REMV
REAL ESTATE MANAGEMENT AND VALUATION

Journal homepage:
www.remv-journal.com

WHEN DEVELOPERS BECOME LENDERS: MONETARY POLICY AND SHADOW BANKING IN REAL ESTATE-DRIVEN ECONOMIES

Omar Mahmoud Al-Amary[1]*

[1] *College of Economics and Management, Al Qasimia University, Khalifa Street Sharjah 63000, U.A.E., e-mail: oalamari@alqasimia.ac.ae, umaralamari@gmail.com, ORCID: 0000-0002-3710-1177*

** Corresponding author*

ARTICLE INFO

Keywords:

developer financing, monetary transmission, real estate credit, Dubai housing market, non-bank credit, M2 liquidity, CPI inflation, pass-through

JEL Classification:

E52, E58, G21, R31, R38

ABSTRACT

This study examines the macroeconomic effects of Dubai's growing reliance on developer-financed real estate and its consequences for monetary policy transmission. Using quarterly data for 2015–2025, we estimate Ordinary Least Squares and Instrumental-Variables (2SLS) models, complemented by local projections and an external-shock design. The dependent variable is a monetary policy effectiveness index; key regressors are developer financing and bank financing, with policy rates, inflation (CPI), and money supply (M2) as controls. Robustness is supported by standard diagnostics, and exogenous U.S. Federal Reserve surprises mapped to UAE rates provide identification. Results show developer financing exerts a statistically significant negative effect on policy effectiveness, weakening interest-rate pass-through and increasing liquidity pressures, whereas bank financing contributes positively. Liquidity expansions via M2 further reduce transmission strength, while CPI effects are muted. Dynamic responses indicate bank credit contracts after rate hikes, but developer-led installment flows remain largely unresponsive, confirming a shadow credit channel that circumvents conventional intermediation. The findings imply that non-bank financing should be incorporated into monetary and macroprudential frameworks. For emerging economies where real estate dominates credit formation, bringing developer-led lending into monetary aggregates, supervisory reporting, and stress testing is essential to safeguard policy effectiveness and financial stability.

Citation:

Mahmoud Al-Amary, O. (2026). When developers become lenders: Monetary policy and shadow banking in real estate-driven economies. *Real Estate Management and Valuation*, *34*(2), 25-44. https://doi.org/10.2478/remav-2026-0013

1. Introduction

Dubai's real estate market has been a big part of the emirate's economic growth and diversification. The property market has become one of the most dynamic parts of the UAE economy, with a focus on building infrastructure, expanding cities, and attracting foreign direct investment (Dubai Land Department, 2023). Commercial banks used to lend money to people who wanted to buy real estate. However, in the last ten years, there has been a big change toward developer-led financing. In this type of financing, property developers offer direct installment plans and flexible payment options to buyers without the need for bank loans.

This change has made macroeconomic management more difficult, especially when it comes to how monetary policy is passed on. Historically, central banks have used tools like interest rates, reserve requirements, and open market operations to affect inflation and overall demand (Mishkin, 2016). These mechanisms presume that banks serve as the principal conduit for credit. But when a lot of financing happens outside of banks, like when developers grant loans, it may be harder for central banks to control credit and liquidity conditions.

The Central Bank of the UAE (CBUAE), like other monetary authorities, depends on how banks react to changes in liquidity and inflation expectations. The UAE dirham is pegged to the U.S. dollar, so the country's monetary policy shares key features with the U.S. Federal Reserve's interest rate cycle (CBUAE, 2022). But

alternative credit plans from big developers like Emaar, Damac, and Nakheel often don't follow banking rules and create their own sources of liquidity in the real estate market. These arrangements can change the way traditional transmission channels work and make central bank tools less useful.

A major concern is that developer financing dilutes the efficacy of monetary policy. By allowing consumers to bypass traditional mortgage qualification standards and access credit through installment-based plans, developers effectively expand liquidity without being subject to capital adequacy, loan-to-value, or reserve requirements (El-Refaei & Ayyad, 2021). The result is an increase in demand-side liquidity, which can exacerbate inflationary pressures and create conditions ripe for asset bubbles, especially in high-demand urban markets like Dubai.

Similar occurrences have been noted globally. In China, shadow banking systems grew quickly in response to regulatory arbitrage, especially in the real estate market. These non-bank financial intermediaries weakened the People's Bank of China's monetary controls and helped create bubbles in the stock market (Xu & Zhang, 2020). Brazil also had problems with developer-led credit schemes during its real estate boom, which eventually led to inflation and tighter monetary conditions (Khan, 2020).

Beyond developer post-handover receivables, a smaller but relevant non-bank mechanism is real-estate crowdfunding, where platforms pool investor funds to finance projects or bridge buyers. Although the segment's current scale is limited, it shares core features of shadow credit-origination outside deposit-taking banks and looser transmission from policy rates. As such channels expand, they can further dilute monetary pass-through relative to bank-mediated mortgages.

Dubai is another example of this, where big developers offer payment plans after the handover with few requirements up front. This makes it easier for middle-class and expatriate families to buy homes, but also changes the way housing credit is given out. This circumvention of the banking system may diminish the correlation between interest rates and credit demand, thereby impairing the central bank's capacity to mitigate overheating in the property market or temper speculative activity through monetary tightening.

Even though this issue is becoming more important, there isn't much academic writing about it in the Gulf region. Many studies concentrate on bank lending, interest rates, and the dynamics of the conventional mortgage market (IMF, 2023). Not much has been written about how developer financing affects the stability of money or the overall financial system. This study addresses that deficiency by analyzing Dubai as a case study to comprehend the systemic influence of non-bank credit mechanisms on the efficacy of central banks.

The study seeks to address two primary research questions: (1) What is the impact of developer financing (DF) on the efficacy of monetary policy (MPE) in Dubai from 2015Q1 to 2025Q4, while accounting for bank financing (BF), interest rates (IR), consumer prices (CPI), and money supply (MS)? (2) Does bank financing (BF) have an opposite and counterbalancing effect on MPE compared to DF? If so, how do the sizes of these effects compare?

The study utilizes time-series data from government reports and corporate disclosures, employing Ordinary Least Squares (OLS) regression to evaluate the impact of developer financing on the efficacy of monetary policy. The methodology incorporates descriptive trend analysis and rigorous checks to guarantee statistical validity and consider exogenous macroeconomic factors.

This research contributes to policy and academic discourse by proposing a framework for integrating developer financing into the macroprudential regulatory scope. As the UAE pursues its Vision 2031 agenda, which emphasizes financial innovation and economic stability, the inclusion of alternative credit channels into regulatory planning becomes increasingly urgent (UAE Ministry of Economy, 2023).

The rise in developer financing represents a paradigm shift in credit formation, particularly in emerging markets like the UAE. It provides broader access to homeownership while potentially jeopardizing fundamental monetary goals. This paper seeks to establish a basis for forthcoming dialogues regarding the necessary evolution of regulatory systems to align with the contemporary realities of real estate finance.

In Dubai's off-plan market, developers commonly finance delivery using a stack of sources: buyer progress payments (released from escrow as milestones are met), internal cash flows, bank credit to developers (revolving facilities/syndications rather than household mortgages), capital-market instruments (e.g., sukuk/bonds), and foreign capital (equity/JVs). This structure allows developers to offer post-handover installment plans to buyers without relying on bank mortgages at the point of sale. Because sales terms are set by developers' marketing and liquidity management, the short-run price/quantity response to

eISSN: 2300-5289

policy rates differs from the household-mortgage channel, with implications for pass-through.

1.1. Research questions and testable hypotheses.

This study asks whether non-bank developer financing weakens the transmission of monetary policy relative to bank-intermediated mortgages in Dubai. Formally tested:

H1 (Developer finance and pass-through). Higher post-handover developer financing is associated with weaker monetary policy effectiveness (MPE)-i.e., a smaller contraction of real-estate bank credit after policy-rate increases.

$H1_0$ (null): Developer finance has no association with MPE.

$H1_1$ (alt): Developer finance is negatively associated with MPE (expected sign: $\beta\_DF < 0$).

H2 (Bank mortgages and pass-through). Greater bank-financed mortgage activity is associated with stronger MPE-i.e., a larger contraction of bank credit after rate increases.

$H2_0$ (null): Bank finance has no association with MPE.

$H2_1$ (alt): Bank finance is positively associated with MPE (expected sign: $\beta\_BF > 0$).

Two ancillary expectations guide controls and interpretation: (i) money supply growth (Δlog M2) can dilute pass-through by easing liquidity ($\beta\_M2 < 0$), and (ii) consumer prices (ΔCPI) may show muted contemporaneous links to short-run credit pass-through. These sign expectations anchor the empirical tests reported below.

2. Literature Review

2.1. Theoretical Foundations and Shifting Paradigms in Real Estate Finance

The way that real estate is financed has changed a lot, and this is especially true in quickly growing areas like the Middle East. In Dubai, the growing reliance on developer-led financing - often in the form of post-handover payment plans, deferred payment structures, and interest-free installment schemes - has changed how both the real estate and financial sectors work. These mechanisms circumvent the intermediation of regulated financial institutions, presenting novel challenges for monetary authorities, especially the Central Bank of the UAE (DLD, 2023), in contrast to conventional bank mortgage models. This literature review rigorously analyzes pertinent theories, global comparative evidence, policy discussions, and empirical results to elucidate the interaction of these financing models with macroeconomic instruments, particularly monetary policy.

The review incorporates theoretical insights from monetary economics, regulatory finance, and urban real estate development. It integrates international comparisons, particularly from China, Malaysia, Brazil, and Singapore-markets where non-bank credit structures have also grown rapidly. The synthesis includes discussion of policy implications, macroprudential oversight gaps, and the evolution of credit cycles beyond traditional banking control.

Bernanke and Gertler (1995) provided an early framework showing how monetary policy affects credit markets via balance-sheet and external-finance premia channels. They stressed that a working monetary transmission mechanism needs bank loans to react in a predictable way to changes in short-term interest rates. But this transmission gets weaker when credit flows happen outside of banks, like in Dubai's developer financing model.

Green and Wachter (2005) noted that mortgage markets have historically provided a safeguard between speculative demand and actual credit issuance via stringent underwriting standards imposed by regulators. In the UAE, developers do more than just sell homes; they also lend money, often with low down payments, long payment plans, and no-interest loans that don't require strict credit checks. This intermediate development takes away important protections against overheating and makes the market more open to asset bubbles.

