THE EFFECTS OF COVID-19 ON RESIDENTIAL PROPERTY PRICES IN MALAYSIA

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Abstract

The physical distancing, lockdown, and other measures due to the COVID-19 pandemic have caused massive job loss and economic hardship, which would result in people not being able to pay their mortgages or rent.   Thus, the main objective of this study is to examine the effects of the Gross Domestic Product (GDP), inflation, investment, and interest rate on residential property prices in Malaysia before and during COVID-19. This research utilises the annual time series data from 1990 to 2020, and the empirical analysis is conducted using the multiple linear regression analysis modelling approach. The finding shows that GDP and interest rates are positive and statistically significant with residential property prices. Practitioners can use these findings to understand the pandemic's effect on house prices. This will provide some guidelines for a policy formulation to moderate the increase in residential property prices to maintain the country's economic stability and indirectly help the government realise its vision of becoming a high-income country between 2024 and 2028. This is the first study that examines the pricing behaviour of Malaysian house prices concerning the COVID-19 shocks. In addition, the study contributes to regional housing price studies by bridging the real estate literature gap.

Keywords: COVID-19, GDP, inflation, interest rate, residential

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INTRODUCTION

The world was already witnessing the trend of accelerating housing prices rising faster than salary and wages increases in many urban areas around the world (Wetzsein, 2017). Empirical evidence showed that housing markets have been susceptible to macroeconomic conditions (Allen-Coghlan & McQuinn, 2021). At the end of 2019, the COVID-19 pandemic began and has severely impacted worldwide economic activities. House prices (year-on-year) in many countries increased substantially after the outbreak of COVID-19 (Wang, 2021; Knight Frank, 2021) despite the negative growth rates of gross domestic product (GDP), high unemployment rates, and halted businesses. It was posited that the increase resulted from measures of cutting interest rates by central banks worldwide (Sahin & Girgin, 2020).

Malaysia's economy has also been adversely affected by COVID-19, and the subsequent movement control order (MCO) was implemented to flatten the pandemic curve. The economic contraction of 17 %in Q2 2020 was the steepest Malaysia has ever experienced (Kadhim et al. 2021). The National Property Information Centre (NAPIC) reported that around 33,000 units of properties were unsold for more than six months in the first half of 2019. Even worse, the house price between the range of RM201,000 to RM300,000, categorised as affordable to purchase by the Housing Ministry of Malaysia, showed the most unsold property, followed by homes priced at RM300,001 to RM400,001, respectively. Almost a third of the unsold houses are below RM300,000. Furthermore, these properties also did not match market requirements as they are often far from city centres, lacking connectivity and public transportation, eventually making them unappealing to potential customers.

Residential property prices boom over the years resulted in unsold housing properties. Despite this problem, overbuilding the house is a normal phenomenon in Malaysia. Developers tend to ignore this situation, which contributes to the decrease in the housing price index, as shown in Figure 2 (Delmendo, 2020). Although the housing price index relatively increase over the years, as shown in Figure 1, in terms of changes, it showed a decreasing trend due to overwhelming unsold residential properties.
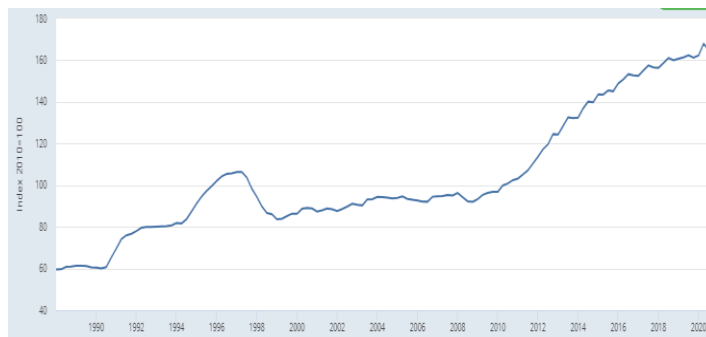
Figure 1: Real Residential Property Prices for Malaysia, Base Year 2010
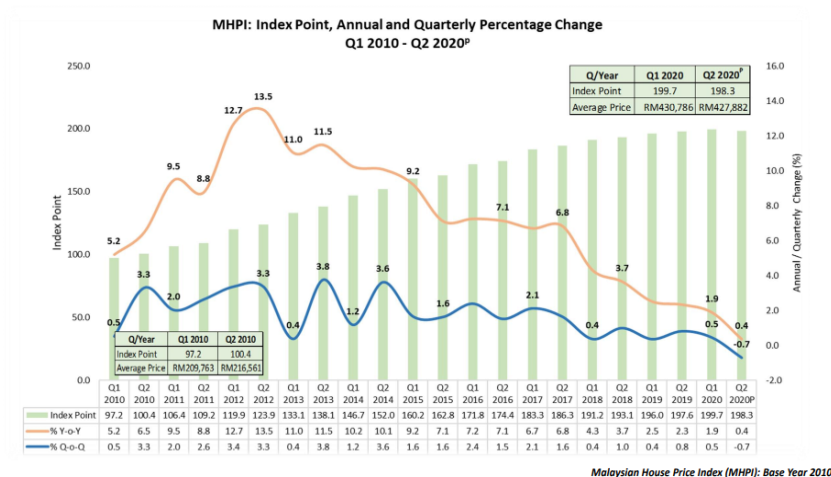*Sources: FRED, Economic Data, 2020*

