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ECONOMIC POLICY UNCERTAINTY AND HOUSING INVESTMENTS: AN EMPIRICAL VAR ANALYSIS FOR THE EURO AREA (EA-19)

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ABSTRACT

The housing sector is considered one of the key factors of macroeconomic fluctuations. Consequently, analyzing the scale of housing investments within economies and identifying the primary drivers influencing these investments is of major importance. Since one of the variables determining investments is uncertainty, and housing investments are affected by uncertainty, it is important to determine to what extent uncertainty has an impact on housing investments. While many studies have examined the effect of uncertainty on housing prices and returns, the effect on housing investments has rarely been discussed. The dynamic impact of Economic Policy Uncertainty (EPU) on housing investments remains nearly unmentioned in the Euro Area-19 (EA-19). According to Real Options Theory, uncertainty leads to investment delays. If this relationship holds for the housing market, new construction investments should fluctuate in response to uncertainty, meaning that dwellings, which can serve as a proxy indicator for housing investments, may be affected by uncertainty. Therefore, this study investigates the relationship between the Europe-wide EPU Index and the EA-19 Dwellings Index by using monthly data (1994 M2–2023 M8). In the literature, this study is the first article to investigate the dynamic relationship between EPU and housing investments for EA-19 by performing Vector Autoregression (VAR) analysis. Based on the VAR analysis, the EPU index produces virtually no statistically significant effect on the dwellings index in the EA-19, although a unidirectional Granger causality from EPU to housing investment is detected. Based on this result, it is also possible to claim that political uncertainties in the EA-19 may not be one of the reasons for economic fluctuations due to housing investments. This study contributes to further research in this field, as it is the first study analyzing the effect of EPU on housing investments in the EA-19.

Keywords: economic policy uncertainty, housing investments, EU housing market, Vector Autoregression (VAR), Real Options Theory

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INTRODUCTION

The housing sector is one of the determinants of macroeconomic fluctuations thanks to its large employment share and significant share in total investments. Since housing production affects many sub-sectors related to it, supply and demand channels in these sectors are also affected. For this reason, housing production affects the economy in general.

Housing investments differ from fixed capital investments due to their long-lasting production and capital commitments that are difficult to return. Investment decisions in the economy can be exposed to changes in expectations and uncertainty. Therefore, housing investments are also affected by expectation changes and uncertainties.

How economic uncertainty influences housing investment decisions remains an intriguing question for both theory and policy. One of the theories that deals with the relationship between economic uncertainties and investments is the "Real Option Theory." Real Options Theory claims that when uncertainty increases in the economy, investors, who cannot give up investing, prefer to wait and see the market conditions instead of starting to invest. According to Real Options Theory, uncertainty leads to investment

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delays. If this relationship holds for the housing market, new construction investments should fluctuate in response to uncertainty, meaning that dwellings, which can represent housing investments as a proxy indicator, may be affected. Thus, housing permits, or dwellings, can be an important variable to examine how uncertainty affects housing investments.

The connection between uncertainty and total investments has been extensively examined in the economic literature. Increased investors' motivation and confidence in the economy facilitate access to capital resources and boost investment (Bezverkhyi et al., 2025). During periods of economic uncertainty, this motivation and confidence decrease, making access to capital more difficult and leading to a decline in investment. However, studies on the relationship between uncertainty and housing investments are less common.

Especially considering the differences between countries and institutions, how uncertainty affects housing investments and the magnitude of these effects are still controversial. These controversial questions require additional empirical studies regarding uncertainty and the housing market.

This study extends the literature by presenting empirical evidence on the relationship between EPU and housing investment in the EA-19, which has received limited attention so far, unlike most previous studies that have focused on investments and housing prices or real estate returns.

LITERATURE REVIEW

Theoretical Background

Economic Policy Uncertainty and Its Relation to Economics

In the economic literature, the concept of uncertainty refers to incalculable situations or situations whose probabilities are unknown. When uncertainty increases rapidly, firms temporarily halt their investment and employment plans or reduce their capacity, leading to a sudden decline in economic activity and production (Bloom, 2009). For this reason, the concept of uncertainty has been used in many studies as an independent variable in explaining many macroeconomic fluctuations such as investment and production.

Economic Policy Uncertainty (EPU), on the other hand, is like a subset of general uncertainty. EPU is a concept developed to measure the effects of future unpredictability of government policies on economic decision-making processes. To measure this uncertainty, the EPU index was developed by Baker et al. (2016). An increase in the EPU refers to the inability of economic actors to predict the direction and consequences of regulatory government actions in monetary, fiscal, and trade matters. Therefore, this situation indicates that the direction of economic decisions such as tax regulations, monetary policy, and government expenditures determined by governments cannot be clearly predicted (Baker et al., 2016; Higgs, 1997). The uncertainty set by the EPU and how it affects the economy is influenced by administrations or judicial decisions. An increase in EPU may cause companies and households to postpone spending and investments (Baker et al., 2016). Therefore, EPU increases are expected to reduce fixed capital investments.

In this context, it can be expected that the macroeconomic effects of the EPU will also occur through firm investments. According to the Real Options Theory in the economic literature, in times of uncertainty or periods of high uncertainty, companies can delay large-scale investments by applying a wait-and-see strategy to avoid the risk of making mistakes (Bernanke, 1983; Dixit and Pindyck, 1994). Therefore, they can postpone their investment decisions. Using firm-level data, Baker et al. (2016) claimed that increases in policy uncertainty reduce investment and employment in policy-sensitive sectors such as defence, health and infrastructure.

Exchange rates can also be significantly influenced by EPU dynamics. Krol (2014), in his analysis for ten developed and developing economies, showed that policy uncertainty has a stronger impact on exchange rate volatility compared to economic uncertainty.

If the theoretical relationship revealed by the Real Option Theory exists in economies, it would not be wrong to say that the EPU can directly affect investments and indirectly affect them through the exchange rate. For this reason, it is also possible to say that changes in the EPU index may also affect housing investments.

Housing Market, Housing Investments and Their Relation with EPU

The housing market refers to a market mechanism through which homes are bought, sold, rented, and priced. The price dynamics in this market are determined by housing supply, housing demand, and existing housing stock. These compo-

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nents are shaped by mortgage interest rates, household income, demographics, credit conditions, and speculative expectations. Housing investment represents the real dynamics on the supply side of this market. Price expectations, demand signals, and especially uncertainties also determine housing investment decisions. Housing investments are particularly sensitive to the EPU as a durable and mostly irreversible form of capital formation.

Real Option Theory (Aye, 2018) provides a theoretical basis for this sensitivity. According to this theory, when uncertainty rises, the option value of waiting increases. This situation leads households to postpone construction and purchasing decisions until the uncertainty disappears. Consequently, enterprises and real estate developers tend to delay their physical investments to obtain clearer market signals and avoid unrecoverable sunk costs (Nguyen and Vergara-Alert, 2023; Aye, 2018). The transmission of this uncertainty into the housing sector operates through distinct channels affecting both supply and demand. From a supply-side perspective, the real options theory claims that when policy uncertainty is increased, developers and construction firms are encouraged to postpone irreversible and capital-intensive real estate projects (Choudhry, 2020; Durmaz and Sun, 2025). Firms seek clearer regulatory and economic signals before committing to new housing developments, which inevitably restricts the overall housing supply (Nguyen and Vergara-Alert, 2023; Durmaz and Sun, 2025).

This structural postponement of economic activity in the housing market reduces supply in the housing market. Furthermore, when there is an increase in the EPU, banks may contract the supply of credit as they reassess collateral risk, reducing household consumption and borrowing appetite and increasing the risk premium integrated into mortgage rates.

Simultaneously, EPU heavily impacts the demand side of the housing market. Income shocks and fluctuating credit conditions stemming from unpredictable economic policies lead to high volatility in asset pricing (Andre et al., 2017; Aye et al., 2019).

