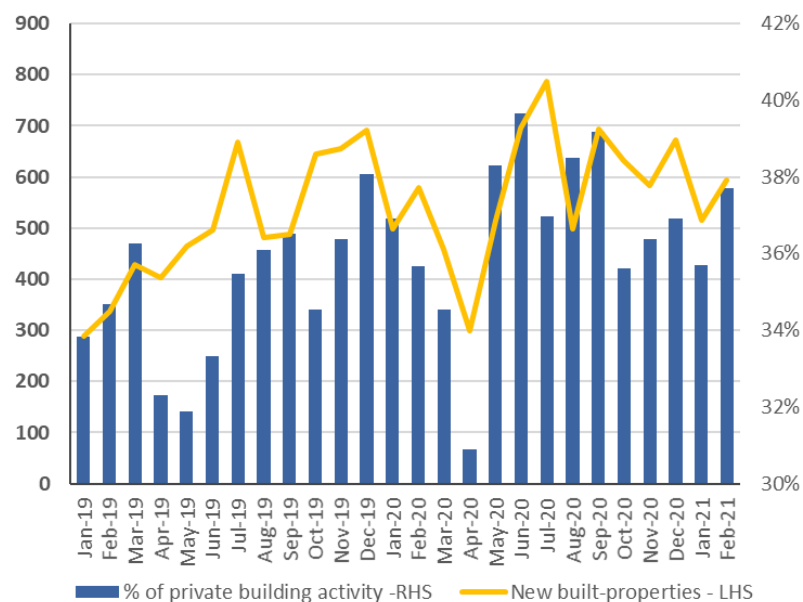
Construction Sector: Activity on the “ground” remains strong!



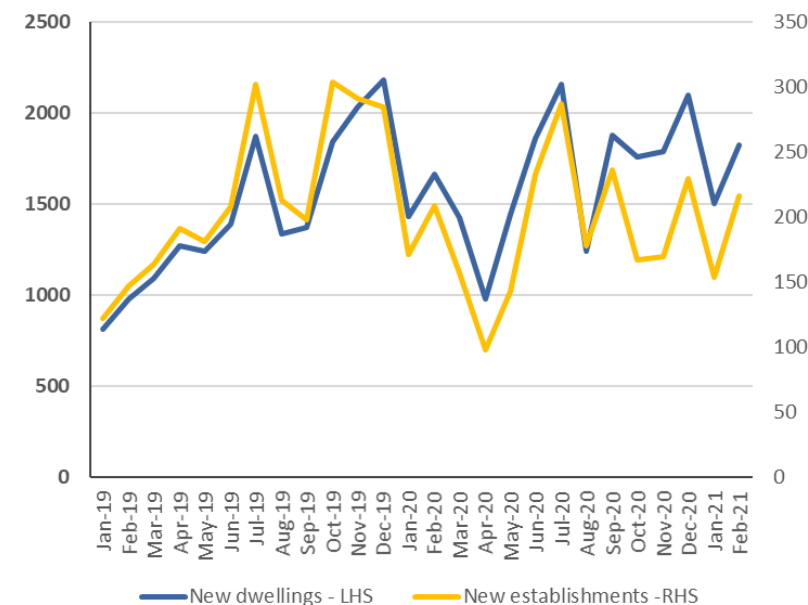
Private Building Activity
(number of permits, nsa data)



New Built-Properties
(number, % of private permits, nsa data)



New Dwellings & New Establishments
(number, nsa data)



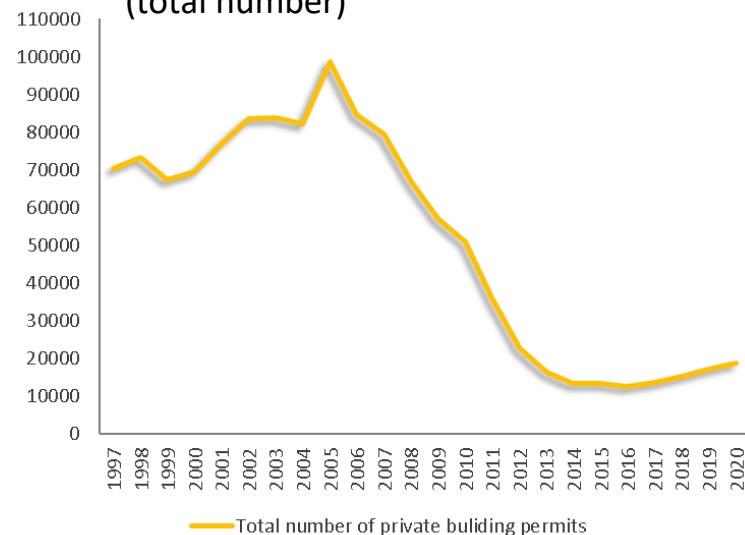
Decomposition of private building permits

