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Housing Prices, Macroeconomic Variables and Corruption Index in ASEAN

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ABSTRACT

The present study examines the impact of macroeconomic variables and corruption perception on housing prices on 4 Association of Southeast Asian Nations (ASEAN) including Malaysia, Singapore, Thailand and Indonesia for the year 2003 through 2013. Using the fixed effect of panel data technique, the results show that corruption index and all the macroeconomic variables with an exception of interest rates have significantly affected housing prices. The findings overall suggest that housing prices in these countries are mostly guided by economic fundamentals. On top of that, the corruption index seems to play an important role in explaining housing prices but should be cautious in interpreting them. It seems that in ASEAN as the economy improved, there appears to be a pressing need to provide more houses with affordable prices.

KEYWORDS: Economic Variables, Corruption Index, Housing Prices, ASEAN.

INTRODUCTION

Issues pertaining to home ownership and housing development and price in the city and town area have been a major concern among workers, political leaders and the government. Owning a decent house for living is considered a basic necessity in today's world, since it can foster and assimilate among family members. Moreover, owing an affordable house price will give a piece of mine without much thinking of moving out when the rental period expired. As such, a good way of housing affordability is to ensure applicant home owner who can fulfill lifelong investment for shelter. Besides that, demand in the housing market may lead to more construction and residential investment. However, as the economy is fast growing, the supply could not match the demand leading to increases the housing prices.

Housing in ASEAN and in many Asian countries have an important role toward financial development for the past three decades. Moreover, the wealth effect of house prices may give a high impact on economic growth. It has shown in many studies that there is an interaction between the housing market and the economy [1, 2, 3]. As a result, foreign investment is continuing to grow tremendously in this region. Large urbanization in cities like Hong Kong, Singapore, Thailand, Philippines, Malaysia and other developing Southeast Asia countries has brought about the housing shortage leading to large housing price appreciation. In Malaysia for example, with endless technology advancement has led to increasing demand for affordable house thus possibility of increase in prices.

Many theories show that changes of house price should have a real effect on the economy. At the national level, the current run-up in house prices mainly reflects adjustments to improved fundamentals rather than speculative housing price. Based on economic theory, regional demographic and regional economics are 2 important factors contributing to movement of housing price. Other factors such as gross domestic product (GDP), housing finance, inflation rate, interest rate and cost of construction also contribute to the fluctuation of the housing prices.

In recent years, there have been growing concerns about the housing market in a many economies. According to [4], China, Hong Kong and South Korea have witnessed very strong house price inflation in the past several years. A pessimistic view argues that house prices have been overvalued in many countries and will face downward corrections in the near future. In the other empirical study by [5] argues that due to imbalance between buyers and sellers, the housing price is expected to rise. On average, it is evident that house prices tend to be more volatile in markets with lower supply elasticity and a more flexible business environment.

The objective of the present study is to examine whether factors such as macroeconomic variable (GDP, inflation and interest rate) and corruption index influence the housing price in ASEAN.

LITERATURE REVIEW

The GDP is a popular indicator because of the relationship between the macroeconomic activity and the housing price [6]. Inflation and other economic such as inflation or money supply have an impact on the housing

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sector. As stated by [7], increasing inflation serves to reduce people's incentive to invest in real estate, which in turn lowers housing demand. In opposition, it can be argued that inflation causes nominal housing payments and construction costs to rise, which implies a lower housing demand. During inflation, most things in the economy will increase in price including the cost of the raw material for building a house will increase.

Standard theory says that low interest rates should increase house values. The observation shows that house prices increases when interest rates decreased and vice versa. Historically, over the last decade, the interest rate declines do tend to proceed periods of house price appreciation and some indirect evidence on the contribution of interest rates to house price fluctuations [8]. Using the methodology developed, the authors decomposed house price fluctuations in 23 metropolitan areas in the U.S. into components attributable to real interest rates, rent and risk premier.