Under these uncertain conditions, risk-averse households are inclined to delay their consumption of durable, high-cost goods, thereby dampening aggregate housing demand (Choudhry, 2020; Houari, 2025). Also, on the demand side, households facing unpredictable future income, fluctuating mortgage interest rates, or shifting tax policies tend to increase their prudential savings. Furthermore, persistent policy uncertainty can alter the behavior of market participants by reducing house price supply elasticity, which further distorts market equilibrium and affordability (El-Montasser et al., 2016; Choudhry, 2020; Durmaz and Sun, 2025).

These mechanisms collectively claim that housing investment should exhibit a pronounced and persistent negative response to EPU shocks, a hypothesis that has received growing empirical support in both advanced and emerging economies.

During periods of institutional or macroeconomic uncertainty, real estate is frequently perceived as a stable, safe-haven asset compared to volatile financial instruments. Therefore, while EPU inherently inhibits supply-side housing investments, its ultimate impact on long-term price dynamics is determined by deferred consumer demand, restricted housing supply, and the safe-haven appeal of residential property.

Based on two different views, the impact of EPU on housing investments is theoretically uncertain. Empirical findings provide evidence regarding both the postponement of housing investments and their increase for hedging purposes. Therefore, understanding how the EPU shapes housing investment decisions in this situation is an important inquiry in terms of understanding the impact of financial stability and macroprudential instruments on the economy and in terms of policy implementations.

EPU and Its Effects on Housing Markets in the EU

The EU housing market has undergone significant structural shifts, shaped by the interplay of macroeconomic conditions, regulatory reforms, and persistent supply-side constraints. Although EPU has attracted growing interest in macroeconomic research, predicting both the scope and the downstream effects of policy interventions remains difficult (Wu et al., 2016; Gülcan, 2022).

Within the specific context of the European Union, the dynamics between EPU and the housing market are uniquely complex due to diverse regional regulations and the overarching monetary policies of the European Central Bank (ECB). While heightened economic uncertainty generally depresses real economic activity, European real estate often exhibits a dual nature as both a consumption good and an investment asset (Druică et al., 2015). Institutional funds and private investors may shift capital away from volatile stock or bond markets into tangible real estate, paradoxically sustaining or even driving up housing prices in core EU economies despite the broader macroeconomic ambiguity (El-Montasser et al., 2016; Jackson and Orr, 2019). Furthermore, distinct differences persist across the continent; while Northern European nations often experience price resilience driven by solid economies and structural supply constraints, Southern European markets tend to exhibit higher sensitivity and volatility in response to policy shocks (Durmaz et al., 2025).

The transmission of EPU into housing markets operates through several interrelated channels that are particularly salient in the European context. First, on the demand side, elevated uncertainty dampens household confidence and triggers precautionary savings behavior, postponing home purchase decisions and weakening mortgage origination volumes (El-Montasser et al., 2016; Choudhry, 2020). Second, on the supply side, construction firms facing uncertain future demand and volatile input costs delay project initiations, which in turn reduces residential investment and tightens housing supply over the medium term (El-Montasser et al., 2016). Third, through the financial channel, EPU widens risk premia in mortgage markets, tightens bank lending standards, and amplifies the sensitivity of housing credit to monetary policy shocks — a mechanism of particular relevance in the bank-based financial systems that dominate continental Europe (El-Montasser et al., 2016; Houari, 2025).

However, recent empirical literature highlights that the relationship between EPU and housing dynamics — particularly among EU economies — is highly interdependent (Durmaz et al., 2025). While heightened uncertainty generally exerts a negative short-term effect on construction volumes and housing transactions due to the delay mechanism, housing is uniquely positioned as both a consumable and investable asset.

Empirical evidence from EU economies confirms the heterogeneity of these effects across countries and housing market segments. Studies on core Eurozone economies such as Germany, France, and the Netherlands tend to find moderate but statistically significant negative responses of house prices and residential investment to EPU shocks, often attributed to relatively resilient labor markets and well-developed mortgage institutions (El-Montasser et al., 2016; Su et al., 2016). In contrast, peripheral economies — including Greece, Italy, Spain, and Portugal — exhibit sharper and more persistent contractions, reflecting legacies of the sovereign debt crisis, higher mortgage default risk, and weaker banking sector balance sheets (El-Montasser et al., 2016; Durmaz et al., 2025). Central and Eastern European member states present a third pattern, where EPU shocks interact with exchange-rate volatility and foreign-currency mortgage exposure to produce nonlinear effects on housing demand (Égert and Mihaljek, 2007).

In sum, EU housing markets are sensitive to EPU, though institutional and regional differences mediate market-specific outcomes. The influence of uncertainty shows up in both investment behavior and housing affordability trends (El-Montasser et al., 2016; Su et al., 2016).

Related Literature

The following review covers the empirical literature on EPU and housing market dynamics, with attention to how uncertainty shocks affect housing prices, investment, and transaction volumes across countries and institutional contexts. Beyond structural transformation, a separate line of research examines how economic and political uncertainty affects housing markets. Uncertainty can operate through several channels: investment decisions, credit conditions, and expectations about future economic conditions. Through these channels, uncertainty shocks can affect housing prices, investment activity, transaction volumes, and mortgage lending.

Real options theory provides a theoretical anchor for the EPU–housing investment relationship. Miles (2009) tests this framework with U.S. quarterly data from 1975 to 2006, using a GARCH-in-Mean model where uncertainty is the conditional variance of unpredicted innovations in housing starts. The results show a statistically significant negative effect of uncertainty on housing starts, consistent with the real options prediction that investors delay irreversible commitments when uncertainty is high. Completions, by contrast, are unaffected by uncertainty, which fits the fact that projects already underway are almost always finished. These results confirm that the uncertainty–investment channel operates primarily at the pre-construction stage, which is closely related to the housing investment indicators examined in the present study.

Bulan et al. (2009) complement this with micro-level evidence from 1,214 condominium projects in Vancouver, Canada (1979–1998). Using a hazard model with a GARCH-based measure of neighborhood-level return volatility, they find that a one-standard-deviation rise in idiosyncratic volatility reduces the probability of investment by 13% — roughly equivalent to a 9% fall in real prices. Market-level systematic risk has a similarly negative effect on development timing. An important finding is that competition weakens the option value of delaying, so the negative uncertainty–investment relationship is less pronounced in more competitive markets. These results support the real options framework at the project level and show that uncertainty affects housing investment through the decisions of individual developers, not only through aggregate dynamics.

Antonakakis et al. (2015) examine the dynamic relationship between EPU and housing market returns in the US using monthly data for the period 1987–2014. The study employs a Dynamic Conditional Correlation–GARCH (DCC-GARCH)

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model to capture the time-varying correlation between EPU and housing market returns while controlling for macroeconomic variables such as industrial production, inflation, the federal funds rate, and financial market volatility (VIX). The results reveal a negative and time-varying relationship between EPU and housing market returns. This relationship becomes particularly pronounced during periods of economic distress, including the global financial crisis. The findings suggest that increases in policy uncertainty raise downside risks in the housing market and can contribute to heightened volatility in real estate returns.

Gupta et al. (2016) study international uncertainty linkages using EPU indices for Canada and seven other countries (China, France, Germany, Japan, Russia, the UK, and the US) over 1997–2015. Applying a Bayesian Additive Regression Trees (BART) algorithm, they document significant and partly nonlinear cross-border spillovers in EPU. The UK and the US emerge as the main transmitters of uncertainty to Canada, with relative importance estimates of about 21 and 19 percent. For the EU, this finding matters because France and Germany are among the key nodes in the international uncertainty network. It suggests that EU-level EPU measures may partly capture global uncertainty dynamics rather than purely domestic policy developments — something to bear in mind when interpreting VAR results in multi-country settings.

