A Study of Hotel and Property Sectors in Malaysia: Developers' Views and Selected Analyses of Price Drivers

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Abstract

This paper reports an assessment of supply-demand side economics of hotel and property sectors, while it also examines the pricing behavior of the real estate sector in Malaysia. First economic fact about the hotel sector is that it has been carefully developed over several decades, and forms an important destination point for international travelers attracting about 26 million visitors with demands ranging from simple hotel services to the most exotic private chalets. This sector has gone through a decline since 2017 and has been made worse by the Covid Pandemic. Analyses of the property sector provide interesting, unexpected finding that price increases in residential units have kept pace with inflation in the country, and that further localizing production of input materials, supply of more land regulatory consolidation would help the industry. Nonetheless, the supply of built units in recent years falls short of national policy aim to provide affordable housing because supply is 22 percent facing a demand closer to 40 percent at costs less than RM250,000. Some insights are gained from examining the broader price drivers other than inflation to understand how the economics of the property sector is shaping up the real estate economy. There is a body of relevant findings to be refined further for policy consideration to address affordable housing issue, for more l to be made available (as is done in Melbourne Australia, as an example),a nd finally to build local capacity to produce quality items that are currently imported.

Key Words: Hotel sector, Housing sector, property prices, inflation, Price drivers, Land price, Supply-side comments

JEL Classification: P25, L52, G14

1. Introduction to Real Estate Research

This paper reports significant findings on the supply-side economics and the economic factors driving hotel sector as well as the residential property market in Malaysia. National Property Information Centre report (NAPIC, 2017) reveals the country's residential price index has sharply increased recording a maximum value in 2017, when it started to fall due to economic problems that can be traced to financial issues of increased national debt, slow economic growth on top of financial fallout from the 1MDB saga. The Malaysian Housing Price Index (MHPI) increased from 97.2 points in 1981 to 184.1 points by 2017, thus increasing by about 89.40 per cent over 38 years or 2.3 percent increase per year. This effectively suggests that prices of residential properties have almost doubled. The doubling of prices may partly be due to inflation over the same period. Over the 38 years, cumulative inflation reached or 2.7 percent per year. Arguably, property market prices have risen to keep in line with inflation although one could say building sector efficiency of about 0.4 percent can be suggested as the reason for the prices just moving up by less than inflation.

Some quarters, however, argue that the rapid rise in house prices is not the result of inflation on house construction inputs. As presented later in this paper, there may be some basis to this argument. House prices right up until 2017 showed a slow but steadily decreasing rate of growth, keeping house prices as a hedge against inflation, which behavior is consistent with international behavior of real estate markets. If so, then other factors are more likely to contribute to rising house prices. In many countries, these would include a shortage of l of labor. In Malaysia, however, there is no foreseeable shortage of l, labor (in the construction sector) although most imported items tend to cost more because the currency has depreciated over the period from one USD at RM=2.56 (1981) to RM4.14 (2021) so important items are increasingly costly. Given these conditions, the continued rise in house prices must be attributed to other than inflation forces.

The forces that are likely to affect prices have been identified in several other studies. These factors were carefully assessed, and time series data collected to verify if some of these factors do influence the price formation in this market. The market is defined as the property market across the country as may be assessed using national data series on prices and other determinants of prices. On-site interviews were conducted with top management executives of

major property developers at their places of work. Further, field work provided comments from these suppliers of built units. The survey was conducted in 2020 before the Covid-19 movement controls came into force in March 2020. Further field work could not be conducted due to ongoing pandemic restrictions. The information collected from five different regions is analyze the supply-side factors affecting prices.

The independent variables known to affect prices were identified from theories and from empirical studies on real estate literature. These factors are identified to collect data over a long period: capital gain/loss, rental per square feet, disposable income, inflation rate, number of marriages, deposit rate, risk premium, and loan-to-value ratio. These factors are known independent variables with significant long-run effects on pricing of property units. Hence, the research question here is "what are the marginal effects of these factors on the prices over the test period in Malaysia?" The results helped to reveal hitherto unknown influences while the long-run effects of these factors are investigated using advanced econometrics such as the ordinary and the dynamic ARDL procedures.

The rest of the paper is organized into five more sections. In the ensuing section, an attempt is made to describe the economics of the hotel sector. In section 1.3 is the descriptive information on the items used in our research to understand their long-run average behavior. The supply-side comments are examined in Section 1.4 from the views of the property sector executives to explain that factors are affecting the supply of built units. Section 1.5 discusses the economic factors correlated with pricing of residential properties. Section 1.6 concludes.

1.2 Understanding the Tourism Sector in Malaysia

Tourism is one of the largest industries in Malaysia, contributing 5.9 percent (RM370 billion) to its gross domestic product (GDP), and employing close to a quarter of the total workforce in Malaysia in 2020. Internationally, the tourism sector is expected to grow by 15 percent per year in terms of employment and value-added to the global economy. Currently, the Malaysian hotels sector caters to both international visitors (26 million a year) and local tourists (240 million trips a year). To put things into perspective, the number of residential

units in Malaysia is about 13 million households. The hotel sector therefore makes a significant contribution to employment and to the nation's income.

Figure 1: Tourism Sector Employment Growth, Malaysia

Fifteen years ago, the tourism industry employed just 1.5 million people compared to more than double that number in 2020. It is likely to create more value to the economy exp in the next 10 years to be a major sector of the economy as the tourism sector is said to be poised for growth once the Covid-19 effect on international travels are over.

There are about 4,750 tourist hotels in the country providing a total of 310,000 rooms within Malaysia which is comprised of Peninsular Malaysia and East Malaysia divided by the South China sea. Some of the hotels are based in the Borneo territory. In fact, one of the four competitors at the top end are located in the Borneo-end of the country: The Bunga Raya Island Resort & Spa.

An interesting aspect of this country's hotel industry is this. There are some 51 boutique resorts in the country, three of which are in Langkawi. These chalets are in high demand with room

rates only high-net worth clients with a zest for privacy, raw nature, hideaway anonymity while demanding very high-standard of hospitality services from the staff can afford.

The value-added to the economy is reported to be US$50 billion a year or 15 percent of the total GDP. The tourism sector employs 3.5 million workers with employment growing at double-digits per year. The structure of the value-added aspect may be understood by looking at four types of services provided in this resort. The biggest contributor across the industry to value creation is the cultural-sporting-entertainment side of tourism. That accounts for some 40 per cent of the value-added in most years. Food services account for 33 percent while the accommodation services provide 20 per cent while the rest is from transport and miscellaneous services.

Table 1: List of Exclusive Luxury Hotel (5 Stars and above)

No	Name of Hotel	Location	Price From (RM)
1	Four Seasons Resort Langkawi	Langkawi	3598
2	The Ritz-Carlton, Langkawi	Langkawi	2050
3	Sweet home bungalow at Penang	Penang	1505
4	The St. Regis Langkawi	Langkawi	2050
5	The Danna Langkawi	Langkawi	1300
6	Four Seasons Hotel Kuala Lumpur	Kuala Lumpur	1010
7	The Second Homestay 1708	Kuala Lumpur	1750
8	The St. Regis Kuala Lumpur	Kuala Lumpur	751
9	Marin Oriental, Kuala Lumpur	Kuala Lumpur	622
10	Eastern & Oriental Hotel	George Town	728
11	Gr Hyatt Kuala Lumpur	Kuala Lumpur	575
12	JW Marriott Hotel, Kuala Lumpur	Kuala Lumpur	416
13	Pangkor Laut Resort	Perak	963
14	Shangri-La’s Rasa Ria Resort & Spa	Kota Kinabalu	783
15	W Kuala Lumpur	Kuala Lumpur	705
16	Shangri-La's Tanjung Aru Resort & Spa	Kota Kinabalu	1297
17	Gaya Island Resort	Sabah	798
18	The Ritz-Carlton, Kuala Lumpur	Kuala Lumpur	620

No	Name of Hotel	Location	Price From (RM)
19	The Banjaran Hotsprings Retreat	Perak	1594
20	Shangri-La's Rasa Sayang Resort & Spa, Penang	Penang	800
21	The Majestic Hotel Kuala Lumpur, Autograph Collection	Kuala Lumpur	314
22	Sama Sama Hotel KLIA	Selangor	576
23	The Westin Langkawi Resort & Spa	Langkawi	910
24	Mulu Marriott Resort	Sarawak	473
25	Bunga Raya Island Resort & Spa	Gaya Island, Sabah	1400
26	The Villas at Sunway Resort Hotel & Spa	Selangor	411
27	Shangri-La Hotel Kuala Lumpur	Kuala Lumpur	364
28	The Magellan Sutera	Kota Kinabalu	791
29	Tanjong Jara Resort	Terengganu	620
30	Hilton Kota Kinabalu	Kota Kinabalu	422
31	Kota Kinabalu Marriott Hotel	Kota Kinabalu	638
32	The Aman, a Luxury Collection Resort, Langkawi	Langkawi	1180
33	Le Meridien Kuala Lumpur	Kuala Lumpur	333
34	Traders Hotel Kuala Lumpur	Kuala Lumpur	432
35	Forest City Phoenix Hotel	Johor	542
36	New World Petaling Jaya	Selangor	342
37	Lexis Hibiscus Port Dickson	Port Dickson	1451
38	Meritus Pelangi Beach Resort Spa, Langkawi	Langkawi	630
39	The Taaras Beach & Spa Resort	Redang, Terengganu	800
40	Hilton Kuala Lumpur	Kuala Lumpur	344
41	Macalister Mansion	George Town	850
42	G Hotel Kelawai	George Town	501

Figure 2: Inbound tourist expenditure by source country

Another aspect of the industry is the inbound tourist expenditures from selected countries. The top five countries are shown as the key origins of the tourist arrival in Malaysia. The first column indicates that the top tourist origin is Singapore (both residents of Singapore and those who stay in that city make side trips to Malaysia providing a total revenue of some RM 6.2 billion in a typical year. In terms of per person expense, Saudi tourists spend the most at an average of RM 11,100 per visit (per diem expenditure is RM 1,100). The Saudi tourists also stay the longest period of 10 nights per visit. The total value of the top five tourist-originating countries is RM 15 billion while the tourism industry is worth about RM 50 billion a year.

