

Article

Macroeconomic Determinants of Housing Prices in Malaysia: Evidence from Time-Series Econometric Analysis

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Abstract

This study examines the effects of population, unemployment rate, construction costs, income per capita, and interest rates on housing prices using annual data from 1990 to 2024. Adopting time series econometric analyses, including stationarity, the ARDL model, VAR, Granger causality and dynamic estimation of VDC and IRF. The results confirm a long-run equilibrium relationship between housing prices and the selected macroeconomic variables. Income per capita and construction costs positively influence housing prices, whereas interest rates have a significant negative effect. In the short run, only income per capita is significant. The findings provide important policy insights for improving housing affordability through sustainable income growth, prudent monetary policy, and efficient housing development. Future studies should incorporate regional and institutional factors to better explain housing price dynamics.

Keywords: housing prices; macroeconomic determinants; ARDL model; JJ model; time-series analysis

1. Introduction

Housing is widely recognised as both a fundamental human need and an important economic asset, representing household wealth, financial security, and long-term socio-economic well-being. Beyond its social function, the housing sector contributes significantly to economic growth by generating employment, stimulating construction and related industries, supporting the development of financial markets, and facilitating capital accumulation. Consequently, housing price movements have important implications not only for household welfare but also for macroeconomic stability (Cevik & Naik, 2023).

Although housing affordability concerns first gained prominence during the period preceding the 1997–1998 Asian Financial Crisis, they have intensified considerably over the past two decades. As shown in Figure 1, both the Malaysia House Price Index (MHPI) and housing prices exhibit a consistent upward trend from 2009 to 2024, indicating a sustained increase in residential property values over the study period. The Malaysian House Price Index (MHPI) has exhibited a persistent upward trend between 2009 and 2024 despite major economic disruptions, including the post-Global Financial Crisis recovery, the implementation of the Goods and Services Tax (GST), the COVID-19 pandemic, and the subsequent post-pandemic recovery (BNM, 2023a). Recent evidence indicates that housing prices have consistently outpaced household income growth, placing increasing



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pressure on housing affordability, particularly among low- and middle-income households (Subramaniam et al., 2024). This sustained appreciation reflects the combined effects of rapid urbanisation, favourable financing conditions, economic growth, and continued demand for residential property (Ong, 2013; BNM, 2015; NAPIC, 2025).

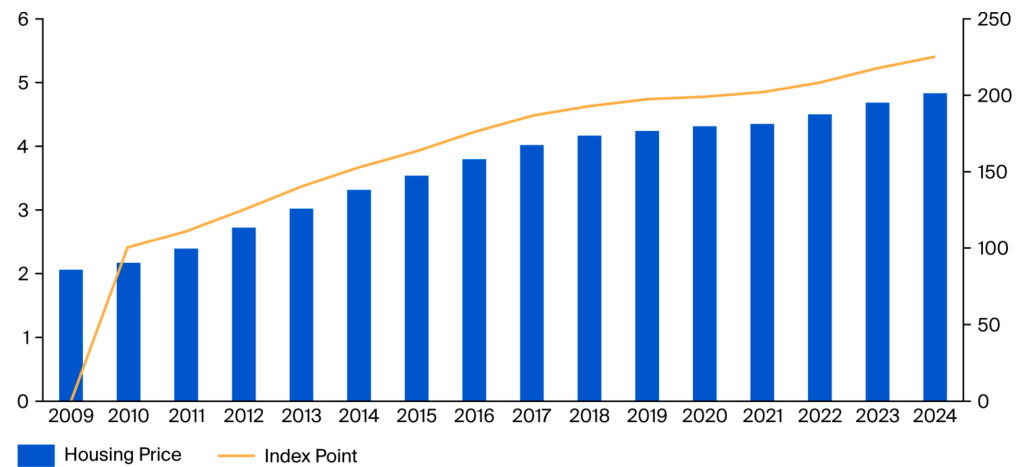


Figure 1. Malaysia housing prices and index points from 2009 to 2024. Source: BNM (2023b) (Base Year 2010 = 100).

The persistence of rising housing prices reflects broader structural imbalances within Malaysia's housing market. As shown in Figure 2, construction costs generally increased between 2010 and 2024 despite fluctuations in annual growth, with a notable decline in 2020 followed by a strong recovery in 2021 and 2022. On the demand side, rapid urbanisation, population growth, the demographic transition, and speculative investment have continued to drive up housing demand. On the supply side, limited land availability, escalating construction costs, regulatory constraints, and an insufficient supply of affordable housing have restricted market responsiveness (BNM, 2017; United Nations Human Settlements Programme, 2020). Furthermore, housing affordability extends beyond conventional price-to-income measures, encompassing accessibility to employment centres, public amenities, housing location, financing conditions, and dwelling characteristics. Policy implementation challenges, including the misalignment between affordable housing programmes and their intended beneficiaries, have further constrained improvements in housing accessibility (OECD, 2021; World Bank, 2022). Collectively, these factors have contributed to a persistent mismatch between housing supply and effective demand, reinforcing long-term affordability concerns.

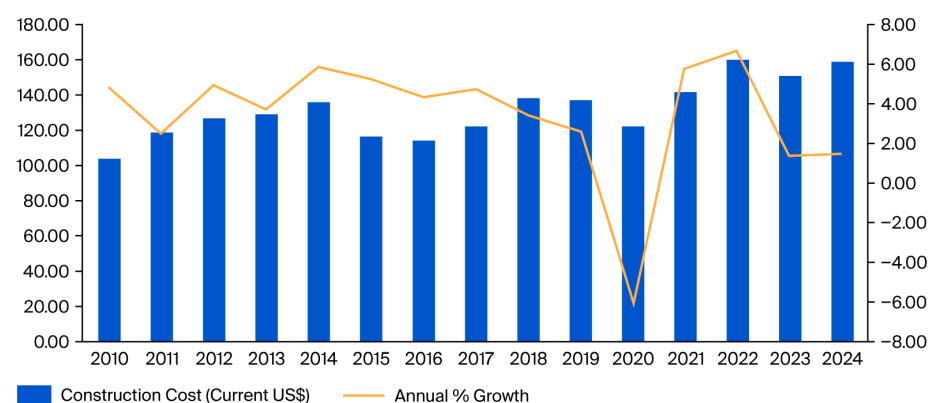


Figure 2. Malaysia construction costs in US\$ and annual growth from 2010 to 2024. Source: World Bank (2025).

Against this backdrop, this study examines the macroeconomic determinants of housing prices in Malaysia using annual data spanning from 1990 to 2024. As shown in Figure 3, Malaysia's income per capita exhibited an overall upward trend from 2010 to 2024, despite temporary declines in 2015–2016 and 2020, reflecting sustained economic growth and a strong post-pandemic recovery. While existing studies consistently demonstrate that macroeconomic factors, including income growth, interest rates, credit availability, and demographic changes, play important roles in shaping housing prices and affordability (Ashaf et al., 2019), the Malaysian literature has generally examined these determinants individually or focused on specific aspects of the housing market, such as affordability, housing finance, or regional issues.