Antonakakis and Floros (2016) study the dynamic interdependencies among the housing market, stock market, EPU, and macroeconomic variables in the UK with monthly data from January 1997 to February 2015. Using the spillover index within a VAR framework with rolling windows, they trace both static and time-varying directional spillovers. EPU shocks reduce housing market returns, while housing market shocks feed through to industrial production, inflation, and monetary policy. Total spillovers peak during the global financial crisis and major geopolitical episodes, which suggests that EPU–housing market interconnections intensify during systemic stress. Generalized impulse response functions confirm that a one-standard-deviation EPU increase produces a statistically significant and persistent drop in real housing returns. For EU-focused research, this study is relevant because its spillover framework goes beyond simple bivariate EPU–housing models and captures the broader macroeconomic channels through which uncertainty reaches the housing sector.

Su et al. (2016) examine the causal relationship between EPU and housing returns in Germany, using monthly data from 1997.01 to 2014.08. Employing bootstrap rolling window causality tests within a VAR framework, the authors analyze the time-varying link between the two variables. Findings indicate that EPU does not significantly affect housing returns in Germany, reflecting the market's institutional stability and strong rental sector. Conversely, housing returns do affect EPU during certain sub-periods, particularly around the Russian financial crisis (1999–2000) and the global financial crisis (2008–2009). These effects vary in direction, suggesting that housing market fluctuations sometimes amplify policy uncertainty. Overall, the study highlights Germany's unique case where the housing market's structural stability limits the influence of EPU, but housing shocks can feedback into policy uncertainty during crises.

El-Montasser et al. (2016), analyzing a panel of 7 advanced economies with quarterly data from 2001Q1 to 2013Q1, apply a bootstrap panel causality test. Evidence suggests bidirectional causality between housing prices and EPU across countries. At the country level, a bi-directional relationship is observed in France and Spain, whereas a one-directional effect runs from EPU to housing prices in Germany, Italy and Canada, and from housing prices to EPU in the U.K. and the U.S. A related strand of work focuses on causality. El-Montasser et al. (2016) apply bootstrap panel causality tests to 7 advanced economies and find both bidirectional and unidirectional causality between EPU and housing prices, depending on the country.

Chow et al. (2017), studying China and India with linear and nonlinear panel Granger causality tests, report unidirectional linear causality from EPU to housing returns in China, while nonlinear tests point to bidirectional causality in both countries.

Christidou and Fountas (2017), using quarterly data for 48 U.S. states from 1988 to 2012, apply a bivariate GARCH (BEKK) model and the EPU index to analyze the effects of uncertainty on housing investment and house price inflation. Results indicate that uncertainty generally increases housing investment growth while reducing house price inflation. However, effects vary across states, with speculative housing markets showing positive investment responses to uncertainty.

André et al. (2017) test the predictive power of EPU for U.S. housing returns and volatility with monthly data from 1953 to 2014. Using nonparametric Granger causality tests, they find that EPU predicts both real housing returns and their volatility, indicating that EPU is a relevant factor for both the level and the riskiness of real estate returns.

Chow et al. (2017), focusing on China and India with quarterly data from 2003Q1 to 2012Q4, apply both linear and nonlinear panel Granger causality tests. Results show unidirectional linear causality from EPU to housing returns in China, while nonlinear tests detect bidirectional causality in both China and India. These findings highlight the stronger EPU-housing linkages during the post-2008 crisis period.

Aye (2018) uses quarterly data from about 1990 to 2016 to investigate the causal relationship between EPU and housing market returns in eight rising economies: BRICS and Chile, Ireland, and South Korea. The study applies the CSV and causality approach, which avoids the limitations of conventional in-sample and out-of-sample splitting procedures. The full-sample results indicate that EPU Granger-causes real housing returns only in Chile and China. However, rolling-window estimations reveal that the relationship between EPU and housing returns is time-varying across most countries in the sample. These findings suggest that the influence of policy uncertainty on housing markets depends on institutional structures, credit market development, and macroeconomic conditions in different economies.

Aye (2018) adds to this by analyzing EPU and real housing returns in eight emerging economies with a Cross-Sample Validation Granger causality approach. EPU Granger-causes housing returns in some countries, though the relationship is time-varying and differs across economies. Collectively, these findings indicate that uncertainty reaches housing markets through expectations, investment decisions, and financial conditions.

Aye et al. (2019) take a different approach, examining how EPU affects the duration of housing market cycles in 12 OECD countries using quarterly data from 1985 to 2012. Instead of focusing on prices or returns, they use a discrete-time hazard (complementary log-log) model to estimate how EPU changes the probability of exiting boom, bust, and normal phases in the housing cycle. Greater economic uncertainty raises the likelihood of leaving housing downturns, which suggests that housing can serve as a hedge during uncertain periods—consistent with portfolio reallocation toward real estate when other asset classes become riskier. The effects are stronger in European countries than in non-European economies. This work shows that EPU's influence on housing markets extends beyond price levels and returns to the cyclical dynamics of market phases, an aspect that has received less empirical attention.

Alola and Uzuner (2020) examined 15 countries from 1997 to 2015 using ARDL and Dumitrescu–Hurlin panel causality tests. They analyzed the relationship between housing prices, agricultural land, and the Global EPU (GEPU) index. Findings show that agricultural land and housing prices are negatively related in the long run: a 1% increase in agricultural land reduces housing prices by 3.97%. GEPU has a negative long-run effect on housing prices (−0.67%) but a positive short-run effect. Causality results reveal feedback between agricultural land and housing prices, as well as unidirectional causality from GEPU to housing prices. These results highlight the long-run trade-off between land use for agriculture and housing demand, alongside the role of global uncertainty in shaping short-term housing price volatility.

Choudhry (2020) examines the EPU–house price relationship at the regional level, using quarterly data (1975–2017) for 10 regions of England and Wales. An ARDL bounds testing approach estimates an inverted housing demand model with EPU alongside real income and real interest rates. A stable long-run cointegrating relationship between house prices and EPU holds in nine of the ten regions. Both short-run and long-run EPU coefficients are statistically significant and mostly negative, with elasticities ranging from 0.01 to 1.50 and peaking in southern England. At five to six quarter lags, EPU has a positive short-run effect, which may reflect portfolio reallocation toward housing as a store of value during prolonged uncertainty. For EU-wide analyses, this finding is important: the EPU–housing relationship varies systematically across regions with different institutional settings, market structures, and degrees of financial integration, which complicates analyses that aggregate over heterogeneous national markets.

Huang et al. (2020), using monthly data for China from 2006 to 2016, employ quantile regression and robustness tests to assess EPU's effect on housing markets. Findings indicate that EPU negatively affects housing prices and returns, while variations in EPU raise housing risk premiums. Specifically, low-amplitude housing price changes are affected by EPU variations, whereas high-amplitude fluctuations are driven by the level of EPU.

Balcilar et al. (2021) analyzed 16 countries between 2004Q2–2018Q4 using a panel vector autoregressive (PVAR) model estimated with Generalized Method of Moments (GMM). Results indicate that positive shocks to EPU significantly decrease housing price returns for about two to eight quarters. Granger causality tests revealed strong unidirectional causality from EPU to housing prices, but not the reverse. EPU was also found to negatively affect GDP growth, but housing prices did not significantly feedback into EPU. The study concludes that EPU is a strong predictor of housing market dynamics, confirming its role as a risk factor for real estate markets.

Yin et al. (2021) assess whether EPU and its components predict China's housing returns over 2005–2019. Using a flexible generalised least squares estimator augmented with structural breaks and asymmetry, they show that EPU-based models outperform the traditional housing-returns model in both in-sample and out-of-sample forecasts. Decomposing the index, they find that monetary policy uncertainty has the strongest predictive power for first-tier cities, whereas fiscal policy uncertainty dominates in the country as a whole and in second- and third-tier cities.

Nguyen and Vergara-Alert (2023) used U.S. gubernatorial elections between 1982 and 2018 as a natural experiment to study the effects of political uncertainty on housing and mortgage markets. The study applied panel OLS regressions,

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multi-period difference-in-differences, and border-county/state identification strategies. Results show that during election years, there was a decline in house price growth, a fall in housing transactions, and an increase in building permits. Effects were stronger in closely contested elections. Mortgage demand and supply also declined during election years, indicating that political uncertainty reduces both housing investment activity and mortgage lending.

