THE IMPACT OF MONETARY POLICY AND ECONOMIC STABILITY ON THE RESIDENTIAL PROPERTY PRICE INDEX IN INDONESIA

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ABSTRACT

Society has primary needs that must be met to survive. Primary conditions involve several essential aspects that ensure the survival and well-being of living things. The growth of the property market can be seen from the consistent increase in residential property prices. In this study, the variables used are the Residential Property Price Index, Wholesale Price Index (IHPB Construction), Gross Domestic Product (GDP), Demand for Mortgage Consumption Credit, Central Bank Interest Rates (SBBI), and Exchange Rates in Indonesia for the 1st quarter of 2009, until the 4th quarter of 2022. The method used is Vector Auto Regression (VAR). The VAR model is a system of equations that shows each variable as a linear function of the constants, the lag values (past) of the variables themselves, and the lag values of other variables in the system of equations. The advantage of the VAR model is to develop the model simultaneously in a complex (multivariate) system. Judging from the AR polynomial table, by looking at the value of all the roots, the modulus value is less than one, all are located in the unit circle, and the maximum lag value is 7. This explains that the response time required by the IHPR variable to changes/shocks is the determinant variable. Took place in 7 study periods (seven quarters) after the change. For the causality test, what happens is that the IHPR affects SBBI, and the IHPB affects mortgages, and the exchange rate affects GDP and mortgages.

Keywords: Price; Property; Monetary Policy; Economic Stability.

1. Introduction

Society has primary needs to survive and carry out its biological functions. Primary conditions involve many essential aspects that ensure the survival and well-being of living things. Other supporting factors, besides the basic needs for clothing and food, require protection outside the body from cold, heat, and other things. Immediate needs related to property refer to basic human needs to have a decent, safe, and comfortable living place. An increase in demand for property needs occurs in a country that influential by an increasing population; this shows how the property market affects individual welfare and economic performance (Latif, 2015)

Indonesia has one of the largest population sizes in the world, with significant population growth every year. Based on data from the Central Statistics Agency (BPS), the estimated population of Indonesia in 2022 will be 275.77 million people, 1.13% higher compared to last year's 272.68 million people. An increase in population equals an increase in the number of consumers, which means there will be more demand for goods and services. Furthermore, limited

supply can result in price increases; if there is an expansion in supply, it cannot keep up with population growth. Lack of infrastructure, low productivity, and challenges in creating adequate production sectors can all affect how much supply can keep pace with growing demand.

The industrial sector that continues to grow every year is the real estate sector. Property is considered a safe investment compared to other sectors, such as stock financial instruments as measured by the Jakarta Composite Index (IHSG) and the precious metal gold (Magdalena, 2015). People with middle to upper-income levels assume that houses or property as an additional source of income, namely as an alternative source of assets chosen to invest in making a profit.

The most significant investment in a family is a house, and when compared to other financial assets, the return on a home investment has a more significant impact on wealth. In addition, given that changes in house prices significantly impact the economy and consumer spending, homes are the most significant assets in everyone's portfolio (Anundsen, 2016). People's interest in the real estate market will increase yearly. The cost of housing will rise along with the level of demand. This requirement allows real estate developers to have a target market throughout Indonesia, not only in certain areas (urban/rural).

The wholesale construction price index is an essential indicator in assessing the stability of a property. This index measures changes in the price of building materials and construction services used in the property industry. If this index shows a steady or gradual upward trend, it will create stability in the property sector. Supported by research (Rahmawati & Sasongko, 2015) that high production costs can be affected by rising prices for building materials, which can increase real estate prices.

This research refers to research conducted before (Anastasia & Hidayat, 2019) and combines research (Rahmawati & Sasongko, 2015), where there are several differences in variables, research methods, and years of research. The previous research used as a reference analyzed the relationship between the residential property price index, GDP, mortgage interest rates, and banking credit from Q1 2002 to Q1 2016 and combined with research using the topic Analysis of the determinants of residential property prices in Indonesia in QII 2005 to TW III 2014. The method applied in this previous research uses the method*Auto Regressive Distribution Lag* (ARDL) and using a regression model *vector autoregression* (WAS)/*vector correction model* (VECM); the method is different from this research in that the method used in this study vector *autoregression* (WAS).