Figure 2: Trend of Malaysian House Price Index (MHPI) and changes
Source: National Property Information Centre (NAPIC), 2020
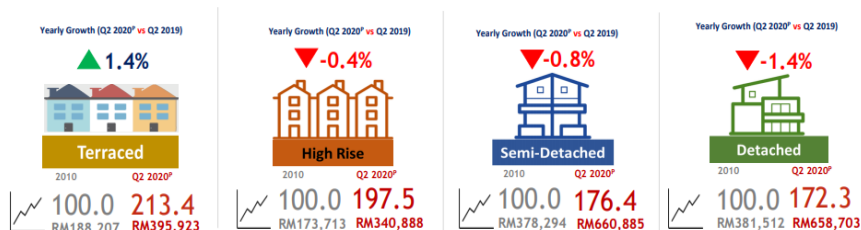

Figure 3: Malaysian House Price Index (MHPI): Base Year 2010
Source: Malaysian House Price Index (MHPI): Base Year 2010

Based on Figure 3, with 2010 as the base price, reflects the decreasing trend in the house price index based on estimated Q2 2020 compared to Q2 2019. However, only terraced houses showed an increasing trend compared to other residential properties. Although the housing markets are expected to be impacted by the economic downturn of COVID-19, this paper attempts to provide empirical evidence on the immediate impact of COVID-19 by examining the relationship between house prices and macroeconomic factors.

LITERATURE REVIEW

Pillaiyan, S. (2015) estimated the impact of real GDP, money supply, the stock market (KLSE), average bank lending rate, inflation (Consumer Price Index), consumer sentiments index, business confidence index, and loan approvals on housing prices. The time series used spanned quarterly data from 2000 to 2010. The study exerted a cointegrating vector error correction model (VECM) developed by Johansen (1988) to determine the number of cointegrating relationships among the seven variables. As a result, it discovered that housing price is positively affected by money supply, the stock market (KLSE), and the number of housing loans approved in the long run. In addition, the study examined that inflation (Consumer Price Index) and bank lending rates negatively affected housing prices.

The Engle LM, and an Autoregressive Conditional Heteroscedasticity (ARCH), were used by Reen and Razali (2016) to investigate the volatility clustering effect and volatility of house prices in three main urban areas in Malaysia. The study used panel data for 9 years from Q1 2005 to Q4 2013. The results indicated that the Base Lending Rate (BLR), GDP, housing stock, and inflation rate significantly impact the volatility of house prices. At the same time, more than half of the housing in Malaysia showed a volatility clustering effect, especially in three main urban areas in Malaysia.

Mariadas et al. (2020) determined the relationship between housing price and gross domestic product, interest rates, population, inflation, money supply, aging population, and stock market price in Malaysia from 1988 to 2017. Using the Autoregressive Distributed Lag (ARDL) modeling approach, all variables were statistically significant with house prices in the long run. Meanwhile, Trofimov et al. (2018) estimated the link between residential property price or known as the House Price Index (HPI) as the dependent variable, and Base Lending Rate (BLR), Consumer Price Index (CPI), Household Income (HI), population growth and Gross Domestic Product (GDP) as independent variables. Three techniques were used in this study: Johansen-Juselius cointegration, unit root and VECM-based Granger causality tests, and variance decomposition. The data used was quarterly for the period 2000-2015 period. The study found that residential property prices are associated with

population growth, low-interest rates, and CPI increases. On the other hand, GDP and HI do not associate with property price growth.