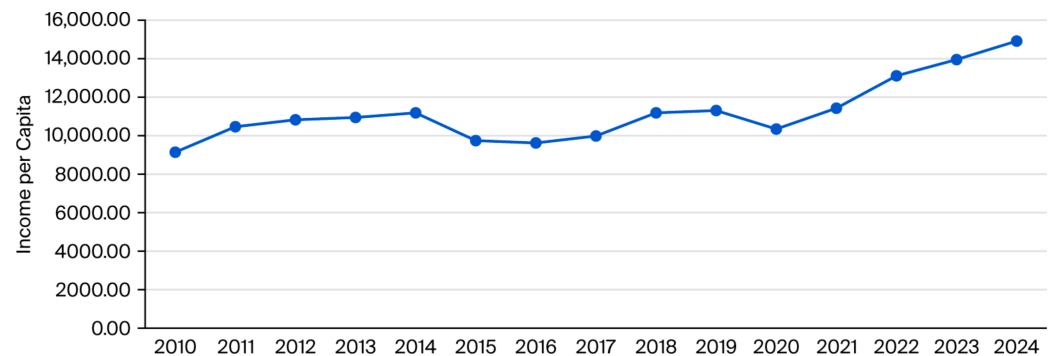


Figure 3. Malaysia's income per capita, 2010 to 2024. Source: [World Bank \(2025\)](#).

This study makes three important contributions to the literature for Malaysia. First, it provides empirical assessments of Malaysia's housing market by incorporating observations through 2024, capturing recent macroeconomic developments and post-pandemic structural adjustments. Second, it develops a more comprehensive empirical framework by simultaneously integrating demographic, macroeconomic, financial, and construction cost determinants, offering a more holistic explanation of housing price dynamics than previous studies that examine these factors in isolation. Third, by combining two complementary time-series econometric techniques, this study generates robust evidence on the dynamic relationships among the key determinants of housing prices, thereby strengthening both empirical understanding and policy relevance. Malaysia provides a particularly appropriate context for this investigation because it is an upper-middle-income economy characterised by rapid urbanisation, demographic transition, expanding financial markets, and persistent housing affordability challenges. Accordingly, the findings are expected to contribute to the growing literature while providing evidence-based insights for the design of housing, monetary, and fiscal policies aimed at improving housing affordability, strengthening financial stability, and promoting the long-term sustainability of Malaysia's housing market. Beyond its economic implications, rising housing prices also have significant social consequences. Declining housing affordability limits homeownership, particularly for young and low- to middle-income households, increases wealth inequality and financial stress, and reduces overall quality of life. These challenges highlight the importance of understanding the factors driving housing price movements in Malaysia (OECD, 2021; World Bank, 2022).

The remainder of this paper is organised as follows. Section 2 reviews the relevant literature. Section 3 outlines the research methodology. Section 4 presents and discusses the empirical findings. Finally, Section 5 concludes the study by summarising the main findings and highlighting their implications.

2. Literature Review

Building upon the issues highlighted in the introduction, where Malaysia has experienced persistent housing price appreciation despite growing affordability concerns, the existing literature suggests that housing market dynamics cannot be explained by a single economic factor. Instead, housing prices are increasingly recognised as the outcome of complex interactions among demographic, macroeconomic, financial, and supply-side conditions. Because housing constitutes both a consumption good and an investment asset, changes in economic fundamentals influence not only housing demand but also developers' investment decisions and financial market behaviours. Consequently, a growing body of literature has examined how macroeconomic variables jointly shape housing price movements across both developed and emerging economies. Although considerable empirical evidence exists, the findings remain far from conclusive, reflecting differences in economic structures, institutional arrangements, housing policies, and estimation methodologies.

Among the various determinants, demographic factors, particularly population growth, have consistently been identified as fundamental drivers of housing demand. Economic theory suggests that population expansion, coupled with rapid urbanisation, increases the demand for residential properties, especially in metropolitan areas where housing supply responds relatively slowly. Empirical evidence from Malaysia (Yap & Ng, 2018; Ong, 2013), China (Rao & Ge, 2015), and Vietnam (Yen et al., 2020) generally supports this positive relationship, indicating that growing populations place upward pressure on housing prices through increased competition for limited housing stock. Nevertheless, the literature also demonstrates that demographic influences are contingent upon broader macroeconomic environments. For example, Rangel and Ng (2017) show that during periods of economic slowdown and declining migration, the relationship between population growth and housing prices may weaken or even become negative. These findings suggest that demographic changes alone cannot fully explain housing market behaviours without considering accompanying economic conditions.

While population determines the size of housing demand, households' ability to participate in the housing market ultimately depends on their economic capacity. Consequently, income has emerged as one of the most robust and consistently significant determinants of housing prices. Higher household income improves purchasing power, enhances mortgage eligibility, and stimulates demand for residential property, thereby exerting upward pressure on housing prices. Empirical studies across Malaysia, China, India, and other emerging economies consistently report a positive relationship between income growth and housing price appreciation (Mahalik & Mallick, 2011; Subramaniam et al., 2024; Ong, 2013). However, recent evidence also reveals an important structural concern. In many economies, particularly Malaysia, housing prices have increased considerably faster than income growth, resulting in declining housing affordability among middle- and lower-income households. This widening affordability gap indicates that income, although fundamental, interacts with other macroeconomic and institutional factors in determining housing market outcomes.

Labour market conditions, which influence both purchasing power and consumer confidence, are closely related to household income. Unemployment has therefore received considerable attention as an important determinant of housing demand. The majority of empirical studies suggest that rising unemployment reduces household income, increases financial uncertainty, weakens consumer confidence, and restricts mortgage accessibility, thereby reducing housing demand and placing downward pressure on housing prices (Mohan et al., 2019; Ramli et al., 2024). Nevertheless, recent studies have reported mixed findings, with several identifying insignificant or even positive relationships between unemployment and housing prices. Such inconsistencies are frequently attributed to

differences in housing market structures, speculative investment activities, government interventions, and supply rigidities. These contrasting results highlight that labour market conditions influence housing prices through multiple transmission channels, the effects of which vary across countries and stages of the economic cycle.

Beyond demand-side considerations, the recent literature has increasingly recognised the importance of supply-side constraints in explaining persistent housing price increases. Among these, construction costs have emerged as one of the most influential determinants of housing supply. Rising prices of construction materials, labour shortages, land acquisition costs, and regulatory compliance increase development costs, which developers commonly pass on to homebuyers through higher selling prices. Malaysian evidence consistently identifies construction costs as a major contributor to housing price escalation (Mansur et al., 2016; Sukrri et al., 2019), while international studies similarly report that construction cost inflation has intensified housing affordability challenges worldwide (Yap & Ng, 2018; Subramaniam et al., 2024). However, the literature also suggests that excessive construction costs may discourage new housing development and constrain supply, implying that the relationship between construction costs and housing prices is not necessarily linear but depends on market conditions, policy incentives, and developers' expectations.

Complementing both demand- and supply-side influences, financial conditions represent another critical dimension of housing market behaviours. Since housing purchases are predominantly financed through long-term mortgage borrowing, interest rates directly affect borrowing costs, housing affordability, and investment decisions. Evidence from Malaysia (Ibrahim & Law, 2014) overwhelmingly supports a negative relationship between interest rates and housing prices: lower borrowing costs stimulate housing demand and increase property values, whereas higher interest rates suppress demand through increased financing costs. More recent studies further demonstrate that prolonged accommodative monetary policies following global financial crises and the COVID-19 pandemic have contributed significantly to housing price appreciation across many economies. Nonetheless, the magnitude of monetary policy transmission differs according to financial market development, banking systems, housing finance structures, and government policy interventions.