Fan et al. (2023) study house-price volatility in the G7 economies between 1998 and 2021 using a GARCH-MIDAS framework. They report a significant relationship between EPU and house-price volatility, with EPU acting as a meaningful determinant of volatility and improving out-of-sample predictive performance relative to benchmark specifications. The study underscores the relevance of policy uncertainty as a risk driver even in mature, developed housing markets.

Wang (2023) investigates the multiscale impact of EPU on housing-market spillovers across Chinese cities over 2006–2021, comparing a conventional news-based index with an unobservable EPU measure constructed from forecast errors. Spillovers are found to be driven mainly by economically developed cities, and the unobservable measure carries greater explanatory power for total spillovers. At longer time horizons, however, smaller cities are more sensitive to the news-based index, indicating that the measured effect of uncertainty depends on both the city tier and the frequency considered.

Qu and Md Kassim (2023) examine the investment margin directly, analyzing Shanghai and Shenzhen A-share listed real estate companies from 2012 to 2022 with fixed-effects regressions grounded in real options, financial-friction, and real-estate-characteristics theories. They find that stronger EPU raises the investment level of real estate corporations, and that house-price fluctuations play a mediating role in this positive effect. This investment-focused, firm-level evidence is particularly relevant to the present study because it speaks to quantity-side responses rather than valuation effects.

Ahiadu et al. (2024) turn to commercial property, estimating reduced-form VAR models for Australian office, retail, and industrial sectors with quarterly data from 2001 to 2022. They find an inverse relationship between uncertainty and commercial property performance, with rents reacting more strongly and persistently than capital values, which show only minimal responses and little long-term persistence. This separation of valuation from quantity responses echoes the distinction at the heart of the present analysis.

Baek et al. (2024) study the United States over 1987–2020 using a logistic smooth-transition VAR (LSTVAR) with short-run restrictions. Real estate uncertainty shocks reduce housing prices, housing starts, and construction-sector employment, and these effects are markedly stronger and more persistent during recessions than in standard linear VAR. Favorable financial conditions dampen the responses, pointing to a regime-dependent transmission of uncertainty that is directly relevant to permit- and starts-based investment measures.

Durmaz and Sun (2025) examined the impact of EPU, income, and interest rates on housing prices in six Asia-Pacific countries (New Zealand, Australia, Japan, S. Korea, China, Singapore) using quarterly data from 1990 to 2022. The study applied ARDL bounds testing for cointegration. Findings indicate that EPU generally has positive effects on housing prices in the short and long time periods, especially in Japan and Korea (EPU increases of 1% led to 0.7%–8% increases in prices). By contrast, New Zealand showed a long-run negative effect (EPU rises reduced housing prices), while in Australia short-run effects were negative but long-run effects were positive. The study highlights country-specific differences in how EPU interacts with macroeconomic fundamentals to influence housing prices.

Sreenu (2025) documents the asymmetrical impact of EPU on property prices across Indian cities over 2000–2022. Positive and negative uncertainty shocks affect property prices with different magnitudes, revealing a state-dependent and nonlinear relationship that simple linear models would tend to obscure.

Guan et al. (2025) apply sub-sample rolling-window causality techniques to monthly Chinese data from 2000 to 2025. They find that EPU exerts both positive and negative effects on house prices and detect a feedback effect of house prices on EPU, implying a genuinely bidirectional and time-varying relationship rather than a stable, one-directional link.

Huang (2025) constructs an uncertainty factor and a business-cycle factor within a Markov-switching housing asset-pricing model for US state-level markets over roughly 2001–2022. The switching specification outperforms traditional linear frameworks in capturing housing risk premiums, especially for top- and middle-tier houses, and the high-impact regimes associated with the uncertainty factor coincide with the 2007–2009 housing crisis and the COVID-19 period.

Finally, Neiwert and Su (2026) analyze German residential house prices using monthly data from 2014 to mid-2025, estimating a VAR for house prices, EPU, and the bank lending rate and applying a bootstrap rolling-window Granger causality test after parameter-stability testing. In the full sample, house-price movements tend to precede changes in EPU rather than the reverse, but the direction of influence shifts around major disruptions such as Brexit, the COVID-19 pandemic, and recent energy- and interest-rate shocks, confirming the time-varying nature of the relationship.

Table 1 summarizes the key empirical studies examining the relationship between housing markets, structural transformation, and EPU.

Table 1. Literature summary.

Author(s)	Country / Sample	Methodology	Period	Main Findings
Bulan, Mayer and Somerville (2009)	Canada	Hazard model, GARCH	1979–1998	A standard-deviation increase in return volatility reduces the probability of investment by 13%. Competition reduced the option value to delay.
Miles (2009)	United States	GARCH-M	1975–2006	Uncertainty has a significant negative impact on housing starts, supporting real options theory. Completions show no sensitivity to uncertainty.
Antonakakis, Gupta and André (2015)	United States	DCC-GARCH	1987–2014	EPU has a negative and time-varying relationship with housing market returns.
Antonakakis and Floros (2016)	United Kingdom	VAR, Spillover index	1997–2015	EPU shocks significantly reduce housing market returns. Spillovers between EPU, housing, and the macroeconomy peak during the global financial crisis.
El-Montasser et al. (2016)	7 advanced economies	Bootstrap panel causality test	2001–2013	Evidence of both bidirectional and unidirectional causality between EPU and housing prices.
Gupta, Pierdzioch and Risse (2016)	Canada + 7 countries	BART algorithm	1997–2015	UK and US are the main exporters of EPU spillovers internationally. France and Germany also play significant roles in the EPU transmission network.
Su et al. (2016)	Germany	Bootstrap rolling-window VAR	1997–2014	EPU does not significantly affect housing returns, but housing returns affect EPU during crisis sub-periods (1999–2000, 2008–2009).
André et al. (2017)	United States	Nonparametric Granger causality	1953–2014	EPU predicts both real housing returns and their volatility, indicating relevance for level and riskiness of real estate returns.
Chow et al. (2017)	China and India	Linear and nonlinear panel Granger causality	2003–2012	Unidirectional linear causality from EPU to housing returns in China; nonlinear tests indicate bidirectional causality in both countries.
Christidou and Fountas (2017)	United States (48 states)	Bivariate GARCH (BEKK)	1988–2012	Uncertainty increases housing investment growth while reducing house price inflation; speculative markets show positive investment responses.
Aye (2018)	Emerging economies	Cross-Sample Validation Granger causality	1990–2016	The impact of policy uncertainty on housing returns is heterogeneous and time-varying across countries.
Aye, Clance and Gupta (2019)	12 OECD countries	Discrete-time hazard model (cloglog)	1985–2012	Higher uncertainty increases the probability of exiting housing busts, suggesting housing acts as a hedge against uncertainty. Effects are stronger in European countries.
Alola and Uzuner (2020)	15 countries	ARDL and Dumitrescu–Hurlin panel causality	1997–2015	GEPU has a negative long-run effect on housing prices but a positive short-run effect; unidirectional causality runs from GEPU to housing prices.
Choudhry (2020)	UK (10 regions)	ARDL bounds cointegration	1975–2017	EPU has a significant negative long-run effect on regional house prices across 9 of 10 regions. EPU elasticity is largest in southern England.
Huang et al. (2020)	China	Quantile regression	2006–2016	EPU negatively affects housing prices and increases risk premiums.
Balcilar et al. (2021)	16 countries	Panel VAR (GMM)	2004–2018	EPU negatively affects housing price returns and predicts housing market dynamics.
Yin et al. (2021)	China	Flexible GLS with breaks and asymmetry	2005–2019	EPU-augmented models outperform standard models in and out of sample; monetary policy uncertainty predicts first-tier cities best, fiscal policy uncertainty the rest.
Nguyen and Vergara-Alert (2023)	United States	Panel OLS and Difference-in-Differences	1982–2018	Political uncertainty reduces housing price growth and transaction volumes while affecting mortgage markets.
Fan et al. (2023)	G7 economies	GARCH-MIDAS	1998–2021	EPU is a significant determinant of house-price volatility and improves out-of-sample forecasts in developed economies.
Wang (2023)	China	Time-frequency spillover analysis	2006–2021	Housing-market spillovers are driven by developed cities; an unobservable EPU measure explains total spillovers better, while smaller cities react more to news-based EPU at long horizons.
Qu and Md Kassim (2023)	China (listed developers)	Fixed-effects panel regression	2012–2022	Stronger EPU raises the investment level of real estate corporations, with house prices acting as a mediating channel.
Ahiadu et al. (2024)	Australia (commercial)	Reduced-form VAR, impulse responses	2001–2022	Uncertainty is inversely related to commercial property performance; rents are more reactive than capital values, which respond only minimally.
Baek et al. (2024)	United States	Logistic smooth-transition VAR (LSTVAR)	1987–2020	Real estate uncertainty shocks reduce housing prices, starts, and construction employment, with stronger effects during recessions; favourable financial conditions dampen responses.
Durmaz and Sun (2025)	6 Asia-Pacific countries	ARDL bounds testing	1990–2022	EPU effects on housing prices are country-specific; mostly positive short- and long-term effects in Japan and Korea, negative long-run effect in New Zealand.
Sreenu (2025)	India (cities)	Asymmetric (NARDL-type) model	2000–2022	Positive and negative EPU shocks affect property prices with different magnitudes, indicating an asymmetric, state-dependent relationship.
Guan et al. (2025)	China	Sub-sample rolling-window causality	2000–2025	EPU has both positive and negative effects on house prices, and a feedback effect of house prices on EPU implies a bidirectional, time-varying relationship.
Huang (2025)	United States (states)	Markov-switching asset-pricing model	2001–2022	A regime-switching model with an uncertainty factor outperforms linear models; high-impact regimes coincide with the 2007–2009 crisis and COVID-19.
Neiwert and Su (2026)	Germany	Bootstrap rolling-window Granger causality (VAR)	2014–2025	In the full sample, house prices precede EPU, but the direction of causality is time-varying and shifts around Brexit, COVID-19, and energy- and interest-rate shocks.