Using a multiple linear regression model, Zandi et al. (2015) found that the BLR, GDP, and inflation rate positively correlated with housing prices in Penang, while GNI was the only independent variable depicting the negative relationship with housing prices. On the other hand, Baharuddin et al. (2019), using the multiple regression method and the Vector Error Correction Model (VECM), found that the GDP showed a positive relationship with housing prices while the inflation rate and interest rate showed a negative correlation between quarter 2005-2019. Also, in the long run, independent variables like GDP, interest rates, and inflation rates are significant in housing prices.

Kiong and Aralas (2019) investigated the impacts of housing prices on macroeconomic indicators such as Gross Domestic Products (GDP), Housing Stock (HS), interest rate, Global Financial Crisis (GFC), Population Growth (POPG), Inflation Rate (INF), and Exchange Rate (EXR) in Malaysia from Q1 2007 until Q4 2017. The Autoregressive Distributed Lag Model (ARDL), Error Correction Model (ECM), Dipasquale, and Wheaton Model were used. The research indicated a long-run relationship among the variables except for GDP. In contrast, GDP and FC demonstrated short-run relationships with housing prices.

In Kenya, Akumu (2014) estimated the link between constructed residential houses' new prices against domestic interest rates, Kenya shilling US dollar exchange rate, public debt, money supply, inflation, gross domestic product, and rental income. The data used was quarterly for Q1 2000 to Q4 2010. Multiple linear regression analysis was applied for this study. The results indicate that gross domestic product, money supply, and public debt positively affect housing prices. However, the rest of the variables negatively affected housing prices.

Previously, other researchers thought buyers' affordability to own a house was the sole factor affecting housing prices. However, according to Abdul Latif et al. (2020), the relationship was viewed broadly. Therefore, they probed the relationship between housing prices in Malaysia and macroeconomic drivers such as Foreign Direct Investment (FDI), Gross Domestic Product (GDP), interest rate, unemployment, and inflation. Therefore, the government and policymakers must make choices by understanding the variables influencing Malaysian housing prices.

FACTORS INFLUENCING RESIDENTIAL PROPERTY PRICES IN MALAYSIA

This study examines four factors influencing residential property prices in Malaysia. These are Gross Domestic Product (GDP), inflation, interest rate, and investment, which are discussed below.

Gross Domestic Product (GDP)

Gross domestic product (GDP) is one of the most popular measures to assess a country's economic wealth. The computation of a country's GDP considers various economic elements, such as consumption and investment. GDP is undoubtedly the most frequently followed and significant economic measure for economists and investors since it represents the total dollar worth of all products and services generated by an economy over a certain period. GDP is stated in two ways: nominal GDP and real GDP. Nominal GDP is based on current market values and does not account for inflation or deflation. Nominal GDP examines the natural movement of prices and monitors the gradual growth in the worth of an economy over time. Inflation is factored into real GDP, which accounts for the overall increase in price levels. Economists typically compare a country's economic growth rate using real GDP. They use real GDP to determine if there has been any growth from one year to the next. It is computed using goods and services prices from a base year rather than current values to adapt to price changes.

The gross domestic product is one of the variables that influence house prices, and it is well known that if house prices rise, the wealth level fall (Abdul Latif et al., 2020). Conversely, wealth impact will likely increase consumer expenditure when wealth levels grow, resulting in higher aggregate levels. As a result, demand is expected to rise, resulting in a rise in Real GDP and a faster pace of economic expansion. However, GDP has no direct influence on housing prices. If the property market ever collapses, it will spread across the economy, causing the GDP to decline.

Residential property is an essential requirement for many Malaysians. Unfortunately, only a few of them could afford it. If the government decides to boost household credit one day, demand for housing will dry up, leading to a drop in residential investment. (Abdul Latif. et al., 2020). Case et al. (2000) and Wit and Dijk (2003) define real GDP as the primary predictor of real estate cycles. According to Zhu (2004), real GDP growth incorporates data from other more direct family income indicators, such as unemployment and salaries. Tze (2013) discovered that real GDP is the primary determinant of Malaysian home prices.