The literature confirms that housing prices are jointly influenced by demographic, economic, financial, and supply-side factors. However, empirical findings remain mixed, particularly regarding the effects of unemployment and construction costs. Moreover, Malaysian studies have generally examined these determinants in isolation or over relatively short sample periods, limiting their ability to capture recent structural changes, including those associated with the COVID-19 pandemic and post-pandemic recovery.

3. Data and Methodology

3.1. Data

This study investigates the macroeconomic determinants of housing prices in Malaysia using annual time-series data covering the period 1990–2024. Annual data are employed because they are more appropriate for examining long-run structural relationships among macroeconomic variables while minimising short-term fluctuations and cyclical noise. Housing prices are measured by the Malaysian House Price Index (HPI), obtained from the National Property Information Centre (NAPIC). Five macroeconomic variables are included as explanatory variables: population (PPL), unemployment rate (UR), construction cost (CC), income per capita (IPC), and interest rate (IR). Population data are obtained from the Department of Statistics Malaysia, while the unemployment rate and GDP per capita are sourced from the World Bank. Construction cost is proxied by the Construction Cost Index

(CCI), and the interest rate is represented by the lending rate published by Bank Negara Malaysia. To facilitate elasticity interpretation and improve the statistical properties of the series, all variables are transformed into natural logarithms.

3.2. Empirical Model

The empirical model is based on the law of demand and supply, which suggests that housing prices are jointly determined by demand-side, supply-side, and financial factors. Population and income per capita represent demand-side factors that are expected to increase housing demand and raise housing prices. Construction cost reflects supply-side conditions, where higher development costs lead to higher property prices. Conversely, unemployment and interest rates are expected to reduce housing demand by lowering purchasing power and increasing borrowing costs.

All variables are transformed into natural logarithms, and the long-run housing price function is specified as

$$LHPI_t = \beta_0 + \beta_1 LPPL_t + \beta_2 LUR_t + \beta_3 LCC_t + \beta_4 LIPC_t + \beta_5 LIR_t + \varepsilon_t$$

where LHPI is the housing price index, LPPL denotes population, LUR is the unemployment rate, LCC represents construction cost, LIPC is income per capita, and LIR denotes the interest rate. The subscript t represents time, β_0 is the intercept, and ε_t is the error term. All variables are expressed in natural logarithms, allowing the estimated coefficients to be interpreted as elasticities. Based on economic theory, population, income per capita and construction cost are expected to have positive effects on housing prices ($\beta_1, \beta_3, \beta_4 > 0$), while unemployment and interest rates are expected to have negative effects ($\beta_2, \beta_5 < 0$), reflecting weaker housing demand and lower affordability.

3.3. Time-Series Modelling: Unit Root, Cointegration, Causality, and Dynamic Analysis

Before conducting cointegration analysis, unit root tests were applied to determine the stationarity properties of the data. Specifically, the Augmented Dickey–Fuller (ADF), Phillips–Perron (PP), and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests were utilised. The ADF test (Dickey & Fuller, 1979, 1981) examines the null hypothesis of non-stationarity (i.e., the presence of a unit root). The PP test (Phillips & Perron, 1988) extends this framework by addressing potential serial correlation and heteroscedasticity in the time-series regression through non-parametric corrections. Employing these complementary tests provides a more robust assessment of the integration properties of the variables.

The study then applies the Autoregressive Distributed Lag (ARDL) bounds testing approach (Pesaran et al., 2001) to examine both the short-run and long-run relationships between housing prices and the selected macroeconomic variables. The ARDL approach is appropriate because it accommodates variables integrated of order $I(0)$, $I(1)$, or a mixture of both, provided none is $I(2)$, and performs well in relatively small samples. The existence of cointegration is determined by comparing the calculated F-statistic with the critical bounds. To validate the long-run relationship, the Johansen and Juselius (1990, JJ) cointegration test is also employed. Based on the VAR framework, the JJ approach utilises the Trace and Maximum Eigenvalue statistics to determine the number of cointegrating vectors, thereby serving as a robustness check for the ARDL findings. Following the confirmation of cointegration, the Vector Error Correction Model (VECM) is estimated to examine both the short-run and long-run Granger causal relationships among the variables. As suggested by Engle and Granger (1987), the Error Correction Term (ECT), derived from the long-run cointegration equation, captures the speed at which deviations from long-run equilibrium are corrected following short-run shocks. Finally, Impulse Response Functions (IRFs) and Forecast Error Variance Decomposition (FEVD) are employed to evaluate the dynamic

responses of housing prices to macroeconomic shocks and assess the relative contribution of each variable in explaining housing price fluctuations over time.

4. Empirical Results

4.1. Unit Root Test Results

Unit root tests were conducted on all variables, namely, the housing price index (LHPI), population (LPPL), unemployment rate (LUR), construction cost index (LCC), income per capita (LIPC), and interest rate (LIR), to determine their order of integration. This testing guides the selection of appropriate econometric models in subsequent analyses, particularly the ARDL and VECM frameworks. To ensure the validity of the time-series properties, two complementary unit root and stationarity tests are implemented: the Augmented Dickey–Fuller (ADF) test (Dickey & Fuller, 1979) and the Phillips–Perron (PP) test (Phillips & Perron, 1988). The results indicate a mixed order of integration among the study variables. While the unemployment rate (LUR) is stationary at the level, the remaining variables, such as housing price index (LHPI), population (LPPL), construction cost (LCC), income per capita (LIPC), and interest rate (LIR), become stationary only after first differencing, implying that they are integrated of order one, $I(1)$. The results are not reported here but can be made available upon request.

The results in Tables 1 and 2 indicate a mixed order of integration among the variables. At level form, some variables, particularly LUR, are found to be stationary, as their test statistics are significant at conventional levels under both ADF and PP tests. Upon first differencing, all variables become stationary, as evidenced by highly significant test statistics across both ADF and PP results. This confirms that the non-stationary variables are integrated of order one, $I(1)$, while LUR can be considered integrated of order zero, $I(0)$. These findings collectively indicate that all six variables LHPI (log of housing price index), LPPL (log of population), LUR (log of unemployment rate), LCC (log of construction cost), LIPC (log of income per capita), and LIR (log of interest rate), are integrated of order one, $I(1)$. In other words, each variable is non-stationary at level but becomes stationary after taking the first difference.

Table 1. Unit root test results for augmented Dickey–Fuller (ADF) test.

Variables	Level		First Difference	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LHPI	−0.211 (1)	−2.791 (3)	−4.056 (0) ***	−3.829 (0) **
LPPL	1.014 (4)	−1.215 (4)	−5.259 (3) ***	−5.414 (3) ***
LUR	−3.359 (0) **	−3.795 (0) **	−5.924 (0) ***	−6.007 (0) ***
LCC	−1.747 (0)	−2.189 (0)	−5.880 (0) ***	−5.527 (1) ***
LIPC	1.491 (0)	−1.964 (0)	−5.145 (0) ***	−5.166 (0) ***
LIR	1.533 (0)	−3.393 (1)	−5.440 (1) ***	−5.403 (1) ***

Note: Asterisks (***) and (**) denote significance at 1% and 5% levels, respectively. The critical values are derived from MacKinnon (1996).

Table 2. Unit root test results for Phillips–Perron (PP) test.