Categories of private building permits

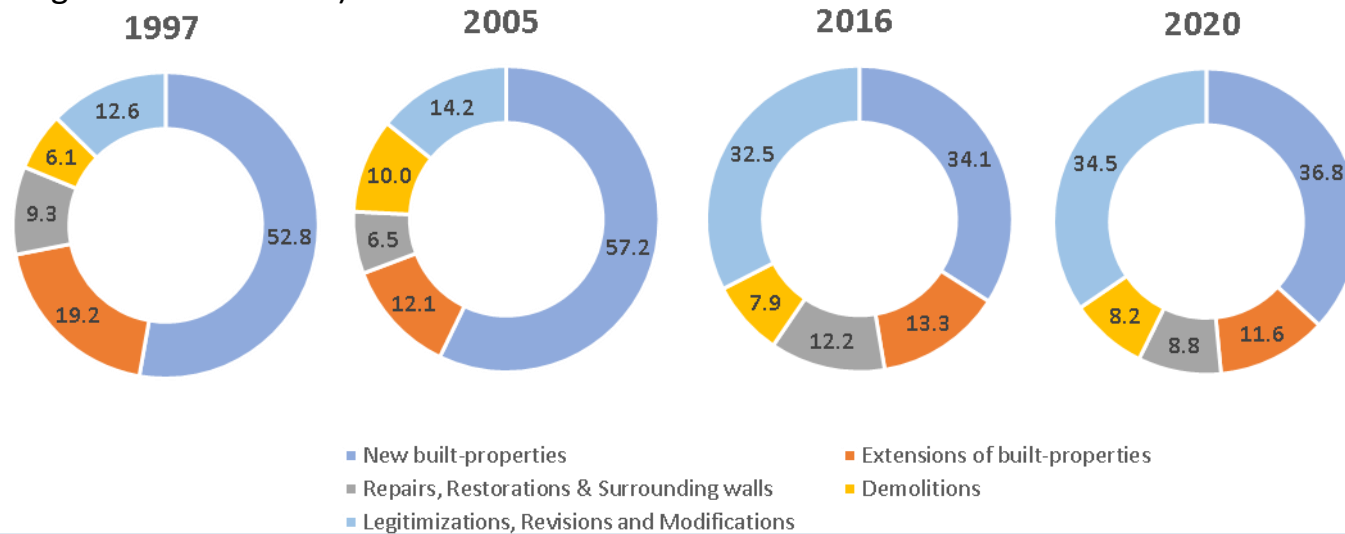
(number of permits)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
New built-properties	37,047	38,619	34,494	35,196	40,446	45,195	45,249	43,446	56,342	45,406	41,790	34,021	27,447	23,380	15,114	9,066	5,675	4,620	4,618	4,305	4,930	5685	6044	6915
Extensions of built-properties	13,453	13,372	12,268	11,625	11,684	11,755	11,434	11,640	11,907	11,708	10,950	8,943	7,833	7,092	4,836	2,983	1,830	1,635	1,757	1,683	1,835	1905	2034	2185
Repairs, Restorations & Surrounding walls	6,531	7,266	7,903	8,153	7,849	8,440	8,279	7,884	6,452	6,712	6,089	5,740	5,789	5,750	4,550	2,500	2,438	1,596	1,649	1,536	1,727	1964	1925	1646
Demolitions	4,305	4,259	4,168	4,770	5,312	6,291	6,067	6,254	9,852	7,085	6,066	4,954	4,088	3,330	2,172	1,238	1,105	937	978	1,003	1,154	1254	1439	1540
Legitimizations, Revisions and Modifications	8,872	9,835	8,577	9,840	11,402	11,981	12,648	13,012	14,016	13,625	14,512	13,082	11,844	11,430	9,403	7,050	5,368	4,646	4,348	4,114	4,139	4372	5787	6482
TOTAL	70,208	73,351	67,410	69,584	76,693	83,662	83,677	82,236	98,569	84,536	79,407	66,740	57,001	50,982	36,075	22,837	16,416	13,434	13,350	12,641	13,785	15,180	17,229	18,768

(total number)



(categories as % of total)

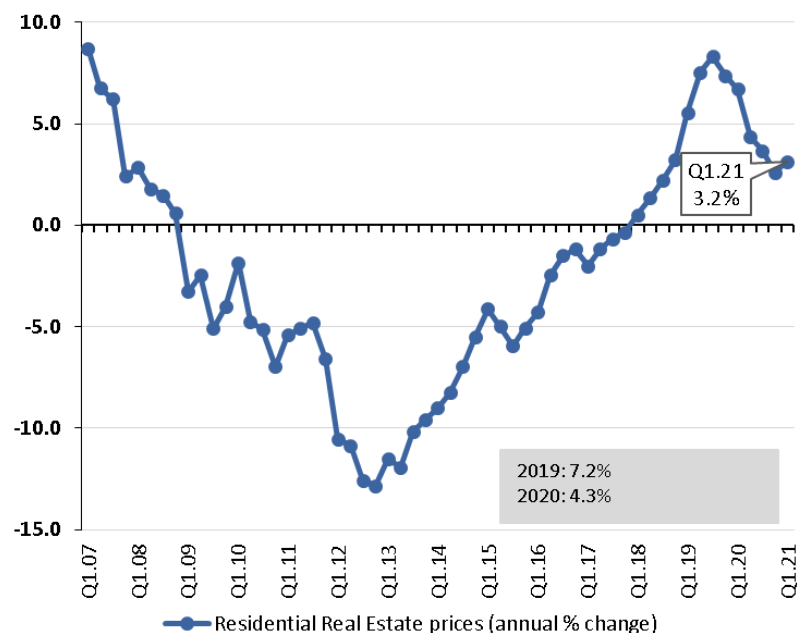


Real Estate: Retains its growth dynamic, despite a record economic contraction



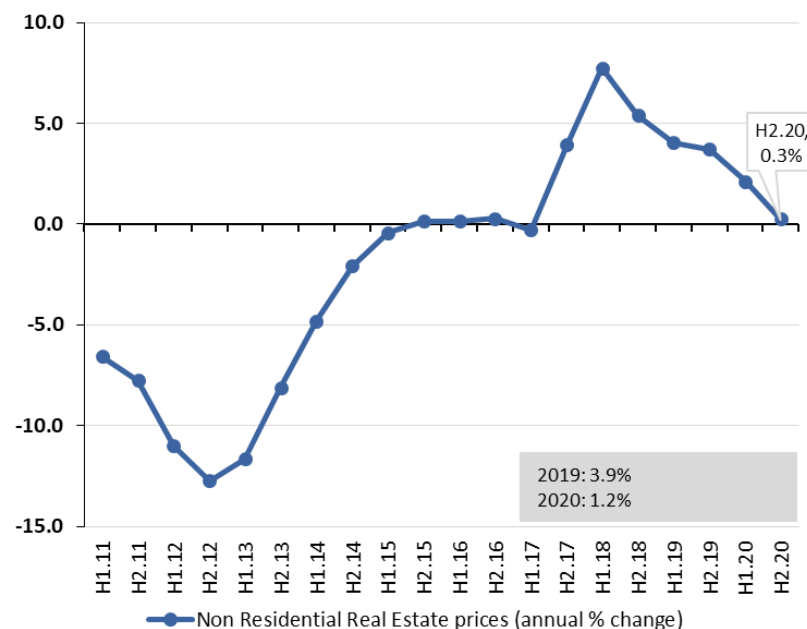
Residential Real Estate Prices

(annual % change)