The real estate sector serving the hotel industry has been rapid over the last three decades of building and promotion activities, as a result, there is a diversity of quality in the services provided to in-bound tourist from across the world. This highly valuable sector, which often is the window for international attraction/image of Malaysia as a modern country, has been buffeted severely by Covid-19 restrictions since March 2020. The sector is in some degree of financial strain and is looking forward to the pandemic disappearing soon perhaps in 2022-23 to restart this damaged industry. With the financial support in place for the industry, the sector survives for now, given its decades of evident ability to survive other crises in the past, recovery/expansion is assured soon as the world travel and domestic travel restrictions are lifted.

1.3 Residential Property Sector Facts Described

Inflation is not the only factor: Figure 3 shows the cumulative effect of inflation on property prices in Malaysia. The 38-year inflation is equal to 105 percent and the price index in 2017 almost equal to inflation (just short of 0.4%). The prices of residential properties have been increasing over the years, as already stated in the previous section in line with the inflation rates in the country. While the average price is in line with the inflation, further parsing of the data at different types of units reveal a different behavior. The Terrace House Price Index (THPI) increased from 102 some four decades ago to 186.7 points in 2017. These units are generally found in urban areas away from the city centers so the l prices in such locations have increased disproportionately. Given high demand for properties by T20 and M40 households, led properties have gone up at almost two times the price of the overall average of all residential properties.

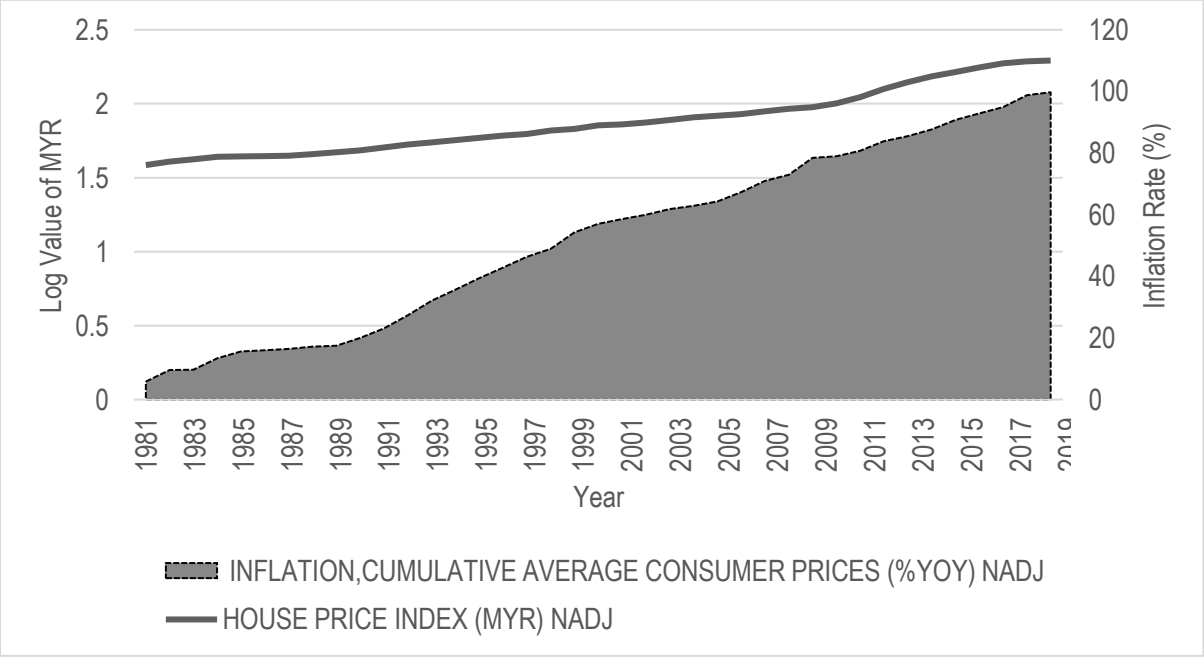


Figure 3: Inflation and Residential Property Prices in Malaysia, 1981-2019

Similarly, the High-Rise Price Index (HRPI) accelerated from 99.5 points in 2010 to 197.8 points in 2017. High-rise properties very popular among city dwellers have also gone up by more than the cumulative inflation rates over 10-years compared to the average prices being

just about the same as the cumulative inflation rates. Thus, both led to suburban units and the high-rise apartments to go up in prices at double the rates of cumulative inflation rate: obviously price rise is not due to inflation for these units. The first fact that the average price is merely the reflection of the inflation over 4 decades is not valid for led residential properties and high-rise apartments nearer or at the city centers of five regions covered in this study.

Income Level Effect on Prices: Figure 4 reveals statistical facts about income levels and housing prices. Income levels in Malaysia are a reflection of the underlying cyclicality of the economic cycles many crises that buffeted the people of this country, starting with (i) 1984-6, when a world recession severely led to economic declines causing income levels to fall drastically; (ii) the 1997 financial crisis that led to severe negative year-on-year changes in incomes; (iii) the October 2001 Dotcom Bubble that affected the electronic sector severely leading to income declines; (iv) the 2007-09 Global Financial Crisis that again led to the negative y-o-y prices dipping to negative regions. The 1-MDB saga, still unresolved as at 2021, together with the Covid pandemic affecting earnings since 2018 but not to the negative region. Thus, from the perspective of property buyers, this fact about greater uncertainty of incomes introduces greater reluctance to buy properties, which has the very bad side effect on the supply side not to expect to sell properties should a recurrent crisis of the past come again soon. That affects both demand and supply sides of the residential properties.

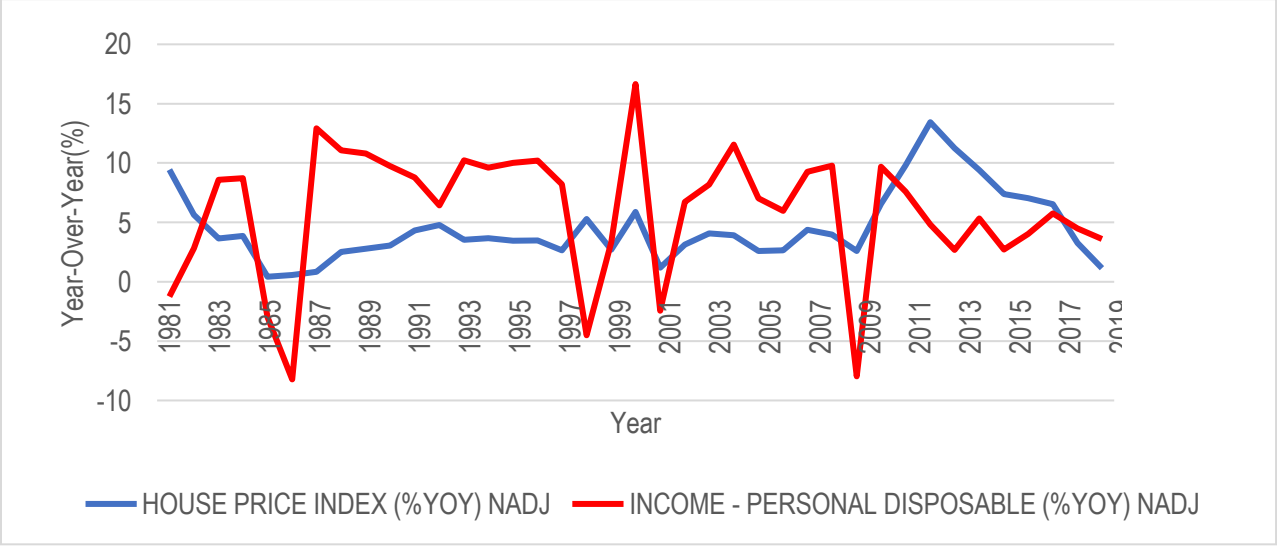


Figure 4: Residential Properties against Income Uncertainty in Malaysia

BNM (2017) statistics suggest three important facts about properties. While one out of five buyers face a price lower than RM 250,000.00 for buying a unit – it was noted that the lowest priced unit is priced at 6 times the annual income - four-out-of-five households face a price higher than RM250,000.00 in recent years. Given the per capita income of residents at RM43,000.00 in 2020, it means that at the bottom price of RM250,000.00 per unit, for every four out of five buyers, the price to income is six times the annual income at the low price for 20 percent of the supplied units. At any higher prices for the 80 per cent demand side, the income to price ratio is beyond six times the annual incomes. Add to that the income itself is like a yoyo given the economy's affected by too many crises.

