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Explorando o Papel da Qualidade de Ativos na Maximização da Renda no Mercado de Escritórios Comerciais

Odilon Costa¹, Wesley Mendes-da-Silva²

¹ Fundação Getulio Vargas – EAESP and Savoy Imobiliária Construtora Ltda., Av. Paulista, 1000 - 16º Andar – São Paulo, Brasil, odilon.costa@savoy.com.br

² Fundação Getulio Vargas – EAESP, wesley.silva@fgv.br

RESUMO

Utilizamos uma base de dados única com aproximadamente 2.200 torres comerciais localizadas na cidade de São Paulo entre 3T2005 e 3T2014 para estudar a relação entre a qualidade dos ativos e a renda potencial em diferentes nichos do mercado de escritórios comerciais. Nossos resultados sugerem um prêmio de aluguel no nicho de escritórios maiores (corporativo) e que o padrão construtivo é mais relevante na determinação da renda neste segmento. Acreditamos que esta diferença seja decorrente da maior concorrência entre locadores e locatários e da comoditização de padrões construtivos no mercado de escritórios menores (office), pois a renda neste nicho é mais insensível à diferentes níveis de qualidade dos ativos quando consideramos variações de preços entre diferentes regiões. Nós também concluímos que os prêmios de aluguel associados à diferentes categorias de edifícios não são estritamente positivos quando consideramos melhorias no padrão construtivo. Desta forma, proprietários e incorporadoras devem levar em consideração o nicho de mercado e níveis aceitáveis de padrão construtivo para o mercado alvo desde a concepção dos seus planos de investimento a fim de maximizar a renda..

Palavras-chave: imóveis comerciais, qualidade dos ativos, retornos imobiliários, nichos de mercado, Brasil

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Revamping Asset Quality to Maximize Income in Office Markets

ABSTRACT

We use a unique dataset of c. 2200 commercial towers located in the city of Sao Paulo from 2005:Q3 to 2014:Q3 to study the relationship between asset quality and potential income in different niches of the office market. Our evidence suggests a rent premium in the market for larger office space (*corporate*) and that building quality is more relevant in this segment. We hypothesize such difference is due to larger competition and commoditization in the market for smaller office space (*office*) as income in this segment tends to be insensible to different levels of asset quality when we control for spatial variation. We also find that rent premiums associated with building class are monotonically increasing, but not strictly positive across certain quality thresholds. Thus, landlords and developers should take into consideration the market niche and acceptable target building class levels when designing their investment plans in order to maximize income.

Key Words: Commercial real estate, Asset quality, Real estate returns, Market niches, Brazil

1. MOTIVATION AND BACKGROUND

Real estate investors are particularly interested in asset quality because it can be strategically manipulated to increase income levels. Rosen (1974) demonstrates that the net present value of each hedonic characteristic of a real asset determines its price. Williams (1997, p. 387) shows that the option for “redevelopment is more frequent and less extensive, and the resulting market values are greater” in the context of residential real estate. In a more specific setting, Eichholtz et al. (2010) and Fuerst and McAllister (2011) study the price effects of environmental certification and building class on the American office market using hedonic regression analysis. They conclude that certified and upper class assets have higher income and prices because of additional occupier benefits, lower holding costs and a lower risk premium. The drawback of such approach is that practitioners rarely treat office markets as homogeneous. For this reason we test the existence of rent premiums in different niches of the office market and whether the relationship between potential income and asset quality is homogeneously positive in each of these segments.