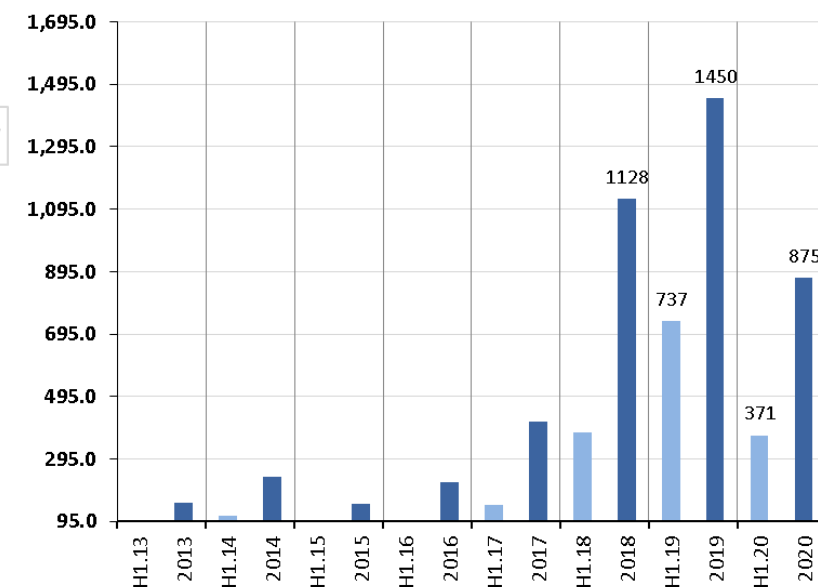
Non Residential Real Estate Prices¹

(annual % change)



Real Estate FDI in Greece²

(annual cumulative flows, € mn)



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Note: 1) Office Price Index
2) Net Foreign Direct Investment in Greece: Real Estate

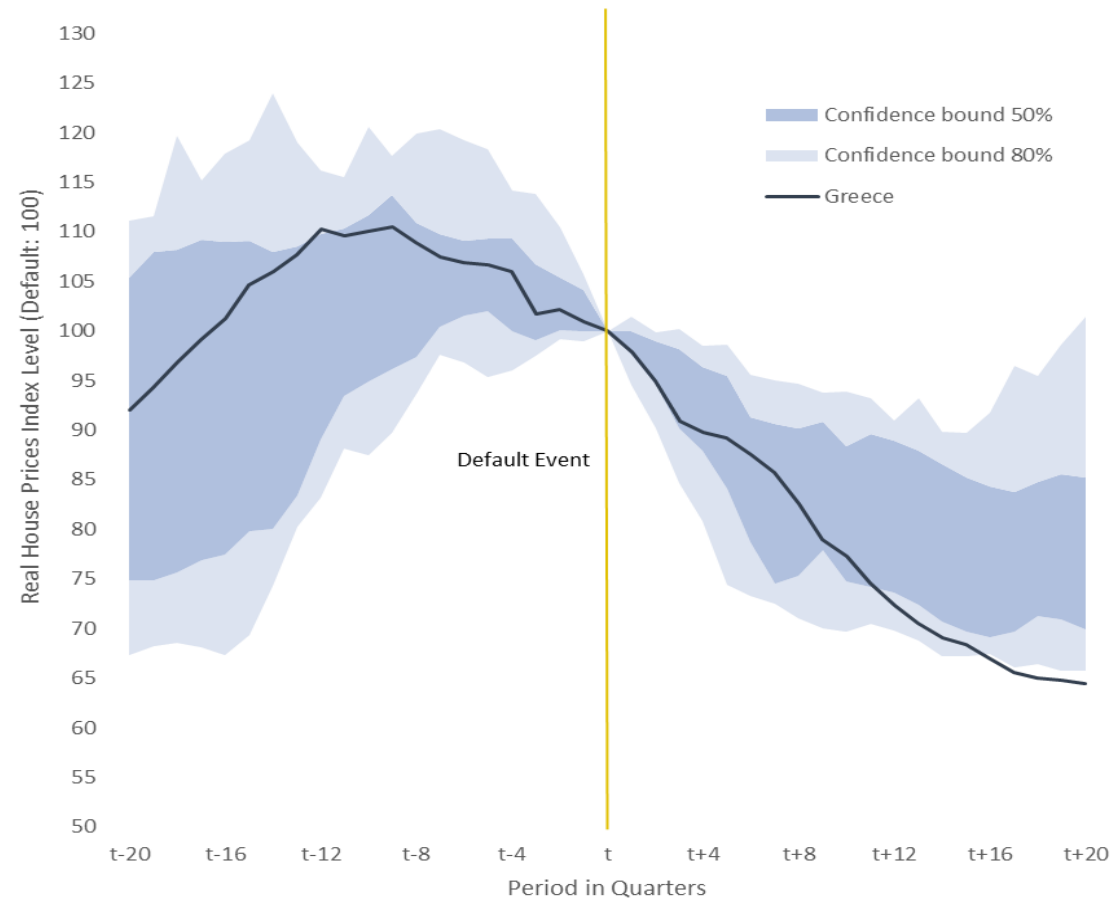


Source: Bank of Greece, Piraeus Bank Research

Putting the Greek Boom - Bust Cycle into a Global Context: Results from an Event Study



Real House Prices Index (level)



Highlights

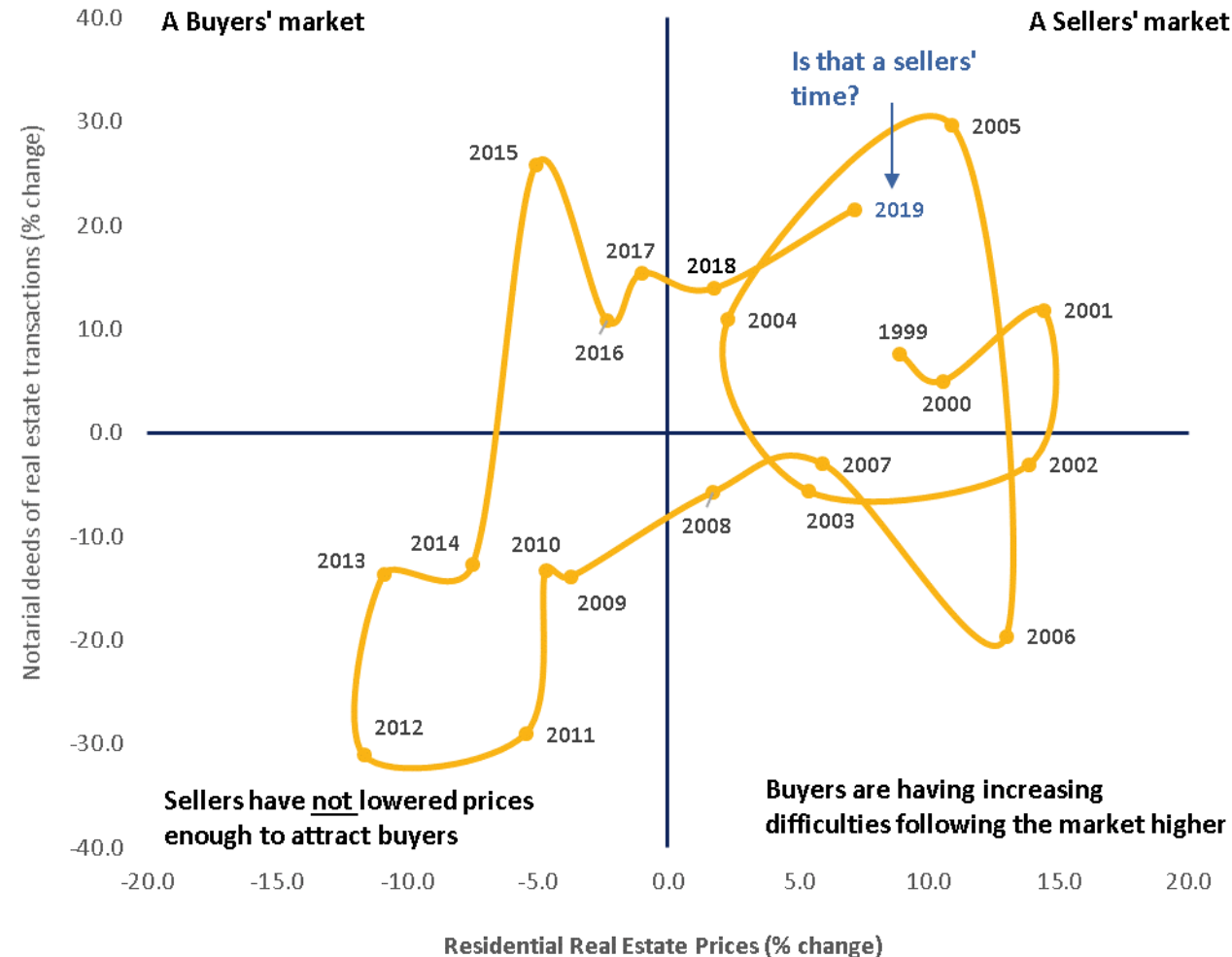
- ✓ Looking at real estate boom – bust cycles in 16 countries between 1970 - 2019, we conclude that the boom phase of Greek Real Estate market wasn't "exceptionally strong".
On the contrary, the bust phase was one of the most severe incidents recorded in history.



