

Different houses, different channels: Monetary policy, macroprudential regulation, and bank liquidity in Indonesia's housing market



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ABSTRACT

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Existing studies typically assume that monetary and macroprudential policies are transmitted uniformly across housing markets, despite substantial differences in financing structures and buyer characteristics across housing segments. This study addresses this gap by examining whether the effects of monetary policy, macroprudential regulation, and bank liquidity differ across small, medium, and large housing markets in Indonesia. Using quarterly panel data from 17 provinces covering 2012Q1–2024Q4, we employ a fixed-effects framework to estimate the effects of interest rates, Loan-to-Value (LTV) regulation, bank liquidity, and their interaction on segment-specific housing prices. The results provide strong evidence of heterogeneous policy transmission. LTV policy significantly affects housing prices across all segments, whereas monetary policy significantly affects small and medium house prices but not large house prices. Moreover, the interaction between LTV policy and bank liquidity is significant only in the large-house segment, indicating that the transmission of macroprudential policy varies with housing market size and liquidity conditions. These findings demonstrate that aggregate housing price responses can mask important differences across market segments. The study contributes to the housing policy literature by providing segment-level evidence on the heterogeneous transmission of monetary and macroprudential policies in an emerging-market economy. The findings also suggest that housing and financial-stability policies may benefit from greater consideration of housing-segment heterogeneity when assessing policy transmission and market responses.

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4. Introduction

Recent studies have reported heterogeneous responses of housing markets to policy shocks across housing types, price tiers, and geographical locations. However, evidence remains fragmented and largely concentrated in advanced economies, leaving limited understanding of whether similar transmission patterns exist in emerging housing markets. In line with [Nikolakaudis \(2024\)](#), housing markets are segmented: even within a narrow geographical region, there is substantial heterogeneity in relative price changes for different types of houses. Such an approach overlooks the possibility that housing markets may consist of heterogeneous submarkets characterized by different buyer profiles, financing structures, affordability constraints, and investment motives. Consequently, housing market segmentation, distinct policy transmission channels may generate, implying that monetary, macroprudential, and liquidity-related policies may affect housing segments differently.

The segmentation perspective is supported by the broader housing literature, which shows that housing submarkets differ according to property characteristics, location, socioeconomic conditions, and the degree of substitutability between properties (Bourassa et al., 1999; Watkins, 2001; Islam & Asami, 2009). More recent evidence further demonstrates that housing segmentation can generate substantially different price dynamics across market groups (Bourassa et al., 2024). This suggests that the assumption of a common housing-market response may obscure important differences in how policy shocks are transmitted across price segments.

The urban economics literature has long recognized segmentation as an important feature of housing markets (Sweeney, 1974; Bourassa et al., 1999; Watkins, 2001), macroeconomic models with a housing sector typically model housing as a commodity that can be bought and sold at a common per-unit price from a homogeneous stock. Consequently, these models abstract from the role of segmentation in shaping house price movements. Furthermore, limited attention has been devoted to understanding how banking liquidity interacts with macroprudential policy in shaping housing market dynamics. Despite a growing literature on housing market segmentation, little is known about whether monetary policy, macroprudential regulation, and banking liquidity operate through similar transmission channels across housing segments. Housing markets may differ not only in their structural characteristics but also in the mechanisms through which policy interventions affect demand and prices. Lower-priced housing markets may respond primarily through affordability and borrowing-cost channels, whereas higher-priced segments may be more sensitive to liquidity conditions and investment incentives. Existing studies typically focus on one policy instrument in isolation, making it difficult to assess how multiple policy tools jointly influence different housing segments.

Those distinction is increasingly supported by empirical evidence on monetary policy. Iacoviello (2005) establishes the importance of housing collateral and borrowing constraints in monetary transmission, while Jarocinski & Smets (2008) document significant effects of monetary policy shocks on house prices. More recent evidence explicitly shows that monetary policy can generate heterogeneous housing-price responses: monetary policy shocks affect regional house prices differently depending on housing affordability (Margaris, 2024), while monetary policy transmission to housing also varies across countries and household housing decisions (Beraja et al., 2019; Andersen et al., 2022).