A third fact is also evident why the residents feel reluctant to buy, not just because (i) their income may be declining when the next crisis comes, (ii) the price-to income ratio is very high. In most developed countries, with less volatile income experiences, the average price to income ratio is in the region of 4 times. The third factor comes from the income distribution in the market participants. The three-level household incomes are: RM 40,000.00 for B40 group; RM80,000.00 for M40 group; RM213,000.00 for T20 group. It is notable that the supply side provides the low-cost units at RM250,000.00 satisfying the demand for 20 per cent of buyers while the low-income household according to the national classification the B40 needs 40 per cent of all supplied units at that low price. Obviously not all the B40 group with low incomes could find sufficient number of units at their affordable prices. For the remaining 60% of the households, the market provides 80 per cent of the built units at prices higher than the RM250,000.00 benchmarked for the low end of the market. It is possible that the cost items (l costs; labor costs; material costs; margin for capital providers) are hindering the supply side to increase supply at the low end, an issue that needs further inquiry.

Demand, Supply and Pricing Behavior: Figure 5 is a summary of 19-year transaction data series behavior of the residential sector. It reveals that the transaction values and trend in prices are correlated. When the volume of transacted units declines as in 1997, again in 2005, also in 2014, the prices declined substantially. On the other side of demand, when demand picks up as in 1994, 2006, 2011, prices increased substantially as is shown in the upward spikes in prices in the figure. Thus, demand that clears the market prices as shown by the transacted volume leads to the rational increases/decreases observed in the prices.

The economy under the eighth PM was noted for a number of negative factors for the economy. Two of them are notable, the kleptocratic nature of the Administration that led to several court cases, which are still buffeting the economy.[1] The impact of the political economy factor coupled with the 1-MDB financial impact on currency will weigh heavily on the future political play needed to reinvigorate the economy. This is evident from the total supply hence the total volume in 2013 of 400,000 units, having declined to around 300,000 units in recent years: decline of 25 per cent in transaction.

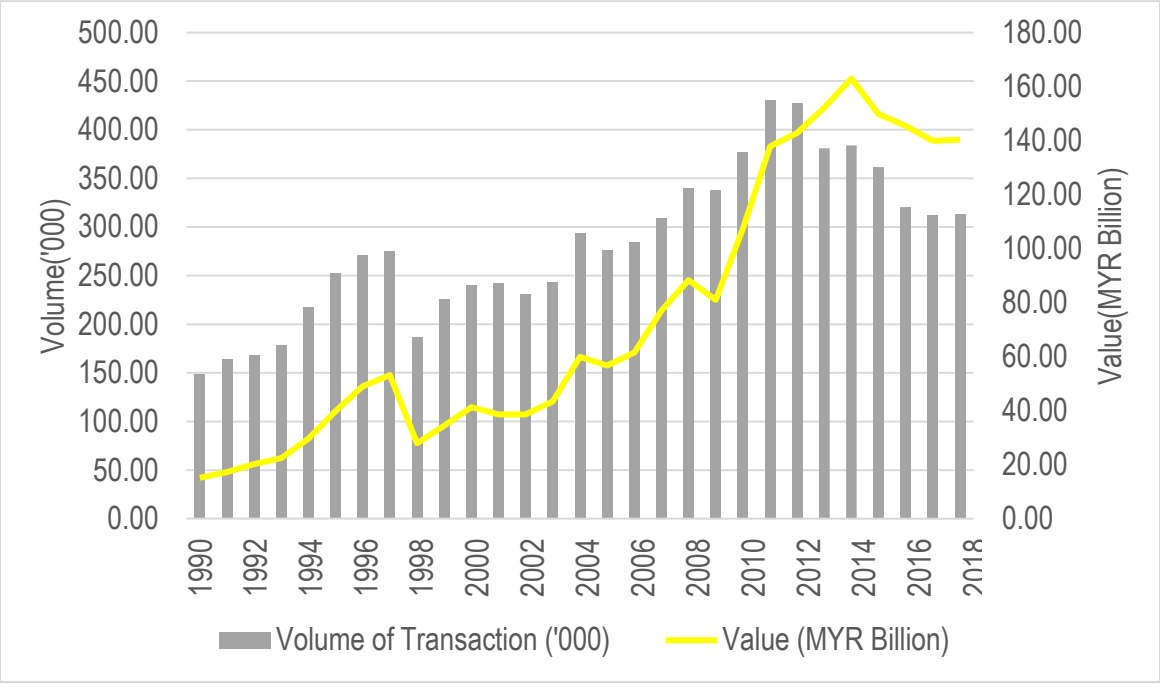


Figure 5: Volume and Value of Property Transactions in Malaysia, 1990-2019

Additional Insights: Historical records show increases in all relevant variables are more than the rate at which affordability is growing/declining as indicated from income increases (approximated by GDP growth rate). According to Cox and Pavletich (2016), affordability of residential property is closely linked to income in which the cost of residential units should not exceed 30 per cent of

[1] On 24 August 2021, the thrice-postponed case of former top politicians is being opened and asked to appear in the Court on charges of corruption. This would further have impact on the economy at least until the court case ends with a decision.

gross income. Bank Negara Malaysia stated a household is no longer sufficiently in affordable spot if the residential price to income ratio exceeds 3.0 (compared for the B40 households at 6 times). However, the range of price to income ratio in Malaysia was 4.0 to 4.4 during 2014-2016 (Khazanah Research Institute, 2016) which would suggest un-affordability is creeping in for both B40 and M40 households, it has to do with the affordability issue. Thus, this matter needs some serious attention.

Finally, the regulatory aspect of the housing sector leaves much to be desired. The current laws make the responsibility for housing at the state level, the state has placed it at the mukim (district) level where the origin of regulations starts. A lot of the land is locked out as in the case of Ireland with the massive amount of land being under the control either the government or the Church. In Ireland, past generations have bequeathed land to the Catholic Church, so the Church holds about 70 per cent of all lands, so the available land for housing purposes are basically limited to the land not in the hands of the rulers. This leads to bidding up the prices of the land since the rulers as sovereigns cannot be asked to release lands. This aspect has yet been investigated, although there are cases of rulers selling a little here and little there to private people at prices not revealed, so no systematic analysis is possible.

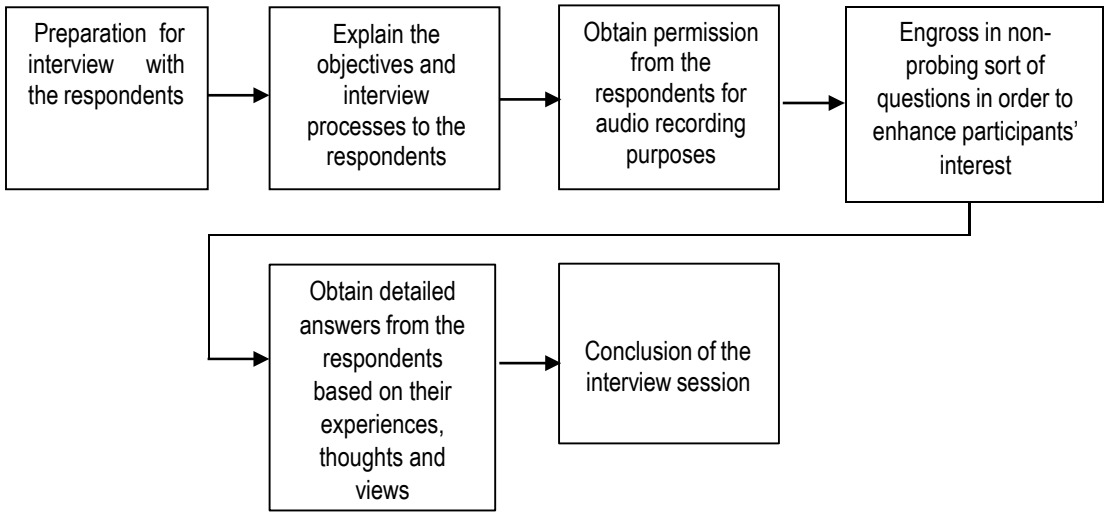
Summarizing the findings on the property sector, it may be said there are key issues that needs to be attended to urgently if the promise of housing of all is to become a reality for Malaysians at all levels. (i) First practical issue is the price to income ratio is far away from 3 as the recommended ration. In Malaysia this ratio is particularly too high for bottom 40 per cent of the households. The land prices in urban areas appear to be very high for developers to build as well as to meet the reported hefty development charges (which is a source of income to the local government). A possible place to start is the scarcity of land in outskirts to draw some demand at the central area as well as find ways to reduce what the developers consider are high development charges in the regulations. (ii) The second issue is how to regulate proportional price-relevant supply to match different demands form low- to middle- to high-income households. There exists a policy that low-income housing must be priced around RM300,000, but supply is so limited all along that the low-income group is left out of the supply side with just about 20 percent of the built units being priced to suit this group.