Variables	Level		First Difference	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept
LHPI	−1.557 (2)	−2.582 (3)	−4.649 (16) ***	−4.643 (18) ***
LPPL	−0.100 (3)	−1.981 (2)	−2.565 (8) ***	−2.502 (10) ***
LUR	−3.372 (2) **	−3.795 (1) **	−6.067 (3) ***	−6.120 (4) ***
LCC	−2.102 (7)	2.190 (1)	−5.595 (3) ***	−6.515 (7) ***
LIPC	−1.483 (1)	−2.064 (2)	−5.117 (2) ***	−5.137 (2) ***
LIR	−1.206 (14)	−2.484 (7)	−6.956 (32) ***	−9.221 (32) ***

Note: Asterisks (***) and (**) denote significance at the 1% and 5% levels, respectively. The critical values are derived from MacKinnon (1996).

4.2. ARDL Bounds Test

The ARDL bounds test provides compelling evidence of a stable long-run relationship among housing prices and their macroeconomic determinants. Before conducting the bounds test, the optimal lag structure was selected using the Akaike information criterion (AIC), which identifies the model that best balances model fit and parsimony. Based on this criterion, the selected ARDL specification was ARDL (2,2,2,0,3,3). As reported in Table 3, the calculated F-statistic of 7.149 exceeds the upper bound critical value of 5.761 at the 1% significance level for the restricted intercept and no-trend specification with five regressors ($k = 5$), following the critical values established by Pesaran et al. (2001). Consequently, the null hypothesis of no cointegration is rejected, confirming that housing prices (LHPI), population (LPPL), unemployment rate (LUR), construction cost (LCC), income per capita (LIPC), and interest rate (LIR) share a long-run equilibrium relationship. This finding suggests that although these variables may exhibit short-run fluctuations, they move together over time toward a common equilibrium path, thereby providing strong empirical justification for estimating the ARDL Error Correction Model (ECM).

Table 3. Results of the bounds testing approach for cointegration.

Model	F-Statistics	ARDL Order
LHPI, LPPL, LUR, LCC, LIPC, LIR	7.149	(2,2,2,0,3,3)
Critical value bounds of the F-statistic: restricted intercept and no trend ($k = 5$)		
Significance level	Pesaran Critical Values $k = 5$	
	I(0)	I(1)
10%	2.407	3.517
5%	2.910	4.193
1%	4.134	5.761

Notes: Critical values are obtained from Pesaran et al. (2001). Table Case II: restricted intercept and no trend. The lag length selection is based on the Schwarz information criterion (SIC).

4.3. Long-Run ARDL Estimates

Table 4 reports the long-run ARDL estimation results. Although the estimated coefficients generally conform to theoretical expectations, none of the explanatory variables are statistically significant at conventional significance levels. Population (LPPL) exhibits a negative coefficient (−30.140), implying an inverse long-run association with housing prices, although this relationship is statistically insignificant. Similarly, unemployment (LUR) exhibits a negative coefficient (−85.057), suggesting that higher unemployment may reduce housing prices through weaker housing demand, but the estimated effect is not statistically significant. Construction cost (LCC) also records a negative coefficient (−95.283), contrary to conventional housing market theory, yet this relationship likewise lacks statistical significance.

Table 4. Results of ARDL long-run estimation.

Variable	Coefficient	SE	t-Statistic	p-Value
LPPL	−30.140	351.184	−0.086	0.932
LUR	−85.057	1027.241	−0.083	0.935
LCC	−95.283	1144.151	−0.083	0.934
LIPC	86.779	1033.599	0.084	0.934
LIR	−42.874	518.006	−0.083	0.935
C	−168.370	2005.042	−0.084	0.934

Conversely, income per capita (LIPC) yields a positive coefficient (86.779), indicating that rising household income tends to increase housing demand and subsequently housing prices, which is consistent with the demand-side housing theory proposed by [Mankiw and Weil \(1989\)](#). Interest rate (LIR) displays a negative coefficient (-42.874), suggesting that higher borrowing costs discourage housing purchases and consequently suppress housing prices, in line with the findings of [Himmelberg et al. \(2005\)](#). Nevertheless, despite these theoretically plausible coefficient signs, all variables exhibit relatively low *t*-statistics and high *p*-values, indicating that none exerts an individually significant long-run influence on Malaysia's housing prices within the estimated model.

These findings are broadly consistent with recent empirical evidence on the Malaysian housing market, which suggests that macroeconomic fundamentals do not always exert statistically significant long-run effects because housing prices are simultaneously influenced by institutional, structural, and policy-related factors. For example, [Pinjaman and Kogid \(2020\)](#) and [Hazmi Hamizan \(2021\)](#) reported that although variables such as income, interest rates, and inflation affect housing prices, their significance varies considerably across empirical specifications and sample periods. Likewise, [Kabine \(2023\)](#), [Zulkarnain et al. \(2023, 2025\)](#), and [Zulkarnain and Nawi \(2024\)](#) observed that the relationship between macroeconomic indicators and housing prices in Malaysia becomes less stable during periods of heightened economic uncertainty, particularly throughout the COVID-19 pandemic. More recently, [Sim and Tan \(2026\)](#), employing an ARDL framework, similarly concluded that while a stable long-run relationship exists among housing market variables, individual long-run coefficients may remain statistically insignificant because of dynamic adjustment processes and cross-market interactions.

Several factors may explain the absence of statistically significant long-run coefficients. First, the Malaysian housing market is heavily influenced by government interventions, housing affordability programmes, financing regulations, and other institutional mechanisms that may weaken the direct transmission of macroeconomic fundamentals into housing prices ([Ong, 2013](#); [BNM, 2020](#)). Second, housing markets are characterised by structural rigidities and slow adjustment processes, meaning that changes in economic fundamentals may only gradually be reflected in housing prices over extended periods ([Case & Shiller, 2003](#)). Third, the relatively large standard errors observed across all explanatory variables may indicate econometric challenges such as multicollinearity, model specification issues, or the relatively small sample size, all of which reduce the precision and statistical power of the estimated long-run coefficients ([Gujarati & Porter, 2009](#)).

Importantly, the lack of statistically significant individual coefficients should not be interpreted as evidence against the existence of a meaningful long-run relationship. Rather, the earlier ARDL bounds test clearly establishes the presence of cointegration among the variables, implying that they jointly determine housing prices over the long run even though their individual effects cannot be isolated with sufficient statistical precision ([Pesaran et al., 2001](#)). Such findings are not uncommon in empirical housing market research, where macroeconomic variables collectively shape housing price movements but often fail to achieve individual statistical significance because of strong interrelationships among the explanatory variables. Consequently, greater emphasis should be placed on the short-run dynamics captured by the Error Correction Model (ECM), which provides a clearer understanding of how housing prices adjust toward their long-run equilibrium following short-term economic shocks ([Engle & Granger, 1987](#)).

Table 5 presents the Error Correction Model (ECM) estimates derived from the ARDL framework, together with the diagnostic tests used to evaluate model adequacy. The short-run results demonstrate that several macroeconomic variables exert statistically significant effects on housing price movements. The lagged dependent variable, $\Delta LHPI_{t-1}$, is positive

and highly significant (coefficient = 0.457, $p < 0.01$), indicating considerable persistence in housing price changes and suggesting that past price movements continue to influence current housing market performance.

Table 5. ARDL ECM: determinants of housing price index in Malaysia.