Reverse – engineering the Demand & Supply Nexus since 1999



Notarial deeds of real estate transactions vs Residential Price Index
(% change)





1 Putting the Real Estate Cycle into Context

2 Thinking in terms of Residential Real Estate Equilibrium

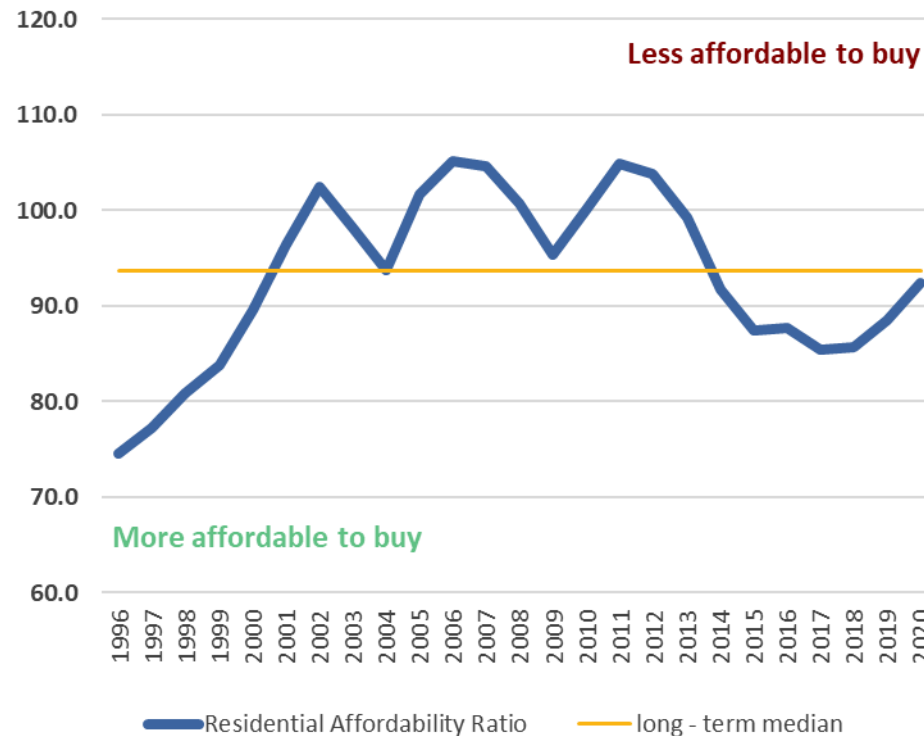
3 Thinking in terms of Commercial Real Estate Equilibrium



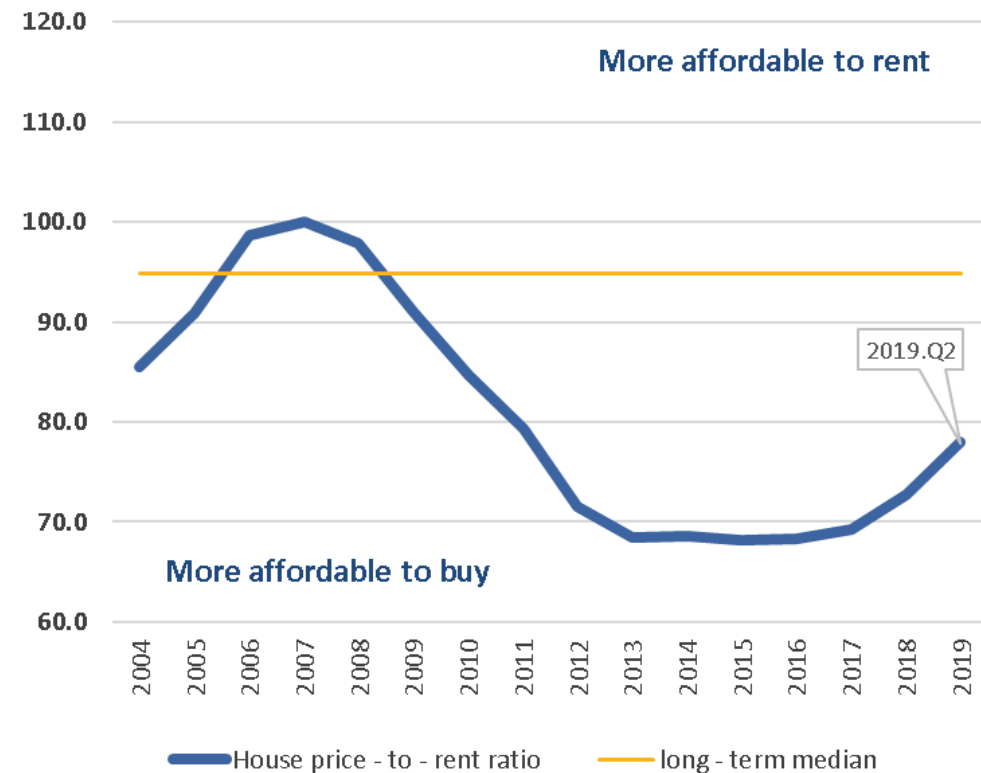
(I) A simple Affordability Assessment approach:



