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GOVERNMENT INTERVENTIONS AND HOUSING PRICES: CAN POLICIES STABILIZE MALAYSIA'S RESIDENTIAL PROPERTY MARKET?

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Abstract

Malaysia's residential property market faces a long-standing affordability problem because house prices have risen faster than household incomes. Government housing programmes are the main policy response, but there is little evidence on whether they significantly affect market prices. This study examines how government housing intervention and state economic conditions affect residential property prices across all 13 Malaysian states and the Federal Territory of Kuala Lumpur, using a balanced panel of 14 units observed annually from 2010 to 2022. In this study, government intervention is measured by the number of completed Program Perumahan Rakyat (PPR) units. The model is estimated using fixed effects with year effects and Driscoll-Kraay standard errors. Two findings emerge. First, state economic conditions are associated with house prices in the expected directions: a one per cent larger population is associated with a house price index about 1.55 points higher and a one per cent higher income per capita with about 0.22 points higher. Second, government housing policy is positively and significantly associated with the price index, with a coefficient of 10.926 and a Driscoll-Kraay standard error of 3.009, significant at the 1% level. This association is not uniform: once the government policy variable is interacted with state economic conditions, all three interaction terms are significant, indicating that the relationship between public housing provision and house prices varies with a state's income level, population size and labour-market conditions. For planning practice, these results imply that targeted affordable housing program should be assessed using sub-market affordability, access and delivery indicators rather than an aggregate state house price index, which covers all market segments.

Keywords: Housing prices, government interventions, macroeconomic factors, panel data, Malaysia

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INTRODUCTION

The real estate market plays a crucial role in Malaysia's economic development within the residential property sector. Over recent years, various studies have reported growing concerns about the affordability and accessibility of housing for the Malaysian population (Daud et al., 2022; Hassan, Ahmad & Hashim, 2021; Liu & Ong, 2021; Musaddad, Maamor & Zainol, 2023; Yap & Ng, 2018). One of the most pressing issues is the mismatch between housing supply and demand in urban areas where property prices have escalated rapidly (Kamal, Lai & Yusof, 2020; Olanrewaju & Idrus, 2020; Tobi, Jasimin & Rani, 2020). Residential properties in high-demand locations have become increasingly out of reach for many, leading to concerns about housing affordability for low- and middle-income households.

Previous reports have highlighted several challenges related to the residential property market in Malaysia, including an oversupply of high-end properties, an increasing number of unsold homes, and a rising property overhang in Kuala Lumpur and other cities (Khazanah Research Institute, 2019; NAPIC, 2024). The growing gap between house prices and household income further worsens these issues, making it difficult for first-time homebuyers to enter the market. Additionally, rapid urbanization and population growth have increased the pressure on housing demand, leading to further inflation in property prices.

Given these challenges, government intervention is essential to address market inefficiencies and ensure the availability of affordable housing. Policy tools such as the introduction of housing affordability schemes have proven to be critical in mitigating price volatility and ensuring that housing remains accessible to the broader population. Government initiatives like Program Perumahan Rakyat (PPR), Perumahan Penjawat Awam 1 Malaysia (PR1MA), Perumahan Mesra Rakyat (PMR) and Program Kediaman SPNB are examples of interventions designed to promote homeownership among lower and middle-income groups (KPKT, 2022). However, the effectiveness of these programs in impacting house prices is often debated, and whether continuous adjustments in government interventions are necessary to respond to evolving market conditions and demographic shifts remains a key concern.

Program Perumahan Rakyat (PPR) is a government initiative through the Ministry of Local Government Development (KPKT) to provide comfortable, safe, and affordable housing for low-income groups in Malaysia, consisting of two distinct categories. The rented PPR programme was introduced in February 2002, aimed at being rented out to target groups, especially for low-income households and squatter communities, at a rate of RM124.00 per month, allowing families to temporarily secure housing while building financial capacity for homeownership. The Government is also implementing the owned PPR, which aims to enable lower income earners to have their own homes, with selling prices

between RM35,000 and RM42,000 per unit depending on location (National Housing Department, 2022).

Review of past studies indicates that the topic of housing issues and macroeconomic factors has become one of the leading issues explored by researchers worldwide and in Malaysia. Those studies found that macroeconomic factors such as money supply, bank lending rate, gross domestic product, inflation, and stock market have a significant effect on residential property prices. This shows that macroeconomic factors have a significant contribution to the rising trend in the property market (Mohan et al., 2019; Tripathi, 2019; Leung & Ng, 2019; Maynou et al., 2021; Plakandaras et al., 2020). In Malaysia, many studies have examined the relationship between macroeconomic factors and housing prices (Pinjaman & Kogid, 2020; Baharuddin, Isa & Zahari, 2019; Camara, 2023; Zulkifli, Pinjaman & Malin, 2022). However, these studies focused only on national-level causal relationships between macroeconomic variables and house prices, without examining the role of government intervention in Malaysia's real estate market. Existing studies on government intervention through housing affordability programmes with respect to property prices remain scarce (Hashim, 2010).