Therefore, the research before is then developed by adding several variables. This research refers to Indonesia's residential property price index in the development of the monetary policy to help the economy remain stable. It can be to make policy decisions and find the right solutions for issues developing in the Indonesian economy, especially in the property sector.

2. Literature Review

2.1 Residential Property Price Index

The Residential Property Price Index (IHPR) is an economic indicator that explains the development of real estate or residential property in the current and upcoming quarters (Bank Indonesia, 2022). IHPR is a reference to represent the high and low value of residential property. Residential property prices rise when IHPR increases, while residential property prices fall when IHPR decreases (Bintang & Agustina, 2021). The Residential Property Price Index (IHPR) from the Primary Market Residential Property Price Survey (SHPR) is a quarterly survey that collects data on residential property prices and trends for both the current quarter and the projection quarter afterward also explains that the grouping of IHPR types into three according to the building area, namely:

a. Small type house or IHPR, with building area ≤ 36m2.
b. Medium type house or IHPR, with building area 36 - 70m2.
c. Large type house or IHPR, with building area > 70m2.

2.2 Construction Wholesale Price Index

The Construction Wholesale Price Index reflects changes in building material prices and construction costs. If the Construction IHPB rises, then construction costs may also increase; when the cost of building materials occurs, it can reduce the incentive for developers to start new construction projects. IHPB indicates construction inflation in the property market and increasing property development costs.

The Property, Real Estate, and Building Construction sector is one of the investment alternatives investors are interested in, where investment in this sector is a long-term investment. However, the Property, Real Estate, and Building Construction sector is the most vulnerable sector in the macro industry to fluctuations in interest rates, inflation, and exchange rates, ultimately affecting people's purchasing power (Nirmalasari, 2018). According to (Rahmawati & Sasongko, 2015), in the long run, the BI rate, inflation, GDP, construction IHPB, and labor wages directly affect the movement of housing prices in Indonesia. In contrast to the theory (Chen & Patel, 1998), the influence of the demand side affect construction costs, which are the initial component in calculating the cost of housing development.

2.3 Gross Domestic Product

According to (Boediono, 2008), who explains the macroeconomic theory, an increase in output can raise prices in all sectors of the economy. GDP growth shows that consumer and producer spending grew during the period. Moreover, similarly to the financial industry, when people's income (GDP) increases, the aggregate demand curve shifts, and the price level rises. The same situation occurs in the Indonesian real estate market, in Keynes' macroeconomic theory, which states that excess demand leads to GDP growth and the ability to raise prices when there is a supply shortage (Rahmawati & Sasongko, 2015).

High national income tends to increase people's purchasing power, especially since housing is a basic need for all people, and when people have more money to spend, the demand for property also increases. High demand tends to push up property prices. According to (Fanama & Pratikto, 2019), Gross Domestic Product has the most significant influence on the Residential Property Price Index because it is considered an indicator of people's income, so the more people's income increases, the higher the demand for housing. However, (Arrondel et al., 2010) found that people allocate income to buy houses as consumption goods (shelter) and investment assets.

2.4 Home Ownership Loan

Demand for mortgage consumption loans (KPR) refers to people's demand for credit to finance the purchase of a house or residential property. This demand includes individuals or families who want financing to buy a house used as their residence and supported by the theory of (Rahmawati & Sasongko, 2015). The characteristics of the community in buying residential property in Indonesia, the majority of consumers prefer to use residential property financing facilities from banks, or mortgages, encouraging the creation of demand-dictated pricing.

Housing demand from two perspectives: total demand or the number of housing units clearly needed in the market. The other on the composition of the housing stock (unit size, age, location,

condition, and the purpose for which the units, whether for rent or sale to consumers) (McKenzie et al., 2010). Rising house prices can lead to higher house price volatility, a significant determinant of default and early repayment of housing loans (Balqis & Purwono, 2021). (Bailey et al., 2019) argue that the selection of mortgages will be affected by people's consideration of home purchases because of the hope that, in the future, there can be an expansion in value.

