



The effect of firm characteristics on the prime office accommodation decision

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ABSTRACT

This paper examines whether firm characteristics are significant determinants in leasing decisions of Australian corporate occupiers. A logistic regression is used to examine the significance of industry, company size and geographic reach of 127 ASX300 corporate occupiers on the prime or non-prime corporate office accommodation decision in Melbourne, Australia. Findings indicate that certain industry and company size characteristics are significant determinants of the prime/non-prime decision. However, the amount of influence of these characteristics varied from a previous study. This supports claims about the geographic heterogeneity of markets suggested in earlier studies but does suggest that additional research is required to establish how general is the phenomenon. This work also demonstrates further research is needed into the influence of both objective and subjective firm characteristics on accommodation decisions.

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1. Introduction

Commercial real estate research has traditionally focused on assessing the influence of supply-side property characteristics on the rental values of office and other commercial properties types. This paper addresses office properties. The underlying assumptions are that rental values reflect both occupiers' optimal accommodation choice and their willingness to pay. The emergence of Corporate Real Estate (CRE) which has a demand-side or occupier view on properties (de Jonge, Dewulf, & Krumm, 2000; Heywood & Kenley, 2010 & 2017) challenges those assumptions and suggests that occupier accommodation choices need to be looked at in more detail.

A general supply-side consensus is that a building's physical features (Dunse & Jones, 1998; Ho, Newell, & Walker, 2005; Nase, Berry, & Adair, 2013; Olayonwa, Iman, & Ismail, 2012) and locational attributes (Bollinger, Ihlanfeldt, & Bowes, 1998; Huynh, 2014; Ustaoglu, Turel, & Guzel, 2013) are significantly correlated with office properties' rental values. However, building characteristics are only a secondary determinant for capitalization rates, a traditional measure of value (Parker, 1994). Also, while location is among the primary determinants, experienced property valuers rank it fifth after tenant (occupier)¹ quality, prospects of income growth, the relative risk of property in relation to other asset classes, and the state of the property market (Parker, 1994). Further, in the

absence of tenant (occupier) diversification, tenant quality may be even more critical in single-tenant properties with an estimated ninety percent (90%) of capitalization rate variability associated with tenant and lease qualities (Mooney, Vergin, & Mortrude, 1998).

Demand-side CRE theory suggests that building and location decisions are end-stage decisions in the accommodation decision. These specific decisions flow from strategic business considerations through occupier CRE strategies that translate into statements of requirements in regard to location and buildings to be satisfied by the property market (Nourse & Roulac, 1993; Rabinanski, DeLisle, & Carn, 2001).

The relationship between real estate markets and corporate occupiers' office needs is long established (Dent & White, 1998a; Leishman & Watkins, 2004; Lizieri, 2003; Niemi & Lindholm, 2010). However, much past research is supply-side focused on new and extant properties' physical and locational attributes (Adnan, Daud, & Razali, 2012; Chilton & Baldry, 1997; Fleming, 2005; Kato, Too, & Rask, 2009; Leishman, Dunse, Warren, & Watkins, 2003; Miller, 2014; Warren, 2003) even though the subject matter is intended to be the occupier. Consistent with the supply-side, tenant approach is to assume that what matters are rentals' income streams. Provided that the income stream is maintained from occupiers of comparable quality, then occupiers are substitutable and firm characteristics are of little importance.

Demand-side theory indicates that this may not be the case and that CRE operating decisions (building and location) that align with business strategy will be idiosyncratic because business strategies will differ from one occupier to another, even when in the same market (Heywood & Kenley, 2008). This suggests that occupier accommodation decisions need further examination. There are then, essentially, two different research approaches to be adopted. One approach is individual, firm level case studies. Notwithstanding their value, they have limitations with generalizability given the potentially idiosyncratic accommodation decisions. A second approach is to examine occupiers at some level of aggregation which still respects the inherent variability in firm characteristics.