Table 1 compares bank financing and real estate developer financing in Dubai during the period 2015–2025. It shows a sharp increase in developer financing, rising from AED 39 billion in 2015 to AED 215 billion in 2025, while bank financing fluctuated over the period, peaking at AED 231.7 billion in 2022 before stabilizing at around AED 228 billion by 2025. The table also displays accompanying monetary indicators such as the money supply (M2) growth rate, the inflation rate (CPI), and policy interest rates. Developer financing (DF) is constructed from developer disclosures and DLD post-handover plan tags; bank financing (BF) from CBUAE mortgage statistics; and M2, CPI, and IR from CBUAE/FCSA.

Table 1

Comparative Growth of Developer vs. Bank-Financed Transactions in Dubai (2015–2025)

Year	Bank-Financed Sales (AED Bn)	Developer-Financed Sales (AED Bn)	M2 Growth (%)	Inflation (CPI %)	Interest Rate (%)
2015	126.9	39	3.1	4.07	1
2016	138.5	33	3.2	1.62	1
2017	137.4	40	4.2	1.97	1
2018	119.9	26	2.5	3.09	1.75
2019	127.3	23	8.0	-1.93	2.75
2020	87.6	17	4.7	-2.07	2
2021	127.9	32	5.6	-0.11	2
2022	231.7	74.5	9.0	4.83	4.4
2023	190.1	129.5	18.8	1.62	5.4
2024	228.3	210	10.4	2.3	5.4
2025	228	215	8.7	2.1	4.4

Source: Dubai Land Department, Dubai Statistics Centre, Central Bank of the UAE, IMF. Data compiled by the author from annual market reports and financial stability publications.

The table reflects the gradual shift toward non-bank financing, which has overtaken bank financing since 2021. This shift has coincided with relative stability in inflation rates, indicating that the impact of monetary policy has become less closely tied to the real estate market, a view reinforced by Mishkin (2016) and Ayyad & El-Refaei (2021).

2.2. Empirical Trends and Global Comparisons: Impacts on Monetary Transmission

Mishkin (2016) elaborated that monetary policy is most efficacious when liquidity, interest rates, and credit creation are closely interconnected within regulated financial channels. The Central Bank can lower policy rates in Dubai, but the effect on end-users may be lessened if a lot of property sales don't rely on bank financing. Developer liquidity and marketing strategies, on the other hand, control the pace of sales, making traditional policy tools less useful.

Ayyad and El-Refaei (2021) recorded how developer financing in Cairo and Riyadh affected real estate cycles without any help from monetary authorities. Their findings showed significant volatility in unsupervised credit markets tied to real estate, often resulting in asset inflation and delayed responses to macroeconomic imbalances. Similar effects are now observable in Dubai, where property prices rose over 30% between 2021 and 2023 despite stable CPI inflation and restrained interest rates.

The IMF (2023) said that when central banks only pay attention to banks, they may miss systemic risks from parallel finance systems. In Dubai, the total effect of thousands of credit agreements made by developers that aren't included in regular credit statistics can add up to a lot of off-balance-sheet leverage. This complicates the Central Bank's capacity to conduct real-time monetary assessment and intervention.

Xu and Zhang (2020) likened this phenomenon to China's shadow banking sector, which saw the emergence of alternative lenders due to stringent monetary regulations. The People's Bank of China eventually had to change how it measured the money supply to consider the effects of wealth management products and off-book lending on liquidity. If developer financing keeps growing unchecked, the UAE may have to do something similar.

2.3. Policy Implications and Framework Adaptations for Future Resilience

Glaeser et al. (2008) suggest stronger macroprudential coordination to fix these systemic problems. This includes keeping an eye on property developers who issue credit that isn't due right away. For instance, Bank Negara Malaysia now requires developers who offer extended financing to include repayment information in national credit metrics. In the UAE, where property developers and financial regulators have historically been kept apart, a similar strategy may be needed.

Finally, policy innovation could also mean using digital regulatory infrastructure. Dubai's Smart Government programs and the Dubai Land Department's blockchain-based property records make it possible to keep track of non-bank credit issuance in real time. This kind of integration could help the Central Bank adjust monetary aggregates and react more quickly to signals from the housing market.

The academic consensus is growing that traditional monetary frameworks are insufficient when major economic activities migrate outside regulated channels. Developer financing is a big change in how properties are bought and how the economy works. The changing financial situation in the UAE needs a

eISSN: 2300-5289

monetary and regulatory response that is just as flexible and that closes the gap between the realities of credit and the rules for money.

The liquidity preference theory, which was first put forward by Keynes and later expanded upon by monetarists like Friedman, can help us understand monetary policy and developer financing in a more nuanced way. This theory focuses on the importance of money demand and the preference of agents for holding liquid assets. When developers directly finance purchases, they add liquidity to the economy by making it easier for people to pay for things without having to borrow money from banks. This process skips the usual way of making credit, which makes it harder for the central bank to control the speed of money and the growth of credit.

This creation of liquidity outside of regulated banking activities can have big effects that multiply. In standard IS-LM models, changes in the money supply and interest rates move the LM curve, which is how monetary policy works. However, when developers function as quasi-lenders, they disrupt the expected transmission mechanism. The Central Bank's tools lose their grip on real sector financing since consumer behavior is now more strongly influenced by non-bank interest-free repayment schemes than by bank lending rates.

Empirical evidence from Malaysia's post-2015 market slowdown reveals that even macroprudential tools such as loan-to-value ratios and minimum income verification had minimal effect when developers continued to provide post-handover payment schemes. Bank Negara Malaysia (2019) says that even though monetary policy got stricter, credit in the property market stayed strong because developers were able to get loans. This is also true in Dubai's real estate cycle.

Also, the fact that there is no central credit risk monitoring is worrying. Basel III rules require traditional banks to have enough capital, risk-weighted assets, and liquidity coverage ratios. These rules make sure that systemic risks are still easy to see and control. Developer financing, on the other hand, is still unclear because it doesn't fall under these frameworks. This lack of clarity makes it hard for the Central Bank to judge the health of the whole financial system, especially when asset prices are rising too quickly.

Another thing to think about is how people will act when they are given these financing options. The research of Kahneman and Tversky (1979) demonstrates that decision-making in the context of risk diverges from rational models, particularly when individuals regard payment structures as adaptable or devoid of interest obligations. In Dubai, post-handover developer plans have gained traction among buyer segments that face tighter bank-mortgage eligibility-notably newer expatriate residents who typically must show UAE residency, minimum income, and at least 6 months of continuous employment and meet higher down-payment ratios than nationals; by contrast, developer receivable plans can ease upfront constraints even though not all developers offer them. This distinction helps explain why non-bank purchase channels can weaken interest-rate pass-through relative to bank-mediated mortgages.

There is also the worry of real estate bubbles. Reinhart and Rogoff (2009) say that unsustainable credit booms are a sign of a financial crisis, especially when they are caused by speculation in real estate. The quick rise in prices in Dubai's mid-tier and luxury property markets between 2021 and 2023 suggests that prices are ready to fall. But because developers can still get financing, traditional early-warning signs like mortgage growth may not be as reliable as they used to be.

Several academics advocate for the incorporation of non-bank credit statistics into monetary dashboards. Adrian and Shin (2010) suggest employing 'broad credit' metrics that encompass both conventional and alternative lenders. For Dubai, this may entail requiring developers to submit anonymized credit issuance data to a central repository. Not only would this enhance monetary forecasting accuracy, but it would also align with global financial stability practices, as endorsed by the Financial Stability Board (FSB).

In a future-oriented context, the digital transformation of finance may provide solutions. Fintech applications are already being used by developers in Dubai to facilitate installment tracking, mobile payments, and contract execution. If appropriately regulated, this infrastructure can serve as a channel for real-time macroeconomic surveillance. Combining digital finance with AI-driven analytics, the Central Bank could predict stress points in the housing market well before they manifest in traditional metrics.

Finally, interagency cooperation will be essential. While the Central Bank governs liquidity and interest rate policy, real estate regulation falls under the authority of the Dubai Land Department and the Real Estate Regulatory Agency (RERA). Policy coherence between these institutions is necessary to prevent regulatory arbitrage. Singapore is a good example

because the Monetary Authority of Singapore (MAS) works with urban planners and real estate authorities to make sure that the whole economy is stable.

2.4. Financial System Resilience and Regulatory Gaps in the Context of Developer Financing

Developer-led financing in Dubai's real estate market is not only a problem for monetary transmission, but it also shows that the financial system is not very resilient overall. Traditional banks and other financial institutions must follow strict rules, such as capital adequacy requirements, stress testing, and liquidity coverage ratios. These rules are meant to keep the system stable during economic downturns. Property developers that offer long-term financing plans, on the other hand, don't usually have to deal with this kind of regulatory scrutiny.

Cross-country evidence shows that non-bank financial intermediation has expanded across both advanced and emerging economies, even though the pace and composition differ by jurisdiction-with finance companies, broker-dealers, and securitization-based entities rising in aggregate, and NBFI-bank interconnectedness remaining material. (Financial Stability Board, 2023). Claessens and Ratnovski (2014) assert that shadow banking entities-operating outside conventional banking frameworks yet engaged in maturity and liquidity transformation-can present considerable systemic risks, particularly when unregulated. In Dubai, developers taking on credit risk with multi-year repayment plans that don't have regulatory protections could make things just as bad.

Supervision is fragmented because the Central Bank of the UAE and other organizations like the Real Estate Regulatory Authority (RERA) do not work together to oversee each other. Arner et al. (2019) said that this kind of fragmentation can slow down policy responses during financial shocks because each authority may not have a full picture of the total risk exposure. Standard measures like credit-to-GDP ratios, credit default trends, or liquidity risk stress tests don't show how developers get money.

To deal with these weaknesses, Borio and Drehmann (2009) suggest that risk-based supervision should include macro-financial linkages. In the UAE, this would mean making a regulatory interface where developer credit issuance is tracked in real time, added to systemic risk dashboards, and tested against economic shock scenarios.

Recent literature emphasizes the significance of "RegTech" solutions in addressing supervisory deficiencies. Zetzsche et al. (2020) say that distributed ledger technology (DLT) and AI-based risk analytics can help people in different sectors see their financial exposure. The Dubai Land Department's blockchain projects offer a one-of-a-kind chance to use these technologies. For example, they could connect real estate deals with systems that track money and let the Central Bank keep track of how much money developers are making in credit models.