Variable	Coefficient	SE	t-Statistic	p-Value
$\Delta LHPI_{t-1}$	0.457 *	0.070	6.535	0.000
$\Delta LPPL$	0.095	0.094	1.005	0.327
$\Delta LPPL_{t-1}$	0.328 *	0.093	3.525	0.002
ΔLUR	0.004	0.040	0.099	0.922
ΔLUR_{t-1}	0.234 *	0.044	5.297	0.000
$\Delta LIPC$	0.702 *	0.062	11.288	0.000
$\Delta LIPC_{t-1}$	0.154 *	0.046	3.369	0.003
$\Delta LIPC_{t-2}$	−0.070 *	0.030	−2.315	0.031
ΔLIR	−0.107 *	0.020	−5.351	0.000
ΔLIR_{t-1}	0.031	0.019	1.626	0.120
ΔLIR_{t-2}	0.059 *	0.018	3.246	0.004
ECT	−0.004 *	0.000	−8.455	0.000
Diagnostic Test				
JB		2.651 (0.266)		
AR		3.447 (0.065)		
ARCH[1]		1.527 (0.226)		
RESET[1]		0.556 (0.588)		

Notes: The lag length selection is based on the Schwarz information criterion (SIC). JB is the Jarque–Bera statistic for the residual normality test. AR is the Lagrange Multiplier test for serial correlation. ARCH[1] and RESET[1] represent the ARCH Heteroskedasticity test and Ramsey RESET specification test, respectively. Figures in parentheses are the p -values. The asterisk (*) indicates statistical significance at the 5 percent level.

Population growth also contributes significantly to short-run housing price dynamics. Although the contemporaneous change in population is insignificant, the lagged change in population ($\Delta LPPL_{t-1}$) is positive and statistically significant (coefficient = 0.328, $p = 0.002$), implying that demographic expansion stimulates housing demand with a lag before translating into higher housing prices. Similarly, labour market conditions play an important role. While the contemporaneous unemployment variable is insignificant, the lagged unemployment variable (ΔLUR_{t-1}) is positive and highly significant (coefficient = 0.234, $p < 0.01$), suggesting that improvements in employment conditions eventually strengthen housing market activity.

Income per capita emerges as one of the strongest short-run determinants of housing prices. Both the contemporaneous change in income ($\Delta LIPC$) and its first lag ($\Delta LIPC_{t-1}$) are positive and statistically significant at the 1% level, confirming that higher household income immediately increases purchasing power and stimulates housing demand. Interestingly, the second lag of income ($\Delta LIPC_{t-2}$) is negative and statistically significant at the 5% level, suggesting that earlier income gains may subsequently induce market adjustments or temporary corrections in housing prices.

Interest rates exhibit the expected inverse relationship with housing prices. The contemporaneous change in interest rates (ΔLIR) is negative and highly significant, indicating that increases in borrowing costs reduce housing affordability and suppress housing demand. Meanwhile, the second lag of interest rates (ΔLIR_{t-2}) is positive and statistically significant, suggesting that monetary policy effects require time to fully transmit through the housing market, whereas the first lag remains statistically insignificant.

4.4. Short-Run ARDL Error Correction Model

The Error Correction Term (ECT) is negative and highly significant, providing strong evidence that the variables are cointegrated and confirming the existence of a stable long-run equilibrium relationship. The estimated adjustment coefficient of -0.004 indicates that approximately 0.4% of any short-run disequilibrium is corrected during each period. Although the speed of adjustment is relatively slow, the negative and statistically significant ECT confirms that deviations from long-run equilibrium are gradually eliminated, allowing the housing market to converge back to its equilibrium path over time.

The diagnostic tests further demonstrate the adequacy and robustness of the estimated model. The Jarque–Bera statistic (2.651; $p = 0.266$) confirms that the residuals are normally distributed. The Breusch–Godfrey Lagrange Multiplier test (3.447; $p = 0.065$) indicates the absence of serial correlation at the 5% significance level. Likewise, the ARCH test (1.527; $p = 0.226$) provides no evidence of heteroskedasticity, while the Ramsey RESET test (0.556; $p = 0.588$) confirms that the functional form of the estimated model is correctly specified. Collectively, these diagnostic results indicate that the ARDL-ECM satisfies the principal econometric assumptions and produces reliable parameter estimates.

Taken together, the ECM findings demonstrate that population growth, labour market conditions, income per capita, and interest rates significantly influence housing prices in the short run, while the significant Error Correction Term confirms that these short-run dynamics are anchored by a stable long-run equilibrium relationship. Together with the satisfactory diagnostic test results, these findings provide strong empirical support for the robustness of the estimated ARDL model and reinforce the conclusion that Malaysia's housing market is simultaneously shaped by immediate macroeconomic shocks and gradual long-run adjustment processes.

4.5. Johansen Cointegration Test

To further verify the existence of a long-run equilibrium relationship among the variables, the Johansen and Juselius (1990, JJ) cointegration test was performed. Unlike the ARDL bounds test, which establishes the presence of cointegration, the Johansen approach determines the number of cointegrating vectors within the multivariate system. Both the Trace and Maximum Eigenvalue (Max-Eigenvalue) statistics were employed, with the results presented in Table 6.

Table 6. Results of Johansen and Juselius cointegration test.

Null	Alternative	Trace Statistic (Un-adjusted)	Trace Statistic (Adjusted)	0.05 Critical Value	Max-Eigenvalue Statistic (Un-adjusted)	Max-Eigenvalue Statistic (Adjusted)	0.05 Critical Value
$r = 0$	$r = 1$	152.171 *	126.302 *	117.708	55.459 *	46.031 *	44.497
$r \leq 1$	$r = 2$	96.711	80.270	88.804	33.883	28.123	38.331
$r \leq 2$	$r = 3$	62.828	52.148	63.876	24.309	20.177	32.118
$r \leq 3$	$r = 4$	38.519	31.971	42.915	23.275	19.318	25.823
$r \leq 4$	$r = 5$	15.245	12.653	25.872	10.431	8.658	19.387
$r \leq 5$	$r = 6$	4.814	3.995	12.518	4.814	3.995	12.518

Note: (*) denotes rejection of the hypothesis at the 0.05 level. Trace test and Max-Eigenvalue test indicate a cointegrating equation. The critical values are provided by MacKinnon et al. (1999) at the 5% level of significance.

The JJ cointegration test provides robust evidence of a stable long-run equilibrium relationship among housing prices and the selected macroeconomic variables. Both the Trace and Max-Eigenvalue tests reject the null hypothesis of no cointegration ($r = 0$), as their adjusted statistics exceed the respective 5% critical values, confirming the existence of

at least one cointegrating vector. However, for the subsequent null hypotheses ($r \leq 1$ and beyond), the adjusted statistics fall below the corresponding critical values, indicating no evidence of additional cointegrating vectors. Collectively, both tests consistently identify a single cointegrating relationship, implying that housing prices (LHPI), population (LPPL), unemployment rate (LUR), construction cost (LCC), income per capita (LIPC), and interest rate (LIR) move together in the long run despite short-run fluctuations. These findings are consistent with the earlier ARDL bounds test, which also confirmed the existence of a stable long-run equilibrium relationship (Pesaran et al., 2001). Accordingly, the presence of cointegration provides strong econometric support for estimating the Vector Error Correction Model (VECM), enabling the analysis of both short-run dynamics and the speed of adjustment toward long-run equilibrium following economic shocks (Engle & Granger, 1987; Johansen & Juselius, 1990).