Therefore, it is pertinent to study how sensitive Malaysia's housing market is to government interventions and macroeconomic factors. This study explores the relationship between government housing policies and macroeconomic factors to better understand the effects of these elements on property prices across Malaysian states. The role of government policies in regulating housing prices and stabilizing the real estate market in response to macroeconomic shifts, is critical in ensuring balanced market growth. This study contributes to new knowledge by not only assessing the impact at the national level but also conducting a state-level evaluation, providing deeper insights into state disparities in Malaysia's residential property market. Hence, it is essential to investigate how government interventions and macroeconomic factors shape Malaysia's real estate market within the residential property sector. The analysis covers all 13 Malaysian states, including Sabah and Sarawak, together with the Federal Territory of Kuala Lumpur, giving 14 cross-sectional units observed annually from 2010 to 2022.

LITERATURE REVIEW

Government housing interventions represent a critical policy path for addressing market inefficiencies and affordability challenges. Hashim (2010) notes that research specifically examining the relationship between government housing affordability programmes and property prices remains scarce, pointing to a significant gap in the empirical literature. Recent evidence by Liu and Ong (2021) demonstrates that Malaysia's existing government housing scheme including the

Program Perumahan Rakyat (PPR), Perumahan Penjawat Awam 1 Malaysia (PR1MA), and rent-to-own arrangements, have proven insufficient in adequately addressing the escalating demand for affordable housing. These programmes face substantial implementation challenges such as bureaucratic delays, limited supply relative to demand, and restrictive eligibility criteria that constrain their effectiveness. Understanding how this policy interventions interact with macroeconomic conditions to influence housing price movements is therefore essential for developing more targeted and effective housing policy strategies that can stabilize Malaysia's residential property market while promoting both affordability and accessibility.

Previous studies have also highlighted that the effectiveness of government interventions may vary considerably across geographical contexts. For example, Cheong, Ngui and Beatrice (2020) found that while targeted affordability programmes like the PPR scheme aim to improve housing accessibility, they may unintentionally increase overall market prices through indirect market effects. This observation is relevant in the Malaysian context, where significant spatial disparities exist across states. Urban states such as Selangor, Kuala Lumpur and Johor exhibit markedly different housing market dynamics compared to less urbanized states in the north and east of Peninsular Malaysia (Kamal et al., 2020; Olanrewaju & Idrus, 2020). These geographical variations present the need for state-level analysis rather than national-level aggregation, as uniform national housing policies may produce heterogeneous outcomes across states with different levels of urbanization, income profiles and housing demand pressures. From a spatial planning perspective, understanding these state-level disparities is critical for designing land use policies and regional development strategies that are sensitive to local market conditions (Liu et al., 2024; Reiner & Musil, 2023).

Based on the discussion above, it is hypothesized that:

H1: Government housing interventions have a significant effect on residential property prices.

The empirical relationship between macroeconomic variables and housing prices has been extensively documented in academic literature. A substantial body of research demonstrates that macroeconomic indicators such as gross domestic product (GDP), money supply, inflation rates, and lending rates exert significant influence on residential property prices both in the short and long term. Internationally, Mohan et al. (2019), Tripathi (2019), Leung and Ng (2019), and Maynou et al. (2021) provide evidence that macroeconomic factors are critical determinants of property market dynamics. In the Malaysian context specifically, numerous studies have examined the causal relationships between

macroeconomic variables and housing prices, including those by Pinjaman and Kogid (2020), Baharuddin, Isa and Zahari (2019), and Zulkifli, Pinjaman and Malin (2022). These studies collectively suggest that macroeconomic fluctuations create significant effects throughout the residential property sector, affecting affordability and market accessibility across different income groups.

Population growth and demographic pressure are consistently identified as among the most robust drivers of housing price appreciation. Rapid urbanization concentrates demand in specific geographic corridors, creating upward price pressure in urban and peri-urban areas and contributing to affordability stress for low- and middle-income households (Jun, Song & Selvaratnam, 2025; Ong, 2013). Similarly, exchange rate movements have been shown to influence housing prices through their effects on construction costs, foreign investment flows, and broader macroeconomic conditions (Pinjaman & Kogid, 2020). These findings carry significant implications for planning policy: spatial planning frameworks that fail to account for population distribution and global economic exposure risk worsening housing affordability challenges at the state level.

Based on the discussion above, it is hypothesized that:

H2: Macroeconomic factors have a significant effect on residential property prices.

METHODOLOGY

Variable Choices

This study aims to determine how government housing policy and macroeconomic factors affect residential property prices across 13 Malaysian states, including Sabah and Sarawak, together with the Federal Territory of Kuala Lumpur. The coverage is therefore national rather than confined to Peninsular Malaysia which has not been examined before in this context. To achieve this objective, this study identifies variables that can proxy for government housing policies, as well as the established macroeconomic factors previously shown in the literature to have significant influence housing prices in Malaysia (see studies by Jun, Song & Selvaratnam, 2025; Ong, 2013; and Pinjaman & Kogid, 2020). Thus, the selected variables capture three key areas namely government policy interventions, demand-side macroeconomic factors (such as GDP, population growth, and unemployment), and capital cost factors (like base lending rate and consumer price inflation, and exchange rate). The dependent variable is the Malaysian House Price Index (MHPI) for each state, published by the National Property Information Centre (NAPIC). State economic conditions are captured by three variables: gross domestic product per capita, population, and the unemployment rate, all measured at state level and obtained from the Department

of Statistics Malaysia. In contrast, the base lending rate, the consumer price index and the exchange rate, are national aggregate series

This study examined every annual statistics report published by the Ministry of Housing and Local Government (KPKT) from 2010 to 2022 in order to build a consistent measure of the policy portfolio. However, PR1MA, PPA1M, the SPNB residential programme and Rumah Mesra Rakyat do not appear in any KPKT statistics report before 2020. They appear for the first time in the 2020 edition, and only as cumulative totals to that date, with no annual breakdown. PPA1M is then dropped from the 2022 edition altogether. State-level schemes such as Rumah Selangorku, and rent-to-own arrangements, cannot be used either. State schemes are not compiled in national statistics on a comparable basis, and a scheme operating in a single state cannot be separated from that state's own time path in a fixed-effects model. Meanwhile rent-to-own is a financing and tenure mechanism rather than a supply intervention. It adds no units to the housing stock, and take-up is recorded by participating institutions rather than published by state and year.