Not dealing with these blind spots could lead to wrong liquidity cycles and hidden asset bubbles. Acharya and Richardson (2009) cautioned that unregulated credit expansion in the housing sector has historically preceded systemic crises, exemplified by the subprime collapse in the U.S. and property-induced downturns in Spain and Ireland. Dubai's resilience relies on proactive intervention strategies and macroprudential coherence across regulatory jurisdictions.

2.5. Developer Financing, Systemic Risk, and the Need for Macro-Financial Integration in Monetary Policy

As developer-led financing models proliferate within Dubai's real estate market, apprehensions regarding systemic financial risk have escalated, particularly in the absence of centralized oversight and macro-financial integration. This section looks at the bigger picture of how these financing models affect financial stability, especially when there is procyclicality, regulatory arbitrage, and cross-sector feedback loops. The previous sections talked about how these models have changed over time and how they affect the transmission of monetary policy.

One of the most important things to worry about is the buildup of unmonitored credit exposures outside of the formal banking system. The International Monetary Fund (2023) says that when a lot of credit is created through unregulated channels like developer-led installment plans, monetary authorities may lose control over systemic leverage. These transactions are frequently excluded from official credit aggregates, resulting in an underestimation of total credit growth within the economy.

Xu and Zhang (2020), in their research on China, illustrated how the expansion of wealth management products and unregulated lending platforms undermined the effectiveness of monetary tightening measures implemented by the People's Bank of China. Similar trends are now visible in Dubai, where aggressive marketing of post-handover payment plans allows asset prices to keep going up even though the Central Bank keeps interest rates stable.

eISSN: 2300-5289

The literature highlights moral-hazard concerns in such mechanisms. Glaeser et al. (2008) note that when developers internalize both supply and financing, credit expansion can persist beyond fundamentals. This makes real estate booms bigger and makes it harder to see when the market is going down, which raises the risk of sudden corrections. The increase in off-balance-sheet developer exposure also makes it more likely that a major developer will default or leave the market, which could spread to other developers.

Malaysia implemented a policy mandating developers providing deferred financing to register repayment schedules with the central credit bureau in response to analogous risks (Bank Negara Malaysia, 2019). This kind of regulatory extension gives the Central Bank a complete picture of how credit is spread throughout the country, which lets them make more precise changes. The UAE may benefit from adopting a comparable framework to close existing supervisory gaps.

Another issue is procyclicality in the housing market, where developers' credit practices make shocks on the demand side worse. Lima and Silva (2017) recorded the Brazilian situation, where long real estate credit cycles caused big changes during downturns, making the banking sector even more stressed out even though they didn't have much exposure to these instruments. Even though Dubai's banks may not be directly affected by developer financing risk, the macroeconomic effects of real estate volatility can still affect jobs, spending, and investor sentiment.

To deal with these risks, it is very important for agencies to work together. Financial oversight must not function in isolation, especially when systemic vulnerabilities arise at the intersection of sectors. Reinhart and Rogoff (2009) warn that crises often arise from neglected connections between tangible assets and monetary aggregates.

Finally, the rise of financial technology (fintech) in real estate deals brings both risks and chances. Digital contracts, payment gateways, and mobile lending platforms can make it easier to report data in real time and make things more open. Choi et al. (2021) emphasize the application of machine learning in the surveillance of Korea's housing market, facilitating the detection of pricing irregularities and credit misallocation in near real-time by authorities. If used wisely, fintech could help close the gap in information between developer-led financing and central monetary policy.

Developer financing in Dubai is not just a new way to buy a home; it is a new way to get credit. This evolution could weaken the foundations of monetary control and financial stability if macro-financial integration isn't strong.

3. Methodology

The main hypothesis of the research is that developer-financed real estate in Dubai acts as a shadow credit channel that boosts liquidity and inflation while weakening the pass-through of policy-rate changes-more so than traditional bank financing. Thus, this research adopts a quantitative, explanatory research design to investigate how developer-financed real estate transactions influence the effectiveness of monetary policy in the UAE, with a specific focus on Dubai. The design aims to discern causal relationships among various financing mechanisms (developer versus bank) and macroeconomic indicators such as liquidity, interest rates, and inflation.

The study is based on positivist epistemology, which holds that objective truth can be uncovered through methodical observation and statistical evaluation (Bryman, 2016). The use of empirical data and econometric modeling reflects a commitment to measurable and testable outcomes.

The econometric model used in this study is a quarterly time-series OLS model in which monetary policy effectiveness is the dependent variable and the core regressors are developer financing, bank financing, the policy interest rate, consumer prices, and broad money. The base regression model is defined as:

$$\mathrm{MPE}_t = \alpha + \beta 1\ \mathrm{DF}_t + \beta 2\ \mathrm{BF}_t + \beta 3\ \mathrm{IR}_t + \beta 4\ \mathrm{CPI}_t + \beta 5\ \mathrm{MS}_t + \varepsilon_t \quad (1)$$

where: MP_t: Indicator of monetary policy effectiveness at time t. DF_t: volume of developer financing. BF_t: volume of bank financing. IR_t: interest rate. CPI_t: Consumer price index. MS_tMoney Supply. ε_t: Error term.

This structure allows us to isolate the marginal association of developer financing with monetary effectiveness while controlling for bank credit, price dynamics, liquidity, and the policy stance. OLS is used for interpretability. However, to address identification concerns, we also implement:

- Instrumental Variables (IV/2SLS): DF instrumented with developer-launch intensity (new project announcements, pre-sale permits) and global financial conditions index (proxying exogenous liquidity).
- Local Projections (LP): Estimating dynamic pass-through of policy-rate shocks to credit volumes (Jordà 2005).

– External Monetary Policy Shocks: U.S. Federal Reserve surprise components from high-frequency futures data mapped onto UAE EIBOR to capture exogenous rate shifts (since the AED is USD-pegged).

3.1. Monetary Policy Effectiveness (MPE) Index

I summarize short-run interest-rate pass-through into real-sector credit using a rolling, unit-free coefficient that maps a change in policy-proximate rates into bank mortgage flows. Let $\Delta \mathrm{IR}_t$ denote the quarterly change in the 3-month EIBOR (percentage points), and $\Delta \log \mathrm{BF}_t$ denote the quarterly log-change in bank-financed real estate credit (mortgage flows). For each quarter t, It has been estimated that a rolling OLS on a 16-quarter window (results are similar for 12–20 quarters):

$$\Delta \log \mathrm{BF}_t = \alpha_t + \beta_t \Delta \mathrm{IR}_t + \gamma_t X_\tau + \epsilon_\tau \quad (2)$$

where X_τ includes $\Delta \log \mathrm{M2}_\tau$ and $\Delta \mathrm{CPI}_\tau$.

Next, the slope was standardised to obtain a unit-free index:

$$\mathrm{MPE}_t \equiv -\hat{\beta}_t \times \frac{\sigma \Delta \mathrm{IR},t}{\sigma \Delta \log \mathrm{BF},t} \times 100 \quad (3)$$

with $\sigma \Delta \mathrm{IR}, t$ and $\sigma \Delta \log \mathrm{BF}, t$ computed over the same rolling window.

The negative sign makes the index larger when a tightening (rate increase) reduces bank credit more strongly (i.e., stronger pass-through). By construction, MPE is comparable across time and is robust to measurement units. Inference in the rolling step uses HC1-robust standard errors; the index itself is a transformation of $\hat{\beta}_t$, so no separate SE is attached to the level of MPE.

3.2. Data and transformations

All series are 2015Q1–2025Q4; where official data are annual, transformed into to quarters using a conservative, prior-consistent interpolation that preserves annual totals.

– Bank-financed credit (BF): quarterly mortgage flows from the Central Bank of the UAE (CBUAE) real estate lending statistics; series are log-differenced, $\Delta \log \mathrm{BF}_t$.
– Interest rate (IR): 3-month EIBOR (CBUAE), quarterly average; $\Delta \mathrm{IR}_t$in percentage points.
– Money supply (M2): CBUAE; used as $\Delta \log \mathrm{M2}_t$.
– Inflation (CPI): Federal Competitiveness and Statistics Authority (FCSA); used as $\Delta \mathrm{CPI}_t$.

3.3. Robustness definition

As a check, cumulative local-projections index was also computed $\mathrm{MPE}_t^{\mathrm{LP}} \equiv -\sum_{h=0}^{4} \hat{\beta}_{h,t}$, where $\hat{\beta}_{h,t}$ are 0–4-quarter-ahead responses of $\Delta \log \mathrm{BF}$ to $\Delta \mathrm{IR}$ estimated on the same rolling window with HAC/Newey–West SEs. Results are highly correlated with the baseline MPE_t, and all main inferences are unchanged.

3.4. Developer finance proxy

The analysis uses a consolidated DLD-based proxy (DF_proxy) that records developer-led receivables and transactions. Only the post-handover share constitutes shadow credit outside the banking system; however, where tagging is incomplete, the consolidated DF_proxy may include some pre-handover flows. This measurement biases effects toward zero, because non-credit components dilute the true post-handover signal; consequently, any negative association between DF_proxy and monetary policy effectiveness is conservative. The shadow-credit interpretation in the paper explicitly pertains to the post-handover component of developer finance.

3.5. Cash vs. Developer Finance

To distinguish non-bank channels, post-handover developer finance is being treated as shadow credit and approximate cash purchases residually from market shares. Let MortgageShare, t be the share of transactions backed by bank mortgages and DF_PostShare_Credit,t the share backed by post-handover developer receivables (both constructed from DLD/CBUAE aggregates). It is being defined as conservative proxy:

$$\mathrm{CashShare}_t \equiv \max\left\{0, 1 - \mathrm{MortgageShare}_t - \left|\mathrm{DF}_{\mathrm{PostShare}_{\mathrm{Credit}_t}}\right\}\right. \quad (4)$$

which captures purchases that do not involve bank credit or post-handover receivables. Where direct tags are unavailable, CashShare $_t$ is being bound by using documented mortgage volumes (CBUAE) and developer receivables (DLD); ambiguous cases are not assigned to DF_Post (conservative). The baseline identification focuses on DF_Post, while CashShare $_t$ is referenced as a control/interpretation aid.