2.5 Central Bank Interest Rates

The central bank interest rate is the interest rate set by the central bank, namely Bank Indonesia (BI), in a country to control inflation or regulate money circulating in society through interest rates and also as a reference for interest rates in the country's financial system and policies that reflect the stance of the monetary policy announced to the public.

Low-interest rates make home financing more affordable for buyers. Boosts demand for residential property, as buyers can borrow at a lower cost. High demand can lead to an increase in property prices. When mortgage interest rates are low, many consumers will try to buy a house because borrowing money from the bank is not a problem (Ong, 2013). According to (Magdalena, 2015), Interest rates for housing loans are the highest variable in explaining variations in property prices and inflation. Inflation also influences IHPR because the higher the inflation, the higher the property prices, and the cost of building materials, construction workers' wages, and other operational costs also tend to increase.

2.6 Exchange Rate

The exchange rate is the ratio between the value of a foreign currency and the rupiah, which is part of the foreign exchange process. The price of one unit of foreign currency in local currency is the exchange rate or the cost of the local currency against foreign money (Simorangkir & Suseno, 2004). Law No. 24/1999 on Foreign Exchange Traffic and Exchange Rate System governs the control of foreign exchange traffic and the exchange rate system in Indonesia to supervise and regulate all activities related to the entry and exit of foreign exchange in Indonesia, including international trade transactions, foreign investment, and other financial activities. Bank Indonesia is authorized to set the exchange rate policy of the rupiah against foreign currencies to maintain the exchange rate's stability and protect the national economy's interests.

Changes in currency exchange rates can significantly impact residential property prices. When the rupiah weakens against foreign currencies, the residential property becomes more affordable for foreign buyers, which can drive demand and increase property prices, and vice versa. According to (Magdalena, The Effect of Interest Rates and Exchange Rates on the Residential Property Price Index (IHPR) in Indonesia 2002-2013, 2015), the weakening of the rupiah exchange rate in the previous period caused an increase in residential property prices or IHPR; this is also what drives the level of supply and demand in the property market. Research (Standish, 2005) shows a negative relationship between exchange rates and residential property prices; this is because any decrease in the local currency against foreign currencies or dollars will increase residential property prices.

2.6 Previous Research

Research (Njo & Hidayat, 2017) discusses the optimistic economic outlook for the future due to the increased ability of households to take out loans with increased collateral. The availability of new bank loans will allow people to buy new properties, thus increasing property prices. Thus, the study explained that there is a long-term relationship between IHPR interest rates,

GDP, mortgages, and bank loans. Suggests that the higher the interest rate and the more bank loans available, the higher the property prices. In addition, an increase in property prices also positively impacts real economic growth per capita.

Many researchers believe that significant house price growth can create a bubble. The bursting of a house price bubble can jeopardize the stability of the country's real economy. Supported theory (Chen & Cohen, 2013) examined the property bubble phenomenon in Beijing, which showed that the house price index was significantly more significant than the equilibrium value based on relative economic fundamental variables (income, inflation, interest rates, and construction costs). Significant house price growth in Beijing may lead to a house price bubble, thus jeopardizing the stability of Beijing's housing market and the Chinese economy. In addition to property bubbles, macroeconomic factors also affect property market conditions in Indonesia. Analysis (Fanama & Pratikto, 2019) shows a significant influence between macroeconomic factors such as GDP, inflation, and LTV policy on Indonesia's Residential Property Price Index (IHPR).

3. Research Methodology

Quantitative methods can develop and prove used to understand, anticipate problems, and solve problems. This research uses a quantitative descriptive approach, which analyses data by explaining a phenomenon or situation that aims to collect data systematically, analyze the data objectively, and describe the characteristics or variables studied numerically (Sugiyono, 2014). In this study, researchers collected data historically. They observed the factors related to the problems studied so that data to help prepare the research. Another supporting factor in using a quantitative approach is that the data used is numerical information published on official government websites such as Bank Indonesia, the Central Bureau of Statistics, and the Ministry of Trade of the Republic of Indonesia, which will then be processed using the Eviews-10 analytical tool for data testing and getting answers to the hypotheses proposed.