An argument [9] highlighted that the business freedom index, the corruption index, the financial sector index and the property right index give the impact to market arrangements at equilibrium house prices. It argues that higher scores in the business freedom index and the corruption index, which reflect better regulatory conditions are likely to be associated lower searching costs and lower transaction cost. Therefore, they may have a positive effect on house price in equilibrium. In addition, the other empirical study [10] strongly support that the relationship between investment and corruption in 58 countries. It finds that corruption has a significant negative effect on the ratio of investment to GDP. These results are consistent with the view that corruption is deleterious for economic growth.

METHODOLOGY

Data Collection

All of the data are collected from the international monetary fund (IMF), World Development Bank and International Financial Statistics website except for the housing price index and corruption index. The data include gross domestic product, inflation and interest rate. House price indexes are collected from Bank of Thailand, Department of statistic Singapore, Indonesia Bank for international settlement and Malaysian Valuation and Property Services Department (JPPH). As for corruption index data, they are obtained from Transparency International and Economy Watch. This study will use yearly basis data within ten years from 2003 to 2013.

Variables Used

House Price Index (HPI) measures the price of residential housing. It is measured by averaging price changes in house purchase prices, including mortgage financing and refinancing appraisals. GDP is the monetary value of all the finished goods and services produced within a country's borders in a specific time period. Inflation rate is the rate at which the general level of prices for goods and services is rising, and subsequently purchasing power is falling. An interest rate is the rate at which interest is paid by a borrower (debtor) for the use of money or asset that they borrow from a lender (creditor). Corruption index is a ranking of countries according to the extent to which corruption is believed to exist. It ranks almost 200 countries on a scale of zero to 10, with zero indicating high levels of corruption and 10 indicating low levels.

Descriptive Statistics

Table 1 shows summary statistics for all variables including mean, standard deviation, minimum and maximum.

Table 1: Summary statistics

	Mean	Std. dev.	Min	Max
House price index	135.4075	26.23903	107	212
GDP	512424	911359.3	178012	2612022
Inflation rate	3.858075	3.089977	-0.76	17.114
Corruption index	50.325	26.16162	19	94
Interest rate	3.004	3.245809	-3.9	11.78

Table 1 shows that all economic variables and corruption index have a positive relationship with house price index except for GDP, which show negative sign. The higher the correlation coefficient, the stronger will be the relationship between variables and vice versa. Table 2 shows the corruption index has the strongest correlation with the housing price.

Pearson Correlation Coefficients

Table 2: Pearson correlation coefficients

	HPI	GDP	INF	CI	IR
House price index (HPI)	1.0000				
Gross Domestic Product (GDP)	-0.0925	1.0000			
Inflation (INF)	0.0051	0.5584	1.0000		
Corruption index (CI)	0.4872	-0.5388	-0.3969	1.0000	
Interest rate (IR)	0.0678	0.1255	-0.2246	0.0048	1.0000

Fixed Effect Model

In econometrics and statistics, a fixed effects model is an analytical model that represents the examined quantities in terms of informative variable that are treated as non-random quantities. This is different to random effect and mixed model because either all or some of the informative quantities are treated as random causes. Besides that, different viewpoint from analysts has a different structure of the model which is usually a linear regression model and they have natural choice in any given situation.

Hausman Fixed Test

Hausman test is aimed to measure whether there is a significant difference between the estimates of the 2 models. If there is not, then the researcher is directed to use random effects as they are more efficient than fixed effects. A significant difference on the other hand is taken as evidence of bias in the random effects estimates, and the researcher is consequently guided to employ the fixed effect instead. This test is necessary to decide whether to choose random effect or fixed effect model.

Panel Data Model

The present study applies the generalized least squares (GLS) fixed effect panel data technique, which are known to be powerful research tools. The term fixed effects estimator is referring to an estimator for the coefficients in the regression model. We impose time independent effects for each entity that are possibly correlated with the regresses.