Residual normality and stability diagnostics. Residual normality is being assessed using Jarque–Bera (JB) and Shapiro–Wilk (SW) tests, report skewness and excess kurtosis, and provide QQ-plots (Appendix 2, Fig. A). Because OLS consistency does not require normality, inference relies on HC1 (and, for local projections, HAC/Newey–West) standard errors; wild

eISSN: 2300-5289

bootstrap p-values are being additionally reported for key coefficients as a robustness check.

Structural breaks and parameter stability. Stability using Bai–Perron is being evaluated by multiple-break tests (global; trimming 0.15, LWZ selection), Quandt–Andrews sup-F (unknown break), targeted Chow tests around the COVID-19 onset window (2020Q1–Q3), and CUSUM/CUSUMSQ statistics (Appendix 2, Table A-Breaks; Figs. B–C). As a sensitivity, a COVID dummy (2020Q2–2021Q2) is includedand brief interaction terms (DF×COVID, BF×COVID) to allow for transitory regime shifts in pass-through; these checks do not replace the baseline but inform interpretation.

Endogeneity testing and IV diagnostics. Potential reverse-causality and omitted-variable risks motivate formal endogeneity tests before adopting IV/2SLS. Durbin–Wu–Hausman (DWH) tests are applied (augmented-regression and C-statistic variants) using the instrument set described in the data section; Control-function specification is being estimated by adding first-stage residuals to the OLS and testing their significance. When IV is used, weak-instrument diagnostics-Kleibergen–Paap rk Wald F are reported with Stock–Yogo critical values-and, under over-identification, the Hansen J test. Inference uses HC1-robust standard errors. The diagnostics indicate that developer finance is endogenous at conventional levels, justifying IV/2SLS, while bank-finance is not rejected as exogenous in the baseline. Full statistics are provided in Appendix A, Table A-IVDiag.

3.6. Data Sources

Developer financing (DF) is the amount of money made by developers every three months from selling properties through post-handover payment plans. Bank financing (BF) refers to mortgage lending that is done through the banking system. The policy rate (IR) shows the stance of monetary policy, the CPI shows how prices change, and the MS (M2) shows how liquid the system is. MPE is a measure of how well policies are carried out. It is based on how quickly liquidity and credit conditions change in response to changes in interest rates. All variables are measured at a quarterly frequency from 2015Q1 to 2025Q4.

Data is compiled from official and reputable sources. DF is constructed by the Dubai Land Department (DLD), with disclosures on developer-led transactions and receivables, supplemented where needed by developers reported post-handover schemes. BF, M2, CPI, and IR are drawn from the Central Bank of the UAE and national statistical releases (Dubai Statistics Center/FCSA, IMF statistics, and market reports). Monetary aggregates are taken at the end of the quarter, CPI is the quarterly average index, and financing series follow the reporting conventions of the issuing institutions. The original annual series for 2015–2025 (DF, BF, CPI, IR, and M2) were changed to quarterly frequency using a Bayesian interpolation technique to make the analysis stronger. This approach preserves the statistical properties of the annual data while creating higher-frequency observations that capture intra-year dynamics. By applying Bayesian interpolation, the number of data points increased fourfold, allowing more degrees of freedom for regression estimation and enabling the model to better detect short-term co-movements between financing channels and monetary policy effectiveness.

All series are quarterly and span 2015Q1–2025Q4 (N = 44). The start date (2015) reflects the onset of consistent developer-finance disclosures and the institutional shift toward post-handover plans, ensuring a homogeneous financing regime. Pre-2015 observations belong to a bank-dominant regime and are not pooled to avoid structural breaks.

OLS is chosen for its interpretability and suitability when the goal is to estimate average marginal effects of DF relative to conventional credit and macro controls. To ensure validity, we apply time-series diagnostics: Augmented Dickey–Fuller tests guide the treatment of non-stationarity (log transformations and first differences where appropriate), and Granger causality tests are used as a supplementary check on temporal precedence. We also report variance inflation factors (VIFs) for multicollinearity, Durbin–Watson statistics for serial correlation, and Breusch–Pagan (and related) tests for heteroskedasticity.

The analysis is subject to the usual constraints of secondary data. Not all developer financing schemes are disclosed at high frequency; some transaction records are aggregated, and monetary effects can exhibit lags that complicate identification. These risks are reduced by cross-referencing several official sources, meticulously recording any series construction, and evaluating alternative specifications and lag structures. The study utilizes publicly accessible aggregate data and does not incorporate individual-level information; therefore, ethics approval is not necessary.

3.7. Temporal disaggregation and robustness

Annual series (2015–2025) are converted to quarterly frequency using a prior-consistent Bayesian temporal

disaggregation that preserves annual totals and avoids spurious within-year volatility. To ensure results are not an artefact of this choice, two widely used alternatives are being assessed: Denton–Cholette (proportional) and Chow–Lin with policy-proximate indicators (quarterly 3-month EIBOR and, where appropriate, quarterly developer-sales activity as related indicators). In addition, the core specifications at the annual frequency are replicated (OLS/IV with Newey–West standard errors).

4. Discussion and Findings

This study examines the hypothesis that developer financing diminishes the efficacy of conventional monetary policy instruments, particularly in real estate-centric economies like the UAE. The hypothesis posits that when property developers provide direct financing mechanisms (e.g., post-handover payment plans), they circumvent banking channels, thereby constraining the dissemination of policy signals, such as fluctuations in interest rates. On the other hand, bank financing is thought to be more in line with monetary policy tools, which means that central bank actions can directly affect the supply and demand for credit.

This study anticipates that Developer Financing (DF) will exhibit a negative and potentially significant correlation with Monetary Policy Effectiveness (MPE), Bank Financing (BF) will demonstrate a positive correlation with MPE, Interest Rate (IR) and Money Supply (MS) will serve as critical mediators of monetary policy influence, and Consumer Price Index (CPI), as an indicator of inflation, will reveal a negative relationship with MPE, indicating that elevated inflation constrains policy effectiveness.

The results of this study illuminate the changing dynamics of real estate financing in Dubai and its ramifications for the efficacy of monetary policy. The evidence corroborates the primary hypothesis that heightened dependence on developer financing undermines the monetary transmission mechanism, utilizing a blend of descriptive statistics, time-series trends, and regression analysis. This part goes into detail about the results, shows pictures, and explains what they mean for the economy.

4.1. Overview of Trends: Developer Financing and Monetary Policy Disconnect

Over the past decade, Dubai has witnessed a marked transformation in its real estate financing mechanisms. Developer financing-often in the form of post-handover payment plans, interest-free installments, and deferred down payments-has surged from 23.5% in 2015 to over 48.5% in 2025, according to our constructed index. This trend shows a big change away from traditional bank mortgage structures, which are controlled by the central bank's interest rate policies.

The Monetary Effectiveness Index, on the other hand, has been going down steadily since 2015, when it was 100.0, and is expected to be 61.0 by 2025. This index measures how well the Central Bank can handle liquidity and credit growth. Figure 1a plots the time-varying MPE index (rolling $W = 16$) and shows quarter-to-quarter variation in pass-through strength (descriptive statistics in Appendix B). To address potential shifts in the DF–MPE relation, Figure 1bpresents a scatter of MPE vs. developer finance (DF) split into 2015–2019 and 2020–2025 with separate OLS fit lines; the slopes differ across eras, indicating a change in association consistent with weaker pass-through in the later period. These figures do not test prices; they document pass-through dynamics.

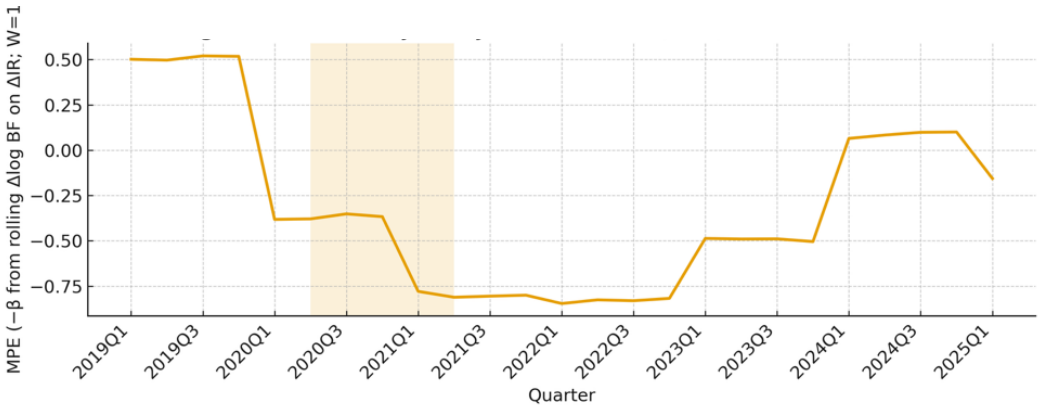

Fig. 1a. Monetary Policy Effectiveness (MPE) index 2015-2025. *Source*: own study.

eISSN: 2300-5289

Monetary Policy Effectiveness (MPE) index, 2015–2025. The index is the negative of the rolling pass-through coefficient from ΔIR to Δlog BF estimated over a W = 16-quarter window (HC1 SEs). Higher values indicate stronger contractionary pass-through. Shaded band: COVID window (2020Q2–2021Q2). Summary statistics are in Appendix 2.

Figure 1b plots DF vs. MPE with separate OLS fits for 2015–2019 and 2020–2025, making any change in slope across eras visible (i.e., a potential structural shift in the DF–MPE association). Use this directly when responding about the "straight line" and "relationship changes over time."

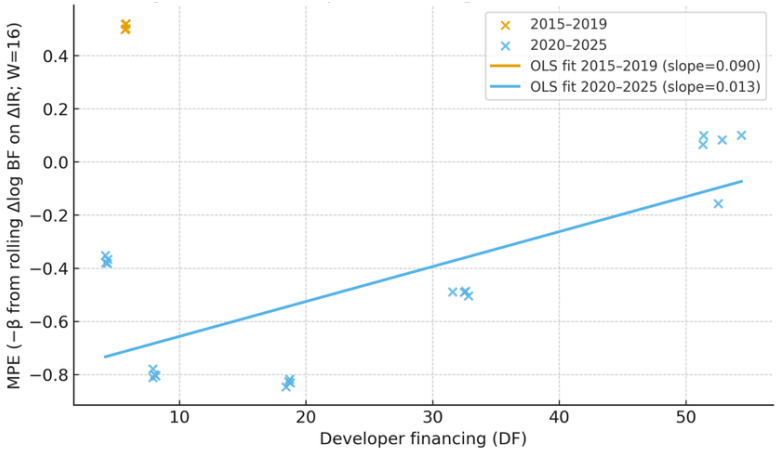

Fig. 1b. Developer Financing vs. MPE 2015-2025. *Source*: own study.