Therefore, Program Perumahan Rakyat (PPR) is used as the primary measure of government housing intervention. PPR is selected as the proxy variable for several reasons. First, it is the flagship and longest-running government housing programme in Malaysia, with the widest spatial distribution across all Malaysia states, making it the most appropriate programme for state-level panel analysis. Second, unlike PR1MA and other affordability programmes, consistent state-level data on PPR completed units is available throughout the study period (2010–2022), ensuring balanced panel data. Third, PPR is explicitly targeted at the lowest income group which the households most affected by housing affordability, making it the most direct policy instrument for studying government intervention in the housing market. Fourth, the use of PPR as a proxy for government intervention is consistent with prior literature, including Hashim (2010) and Liu and Ong (2021), who identify PPR as the primary instrument of government housing intervention in Malaysia. Cheong, Ngui and Beatrice (2020) further highlight an important policy trade-off while targeted affordability programmes like the PPR scheme aim to improve housing accessibility, they may unintentionally increase overall market prices through indirect market effects.

Data and Model Specification

This study employs balanced panel data consisting of 13 Malaysian states and the Federal Territory of Kuala Lumpur observed over 13 years from 2010 to 2022, yielding 182 observations. The following regression model is proposed:

$$hpi_{it} = \alpha_i + \lambda_t + \beta_1 \ln govpol_{it} + \beta_2 \ln gdppc_{it} + \beta_3 \ln pop_{it} + \beta_4 unemp_{it} + \beta_5 blr_{it} + \beta_6 cpi_{it} + \beta_7 exrate_{it} + \gamma MP_{it} + \varepsilon_{it}$$

Where α_i denotes state fixed effects and λ_t denotes year fixed effects. hpi_{it} is the housing price index for state i at time t and $lngovpol$ is the government policy variable measured via the number of completed Program Perumahan Rakyat (PPR) units in each state and year. Meanwhile, three variables for the demand-side macroeconomic factors are $lngdppc$ capturing the gross domestic product per capita, $lnpop$ is the population, and $unemp$ is the unemployment rate for each state. For capital cost factors, blr , cpi , and $exrate$ are included as control variables to capture base lending rate, consumer price index, and exchange rate, respectively. MP is the vector of three interaction terms where the interaction variables were generated as $(lngdppc \times lngovpol)$, $(lnpop \times lngovpol)$ and $(unemp \times lngovpol)$. ε_{it} is the error term. Six models are estimated where Models 1 to 3 add the policy variable and then the interactions to the state economic variables. Models 4 to 6 repeat these three specifications with the control variables added. All six models are estimated in levels rather than in first differences. The dependent variable is the state house price index measured in index points. The government policy, gross domestic product per capita and population variables are measured in natural logarithms, while the unemployment rate is measured in percentage points. The level specification is retained because the study is concerned with the long-run relationship between affordable housing provision, state economic conditions and house prices. First differencing would remove this long-run information and would instead measure short-run year-to-year changes, which does not correspond to the objective of this study.

Preliminary Diagnostic Tests

Given the panel nature of the data and the potential presence of unobserved heterogeneity across states, multiple diagnostic tests were conducted prior to model estimation including the Multicollinearity Test, the Pesaran Cross-Sectional Dependence (CSD) Test and the Model Selection Test.

RESULTS OF TESTS AND ESTIMATION

This section presents and discusses the diagnostic tests, and estimated regression results. The presence of multicollinearity among the independent variables was assessed using the Variance Inflation Factor (VIF), the results of which are reported in Table 1.

Table 1: Multicollinearity Test

Variable	VIF	1/VIF
Government Housing Policy (lnGOVPL)	2.26	0.442409
GDP per capita (lnGDPPC)	1.48	0.674600
Population (lnPOP)	1.28	0.779471
Unemployment Rate (UNEMP)	1.68	0.595618
Base Lending Rate (BLR)	1.36	0.734831
Consumer Price Index (CPI)	7.43	0.134643
Exchange Rate (EXRATE)	7.03	0.142306
Mean VIF	3.22	

Note: VIF > 5 for Consumer Price Index and Exchange Rate indicate a moderate collinearity for these variables; however, both remain below the conservative threshold of 10 (Hair et al., 2010).

Based on the Table 1 above, the theoretical importance of CPI and exchange rate in housing price determination is well-established in the literature and both are national data series that trend upward over the sample period, so they move together almost mechanically. Thus, their exclusion would risk omitted variable bias. The Driscoll-Kraay robust standard errors applied in the final model is expected to further mitigate the influence of collinearity on statistical inference. The mean VIF of 3.22 confirms that multicollinearity is not a systemic concern across the model.