The macroprudential literature provides a parallel but distinct perspective. LTV restrictions are among the most widely used borrower-based instruments because they directly constrain household leverage and mortgage borrowing. Cross-country evidence shows that LTV and related borrower-based measures can affect housing credit and housing-market conditions (Kuttner & Shim, 2016; Cerutti et al., 2017; Alam et al., 2019). However, the transmission of LTV policy is not necessarily uniform across borrowers. Evidence from loan-level data shows that constrained borrowers can respond to LTV restrictions by increasing down payments and shifting toward more affordable properties (Tzamourani, 2020). More recent research reinforces this heterogeneity: borrower-based macroprudential policies can have different effects across household segments, transaction types, and regional housing markets (Karmelavičius & Otten, 2026). Thus, although the effectiveness of LTV regulation is well established, an important question remains regarding whether its housing-price effects differ systematically across housing price segments.

Furthermore, limited attention has been devoted to understanding how banking liquidity interacts with macroprudential policy in shaping housing market dynamics. The banking literature suggests that liquidity conditions can influence credit supply and, consequently, housing-market outcomes. Dursun-De Neef (2019) finds that negative bank liquidity shocks reduce loan supply, with particularly strong effects on real-estate lending and house prices. Similarly, Min et al (2023) show that bank credit shocks have important implications for housing prices and financial stability. These findings indicate that the effectiveness of a borrower-based restriction such as LTV may depend not only on the regulatory constraint itself but also on banks' capacity and incentives to supply credit. The theoretical literature also recognizes an interaction between monetary policy, LTV limits, and financial conditions. Nelson (2024), for example, explicitly examines the joint implications of monetary policy and optimal LTV limits in a model with financial frictions. Nevertheless, empirical evidence remains limited on whether banking liquidity conditions alter the transmission of LTV regulation across different housing segments.

This leads to a more specific research gap. First, although monetary policy studies increasingly recognize heterogeneous housing-price responses, most evidence examines geographical or aggregate heterogeneity rather than differences across housing price segments. Second, although the macroprudential literature establishes that LTV regulation affects mortgage credit and housing outcomes, relatively limited evidence examines whether these effects differ systematically between lower- and higher-priced housing segments. Third, while existing evidence establishes that bank liquidity and credit supply affect housing prices, the interaction between banking liquidity and LTV regulation remains insufficiently examined. Consequently, the literature has not yet provided a sufficiently integrated empirical assessment of whether monetary policy, macroprudential regulation, and banking liquidity operate through distinct transmission channels across housing segments. The central gap addressed by this study is therefore the absence of a segment-level framework that jointly considers monetary policy, LTV regulation, and banking liquidity rather than examining these policy channels separately or treating the housing market as homogeneous.

Indonesia provides a particularly relevant setting for examining heterogeneous policy transmission in housing markets. The country's housing finance system remains heavily bank-dependent, while mortgage access varies substantially across income groups and housing segments. Since the early 2010s, Bank Indonesia has repeatedly adjusted Loan-to-Value (LTV) regulations and actively employed monetary and liquidity-management instruments to support both economic growth and financial stability (Nugroho et al., 2024; Fauzia et al., 2019). At the same time, the Indonesian housing market exhibits pronounced segmentation, ranging from affordability-driven demand in lower-priced housing to investment-oriented demand in higher-priced segments. These institutional and market characteristics create a natural environment for investigating whether monetary policy, macroprudential regulation, and banking liquidity affect housing segments through different transmission channels. The Indonesian institutional setting is particularly relevant because Bank Indonesia has used LTV limits as a macroprudential instrument since 2012, with subsequent adjustments and differentiated requirements across types and sizes of property. This policy environment provides a useful setting for examining whether a common macroprudential instrument produces heterogeneous housing-price responses when combined with differences in banking liquidity and housing-market characteristics.

This study contributes to the literature in three important ways. First, this study investigates whether different housing segments are characterized by distinct policy transmission channels rather than a common housing-market response. Second, it investigates the interaction between LTV policy and banking liquidity, thereby identifying whether liquidity conditions amplify or constrain macroprudential policy effectiveness. Furthermore, this study provides new evidence from a large emerging economy where housing markets remain highly segmented and financial deepening continues to evolve. First, by distinguishing small, medium, and large housing markets, the study extends the emerging literature on heterogeneous housing-price responses beyond geographical heterogeneity and examines heterogeneity directly across housing price segments. Second, by interacting LTV policy with banking liquidity, the study connects the borrower-based macroprudential literature with the bank-credit and liquidity literature, providing evidence on whether the effectiveness of LTV regulation is conditional on financial conditions. Third, the study contributes evidence from Indonesia, an emerging economy in which bank-based housing finance and active macroprudential regulation coexist with substantial housing-market segmentation.