Malaysia's real GDP in 2020 was 376,654 million US dollars. Malaysia's real GDP increased significantly during the previous 50 years, growing from 22,776 million to 376,654 million US dollars at an increasing yearly rate that peaked at 11.70% in 1973 and then fell to -5.59% in 2020. The trend of Real GDP from 1960 to 2020 is shown in Figure 4.
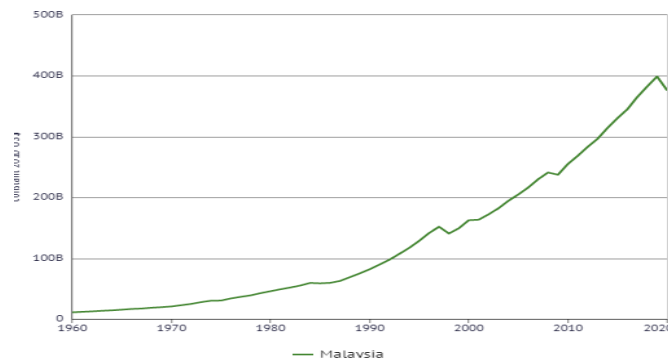
Figure 4: GDP (Constant 2010 US$)
Source: Department of Statistics Malaysia, 2020

Inflation

From 2005 to 2015, Kuala Lumpur property values pitched by nearly 122% (73% inflation-adjusted). In comparison, domestic price increases have been more discreet. From 2005 to 2015, Malaysia's house prices rose by 96.1% (52.4% inflation-adjusted). From 2016 to 2018, nationwide house prices rose by an annual average of 5.2% (3.3% inflation-adjusted). However, the housing market finally lost steam last year as the government's market cooling measures took effect (Delmendo, 2020). Unsold apartments in Malaysia's metropolises are now valued at RM 8.3 billion (US$ 1.9 billion), resulting from the rigid construction of top-end houses throughout the latest thriving (Delmendo, 2020).

Inflation is frequently indistinct as a continuous rise in prices for various services and goods. Economists clarify that price increases are the sign, not the root, of the problem. The fundamental reason for inflation is currency depreciation, which is consequently affected by increased printed currency in the market. Recently, several papers cited the effect of inflation on the housing market and prices. For example, Zandi et al. (2015) note that rising inflation increases residential property prices. On the other hand, Pillaiyan, S. (2015) mentioned that house prices have significantly inclined above the market value, influencing the inflation rate and hiking. However, the research conducted by Zandi et al. (2015) indicates that the inflation rate is not a significant variable of the residential property price.

Pillaiyan, S. (2015) argues the correlation between inflation and interest rates, the house price is related to the rental market, and the use of deposit-taking as a guarantee to the owner that the tenants will stay for a certain period that was agreed upon upfront for both parties. The critical point of his paper was that the market value depends on the inflation ratio to the real interest rate. Therefore, even when the banking institutions continue to announce a new level of the inflation rate, the actual price of sales to choose increases if the real interest rate declines. This result increased the knowledge of the rise of residential prices

despite stabilized prices. Significantly supporting the relationship, it may be practical to slow down the new level of inflation rate in the market so that the real interest rates decline continuously if the community requests to reduce its adverse effect on the wealth circulation between landlords and tenants.

Interest Rate

Many more elements influence property values in the economy, and the relationship is not as protruding as in the previous sample. One of the other significant determinants is triggering house prices to rise in interest rates. For example, Nguyen (2020) found that low-interest rates result in more reasonable purchasing of homes price and escalate the demand for houses. If the housing supply is stagnant and the demand increases, the cost of places will rise. In big capitals where land accessibility is frequently restricted, inflation has a more prominent consequence.

Interest rate risk is mainly abided by individuals and organizations, and monetary policy transfers through debtors' balance sheets, with concerns for expenditures and shares (Hoffmann et al., 2019). Next, the distribution of interest rate risk is essential for financial strength. Determined acquaintances in the banking segment can contribute to concurrent bank defaults, increasing interest rates severely. Two differing understandings regarding banks' acquaintance with interest rate risk can be measured. Conferring to the "conventional opinions," banking institutions give away long-term facilities with short-term repayment. This short-period repayment system results in a rising risk of the interest rate. Under an initiative called "contemporary opinions," banking institutions deal with the interest rate risk exposure of their properties with that of their accountabilities and thus avoid interest rate risk (Hoffmann et al., 2019). Banks have better performance due to longer variable-rate loans by the debtors. Fluctuations et al. (1993) discuss the role of that deposit as term liabilities efficiently because banking institutions can exercise market power. They thus optimally invest in long-term assets such as properties. This leads to increased monetary stability for the banking institutions.