The statistics cited above show inflation and personal incomes are two fundamental price factors for the housing market. Those are rational drivers of price (test results will be shown in the next section), price formation does not care about land banks in the hands of rulers, or that the income is so much cyclical in this country prone to periodic crises. If issue number two is to be pursued, one needs to know the impact of land-banks on the price levels for lands being bid by the developers for the limited supply due to land blocks issue could be an issue. If the affordability as per the international guide is 3 times the income, then the current ratio of 6 times is not sustainable, which also explains the heavy debt levels of households.

1.3 What do Property Developers Consider as Supply-side Factors?

Semi-structured interviews were used to help us gain a better understanding of the relevant information in measuring the research objectives. Information was obtained from the respondents' work experience, the level of knowledge, and skills. This is expected to reduce the issues of bias and to maximize the data reliability of the content of answers produced by the respondents, thereby enhancing its reliability as the answers are derived from the respondents' individual experiences, thoughts and perspectives. Therefore, the results obtained from the interview were analysed and the analyses are expected to provide impactful outcomes. The process of the semi-structured interview is shown Figure 6. The process begins with preparing for the interview session with each respondent, followed by an explanation of the objectives and purpose of the interviews. The interview is audio-recorded for transcribing purposes which allow for non-probing questions to get respondent's interest during the interview. The interview concluded with collecting feedback provided by respondents followed by a wrap-up of the interview.

The sampling technique used in this study to select the right respondents for analysis adheres to judgemental sampling in which only developers who actively engage in residential projects were included. The initial plan to interview ten developers had to be abandoned as only six were successfully sourced for the interview. Some developers declined to participate in the research due to their heavy work schedule other commitments. The respondents were approached via telephone calls, email to reserve the interview session. According to Polit and Beck (2010), less than ten respondents are sufficient for a detailed exploration of the subject matter. Our number of respondents is expected to meet this suggestion.



Note: This figure reveals the processes involved in carrying out the semi-structured interview. In total, there were six steps involved.

Figure 6: The Process of Semi-Structured Interviewing

The respondents involved in this research are executives working for property developers of residential projects in Malaysia who possess a wide range of experience in the property market. As a rule of thumb, the respondents must have at least five years working experience in the field, for that is believed adequate to allow the respondents to provide enough feedback which are justifiable and comprehensive with regards to the subject matter. This is necessary as the existing literature has largely concentrated on home buyers and investors. Moreover, current studies have also been largely directed towards empirical analysis. As there have been limited studies, if any, which focus on developers' perspectives, this would distinguish our study to that of others, making our study a standalone in the existing literature. We believe that obtaining the developers' understanding of views will make the findings more interesting and significant. Among the participants selected in this study, one is unique in that the respondent is a representative of the National House Buyers Association of Malaysia.

In the process of analysis for the purpose of discussion, all direct quotations from the respondents are included and maintained to ensure the reliability and consistency of responses. The interview was conducted in English as a medium of communication. For confidentiality, each interviewee was labelled 'R1' to 'R6'. A description of the respondents is provided in Table 2. The formulation of interview questions went through a rigorous process prior to the actual interview. The interview

sessions included noting, for example, the number of questions, details of the interviewees and their professional position, with date and time clearly specified disclosed.

Table 2: Interviewees' Profiles for Property Sector Research in Malaysia

Respondent Code	Company Name Respondent's Position	Number of years (working experience)	Number of years company established	Scales of developers M: Medium & S: Small	Total Revenue as of 2018	Listed or Private company	Location
R1	Inta Bina Berhad Assistant Site Agent	10 years	25 years	M	RM 21,199,623	Public Listed	Selangor
R2	HO HUP Construction Company Berhad Manager-Commercial	8 years	More than 50 years	M	RM 28,263,000	Public Listed	Kuala Lumpur
R3	BINASTRA ABLEBUILD Sdn Bhd Senior Project Manager	10 years	7 years	S	N/A	Private Listed	Kuala Lumpur
R4	Malaysian National House Buyers Association Hon. Secretary General	More than 25 years	20 years	N/A	N/A	Non-profit non-political organization	Kuala Lumpur
R5	Ivory Properties Group Berhad Executive Officer	More than 30 years	20 years	M	RM 10,532,000	Public Listed	Penang
R6	Gr Global Medini Sdn Bhd Manager	20 years	5 years	S	RM 871,759	Private Listed	Johor

Note: This table shows the profile of the respondents and the code of interviewees. Overall, the total number of respondents are six (n=6). The respondents are from four main states in Malaysia, namely Kuala Lumpur, Selangor, Penang and Johor.

Once the interview session was over, the interview transcripts underwent content analysis to generate common themes. Each item was carefully examined to produce valuable interpretation. The findings were later synthesised in accordance with themes obtained from the interview transcripts.

The initial step involved in the interview analysis began with carefully listening to the audio recording taken during the interview session and then transcribing the audio into text. This also

allowed for the study to identify key points that the respondents wished to highlight. To preserve the integrity of the interview contents during the transcription process, we maintained 100 percent of their responses without any editing, even for discourse fillers such as "hmm," "yeah," "oh yeah," "ar," etc. The outcomes of interview feedback were divided based on the research question and themes which later helped in differentiating the opinions of the respondents. After the completion of the transcriptions process, we identified four main themes, namely (i) residential market development in Malaysia, (ii) factors influencing residential price in Malaysia, (iii) fulfilment of the needs and wants of middle- and low-income earners in the residential market the role of government, (iv) developers' view on residential price control.

Factors influencing supply side drivers of residential price in Malaysia

With regards to the factors influencing residential prices in Malaysia, we received similar responses from all respondents. The developers argued that the rise in material costs has led to an increase in residential prices in Malaysia. In addition to material costs, one of the respondents also shared that labour costs have gone up as well. In cases where the costs go beyond the planned budget, the developer has to cover the extra cost involved, thus affecting their cost side. Another developer highlighted an interesting point where the existing residential owners tend to increase the value of their house during the liquidation process in order to sell at a good price. This has led to price competition between existing and new residential units. One reason for this may be due to price speculation as existing owners would obviously opt to sell at a higher price. Surprisingly, the demand for existing residential units is higher compared to newly build houses because: (i) existing houses are ready to occupy; (ii) there is more flexibility in administrative matters; (iii) some are even fully furnished; and (iv) other factors. In Malaysia, the demand for existing houses is relatively higher compared to new houses for both purposes such as buy and rent. This has caused a lot of pressure on developers, especially smaller ones. Consistently, Jakabovics et al (2014) and Geithner (2014) also argue the same point where the nature of investment in real estate is causing a hike in housing price especially for rent units. Following are verbatim responses with regards to this matter:

> *"The material costs become so expensive until we have to bear the extra cost. If this is the case, then how can we charge a lower price for the houses? We (the developers)*

receive more impacts such as unable to sell residential units, pressure from government to face heavy competition in the industry" (R1)

"Yes, the residential price nowadays is so high because of higher production costs such as materials and labour cost" (R2)

"I personally think that the speculation in residential market is also playing an important role in the pricing issue. Some buy houses for investment purpose, later when they want to sell, they will quote a higher price for the existing unit to realize good capital gain. If this is the case, then the impact would be on the developer's side as well when building new houses and setting the price. I believe this issue will cause heavy competition in terms of price between existing and new houses" (R3)

The predicament surrounding relationship between land price (land market) and housing price (housing market) is applied through a two-face theoretical argument; neoclassical and Ricardian. As Ooi and Lee (2006) put it: "Do high land prices contribute to high property prices (*Neoclassical*)? Or is it the other way around, high property prices result in high land prices (*Ricardian*)?" (p. 96). Innately, increase in land scarcity whether naturally or artificially will restrict the supply, leading to an increase in the land price, which pushes housing prices even higher (Green et al., 2016; Liang et al., 2016; Hui et al.,2014; Moran, 2008; Glaeser. et al,, 2005b; Mayo and Sheppard, 2001; Hannah et al., 1993). Alternatively, it may be argued that the rise in house prices fuels higher supply of housing capital, in that it contributes to higher demand for land, resulting in higher land prices (Wen and Goodman, 2013). Empirical evidence, however, is somewhat mixed. Ooi and Lee (2006) found that land supply through its price movement have less causation to house prices in Singapore. The same was found in Hong Kong (Tse,1998) and Spain (Altuzarra and Esteban, 2011). In contrast, studies examining land-to- house price in China show that housing prices have greater influence on land prices (Gao and Mao 2003; Wen and Goodman 2013). Kim et al., (2008); Potepan (1996) meanwhile show a bidirectional causality in the relationship between housing prices and land prices in the United States.

In Malaysia, Respondent R1 and R2, attributes the relationship between land cost and house prices to a cost-driven perspective, otherwise known as the neoclassical rent theory argument. A scarcity of available land banks to support rapid urban growth near key economic regions such as the Klang Valley correlates with increasing house prices (see Figure 7). Profitability, as a result, shrinks

exponentially since developers (especially small-scale developers) are highly sensitive to land price changes as they cannot readily pass short-run variations in land cost to the buyers (Somerville, 1996). Implicitly, the more elastic the supply of land the more elastic housing supply will be (Grimes and Atiken 2010).