Taken together, these studies show that economic and political uncertainty affects housing markets in ways that differ across countries and institutional settings. In the U.S., election-related uncertainty reduces price growth and transactions; in Asia-Pacific countries, the effects depend on local market structures. Panel evidence indicates that uncertainty shocks tend to destabilize housing markets in the short run, while their longer-run effects depend on income, interest rates, and land use constraints. The agricultural land nexus adds another dimension, pointing to the need for policies that balance food security and housing development when uncertainty is elevated.

Despite this body of evidence, several gaps remain. First, most studies analyze housing prices or real estate returns rather than housing investment activity. Second, there is limited empirical evidence on the dynamic interaction between economic

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policy uncertainty and housing investment indicators, particularly for the EU. Third, much of the existing work relies on panel approaches, while fewer studies use high-frequency time-series methods to trace uncertainty–housing investment dynamics. This article points out these shortcomings by examining the relationship between EPU and housing investment in the EU through a VAR framework with monthly data.

Having reviewed the theoretical framework and the available data, we now turn to an empirical analysis of whether the interaction between EPU and the dwellings index in the EU is consistent with theoretical expectations. Several existing studies examine this topic with various econometric approaches; their variables, methods, and findings are summarized below.

AIMS AND OBJECTIVES

The essential objective of this article is to investigate the dynamic interaction between EPU and housing investments across the EA-19 and to determine whether policy uncertainty significantly influences housing investment decisions.

The research is structured around a set of specific objectives, detailed as follows:

1. To investigate the effect of EPU on housing investment in the EA-19 using the dwellings index as a proxy.
2. To analyze the dynamic relationship between EPU and housing investment through a VAR framework.
3. To determine the direction of causality between EPU and housing investment by applying Granger causality analysis.
4. To evaluate the response of housing investment to uncertainty shocks using impulse-response functions.
5. To contribute to the empirical literature on uncertainty and housing markets in the EA-19.

METHODS

Empirical Analysis for the EA-19

Most of the mentioned studies, however, focus on housing prices or returns rather than investment indicators. Evidence on the dynamic interaction between EPU and housing investment activity using high-frequency time-series methods is limited, especially for the EA-19. This study addresses that gap by applying a VAR framework to monthly data on EPU and housing investment in the EA-19.

By examining housing investment indicators rather than prices and using a high-frequency VAR framework, the analysis produces new evidence on how uncertainty shocks affect housing investment dynamics in the EA-19.

Both theory and existing evidence suggest that housing investment can be affected by uncertainty. The question is to what extent. To examine this, the empirical analysis links housing investment, proxied by the dwellings index, to uncertainty as measured by the EPU index for the EA-19.

The construction-permits series is used as a proxy for housing investment because building permits capture the pre-construction decision margin at which investment commitments are made. A permit reflects a forward-looking and largely irreversible decision to commit resources to residential construction, and aggregate permit issuance therefore leads housing starts, completions, and realized residential investment. This property makes permits particularly suitable for testing the real-options mechanism, since the wait-and-see response to uncertainty operates precisely at the point of authorizing new construction rather than at later building or sale stages. Permit- and starts-based measures are widely employed as high-frequency indicators of housing investment activity (Bulan et al., 2009; Miles, 2009) and, unlike house prices, capture quantity-side investment behavior rather than valuation effects.

The analysis uses two variables: the EPU Index for Europe and the Construction Permits Issued: Dwellings and Residential Buildings Index for the Euro Area (19 countries), examined within a VAR framework. Monthly data are available from 1994M2 – the earliest date for which both series are recorded – through 2023M8, the most recent period with complete data. Table 2 provides details on the variables used. Two distinct geographic scopes are involved. The European EPU index captures Europe-wide policy uncertainty, whereas the dwellings (construction-permits) series is compiled for the Euro Area of 19 countries (EA-19). The EA-19 series therefore defines the empirical scope of the housing-investment dimension and serves as the proxy for the EA-19 housing-investment environment; accordingly, EA-19 denotes this empirical proxy throughout, while EU and Europe refer to the broader policy-uncertainty and institutional context.

Table 2. Variables' Explanations. Note: 1 - https://fred.stlouisfed.org/series/EUEPUINDXM Access: April 11, 2026; 2 - https://fred.stlouisfed.org/series/EA19ODCNPI03GPSAM Access: April 12, 2026.

Variables in Analysis	Explanation of Variables	Period Analyzed	Source of Info
EPU	Economic Policy Uncertainty Index for Europe (integers were used)	1994M2 – 2023M8	Fred Statistics1
Dwellings	Construction Permits of Dwellings and Residential Buildings for the Euro Area (19 Countries), Index March 1994=100	1994M2 – 2023M8	Fred Statistics2

The Vector Autoregression (VAR) model examines how random disturbances affect a set of interrelated variables over time. Since the variables included in a VAR model are required to be stationary, both the EPU and the dwellings time series must exhibit stationarity. Accordingly, the Augmented Dickey-Fuller (ADF) test results are shown in Table 3 to assess the stationarity of the time series. Table 3 reports the results of the ADF unit root test, indicating that both the LNEPU and LNDWELL series are stationary at the I(0) level.

Table 3. ADF Tests.

