

**TRANSACTION-BASED INDUSTRIAL REAL
ESTATE PRICE INDICES FOR ISKANDAR MALAYSIA**

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ABSTRACT

Iskandar Malaysia is one of the fast growing special economic zones since established in 2006. The huge influx of investment which secured over RM160 Billion, especially on manufacturing sector has created enormous opportunity for demand on industrial real estate. Inspired by the call to have a more open, informative, transparent and sustainable real estate market growth in IM, it is therefore recommended to introduce industrial real estate price indices which are crucial for investment performance assessment and long run price trend tracking purpose. The study used 1,764 industrial real estate transaction data procured from NAPIC over 2005-2014. 2 pricing models have been employed to construct the industrial price indices for IM. Hedonic Regression Model (HRM) is conventional method as alternatively compared to Spatial Hedonic Model (SHM) which is statistically proven to be more superior by capturing the spatial correlation (adjacency effect) into the model. Robustness test on reliability and accuracy of the 2 price indices are also empirically substantiated that SHM is better than HRM with lower Mean Squared Error (MSE) and SEE (Standard Error Estimate). Out of Sample test also reveals that SHM has smaller price differences in between forecasted price versus actual transaction price throughout the study period. The Logical Test on regression coefficient signs postulate SHM is a reliable model for price forecasting in accordance to IM market norm.

ABSTRAK

Iskandar Malaysia merupakan salah satu Zon Ekonomi Istimewa yang berkembang dengan pesat sejak penubuhannya pada tahun 2006. Aliran pelaburan yang amat menggalakkan dengan pencapaian melebihi RM160 Billion, terutamanya dalam sektor perkilangan and pembuatan telah mencipta peluang keemasan kepada permintaan harta tanah industri. Dengan adanya inspirasi untuk menghala ke arah pasaran harta tanah yang lebih terbuka, informatif dan telus supaya mencapai pertumbuhan yang mampan di IM, maka cadangan supaya indek harga harta tanah industri diperkenalkan di mana indek ini amat penting untuk penilaian prestasi pelaburan dan juga untuk tujuan pengesanan and pengawalan harga pasaran dalam jangka masa panjang. Kajian ini mengandungi sebanyak 1,764 data urusanniaga diperolehi daripada NAPIC dalam lingkungan masa 2005 – 2014. 2 model penilaian harga telah dicadangkan untuk membentuk indek tersebut. Model Hedonic Regresi (HRM) merupakan kaedah tradisi yang digunakan berbanding dengan Model Hedonic Spatial (SHM). SHM dibuktikan secara statistiknya merupakan kaedah yang lebih baik dalam menjelaskan perubahan harga kerana SHM mengambil kira hubungan spatial (kesan bersebelahan). Ujian atas kebolehpercayaan and ketepatan untuk indek harga yang dibina mengikut kaedah yang berlainan, keadah SHM terbukti secara empiriknya mempunyai Mean Square Error (MSE) dan Standard Error of Estimate (SEE) yang lebih rendah berbanding dengan HRM. Ujian Out of Sample juga mendedahkan SHM mempunyai julat perbezaan yang lebih rendah di antara harga unjuran dengan harga sebenar dalam sepanjang masa kajian. Ujian Logik atas tanda pekali regresi menyokong SHM sebagai kaedah yang boleh dipercayai untuk unjuran harga mengikut kebiasaan pasaran harta tanah di Iskandar Malaysia.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Real estate price indices study has been one of the core interests in research frontier. Discovering highly reliable and credible price indices to track the rate of price appreciation over time (Li & Tu 2011) and seizing the market trend have proven enormously beneficial for real estate professionals and highly sought after in finance and business application. Simply, price indices could establish barometer of market information on risk and its turning points is paramount important to investment decision making, e.g. risk and return modeling, asset portfolio allocation strategy mapping (Hoesli & Macgregor 2000), price bubbles identification and evaluating investment performance benchmarking (Steven & Roberto 2011).

Nevertheless, price indices are crucial in forming part of the transparency and efficiency functioning of real estate market as the asset class suffers from numerous deficiencies by nature. Abundant real estate literature have peculiarly highlighted the heterogeneity, spatially dispersed, thin transaction and lack of a central market for transaction taking place and therefore, hinder constructing robust and rigorous measures on its market performance. Conversely, the existence of these inefficiencies fundamentally provides idiosyncratic spectrums in real estate studies, including price indices.