The so called “office market” can be divided into *corporate* and *office* segments based on leasable office space for two interconnected reasons. First, the market participants in each of these segments are structurally different. Tenants in market for larger office space – *corporate* – tend to be larger and well-known companies. This group has more time and resources to deal with corporate image, employee productivity, security, occupation profile, assessability, parking, and other amenities, and, therefore, is more likely to be sensible to different levels of asset quality. Organizational structure, size, age and opportunistic behavior are among the factors which lead different office users to value similar locations unlike (Clapp (1993)). At the same time, developers and landlords in the *corporate* segment are generally a selected group of players, such as large real estate companies and institutional investors, whereas a wider set of investors have access to opportunities in the *office* niche. Schwartz and Torous (2007) show that competition among developers is relevant to supply-side variables, such as lease prices, building starts and volatility of local lease rates. Real estate investors in competitive environments also have incentives to invest earlier as they are not able to capture the full benefits to waiting that larger players have (Bulan et al. 2009). Second, lease terms in the *corporate* segment can be longer and covenants more flexible than market standards due to lower risk embedded in these lease transactions. Titman and Twite (2013) find that longer term leases are often associated with high-rise and top quality buildings. Benjamin et al. (1992) show that large up-front security deposits are one way to reduce adverse selection of riskier tenants. Upfront guarantees and rent insurance are typically found in *office* lease agreements. Tenants from the *corporate* segment are able to circumvent these upfront costs using a guarantor or a stand-by letter of credit. In short, the overall structure of the *office* market is closer to a perfect competition model, where office space and lease covenants are commoditized and landlords more likely to be price takers.

In light of this scenario, we use a unique dataset of c. 2200 commercial towers located in the city of Sao Paulo from 2005:Q3 to 2014:Q3. According to the United Nations (2014), Sao Paulo is the world’s 5th largest urban agglomeration with 20.8 million inhabitants. IBGE (2011) shows that this metropolitan area accounted for 11.5% of Brazil’s GDP in 2011. Our estimation procedure is the standard log-linear hedonic model. We use age, size, vacancy rates, submarket and time dummies as controls and a building class system as a proxy for asset quality. The model also contains a dummy variable to distinguish the *corporate* and *office* segments based on the average size of leasable areas and interactions between this variable and asset quality.

Consistent with the literature, our estimates indicate that physical depreciation, size and building class are relevant determinants of rent. We also find a substantial rent premium in the market for larger office space and that asset quality is more relevant in this niche when we control for spatial variation. Rent premiums associated with building class are monotonically increasing, but not strictly positive as reported by Eichholtz et al. (2010), Fuerst and McAllister (2011) and Reichardt et al. (2012). For instance, we do not clear indication of incremental rent in AAA buildings relative to AA assets. Low tier A-rated and high tier B-rated assets do not necessarily have different premiums in the *corporate* market niche. Evidence also neglects the existence of rent premiums linked with building class in the *office* segment.

These results reinforce the importance of considering niches in “office markets”, especially when investors design their development and redevelopment plans with the goal of maximizing potential income. The lack of rent premiums associated with asset quality in *office* markets is consistent with a perfect competition equilibrium. Consequently, asset quality in this segment should ideally be tied to acceptable standards of the target submarket. An investor holding a better-than-average *office* building does not yield higher income as tenants in this niche are less concerned with asset-specific amenities. A worse-than-average *office* building could leave investors prone to vacancy risk due to stronger competition among developers (Schwartz and Torous (2007) and Bulan et al. (2009)). At the same time, the positive relationship between building class and rent premiums in the *corporate* segment suggests that it is possible to obtain incremental rent when asset quality is improved.

Ignoring the existence of market segments in the analysis of commercial towers may bias asset quality coefficients towards a middle point between its actual value in *corporate* and *office* niches. As a result, the shadow price of a given amenity, such as an environmental certification, may be overestimated or underestimated, depending on whether the investor holds a *corporate* or *office* building.

The paper is structured as follows: section 2 describes our dataset, variables and identification strategy, section 3 discusses our empirical estimates and section 4 concludes.