Accordingly, this study addresses the following research questions: (1) Do monetary and macroprudential policies exert different effects across housing market segments? (2) Does banking liquidity amplify the transmission of macroprudential policy in housing markets? and (3) What are the implications of heterogeneous policy transmission for housing market stabilization and financial stability in Indonesia? By answering these questions, the study provides evidence on how policy transmission varies across housing segments and how banking liquidity conditions shape the effectiveness of macroprudential interventions in emerging housing markets.

2. Method

This study employs a balanced quarterly panel dataset covering 17 provinces in Indonesia from 2012Q1 to 2024Q4. The data are collected from three main sources. Housing price indices, housing demand, and housing market indicators are obtained from the Residential Property Price Survey (RPPS) published by Bank Indonesia (BI). Information on Loan-to-Value (LTV) regulations,

mortgage lending, and banking liquidity is gathered from Bank Indonesia and the Financial Services Authority (OJK). Socioeconomic variables, including regional gross domestic product (GRDP), income, and population, are obtained from Statistics Indonesia (BPS). The sample of RPPS consists of 17 provinces for which Bank Indonesia consistently publishes residential property price data. These provinces represent the major economic regions of Indonesia, including Sumatra, Java, Bali, Kalimantan, and Sulawesi, and account for a substantial share of national economic activity and housing transactions. A key advantage of the dataset is the availability of housing prices, housing demand, and LTV regulations by housing segment, allowing the analysis to distinguish between small, medium, and large housing markets.

This study examines whether monetary policy, macroprudential policy, and banking liquidity exert heterogeneous effects on housing prices across small, medium, and large housing segments. Table 1 reports the operationalization, measurement, and sources of all variables. The dependent variable is the segment-specific housing price index (*hp*). The main explanatory variables are LTV (*ltv*), LDR (*ldr*), and mortgage lending interest rates (*ir*), representing macroprudential regulation, banking intermediation and liquidity conditions, and mortgage financing costs, respectively. Housing loans (*loan*), housing demand (*qd*), income (*inc*), population (*pop*), and GRDP (*gdp*) are included as control variables. Variables expressed as monetary values or other scale measures are transformed into natural logarithms, whereas LTV, LDR, and interest rates are retained in percentage form to preserve their economic interpretation.

Table 1. Variable Operationalization and Data Sources

Variable	Operationalization	Measurement	Data Source
Housing Price (<i>hp</i>)	Residential property price index for each housing segment, capturing quarterly movements in residential property prices	Index	BI
Loan-to-Value (<i>ltv</i>)	Maximum allowable ratio of mortgage financing to the value of the financed residential property	Percentage (%)	Bank Indonesia
Loan-to-Deposit Ratio (<i>ldr</i>)	Ratio of total bank loans to third-party funds, capturing banks' intermediation and credit-liquidity conditions	Percentage (%)	OJK
Mortgage Interest Rate (<i>ir</i>)	Lending interest rate applied to housing/mortgage financing, representing the financing-cost channel	Percentage (%)	Bank Indonesia
Housing Loans (<i>loan</i>)	Nominal value of housing-related credit extended by the banking sector	IDR billion	OJK
Housing Demand (<i>qd</i>)	Residential property demand indicator reported for each housing segment	unit	OJK
Income (<i>inc</i>)	Regional income per capita, capturing household purchasing capacity	IDR per capita	BPS
Population (<i>pop</i>)	Total population of each province, capturing demographic market size	Number of persons	BPS
Gross Regional Domestic Product (<i>gdp</i>)	Provincial economic output, capturing regional economic activity and purchasing-market conditions	IDR billion	BPS