Real estate price indices are widely applied in financial and economic world and given its influential effects on deciding taxes, financial and monetary investment call by users like policy-makers, local authorities, real estate developers, mortgage lenders, broker & consultants, retail or institutional investors and other participants. It is envisaged that real estate price indices study will continuously to be the center of attraction by researchers and practitioners.

Undeniably, the capability of accurate, reliable and timely produced real estate price indices in improving real estate market efficiency, detecting inflationary pressure and tracking the real estate credit risk in banking system (EL Mahmah 2012) deems to be the most important application in real estate investment arena. Otherwise, investment decisions based on flawed indices signal can be bias and mislead to sub-optimal portfolio diversification and resources misallocation (Sau 2004).

The evolution of more sophisticated research techniques, especially advancement on spatial and geo-statistical analysis tools allows real estate price indices to be studied at disaggregate level, e.g. focus on specific segment or sub-market together with richness of dataset has further inspired the study on Iskandar Malaysia region, the “limelight” special economic zone since its inception in year 2006.

The Iskandar Malaysia (“IM”) development concept, catalyzed by high impact entry projects and 9 value-added sectors as strategic economy pillar, has successfully created an enormous economic spillover effect on real estate market, cutting across the board of 3 main segments, residential, commercial and industrial. However, there occurs a tremendous price hike, triggering concern of over-valued and fears of sharp correction in due course (Economics Malaysia Nov 14). KGV International Property Consultant shared view that JB real estate market has been sluggish after 1997 Asian Financial crisis, was drawing a steep climb due to investment rush from Singaporean, notable 2012 and 2013 due to both countries warm bilateral relations and enhance of joint venture cooperation by both countries in Singapore and IM.

Industrial real estate segment, for instance, in Southern Industrial Logistic Cluster (SILC) where the land price were RM25 PSF in 2006, doubled in year 2012 and plots are transacted at RM75 PSF currently, as tracked by CBRE Richard Ellis. On the end-product sale, the industrial real estate in JB district used to be transacted below RM200 PSF for years, has surged beyond RM300 PSF in some emerging industrial areas, notably in Pulai, Nusajaya and Senai zone driven by a combination of stimulus factors, like well-planned infrastructures, amenities, catchment and accessibility, apart from introduction of newer product design concept.

IM is an ambitious long term development plan and should be reaching its maturity stage in 2025. The short term spike in real estate prices, although seems to be normal due to the strong interest and speculative element, however, the long term market sustainability will be the real challenges to face. How much of the current real estate market transaction is a hype or highly speculative and how much of it is real transaction that fundamentally supported, there should be a timely and efficient market platform to track and assess in order to promote transparent and informative real estate market in IM. For this purpose, a robust, credible and highly accessible real estate price indices should be part of the reference to facilitate the investment and financial decision making.

1.2 Problem Statement

In tandem with the rapid growth of IM, the industrial real estate segment has experienced remarkable sales performance for past few years. Between 2012 and 2013, almost RM1.0 Billion transactions were recorded (excluding industrial land and workshop)¹ by NAPIC.

Notably, those emerging industrial real estate areas developed after IM inception like Nusajaya's SILC, Senai High Tech Park, Kulai's SME City, Nusajaya's Setia Eco Business Park and etc. have recorded historical high sales prices as compared to traditional industrial areas in JB, Tebrau, Plentong, Larkin, Pasir Gudang and etc. This coincides with some industry experts' feedback that real estate prices in IM has been spirally escalating which can be harmful for overall development due to emerging of price bubbles, if bursts (Economics Malaysia Nov 2014).

Repeatedly, the highlighted problem on without comprehensive data compilation to provide timely assessment on the actual well-being of IM real estate market, especially on the new schemes transactions and its pricing and sales response which mostly relying on announcement from private developers. This will trigger the reliability on such information to be digested as reference for million dollar investment by investors.

1 However, it is believed that the transaction volume should be exceeded the figure as some of the new industrial real estate sales is under the master title prior subdivision into individual title, therefore its transactions have not been recorded as there is no valuation on Memorandum of Transfer (MOT) is required, especially for projects under master developers like SILC.