Investment

A company's capital investment is in the form of money to achieve its organizational goals and objectives. Gross capital formation (also known as a gross domestic investment) consists of outlays on additions to the fixed assets of the economy, plus net changes in the level of inventories. The concept can also apply to purchasing long-term assets such as real estate, industrial plants, and machinery by an organization. A capital investment can be made with cash on hand, by selling other assets, or by raising funds through the issue of debt or stock. There is no such thing as a minimum or maximum capital investment. It can range from less than $100,000 for a startup to hundreds of millions of dollars for large

projects done by corporations in capital-intensive industries such as mining, utilities, and infrastructure. Capital investments are often used to improve operational capacity, gain a competitive market advantage, and generate more profit. For the same reasons, the firm may invest an equity share in another company's complementary operations.

Previous studies, such as Abdul Latif et al. (2020), used Foreign Direct Investment (FDI), which only focuses on foreigners investing in estates and property in a country. In Malaysia. FDI is the one that drives up prices more in local authorities with more considerable house price-earnings elasticity, which is one with less elastic housing supply. Additionally, FDI reduces homeownership rates, suggesting that residents may be priced out of the market in areas where foreign investors are more active and must rent rather than own homes. In this study, we used capital investments or, in other words, gross capital formation (also known as a gross domestic investment), which is way different from previous studies. This is because the data is more accurate than FDI as it combines foreign and domestic investment entirely for capital.

Malaysia's gross capital formation in 2019 was 76,738 million US dollars. Malaysia's gross capital formation grew from 676 million US dollars in 1970 to 76,738 million US dollars in 2019, rising at an annual rate of 12.56% on average. The trend of Capital Investment (Gross Capital Formation) from 1970 to 2020 is shown in Figure 5.
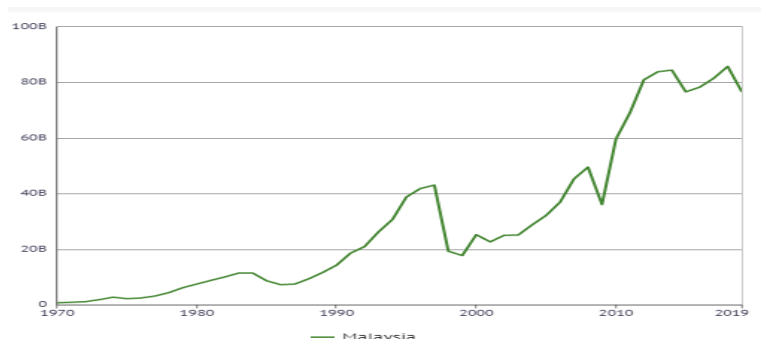

Figure 5: Gross Capital Formation (Current US$)
Source: Department of Statistic Malaysia, 2019

RESEARCH METHODOLOGY

This study employs an experimental technique. The objectives are to examine the influence of GDP, Inflation, Interest Rate, and Investment on Residential Property Prices in Malaysia before and during COVID-19. Multiple Linear Regression (MLR) was done to test the relationship between Residential Property Price, GDP, Inflation, Interest Rate, and Investment, as shown in Figure 6. All

data used are annual observations of the variables, and the estimation period is 1990–2020. Annual data for all variables are obtained from the World Bank.

Figure 6: The relationship between the residential price and other economic factors

Hypothesis:
H_1:   The real Gross Domestic Product (GDP) positively influences residential property prices.
H_2:   The inflation rate (INF) positively influences residential property prices.
H_3:   The interest rate (INT) positively influences residential property prices.
H_4:   The investment (INV) positively influences residential property prices.

The following model specification is used to investigate the relationship between residential property price, Gross Domestic Product (GDP), inflation (INF), interest rate (INT), and investment (INV) in Malaysia Before and During COVID-19:

$$\text{Regression Model: HPI= GDP + INF + INT + INV} + e,$$

where:
HPI = Residential Property Price
GDP = Real Gross Domestic Product
INF = Inflation Rate
INT = Interest Rate
INV = Investment
e = Error

ANALYSIS AND DISCUSSION

The research started by regressing the four variables, interest rate (INT), inflation rate (INF), Growth Domestic Product (GDP), and investment (INV), against the residential property price (HPI) using the Ordinary Least Square method of regression. The study uses Eviews software as the statistical analysis tool; the result is shown in Figure 7.