Following the confirmation of a long-run equilibrium relationship through the Johansen and Juselius cointegration test, the Vector Error Correction Model (VECM) was estimated to examine both the short-run dynamics and the long-run adjustment process among housing prices (LHPI), population (LPPL), unemployment rate (LUR), construction cost (LCC), income per capita (LIPC), and interest rate (LIR). Before estimating the VECM, the optimal lag length was determined using several information criteria. Given the relatively small sample size, this study adopts the AIC, which has been shown to outperform alternative criteria by reducing the likelihood of underestimating the optimal lag length in small samples (Liew, 2004). Accordingly, a VAR(2) specification was employed for the subsequent VECM estimation.

4.6. Vector Error Correction Model

The VECM results, presented in Table 7, reveal limited short-run interactions among the macroeconomic variables. The Wald χ^2 statistics indicate that, within the housing price equation ($\Delta LHPI$), only the lagged changes in the interest rate (ΔLIR) significantly influence housing price movements ($\chi^2 = 12.375$, $p = 0.002$), whereas population, unemployment, construction cost, and income per capita do not exhibit statistically significant short-run effects. These findings suggest that short-run fluctuations in Malaysia's housing prices are driven primarily by monetary policy rather than demographic, labour market, or cost-side factors.

Table 7. Results of Vector Error Correction Model.

Dependent Variables	χ^2 Statistics						ECT	
	$\Delta LHPI$	$\Delta LPPL$	ΔLUR	ΔLCC	$\Delta LIPC$	ΔLIR	Coefficient	t-Statistic
$\Delta LHPI$	-	5.308 (0.070)	2.630 (0.268)	6.206 (0.449)	8.214 (0.165)	12.375 (0.002) *	−0.001	−0.105
$\Delta LPPL$	5.099 (0.078)	-	0.839 (0.657)	3.503 (0.173)	3.503 (0.173)	0.365 (0.833)	−0.005	−0.361
ΔLUR	1.812 (0.404)	2.845 (0.241)	-	2.404 (0.301)	3.265 (0.195)	0.588 (0.745)	0.070	1.378
ΔLCC	0.610 (0.736)	2.273 (0.321)	3.030 (0.219)	-	2.577 (0.275)	3.354 (0.186)	−0.044	−0.710
$\Delta LIPC$	1.059 (0.588)	3.111 (0.211)	5.053 (0.079)	2.908 (0.233)	-	5.107 (0.077)	0.000	0.015
ΔLIR	3.216 (0.200)	0.263 (0.876)	3.015 (0.221)	1.961 (0.375)	0.335 (0.8456)	-	−0.157	−2.061

Notes: The χ^2 -statistic tests the joint significance of the lagged values of the independent variables, and the significance of the Error Correction Term (s). The figures in parentheses are the p -values. Asterisk (*) indicates statistical significance at the 5 percent level.

The long-run adjustment mechanism is captured by the Error Correction Term (ECT). Among all estimated equations, only the interest rate equation exhibits a negative and statistically significant ECT coefficient ($ECT = -0.157$; $t = -2.061$), satisfying the theoretical requirement for convergence toward long-run equilibrium. The estimated coefficient indicates that approximately 15.7% of any disequilibrium is corrected during each period, implying a gradual adjustment process following short-run shocks. This finding suggests that interest rates play the principal role in restoring long-run equilibrium within the housing market, highlighting the importance of monetary policy transmission in maintaining market stability. Similar evidence has been documented by Ibrahim and Law (2014), who identified interest rates as an important stabilising mechanism within Malaysia's housing and credit markets, while Lean and Smyth (2014) likewise reported that monetary policy exerts a significant long-run influence on housing prices.

To further examine the direction of dynamic relationships, Granger causality tests were performed based on the estimated VECM. Consistent with the short-run ARDL-ECM and VECM findings, the results indicate a unidirectional causal relationship running from interest rates (LIR) to housing prices (LHPI) at the 5% significance level, implying that changes in interest rates contain significant predictive information regarding future movements in housing prices. In contrast, no evidence of Granger causality is found from population (LPPL), unemployment rate (LUR), construction cost (LCC), or income per capita (LIPC) to housing prices. The consistency of the ARDL, Johansen cointegration, VECM, and Granger causality results strengthens the robustness of the empirical findings and demonstrates that, although macroeconomic variables collectively maintain a stable long-run equilibrium relationship with housing prices, interest rates emerge as the dominant short-run transmission channel influencing Malaysia's housing market. These findings underscore the central role of monetary policy in shaping housing price dynamics and suggest that interest rate adjustments remain one of the most effective policy instruments for promoting housing market stability.

4.7. Variance Decomposition

The dynamic interactions among the variables were further examined using Variance Decomposition (VDC), which was employed to evaluate the relative importance of each macroeconomic variable in explaining fluctuations within the system over a 50-period horizon. VDC quantifies the proportion of forecast error variance attributable to innovations originating from each variable, thereby identifying the dominant sources of variation in the housing market.

The results in Table 8 reveal that housing prices are largely self-determined throughout the forecast horizon. Initially, 100% of the forecast error variance in housing prices is explained by their own innovations, and although this proportion gradually declines, own shocks continue to account for approximately 82.8% of total variation by period 50. This finding indicates a high degree of persistence within Malaysia's housing market, suggesting that historical housing price movements remain the principal determinant of future price fluctuations. Among the macroeconomic variables, unemployment emerges as the most influential external determinant, explaining approximately 9.8% of housing price variation in the long run, while the contributions of population, construction costs, income per capita, and interest rates remain comparatively modest.

Table 8. Variance decompositions.

Period	$\Delta LHPI$	$\Delta LPPL$	ΔLUR	ΔLCC	$\Delta LIPC$	ΔLIR	ΔCU
Variance decomposition of $\Delta LHPI$							
1	100.000	0.000	0.000	0.000	0.000	0.000	0.000
4	88.186	0.697	4.490	3.156	1.115	2.356	11.814
8	81.968	1.256	8.079	3.302	3.106	2.289	18.032
12	80.493	1.692	9.123	2.558	3.215	2.918	19.507
16	81.757	1.467	9.132	2.622	2.657	2.364	18.243
20	81.886	1.166	9.378	2.597	2.702	2.271	18.114
30	82.383	0.950	9.617	2.488	2.482	2.080	17.617
40	82.636	0.810	9.747	2.434	2.387	1.985	17.364
50	82.797	0.720	9.824	2.406	2.330	1.923	17.203
Variance decomposition of $\Delta LPPL$							
1	0.006	99.994	0.000	0.000	0.000	0.000	0.006
4	0.031	80.318	0.045	1.466	13.507	4.633	19.682
8	0.939	68.903	0.195	1.034	18.599	10.330	31.097
12	2.933	68.813	0.485	0.939	17.119	9.711	31.187
16	2.625	70.669	0.431	0.715	16.630	8.929	29.331
20	2.707	69.478	0.382	0.626	17.234	9.573	30.522
30	2.943	70.002	0.377	0.457	16.925	9.297	29.998
40	3.057	70.154	0.366	0.366	16.833	9.225	29.846
50	3.116	70.219	0.355	0.309	16.802	9.199	29.781
Variance decomposition of ΔLUR							
1	12.513	11.652	75.835	0.000	0.000	0.000	24.165
4	38.411	7.844	45.266	3.298	0.276	4.905	54.734
8	55.078	5.815	29.075	2.151	4.531	3.350	70.925
12	54.865	10.386	25.386	2.389	4.339	2.635	74.614
16	56.942	10.371	24.629	2.152	3.794	2.112	75.371
20	59.129	10.112	22.905	2.011	4.063	1.781	77.095
30	60.718	10.692	21.547	1.922	3.863	1.257	78.453
40	61.658	10.927	20.771	1.869	3.795	0.979	79.229
50	62.281	11.038	20.282	1.831	3.760	0.807	79.718
Variance decomposition of ΔLCC							
1	28.450	2.117	36.638	32.796	0.000	0.000	67.204
4	37.991	4.084	27.250	28.749	0.147	1.778	71.251
8	36.967	5.600	22.820	32.130	1.271	1.213	67.870
12	32.728	8.033	23.281	34.079	0.899	0.979	65.921
16	33.019	7.510	23.515	34.309	0.753	0.895	65.691
20	32.787	7.756	23.153	34.826	0.754	0.724	65.174
30	32.104	7.965	23.331	35.442	0.601	0.556	64.558
40	31.777	8.084	23.378	35.777	0.525	0.459	64.223
50	31.601	8.148	23.394	35.978	0.481	0.398	64.022
Variance decomposition of $\Delta LIPC$							
1	35.547	2.025	35.594	24.697	2.138	0.000	97.862
4	53.998	1.870	17.709	20.573	4.768	1.082	95.232
8	43.237	7.187	10.289	23.171	11.169	4.947	88.831
12	37.278	12.134	11.446	26.690	8.702	3.750	91.298
16	38.729	11.046	11.490	27.106	8.477	3.153	91.523
20	37.880	11.611	10.900	27.742	8.700	3.168	91.301
30	37.182	12.056	11.034	28.901	8.196	2.631	91.804
40	36.780	12.320	11.045	29.523	7.963	2.368	92.037
50	36.557	12.463	11.030	29.893	7.842	2.215	92.158