Table 2: Panel Unit Root Test (Im-Pesaran-Shin W-statistic)

Variable	Level W-stat	p-value	Decision	1st Diff W-stat	p-value
Housing Price Index (HPI)	2.982	0.999	<i>I</i> (1)	-3.002	0.001***
lnGOVPL	3.028	0.999	<i>I</i> (1)	-3.484	0.000***
lnGDPPC	4.010	1.000	<i>I</i> (1)	-2.873	0.002***
lnPOP	6.552	1.000	<i>I</i> (1)	-3.387	0.000***
UNEMP	-0.287	0.393	<i>I</i> (1)	-9.820	0.000***
BLR	7.860	1.000	<i>I</i> (1)	-3.681	0.000***
CPI	3.685	1.000	<i>I</i> (1)	-2.984	0.001***
EXRATE	4.261	1.000	<i>I</i> (1)	-2.133	0.016**

**Note: H0: All panels contain a unit root. W-statistic follows standard normal N(0,1) under H0. Level tests use intercept and trend; first-difference tests use intercept only. All variables are I(1), non-stationary in levels but stationary in first differences.*

The IPS unit root test results in Table 2 above confirm that all variables are non-stationary in levels but become stationary after first differencing, indicating that all series are integrated of order one, $I(1)$. This finding is important because when all variables share the same order of integration, long-run cointegrating relationships may exist between them. The use of a fixed effects estimator with Driscoll-Kraay standard errors, which is explicitly robust to serial correlation and heteroskedasticity, both of which are common features of $I(1)$ processes, therefore appropriate for estimating the long-run relationship between housing prices and the explanatory variables.

Two qualifications apply to this result. First, the panel has a short time dimension of only 13 annual observations per state. The Im-Pesaran-Shin test is designed for panels with a relatively large time dimension, so at $T = 13$ it has limited power to detect unit roots. The $I(1)$ classifications in Table 2 are therefore better read as evidence that the series are trending than as strong evidence of unit roots and they do not on their own require the model to be estimated in first differences. Second, panel cointegration tests such as Pedroni (1999) and Westerlund (2007) likewise require a longer time dimension than the 13 annual observations available here, and their reliability at this sample length would be limited.

The trending nature of the data is consequently addressed through the design of the model rather than through a cointegration test. Year fixed effects captured common trends and common shocks over time, state fixed effects control for permanent differences across states, and Driscoll-Kraay standard errors computed with a maximum lag of 2 remain valid in the presence of serial correlation, heteroskedasticity and cross-sectional dependence. This combination is the reason a two-way fixed-effects estimator with Driscoll-Kraay standard errors is considered sufficient for the panel used in this study.

Table 3: Pesaran Cross-Sectional Dependence Test

Variable	CD-Test	p-value	Mean ρ	Mean abs(ρ)
HPI	20.773	0.000	0.60	0.64
lnGOVPOL	28.472	0.000	0.95	0.95
lnGDPPC	27.424	0.000	0.80	0.83
lnPOP	23.349	0.000	0.68	0.71
UNEMP	15.172	0.000	0.44	0.47
BLR	34.395	0.000	1.00	1.00
CPI	34.395	0.000	1.00	1.00
EXRATE	34.395	0.000	1.00	1.00

Note: All variables are significant at the 1% level with p-value of 0.000, confirming cross-sectional dependence across states.

The Pesaran CSD test results in Table 3 above indicate statistically significant cross-sectional dependence across all variables at the 1% significance level, confirming highly dependent and interconnected housing market conditions across Malaysian states. This finding is important in the Malaysian context, where housing markets in urban states like Kuala Lumpur and Selangor are likely to influence neighbouring states through price spillovers. This is in line with Lean and Smyth (2013) that found evidence of price spillovers from the most developed states to less developed ones. Similarly, Fereidouni et al. (2016) also showed the existence of price spillover effects from Malaysia's major economic regions such as Kuala Lumpur, Selangor, Pulau Pinang, and Johor onto the neighbouring housing markets.

The mean correlation reported in Table 3 reaches 1.00 for the base lending rate, the consumer price index and the exchange rate because these are national data series that take the same value in every state in a given year, so their cross-state correlation is mechanical rather than behavioural. This pattern is precisely why a two-way fixed-effects specification is adopted. Year fixed effects absorb the common time-varying component that generates this dependence, while Driscoll-Kraay standard errors account for the remaining cross-sectional dependence, heteroskedasticity and serial correlation in the residuals.

Table 4: Model Selection Test

	Statistics	p-value	Decision
Poolability test (FE vs POLS)	$F(13, 131) = 2.93$	0.0009	Rejects POLS at 1%
Hausman test (FE vs RE)	$\chi^2(16) = 19.11$	0.2629	Does not reject RE
Breusch-Pagan LM test (RE vs POLS)	$\text{chibar}^2(01) = 2.02$	0.0777	Rejects POLS at 10% only
Joint test - year effects	$F(9, 131) = 12.41$	0.0000	Year effects required

The Poolability test in Table 4 above provides stronger evidence against the pooled specification. The FE estimation produces an F-test of 2.93 with a p-value of 0.0009 for the null hypothesis that all state-specific effects are zero. The null is rejected at the 1% level, indicating the presence of statistically significant state-specific heterogeneity. This reflects geographic characteristics, local housing policies, and regional economic structures, and heterogeneity is also of direct relevance to spatial planning practitioners and policymakers operating at the state level. This is in line with some studies done by Suh (2023) and Liu et al. (2024). For example, Suh (2023) found that regional housing cycles differ substantially due to idiosyncratic regional shocks, and argues explicitly that

uniform national policies are inadequate, hence, stabilization tools such as property tax and housing policy are needed to address the heterogeneity.