Residential Affordability Ratio, RAR_{2010} (2010 = 100)



House Price - to - Rent Ratio (2007 = 100)



$$RAR_t^{2010} = 100 \times \frac{\frac{RP_t}{HDI_t}}{\frac{RP_{t=2010}}{HDI_{t=2010}}}$$

Where: HDI: Household Disposable Income, current prices at time t

RP: Residential price at time t

$HDI_{t=2010}$: Household Disposable Income, current prices at base year 2010

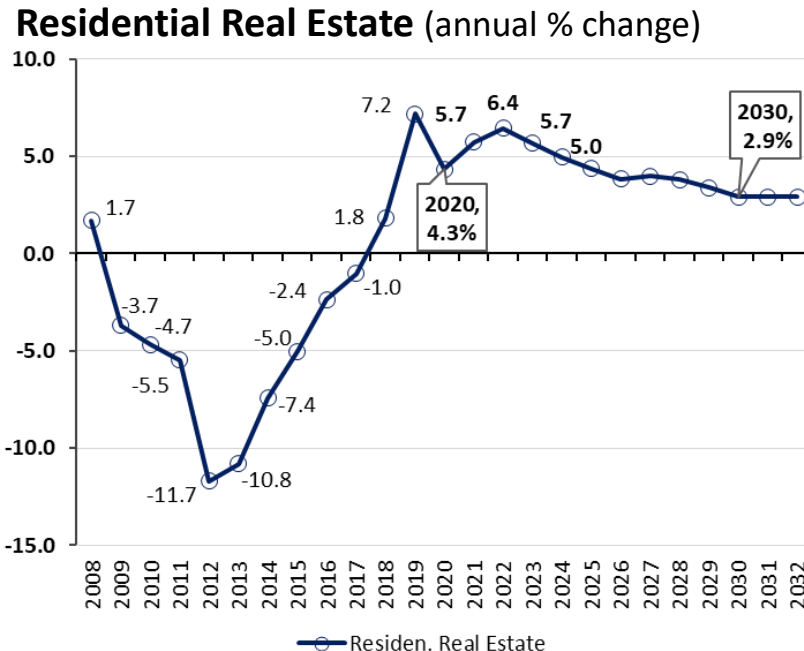
$RP_{t=2010}$: Residential price at base year 2010



(II) Residential Real Estate Outlook: +5.7% in 2021, +6.4% in 2022

Main Assumptions

- ✓ GDP to increase by 6.6% in 2021
- ✓ Convergence to a steady state level by 2030.

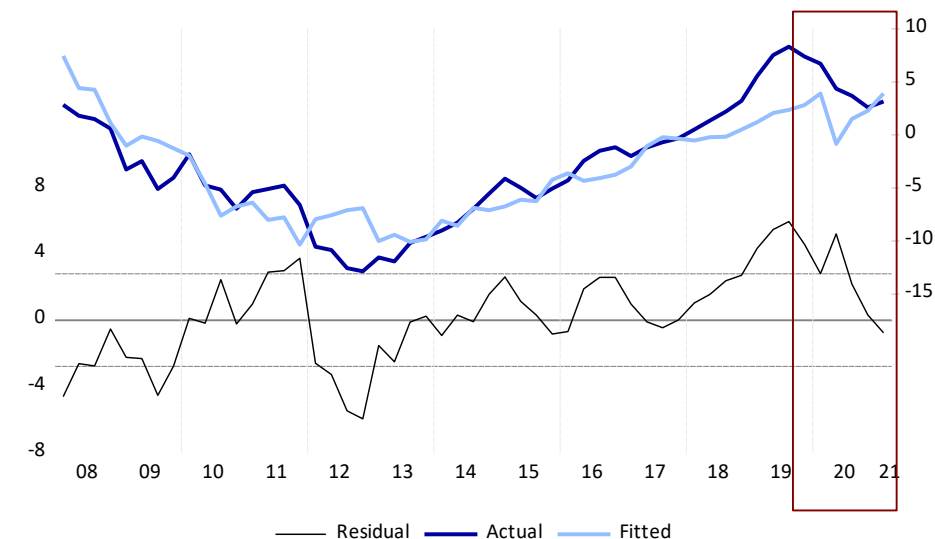


Dependent Variable: RRE_GRWTH
 Method: Least Squares
 Sample (adjusted): 2008Q1 2021Q1
 Included observations: 53 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP_GRWTH_BL	0.462869	0.077900	5.941835	0.0000
RRE_GRWTH(-4)	0.739929	0.061214	12.08760	0.0000
Root MSE	2.736930	R-squared		0.752642
Mean dependent var	-2.747380	Adjusted R-squared		0.747792
S.D. dependent var	5.555680	S.E. of regression		2.790079
Akaike info criterion	4.927022	Sum squared resid		397.0116
Schwarz criterion	5.001373	Log likelihood		-128.5661
Hannan-Quinn criter.	4.955614	Durbin-Watson stat		0.435234


	RRE growth	Real GDP growth rate
2020	4.3%	-7.8%*
2021	5.7%	6.6%
2022	6.4%	6.1%
2023	5.7%	4.1%
2024	5.0%	3.8%


* Based on the average of the quarterly annual seasonally adjusted growth rates




(III.a) Maximum Borrowing Capacity approach*



 The aim of the approach is to estimate the value of real estate according to economic fundamentals without any reference to observed house prices.

