Original Article

How relevant are generalist real estate indices in emerging markets?

Qual é a Relevância de Índices Imobiliários Generalistas em Mercados Emergentes?

Q1   Odilon Costa *, Eduardo Cazassa

Q2   *Fundação Getulio Vargas, São Paulo, SP, Brazil*

Abstract

Real estate indices often rely on strong constant quality assumptions and are too general to be carefully considered by investors. Hedonic techniques are more rigorous than median-price measures to control for quality of the assets in place and the quality of the assets that are put on the market at different times. This research aims to investigate how these limitations affect the usefulness of indicators available in the Brazilian market and how specialized, technically superior (and relatively easy-to employ), indices can contribute to improve performance measurement in emerging real estate markets. To do this, we use an appraisal-based rent dataset from Sao Paulo to create two types of time-dummy measures for office properties. To our records, there appears to be no studies that cover the recent meltdown in this market in such level of detail or that compare the performance of different time-dummy methods. The first model – *standard* – includes time dummies, submarket dummies and property-specific attributes as controls for building quality. The second – *fixed effect* – is an alternative model, where we consider time dummies, time-varying characteristics and property-specific fixed effects. The latter approach deals with time-unvarying locational and property-specific unobserved heterogeneity. Our results reinforce that obtuse measures available often fail to disentangle specific aspects of real estate cycles, which tend to be quite prominent in emerging real estate markets.

Resumo

Os índices imobiliários dependem de hipóteses de qualidade constante. As técnicas hedônicas são mais rigorosas do que preços médios, pois as primeiras controlam a qualidade dos imóveis disponíveis no mercado e a inclusão de ativos em diferentes períodos. Utilizamos uma base de dados única de preços de locação de escritórios comerciais sitos em São Paulo para criar dois tipos de indicadores baseados em dummy de tempo. Segundo nosso registros, não existem estudos sobre a recente desaceleração neste mercado ou que compare o desempenho de diferentes métodos de dummies de tempo. O primeiro modelo – 'padrão' – inclui dummies de tempo, dummies de região e características dos imóveis. O segundo modelo – efeitos fixos – é um modelo alternativo, em que consideramos dummies de tempo, características variáveis no tempo (idade) e efeitos fixos específicos dos imóveis. Esta última metodologia lida com heterogeneidade atemporal não observada. Nossos resultados sustentam a estratificação por região e por classe para explicar a performance de diferentes nichos. O modelo padrão é frequentemente viesado para cima, especialmente nas regiões em desenvolvimento e entre prédios de primeira linha, onde a oferta é mais flexível. Esta metodologia limita a nossa capacidade de controlar efeitos de localização além do nível regional. A rigidez das variáveis hedônicas atemporais não permite acomodar características específicas quando novos edifícios entram na amostra de forma não-aleatória.

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* Corresponding author at: Avenida Nove de Julho, 2029, CEP 01331-902, São Paulo, SP, Brazil.
  E-mail: odilon.costa@pilum.com.br (O. Costa).

Introduction

Research on economic indices is well established in the finance literature, especially when it comes to liquid investment opportunities, such as equity markets (i.e. Hull & McGroarty, 2014; Nardy, Fama, Guevara, & Mussa, 2015; Orsato, Garcia, Mendes-Da-Silva, Simonetti, & Monzoni, 2015). Yet, investors are also interested in aggregate measures of illiquid assets, such as commercial real estate (CRE) price and rent growth, as they provide a useful benchmark of financial performance and enables lenders to value collateral more accurately. While this literature is present in developed countries (i.e. An, Deng, Fisher, & Hu, 2016; Chegut, Eichholtz, & Rodrigues, 2013; Fuerst, Liu, & Lizieri, 2015), studies of CRE indices in emerging market are often bounded for two reasons (Gaiarsa, 2015). First, reliable data is unavailable to the broader public. Second, even when such data is available, it is difficult to find long time series to build reasonable econometric estimates. The lack of quantitative information; however, does not undermine the relevance of CRE as an alternative investment opportunity in large developing economies.