Besides that, the result detects significant time effects. The joint test of the year dummy variables produces an F-statistic of 12.41 with a p-value of 0.0000, rejecting the null hypothesis that the year effects are jointly zero. Accordingly, year fixed effects are included in all principal specifications to control for common time shocks affecting the Malaysian housing market. Taken together, the diagnostic evidence supports the use of a two-way fixed-effects with state and year effects, while the presence of cross-sectional dependence motivates the use of Driscoll–Kraay standard errors for statistical inference.

Table 4 also reports a Hausman test comparing fixed and random effects, which returns a chi-square statistic of 19.11 with 16 degrees of freedom and a p-value of 0.2629 and therefore does not reject the random-effects specification. The fixed-effects estimator is nonetheless retained for three reasons. A failure to reject is not positive evidence that the state effects are uncorrelated with the regressors in a panel with only 13 time periods in which the test has low power. The poolability test already confirms that state-specific effects are jointly significant at the 1% level. Finally, the fixed-effects estimator remains consistent whether or not the orthogonality condition required by random effects holds, and it is the specification under which Driscoll–Kraay standard errors are applied here.

Table 5: Fixed Effects Estimation with Driscoll–Kraay Standard Errors

Variable	Model 1	Model 2	Model 3
lnGOVPOL		10.926*** (3.009)	–25.154 (33.380)
lnGDPPC	21.396* (11.006)	22.145** (8.470)	77.223** (28.334)
lnPOP	154.692* (72.216)	155.360** (67.468)	14.191 (32.145)
UNEMP	–4.424* (2.144)	–3.610 (2.952)	42.467*** (11.246)
MP1 (lnGOVPOL × lnGDPPC)			–7.888** (3.371)
MP2 (lnGOVPOL × lnPOP)			9.892** (4.208)
MP3 (lnGOVPOL × UNEMP)			–5.378***

Variable	Model 1	Model 2	Model 3
			(1.489)
Constant	-1028.568* (527.961)	-1133.608** (505.114)	-370.660 (279.662)
Year fixed effects	Yes	Yes	Yes
Observations	182	161	161
Number of states	14	14	14
Within R ²	0.5346	0.5497	0.5912

*Note: Within R² measures the proportion of within-state variation in the house price index explained by the model. Driscoll–Kraay standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Maximum lag = 2. Dependent variable: house price index.*

Based on the Table 5 above, Model 1 is significant overall, with an F-statistic of 114.80 ($p < 0.001$). All three signs are as expected where higher income raises the ability of households to buy, population concentration and migration towards economically attractive states increase demand where supply does not adjust quickly, and a weaker labour market reduces household purchasing power and effective demand. Overall, Model 1 shows that housing prices are closely associated with the economic and demographic conditions of Malaysian states.

Model 2 extends the baseline specification by incorporating the housing-policy variable. The inclusion of housing policy increases the within R-squared from 0.5346 to 0.5497, suggesting that housing policy contributes additional explanatory power beyond the macroeconomic variables. The positive policy coefficient should, however, be interpreted as an association rather than evidence that housing policy causes prices to rise, since programmes may be introduced or expanded in response to market conditions, which raises the possibility of reverse causality. Nevertheless, the statistically significant positive coefficient indicates that housing-policy measures are systematically associated with housing-price movements across Malaysian states. The coefficient on $\ln\text{GOVPOL}$ is 10.926 with a Driscoll-Kraay standard error of 3.009 and is significant at the 1% level (Model 2). The policy series is constructed from every Ministry of Housing and Local Government (KPKT) annual statistics report from 2010 to 2022, giving a consistent series for all 14 units.

Three interaction terms are introduced in Model 3 to investigate whether housing policy changes the relationship between macroeconomic conditions and housing prices. Model 3 produces a within R-squared of 0.5912, compared with Model 1 and Model 2. The increase in explanatory power indicates that allowing the effects of macroeconomic conditions to vary with

government housing policy provides a better representation of the observed within-state variation in housing prices. All three interactions are significant. This indicates that housing policy does not operate independently of macroeconomic conditions. Instead, its association with housing prices varies according to the underlying economic and demographic environment. The significant interaction terms therefore provide evidence against a simple assumption that housing policy has a uniform effect across states and over time. Because each marginal effect depends on the value of the other variables, these coefficients cannot be interpreted in isolation.