Sources: BPS, OJK and BI

Following the housing finance literature, housing prices and other scale variables are transformed into natural logarithms to improve comparability and reduce distributional skewness, whereas policy-related variables remain in percentage form to preserve their economic interpretation. To capture both the direct and conditional effects of policy instruments, the empirical analysis is conducted in two stages using a fixed-effects estimator that controls for unobserved provincial heterogeneity. The first stage estimates the direct effects of monetary, macroprudential, and liquidity conditions on housing prices, while the second stage incorporates interaction terms to assess whether banking liquidity and monetary conditions amplify or weaken the effectiveness of macroprudential policy. The baseline model is specified as follows:

$$hp_{ijt} = \beta_0 + \beta_1 LTV_{jt} + \beta_2 LDR_t + \beta_3 ir_t + \beta_4 loan_{it} + \beta_5 qd_{ijt} + \beta_6 gdp_{it} + \beta_7 inc_{it} + \beta_8 pop_{it} + \varepsilon_{ijt} \quad (1)$$

The interaction terms capture whether the effectiveness of macroprudential policy depends on banking liquidity conditions and the prevailing monetary policy environment. The interaction model is specified as:

$$hp_{ijt} = \beta_0 + \beta_1 (LTV_{jt} \times LDR_t) + \beta_2 (LTV_{jt} \times ir_t) + \beta_3 loan_{it} + \beta_4 qd_{ijt} + \beta_5 gdp_{it} + \beta_6 inc_{it} + \beta_7 pop_{it} + \varepsilon_{ijt} \quad (2)$$

Where, i denotes province, j denotes housing segment (small, medium, and large houses), and t denotes quarter. Then, β_0 represents the intercept, β_1 – β_8 are slope coefficients, and ε is the error term.

3. Results and Discussion

Descriptive statistical examination summarises the research's variables and their distribution. The statistics reveal considerable heterogeneity across provinces and housing segments, particularly in housing prices, housing demand, and economic fundamentals (Table 2). The mean LTV ratio decreases from 90.54% in the small-house segment to 82.15% in the large-house segment, reflecting the differentiated design of macroprudential regulations in Indonesia. Moreover, the substantial variation in housing demand, banking liquidity, income, and regional economic activity suggests that the transmission of monetary and macroprudential policies is unlikely to be uniform across housing market segments.

Table 2. Descriptive Statistics

Variables	Obs	Mean	Std. Dev	Min	Max
hp_small	850	245.87	86.45	100.00	496.48
hp_medium	850	223.65	75.21	100.00	429.34
hp_large	850	181.35	47.90	100.00	325.25
ltv_small	884	90.54	9.35	70.00	98.00
ltv_medium	884	87.06	9.44	70.00	97.00
ltv_large	884	82.15	11.66	65.00	95.00
ldr	884	92.40	22.81	53.74	174.38
loan	884	21602.48	33435.72	434	183254.3
ir	884	9.32	1.44	6.91	11.00
qd_small	882	12418.16	14816.64	663.00	87089.00
qd_medium	882	100262.80	137381.60	13959.00	861974.00
qd_large	882	13045.44	20374.49	964.00	101267.00
gdp	884	136366.20	150015.40	13208.00	947126.90
inc	884	2207625.00	841699.20	745000.00	5067381.00
pop	884	12360.91	13653.41	1805.10	50759.00

Notes: Variables with the suffixes _small, _medium, and _large indicate housing-segment-specific data available from the Bank Indonesia Residential Property Price Survey and correspond to small, medium, and large residential properties, respectively. The number of observations differs across variables, reflecting variations in data availability across provinces and over the study period

The empirical findings indicate that monetary, macroprudential, and banking liquidity instruments do not affect all housing market segments equally. The estimated coefficients consistently demonstrate that the transmission of policy interventions varies across small, medium, and large housing markets, although the estimated relationships should be interpreted as evidence of heterogeneous policy responses rather than direct evidence of differences in unobserved household or buyer characteristics. This evidence challenges the conventional assumption that housing markets respond homogeneously to policy actions and suggests that housing market segmentation constitutes an important source of transmission heterogeneity. Consistent with the arguments of Cerutti et al (2017), the effectiveness of housing-related policies depends not only on the design of individual instruments but also on broader financial conditions and the characteristics of housing finance. Therefore, understanding segment-specific responses becomes essential for designing integrated monetary, macroprudential, and liquidity policies aimed at mitigating housing booms and preserving financial stability.