Meanwhile, the seemingly disproportionate investment gradient towards real estate sector instead of business activities raise the fundamental concern of enough tenancy demand from incoming FDI to fill up the industrial real estate space upon completion (The Straits Times July 2014). The accumulated quarterly incoming supply units² as per record from NAPIC shows tremendous increase of stocks, for example, from Q1-2006 at 119 units to 1,144 units in Q3-2014. The most significant increase was in Q1-2014 to Q2-2014 whereby an increase of 266 units of stock. Meanwhile, the increase of industrial real estate supply units was in tandem with the increase of accumulative committed investment for manufacturing sector in IM, from RM5.5 Billion in 2006, to achieve RM50.97 Billion in 2014 (Sep).

The popularity of IM has led to increase of industrial real estate supply and demand (Transacted Units). The demand (transacted units) were increasing from 100 units in Q1-2006 to 210 units in Q3-2014 against the supply units from 119 units to 1,144 units in the same period. However, the incoming supply in industrial real estate is expected surge in near future given the local developers are realigning their product mix strategy by focusing on industrial segment instead of high rise residential to avoid intense competition with China developers (The Start Oct 2014 & PropertyGuru April 15). This unavoidably will create further intense competition in industrial real estate segment as well and possibly resulting a wait and see sentiment from demand side.

2 The incoming supply units are referred to terrace, semi-detached and detached factory units only which are the type of industrial real estate product that commonly offered for sales in market.

The actual demand on industrial real estate shall be depending on the actual realization on the committed manufacturing investment that expected to generate the space demand. What is plausible happens may be the supply of industrial real estate in IM is far beyond the current need and therefore, a lot of units at “hotspot” areas remain untenanted after a year or 2 of handover, for example, Setia Eco Garden 1 which was completed and handover for more than 2 years by developer, out of 131 units , only 22 units with tenants whereas 83% of the units are still remain vacant as per field survey in March 2015.

The main related issue is not on the high vacancy rate itself under this study, but is pertinent to the underlying investment decision, the acquisition cost (the price) and the rate of return, rent & capital appreciation. For instance, the selling price PSF in new schemes in emerging industrial areas (scheme launched and completed after 2006) at average RM320 PSF net³, the required rental PSF is RM1.60 PSF monthly, based on 6% p.a. (The Edge Mar 2013) as return threshold for investment consideration. Our IM’s rental rate survey⁴ generally revealed that the average asking rent per square feet is below the threshold at approximately. The low capitalization rate reflects the industrial real estate prices likely over-priced. At such, there is an immediate need to create a reliable price indices in IM that help to gauge the rental income yield performance⁵ which is beneficial to provide diagnostic signaling on the healthy growth of this segment to investors.

3 PSF Nett refers to net selling price excludes all sales gimmicks from developers.

4 We compiled some asking rental rate from iproperty.com and average asking rental is below RM1.50 PSF.

5 Rental income yield is total rental per annum after incidental costs incurred divided by the real estate asset value. Increase of price indices signals the possible of low rental yield (%) if rental remains. Therefore, investors can benchmark the yield of return with other alternative investments like FD, bond etc.

In Johor, the residential price indices have been tracked by NAPIC either in district level or in state level by applying Hedonic Regression method. However, industrial real estate price indices have not been compiled by NAPIC under IM region. This will put IM in a disadvantage position because real estate as an attractive asset investment will need a better source of information to analyze its pricing and investment performance either for portfolio management or forecasting general market outlook (Ekaterina 2004). Apparently, price indices is part of this important source and being the special economic zone that aim to draw international investors interest, in the absence of such important investment reference, it is likely a deterrent for active participation from international institutional such as pension fund, insurance companies or real estate investment fund house and etc.

A reliable and accurate industrial real estate price indices can provide a yardstick to measure the manufacturing sector or SME growth pulse. Real estate price indices could prevent the surge of speculative investment and irrational price hikes by providing historical price performance and forward benchmarking. For example, the mean price for IM Industrial real estate has more than doubled from 2006 to 2014. With price trend over the times shown in the price indices, it can provide indication on price movement behavior. For instance, the rate of return for each period whether is in incremental or decrement trend. Therefore, it triggers another concern that in the event the industrial real estate price indices is constructed by using Hedonic Regression, how reliable and accurate of the price indices as compared to other method, for example, Spatial Hedonic method.

Ideally, the price indices study should be disaggregated and zooming into micro level, for instance, in accordance to district, zone or type as variations on prices and its transaction volume is envisaged. Failing to capture the presence of this sub-market will likely to restrain the explanatory capabilities of the developed price indices (Ting 2003). However, the depth of the disaggregation level of study will be primarily depending on the richness of the dataset. Base on the transaction record from NAPIC, the transaction in industrial real estate is much thinner as compared to other segments like residential and commercial, for example, in year 2013, transacted units for residential was about 250,000 units while commercial was about 35,000 units compared to industrial only at about 8,000 units. Therefore, further attempts to track price changes in more disaggregated level may yield insignificant representation on the market changes.