3.1 Research Variable

Dependent variables or dependent variables are output variables that by independent variables (X) or that are the result of the existence of independent variables (Sugiyono, 2014). In this research, the dependent variable is the Residential Property Price Index. IHPR, with a percent, is an essential component in the property sector and is used to see the development of the residential property sector; and is obtained from the Primary Market Residential Property Price Survey (SHPR) conducted quarterly by Bank Indonesia with index units.

Independent variables affect or cause changes or the formation of dependent variables. This study has five independent variables: the Construction Price Index of Wholesale Trade (IHPB), Gross Domestic Product, Demand for Mortgage Consumption Loans, Central Bank Interest Rates, and Exchange Rates.

Variable X1 is the Construction Wholesale Price Index (IHPB) with units of percent; IHPB Construction is a tool to monitor inflation in the construction sector, identify price trends, and as a reference for comparing prices between different periods with index units. Variable X2 is Gross Domestic Product; GDP is the market value of all goods and services produced by the country in a certain period which results in the calculation of productivity or income of land in units of Billion Rupiah. The GDP used is based on constant prices with a base year 2010.

Variable X3 is Demand for Mortgage Consumption Loans (KPR), referring to the demand from individuals or households who wish to obtain loans from banks or other financial institutions to finance the purchase of a house or residential property in units of percent. Data processing uses

the Net Balance Difference method, where respondents answer the Banking Funding Supply and Demand survey with their credit weight (100%). Then, the difference between the percentage of respondents who give answers up and down becomes the data of mortgage demand.

Variable X4 is the Central Bank Interest Rate, the interest rate set by the central bank, namely Bank Indonesia (BI), in a country to control inflation or regulate money circulating in society through interest rates with units of percent. Variable X5 is the Exchange Rate, which is the ratio of the comparison between the value of the US Dollar currency and the rupiah currency, which is part of the foreign exchange process with units of Rupiah.

3.2 Analysis Tool

The Vector Autoregressive (VAR) model by Christopher A Sims in 1980; in theory (Gujarati, 2007), VAR is simultaneous equation modeling by considering several endogenous variables simultaneously, and each endogenous variable by the lag value or past value and the lag value of all other endogenous variables in the model. The Vector Autoregressive model is a non-structural or atheoretical model that aims to explain economic phenomena with consideration of minimizing the theoretical approach, and the VAR dynamic simultaneous equation model is as follows:

$$yt = b10 - b12zt + \gamma 11yt\text{-}1 + \gamma 12zt\text{-}1 + \varepsilon 1t \quad (1)$$

$$Zt = b20 - b12zt + \gamma 21yt\text{-}1 + \gamma 22zt\text{-}1 + \varepsilon 2t \quad (2)$$

The two variables (Y and Z) directly affect each other and are indirectly affected by the lag value of each variable in the system.

Vector Autoregressive is one of the models for time series data that can analyze the interdependence of time series variables. Research using VAR on the conceptual framework shows a direct and indirect relationship and a dynamic relationship between variables and their past. The research must develop a flow chart model construction to explain the relationship between each variable (Ekananda, 2019).