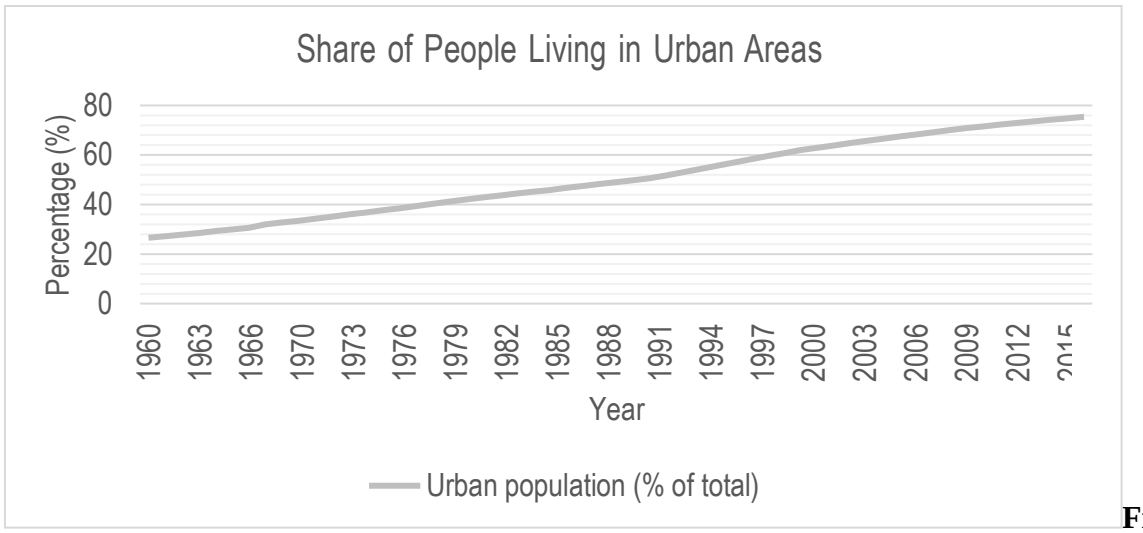


Figure 7: Share of populations living in urban areas (World Bank, 2019)

Interestingly, a representative of the Malaysian National House Buyers Association argued that apart from the issue of increase in material and labor costs, the Good and Services Tax (GST) its removal after the change of government the introduction of Sales Services Tax (SST) has caused the changing cost of production. According to the respondent, construction materials and property transactions costs are not SST-exempted;

> *"There is no change in price of materials although GST has been removed and replaced with SST. Not all materials are exempted under this new tax called SST" (R4)*

Respondent 6 was of a different view when it came to factors influencing residential prices. According to the respondent, location plays a major role in determining the cost. If the location is a built-up location equipped with facilities like universities, theme parks, shopping malls etc., prices are higher due to the better-perceived socioeconomic status and conformability the location provides (Pollakowski, 1982; Rosen, 1974; Mohr, 2001; Greenstone, 2017; Alias et al., 2011). For example, in Bar Iskar, Johor Bharu, the starting price for a newly built condominium is about RM400,000 above due to its built-up location. R6 said:

"It is very common that location plays an important role in the price of a residential property. Moreover, I also think that urbanization will have a direct impact on housing price" (R6)

Rapid urbanization may also cause the sharp increase in prices due to heavy demand from local as well as foreigner buyers (Hay, 2013; Ley, 2010 and Lennartz, 2017, Wang et al., 2017). As urbanization occurs, there is a need for sufficient labor to support economic activity in the locality. The workers – both foreign and domestic – require housing, thereby contributing to rising house prices through demand for real estate.

Developers' opinion with regard to residential price control: This section asks the respondents on methods to control the rising residential price in Malaysia, again prompting different views. Most of the developers agreed that everyone, including developers, contractors, the authorities, financiers, and buyers in the industry play an important role. All parties are linked in this industry. Developers and contractors are facing the issue of higher production costs when building residential units. Therefore, there must be different methods in building a project. For example, in some countries, the use of Industry Based System (IBS) in property construction has been implemented. This method is considered far cheaper compared to the classical method of construction in the long run. As for a start, Malaysia government mandated that public projects should comprise at least 70% of IBS (Khalil, Aziz, Hassim, and Jaafar, 2016). In the private sector, poor economies of scale is a major hindrance in adopting IBS (Yunus, 2017) resulting in higher capital costs (Blismas and Wakefield, 2009; Kamarul, et al., 2010). If there is synergy between everyone in the industry the problem of economies scale can be overcome. Adopting new technologies will lead to higher productivity and reduce the dependency towards foreign workers. Together with the adoption of new technologies, developers also need to consider the use of localized equipment and materials instead of investing on expensive imported materials which would increase the cost of construction and residential price. A respondent stated:

"All of us need to play an important role in controlling housing price. Not only one party is involved. We also consider the use of different techniques such as the Industry Based System (IBS) in order to overcome the issue of production costs"

Providing a different perspective, the representative of the Malaysian National Buyer Association (R4) shared that there must be a continuous review of regulations and monitoring when it comes to residential prices. The Malaysian government needs to continuously design better plans without affecting local as well foreign home buyers to make sure everybody has equal accessibility to own a property. In addition, control over the rental and selling of second-h houses need to be monitored closely as some owners tend to increase the price drastically when liquidating their assets which affect the sales of newly built houses. This view is consistent with the study done by Thaker and Sakaran (2016) and Thaker (2019) which found that the formula of median multiple affordability in Malaysia was "seriously unaffordable" with the median value exceeding 3.0 of housing affordability. This is not a good sign especially for future generations of low- and middle-income earners. The view of R4 is also in line with that of the KRI director which states that there is a need for regulation and better planning to shrink the exploitation of market and the monopoly of higher residential price owned by certain group of developers (The Sun Daily, 2019). Additionally, the planning or regulation which are going to take place must create a healthy competitive market in general. R4 respondent said;

> *"I think, new rules and regulations including better planning are needed to overcome the issue of higher price in residential market in Malaysia. This includes newly built houses as well as second h houses. One way to control the price is via good and viable rules and regulations because everyone adheres to it once implemented"*

R4 further argued that there is a need to consistently monitor the regulations imposed. For instance, the price ceiling for the property value should be revised from time to time as the economy is facing yearly inflation which will affect the land cost and materials. Thus, as an incentive, the government should consider a reduction of infrastructural fees need to understand the cost of development components thoroughly. The respondents also emphasized that as far as the mixed unit development is concerned, incentives should only be given if the development is awarded the Green Building Index GOLD (GBI GOLD). More incentives similar to this need to be offered to further increase the quantity of mixed units. Subsequently, more affordable houses will be available in the market. R4 shared his idea,

> *"…the regulation has to be changed and reviewed on consistent basis by looking at the current economic situation. also, more incentive must be given to developers to cover the cost of production. If there is something to back up the cost, obviously we can offer more residential units which are affordable"*

R3 and R6 shared the view that more partnerships are needed between the government and small-scale developers in developing more low-cost housing projects. Given more partnership, the costs can be divided accordingly, thus reducing the cost of building the residential units. As small-scale developers, it is very important for them to deliver their promises on time without any delay. Furthermore, the demand from local buyers is relatively low while the demand from foreign buyers is higher. This will definitely increase housing price. If there is enough support from the government such as l support, production costs sharing, utilities and other stuff, developers believe that they will be able to offer more affordable units. Abdul-Aziz et al. (2006) capitulate it by showing the existence of highly competitive nature in housing sector. Moreover, according to them, the design of houses keeps changing in accordance with time and pace. Today, the demand from foreign buyers is getting lesser as the current rules and regulation are tightened due to the "Malaysia My Second Home" (MM2H) program and the rarity for foreigners to obtain loans from banks. According to the respondents, this matter has further caused them to suffer losses due to less demand. Considering this scenario, the respondents argued over the possibility and the likelihood for them to offer affordable units given the pressures of oversupply. They said;

> *"Our company is not a well-established company, therefore, the support from government is less. We hope we can have more partnerships with the current government to develop further the property market in Malaysia" (R3)*

> *"Rules and regulation have been changed, subsequently causing pressure on our side where we can't sell the existing units with a good price which can at least cover the cost of production. Last time, we have many foreign buyers in Johor and Penang, but now the demand from them is less due to tighter rules. For example, like MM2H" (R6)*

In summary, the developers have recommended some regulatory steps as suggestions in order to curb the rise of residential price in Malaysia. The recommendations include to: (i) change construction styles, (ii) use localized materials in building the property, (iii) produce better and consistent reviews of rules and regulation, (iv) offer more incentives to developers; (v) encourage more partnerships between private and government agencies in offering affordable houses. The writers would add two more items: (vi) examine the effect of block landholdings on the land prices; (vii) create a single authority in place of 19 different statutory bodies overseeing the housing sector at the Federal level while also making that new omnibus body to have power to over-rule the states on a number of state powers.

1.4 Key Macroeconomic Factors Associated with Prices

The purpose of this paper is to investigate the price drivers of residential property market price to examine co-movement of prices among the regional housing markets. Some authors have dubbed it a thorny issue (Rahman, 2010; Dietz and Haurin, 2003). In a physiological construct, residential property having been culturally instrument of wealth, a source of investment with reference to social and economic status (Liang and Messner, 2017; Couper and Brindley, 1975; Liow et al., 2019b; Kim, 2004). Some have dubbed it a psychological anchor (Logan and Molotch, 1987). Some (Fan et al., 2019; Kok et al., 2018) They even claim that residential property markets is a critical meditating factor in stabilizing the nation economy. It was remarked in the section 1.2 that this economy has too often been buffeted repeated crises, so would stabilizing the property market contribute to stabilizing the economy?