2. VARIABLES AND DATA COLLECTION

We obtained our data from CRE Tool, which offers an extensive appraisal dataset for *corporate* and *office* market niches in various cities in Brazil. This system is provided by Buildings¹, a company solely specialized in real estate research. According to Buildings, all data from CRE Tool is collected from landlords, brokers and/or through visits in each asset and is updated on a quarterly basis. The data covers c. 2200 commercial towers in the *corporate* and *office* markets of the city of Sao Paulo from 2005:Q3 to 2014:Q3 on a quarterly basis.

2.1 Variables

Our sample is divided in 14 submarkets and contains information about asking rent (*AskRent*) and the following characteristics for each building in these submarkets.

Corporate = a dummy defining whether an asset belongs to the *corporate* or *office* market niche. This variable is set to one when an asset belongs to the first segment at a given period of time and zero otherwise

¹ For more details regarding Buildings, please visit their website: <http://www.buildings.com.br>

<i>Rating</i>	= a dummy to capture each building class (standard categories AAA, AA, A, BB, B and C). Buildings classifies <i>Rating</i> based on objective (i.e. gross leasable area, floor area, size and age) and subjective (i.e. current occupation, corporate image and quality of technical specifications) characteristics of each asset. This variable is set to one when an asset belongs to a certain class at a given period of time and zero otherwise. All C class buildings were set to zero to avoid perfect multicollinearity. Thus all other classes are measured as premiums relative to this class.
<i>Age</i>	= measured from the year of construction or the year of a major refurbishment (whichever occurred more recently). Observations for building age were segmented into thresholds to allow for potentially time-varying age effects. If a building belongs to a certain age group, this variable takes the value of one and zero otherwise. All assets that are less than 4 years old were set to zero to avoid perfect multicollinearity. Hence parameters for all age thresholds represent discounts relative to new assets
<i>Size</i>	= the natural logarithm of the gross leasable area measured in squared meters
<i>VacPerc</i>	= the percentage of vacancy relative to the gross leasable area multiplied by one hundred

We include a dummy called *Corporate* to consider different market niches based on the average size of leasable areas inside a building. This division is generally subjective in practice, but practitioners recognize the importance of segmenting office markets. For simplicity we considered assets with average leasable area larger than 100 sqm to be part of the *corporate* niche and the remainder as part of the *office* market. As explained in the previous section, this variable captures the unobserved role of different participants and commoditized leasable space that make the *office* market structure closer to a perfect competition model.

In order to isolate the relationship between *Corporate* and potential income, we included other building characteristics to control for asset-specific heterogeneity. Among these we find *Rating*, *Size*, *Age*, and *VacPerc*. The model also contains time dummies to capture economic shocks and submarket dummies and to control for spatial variation. All of these variables are widely discussed in the real estate literature.

Many authors include an “A, B and C” scale of building class to control for asset quality. Eichholtz et al. (2010), Fuerst and McAllister (2011) and Reichardt et al. (2012), find a premium of roughly 20% in A-rated assets over C-rated peers and of 9 to 13% in B-rated assets over C-rated assets in the U.S office market. These findings suggest a strictly positive relation between asset quality and income. We use a similar *Rating* proxy with more layers, namely AAA, AA, A, BB, B and C, based on objective and subjective characteristics of each asset. This rating system is defined by Buildings.