Table 3 presents the fixed-effects estimation results for the three housing segments. Columns (1)–(3) report the baseline specifications that focus on the direct transmission of monetary policy, macroprudential policy, and banking liquidity to housing prices. Columns (4)–(6) augment the baseline models by introducing interaction terms between policy instruments to capture potential complementarities between macroprudential regulation and broader financial conditions. This modelling strategy allows the analysis to distinguish between the standalone effects of policy measures and the extent to which their effectiveness depends on the prevailing liquidity and monetary environment.

Table 3. Housing Market Segmentation Results

Variable	(1) lhps	(2) lhpm	(3) lhpb	(4) lhps	(5) lhpm	(6) lhpb
ltv	0.00916*** (6.79)	0.00724*** (6.02)	0.00239*** (5.06)			
ldr	0.000101 (0.08)	0.00176 (1.04)	0.00312** (2.48)			
ir	-0.0164** (-2.51)	-0.0139* (-1.81)	-0.00445 (-0.88)			
loan	0.0528 (0.90)	0.121 (1.53)	0.0796* (2.04)	0.160** (2.28)	0.178* (1.90)	0.0748* (2.02)
qd	0.0197 (1.10)	-0.0977 (-1.44)	0.0966*** (2.97)	-0.0204 (-0.99)	-0.0894 (-1.16)	0.108*** (4.23)
gdp	0.0578** (2.58)	-0.00497 (-0.12)	0.0297 (1.47)	0.0764*** (2.98)	0.0224 (0.53)	0.0245 (0.97)
inc	0.0451 (1.66)	0.0414 (1.65)	0.0770** (2.88)	0.141** (2.80)	0.125** (2.68)	0.0848*** (3.25)
pop	0.107*** (6.42)	0.0952*** (4.36)	0.0517 (1.61)	0.0884*** (3.21)	0.0809*** (3.17)	0.0442 (1.21)
ltv*ldr				0.0000163 (1.49)	0.0000298 (1.70)	0.0000315* (2.69)
ltv*ir				0.0000982 (1.34)	0.0000406 (0.48)	-0.0000701 (-0.97)
_cons	1.810** (2.40)	3.215*** (3.94)	1.208* (2.07)	0.200 (0.21)	1.604* (1.99)	1.426** (2.25)
Obs	848	848	848	848	848	848
Province	17	17	17	17	17	17
R square	0.817	0.737	0.761	0.781	0.707	0.760

Source: data processed

The statistical significance of the estimated coefficients is complemented by their economic magnitude. Because housing prices are specified in logarithmic form while LTV and interest rates are measured in percentage points, the coefficients can be interpreted as the approximate percentage change in housing prices associated with a one-percentage-point change in the respective policy variable. In the baseline specification, a one-percentage-point increase in the LTV ratio is associated with approximately a 0.92% increase in small-house prices, a 0.73% increase in medium-house prices, and a 0.24% increase in large-house prices. Thus, although the LTV coefficient is statistically significant across all three segments, its estimated economic magnitude declines as the housing segment becomes larger. For mortgage interest rates, a one-percentage-point increase is associated with approximately a 1.63% decline in small-house prices and a 1.38% decline in medium-house prices.

The corresponding coefficient for large-house prices implies an estimated decline of approximately 0.44%, but this effect is statistically insignificant. These magnitudes reinforce the empirical distinction between the segments: LTV regulation is statistically relevant across the housing market, while interest-rate transmission is concentrated in the small- and medium-house segments. The empirical results provide strong evidence that housing market responses to policy interventions vary substantially across housing segments in Indonesia. The estimated coefficients reveal that monetary policy, macroprudential policy, and banking liquidity do not affect small, medium, and large housing

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markets uniformly. This finding challenges the conventional assumption that the housing market operates as a single integrated system and instead suggests the existence of distinct transmission mechanisms across market segments. The result is consistent with the housing market segmentation literature, which argues that housing submarkets differ in their responses to economic fundamentals and policy shocks due to variations in buyer characteristics, housing quality, and financing structures (Sweeney, 1974; Bourassa et al., 1999; Watkins, 2001). More recent studies further show that macroprudential and monetary policies generate heterogeneous effects across housing submarkets and household groups rather than producing uniform market-wide outcomes (Farmer et al., 2023; Nikolakoudis, 2024).