In IM context, constructing industrial real estate price indices will be the pioneering attempt to mitigate the void and this study's focus is on IM region which consists of the transactions under the 5 flagship zones, perhaps it is the first industrial real estate price indices created for IM.

1.3 Research Questions

This study will comprehend the main issues being discussed in problem statement which can be summarized as below;

1. No IM Industrial real estate price indices available currently. What are the different construction methods for price indices?
2. How to construct Hedonic Regression model and Spatial Hedonic model for IM industrial real estate price indices?
3. How reliable and accurate of the price indices being constructed under these pricing models?

1.4 Objectives of Study

The objectives of this study are to respond to the stipulated research questions;

1. To determine the various real estate price indices construction methodology for transaction-based price indices for IM industrial real estate over 2005-2014.
2. To construct transaction-based price indices for IM industrial real estate over 2005-2014 using Hedonic Regression model and Spatial Hedonic model.
3. To compare the robustness of the Hedonic Regression model and Spatial Hedonic model for IM industrial real estate over 2005-2014.

It is hopeful that such findings will inspire further research on this specific area by advocating the initiative of introducing such important price indices by NAPIC as this study is supported by NAPIC with 10 years dataset being furnished for this study.

1.5 Scope of Study

This study shall concentrate on the industrial real estate, namely terrace, semi-detached and detached factory in the 5 flagship zones of IM. The study excludes industrial land and workshop⁶ as the focus is on end product that with land and building that meant for manufacturing activities only. The application of Spatial Hedonic model (SHM) and Hedonic Regression model (HRM) will process the dataset, commenced from Q2 2005 to 2014. This will enable to track the price changes during IM's introduction stage (2005–2006), the beginning stage (2007–2008), the implementing stage (catalyst projects implementation 2009 – 2011) and during the growing stage (2012 – 2014).

1.6 Significance of Study

Given the increasingly prominence of industrial real estate segment in IM, ample of measurement on price behavior is essentially required. The IM industrial real estate price indices aim to bring benefits to followings interest parties, namely;

1. Government / Policymaker

The price indices can be the common proxy for measuring how well of IM's manufacturing sector performs which allows government to strategies further a sustainable growth of the sector. Increase of industrial real estate value indirectly reflects the growth of manufacturing sector.

6 Workshop is excluded because the product is having restriction for ownership to be transferred to foreign buyers.

2. Financial / Banking

As banks still the main source of financing for this asset class, it is important for banks to be triggered with possible price bubbles emerge (Mansor & Law 2013). The abnormal and accelerative price changes under a highly speculative market will likely endanger real economy resulting chaos and distortion. Given IM is the leading special economic zone in the region, obviously the availability of such price indices is vital.

3. Real Estate Developers

The function of price indices is capable to facilitate decision making by industrial real estate developers on development planning and their launching plan so as not to trap with high priced unsold stock when market collapses.