Table 6: Estimation with Control Variables

Variable	Model 4	Model 5	Model 6
lnGOVPOL		10.926*** (3.009)	-25.154 (33.380)
lnGDPPC	21.396* (11.006)	22.145** (8.470)	77.223** (28.334)
lnPOP	154.692* (72.216)	155.360** (67.468)	14.191 (32.145)
UNEMP	-4.424* (2.144)	-3.610 (2.952)	42.467*** (11.246)
MP1 (lnGOVPOL × lnGDPPC)			-7.888** (3.371)
MP2 (lnGOVPOL × lnPOP)			9.892** (4.208)
MP3 (lnGOVPOL × UNEMP)			-5.378*** (1.489)
BLR	-132.891* (62.237)	-140.417** (57.585)	-56.115* (30.069)
CPI	-2.285 (1.536)	-2.883* (1.589)	-0.328 (1.010)
EXRATE	omitted	omitted	omitted
2022 year dummy	omitted	omitted	omitted
Constant	omitted	omitted	omitted
Year fixed effects	Yes	Yes	Yes

Variable	Model 4	Model 5	Model 6
Observations	182	161	161
Number of states	14	14	14
Within R ²	0.5346	0.5497	0.5912

*Note: Driscoll–Kraay standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. The exchange rate is omitted because of collinearity.*

The within R² values are identical across the paired specifications: Model 1 and Model 4 both give 0.5346, Model 2 and Model 5 both give 0.5497, and Model 3 and Model 6 both give 0.5912. The explanation lies in the nature of the three control variables. The base lending rate, the consumer price index and the exchange rate are national data series, thus, every state records the same value in a given year. A full set of year dummies already captures everything that varies over time but not across states, which means these three variables lie entirely within the space spanned by the year dummies. Adding them therefore cannot change the fit of the model.

A direct consequence is that the base lending rate, the consumer price index and the exchange rate are not separately identified once year fixed effects are included. The estimator drops the exchange rate, the 2022-year dummy and the constant because of exact collinearity and the surviving coefficients on the base lending rate and the consumer price index should therefore not be interpreted as separately identified macro-financial effects. Common national macro-financial conditions are instead controlled for through the year fixed effects themselves. This also serves as the robustness check on the moderate collinearity reported in Table 1 where the coefficients of interest on government housing policy and the state economic variables are unchanged whether the three national controls are included or excluded, which shows that the collinearity between the consumer price index and the exchange rate does not affect the main findings of the study.

DISCUSSION OF THE MAIN FINDINGS

The results in Table 5 reveal three key findings. First, government policy is statistically significant in explaining housing-price movements. Second, housing prices across Malaysian states are strongly associated with macroeconomic and demographic conditions. Third, the interaction results indicate that government policy modifies the relationship between macroeconomic conditions and housing prices.

The coefficient on government policy is positive, and this does not support a supply-and-demand expectation in which public housing lowers market prices. Diamond and McQuade (2019) found that subsidised development raises

house prices by 6.5 per cent in low-income neighbourhoods while lowering them by 2.5 per cent in higher-income ones. Similarly, Baum-Snow and Marion (2009) report the same pattern where a neighbourhood was already in decline, building subsidised housing raised nearby property values. The possible explanations are as follows: (1) affordable housing program may be located where prices are already rising, thus the relationship reflects where government chooses to build rather than what building does; (2) affordable housing is usually accompanied by roads, utilities, schools and public transport, and these may raise the value of surrounding property; and (3) the units delivered may be too few relative to total stock to move an aggregate index. In Malaysia context, Liu and Ong (2021) report that 32.4 per cent of the 30,664 unsold residential units in 2019 were affordable housing, which suggests a mismatch between delivery and effective demand rather than a supply expansion large enough to depress prices.

These explanations point to a limited effect on the aggregate state house price index rather than to an ineffective policy. The house price index covers all market segments, whereas PPR is targeted specifically at the lowest income group, so a programme of this size need not move a broad state-level index even where it succeeds in its own terms. The performance of targeted public housing is accordingly better assessed against sub-market affordability, accessibility and delivery indicators than against the aggregate price index alone.

Higher GDP per capita and a larger population are associated with higher housing prices, whereas unemployment is negatively associated with them. This result is consistent with the previous studies done by Adams and Fuss (2010), Mankiw and Weil (1989) and Gan, Wang and Zhang (2018). For example, Adams and Fuss (2010) found that a one per cent rise in economic activity raises house prices by about 0.6 per cent in the long run. Mankiw and Weil (1989) established the demographic channel, showing that changes in the size of the house-buying population produce large and predictable movements in real house prices. Gan, Wang and Zhang (2018) reported that a three-percentage point rise in unemployment lowers house prices by about 10.7 per cent, working through both weaker demand and thinner market activity.

The significant interaction coefficients show that the association of income, population and unemployment with prices is not constant across levels of government policy. The negative GDP per capita interaction means that higher income is associated with smaller price increases where housing policy is more intensive. Diamond and McQuade (2019) and Baum-Snow and Marion (2009) find property values rising in weaker local markets. The positive population interaction means that the price pressure associated with a larger population is stronger where policy is more intensive. Tajrishy and Vesal (2024) found that the price effect of Iran's Mehr housing project depended on whether schools and other public facilities expanded alongside the new housing. The results are reported in

Model 3 of Table 5, where $\ln GOVPOL \times \ln GDPPC$ is -7.888, $\ln GOVPOL \times \ln POP$ is 9.892 and $\ln GOVPOL \times \ln UNEMP$ is -5.378, and all three interaction terms are statistically significant. The relationship between government policy and house prices therefore depends on a state's income level, population size and labour-market conditions.

Overall, housing prices are shaped by the interaction of economic fundamentals, demographic pressures, labour-market conditions and government policy interventions. The results suggest that an affordable housing programme applied on identical terms across states that differ widely in income, population and employment is therefore unlikely to produce uniform price outcomes. A state-level housing policy framework should therefore account for both state-specific structural conditions and broader national housing-market dynamics.