The heterogeneity observed across housing is consistent with differences in the financing and demand conditions associated with different housing tiers. However, because household-level buyer characteristics are not directly observed in the present dataset, the estimated coefficients do not by themselves establish that first-time buyers, lower-income households, or property investors are the underlying mechanism. Small-house markets may be more exposed to mortgage affordability and borrowing-cost conditions, while higher-value housing markets may be relatively less sensitive to these financing channels. These structural differences provide a plausible interpretation of the observed heterogeneous policy responses, rather than a directly tested mechanism in this study. This finding aligns with studies showing that housing affordability constraints strengthen the sensitivity of lower-tier housing markets to monetary and macroprudential policies, whereas higher-tier housing markets tend to respond more strongly to liquidity conditions, wealth effects, and investment incentives (Cerutti et al., 2017; Margaritis, 2024; Ferrero et al., 2022).

3.1. Macroprudential Policy as the Dominant Housing Market Instrument

The empirical results provide strong evidence that housing market responses to policy interventions vary substantially across housing segments in Indonesia. The estimated coefficients reveal that monetary policy, macroprudential policy, and banking liquidity do not affect small, medium, and large housing markets uniformly. This finding challenges the conventional assumption that housing markets operate as a single integrated system and instead indicates the presence of distinct transmission mechanisms across housing segments. Urban economics scholars have long recognized housing market segmentation as a fundamental characteristic of residential markets because differences in housing quality, location, buyer preferences, and financing structures create separate submarkets with different price dynamics (Sweeney, 1974; Bourassa et al., 1999; Watkins, 2001). Recent studies further demonstrate that macroprudential and monetary policy interventions generate heterogeneous effects across housing submarkets and household groups rather than producing uniform market-wide outcomes (Farmer et al., 2023; Nikolakoudis, 2024; Margaritis, 2024; Cesa-Bianchi et al., 2018; Cloyne et al., 2020).

The observed heterogeneity is consistent with differentiated financing conditions across housing segments. While the existing literature provides theoretical grounds for associating lower-tier housing with greater affordability constraints and higher-tier housing with relatively greater exposure to wealth and investment channels, these underlying household characteristics are not directly measured in the present dataset. Small-house markets may therefore be more responsive to mortgage accessibility and borrowing costs, while higher-value housing markets may be relatively more responsive to broader financial conditions. These structural differences should be interpreted as plausible mechanisms consistent with the estimated patterns rather than as directly identified causal channels. Macroprudential policies influence lower-tier housing markets primarily through borrowing constraints and mortgage accessibility, whereas liquidity conditions and wealth effects play a more prominent role in higher-tier housing markets (Cerutti et al., 2017; Farmer et al., 2023; Ferrero et al., 2022). Consequently, policy authorities may achieve more effective housing market stabilization when they recognize housing segmentation and coordinate monetary, macroprudential, and liquidity-management instruments according to the characteristics of each housing segment (Cesa-Bianchi et al., 2018; Richter et al., 2024).

3.2. Banking Liquidity as a Transmission Amplifier

One of the most important findings of this study concerns the interaction between macroprudential policy and banking liquidity. The estimated results show that the interaction between the Loan-to-Value (LTV) ratio and the Loan-to-Deposit Ratio (LDR) is statistically significant only in the large-house segment, indicating that banking liquidity conditions are associated with a stronger conditional relationship between LTV regulation and housing prices in this segment. This finding supports the

financial accelerator and credit supply literature, which argues that abundant liquidity enables banks to expand mortgage lending more aggressively, thereby amplifying the effects of policy relaxation on asset prices (Adrian & Shin, 2010; Cerutti et al., 2017; Ferrero et al., 2022). The result is also consistent with studies showing that higher-tier housing markets are more sensitive to financial conditions and investment-driven demand than lower-tier housing markets (Nikolakoudis, 2024; Farmer et al., 2023). Under accommodative liquidity conditions, relaxed borrowing constraints may be associated with stronger credit expansion and housing price responses in premium housing segments, thereby reinforcing the credit-fueled asset price cycles frequently highlighted in the financial stability literature (Mian & Sufi, 2022; Jordà et al., 2016).