4. Investing buyers

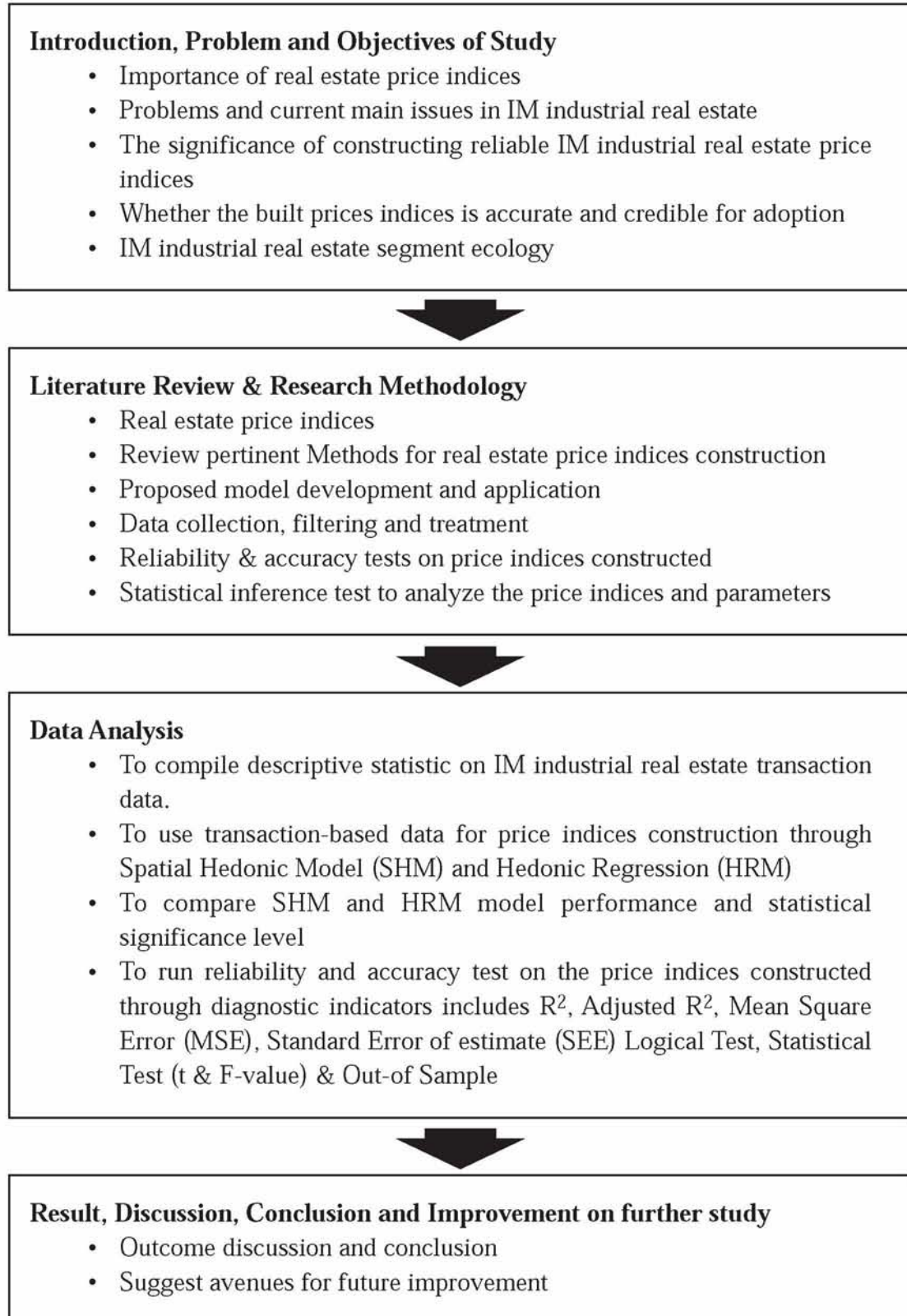
The price indices is useful for investing buyers to assess market performance, to make investment review in according to right timing, ideally, “buy low, sell high” or to avoid capital sunk in during price unreasonably inflated or price bubbles overly ballooned.

5. Researchers

Perhaps, this study will further motivate subsequent exploration on the price indices study not only in IM but on other economic corridors to examine how well being of the real estate market after the special economic zone in place.

1.7 Research Design

The research design is charted as per following :-



1.8 Organization of Study

To fulfill academic research requirement, the study will be systematically organized into following Chapters;

Chapter 1 Introduction

The standard deliverables under this chapter are background of study, understanding on IM and its industrial real estate segment in brief, problem statement, the study objectives, scope of study and its significance to interest parties and lastly on intended research design.

Chapter 2 Understanding Iskandar Malaysia and Industrial Real Estate

The chapter will briefly introduce the Iskandar Malaysia, its development history and vision, current progress and most importantly to discuss the ecology of its industrial real estate.

Chapter 3 Literature Review

The chapter will literately review the relevant journals on real estate price indices, relevant issues, its construction methods and criticisms and lastly, to recommend pricing models for the study.

Chapter 4 Research Methodology

The chapter will prominently discuss on the methods to be applied for price indices construction, dataset sources and its treatment and filtering process, outliers' omission, model development and application and how the data analysis is statistically executed.

Chapter 5 Analysis and Findings

Outcome from the data analysis and application process will be presented and its findings also to be interpreted in this chapter, together with descriptive statistic on data and performance comparison on SHM and HRM.

Chapter 6 Conclusion and Recommendation

Summary of findings will be tabulated while recommendation will be made for future research due to limitation or imperfection from this study.

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