 In a nutshell, we compute the house prices implied by the maximum amount households' can safely borrow from a bank given:

- ✓ their disposable income
- ✓ mortgage rates
- ✓ prevailing levels of Loan to Value

 The mathematical formula of the model is:
$$P_t = \varphi^{-1} \cdot \frac{f(i_t, N) \cdot \alpha \cdot Y_t}{H}$$

where,

P_t : Implied House Price per sq. meter

φ : Loan to Value ratio

α : Debt Service to Income ratio

Y_t : Disposable Income

H : House Size (in sq. meters)

$f(i_t, N)$: Present value formula based on interest rates and mortgage maturity



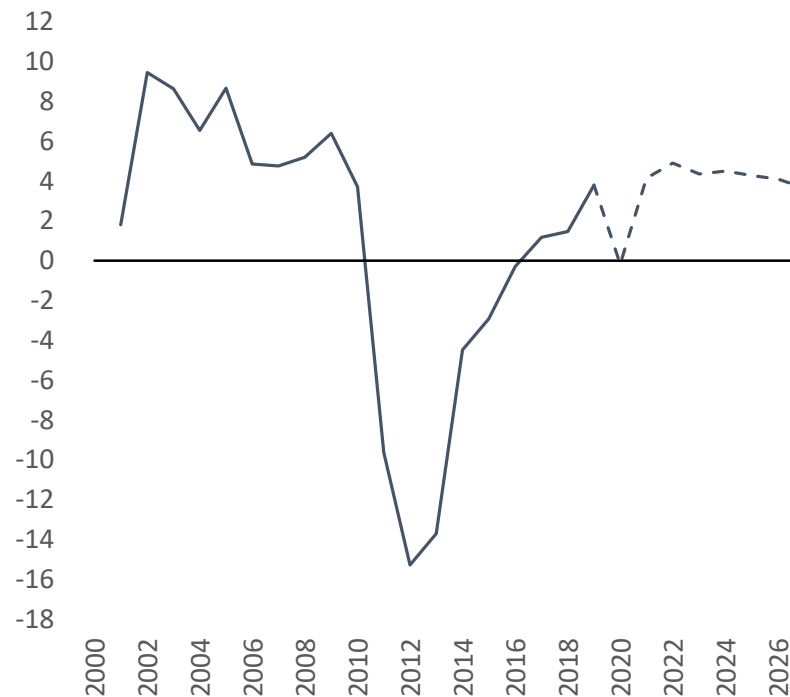
(III.b) Maximum Borrowing Capacity approach: Model Inputs



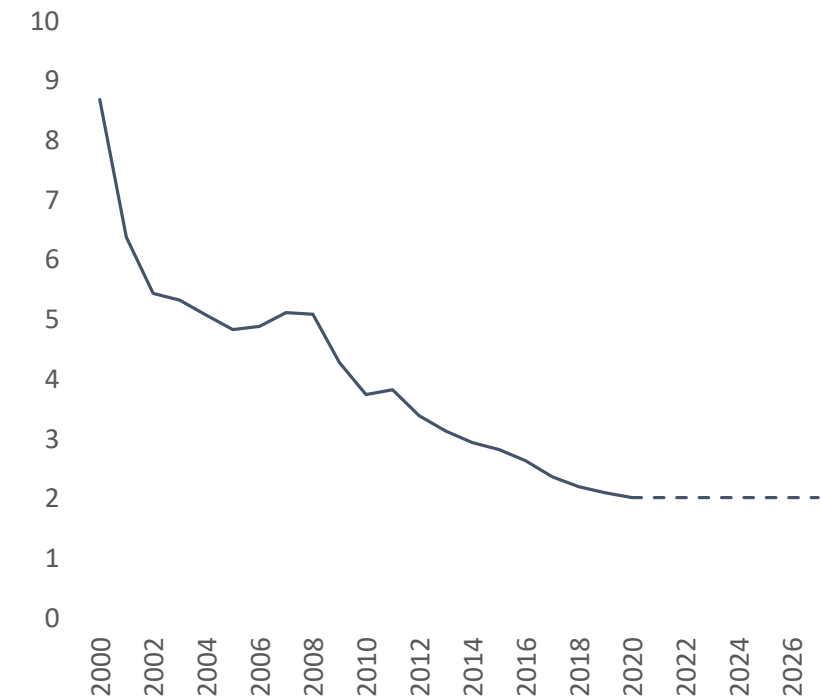
Inputs to the Model

House Size (H): 80 sq. meters
Loan Maturity (N): 20 years
Loan to Value (φ): 70%
Debt Service to Income (α): 35%

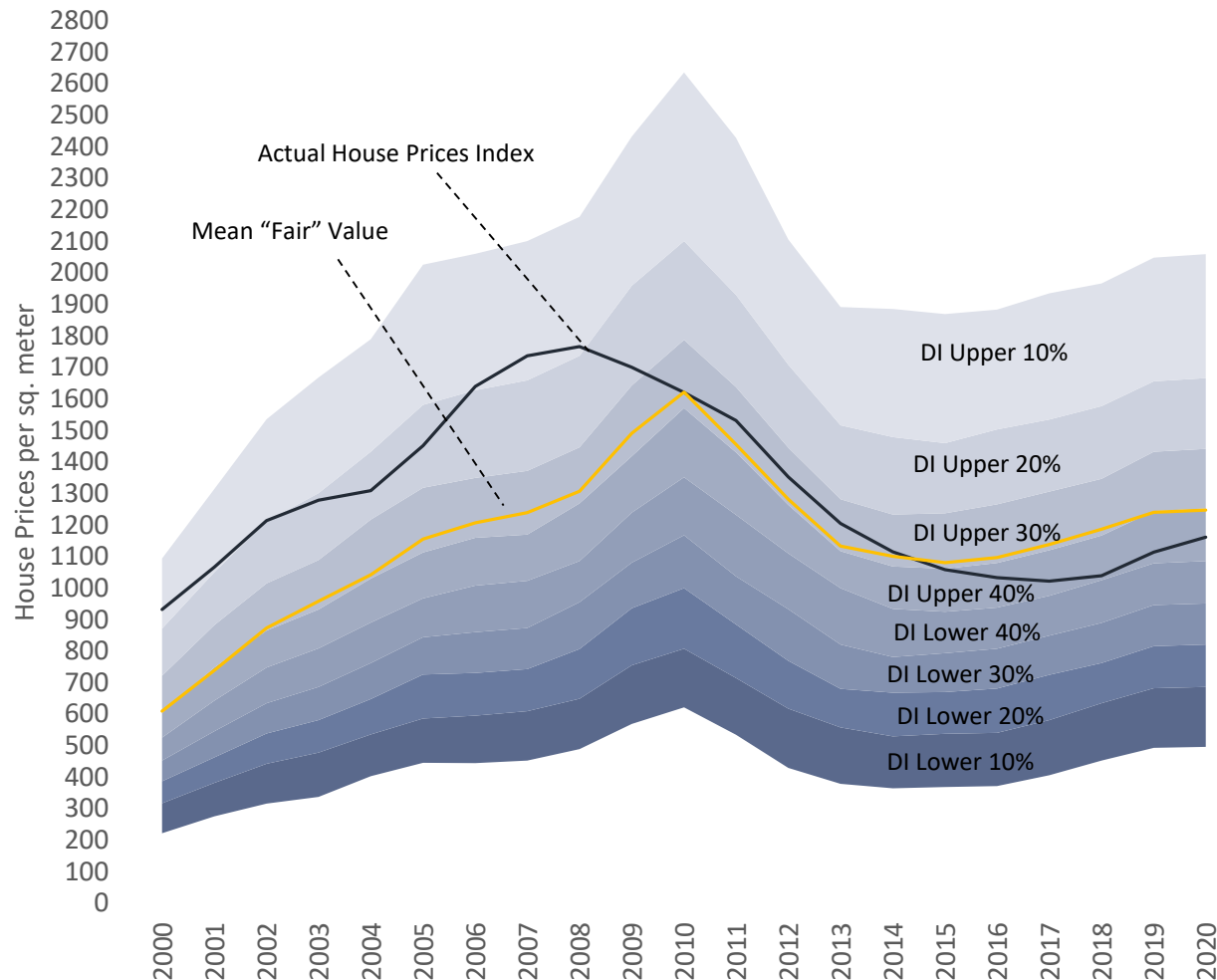
Household Disposable Income
(% growth rate)