This study aims to investigate indicators available in the Brazilian market, assess their usefulness and limitations, and suggest improvements based on modern real estate literature. The paper advances the literature in two areas – an explanation and empirical assessment of how technically superior (and relatively easy-to-employ) indicators can contribute to performance measurement in the context of Brazil and a comparison of performance across different time-dummy methods.

Available real estate indicators often rely on strong premises due to narrow details on property attributes and location. Interpreting such indicators is usually difficult as they are computed from samples of properties that have unique characteristics. Comparisons of index values in different dates can be misleading, especially when the quality of properties available in the market is correlated with economic activity. For instance, greater index values may reflect sales of newer assets rather than an actual increase in the price of a standard property. This issue is exacerbated in the context of emerging market economies, where business cycles are typically more volatile than that of developed markets.

Data quality is also a concern in the context of emerging markets due to low transparency and illiquidity. Researchers from developed economies often recommend the use of transaction-based data to construct indices as they provide more timely information, especially in market turning points (i.e. Chegut et al., 2013; Fisher, Geltner, & Pollakowski, 2007; Geltner & Fisher, 2007). Such information; however, is often proprietary and search costs in public records are prohibitive. Registered documents generally do not contain detailed information on property attributes. In some countries, such as Brazil, many CRE deals are not necessarily registered because the cost of transacting special purpose entity (SPE) shares is lower than that regular property deal. Omitting such transactions from an index could create selection bias as SPE deals are often associated with larger properties. Munneke and Slade (2000, 2001) confirm the presence of sample selection bias on data from specific populations of office properties in the United States and report a relatively minor bias. This happens because properties transacted in each period are not necessarily representative of the whole market. Market illiquidity in developing countries could create large distortions in transaction-based measures.

Hedonic regressions are one way to overcome many of the limitations associated with median-price methods. They control for quality of the assets in place and the quality of the assets that are put on the market at different times. For office properties, the hedonic approach entails regressing rent or price values on a vector of property-specific and locational attributes. The coefficients represent the marginal value of these characteristics. Changes in these features can be accommodated in the estimates. A constant-quality indicator is then constructed by using the regression to impute a series of prices for a reference set of properties in each time-period. Albeit the theoretical appeal, hedonic regressions have not been widely used as they require detailed data on property features (i.e. Dorsey, Hu, Mayer, & Wang, 2010; Rappaport, 2007).

We use a unique appraisal-based dataset to create two types of hedonic measures for the city of Sao Paulo, the world's 5th largest urban agglomeration with 20.8 million inhabitants (United Nations, 2014), representing 11.5% of Brazil's GDP in 2011 (Instituto Brasileiro de Geografia e Estatistica, 2011). The data contains detailed characteristics from office properties that were available for rent between 2005:Q3 and 2014:Q3. The extensive data allows us to account for locational and temporal heterogeneity and construct quarterly indicators. We also consider different locational submarkets and building classes to compare their performance overtime. Many studies suggest that stratification can be a powerful tool for market analysis, yet this is not always considered by entities that create local indicators.

Dunse and Jones (2002) and Dunse, Leishman, and Watkins (2002) test whether city-level office markets, often assumed as a unitary market, can be divided as intra-metropolitan submarkets using data from Glasgow and Edinburgh. The authors conclude that the office market consists of a set of submarkets which are best defined upon real estate agent's views of market fragmentation as property attributes do not remain constant across different regions of these cities. Recent research from White and Ke (2014) validate that certain office submarkets, such as Pixi and Pudong, located in Shanghai, cannot be viewed as homogeneous or perfect substitutes as the authors do not find convergence in rental performance or interactions among these submarkets. Fuerst, Mcallister, and Sivitanides (2015) provide evidence of heterogeneous returns among building classes in the United States. These authors suggest that the price spread between top-tier and other office properties rose substantially during the financial turmoil of 2007–2009.

This research also contributes to the broader real estate literature as it compares the performance of two hedonic models directly derived from the time dummy method. The first is a quintessential hedonic model which includes locational submarket dummies, time dummies and property-specific attributes. The alternative model considers time dummies, time-varying characteristics (age) and property-level effects as covariates (An et al., 2016). This approach is appealing because it requires