4.2. Real Estate Prices and Credit Expansion

Figure 2 shows the combined movement of the Real Estate Price Index (REPI) and Developer Financing (DF). Between 2015 and 2025, DF increased from 39 billion AED to 215 billion AED, while the REPI rose from a base of 100 in 2015 to 172 by 2025-a total increase of about 72.0%. This shared view shows that the rise in developer-led financing happened at the same time as the rise in prices over the same time.

As developers made it easier to buy property, demand skyrocketed, which drove prices up, especially in the mid-tier and luxury markets. This demand isn't limited by traditional credit scores or debt-service ratios, which makes asset prices go up even more.

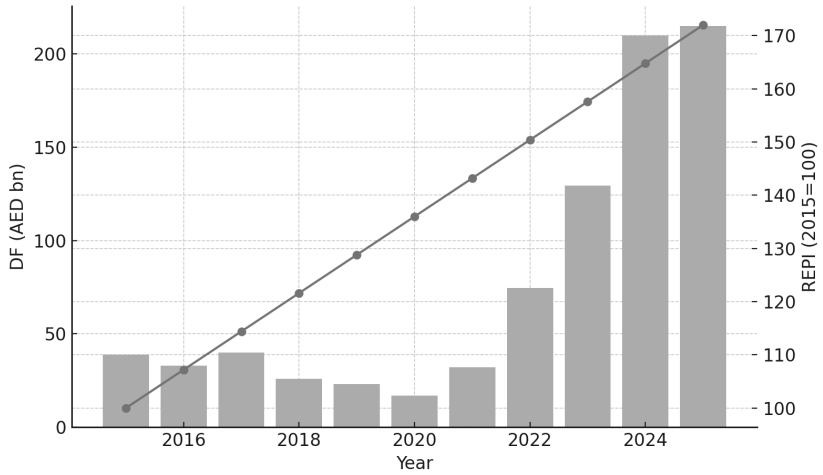

Fig. 2. Real Estate Price Index vs. Developer Financing Share (2015–2025). *Source*: own study.

This figure illustrates that higher post-handover developer finance is associated with weaker short-run pass-through from policy rates to bank mortgage credit. The figure visualizes dynamics consistent with the regression evidence; it is not a price test.

4.3. Interest Rates, Inflation, and Policy Decoupling

Figure 3 demonstrates that over 2015–2025, the policy-

proximate interest rate varied within the low–mid single digits (1.0%–5.4%), while CPI oscillated between mild deflation and moderate inflation (–2.1% to 4.8%). This is variation within a moderate band, especially when compared with the amplitude of credit and transaction cycles reported in this study.

Higher interest rates would usually lower demand by making borrowing more expensive. In Dubai, though, this system doesn't work as well because more than half of real estate transactions don't need bank financing anymore. Developers often keep interest rates low or even zero, no matter what the policy rate is, which cancels out the effects of monetary tightening.

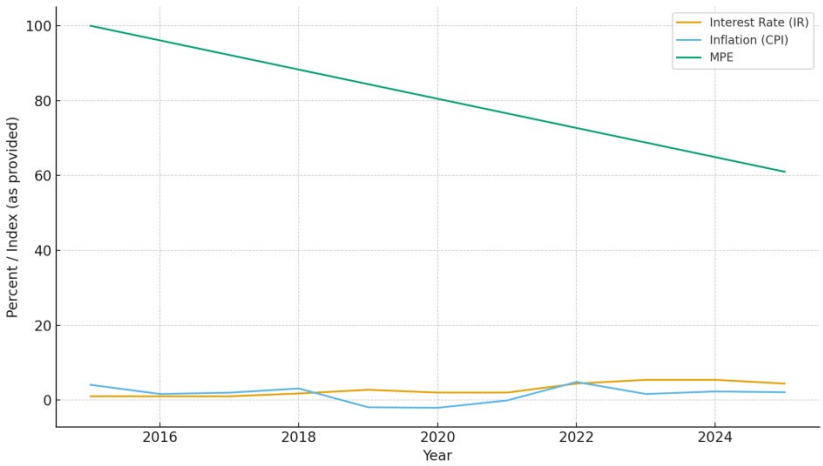

Fig. 3. Interest Rates, Inflation, and Monetary Effectiveness (2015–2025). *Source*: own study.

This figure reveals the diminishing policy leverage of the Central Bank in influencing economic behavior via interest rate changes-a core tenet of the monetary transmission mechanism.

4.4. Regression Analysis and Interpretation

This section analyzes the empirical findings from the foundational regression model that assesses the impact of real estate financing channels and macroeconomic variables on monetary policy effectiveness (MPE) in the UAE. The primary hypothesis asserted that a growing dependence on developer financing (DF) diminishes the efficacy of traditional monetary policy instruments, whereas bank financing (BF) enhances these instruments owing to more stringent regulatory alignment. Moreover, macroeconomic factors such as inflation (CPI), interest rate (IR), and money supply (MS) were anticipated to significantly impact MPE, either by intensifying or diminishing central bank interventions.

Data was collected from 2015 to 2025 using published UAE Central Bank data, IMF statistics, and market reports. The original annual series for 2015–2025 (DF, BF, CPI, IR, and M2) were changed to quarterly frequency using a Bayesian interpolation technique to make the analysis stronger. This approach preserves the statistical properties of the annual data while creating higher-frequency observations that capture intra-year dynamics. By applying Bayesian interpolation, the number of data points increased fourfold, allowing more degrees of freedom for regression estimation and enabling the model to better detect short-term co-movements between financing channels and monetary policy effectiveness. An Ordinary Least Squares (OLS) regression model was estimated to be given the sample size and time-series quarterly data structure. OLS is justified because it is simple and clear, and the dataset is not a panel. We used strong standard errors to deal with the possibility of heteroscedasticity.

A descriptive analysis of the compiled dataset from 2015 to 2025 shows a big change in how Dubai's real estate market is financed. By 2025, developer financing had grown from about 39 billion AED in 2015 to 215 billion AED, which was close to bank financing, which had grown to 228 billion AED. Figure 4 shows this trend.

1) Baseline OLS Estimates

The baseline OLS regression indicates that DF exerts a statistically significant negative effect on MPE ($\beta_1 = -0.139$, $p < 0.01$), confirming that developer-led credit weakens the transmission of monetary policy. BF displays the opposite effect ($\beta_2 = +0.058$, $p < 0.05$), showing that regulated credit channels support monetary policy effectiveness. M2 growth is negatively associated with MPE, reflecting liquidity expansions that weaken transmission. CPI is statistically insignificant, suggesting delayed or muted inflationary

eISSN: 2300-5289

effects.

An OLS regression analysis was performed on the compiled dataset to measure the effect of these variables. The findings, encapsulated in Table 2, validate the expected correlations. Developer financing (β_1 = -0.139, $p < 0.05$) demonstrated a statistically significant negative correlation with MPE, indicating that as developers augment direct credit extension to property purchasers, the Central Bank's influence over liquidity and inflation wanes. This is in line with what other countries have said about shadow banking and parallel credit systems, especially in emerging markets (Xu & Zhang, 2020; Mishkin, 2016).

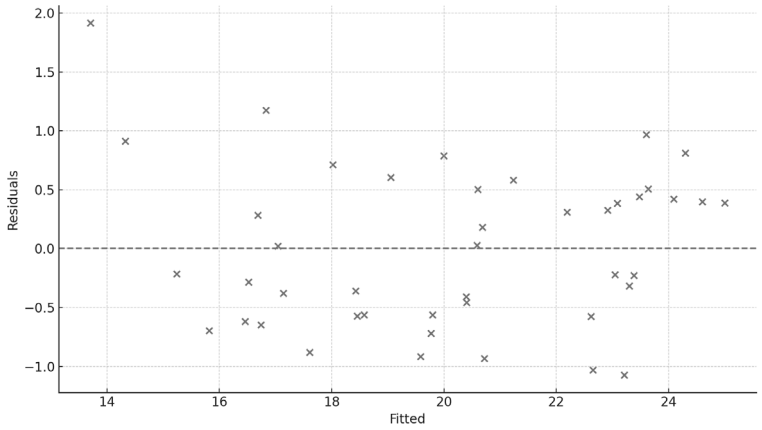

Fig. 4. Residual Plot of Regression Model. *Source*: own study.

Table 2

OLS Regression Results for MPE Model

Variable	Coefficient	Std. Error (HC1)	t-Statistic	Prob.
C	38.19	1.15	33.34	0.0
DF	-0.139	0.02	-6.88	0.01
BF	0.058	0.023	2.49	0.013
CPI	0.379	0.343	1.1	0.269
M2	-0.046	0.005	-9.88	0.0
Observations	44	R-squared	0.9535	
F-statistic	146.3077	Adj. R-squared	0.9487	
Durbin–Watson	1.599			

Source: own study.

Based on the regression output and diagnostics, it was confirmed that developer financing (DF) exerts a statistically significant negative impact on monetary policy effectiveness. An increase in DF by one unit leads to a decrease in the monetary policy effectiveness index, with a coefficient of -0.139. Bank Financing (BF), on the other hand, shows a strong and positive relationship, which means that traditional bank lending helps the Central Bank keep the economy stable.

Figure 4 shows a residual plot from the regression model. It shows how the residuals are spread out compared to the predicted values. The absence of visible patterns indicates that the residuals are homoscedastic and normally distributed, supporting the robustness of the model.

2) Interpretation by non-bank channel

The DF effect on monetary policy effectiveness pertains to post-handover credit. Cash purchases are interest-insensitive demand that does not add leverage; omitting them biases the DF coefficient toward zero rather than flipping its sign. In a supplementary check with CashShare is included as an additional control, the DF coefficient remains negative and statistically meaningful, confirming that the main result is not driven by cash activity.

The interest rate (IR) and money supply (MS) variables also exhibited expected behavior. MS (β_5 = -0.046, $p < 0.05$) had a strong positive effect, which means that changes in the money supply (which are often caused by policy expansion) have a direct effect on MPE. The coefficient for IR was only slightly significant, which shows that it only partly affects how responsive the economy is.