H0: LNEPU has a unit root				
Exogenous: Constant, Linear Trend				
Lag 1 (Defaul - based on SIC, maxlag=16)				
			t-Stat.c	Prob.*
ADF Test Statistic			-6.139405	0.0000
Critical values:	1% level		-3.984269	
	5% level		-3.422606	
	10% level		-3.134184	
*MacKinnon (1996) one-sided p-values.				
ADF Test Equation				
Variable (Dependent): D(LNEPU)				
Method: LS				
Adjusted Sample: 1994M04 2023M08				
After Adjustments Observations (Included): 353				
Variables	ß	Std. Error	t-Stat.	Prob.
LNEPU(-1)	-0.247758	0.040355	-6.139405	0.0000
D(LNEPU(-1))	-0.154254	0.052540	-2.935954	0.0035
C	1.063285	0.174749	6.084654	0.0000
@TREND("1994M02")	0.000911	0.000185	4.923804	0.0000
R2	0.168187	Mean dependent var		0.002795
Adjusted R2	0.161037	S.D. dependent var		0.240162
S.E. of regression	0.219976	AIC		-0.179329
Sum squared resid	16.88792	SIC		-0.135517
Log likelihood	35.65164	HQ		-0.161896
F-stat.	23.52185	DW stat		2.009222
Prob(F-stat.)	0.000000			
H0: LNDWELL has a unit root				
Exogenous: Constant, Linear Trend				
Lag: 0 (Default - based on SIC, maxlag=16)				
			t-Stat.	Prob.*
ADF Test Statistic			-20.28276	0.0000
Test critical values:	1% level		-3.984195	
	5% level		-3.422569	
	10% level		-3.134162	
*MacKinnon (1996) one-sided p-values.				
ADF Test Equation				
Variable (Dependent): D(LNDWELL)				
Method: LS				
Adjusted Sample: 1994M03 2023M08				
After Adjustments Observations (Included): 354				
Included observations: 354 after adjustments				
Variables	ß	Std. Error	t-Statistic	Prob.
LNDWELL(-1)	-1.079464	0.053221	-20.28276	0.0000
C	7.986013	0.396476	20.14248	0.0000
@TREND("1994M02")	0.000238	0.000232	1.026375	0.3054
R2	0.539608	Mean dependent var		-0.000127
Adjusted R2	0.536985	S.D. dependent var		0.655202
S.E. of regression	0.445834	AIC		1.230698
Sum squared resid	69.76750	SIC		1.263488
Log likelihood	-214.8335	HQ		1.243744
F-stat.	205.6968	DW stat		2.008817
Prob(F-stat.)	0.000000			

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In order to identify the optimal lag length of the model, selection criteria for lag were applied to identify the optimal lag length, which was determined to be lag level 4, as shown in Table 4.

Table 4. Selection criteria for lag.

Selection Criteria for Lag						
Variables (Endogenous): LNDWELL LNEPU						
Variables (Exogenous): C @TREND						
Sample Period: 1994M02 2023M08						
Observation (Included): 347						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-305.7556	NA	0.020437	1.785335	1.829707	1.803002
1	-182.1860	244.2901	0.010259	1.096173	1.184918*	1.131508*
2	-176.7086	10.76542	0.010172	1.087658	1.220776	1.140660
3	-175.7837	1.807149	0.010354	1.105382	1.282872	1.176052
4	-165.6373	19.70809*	0.009994*	1.069956*	1.291819	1.158293
5	-164.8419	1.535681	0.010181	1.088426	1.354662	1.194431
6	-161.6120	6.199161	0.010226	1.092865	1.403473	1.216537
7	-159.9423	3.185571	0.010365	1.106295	1.461276	1.247635
8	-159.3074	1.203846	0.010569	1.125691	1.525045	1.284698
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

The Diagnostics of the VAR model

Regarding the heteroskedasticity and serial correlation, the diagnostics of the model were made respectively. The associated test results concerning heteroskedasticity are presented in Table 5.

Table 5. Test of Heteroskedasticity.

Test of Heteroskedasticity (Levels and Squares)					
Time Period: 1994M02 2023M08					
Observations (Included): 351					
Joint test:					
Chi2	df	Prob.			
52.55323	54	0.5303			
Individual components:					
Dependent	R2	F(18,332)	Prob.	Chi2(18)	Prob.
res1*res1	0.061404	1.206659	0.2530	21.55284	0.2524
res2*res2	0.060536	1.188497	0.2681	21.24808	0.2671
res2*res1	0.058253	1.140909	0.3107	20.44687	0.3082

The Heteroskedasticity Test results show no significant heteroskedasticity, as the Joint Test indicates Chi2 = 52.55, p-value = 0.53, which exceeds the commonly used significance thresholds of 0.05 or 0.10. Therefore, it can be concluded that the reliability of the model is supported by standard errors and hypothesis tests.

Regarding the serial correlation, the LM Test is employed to assess whether any serial correlation remains in the model's residuals. Table 6 provides the relevant results for this test.

Table 6. LM Test.

LM Tests						
Time Period: 1994M02 2023M08						
Observations (Included): 351						
H0: No serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	2.412342	4	0.6604	0.603269	(4, 676.0)	0.6604
2	1.463484	4	0.8331	0.365726	(4, 676.0)	0.8331
3	4.368378	4	0.3584	1.094007	(4, 676.0)	0.3584
4	2.752774	4	0.6000	0.688576	(4, 676.0)	0.6000
5	1.613839	4	0.8063	0.403344	(4, 676.0)	0.8063
H0: No serial correlation at lags 1 to h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	2.412342	4	0.6604	0.603269	(4, 676.0)	0.6604
2	6.730039	8	0.5660	0.841705	(8, 672.0)	0.5660
3	11.67506	12	0.4721	0.974118	(12, 668.0)	0.4721
4	13.35327	16	0.6468	0.834146	(16, 664.0)	0.6468
5	16.14063	20	0.7079	0.805857	(20, 660.0)	0.7079
*Edgeworth expansion corrected likelihood ratio statistic.						

The test results demonstrate that there is no serial correlation in the residuals at the tested lags, because the p values exceed the conventional significance thresholds of 0.05 and 0.10. The result confirms the selected lag length and reinforces the assumption that the study's estimated coefficients are efficient; standard errors can also be considered for hypothesis testing as reliable.

Concerning the model's stability, the inverse roots of the AR can be examined in Figure 1. The graph is employed to evaluate the stability of the model. The Model is regarded as stable when all inverse roots are spread within the circle.

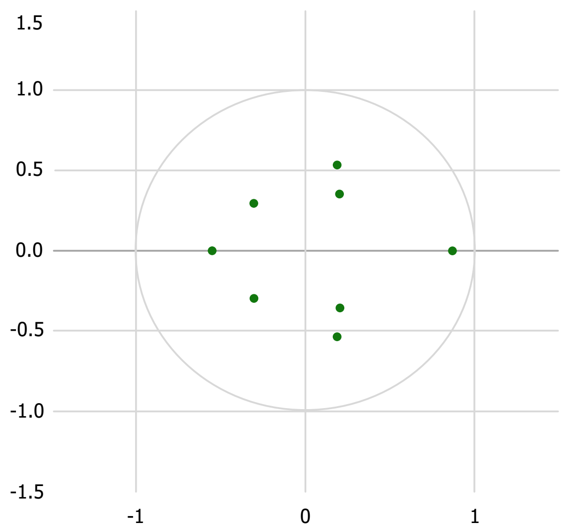

Figure 1. AR Inverse Root Test.

RESULTS

In the VAR model, the connections among variables are identified through impulse-response analysis. This analysis relies on the causal relationship between variables, where one variable influence another. Concerning the impulse-response analysis, we measure how every variable in the model reacts to a shock applied to either the variable itself or to other variables, and we plot these measurements. Consequently, the reaction of each model variable to its own or to other variables is displayed, together with the associated standard errors. Within the impulse-response analysis, an impulse is applied to the variable that generates a standard-error shock, and the resulting response is observed in the variable that gets the shock. Figure 2 displays the dwellings' response to EPU for the periods (1- 10).