Mortgage rates
(%)



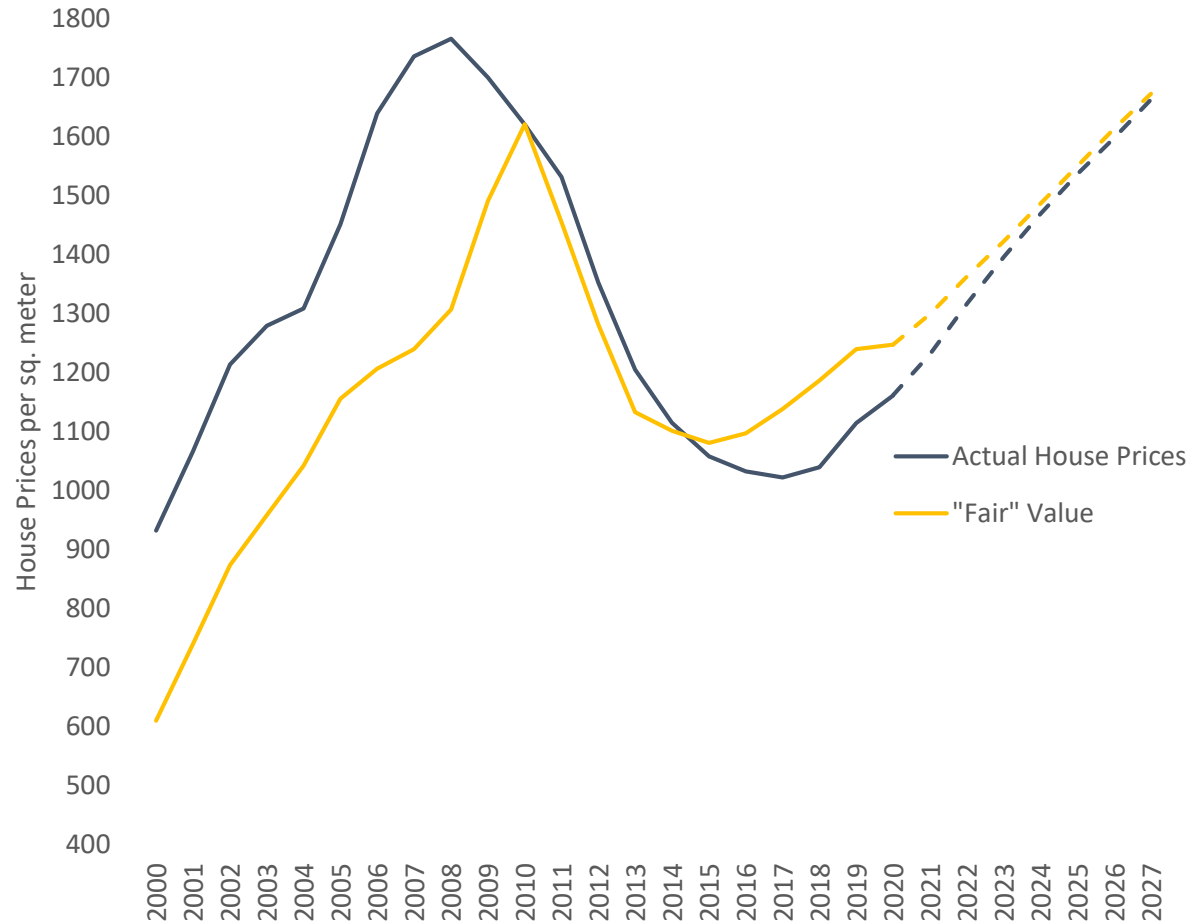
(IV) Maximum Borrowing Capacity Model: Estimation Results



Highlights

- ✓ From 2000 to 2010, Greek residential real estate prices were easily affordable only for households in the upper 20% & 10% of decile of disposable income level. Conversely, they were overvalued by 12-35% for middle class income levels.
- ✓ Model valuations based on mean disposable income show that house prices were undervalued by 11% in 2019 and 7.3% in 2020.
- ✓ For households with disposable income in the upper 30% of the income distribution the undervaluation is even more pronounced at 28% in 2019 and 24% in 2020.

(V) Maximum Borrowing Capacity Model: Forecasts



Highlights

- ✓ According to our projections for household disposable income growth and the expected evolution of mortgage rates for the next 7 years we anticipate house prices to increase by 4.9% per annum reaching pre-debt-crisis levels no sooner than 2027.