Table 8. Cont.

Period	$\Delta LHPI$	$\Delta LPPL$	ΔLUR	ΔLCC	$\Delta LIPC$	ΔLIR	ΔCU
Variance decomposition of ΔLIR							
1	8.321	14.415	2.300	0.497	35.907	38.560	61.440
4	14.827	18.661	6.673	1.876	35.295	22.668	77.332
8	21.209	8.781	3.295	1.945	44.990	19.781	80.219
12	18.547	9.218	2.450	1.322	45.813	22.651	77.349
16	18.690	8.997	2.075	1.150	47.012	22.076	77.924
20	19.515	7.421	1.790	0.968	48.360	21.946	78.054
30	19.373	6.534	1.346	0.689	49.819	22.239	77.761
40	19.385	5.922	1.109	0.533	50.674	22.377	77.623
50	19.430	5.509	0.963	0.437	51.222	22.439	77.561

Note: The bold column represents the impact of its own shock.

Population dynamics also exhibit considerable persistence. Although population shocks explain virtually all of their own variation during the initial period, their contribution gradually declines to approximately 70.2% by period 50. This reduction reflects the increasing influence of housing prices, income per capita, and interest rates on long-run demographic dynamics, highlighting the interconnectedness between housing market conditions and broader economic development. A notable finding concerns the unemployment rate, whose own explanatory power declines substantially over time from 75.8% in the first period to only 20.3% by period 50. Conversely, housing prices become the dominant source of unemployment fluctuations, accounting for more than 62% of forecast error variance in the long run. This result suggests a strong feedback mechanism whereby housing market performance increasingly influences labour market outcomes through wealth effects, construction activity, and broader economic conditions.

Construction costs demonstrate relatively stable persistence, with innovations consistently explaining approximately 36% of their long-run variation. Nevertheless, housing prices account for approximately one-third of construction cost fluctuations throughout the forecast horizon, indicating that sustained increases in housing demand eventually place upward pressure on construction input prices. Income per capita similarly exhibits strong interactions with housing prices and construction costs. While housing prices explain a substantial proportion of income variation during the early periods, construction costs become increasingly influential over time, jointly accounting for a considerable share of long-run income dynamics.

The interest rate equation highlights the dominant role of income per capita in monetary policy transmission. Although own innovations explain approximately 38.6% of interest rate variation initially, this contribution declines steadily to around 22.4% by period 50. In contrast, income per capita becomes the primary source of interest rate fluctuations, accounting for more than half of the long-run variance. This finding suggests that monetary policy adjustments in Malaysia respond closely to changes in overall economic activity and income growth. Collectively, the VDC results reinforce the conclusions obtained from the impulse response analysis. Housing prices remain highly persistent and largely self-driven, while unemployment represents the most important external source of housing market fluctuations. At the same time, housing prices increasingly influence labour market conditions, construction costs, and household income, illustrating the central role of the housing sector within Malaysia's macroeconomic system.

4.8. Impulse Response Functions

The Impulse Response Function (IRF) traces the response of endogenous variables to a one-standard-deviation shock in another variable over a 50-period forecast horizon. Figure 4 illustrates the responses of housing prices (LHPI), population (LPPL), unemployment rate (LUR), construction cost (LCC), income per capita (LIPC), and interest rate (LIR) to innovations originating from each variable. First, housing prices exhibit strong persistence, as reflected by the pronounced positive response to their own shocks, although the magnitude of this response gradually diminishes over time. This pattern suggests that the Malaysian housing market possesses considerable inertia, whereby past housing price movements continue to influence future price dynamics. Such persistence indicates that housing prices are largely driven by their own historical behaviour before gradually converging towards a new equilibrium. Second, population shocks initially generate a modest decline in housing prices before producing a sustained positive response over the longer horizon. This finding reflects the gradual nature of demographic influences on the housing market, where population growth increases housing demand only after a period of adjustment as households expand and urbanisation intensifies.

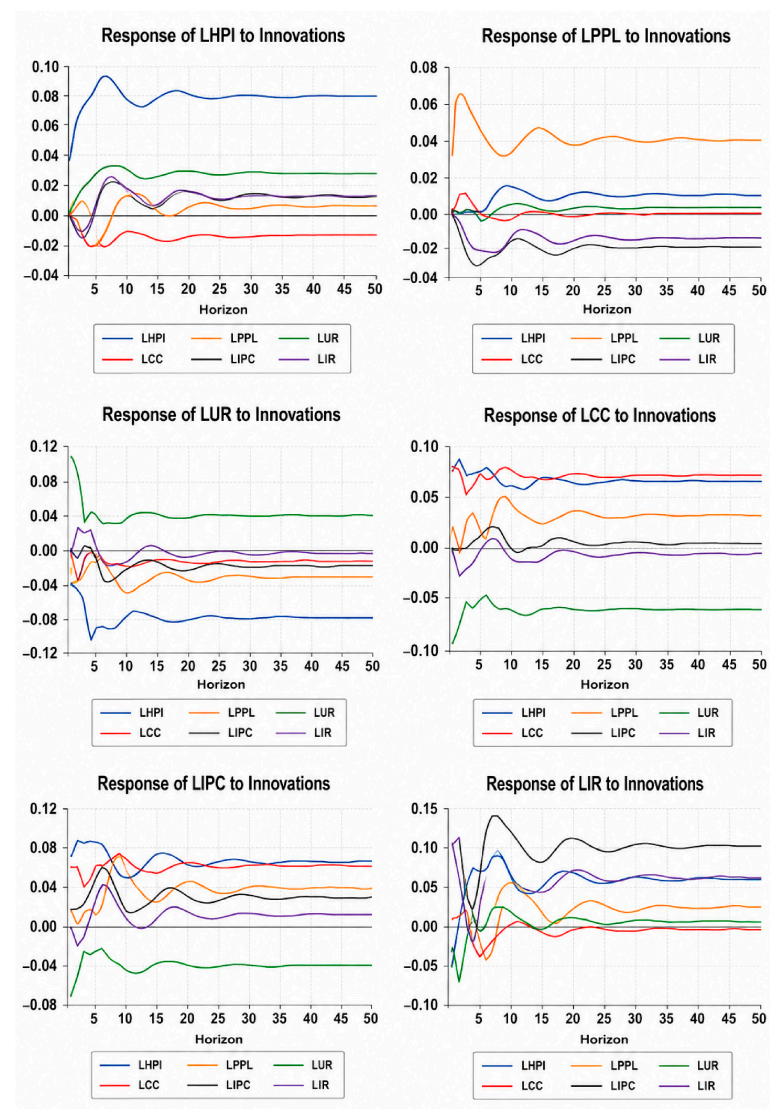


Figure 4. Impulse Response Function.