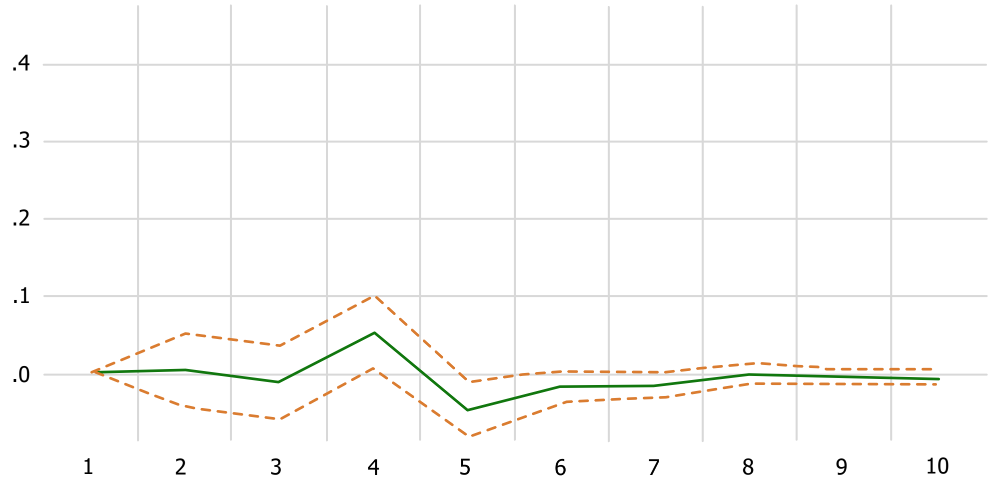

Figure 2. Response of Dwellings to EPU.

Figure 2 illustrates how dwellings respond to changes in EPU. As illustrated in Figure 2, the horizontal axis denotes the number of periods (1–10), and the vertical axis indicates the size of the dwellings' response to the shock. In Figure 2, the black line between the red lines begins almost at zero during period 1, indicating that an unanticipated standard-deviation shock to the EPU exerts virtually no immediate effect on dwelling counts. Likewise, an unexpected one-standard-deviation rise in the EPU does not produce a statistically significant change in dwellings over the subsequent ten periods. The response remains near zero for almost all periods and never deviates significantly from zero, because the confidence interval consistently includes zero. Consequently, shocks to EPU can be said not to significantly affect the level of dwellings.

According to the impulse response graph, no sustained systematic impact of increases in policy uncertainty on the EU housing market has been identified. However, the response of dwellings to the shock of EPU is positive and statistically significant in period 4. Also, it is seen that there is a negative and statistically significant response in period 5. However, the magnitude of this response decreases and subsides in periods 6 and 7. In the other periods, shown in the graph, the relationship between housing investments and the EPU is weak and statistically insignificant. This fluctuation may be due to the simultaneous reflection of two opposite economic situations. On the one hand, demand for housing may increase due to safe-haven status (positive response); on the other hand, investments may be postponed due to the real option effect (negative response). When these two effects neutralize each other, the net effect may become statistically invisible.

Based on the graph's findings, when future economic conditions (e.g., mortgage interest rates or taxes, government spending, regulations) are uncertain or deteriorate, individuals or firms in the EU may delay housing investment decisions due to a loss of confidence, adopting a wait-and-see strategy until the uncertainty is resolved. Therefore, it is possible for housing investment to become insensitive to EPU movements.

In the VAR model, the relationships among variables are further clarified by variance decomposition analysis. This analysis quantifies the proportion of shocks originating in each variable and in other variables. In other words, it indicates the proportion of a change in the model's variables that is attributable to each variable itself versus to other variables (Enders, 1995).

The variance decomposition analysis indicates that the EPU influences dwellings at a 2.87 percent level over ten periods. Table 7 demonstrates that changes in dwellings are almost entirely caused by their own past shocks. Shocks to EPU exert a negligible influence on dwellings. These findings indicate a relatively weak causal link from EPU to dwellings in the specified model under Cholesky ordering. The observation is consistent with the impulse-response plot, which displays insignificant reactions.

Table 7. Variance Decomposition.

LNDWELL Variance Decomposition			
Time Period	**S.E.**	**LNDWELL**	**LNEPU**
1	0.443553	100.0000	0.000000
2	0.445075	99.99693	0.003070
3	0.446330	99.90698	0.093023
4	0.449447	98.58518	1.414817
5	0.452509	97.47038	2.529625
6	0.452952	97.29247	2.707533
7	0.453260	97.16294	2.837064
8	0.453264	97.16108	2.838922
9	0.453308	97.14421	2.855790
10	0.453360	97.12316	2.876844

The share of EPU shocks in the variance of dwellings, which is the explanatory power of EPU on dwellings, is increasing slowly, reaching only about 2.87% by the 10th period. This can be considered as evidence that EPU shocks are felt by housing investors with a lag. These delays may indicate that home buyers and sellers take several months to consider their decisions, that loan applications take time, and that construction companies do not immediately change their project schedules.

On the other hand, the explanatory power of EPU is stabilized in the 2.5-2.9% band from the 5th period onwards. The variance decomposition results show that the housing market has strong persistence and inertia characteristics. Furthermore, it may be considered that the impact of EPU on housing investments occurs through indirect channels rather than direct channels. The relationship between EPU and housing investment may not be reflected in the model because it can be influenced by other determinants.

This study also uses a Granger causality test as an additional econometric method. While impulse response functions and forecast error variance decomposition offer key evidence on the dynamic effects and relative contributions of shocks among variables, they alone do not determine the direction of predictive causality within the system. Here, the Granger causality framework provides an extra level of inference by examining whether past values of economic policy uncertainty consistently enhance the prediction of housing investment activity — measured by the dwellings index — beyond what is already captured by its own historical values. In the meantime, the test also enables an assessment of the reverse predictive relationship, that is, whether housing investment dynamics contain explanatory power for future changes in economic policy uncertainty. The findings are presented in Table 8.

This method formally tests whether one variable Granger-causes another within the VAR framework. Within the VAR framework, the Granger causality test investigates whether past values of one variable contain statistically significant predictive information for another by testing the joint significance of its lagged coefficients in each equation.

Table 8. Causality Analysis (Granger).

Causality Analysis (Granger) Wald Tests			
Data Range: 1994M02 2023M08			
Number of observations: 351			
Variable (Dependent): LNDWELL			
Excluded	Chi-sq	df	Prob.
LNEPU	10.71141	4	0.0300
All	10.71141	4	0.0300
Variable (Dependent): LNEPU			
Excluded	Chi-sq	df	Prob.
LNDWELL	1.328025	4	0.8566
All	1.328025	4	0.8566

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According to the VAR Granger Causality Test, EPU Granger-causes housing investments at the 5 % significance level ($\chi^2 = 10.71$, $p = 0.030$). Conversely, housing investments do not Granger-cause EPU ($p = 0.8566$). These results indicate a unidirectional causal relationship from EPU to housing investments.

This result is consistent with the interpretation that EPU functions as a statistical leading indicator for housing investments as a Granger cause; the test establishes temporal precedence rather than structural economic causality.

Based on these three analyses, EPU is a statistical determinant of the EU housing market and a Granger cause; however, the magnitude of this important finding is weak, and the housing market is mostly driven by its own internal dynamics. The relationship between the housing market and EPU is unidirectional, asymmetric, and lagged. The fact that EPU's contribution to the variance of dwellings remains around 3% and explains 97% of the housing market's own dynamics may indicate that the EU housing market is a unique, slow-moving market relatively isolated from external shocks. Therefore, this situation shows that the housing market is relatively resilient to EPU and is largely driven by its own internal dynamics.

DISCUSSION

While existing literature extensively explores the impact of Economic Policy Uncertainty (EPU) on housing prices and returns. Studies focusing on housing investments remain scarce. This study contributes significantly to the literature by addressing this gap and testing the EPU-housing investment relationship specifically within the EA-19 context.

The VAR results obtained in this study yield a more nuanced and different picture than is commonly reported in the EPU–housing literature. Taken together, these results suggest that EPU carries some predictive information for EA-19 housing investments as a Granger cause, yet the dynamic, shock-based effect is negligible in terms of economics. This pattern differs in important ways from much of the existing literature and merits a careful comparison. This divergence largely reflects the fact that most studies reporting strong negative EPU effects work with housing prices or returns rather than housing investment indicators, whereas the dwellings series used here measures construction permits issued for residential buildings.