4. Results

4.1 Stationarity Test

Table 1
Stationarity Test Results

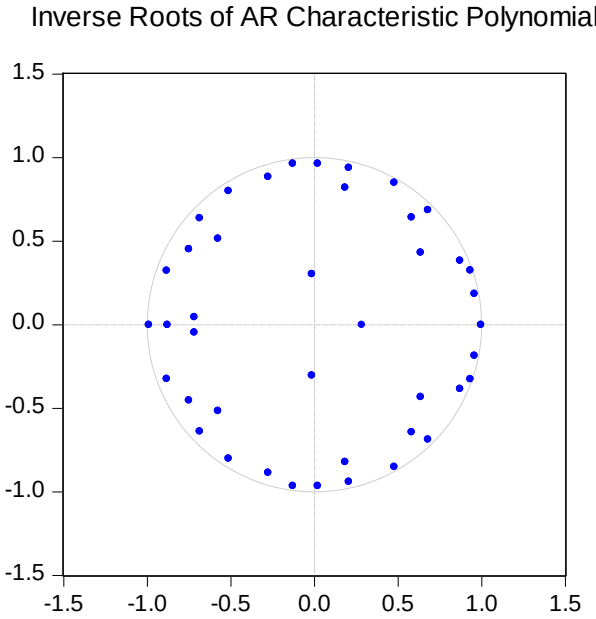
Variable	ADF-Test	Level	Critical Value (5%)	Description
IHPR	-1.279005	Level	-2.915522	Not Stationary
	-7.207880	1st Difference	-2.916566	Stationary
IHPB	-1.501368	Level	-2.915522	Not Stationary
	-7.789781	1st Difference	-2.916566	Stationary
GDP	-0.913633	Level	-2.919952	Not Stationary
	-5.444206	1st Difference	-2.917650	Stationary
Demand for KPR	-5.590849	Level	-2.915522	Stationary
	-13.92434	1st Difference	-2.916566	Stationary
Central Bank Interest Rates	-2.089354	Level	-2.916566	Not Stationary
	-4.202028	1st Difference	-2.916566	Stationary
Exchange Rate	-0.357280	Level	-2.916566	Not Stationary
	-9.761562	1st Difference	-2.916566	Stationary

Source: data processed, 2023.

The unit root test results above show that the variables IHPR, construction IHPB, GDP, mortgage consumption loan demand, Central Bank Interest Rate, and exchange rate are stationary at the first difference level with a confidence degree of 5%. Is evidenced by the unit root test results above that ADF-test > Critical value.

4.2 Maximum Lag.

VAR stability can refer to the roots of the inverse characteristic of the AR polynomial, which is inside the circle, which means the VAR system is stable. Furthermore, based on the VAR stability test, it can be concluded that the VAR estimation that can show for impulse response function (IRF) and forecast error variance decomposition (FEVD) analysis is stable, and the optimal lag is stable.



Source: data processed, 2023.

Figure 1

4.2 Lag Length Test

Based on the table above, the optimal lag length in this study is lag 7. The lag Length test explains that the response period required by the IHPR variable to changes/shocks in its determinant variables takes place in 7 research periods (seven quarters) after the change.

Table 2

Lag Length Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1828.983	NA	1.36e+25	74.89728	75.12893	74.98517
1	-1624.044	351.3239	1.39e+22	68.00181	69.62337	68.61703
2	-1587.284	54.01585	1.44e+22	67.97076	70.98223	69.11331
3	-1532.215	67.43136	7.91e+21	67.19243	71.59381	68.86231
4	-1489.861	41.48904	8.89e+21	66.93311	72.72440	69.13032
5	-1419.577	51.63716*	4.53e+21	65.53377	72.71496	68.25830
6	-1320.943	48.31057	1.42e+21	62.97728	71.54838	66.22914
7	-1134.753	45.59754	6.82e+19*	56.84707*	66.80809*	60.62627*

Source: data processed, 2023.

4.3 Granger Causality Test

Table 3
Granger Causality Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
IHPB does not Granger Cause IHPR	49	0.20765	0.9814
IHPR does not Granger Cause IHPB		0.07473	0.9992
GDP does not Granger Cause IHPR	49	0.76678	0.6188
IHPR does not Granger Cause GDP		0.43797	0.8713
KPR does not Granger Cause IHPR	49	0.75953	0.6245
IHPR does not Granger Cause KPR		0.53148	0.8045
SBBI does not Granger Cause IHPR	49	1.70871	0.1400
IHPR does not Granger Cause SBBI		**2.36143**	**0.0444**
ER does not Granger Cause IHPR	49	0.32795	0.9358
IHPR does not Granger Cause ER		0.34113	0.9291
GDP does not Granger Cause IHPB	49	0.99553	0.4512
IHPB does not Granger Cause GDP		0.98508	0.4582
KPR does not Granger Cause IHPB	49	0.55426	0.7871
IHPB does not Granger Cause KPR		**2.41425**	**0.0404**
SBBI does not Granger Cause IHPB	49	0.93207	0.4948
IHPB does not Granger Cause SBBI		0.55846	0.7839
ER does not Granger Cause IHPB	49	2.12604	0.0673
IHPB does not Granger Cause ER		0.09247	0.9984
KPR does not Granger Cause GDP	49	1.27304	0.2927
GDP does not Granger Cause KPR		1.17974	0.3401
SBBI does not Granger Cause GDP	49	0.77268	0.6141
GDP does not Granger Cause SBBI		1.27541	0.2916
ER does not Granger Cause GDP	**49**	**2.46129**	**0.0372**
GDP does not Granger Cause ER		0.70281	0.6695
SBBI does not Granger Cause KPR	49	1.38724	0.2425
KPR does not Granger Cause SBBI		1.60844	0.1666
ER does not Granger Cause KPR	**49**	**2.47337**	**0.0364**
KPR does not Granger Cause ER		0.89136	0.5240
ER does not Granger Cause SBBI	49	1.54596	0.1854
SBBI does not Granger Cause ER		1.72415	0.1363