Third, shocks to the unemployment rate generate persistently negative responses in housing prices, consistent with economic theory. Rising unemployment weakens household income, reduces purchasing power, and lowers housing affordability, thereby dampening demand within the housing market. This finding underscores the important role of labour market conditions in influencing residential property prices. Fourth, construction cost shocks produce a consistently positive response in housing prices, suggesting that increases in construction input costs are eventually transmitted to homebuyers through higher property prices. This cost pass-through mechanism highlights the importance of supply-side factors in determining housing market performance, particularly in periods of rising material and labour costs.

Fifth, income per capita elicits the strongest and most persistent positive response among all macroeconomic variables. The results reaffirm that improvements in household income substantially increase purchasing power and housing demand, making income growth one of the most important determinants of housing price appreciation in Malaysia. Sixth, interest rate shocks generate only modest short-run responses in housing prices, followed by gradual negative adjustments over longer horizons. This finding suggests that monetary policy influences the housing market primarily through financing costs and mortgage affordability, with its effects materialising progressively rather than immediately. Seventh, the responses of the remaining endogenous variables reveal several important macroeconomic linkages. Housing price shocks induce only marginal improvements in labour market conditions, implying that housing market expansion does not immediately translate into employment growth. Conversely, income per capita responds negatively to unemployment shocks, reflecting the close relationship between labour market performance and household earnings. Construction costs display considerable persistence following their own innovations, indicating that construction input prices are relatively inelastic and adjust slowly over time. Meanwhile, interest rates respond moderately to positive income shocks, suggesting that stronger economic activity and rising incomes may prompt monetary authorities to tighten policy in response to potential inflationary pressures.

The IRF analysis demonstrates that Malaysia's housing market is characterised by substantial persistence and is primarily influenced by its own historical dynamics, while remaining particularly responsive to income growth and construction costs. Unemployment shocks exert persistent adverse effects on both housing prices and household income, whereas interest rate innovations produce comparatively weaker and less persistent impacts. Collectively, these findings highlight the critical role of macroeconomic fundamentals in shaping housing market dynamics and suggest that the transmission of monetary policy operates gradually through the financial system before affecting housing prices.

5. Conclusions

This study examined the macroeconomic determinants of housing prices in Malaysia over the 1990–2024 period using annual time-series data. First, the findings show that the long-run effects of the selected macroeconomic variables are generally weak. Although income per capita exhibits a positive relationship with housing prices, its effect is not statistically significant. Similarly, the unemployment rate, construction cost, and interest rate display negative but insignificant relationships. These results suggest that long-run housing price dynamics are influenced by broader structural, institutional, and market factors beyond the variables included in the model (Willis & Mohsin, 2025).

Second, the short-run results reveal stronger relationships. Lagged housing prices and income per capita significantly increase housing prices, while interest rates exert a significant negative effect. In contrast, unemployment remains insignificant, indicating limited short-run influence on housing price movements. Third, the negative and sig-

nificant Error Correction Term (ECT) confirms the existence of a long-run equilibrium relationship, although the slow adjustment speed indicates gradual convergence due to structural rigidities in the housing market. Fourth, variance decomposition analysis identifies housing prices as relatively exogenous, whereas construction cost is the most endogenous variable, highlighting the importance of supply-side cost shocks. This evidence suggests that Malaysia's housing prices cannot be fully explained by conventional macroeconomic fundamentals alone, emphasising the growing importance of structural characteristics, institutional factors, and market expectations in shaping long-term housing market dynamics.

From a policy perspective, improving housing affordability requires a balanced policy approach that simultaneously addresses both demand-side and supply-side constraints. While income growth enhances purchasing power and stimulates housing demand (Musaddad et al., 2023, 2025; Ullah et al., 2025), policymakers should ensure that rising household incomes are accompanied by an adequate supply of affordable housing to prevent excessive price appreciation. Expanding affordable housing programmes, improving the targeting of lower- and middle-income households, and promoting cost-efficient construction technologies such as the Industrialised Building System (IBS) can help alleviate supply shortages and improve housing affordability (Saleh et al., 2025). Furthermore, given that construction costs appear to interact with regulatory inefficiencies and financing constraints (Ullah et al., 2025), broader structural reforms are required beyond simply reducing construction expenses. The relatively exogenous behaviour of housing prices also suggests that speculative activities and market expectations may contribute to price distortions. Consequently, strengthening market transparency, improving regulatory oversight, and implementing targeted anti-speculation measures are essential for promoting a more stable and sustainable housing market. Collectively, these findings support the need for an integrated housing policy combining demand management, housing supply expansion, and institutional reforms.

Like all empirical research, this study has several limitations. First, it focuses on macroeconomic variables and does not include microeconomic or institutional factors, such as household wealth, education, credit accessibility, and buyer behaviour, which may also influence housing prices (Musaddad et al., 2023). Second, the use of aggregate national-level data may mask regional variations in housing market dynamics across Malaysia. Third, the use of annual data limits the analysis of short-term fluctuations and rapid responses to economic shocks and policy changes. In addition, this study does not explicitly account for structural breaks, such as the Asian Financial Crisis and the COVID-19 pandemic, which may have affected housing price behaviour (Willis & Mohsin, 2025).

Despite these limitations, this study provides useful evidence on the macroeconomic determinants of housing prices in Malaysia. Future research should incorporate microeconomic and institutional variables; employ state-level or higher-frequency data; account for structural breaks; and apply advanced econometric techniques, such as the Nonlinear Autoregressive Distributed Lag (NARDL), Vector Autoregression (VAR), or Structural VAR (SVAR) models, to provide a more comprehensive understanding of housing price dynamics.

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Abbreviations

The following abbreviations are used in this manuscript:

ADF	Augmented Dickey–Fuller
AIC	Akaike information criterion
ARDL	Autoregressive Distributed Lag
BNM	Bank Negara Malaysia (Central Bank of Malaysia)
ECM	Error Correction Model
ECT	Error Correction Term
VDC	Variance Decomposition
GDP	Gross Domestic Product
GST	Goods and Services Tax
HPI	Housing Price Index
IRF	Impulse Response Function
JB	Jarque–Bera
JJ	Johansen and Juselius
MHPI	Malaysian House Price Index
NAPIC	National Property Information Centre
PP	Phillips–Perron
RESET	Ramsey Regression Equation Specification Error Test
SIC	Schwarz Information Criterion
VAR	Vector Autoregression
VECM	Vector Error Correction Model

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