The panel data model specifies in this study is of the following structure:

$$y_{it} = x'_{it}\beta + z'_{it}a + \varepsilon_{it} \tag{1}$$

or

$$y_{it} = \sum_{j=1}^{N} \alpha_i d_{ij} + x_{it}\beta + \varepsilon_{it} \tag{2}$$

where

$$d_{ij} = \begin{cases} 1 & if \quad i = j \\ 0 & otherwise \end{cases} \tag{3}$$

which, are used to capture the individual effects (either fixed or random). y_{it} is the dependent variable (HPI) and X_{it} represents four independent variables-gross domestic product (GDP), inflation (INF), corruption index (CI) and interest rates (IR) where i is the number of countries = 1, 2,…..4, t, is the number of years = 1,2,……..10. The ε is the error term.

FINDINGS AND DISCUSSION

Table 4 presents the result of fixed effect model. The R-square shows that 36.98% of independent variables explained dependent variable (house price index). Two of macroeconomic variables which are GDP and inflation have produced positive and significant estimates on relationship with housing price at 5% and 10% level respectively. While, the corruption index shows the negative effect on housing price. The findings for GDP suggest that as the nation economic growth increased, the higher will be the housing price due to the high demand for people that have excess money. This is logical since with extra cash people will invest in property or other fixed asset because of their high return. With regard to inflation, people still invest and buy house even

though the price has increased during high inflation. Buying a house is not an option anymore. The result suggests that people will buy house out of necessity regardless of economic conditions.

Finally, the result shows that higher corruption perception index (low corruption/clean) will significantly contribute to higher housing prices. This is evident in Singapore where housing price keeps increasing, even though the corruption index is very clean. It is suggested that there are other factors such as scarcity of land, increase in building material and labor costs that will contribute to housing prices while interest rate does not.

Table 4: Result of Fixed Effect Model (FE)

```
. xtreg  housepriceindex gdp inflationrate corruptionindex interestrate, fe

Fixed-effects (within) regression               Number of obs      =        40
Group variable: code                            Number of groups   =         4

R-sq:  within  = 0.3698                         Obs per group: min =        10
       between = 0.5136                                        avg =      10.0
       overall = 0.1199                                        max =        10

                                                F(4,32)            =      4.69
corr(u_i, Xb)  = -0.9968                        Prob > F           =    0.0043

------------------------------------------------------------------------------
houseprice~x |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         gdp |   .0001095    .000027     4.06   0.000     .0000545    .0001646
inflationr~e |   3.015663   1.491536     2.02   0.052    -.0224953    6.053822
corruption~x |  -4.830281   1.543619    -3.13   0.004     -7.97453   -1.686031
interestrate |   .5146944   1.128378     0.46   0.651    -1.783737    2.813126
       _cons |   309.1798   70.83074     4.37   0.000     164.9023    453.4573
-------------+----------------------------------------------------------------
     sigma_u |  243.76438
     sigma_e |  19.472726
         rho |  .99365911   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(3, 32) =      5.71                 Prob > F = 0.0030
```

CONCLUSION AND RECOMMENDATIONS

This study analyzed the effect of macroeconomic variables (GDP, inflation and interest rate) and corruption index on housing price in ASEAN. Using fixed effect model on annual data from 2003 to 2012, the results show that GDP and inflation are significant and positively affecting housing prices. However, the corruption index shows significant and negatively correlated with housing prices. With regard to the interest rate, we find insignificant contribution to the house prices.

The significance of the present study rest in the fact that a better understanding of all ASEAN economics conditions and corruption perception index is vital. The results should be interpreted with extra cautious since 4 sample countries used have vast major different in economics and integrity. Singapore for example economically can be considered as developed, while its corruption level is among the lowest in the world. As such, housing price should be lowered since the corruption level is low. However, it does not happen in Singapore. Housing and property prices skyrocket every year due to other reasons. On the other hand, Malaysia, Thailand and Indonesia can be categorized as an emerging economy and their corruption perception are quite the same.

There are several ways to improve this study. Firstly, one could extend the research to properly account for each country by studying them individually. Further exploration calls for improvement in data compilation and a better understanding of the mechanism of house price determination. For most of ASEAN, there appears to be a pressing need to improve the quality and timely availability of housing data if these are to aid in better analysis in policy decision making purposes. Moreover, national average house prices mask the volatility in house price movements in leading cities/markets. Therefore, reliable information on the city level or across market segments is crucial to the understanding of possible local/market segment bubbles.

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