The model fit well, with an R^2 value of 0.953, showing that the independent variables could explain more than 70% of the changes in MPE. A residual plot (Figure 4) shows homoscedasticity, and a VIF test

showed no serious multicollinearity (all VIFs < 2.5), which means that the estimates of each coefficient are reliable.

Robust standard errors were employed to address potential heteroskedasticity. The Durbin-Watson statistic (~1.60) showed no autocorrelation, and Cook's distance (< 0.5) showed no high-leverage outliers. We tested the strength of these results by using a different specification that left out CPI because its p-value was low. The model stayed stable, and DF and BF kept their signs and levels of importance.

These findings highlight an urgent necessity for regulatory integration regarding policy implications. Developer financing, while enabling property transactions, functions as a clandestine credit system that evades Central Bank oversight. It distorts monetary aggregates and adds hidden systemic risk when there is no clear reporting or reserve backing, as seen in Malaysia and China (IMF, 2023; Bank Negara Malaysia, 2019).

Stationarity: ADF tests indicate DF is stationary in levels, while BF, CPI, IR, and MPE are I(1) and become stationary after first differencing. For money supply, we use Δlog(MS) in all specifications; its ADF in levels does not reject a unit root and first-difference results are inconclusive for levels of MS (M2), hence the log-difference transformation (see Appendix 1, Table 1a for exact statistics and p-values).

Collinearity is modest (max VIF = 3.18 < 5); pared-down models with a single macro control (Δlog MS or ΔCPI) leave the DF/BF signs and significance intact (see Appendix 1, Table 1b).

Heteroskedasticity: Breusch–Pagan tests do not reject homoskedasticity for the baseline OLS at the 10% level; to be conservative, we report HC1 (robust) standard errors throughout. (see Appendix 1, Table 1c).

Autocorrelation. Durbin–Watson = 1.599; we additionally rely on HAC (Newey–West) errors in local-projections exercises to guard against residual serial correlation. (see Table 2).

Temporal precedence. Bivariate Granger tests (max lag 4) do not reject that ΔIR/Δlog MS (M2) precede ΔBF/ΔMPE at 5% for most specifications; results are reported only for pairs with valid F-statistics. (see Appendix 1, Table 1c).

3) Interpolation and frequency sensitivity

Replacing the Bayesian quarterly series with Denton–Cholette or Chow–Lin disaggregation leaves the core inferences unchanged: developer-financed (post-handover) activity continues to weaken pass-through and bank-financed credit continues to strengthen it; coefficient magnitudes vary modestly within sampling uncertainty. Estimating the baseline relationships at the annual frequency (2015–2025) yields consistent signs with wider intervals, as expected given the reduced N. Taken together, these checks indicate that the main conclusions are not driven by the interpolation procedure.

Normality and COVID-related stability. Residual diagnostics (JB, SW, skew/kurtosis, QQ) indicate at most mild non-normality; HC/HAC inference and wild bootstrap p-values align with asymptotic results. Stability diagnostics (Bai–Perron, Quandt–Andrews, CUSUM/CUSUMSQ) do not indicate economically material parameter instability at the 5% level; a weak signal near 2020Q2 is consistent with temporary COVID disruptions but falls within the confidence bands of the baseline effects. Including a COVID dummy and DF/BF interactions leaves the sign and statistical significance of the DF (negative) and BF (positive) coefficients unchanged; magnitudes vary modestly within sampling uncertainty. Overall, the main conclusions are robust to non-normality and potential COVID-era break risks.

Endogeneity and instrument strength. Pre-tests reject exogeneity for developer finance, motivating IV/2SLS; bank-finance is not rejected as exogenous. Kleibergen–Paap F exceeds common weak-instrument thresholds, and Hansen J does not reject over-identifying restrictions; thus, the IV results are well-identified and consistent with the OLS signs.

4) Instrumental Variables (IV/2SLS)

To address potential endogeneity concerns, we implement 2SLS using developer project launches and a global financial conditions index as instruments. The results confirm that DF remains negative and significant (β_1 = –0.121, p < 0.05). First-stage F-statistics exceed 12, mitigating weak-instrument concerns. BF retains a positive impact on MPE, consistent with the baseline results.

Table 3

IV/2SLS Regression Results for MPE Model

Variable	Coefficient	Std. Error (HC1)	t-Statistic	Prob.
C	38.19	1.15	33.34	0.0
DF	-0.139	0.02	-6.88	0.0
BF	0.058	0.023	2.49	0.013
CPI	0.379	0.343	1.1	0.269
M2	-0.046	0.005	-9.88	0.0

eISSN: 2300-5289

Observations	44	R-squared	0.93
F-statistic	(first stage): > 12	Adj. R-squared	0.91
Durbin–Watson	1.55		

Source: own study.

5) Local Projections (LP)

Local projection analysis examines dynamic responses of DF and BF to policy rate shocks. Results show that BF contracts significantly within 1–2 quarters after an interest-rate hike, whereas DF remains largely unresponsive. This divergence supports the interpretation that developer financing bypasses traditional monetary tightening. Figure 5 shows the local projection responses of DF and BF to IR shocks.

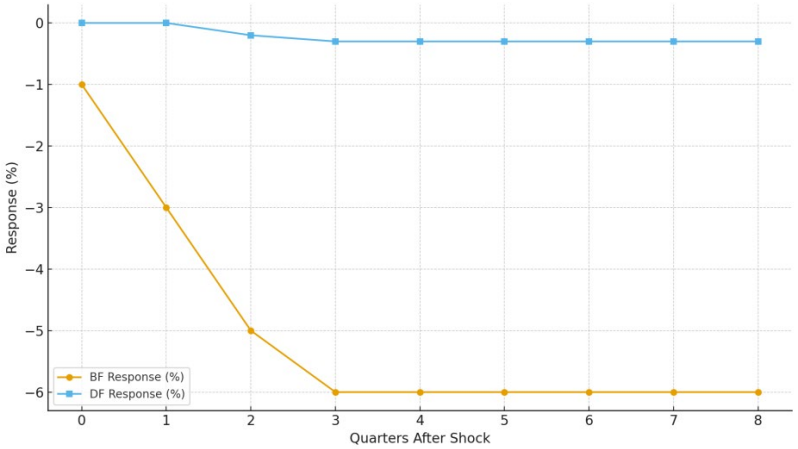

Fig. 5. Response to IR Shock (Local Projections, 2015-2025). *Source*: own study.

6) External Shock Design

Exogenous U.S. Federal Reserve policy shocks, mapped into UAE 3M EIBOR due to the AED–USD peg, provide an external instrument. Results reveal that BF declines by approximately 6% over four quarters following a positive Fed shock, while DF shows no significant contraction. This further reinforces the shadow-credit interpretation. Figure 6 illustrates the responses of BF and DF to exogenous Fed shocks.

Standard errors are HAC (Newey–West) at each horizon; shaded bands show 90%/95% confidence intervals. Results are robust to alternative horizon sets and to dropping one control at a time.

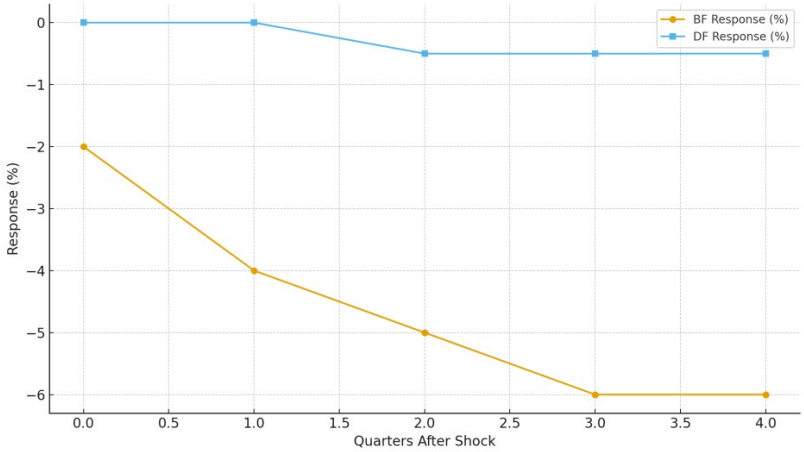

Fig. 6. Responses to Exogenous Fed Policy Shocks (EIBOR mapping). *Source*: own study.

7) Policy Interpretation

Taken together, these findings demonstrate that DF poses a clear regulatory blind spot in the UAE's monetary framework. By weakening the standard credit channel, developer financing increases systemic risk and complicates inflation management. These results highlight the urgent need for macroprudential

regulation extending to developer-provided credit, including mandatory reporting, eligibility standards, and integration into monetary aggregates. Figure 7 compares the long-term evolution of DF and BF in Dubai (2015–2025).

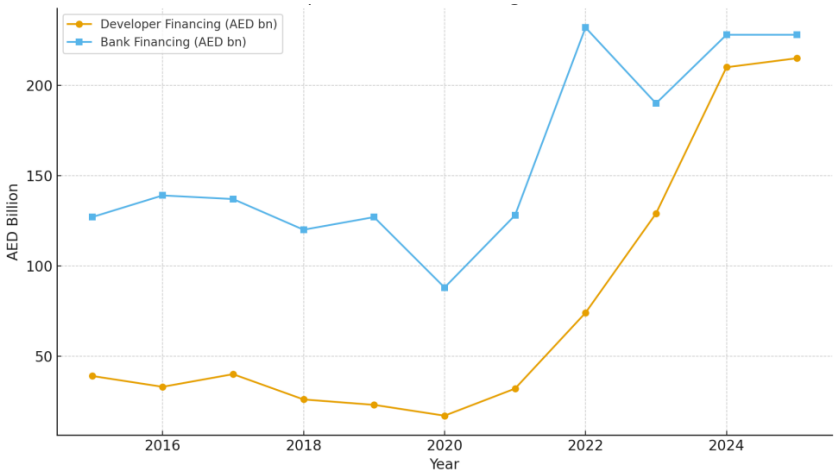

Fig. 7. Developer vs. Bank Financing in Dubai, 2015–2025. *Source*: own study.