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(I) A simple Affordability Assessment approach:

Commercial Affordability Ratio, $CRAR_{2010}$ (2010 = 100)

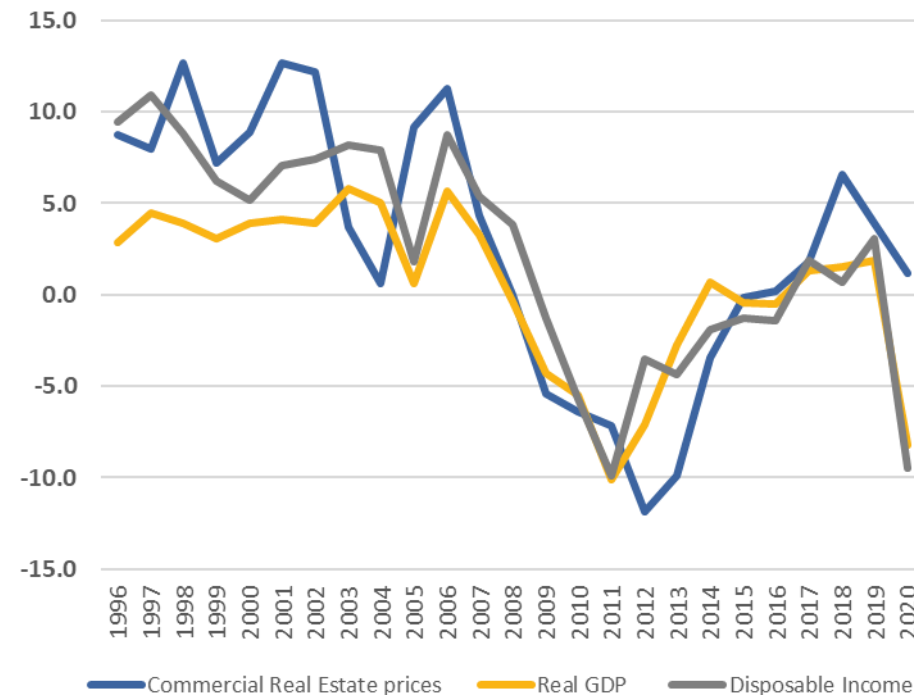


$$CRAR_t^{2010} = 100 \times \frac{\frac{CRP_t}{DI_t}}{\frac{CRP_{t=2010}}{DI_{t=2010}}}$$

* Office price index

1995 – 2010 data: Piraeus Bank estimate

**Commercial Real Estate Price Index* (annual % change)
vs Real GDP (annual % change) &
Disposable Income (current prices, annual % change)**



Where: DI: Disposable Income, current prices at time t

CRP: Commercial price at time t

$DI_{t=2010}$: Disposable Income, current prices at base year 2010

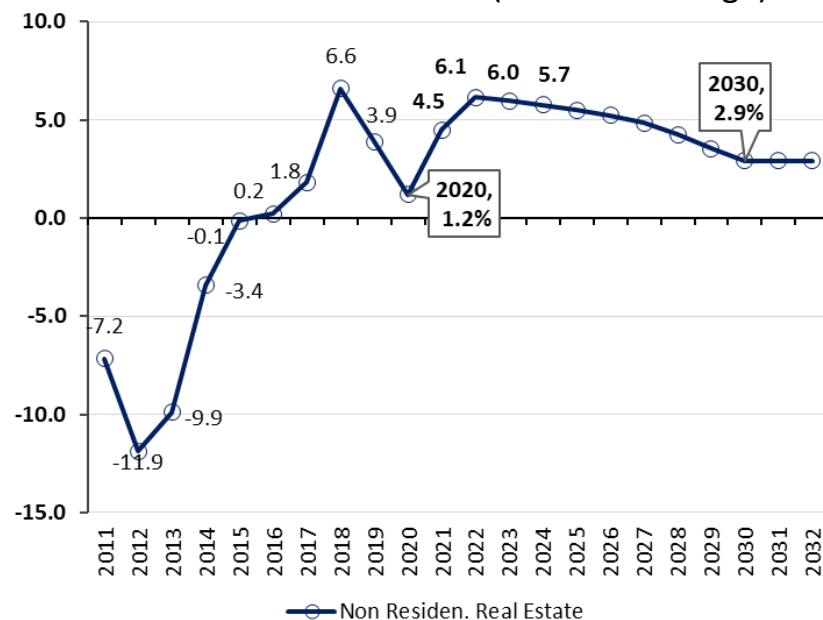
$CRP_{t=2010}$: Commercial price at base year 2010

(II) Non-Residential Real Estate Outlook: +4.5% in 2021, +6.1% in 2022

Main Assumptions

- ✓ CRE increased by 1.2% in 2020
- ✓ GDP to increase by 6.6% in 2021
- ✓ Convergence to a steady state level by 2030.

Non Residential Real Estate (annual % change)

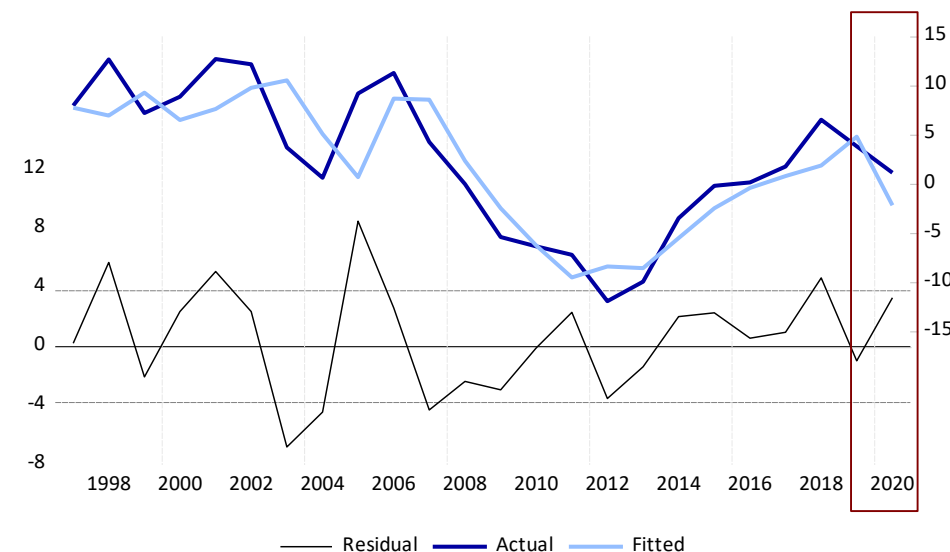


Dependent Variable: CRE_GRWTH
 Method: Least Squares
 Sample (adjusted): 1997 2020
 Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP_GRWTH_BL	0.568268	0.238041	2.387269	0.0260
CRE_GRWTH(-1)	0.596018	0.136547	4.364934	0.0002
Root MSE	3.630788	R-squared		0.735839
Mean dependent var	2.535217	Adjusted R-squared		0.723832
S.D. dependent var	7.216198	S.E. of regression		3.792234
Akaike info criterion	5.583443	Sum squared resid		316.3829
Schwarz criterion	5.681614	Log likelihood		-65.00132
Hannan-Quinn criter.	5.609488	Durbin-Watson stat		1.900030

	CRE growth	Real GDP growth rate
2020	1.2%	-7.8%*
2021	4.5%	6.6%
2022	6.1%	6.1%
2023	6.0%	4.1%
2024	5.7%	3.8%

* Based on the average of the quarterly annual seasonally adjusted growth rates





Economic Research & Investment Strategy

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