In contrast, the insignificant interaction effect observed in the small- and medium-house segments suggests the estimated LTV response in these segments is not significantly conditioned by the LDR measure used in this study. This pattern is consistent with the possibility that other constraints, including affordability and credit eligibility, may limit the response to broader banking liquidity conditions, although these mechanisms are not directly tested here. This finding aligns with studies emphasizing the importance of household affordability and borrower constraints in determining housing demand responses to credit conditions (Cloyne et al., 2020; Kaplan et al., 2020). However, some studies argue that liquidity expansion may affect all housing segments through broader credit market channels and wealth effects, regardless of borrower characteristics (Margaris, 2024; Cesa-Bianchi et al., 2018). The Indonesian evidence presented here therefore indicates that the conditional association between LTV and housing prices is concentrated in the large-house segment, rather than establishing that liquidity universally amplifies macroprudential transmission in higher-value housing markets. Consequently, borrower-based regulations alone may be insufficient to mitigate overheating risks in premium housing markets, highlighting the need for a coordinated policy framework that combines macroprudential measures with banking liquidity management and monetary policy interventions.

3.3. Monetary Policy and the Housing Affordability Channel

The results indicate that monetary policy influences housing prices primarily through the affordability channel rather than through a uniform market-wide transmission mechanism. The estimated coefficients show that mortgage interest rates exert a negative and statistically significant effect on small and medium housing prices, while their impact becomes insignificant in the large-house segment. This finding suggests that the effectiveness of monetary policy depends critically on household financing constraints and the extent to which housing purchases rely on external borrowing. The result is consistent with studies showing that interest rate changes affect housing demand by altering borrowing costs, mortgage affordability, and households' capacity to finance home purchases (Iacoviello, 2005; Calza et al., 2013; Cloyne et al., 2020). In the Indonesian context, small-house markets may be more exposed to changes in mortgage affordability and borrowing costs, and the estimated negative coefficients are consistent with this mechanism. Consequently, higher interest rates increase debt-servicing costs, reduce housing affordability, and weaken demand, thereby slowing housing price growth. Because household-level debt-servicing costs and mortgage dependence are not directly observed in the dataset, however, this affordability mechanism should be understood as an interpretation supported by the estimated pattern rather than as a directly identified causal mechanism. Similar evidence has been documented by Margaris (2024) and Cesa-Bianchi et al (2018), who find that monetary tightening generates stronger housing market responses among financially constrained households and affordability-sensitive housing segments.

In contrast, the insignificant effect of interest rates in the large-house segment reveals a fundamentally different transmission mechanism. The absence of a statistically significant coefficient indicates that the conventional mortgage interest-rate channel is not detectable in this segment within the estimated specification. Higher-income households and property investors typically possess greater financial resources, larger down payments, and alternative funding sources, reducing their dependence on mortgage financing when making housing investment decisions. The absence of a statistically significant coefficient indicates that the conventional mortgage interest-rate channel is not detectable in this segment within the estimated specification. Consequently, changes in borrowing costs exert only a limited influence on housing demand in premium market segments. This finding supports studies arguing that upper-tier housing markets respond more strongly to wealth effects, investment expectations, and financial market conditions than to conventional interest rate movements (Nikolakoudis, 2024; Ferrero et al., 2024). However, some studies suggest that monetary policy can still affect high-end housing markets indirectly through asset valuation, portfolio rebalancing, and

broader credit-market channels (Kaplan et al., 2020; Jordà et al., 2016). The Indonesian evidence presented here indicates that these indirect channels are not statistically apparent in the estimated interest-rate coefficient for the large-house segment, implying that the effectiveness of monetary policy as a housing stabilization instrument may be more limited for this segment within the observed period and model specification.

3.4. Implications for an Integrated Monetary–Macroprudential–Liquidity Framework

Mortgage lending constitutes a central mechanism through which financial conditions shape housing market dynamics in Indonesia. The results suggest that the expansion of housing credit strengthens households' purchasing capacity and facilitates the conversion of future income streams into current housing consumption. This mechanism reinforces housing demand and contributes to sustained price appreciation across market segments. Such evidence supports the financial accelerator framework, which emphasizes the mutually reinforcing relationship between credit availability, collateral values, and housing market activity (Bernanke et al., 1999; Iacoviello, 2005). The Indonesian experience also aligns with international evidence documenting the pivotal role of mortgage market development in driving housing cycles and asset-price fluctuations (Jordà et al., 2016; Cerutti et al., 2017). Compared with broader socioeconomic fundamentals, housing finance appears to provide the most immediate channel through which changes in financial conditions are transmitted to housing prices.