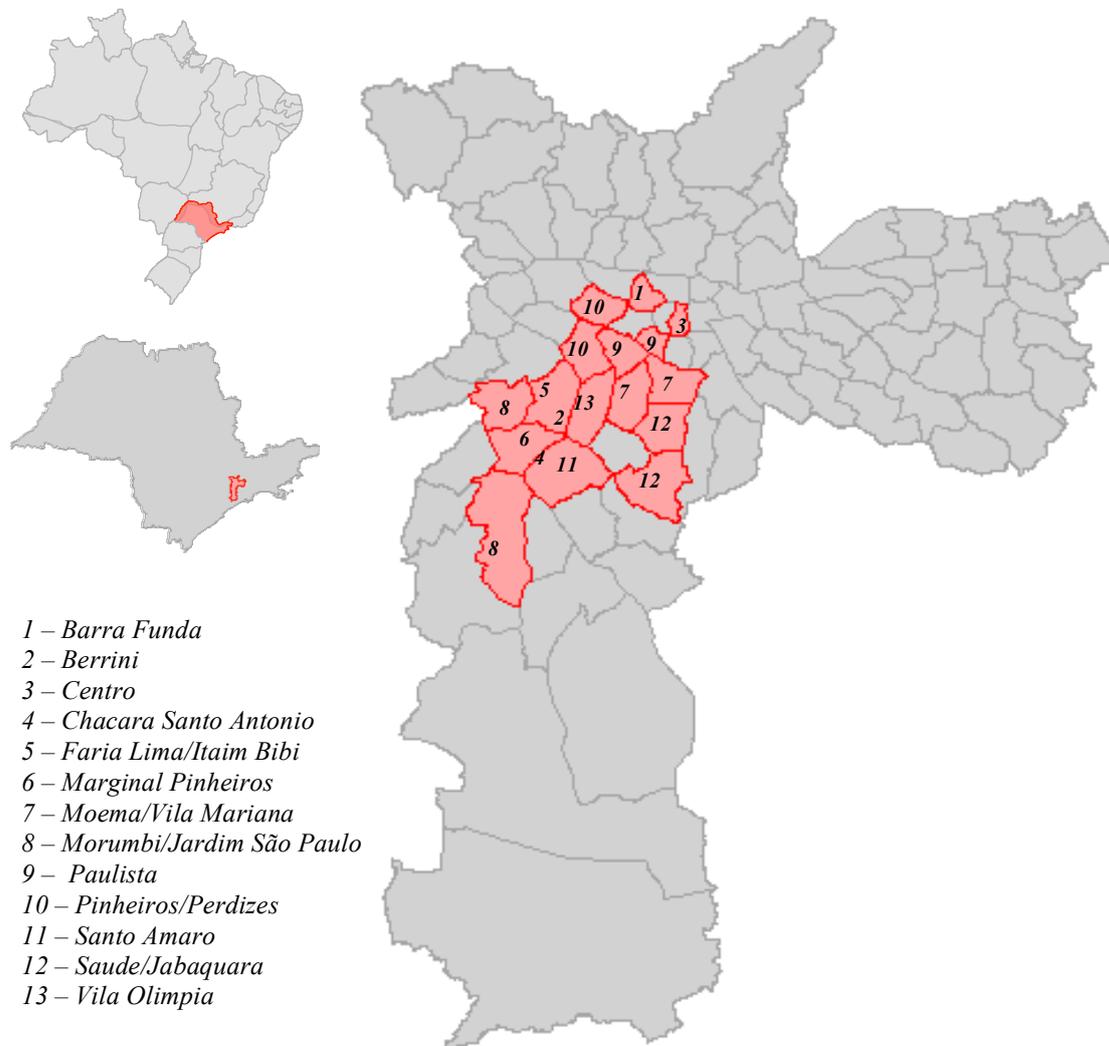
Research on other determinants of rent is considerably more developed. Asset-specific characteristics, such as age, size and vacancy are commonly found as significant in income and price equations. Clapp (1980), Bollinger et. al (1998), Slade (2000) and Dunse et al. (2003) discuss the role of age as a relevant physical characteristic in real estate pricing. Early work by Clapp (1980), Glascock et al. (1990), Bollinger et al. (1998) recognize the role of building size and floor area. Glascock et al. (1990) also find a link between rent prices and vacancy. Pollakowski et al. (1992) and Hendershott et al. (2002) provide further empirical evidence of this link in office markets. Similar results for most of these characteristics are also found in recent

research from Eichholtz et al. (2010), Brounne and Kok (2011), Fuerst and McAllister (2011) and Reichardt et al. (2012).