CONCLUSION AND POLICY IMPLICATIONS

This study employs a quantitative approach to examine the determinants of residential property prices across Malaysian states. The main objective of this study is to investigate the effect of government housing interventions and macroeconomic factors on housing prices in Malaysia. The results indicate that government housing policy significantly affect aggregate housing prices. The findings of this study present several policy implications for housing developers, policymakers, and development authorities in Malaysia:

First, housing planning should be more closely linked to population growth and the availability of developable land. Population is the strongest measured driver of state-level house prices in this study. The interaction results also show that the price pressure from population growth is stronger where government housing intervention is more intensive. Therefore, building more affordable housing alone may not be sufficient to reduce housing pressure. The amount and location of land available for housing should also be considered. State and local planning authorities should set housing targets based on expected population growth, household formation and local housing demand, rather than applying the same target to all states. Land for affordable housing should be identified early in the planning process and protected for this purpose. New housing areas should also be supported by basic infrastructure such as roads, water supply, schools and health facilities. This is important because housing supply does not always match actual demand.

Second, housing targets should be planned together with facilities, public transport and urban development. People tend to live near jobs, schools, services and transport facilities. Affordable housing located far from these facilities may result in higher transport costs and longer commuting times for households. Planning authorities should therefore identify suitable public transport corridors and encourage higher-density and mixed-income housing in

these areas. Evidence from Tajrishy and Vesal (2024) also shows that the impact of large-scale affordable housing can depend on the availability of public facilities, such as schools. Urban containment can also be used to manage outward expansion and encourage more efficient use of land within existing urban areas. However, such measures should be supported by sufficient development capacity within the designated areas. If development is restricted without allowing sufficient housing supply and higher-density development, housing shortages and price pressures may increase. Therefore, urban containment, appropriate density and efficient development approval should be considered together.

Third, housing supply should be planned at the regional level. The cross-sectional dependence results show that housing markets across Malaysian states are strongly connected. This suggests that housing demand and price pressures in one area may also affect neighbouring areas. High-demand areas should therefore not be expected to provide all additional housing within their own boundaries where land is limited or expensive. Housing supply can instead be planned across wider city regions, with affordable housing and public transport better connected across state and district boundaries. The results also suggest that a single national housing programme may not produce the same outcomes in every state. States could therefore be grouped according to their level of housing demand and price pressure, such as high-, medium- and low-pressure areas. Housing targets, land release and government housing allocations could then be adjusted according to local conditions. Finally, because government intervention is associated with higher aggregate housing prices in the model, the success of affordable housing programmes should not be assessed using the overall house price index alone. Instead, programmes should also be evaluated based on whether they improve housing affordability, accessibility and access to suitable housing for the households they are intended to support.

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REFERENCES

- Adams, Z., & Fuss, R. (2010). Macroeconomic determinants of international housing markets. *Journal of Housing Economics*, 19(1), 38–50.
<https://doi.org/10.1016/j.jhe.2009.10.005>
- Camara, A. K. (2023). Determinants of house prices in Malaysia. *International Journal of Housing Markets and Analysis*, 16(1), 85–99.

- Baharuddin, N. S., Isa, I. N. M., & Zahari, A. S. M. (2019). Housing price in Malaysia: The impact of macroeconomic indicators. *Journal of Global Business and Social Entrepreneurship (GBSE)*, 5(16).
- Baum-Snow, N., & Marion, J. (2009). The effects of low income housing tax credit developments on neighborhoods. *Journal of Public Economics*, 93(5–6), 654–666. <https://doi.org/10.1016/j.jpubeco.2009.01.001>
- Cheong, C. W. H., Ngui, L. L. H., & Beatrice, S. G. (2020). Sentiments in the housing market and the effectiveness of government interventions. *Pacific Rim Property Research Journal*, 26(3), 223–247. <https://doi.org/10.1080/14445921.2021.1946259>
- Daud, M. A., Rosly, S. A., & Sori, Z. M. (2022). Understanding issues of affordable housing in Malaysia to attract investment: An exploratory investigation. *Planning Malaysia*, 20(1), 1–12. <https://doi.org/10.21837/pm.v20i20.1074>
- Diamond, R., & McQuade, T. (2019). Who wants affordable housing in their backyard? An equilibrium analysis of low-income property development. *Journal of Political Economy*, 127(3), 1063–1117. <https://www.jstor.org/stable/26846669>
- Fereidouni, H.G., Al-Mulali, U., Lee, J. Y. M., & Mohammed, A. H. (2016). Dynamic relationship between house prices in Malaysia's major economic regions and Singapore house prices. *Regional Studies*, 50(4), 657–670. <https://doi.org/10.1080/00343404.2014.928408>
- Gan, L., Wang, P., & Zhang, Q. (2018). Market thickness and the impact of unemployment on housing market outcomes. *Journal of Monetary Economics*, 98, 27–49. <https://doi.org/10.1016/j.jmoneco.2018.04.007>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson Prentice Hall.
- Hashim, Z. A. (2010). House price and affordability in housing in Malaysia. *Akademika*, 78, 37–46.
- Hassan, M. M., Ahmad, N., & Hashim, A. H. (2021a). Factors influencing housing purchase decision. *International Journal of Academic Research in Business and Social Sciences*, 11(7), 429–443.
- Hassan, M. M., Ahmad, N., & Hashim, A. H. (2021c). A review on housing affordability in Malaysia: Are we doing fine? *Malaysian Journal of Consumer and Family Economics*, 26.
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53–74.
- Jun, A. O. Y., Song, Z. Y., & Selvaratnam, D. P. (2025). Macroeconomic factors affecting housing price in Malaysia. *International Journal of Research and Innovation in Social Science (IJRISS)*, 9(6), 6150–6163. <https://dx.doi.org/10.47772/IJRISS.2025.906000473>
- Kamal, E. M., Lai, K. S., & Yusof, N. A. (2020). The low-middle income housing challenges in Malaysia. *Journal of the Malaysian Institute of Planners*, 18(1), 102–117.
- Khazanah Research Institute. (2019). *A Nation in Transition: Revisiting Malaysia's Development Agenda*. Khazanah Research Institute.
- Lean, H. H., & Smyth, R. (2013). Regional house prices and the ripple effect in Malaysia. *Urban Studies*, 50(5), 895–922. <https://doi.org/10.1177/0042098012459582>