The broader pattern of results highlights the segmented nature of housing market adjustment and underscores the limitations of relying on a single policy instrument to stabilize housing cycles. The empirical estimates show that interest-rate sensitivity is concentrated in small and medium housing segments, while the statistically significant LTV–LDR interaction appears only in the large-house segment. These patterns provide direct evidence of heterogeneous policy responses, whereas the underlying roles of affordability, borrower type, and investment motives remain mechanisms inferred from the literature rather than directly measured in the dataset. Affordability considerations may therefore be particularly relevant in lower-tier housing markets, where households depend heavily on external financing to enter the housing market. By contrast, liquidity conditions and investment incentives become increasingly important in higher-value housing segments, where purchasing decisions can be less directly tied to borrowing costs. This heterogeneity mirrors recent evidence suggesting that monetary, macroprudential, and liquidity-related policies are transmitted through different channels depending on market structure and borrower characteristics (Farmer et al., 2023; Nikolakoudis, 2024; Ferrero et al., 2024). Consequently, effective housing market stabilization requires a coordinated policy framework that simultaneously addresses financing costs, borrowing constraints, and banking-sector liquidity, rather than treating housing markets as a homogeneous sector responsive to a single policy lever (Cerutti et al., 2017; Cesa-Bianchi et al., 2018; Richter et al., 2024).

4. Conclusion

This study provides strong evidence that monetary policy, macroprudential regulation, and banking liquidity are transmitted heterogeneously across housing market segments in Indonesia. The findings challenge the conventional assumption that housing markets respond uniformly to policy interventions and instead reveal the existence of distinct transmission channels across housing categories. More specifically, the empirical results show that LTV regulation has a statistically significant positive association with housing prices across small, medium, and large housing segments, although its economic magnitude declines from approximately 0.92% to 0.24% for a one-percentage-point increase in LTV. In contrast, mortgage interest rates have a statistically significant negative association with small- and medium-house prices, corresponding to approximately 1.63% and 1.38% lower prices, respectively, for a one-percentage-point increase in the interest rate, while the effect is statistically insignificant for large houses. Furthermore, the LTV–LDR interaction is statistically significant only in the large-house segment, indicating that the relationship between LTV regulation and housing prices is conditional on banking liquidity conditions in this segment.

While Loan-to-Value (LTV) regulations exert significant effects across small, medium, and large housing markets, monetary policy influences primarily the small- and medium-house segments through affordability-related mechanisms. In contrast, the large-house segment exhibits a different transmission structure in which banking liquidity is associated with a stronger conditional relationship between LTV regulation and housing prices. These results suggest that housing market segmentation

extends beyond differences in price levels or buyer characteristics and is fundamentally reflected in the way policy interventions affect housing demand and price dynamics.

The findings carry important implications for both housing market stabilization and financial stability. A uniform policy approach is unlikely to achieve balanced outcomes across all housing segments because each segment responds to different policy channels. Affordability-driven housing markets remain highly sensitive to borrowing costs and credit accessibility, whereas higher-value housing markets are more vulnerable to liquidity-driven credit expansion and asset-price pressures. Importantly, these interpretations should be distinguished from the directly estimated empirical relationships: household buyer characteristics, affordability constraints, and investment motives are not directly measured in the dataset and therefore represent plausible mechanisms rather than directly identified channels.

Consequently, effective housing market management requires closer coordination between monetary policy, macroprudential regulation, and banking-sector liquidity management. More broadly, this study contributes to the growing literature on housing market segmentation by providing segment-level empirical evidence that the same policy instrument does not generate uniform effects across housing tiers: LTV regulation is significant across all three segments, interest-rate transmission is concentrated in small and medium housing, and the LTV–LDR interaction is confined to large housing. This evidence demonstrates that policy transmission heterogeneity is not merely a difference in housing price levels but a measurable difference in the response of housing prices to specific policy instruments and their interaction.

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