Source: data processed, 2023.

From the data processing results above, it can summarise that if the causality relationship has a probability value smaller than alpha 0.05, Ho will reject it, which means the variable affects other variables, and vice versa. The Granger test above can show as follows. SBBI (Central Bank Interest Rate) variable statistically insignificantly affects IHPR (Residential et al.) (0.14), so we accept the null hypothesis. In contrast, IHPR (Residential et al.) statistically significantly affects SBBI (Central Bank Interest Rate) (0.04), so we reject the null hypothesis. Thus, it shows unidirectional causality between the SBBI (Central Bank Interest Rate) and IHPR (Residential et al.) variables.

The variable Mortgage Demand (Demand for KPR) statistically insignificantly affects IHPB (Construction et al.) (0.79), so we accept the null hypothesis. In contrast, IHPB (Construction et al.) statistically significantly affects Mortgage Demand (Demand for KPR) (0.04), so we reject the null hypothesis. Thus, it found unidirectional causality between Mortgage Demand (Demand for KPR) variables and IHPR (Residential et al.).

The variable ER (Exchange Rate) does not statistically significantly affect GDP (0.04), so we accept the null hypothesis. In contrast, GDP statistically significantly affects ER (Exchange Rate) (0.67), so we reject the null hypothesis. Thus, it shows unidirectional causality between the ER (Exchange Rate) and GDP variables, only GDP statistically significantly affects ER (Exchange Rate) and not vice versa. The variable ER (Exchange Rate) does not statistically significantly affect Mortgage Demand (Demand for KPR) (0.04), so we accept the null hypothesis. In contrast, Mortgage Demand (Demand for KPR) statistically significantly affects ER (Exchange Rate) (0.52), so we reject the null hypothesis. Thus, it shows that there is unidirectional causality between the variables ER (Exchange Rate) and Mortgage Demand (Demand for KPR), only Mortgage Demand (Demand for KPR) statistically significantly affects ER (Exchange Rate) and not vice versa.

4.4 Variance Decomposition Test

Table 4
Variance Decomposition Test Results

Period	S.E.	IHPR	IHPB	GDP	KPR	SBBI	ER
Variance Decomposition of IHPR:							
10	67.26067	48.70867	2.988219	**38.07635**	6.230569	2.228506	1.767690
Variance Decomposition of IHPB:							
10	40.09773	19.69192	20.22248	**44.80350**	9.983568	3.634796	1.663736
Variance Decomposition of GDP:							
10	149870.6	41.67530	7.343661	**42.58366**	5.268302	2.056610	1.072475
Variance Decomposition of KPR:							
10	38.50608	**32.69709**	14.10212	18.52932	29.48302	4.026316	1.162135
Variance Decomposition of SBBI:							
10	1.612526	**46.73312**	2.692987	38.85336	8.209800	1.646745	1.863988
Variance Decomposition of ER:							
10	2303.930	**41.78598**	4.519160	40.64840	6.343927	5.049376	1.653164

Source: data processed, 2023.