In contrast, transparent and clear understanding are needed especially for understanding of housing price drivers from macroeconomics and financial perspectives. In other words, which macroeconomics factor and finance specific variables have the impact on housing price? Leung (2004) articulated the importance of macroeconomics variables in integrating with housing market should not be discarded or disregarded as slight fluctuation should detangle the stability in the economy; even yielding a spillover effect to financial market.[2]

A uniqueness of this study is that it includes financial variables as well as economic ones as price drivers. Applying the dividend as rental with a g-rate of growth enables this finance theory to be tested in the property market places. The use of dividend discount model from finance in context of this research brings a novel approach to pricing analysis since this theory is applicable if we consider rent as equivalent to dividends in this theory. Further, we adopt the Jordan and Philips (2018) Dynamic Autoregressive Distributed Lag (DARDL), to investigate house price determinants. Using a dynamic simulation of the ARDL model allows us to dissect and improve

[2] See Chetty et al. (2017) as it explains the effects of housing equity on household portfolio choice, in which increase in the housing price risk will leads to decrease in household tendency to participate in the stock market as they become more risk averse.

the inter-wined, complicated relationship across time horizon as demand/supply forces adapt to changing to time-variant factors.

A review of literature on housing price reveals a number of price-relevant economic and financial factors associated with housing prices: see a summary of price-relevant variables in Table 3. Thirteen variables are identified from review of a large body of literature, and no study exists on Malaysia with a fully developed list of variables to be tested with property prices over a long-length observation period. The dependent variable is the rate of change in the price index for the property sector (total is parsed into demand for led-residential and high-rise apartments in five regions of Malaysia. The price index observed over annual end-of year items are reported values collected from sources well known to researchers. The independent variables are theory-cum-empirical study-suggested factors. These factors are grouped as: and rent-specific factors; macroeconomic factors; and financial system variables. It is noted that this attempt to include a large numbers of criterion variables is to enable the results to be robust, and current for the country being studied.

The variables are named in the second column, and the specific equations for the computation of the variables are given in the table. The time series analyses are executed using the basic ARDL model and then re-specified for different assumptions as shown below: The DARDL Equation is using the variables defined in Table 3:

Table 3: Classification of Factors Driving Property Prices and Theory-suggested signs

Variable	Term	Measurement	Source	Expected sign
Dependent variable				
lnΔRp	Residential prices	$\Delta R_P = ln\,(\frac{Rp_t}{Rp_{t-1}})$-1	NAPIC	n/a
Independent variable				
Rent-specific determinants				
lnΔCCGL	Capital Gain Loss	$ln\,\Delta\,CGL = ln\,(\frac{CGL_t}{CGL_{t-1}}) - 1$	NAPIC	+
lnΔCRY	Rental Yield	$ln\,\Delta\,CRY = ln\,(\frac{RY_t}{RY_{t-1}}) - 1$	NAPIC, DOSM I-Property.com	+

ΔCRENS	Rental/Square feet	$ln\,\Delta\,CRENS = ln\,(\frac{RENS_t}{RENS_{t-1}}) - 1$	NAPIC, DOSM I-Property.com	+
Macroeconomic-specific determinates				
lnΔDI	Disposable Income	$ln\,\Delta\,DI = ln\,(\frac{DI_t}{DI_{t-1}}) - 1$	BNM	+
Inf	Inflation	Measured by real inflation	BNM DOSM	+/-
lnΔMarr	Number of Marriage	$ln\,\Delta\,MARR = ln\,(\frac{MARR_t}{MARR_{t-1}}) - 1$	DOSM	+/-
lnΔWG	Wages	$ln\,\Delta\,WG = ln\,(\frac{WG_t}{WG_{t-1}}) - 1$	DOSM	+
Financial system-specific determinants				
BLR	Base Lending Rate	n/a	BNM	+/-
DR	Deposit Rate	n/a	BNM DOSM	+
lnΔMS	Money Supply (M1, M2, M3)	$ln\,\Delta\,MS = ln\,(\frac{MS_t}{MS_{t-1}}) - 1$	WB	+
lnΔCPM	Risk Premium	$ln\,\Delta\,CPM = ln\,(\frac{CPM_t}{CPM_{t-1}}) - 1$	BNM DOSM	+
LTV	Loan to Value Ratio	$LTV = \frac{Loan\ Amount}{Appraised\ Property\ Value}$	BNM	-

Note: This table shows the variables used in the research, it consists of, terms used, measurements, sources

$$\ln \Delta RP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \ln \Delta RP_{t-i} + \sum_{i=0}^{p} \alpha_2 \ln \Delta CCGL_{t-i} + \sum_{i=0}^{p} \alpha_3 \ln \Delta CRY_{t-i} + \sum_{i=0}^{p} \alpha_4 CRENS_{t-i} +$$
$$\sum_{i=0}^{p} \alpha_5 \ln \Delta DI_{t-i} + \sum_{i=0}^{p} \alpha_6 Inf_{t-i} + \sum_{i=0}^{p} \alpha_7 \ln \Delta Marr_{t-i} + \sum_{i=0}^{p} \alpha_8 \ln \Delta WG_{t-i} + \sum_{i=0}^{p} \alpha_9 BLR_{t-i} + \sum_{i=0}^{p} \alpha_{10} DR_{t-i} +$$
$$\sum_{i=0}^{p} \alpha_{11} \ln \Delta MS_{t-i} + \sum_{i=0}^{p} \alpha_{12} \ln \Delta CPM_{t-i} + \sum_{i=0}^{p} \alpha_{13} LTV_{t-i} + \omega_t$$

The F- statistic would show the underlying statistic to measure the existence of the long-run relationship. If the long-run relationship (if cointegration) exists, the F- statistic test explains which variable should be stabilized. According to Pesaran et al. (2001), F-statistic is in a generalized Dickey-Fuller regression which is used to test significance at lagged levels of the variables in a conditional unrestricted equilibrium correction model. The orders observed for the DARDL are selected by the Akaike Information Criterion (AIC) the Shwcharz Bayesian Criterion (SBC) rule

before the chosen model is projected by the Ordinary Least Square (OLS). Furthermore, in the existence of cointegration for DARDL the following equations for short-run elasticity can also be plagiaristic by constructing an ECM of the following form:

$$\ln \Delta RP_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \ln \Delta RP_{t-i} + \sum_{i=0}^{p} \beta_2 \ln \Delta CCGL_{t-i} + \sum_{i=0}^{p} \beta_3 \ln \Delta CRY_{t-i} + \sum_{i=0}^{p} \beta_4 CRENS_{t-i} +$$
$$\sum_{i=0}^{p} \beta_5 \ln \Delta DI_{t-i} + \sum_{i=0}^{p} \beta_6 Inf_{t-i} + \sum_{i=0}^{p} \beta_7 \ln \Delta Marr_{t-i} + \sum_{i=0}^{p} \beta_8 \ln \Delta WG_{t-i} + \sum_{i=0}^{p} \beta_9 BLR_{t-i} + \sum_{i=0}^{p} \beta_{10} DR_{t-i} +$$
$$\sum_{i=0}^{p} \beta_{11} \ln \Delta MS_{t-i} + \sum_{i=0}^{p} \beta_{12} \ln \Delta CPM_{t-i} + \sum_{i=0}^{p} \beta_{13} LTV_{t-i} + \psi ECT_{t-1} + \vartheta_t$$

where Δ= the first difference of the operator,$\beta's$= coefficients of short-run dynamics of the model convergence to equilibrium, $\boldsymbol{\psi}$= shows the speed of adjustment. Error term with lagged parameter (ECT) postulates short-term dispersal from long-term equilibrium. In the short-term phenomena, the variables may scatter from one to another which later will cause a system in equilibrium. Thus, the significance of the coefficient in relation to ECT furnish use proves where ECT drives the variables back to their long-term relationship. The primary data for each variable is subject to certain batteries of diagnostics tests such as (i) stationarity, (ii) multicollinearity, (iii) heteroscedasticity, (iv) serial autocorrelation for those issues.

In this subsection are the findings from the analyses of data. The discussion is based on the main estimator, alternative estimators, and finally on the hypothesis tests.

Cointegration and Bound Test with Critical Values: As Grant and Lebo (2016) pointed that there is need for a well conservative cointegration, Philips (2017) articulated using Monte Carlo simulation and found that autoregressive distributed lag model bound cointegration test is the superlative choice compared to other cointegration test as its ability to disregard spurious relationship for a weakly exogenous regressor. In other word, Malaysia housing price may attribute to be a weakly exogenous dependent. The first step was to select the lag length of the DARDL model, and the chosen lag length was 2 based on the minimum value of AIC (Akaike Information Criteria) and the SBC lag-length criteria technique via the least-square method. The F-statistic results in Table 5 will decide on the existence of co-integration among the variables. The calculated F-statistic for equation (3) is 6.43 which is higher than lower bound critical value at 1 percent (3.2330), 5 percent (2.4760), with 10 percent (t=2.1290), upper bound critical value at 1 percent

(4.760), 5 percent (3.746), 10 percent (3.289) using unrestricted intercept and no trend. This proves that the null hypothesis of no cointegration between ln(ΔRp) and selected variables is rejected at various levels of significance, so the results indicate existence of a long-run relationship between ln (ΔRp) and selected variables.