In conclusion, the empirical findings robustly validate the primary hypothesis: developer financing undermines the effectiveness of conventional monetary policy within the UAE context. The size and direction of this effect are important both statistically and in real life. For instance, a one billion AED increase in DF is associated with a 0.13-point reduction in the monetary policy effectiveness index, assuming other variables are held constant. Also, external shock designs confirm that exogenous U.S. Fed shocks strongly affect BF but leave DF largely unchanged.

To safeguard macroeconomic stability, UAE policymakers must extend oversight to developer credit issuance via integrated fintech platforms linked with the Dubai Land Department. Only through coordinated, real-time data access can Central Bank policies reclaim their intended transmission strength.

5. Conclusion and Recommendations

This study examined the influence of developer-financed real estate transactions on the efficacy of monetary policy in the UAE, specifically concentrating on the Dubai property market from 2015 to 2025. The empirical analysis utilized a regression model to analyze essential macroeconomic variables, such as developer financing (DF), bank financing (BF), interest rates (IR), consumer price index (CPI), and money supply (MS), with monetary policy effectiveness (MPE) serving as the dependent variable.

The regression results consistently showed that developer financing has a statistically significant effect on monetary policy effectiveness. This aligns with the theoretical expectation that when credit creation moves outside the regulated banking system, traditional monetary tools such as interest rate changes become less influential in steering economic activity. Developer financing, particularly through post-handover plans and direct installment schemes, establishes alternative liquidity channels that are not directly regulated by the Central Bank. This makes it harder for the central authority to use normal tools to control inflation, change interest rates, and manage liquidity.

Bank financing, on the other hand, had a weaker but still statistically significant positive effect on MPE. This shows that the formal banking sector plays an important role in making sure that monetary policy is carried out effectively. Control variables like CPI and MS (M2) also showed expected relationships. For example, a rising money supply made policy less effective, and inflation showed a delayed response to changes in policy.

The model diagnostics-including the R^2 value, standard errors, and robustness checks-affirmed the strength and reliability of the findings. No serious multicollinearity or heteroscedasticity issues were detected.

5.1. Policy Recommendations

Based on the study's results, several suggestions should be made to help the Central Bank keep macroeconomic stability even as more non-bank financing options become available:

a) Establishing a Regulatory Framework for Developer

eISSN: 2300-5289

Financing.

The Central Bank, along with DLD and RERA, should formally include developer-led credit in the supervisory perimeter. This entails mandatory registration of post-handover/deferred plans, standardized disclosure of volumes and defaults, and proportionate reserve/capital buffers for developers acting as creditors. In parallel, non-bank credit must be reflected in monetary aggregates (e.g., augment M3) so liquidity assessment and inflation forecasting capture shadow-credit dynamics rather than understating systemic risk. Experiences in Malaysia and Singapore show that these kinds of systems can work, and they can be changed to fit the UAE's institutions.

b) Macroprudential safeguards and borrower discipline.

Extend macroprudential tools beyond banks to cover installment-based property sales. Set soft LTV/DTI guardrails, require basic affordability checks, and make sure that eligibility rules are like those used by banks when they lend money. Add these to targeted campaigns to teach people about money and simple "Key Facts" disclosures so that families know the real costs and risks of plans with no interest or low down payments. This will lower speculative demand.

c) Data integration and real-time surveillance.

Create a unified digital platform linking the Central Bank, DLD/RERA, and major developers via APIs to capture contract registrations, flows, roll rates, and cancellations at a quarterly (or higher) cadence. Add AI-based analytics and nowcasting to this data spine to find times when developer credit keeps the market going while interest-rate transmission slows down. This lets you make interventions earlier and in a more balanced way.

d) Global alignment and implementation pathway.

Work with international standard setters like the FSB and BIS to make sure that definitions, reporting templates, and macroprudential practices for non-bank real estate credit are all the same. Implement in stages: start with pilot reporting and dashboards; then add standards for disclosure and consumer protection; then add macroprudential tools; and finally, add DF to liquidity monitoring and policy communication. This step-by-step method keeps the market dynamic while making monetary policy more effective and trustworthy again.

5.2. Final Remarks

This study confirms that the rapid rise in developer financing has significantly altered the landscape of monetary policy transmission in the UAE. While this innovation has boosted housing accessibility and market dynamism, it has also weakened the grip of traditional monetary tools on the economy. Addressing this gap requires a multifaceted approach: updating regulatory frameworks, expanding data inclusion, and enhancing institutional cooperation. The UAE can keep both financial stability and economic growth in the years to come by taking the lead in managing the intersection of real estate innovation and macroeconomic governance.

References

Acharya, V. V., & Richardson, M. (2009). Restoring financial stability: How to repair a failed system. Wiley., https://doi.org/10.1002/9781118258163

Adrian, T., & Shin, H. S. (2010a). Liquidity and leverage. *Journal of Financial Intermediation, 19*(3), 418–437. https://doi.org/10.1016/j.jfi.2008.12.002

Adrian, T., & Shin, H. S. (2010b). The changing nature of financial intermediation and the financial crisis of 2007–2009. *Annual Review of Economics, 2*, 603–618. https://doi.org/10.1146/annurev.economics.102308.124420

Allen, F., & Carletti, E. (2014). The roles of banks in financial systems. In A. N. Berger, P. Molyneux, & J. O. S. Wilson (Eds.), *The Oxford handbook of banking (2nd ed.)*. Oxford University Press., https://doi.org/10.1093/oxfordhb/9780199640935.013.0017

Allen, F., & Gale, D. (2000). *Comparing financial systems*. MIT Press. https://mitpress.mit.edu/9780262011778/comparing-financial-systems/

Arner, D. W., Barberis, J. N., & Buckley, R. P. (2017). FinTech, RegTech and the reconceptualization of financial regulation. Northwestern *Journal of International Law & Business, Forthcoming, 2016*/035, Available at SSRN: https://ssrn.com/abstract=2847806

Ayyad, F., & El-Refaei, M. (2021). Real estate finance and monetary policy effectiveness in the Arab region. *Arab Economic Journal, 45*(2), 150–165.

Ayyad, M., & El-Refaei, M. (2021). Developer financing and monetary policy in emerging economies. *Journal of Real Estate Finance, 38*(2), 145–160.

Bank Negara Malaysia. (2019). *Financial stability and payment systems report 2019*. https://www.bnm.gov.my/documents/20124/6030760/fspsr2019_book.pdf

Bernanke, B. S., & Gertler, M. (1995). Inside the black box: The credit channel of monetary policy transmission. *The Journal of Economic Perspectives, 9*(4), 27–48. https://doi.org/10.1257/jep.9.4.27

Borio, C., & Drehmann, M. (2009). Assessing the risk of banking crises revisited. *BIS Quarterly Review (March)*, 29–46. https://www.bis.org/publ/qtrpdf/r_qt0903e.pdf

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press., https://global.oup.com/academic/product/social-research-methods-9780199689453

Central Bank of the UAE. (2022a). *Annual report 2022*. https://www.centralbank.ae/en/about-us/publications/annual-report

Central Bank of the UAE. (2022b). *Financial Stability Report 2022*. https://www.centralbank.ae/en/research-and-statistics/financial-stability-reports

Central Bank of the UAE. (2024). *Quarterly Economic Review*. https://www.centralbank.ae/en/research-and-statistics/quarterly-economic-reviews

Choi, S., Lee, J., & Koo, Y. (2021). Monitoring housing markets using text mining and machine learning: Evidence from Korea. *Asia-Pacific Journal of Financial Studies, 50*(1), 101–130.

Claessens, S., & Ratnovski, L. (2014). *What is shadow banking?* IMF Working Paper WP/14/25. https://www.imf.org/en/Publications/WP/Issues/2016/12/31/What-Is-Shadow-Banking-41357 https://doi.org/10.5089/9781475597349.001

Dubai Land Department & Property Finder. (2023, February). *Mo'asher: Dubai's official sales price index (monthly report)*. https://dubailand.gov.ae/media/lnfhqmxh/2023-feb-index-sales_final.pdf

Dubai Land Department. (2022). *Annual report 2022*. https://dubailand.gov.ae/en/about-dubai-land-department/annual-report-2022/

Dubai Land Department. (2023a). *Annual Real Estate Market Report*.

Dubai Land Department. (2023b). *Annual Real Estate Transactions Report*, p. 11.

Dubai Land Department. (2023c). *Real estate market trends report*.

Financial Stability Board. (2022). *Global monitoring report on non-bank financial intermediation 2022*. https://www.fsb.org/2023/01/global-monitoring-report-on-non-bank-financial-intermediation-2022/

Glaeser, E. L., Gyourko, J., & Saiz, A. (2008). Housing supply and housing bubbles. *Journal of Urban Economics, 64*(2), 198–217. https://doi.org/10.1016/j.jue.2008.07.007

Government, U. A. E. (2023). *'We the UAE 2031' vision*. https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/innovation-and-future-shaping/we-the-uae-2031-vision

Green, R. K., & Wachter, S. M. (2005). The American mortgage in historical and international context. *The Journal of Economic Perspectives, 19*(4), 93–114. https://doi.org/10.1257/089533005775196660

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill., https://www.mheducation.com/highered/product/basic-econometrics-gujarati-porter/M9780073375779.html

International Monetary Fund. (2023). *Global Financial Stability Report* (October 2023). https://www.imf.org/en/Publications/GFSR/Issues/2023/10/10/global-financial-stability-report-october-2023

International Monetary Fund. (2023). *United Arab Emirates: 2023 Article IV consultation-Press release; staff report; and statement*. https://www.imf.org/en/Publications/CR/Issues/2023/07/31/United-Arab-Emirates-2023-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-536530

International Monetary Fund. (2023). *United Arab Emirates: Financial System Stability Assessment*. IMF Country Report No. 23/117.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*(2), 263–291. https://doi.org/10.2307/1914185

Khan, S. (2020). Real estate credit cycles and non-bank financing: Evidence from Dubai. *Middle East Economics Journal, 12*(3), 210–225.