Dependent Variable: HPI
Method: Least Squares
Date: 07/26/21   Time: 23:12
Sample: 1990 2020
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-22.97661	11.02026	-2.084942	0.0470
GDP	5.24E-10	5.92E-11	8.849819	0.0000
INF	1.228766	1.808890	0.679293	0.5030
INT	1.490180	0.631589	2.359413	0.0261
INV	1.74E-11	2.02E-10	0.085824	0.9323

R-squared	0.957672	Mean dependent var		101.6552
Adjusted R-squared	0.951159	S.D. dependent var		49.34022
S.E. of regression	10.90413	Akaike info criterion		7.762851
Sum squared resid	3091.404	Schwarz criterion		7.994139
Log likelihood	-115.3242	Hannan-Quinn criter.		7.838245
F-statistic	147.0610	Durbin-Watson stat		0.555560
Prob(F-statistic)	0.000000			

Figure 7: Result of regression

Symbol	Description	Measure/Proxy
HPI	Residential Property Price	Housing price index in constant 2010
GDP	Gross Domestic Product	Real GDP in constant 2010 based price
INF	Inflation rate	Inflation, consumer prices (annual %)
INT	Interest rate	Real interest rate (%)
INV	Investment	Capital investment @ Gross capital formation (current US$) (formerly gross domestic investment)

The equation is as follows:

HPI = -22.9767 + 5.24E-10GDP + 1.2288INF + 1.4902INT + 1.74E-11INV.

Based on the results, the goodness of fit (R^2=0.9577) shows that the variables have a significant positive relationship with the housing price. Furthermore, it shows that 95.77% of the variation of INT, INV, INF, and GDP is explained by the variation of HPI. Overall statistical testing is determined using the calculated F-statistic, 147.0610. This interpretation supports that the regression is significant because the probability of F-statistic, 0.0000, is statistically significant at 10%, 5%, or 1%. The mean is 101.6552. Moreover, the Durbin-Watson statistic is 0.5556 and falls under positive serial correlation.

Also, by referring to the above results, taking a 1% level of significance, the independent variables of GDP (β_1=5.24(10)$^{-10}$, t-statistic = 8.8498, p=0.0000<0.01) significantly and positively affect the residential property price. As a result, it shows a positive relationship between this variable and residential property price. Also, it supports other researchers' findings, like Zandi et al. (2015) and Akumu (2014); they mentioned that the GDP positively affects the residential property price in Malaysia.

Furthermore, the independent variables of INF (β_2=1.2288, t-statistic = 0.0858, p=0.5030>0.10) do not significantly affect the residential property price. By comparing the p-value, it shows that p=0.5030>0.10. This result aligns with San Ong (2013), who indicated that INF is not statistically significant with residential property prices.

On the other hand, the independent variables of INT (β_3=1.4902, t-statistic = 2.3594, p=0.0261<0.05) significantly and positively affect the residential property price. As a result, it shows a positive relationship between this variable and residential property price. Also, it supports other researchers' views, like Zandi et al. (2015) and Akumu, D. O. (2014), that INT positively affects the residential property price in Malaysia.

Last, the independent variables of INV (β_4=1.74(10)^{11}, t-statistic = 2.3594, p=0.932 (p=0.932>0.10) do not significantly affects the residential property price. By comparing the p-value, it shows that p=0.5030>0.10. This finding is consistent with Abdul Latif et al. (2020), who said that the relationship was viewed broadly.

Now by referring to the probability value of each variable, both p-values of variables INF=0.5030 and INV=0.9323 are not statistically significant at a 5% or 10% significance level. Thus, H2 and H4 are rejected at a 5% or 10% significance level. Therefore, investment (INV) and inflation (INF) positively influence the residential property price but are statistically insignificant. In contrast with the Growth Domestic Product (GDP) and interest rate (INT) variables, both are statistically significant at 1% and 5%, with the probability value of GDP=0.0000 and INT=0.0261. Thus, H1 and H3 are accepted and statistically significant. Therefore, investment (INV) and inflation (INF) positively influence the residential property price and significantly affect the residential property price statistically.

CONCLUSION

In conclusion, this study aims to analyse the influence of inflation, investment, interest rate, and GDP on the residential price in Malaysia before and during COVID-19. This study used annual time series data covering the period from 1991 to 2020. Multiple regression model techniques are conducted to meet the purpose of the study.

As reported in the previous section, the findings based on multiple regression modelling approaches show that GDP and interest rate only have a positive relationship and a statistically significant impact on residential property prices in Malaysia. However, investment and inflation positively influence the residential property price but are statistically insignificant.

In contrast with the growth domestic product and interest rate variables, both are statistically significant at 1% and 5%. These findings are consistent with the research conducted by (Zandi et al., 2015), which indicated that the inflation rate is not a significant variable of the residential property price.

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