Table 5: F-statistics of Cointegration Relationship and Bound Critical Values

Equation	Lag	F-Statistics	Significant Level	Bound Critical Values* Unrestricted intercept no trend	
				I(0)	I(I)
(1)	2	6.43	1%	3.2330	4.760
			5%	2.4760	3.746
			10%	2.1290	3.289

Note: *, **. *** denote significant at 10%, 5%, and 1% levels, respectively. Critical values were obtained from Narayanan (2005). The samples involve five residential categories such as semi-D, terrace, condominiums, apartment, detached house, and cluster house. The states covered are Selangor, Kuala Lumpur, Putrajaya, Penang, and Johor. The timeframe used is from 2007 to 2018. The number of lags used is 2 lags.

4.4 Discussion on Dynamic Autoregressive Distributed - Lagged (DARDL)

4.4.1 Diagnostic checks

The research commenced with several diagnostic tests to ensure that the data were fit for the research purpose. Firstly, the test of heteroscedasticity was examined for checking the variation of error terms across the number of observation and this was done via deploying the Breush-Pagan or Cook-Weisberg test. The p-value was (0.1087), indicating no presence of heteroscedasticity in the model. The Cameron and Trivedi's Decomposition of IM-Test with a p-value of 0.12 and the Ramsey RESET: F (3,223) = 1.98 Prob value of 0.1184 revealed the model had no omitted variables. Breush-Godfrey Serial Correlation LM Test with Prob. Chi-Square (2) value is 2.1981 revealing the absence of serial correlation in the model. The correlation results postulated that most of the variables scored less than 70%. Furthermore, the cumulative sum (*CUSUM*) with recursive estimation via OLS showed the model as dynamically stable and acceptable as valid results.

4.4.2 Result Discussion for Regression Analysis

The discussion of the main findings will be based on the main model of Dynamic ARDL. Firstly, the R- Square value (91.56%) presents highly explanatory power in explaining the variation in residential prices in Malaysia with a significance level of F-Statistics. Capital gain /losses (CCGL) show a positive association with residential prices. This highlights that variation in residential prices is subject to investment activities in the property market. Buyers may purchase residential properties for investment purposes. Thus, they can sell the property at a maximum price in the future and enjoy higher capital gains and the opposite is true when residential prices drop. Similarly, Gao et al. (2020) argue that in the US, house market speculation leads to greater residential price appreciation, was a factor in the expansion of the economic and construction of houses during 2004-2006 and the disastrous economic recession due to the economic bust in 2007-2009.

Interestingly, rental yield (RY) does not show any significant relationship. However, rental per square feet (RENS) displays a positive association with change in residential prices. The rental charges obviously depend on the size of the house or unit. The larger the house (higher square feet), the higher would be the price of the residential property. A common phenomenon among developers or existing homeowners nowadays is to set the price of residential based on rental/square feet and the development activities in a particular location. One possible explanation to justify the lack of a relationship between rental yield and the residential price is because rental yield is also dependent on rental per square feet. This outcome is as in Chen et al. (2018) who contend that rental based on district and the size of houses suppress the housing price in Taipei.

The disposable income (DI) presents a positive relationship with residential prices. Affordability principally concerns the cost of the house relative to income. As disposable income increases, the cash holdings will also increase, thus leading to a higher demand for the houses. This is called the dem-pull effect whereby house prices will surge due to greater demand. Another perspective claims that the effect of disposable income towards residential prices may be different depending on how households are described to the buyer, owner, or a tenant. Over the years, Malaysia's economy has recorded positive economic growth (except for the financial and economic crisis in 1997 and 2008), which has successfully transformed the economic status into an upper-middle-income nation. Malaysia is a country with a vision of becoming a high-income-status nation by the year 2020. This has contributed to an increase in the average population's monthly income.

The findings of the Department of Statistics revealed that the median monthly household income has increased from RM 4,585 in the year 2014 to RM 5,228 (data released in 2016), an increase at about 14.2 percent per annum (nominal). The increase in income directly increases the individual purchasing power and the demand for housing. Furthermore, based on the aggregate level behavior, residential prices have increased by a large deviation than the household disposable income. Similar finding, as in Battistini et al. (2018) also report same outcome in the context of the European market Li (2018) in China's residential market.

Next, inflation (INF) recorded a positive association with residential prices. This relationship is common due to the cost-push influence of inflation factor on all inputs. The rise in material costs involving construction such as cement, labor, machinery, equipment, etc. lead to an increase in the cost, subsequently affecting the prices of residential properties. This has been hypothesized by Maguire et al. (2013) and Hussain and Malik (2011). Though government has eliminated the Sales Services Tax (SST) at the time of the study, the costs of construction remain the same and may have dropped slightly. This is because other costs involved in construction the property transaction are not SST-exempted (The Edge, 2019). Following inflation effect, the number of marriages (Source: MARR) was also found to be statically significant in a negative direction. Looking at the social norm perspective, it is very usual for newly married couples to purchase a house soon after marriage. In the point of view of how this affected, escalation of housing prices will lead to a decrease in marriage rate for its effect on income and compensated-substitution effect. This view applies in this market and is similar to reports of Yi and Zhang (2010) Zhang et al. (2011) also revealing same results in their studies in China.

The results also show that the deposit rate (DR) has a positive and significant relationship with residential prices. Although the result was expected to be negative, a possible explanation for the finding may be due to the time horizon. From a long-term viewpoint, a higher deposit rate will result in the surplus of funds in the future which will subsequently cause an increase in residential prices. However, in the short-term perspective, such a relationship will be non-existent. Sutton et al. (2017) are of the same stance after discovering that deposit rate or policy rate did not influence house prices outside of the US but was instead the change in rates. Housing risk-premium was found to have a negative relationship with residential prices.

Table 6: Dynamic ARDL, OLS and Stepwise Regressions Results for Drivers of Residential Prices

Dep. Var. = lnΔRp	Dynamic ARDL(DARDL)	OLS	Stepwise Regression
lnΔCCGL	0.056796	0.123327	
	(0.027056)**	(0.163553)	
lnΔCRY	0.084519	0.051269	
	(0.124040)	(0.352909)	
ΔCRENS	0.266284	0.697429	
	(1.716155)*	(0.425377)*	
lnΔDI	0.0379610	0.039610	0.037217
	(0.0112629)**	(0.0100195)**	(0.0147730)***
Inf	0.0686704	0.062231	
	(0.0386772)**	(0.0686705)*	
lnΔMarr	-1.580593	-6.636853	-5.619
	(0.902218)*	(2.046933)**	(1.860)**
lnΔWG	0.184437	-1.285374	
	(0.330780)	(0.870650)	
BLR	0.059836	0.098648	0.042540
	(0.032762)	(0.098648)**	(0.0343154)**
DR	0.0756802	0.0754381	0.0644981
	(0.037193)***	(0.0310106)*	(0.047486)**
lnΔMS	0.259543	-0.701009	
	(0.259652)	(0.701224)	
lnΔCPM	-8.592656	-2.793583	-1.365
	(1.975865)***	(1.061504)*	(0.640)**
LTV	0.236195	0.799215	0.839
	(0.112046)**	(0.285094)**	(0.285)**
Constant	-3.580287	-8.708622	-3.906
	(-3.653472)**	(-9.725273)*	(3.617)*
R	0.915648	0.250390	0.471
F	6.318805	6.318681	11.088
	(0.000)***	(0.000)***	(0.000)**

Note: This table shows the result of the study's model in terms of the overall analysis. The signs *, **, *** denote significant at 10%, 5% and 1% respectively. The time framework used is an annual basis spanning from 2007 to 2018. Heteroscedasticity = Breush – Pagan/ Cook – Weisberg Test for Heteroscedasticity = chi2 (1): 2.57, Prob >chi2: 0.1087, thus there is no presence of heteroscedasticity in the model. Cameron and Trivedi's Decomposition of IM-Test with Chi-squared of 25.27 p-value of 0.0002. Ramsey RESET: F (3,223) = 1.98 Prob value of 0.1184 revealed the model has no omitted variables. Breush-Godfrey Serial Correlation LM Test with Prob. Chi-Square (2) = 0.1981 revealed there is no presence of serial correlation in the model, Correlation result postulate that most of the variables score less than 70%. The Standard Error-values are reported in the parentheses. The maximum lag length for DARDL is two. The samples involve five residential categories such as semi-D, terrace, condominiums, apartment, detached house, and cluster house. The states covered are Selangor, Kuala Lumpur, Putrajaya, Penang, and Johor. The timeframe used is from 2007 to 2018.

Risk premium tends to have a negative association with housing prices due to risks attached to residential properties such as market risk, earthquake, location risk, and many others. This will

subsequently affect the price movement of residential properties (Bunda and Ca'Zorzi, 2010; Gallin, 2008). The last significant factor is the loan to value ratio (LTV) which is positively related to residential prices. The LTV basically looks at the housing loan eligible based on net income rather than gross income. Thus, the higher the income, the higher the LTV. Correspondingly, as the demand for units will increase, so will the prices. A higher LTV ratio presumably helps to form a more substantial and stable source for housing demand. Our results are also consistent with a study done by Depken et al. (2009).