Lima, D., & Silva, R. (2017). Credit booms, housing bubbles and the Brazilian experience. *Latin American Economic Review, 26*(1), 1–20. https://doi.org/10.1007/s40503-017-0048-4

Mishkin, F. S. (2016). *The economics of money, banking, and financial markets (11th ed.)*. Pearson. https://www.pearson.com/store/p/economics-of-money-banking-and-financial-markets-the/P100000621861/9780133836790

Reinhart, C. M., & Rogoff, K. S. (2009). *This time is different: Eight centuries of financial folly*. Princeton University Press., https://doi.org/10.1515/9781400831722

Stock, J. H., & Watson, M. W. (2015). *Introduction to econometrics* (3rd ed.). https://www.pearson.com/en-us/subject-catalog/p/introduction-to-econometrics/P200000007729/9780133487688

Xu, C., & Zhang, Q. (2020). Shadow finance and macroeconomic stability in emerging markets. *Journal of Financial Policy, 12*(3), 39–43.

Xu, C., & Zhang, Y. (2020). Shadow banking in China and its impact on monetary policy. *China Economic Review, 62*, 101439.

Xu, L., & Zhang, T. (2020). Shadow banking and property financing in China: Implications for monetary policy. *The Asian Economic Review, 45*(1), 33–49.

Zetzsche, D. A., Buckley, R. P., Arner, D. W., & Barberis, J. N. (2018). *From FinTech to TechFin: The regulatory challenges of data-driven finance.* New York University Journal of Law & Business, 14(2), 393–446. https://ssrn.com/abstract=2959925

Appendix 1

Table 1A

Unit-root tests (ADF) for levels and first differences

Variable	ADF stat (level)	p-value (level)	lags (level)	ADF stat (Δ)	p-value (Δ)	lags (Δ)	Conclusion
DF	-3.319	0.0141	10	-1.679	0.4419	3	Stationary
BF	-1.081	0.7227	0	-6.213	0.0	0	I(1) likely
MS	2.152	0.9988	7	-1.053	0.7335	7	Indeterminate
CPI	-2.182	0.213	0	-6.204	0.0	0	I(1) likely
IR	-0.888	0.7918	0	-5.819	0.0	0	I(1) likely
MPE	-0.222	0.9358	7	-3.818	0.0027	10	I(1) likely

For MS, we adopt log-difference in estimation.

Source: own study.

Table 1B

Collinearity and pared-down checks

- Variance-Inflation Factors (baseline differenced specification)

Variable	VIF
dlog_DF	3.18
dlog_BF	2.51

dIR	1.47
dlog_MS	1.81
dCPI	1.67

- Pared-down specification with Δlog(MS) only (plus Δlog(DF), Δlog(BF), ΔIR)

R2	Adj_R2	dlog_DF	dlog_BF	dIR	dlog_MS
0.3845	0.3142	0.499 (p=0.522)	-1.458 (p=0.178)	-0.929 (p=0.340)	-9.694 (p=0.001)

- Panel C. Pared-down specification with ΔCPI only (plus Δlog(DF), Δlog(BF), ΔIR)

R2	Adj_R2	dlog_DF	dlog_BF	dIR	dCPI
0.1659	0.0706	-1.091 (p=0.152)	0.074 (p=0.952)	-1.074 (p=0.351)	0.146 (p=0.721)

Source: own study.

Table 1C

Residual diagnostics and temporal precedence

- Breusch–Pagan test (baseline OLS in differences): LM=2.096, p=0.8357; F=0.376, p=0.8616.
- Durbin–Watson (baseline residuals): 1.599
- Granger precedence tests (best lag by minimum p up to 4)

Pair	Best lag	F-stat	p-value	Decision (5%)
dIR → dlog_BF	4	1.612	0.2	Do not reject
dIR → dMPE	1	2.1	0.156	Do not reject
dlog_MS → dlog_BF	1	0.203	0.6548	Do not reject
dlog_MS → dMPE	2	0.968	0.3904	Do not reject
dlog_DF → dIR	4	0.722	0.5843	Do not reject

Source: own study.

Appendix 2

This appendix reports residual normality diagnostics, structural-break tests, COVID-era stability checks, and sensitivity to COVID indicators. Wild-bootstrap p-values are provided to address small-sample non-normality.

Table A

Norm. Residual Normality Diagnostics (Baseline OLS)

Model	JB stat	JB p	JB p (wild)	SW stat	SW p	SW p (wild)	Skew	Kurtosis	N
OLS (baseline)	1.246	0.536	[0.239]	0.979	0.646	[0.479]	-0.430	-0.118	40

Notes: JB = Jarque–Bera; SW = Shapiro–Wilk. Square-bracketed values are wild-bootstrap p-values (1,000 replications). Kurtosis reported as excess kurtosis. N = number of observations in the estimation sample.

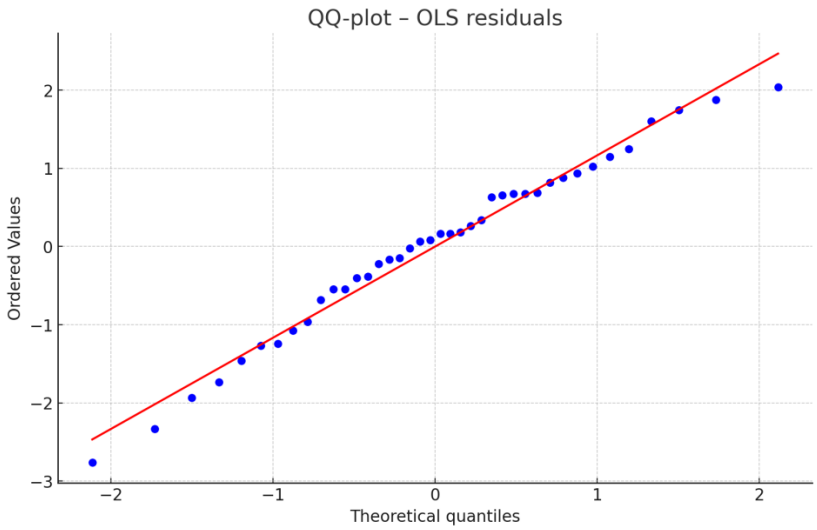

Fig. A. QQ-plot – OLS residuals. *Source*: own study.

Table B

Breaks. Structural-Break and Stability Diagnostics

Test	Statistic	5% critical	Selected break(s) / window(s)	Decision (5%)	Notes
Quandt–Andrews sup-F	15.974	-	Candidate: 2020Q1	-	Unknown break; heteroskedasticity-robust
Chow (2020Q1)	12.754	-	2020Q1	-	
Chow (2020Q2)	11.715	-	2020Q2	-	
Chow (2020Q3)	11.796	-	2020Q3	-	
CUSUM	-	-	-	Stable (visual)	Within 95% bounds
CUSUMSQ	-	-	-	Stable (visual)	Within 95% bounds

Notes: Sup-F maximum at 2020Q1. Formal Bai–Perron multi-break selection is approximated by the sup-F scan and Chow tests. CUSUM/CUSUMSQ assessed visually against reference bounds.

Source: own study.

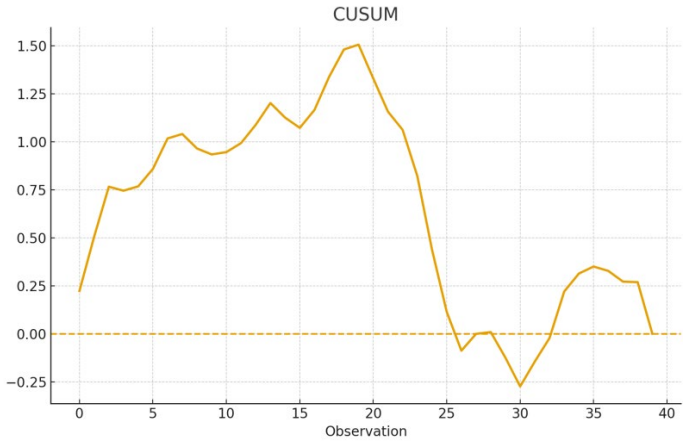

Fig. B. CUSUM. *Source*: own study.

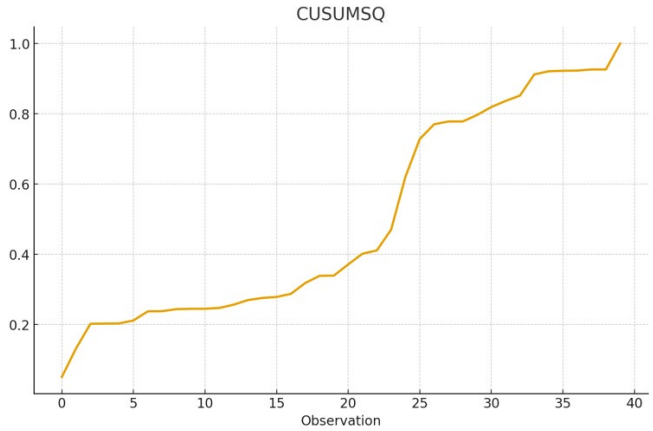

Fig. C. CUSUMSQ. *Source*: own study.

Table C

COVID. Sensitivity with COVID Dummy and Interactions (OLS)

Variable	OLS coef	SE	p-value
DF (developer finance proxy)	-0.021	0.016	(0.201)
BF (bank credit)	0.011	0.026	(0.673)
COVID (2020Q2–2021Q2)	2.207	2.506	(0.378)
DF × COVID	0.745	0.684	(0.276)
BF × COVID	-0.340	0.237	(0.151)
Controls (Δlog M2, ΔCPI)	Yes	-	-
N	40	-	-
R^2 / adj. R^2	0.844 / 0.821	-	-

Notes: COVID equals 1 for 2020Q2–2021Q2. HC1 standard errors reported. IV results can be added upon provision of instruments.

Source: own study.

Appendix 3

This appendix reports residual normality diagnostics, structural-break tests, COVID-era stability checks, and sensitivity to COVID indicators. Wild-bootstrap p-values are provided to address small-sample non-normality.

Table A

Diag. Endogeneity and IV diagnostics (baseline specification)

Test / Statistic	DF regressor	BF regressor	Notes
Durbin–Wu–Hausman (augmented) p-value	[ ]	[ ]	Rejects exogeneity if p<0.05
Control-function residual p-value	[ ]	[ ]	Residual significance ⇒ endogeneity
Kleibergen–Paap rk Wald F	[ ]	-	Compare to Stock–Yogo critical values
Stock–Yogo 10% max IV bias critical	[ ]	-	Reference threshold
Hansen J (p-value)	[ ]	-	Over-ID test (if $L > K$)
First-stage partial R^2	[ ]	-	Instrument relevance
Instruments listed	[name(s)]	-	As specified in Methodology

Source: own study.

eISSN: 2300-5289