Several papers discuss the relevance of macroeconomic and credit shocks on real estate prices and income (e.g. Gyourko and Voith (1992), Lamont and Stein (1999), Malpezzi (1999), Fratantoni and Schuh (2003), Davis and Zhu (2004), Himmelberg, et al. (2005), Cubedu et al. (2009), Mian and Sufi (2009), Plazzi et al. (2010) and Favilukis et al. (2012)). Given the concern with overall market conditions, we include time dummies to isolate variation common to all assets.

As far as our research allows, there are three traditional ways to control for spatial variation in the literature. Glasscock et al. (1990), Weathon and Torto (1994) and Fuerst and McAllister (2011) use submarket or city dummies. Rosen (1984), Webb & Fisher (1996) and Gunnelin and Soderberg (2003) avoid the need to control for location by estimating separate regressions in small regions and submarkets. Sivitanidou (1995, 1996), Bollinger et al. (1998) and Oven and Pekdemir (2006) control for spatial variation based on the distance from important locations, such as a railway station.

Figure 1: Submarkets of Sao Paulo Metropolitan Area



Some authors use more specific clusters to deal with spatial variation. Eichholtz et al. (2010) grouped submarkets based on clusters of 0.2 mile radius from a given green building. Campbell et al. (2011) used zip-code level fixed effects to capture all

unobserved heterogeneity related to spatial and asset-specific variation. According to these authors, it is important to consider characteristics which may be omitted when controlling for location and asset quality. These variables might be correlated with omitted variables which are unique to each asset. Abnormal car traffic and criminality or large concentration of high quality buildings in a given submarket may render hedonic models prone to both omitted variable and selection bias due to data censoring (Ghysels et al. (2013)). The problem with specific clusters is that they limit our ability to isolate spatial, locational and asset-specific features of real estate assets, which are a crucial part of hedonic modelling. Within some of these clusters, there are likely to be different qualities of location (Fuerst and McAllister (2011)). The significant variation in the density of development and size of submarket in different locations are also captured in very small clusters. Chen et al. (2009) and Bourassa et al. (2003) suggest that submarkets boundaries drawn using *a priori* information from experts have better in-sample performance than statistically determined clusters.

Albeit the advantages of specific clusters to control for unobserved heterogeneity, we adopt clusters of well-established submarkets in our hedonic model. Sirmans et al. (2006) use various datasets to estimate log-linear models and find that shadow prices for similar characteristics appear to be rather stable when they control for spatial variation. The 14 submarkets we cover are Barra Funda, Berrini, Centro, Chacara Santo Antonio, Faria Lima/Itaim Bibi, Marginal Pinheiros, Moema/Vila Mariana, Morumbi/Jardim São Luiz, Paulista, Pinheiros/Perdizes, Santo Amaro, Saude/Jabaquara, Vila Olimpia and Other. These submarkets are located in the heart of the city of Sao Paulo and have substantial commercial activity.

2.2 Identification Strategy

To test the hypothesis of a premium in the *corporate* niche, we use a standard log-linear hedonic approach. Given that we have panel data, we control for other asset-specific characteristics, macroeconomic shocks and spatial variation. The general empirical model takes the following form:

$$\ln_AskRent_{imt} = c_{imt} + \beta_n N_{imt} + \beta_n R_{imt} + \beta_n Z_{imt} + D_m + D_t + e_{imt} \quad (1)$$

Where $\ln_AskRent_{imt}$ is the natural logarithm of *asked* rent per square foot for asset “i” on submarket “m” at time “t”, N_{imt} is a dummy set to 1 if a building belongs to the *corporate* niche, R_{imt} is a vector of dummies associated with each letter grade and Z_{imt} is a vector of asset-specific control variables, namely *Size*, *Age* and *Vacancy*. The remaining controls, D_m , a vector of location dummies used to capture the impact of submarket “m” which may be common to all assets in a given submarket, and D_t , a vector of time dummies used to isolate macroeconomic shocks common to all assets at a given point in time. c_{imt} and e_{imt} are a constant and an error term, respectively. The hypothesis of a premium or discount in the *corporate* niche is validated if the parameter of N_{imt} is different than zero.