Three residential price drivers were not significant, namely (i) wages (WG), (ii) base lending rate (BLR), money supply (MS). Wage is not a significant factor, perhaps because the increase or

decrease in wages will *not* drive up the cost of housing for a given level of quality unless the housing development is artificially curtailed by government actions. Unswervingly, BLR and MS were insignificant as their effects are uncertain and dependent on time horizon policies implemented by the government.

As a summary of the results obtained, it is useful to show the parameters estimated against the theory suggested signs described in Table 7: see the summary below:

Table 7: Outcome on coefficient signs of hypotheses

CCGL	CRY	CRENS	DI	INF	MARR	WG	BLR	DR	MS	CPM	LTV
(√)	(×)	(√)	(√)	(√)	(√)	(×)	(×)	(√)	(×)	(√)	(√)
[+]	[+]	[+]	[+]	[+]	[-]	[+]	[+]	[+]	[+]	[-]	[+]

Note: This table shows the overall decision of the hypothesis. (√) which indicates that the hypothesis was supported while (×) informs that the hypothesis was not supported. In addition, [+] denotes that the relationship was positive [-] signifies that the relationship was negative.

It is evident from this table of statistics that excepting four identified price-drivers, 8 variables are found to be consistent with the theorised propositions. The Table 6 may be referred to see the parameter estimates and the statistical significances of the 8 price-relevant factors. The model specific analyses are summarised in the Notes to the Table 6. It may be concluded that the following 8 factors significantly drive the property prices in the country. These factors are CCGL or capital gain/loss; CRENS or rental per square foot; DI or disposable income; INF or inflation; MAARR or number of marriages; DR or bank deposit rate; CPM or market risk premiums; LTC or loan to value ratio.

It is also observed in that table that the model fitness is excellent as indicated by summary statistics. The R- Squared value (91.56%) is evidence of a high explanatory power of the model tested in explaining the variation in residential prices. The F-statistics are also significant suggesting the model is relevant and fits well. In the paragraph above (see also the table for the size of the estimated parameters) eight variables are found to be significantly driving the property price formation.

Further investigation is on whether sentiment index on property a good indicator of actual price formation is (thus also the return to holding the property). We used a constructed sentiment index (SI) as presented in Cheong et al. (2021) and examined its co-movement with the actual price movement over a lengthy period: see Figure 8.

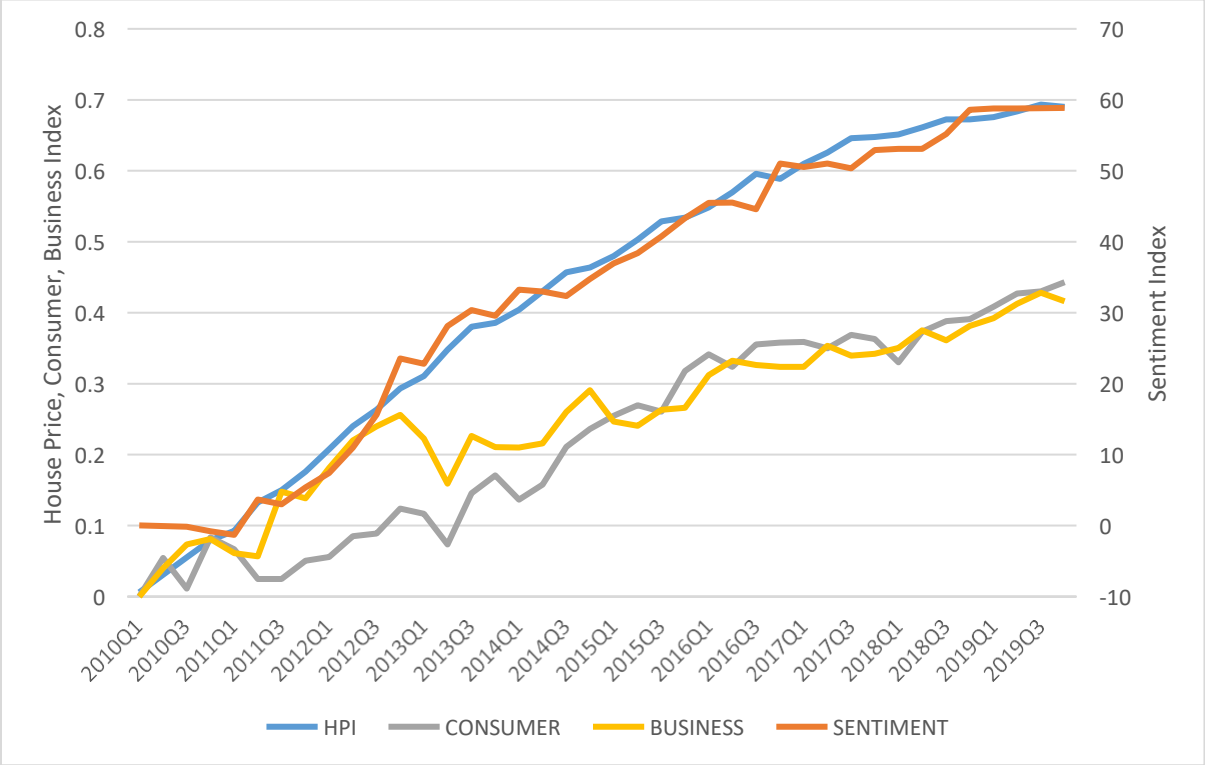


Figure 8: Relationship between Housing Price Index and Sentiment Index, Malaysia

The relationship is plotted for (i) housing price shown in the top graph with the left scale showing the price and (ii) consumer prices and inflation (bottom graph). It is evident that the sentiment index is highly correlated with the housing prices and that the consumer prices sentiment index is also correlated. In an earlier section, evidence was produced that the housing prices over 38 years

tracks the inflation rates. In this graph, it is also evident that the sentiment index is correlated with the consumer price index values. Closer scrutiny of the latter indicates that the relations between consumer price and the sentiment index values is getting very close since 2015. This evidence shows that the sentiment index if polled ahead of time, can be a leading indicator of housing price formation.

1.5 Summary of Findings

This working paper provides new and interesting findings not yet reported about the hotel and the property sector pricing behavior in Malaysia. Based on this ongoing research funded by a national grant, our results have potential referencing value in the literature if published while it has led to three major findings about on the hotel and overall property sectors from data analyzed over a lengthy period. The data gathered spans 38 years to 2019 with about 15 factors examined as to how these factors are inter-related as well as top executives of property companies explaining their perspectives as suppliers of the economic good called built units in two major sectors.

Supply-side comments: The developers clearly see the real estate sector as a key contributor to economic activities while also pointing out the social role of building affordable housing as a unfinished job because of several challenges to fulfilling this social function. Parsing down to some granular level, it is admitted that the national goal of providing affordable (a target of RM300,000 has been suggested as the goal) for low-income group (defined as bottom 40 percent households with about RM43,00 annual incomes) is yet achieved after almost half a century of trying to reach this goal. Three comments emerged as key issues: (i) The land-bank held by state governments should have an impact on the pricing of the lands available to encroach on such lands as a township expands. This problem is the same as that in Ireland where the Church is known to be a block owner of about 70 percent of lands.

The second factor from builders' insights is that there are fragmented regulatory bodies at the Federal level leading to high cost of development charges in addition to the high land cost given the block-ownership problem. There is a need for state jurisdictions to be controlled through laws at the Federal level to speed up start to completion time to bring down the capital cost of longer start to finish time experienced because of lack of Federal laws that could help to overcome delays

and too many layers of approvals form land, and zoning (state controlled) and the overall control of housing. That applies also to the hotel sector. Finally, developers suggest that there is a need to source materials locally meeting the standards to bring down the cost of importing especially with currency depreciation that increases the cost of imported items. If Malaysia is a home for producing Boeing parts, is it not time to manufacture specialist materials for housing?

Pricing Factors at Play in the Market: Two out of some 15 factors are evidently relevant for pricing issue as reported in this study. First is that the housing sector prices has doubled, so has the inflation rate over the same 38 years. While this is now verified, what is unknown is the share of the high land prices for landed properties in the suburban areas as well as the prices being very high for those who wish to stay nearer to the urban centers in high-rise units. Part of the reason for this demand nearer to the city, as in other countries, is the cost and time to travel to work and leisure located at the city centers, let us add the heavy traffic congestion in all cities that makes families to move to the city suburbs and push up costs and prices.

The results of statistical analyses showed that affordability - measured as multiples of annual incomes needed to buy a unit – is around 6 compared to the international norm of 3 times. From this perspective, it helps to explain why the public perception is “housing is not affordable”. This is also partly due to the economy such as this one studied being susceptible for periodic down cycles more so in this region than in developed countries. An adverse effect of the high-price-properties is that households have taken too much debt, which makes household finances highly fragile. Finally, we noted that consumer prices and incomes are the two main drivers of the prices of the properties, be it hotels or housing.

Institutional reasons for low affordability and for the high price of land as well as high development cost (due to fragmented regulations) are perhaps the real drivers for low affordability as well as lack of sufficient supply of targeted priced units. Further studies may have to examine the institutional reasons to understand why affordability is low, and the supply side is unable to build more than about 20 percent for an expected demand of 40 percent of built units as low-cost units.

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