Gross Domestic Product (GDP) has the most significant contribution to the determinant of the IHPR (Residential et al.), which is 38.07% up to a 10-quarter forecasting period. GDP contributes most to the determinants of the Construction Wholesale Price Index (IHPB), which is 44.80% up to the 10-quarter forecasting period. At the same time, IHPR (Residential et al.) enormously contributes to the determinants of GDP, which is 41.68% up to the 10-quarter forecasting period. IHPR (Residential et al.) contributes immensely to the determinant of Mortgage Consumption Loan Demand (Mortgage Demand KPR), which is 32.70% up to the 10-quarter forecasting period. IHPR (Residual et al.) contributes most significantly to the determinant of the Central Bank Interest Rate (SBBI), which is 46.73% up to the 10-quarter forecasting period. Then IHPR (Residential al.) has the most significant contribution to the determinant of Exchange Rate (ER), which is 41.79% up to the 10-quarter forecasting period.

5. Discussion

SBBI variable does not affect IHPR, but IHPR affects SBBI. In line with research conducted by (Suprijati et al., 2023) and (Rohmawanto & Susamto, 2018), the correlation between interest rates and the property index is insignificant. The increase in interest rates imposed by Bank Indonesia has an insignificant impact on investors in the property group. Increased interest rates have little effect on investors' high and low interest to invest or carry out investment activities in the property sector. Furthermore, increased SBBI will decrease property prices with IHPR as a proxy. Shows that because the opportunity cost of buying property is high, people tend to choose to save and reduce the demand for property assets, reducing the demand for property.

The one-way relationship between KPR and IHPR shows that KPR does not affect IHPR. According to (O'Brien et al., 2022), easy access to mortgages obtained by the community will increase home ownership and reduce the backlog of home ownership. However, this increase will erode people's purchasing power for other needs because the increase in property prices differs from the increase in income. However, some people no longer buy houses to fulfill their housing needs but as investments. (Mahalik & Mallick, 2011) They mentioned that in the long run, mortgages negatively influence IHPR, which is stronger on the credit impetus for the supply side than the demand side. An increase in the availability of bank credit facilities (supply side) by an increase in new housing construction (increased housing supply) has an impact on slowing down the price of housing, by the characteristics of the Indonesian residential property market, which is currently more supply driven.

In causality, there is a one-way relationship between the exchange rate (ER) and GDP, which shows that ER is not significant to GDP but has a significant effect on ER. (Lubis et al., 2017) States that the exchange rate is not significant to GDP in the short or long term. Mundell-Fleming theory (Mankiw, 2006) states that there is a negative influence between exchange rates and economic growth, where the higher the exchange rate, the lower the net exports (the difference between exports and imports); this decrease will have an impact on the amount of output that is decreasing and will cause GDP (Economic growth) to decline. The monetary approach to exchange rates predicts that the exchange rate will depreciate by the excess of money growth in a country against other countries. This approach also states that faster GDP growth will lead to appreciation, and higher expected interest rates will lead to depreciation.

There is a one-way relationship between exchange rates and mortgages, where ER is not significant to mortgages, but mortgages significantly affect ER. (Rohman & Zulaikha, 2019) Moreover, it states that the exchange rate has no significant direct effect on mortgages. Then, it is that mortgages affect ER, where the higher depreciation of the domestic exchange rate will reduce a bank's credit. (Boamah, 2011) stated that the exchange rate is the main factor affecting the ability and willingness to apply for a mortgage. His research (Boamah, 2011) mentioned that income earned in foreign currency provides domestic mortgage loans. So the risk exposure of mortgage borrowers is higher related to the exchange rate than the domestic inflation rate and volatility due to the nature and source of income of mortgage borrowers.

6. Conclusion

The home is the largest investment in a family, and compared to other financial assets, the return on home investment has a greater impact on wealth. IHPR is an economic indicator that explains the development of real estate or residential property, which refers to the high and low value of residential property. Based on the results of the causality test, there is a unidirectional relationship

between the interrelated IHPR, SBBI, ER, GDP, and mortgage variables. The largest contribution to the determinants of IHPR is GDP by 38.07 percent over ten quarters. Then, GDP is also the largest contributor to IHPB by 44.80 percent, with the same length of the forecasting period. Furthermore, the contribution of IHPR to the GDP variable is 41.68 percent, to KPR is 32.70 percent, to SSBI is 46.73 percent, and to ER is 41.79 percent.

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