In our study, as a result of Granger causality analysis, we concluded that EPU is a weak determinant of housing investments due to the low share of EPU shocks, which is 2.8% of the variance of dwellings; however, as a result of impulse-response analysis, we found that short-term shocks in EPU do not affect housing investments. In this context, the results of the study contradict the results of Miles (2009) and Baek et al. (2024), as these studies emphasize that EPU has a negative effect on housing investments. Furthermore, the results of this study contradict the results of Christidou and Fountas (2017), Aye et al. (2019), and Qu and Md Kassim (2023), as these studies consider EPU to have a positive effect on housing investments.

Su et al. (2016), on the other hand, concluded that EPU has no significant effect on housing returns.

This article, however, tested the relationship between housing investments, represented by construction permits, and EPU using VAR analysis. It differs from previous studies in the literature because it did not reveal a significant relationship between the two variables.

Regarding the limitations of this study, there are two limitations of the present analysis. First, the dwellings index used as the dependent variable is constructed at the Euro Area-19 (EA-19) aggregate level and treats the Euro Area as a single block. Second, the sample period is constrained to 1994M2–2023M8, which corresponds to the longest interval over which both the EPU index for Europe and the Euro Area dwellings index are jointly available.

CONCLUSIONS

The result of the Granger causality analysis shows unidirectional causality from EPU to dwellings, indicating that EPU is the Granger cause of housing investments, consistent with its role as an indicator. On the other hand, Impulse - Response analysis determines the dynamic effect of an unexpected shock of one standard deviation of the EPU on dwellings over time. According to this result, uncertainty affects housing investments, but it can be inferred that shock-based effects are weak. Based on the findings, it can be said that the housing investments in the EA-19 can be affected by EPU; but not by EPU shocks. It can also be said that EPU can have an indirect effect on dwellings in the EA-19 through effects such as interest, credit conditions, and willingness to invest.

Increased uncertainty in the economy affects investor behavior, credit conditions, and risk perception. Therefore, EPU shocks are expected to have effects on housing investments through housing demand and housing prices. Generally, increases in the EPU and Global Economic Policy Uncertainty (GEPU) indices can reduce housing investments and housing prices with a delay. This relationship is explained by the wait-and-see behavior created by uncertainty on both the demand and supply sides of the housing market. When uncertainty indices rise, three main economic theories underlie the contraction of the housing market. The first is the Real Options Theory. In the economic literature, the Real Options Theory predicts that when uncertainty (EPU) increases, firms and households will follow a "wait-and-see" strategy and postpone fixed capital investments. In practice, while EPU is increasing, housing investments do not decrease because housing is a safe haven. Especially in the uncertainties of the early 90s, housing was seen as a hedge against inflation as a "real asset." When stock/bond volatility in financial markets increased, funds turned to the housing market, which is less liquid but seen as a store of value. This weakened the negative relationship between EPU and housing investments. The presence of the delayed effect can also contribute to the emergence of this result. For example, the "housing investment" figure you see between two years may actually be the result of decisions taken 2-3 years before that date (perhaps at a time when the EPU was low). Even if the "sunk cost" problem arises after construction starts and uncertainty increases, the project may not be stopped. Buying a house is an investment decision that is made by paying a high price and is generally difficult to cancel, especially if a deferred purchase is made. When the EPU or GEPU rises, future policy regarding tax and interest becomes uncertain. Investors and buyers prefer to wait until the uncertainty passes. The return on waiting can increase, which lowers investments and sales in the current period.

The impact of the EPU and GEPU indices on the housing market can also vary with the degree of economic openness. Global uncertainty increases the cost of rebar, cement, and energy through the exchange rate (Pass-through Effect). This affects housing costs and restricts housing supply. The response to the start of new construction projects against the shocks of uncertainty may reach its bottom with a lag. In economies with price stickiness, housing prices may not fall as quickly as investments. However, sales or transaction volume in the housing market may decline more rapidly. When there are long-term high EPU increases, housing prices may decline on a real basis, and mortgage housing sales and housing investments may experience delayed sharp declines.

The other factor why housing investments in the EA-19 may be insensitive to the EPU index may be due to the heterogeneity of EU countries' data and the neutralization of the opposite effects by aggregated data. Modeling the EA-19 data as a single block also causes the opposite effects between countries to neutralize each other. For example, EPU shocks reduced housing investments in one of the countries in the EA-19; it can lead to capital inflow and housing investment in another country in the EA-19. These two effects neutralize each other when aggregated data is used, and insensitivity may occur.

The fact that housing in economies is no longer just a need for shelter and is seen as a financial investment tool can also be effective in achieving this result. The EPU index, developed by Baker et al. (2016), is newspaper-based and measures policy uncertainty. However, when buying a house, households may look at income uncertainty or employment security rather than EPU. EPU and the household confidence index may not always coincide exactly. When households cannot foresee how economic policies will affect their incomes in the future (e.g., unemployment risk, tax increases), they cut spending and increase savings. Large expenditures, such as housing, are the first items to be postponed. In times of uncertainty, banks and financial institutions take a more risk-averse attitude. They tighten credit standards. Since the housing market is largely based on credit (mortgage), the narrowing of the credit channel makes it difficult for both construction companies to finance and buyers to access credit.

This study can be extended in various ways. The impact of uncertainty on housing investments can be examined using country-specific panel data analysis within the EA-19 framework. Additionally, by including interest rate, credit, and mortgage market indicators in the system, the indirect effects of policy uncertainty on housing investment can be tested.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

All authors have contributed equally.

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The Authors declare that there is no conflict of interest.

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НЕВИЗНАЧЕНІСТЬ ЕКОНОМІЧНОЇ ПОЛІТИКИ ТА ІНВЕСТИЦІЇ В ЖИТЛО: ЕМПІРИЧНИЙ АНАЛІЗ VAR ДЛЯ ЄВРОЗОНИ (EA-19)

Житловий сектор уважають одним із ключових факторів макроекономічних коливань. Отже, аналіз масштабів інвестицій у житло в економіках і визначення основних рушійних сил, що впливають на ці інвестиції, має велике значення. Оскільки однією зі змінних, що визначають інвестиції, є невизначеність, а інвестиції в житло залежать від невизначеності, важливо визначити, якою мірою невизначеність упливає на інвестиції в житло. Хоча багато досліджень вивчали вплив невизначеності на ціни та прибутковість житла, вплив на інвестиції в житло нечасто обговорювали. Динамічний вплив невизначеності економічної політики (ЕПП) на інвестиції в житло залишається майже незмінним у Єврозоні-19 (ЄР-19). Згідно з Теорією реальних опціонів, невизначеність призводить до затримок інвестицій. Якщо цей зв'язок зберігається для ринку житла, інвестиції в нове будівництво повинні коливатися у відповідь на невизначеність, а це означає, що житло, яке може служити проксі-індикатором інвестицій у житло, може зазнавати впливу невизначеності. Тому це дослідження вивчає зв'язок між загальноєвропейським індексом ЕПП та індексом житла в ЄР-19, використовуючи щомісячні дані (1994M2–2023M8). У літературі це дослідження є першою статтею, яка вивчає динамічний зв'язок між EPU та інвестиціями в житло для EA-19 шляхом проведення векторного авторегресійного (VAR) аналізу. Ґрунтуючись на VAR-аналізі, бачимо, що індекс EPU практично не має статистично значущого впливу на індекс житлової нерухомості в EA-19, хоча виявлено односпрямований причиново-наслідковий зв'язок Ґрейнджера від EPU до інвестицій у житло. Ґрунтуючись на цьому результаті, також можна стверджувати, що політична невизначеність в EA-19 може не бути однією з причин економічних коливань, спричинених інвестиціями в житло. Ця робота сприяє подальшим дослідженням у цій царині, оскільки воно є першою науковою працею, що аналізує вплив EPU на інвестиції в житло в EA-19.

Ключові слова: невизначеність економічної політики, інвестиції в житло, ринок житла ЄС, векторна авторегресія (VAR), теорія реальних опціонів

JEL Класифікація: C32, D81, E61, R11, R31