- Leung, C. K. Y., & Ng, C. Y. J. (2019). Macroeconomic aspects of housing. In J. H. Hamilton, A. Dixit, S. Edwards, & K. Judd (Eds.), *Oxford Research Encyclopedia of Economics and Finance*. Oxford University Press.
- Liu, J., & Ong, H. Y. (2021). Can Malaysia's national affordable housing policy guarantee housing affordability of low-income households? *Sustainability*, 13(16), 8841. <https://doi.org/10.3390/su13168841>
- Liu, J., Xiang, H., Zhu, S., & Chen, S. (2024). Spatial heterogeneity analysis of biased land resource supply policies on housing prices and innovation efficiency. *Humanities & Social Science Communication*, 11, 1180. <https://doi.org/10.1057/s41599-024-03702-1>
- Mankiw, N. G., & Weil, D. N. (1989). The baby boom, the baby bust, and the housing market. *Regional Science and Urban Economics*, 19(2), 235–258. [https://doi.org/10.1016/0166-0462\(89\)90005-7](https://doi.org/10.1016/0166-0462(89)90005-7)
- Maynou, L., Monfort, M., Morley, B., & Ordóñez, J. (2021). Club convergence in European housing prices: The role of macroeconomic and housing market fundamentals. *Economic Modelling*, 103. <https://doi.org/10.1016/j.econmod.2021.105595>
- Mohan, S., Hutson, A., MacDonald, I., & Lin, C. C. (2019). Impact of macroeconomic indicators on housing prices. *International Journal of Housing Markets and Analysis*, 12(6), 1055–1071
- Musaddad, H. A., Maamor, S., & Zainol, Z. (2023). Affordability of affordable housing in Northern Region of Malaysia. *Malaysian Management Journal*, 27, 183–209. <https://doi.org/10.32890/mmj2023.27.8>
- Olanrewaju, A. L., & Idrus, A. (2020). What is determining affordable housing shortages in the Greater Kuala Lumpur, Malaysia? *Property Management*, 38(1), 52–81. <https://doi.org/10.1108/PM-05-2019-0025>
- Ong, T. S. (2013). Factors affecting the price of housing in Malaysia. *Journal of Emerging Issues in Economics, Finance and Banking*, 1(5), 414–429.
- Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and Statistics*, 61(S1), 653–670. <https://doi.org/10.1111/1468-0084.0610s1653>
- Pinjaman, S., & Kogid, M. (2020). Macroeconomic determinants of house prices in Malaysia. *Jurnal Ekonomi Malaysia*, 54(1), 153–165. <https://doi.org/10.17576/JEM-2020-5401-11>
- Plakandaras, V., Gupta, R., Katrakilidis, C., et al. (2020). Time-varying role of macroeconomic shocks on house prices in the US and UK: Evidence from over 150 years of data. *Empirical Economics*, 58, 2249–2285. <https://doi.org/10.1007/s00181-018-1581-x>
- Reiner, C., & Musil, R. (2023). The regional variation of a housing boom. Disparities of land prices in Austria, 2000–2018. *Review of Regional Research*, 43, 125–146. <https://doi.org/10.1007/s10037-022-00176-z>
- Suh, H. (2023). Regionally heterogeneous housing cycles and housing market stabilization policies: Evidence from Korea. *Economic Modelling*, 120, 106192
- Tajrishy, S., & Vesal, M. (2024). Large-scale affordable housing construction and public goods provision: Evidence from Iran. *Journal of Economic Geography*, 24(1), 171–189. <https://doi.org/10.1093/jeg/lbad030>

- Tobi, S. U. M., Jasimin, T. H., & Rani, W. N. M. W. M. (2020). Overview of affordable housing from supply and demand context in Malaysia. *IOP Conference Series: Earth and Environmental Science*, 409, 012010. <https://doi.org/10.1088/1755-1315/409/1/012010>
- Tripathi, S. (2019). Macroeconomic determinants of housing prices: A cross country level analysis (MPRA Paper No. 98089). University Library of Munich, Germany.
- Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics*, 69(6), 709–748. <https://doi.org/10.1111/j.1468-0084.2007.00477.x>
- Yap, J. B. H., & Ng, X. H. (2018). Housing affordability in Malaysia: Perception, price range, influencing factors and policies. *International Journal of Housing Markets and Analysis*, 11(3), 476–497.
- Zulkifli, A., Kogid, M., Pinjaman, S., & Malin, J. (2022). Macroeconomic variables and Malaysia house price index. *International Journal of Academic Research in Economics and Management Sciences*, 11(1).

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