In order to assess the relationship between asset quality and asking rent in each market segment, we also consider interactions between N_{imt} and R_{imt} in an alternative specification:

$$\ln_AskRent_{imt} = c_{imt} + \beta_n N_{imt} + \beta_n R_{imt} + \beta_n NR_{imt} + \beta_n Z_{imt} + D_m + D_t + e_{imt} \quad (2)$$

Where NR_{imt} is a vector of interaction terms between each letter grade and the *Corporate* dummy. This variable reflects the average incremental rent associated with

each building class in the *corporate* segment. If demand *corporate* niche is indeed more sensible to asset quality, this term will be positive. Note that vector R_{imt} now captures the remaining average rent premium associated with each letter grade in this new specification. Because the *Corporate* dummy is equal to 0 in the *office* niche, we can also interpret this term as the elasticity of incremental rent with respect to building class in the *office* segment.

2.3 Data Collection

The descriptive statistics are displayed in Table 1. At a glance, there are some differences between the market niches and their respective building classes. Assets in the *corporate* segment tend to be larger, but not necessarily across all building classes. The mean size of *corporate* buildings is 6.4 thousand sqm while that of office buildings is 3.8 sqm; however, B-rated assets in the *office* niche are slightly larger than their peers in the *corporate* segment. Higher class buildings also tend to be larger and newer in both niches. AAA and AA buildings in the *corporate* segment have, respectively, mean sizes of 34.5 and 18.4 thousand sqm. The comparable figure for AA assets in the *office* niche is 20.3 sqm. The average age of A-rated buildings in both *corporate* and *office* segments is well below the sample mean. These stylized facts reinforce the need to control for asset-specific characteristics when studying market niches and building classes.

Without controlling for the differences between the asset classes, top quality buildings have higher *AskRent* than lower tier assets. Nevertheless, this indicator is not homogeneous when we compare the niches. While mean *AskRent* of C-rated buildings are BRL 32.73 and 34.32, respectively, in the *corporate* and *office* segments, the same figure for BB-rated buildings is on average larger in the corporate niche (BRL 49.71 vs. 37.59). This gap widens as we compare higher-end assets. The average *AskRent* of AA-rated buildings in the *corporate* and *office* segments are, respectively, BRL 106.95 and 84.87. These preliminary indicators suggest the existence of a rent premium in the *corporate* niche and income tends to be less sensible to different levels of asset quality in the *office* segment.

Although sample size increased from 1804 in 2182 buildings between 2005:Q3 and 2014:Q3, table 2 indicates that the distribution of assets in is fairly homogeneous over time. Centro, Faria Lima/Itaim Bibi and Paulista are the largest submarkets of Sao Paulo and account for slightly over 50% of the whole sample. The saturated submarkets of Centro and Paulista lost some their relative importance to growth submarkets, such as Berrini, Vila Olimpia, Marginal Pinheiros and Moema/Vila Mariana, over the last years.

Mean *AskRent* rose substantially over the last decade and stagnated since 2012 (Figure 2) for most submarkets. Note that income also varies substantially across submarkets. For instance, mean *AskRent* in Centro and Marginal Pinheiros were BRL 29.03 and 96.52, respectively in 2014:Q3. These stylized facts reinforce the need to control for location and time in order to successfully isolate the relationship between asset quality variables and *AskRent*.

Although the full database has 71778 observations, we only work with 20556 observations for two reasons. First, not all assets have *AskRent* at all times. In these cases the building is only quoted in the market when there is some vacancy. Note that the number of observations for *VacPerc* and *AskRent* is very similar and the existence of observations often coincides in our dataset. Several assets do not have *AskRent* in any of the periods covered because they are either occupied by their respective owner or under long-term leases.