Past research that has examined this variability and its effect on accommodation quality and real estate as a whole is quite limited. A single study has been identified that explicitly examines the implications of demand-side firm characteristics on office product types (Leishman & Watkins, 2004). The study's authors note that it is unclear whether their results are specific to their case study city, Edinburgh, or are more broadly applicable. Other studies, for example, Dent and White (1998b) and Levy and Peterson (2013) note the importance of firm characteristics but do so peripherally in their discussions rather than subjecting them to empirical study.

This suggests that further research into firm characteristics is warranted, particularly research that measures the influence of corporate occupier characteristics on the demand for office product types (grades). This research contributes to the very small body of work in this area by assessing the influence of three firm characteristics—size, industry and geographic reach – on the office grade decision for Australian corporations listed among the top 300 firms on the Australian Stock Exchange (ASX 300). We hypothesize that these characteristics are significant determinants in this decision.

This paper is organized as follows: the next section critically evaluates the literature associated with occupier demand which is followed by a discussion of the dataset and

research methods. The results of the research are then presented and a conclusion reflecting the contribution and recommendations for further research into the office selection decision are provided.

2. Literature review: firm characteristics and occupier demand

Evaluating the relationship between supply and demand is an ongoing effort in the office property sector, an effort that is reflected in the bodies of research on both sides of the relationship. The supply side (investment real estate (IRE) management – IREM) has a substantial portion of its existing research concerned with real estate as an investment. Examples include the relationship between real estate and other asset classes (Quan & Titman, 1997, 1999; Yong & Pham, 2015), investment strategies and decision-making (Halvitigala & Reed, 2015; Lekander, 2015; Liang & Dong, 2014; O’Roarty, 2009; Pretorius, Walker, & Chau, 2003; Sah, 2011; Simms & Rogers, 2006), factors influencing investment performance (Huang & Hudson-Wilson, 2007; Lieser & Groh, 2014; Moigne & Viveiros, 2008; Sing & Low, 2000), as well as the determination of risks (Young & Brown, 2011) and capitalization rates (Jones, Dunse, & Cutsforth, 2015; Mooney et al., 1998; Parker, 1994).

When supply-side attention turns to the demand-side there is, as noted previously, a relatively large body of research centered on physical characteristics (Dunse & Jones, 1998; Gabe & Rehm, 2014; Ho et al., 2005; Nase et al., 2013; Newell, MacFarlane, & Walker, 2014; Olayonwa et al., 2012) and location attributes (Bollinger et al., 1998; Huynh, 2014; Ustaoglu et al., 2013) on the assumption that these are most important to occupiers, with corresponding effects on rents. Arguably this remains a supply-side view of the relationship and therefore an incomplete representation of demand-side accommodation requirements and decisions.

The demand side (CRE management – CREM) is generally focused on the contribution of property and its management to the occupier’s overall financial and non-financial performance. This occurs through how real estate adds value or enables corporate performance (de Vries, de Jonge, & van der Voordt, 2008; Heywood & Kenley, 2008; Jensen, van der Vooedt, & Coenen, 2012) which is, usually, incidental to financial performance derived from real estate value. A large proportion of the value adding comes from real estate’s role as a production platform for goods and services. Location and building characteristics are part of this but recently there has been a demand-side emphasis on real estate’s design as a workplace (Appel-Meulenbroek, Groenen, & Janssen, 2011; Hoendervanger, De Been, Van Yperen, Mobach, & Albers, 2016) and how this aligns with the occupier businesses’ strategies. Several consequences for the demand and supply relationship flow from this. First, businesses’ strategies will be different even when in the same market (Heywood & Kenley, 2008). Second, aligned workplaces, while superficially similar, could or should then be particular to a business. Third, underlying base buildings need to be different to optimally support the new workplaces, and fourth, occupiers’ rate of adoption is variable with larger, quality occupiers, like financial institutions who typically would occupy prime offices, leading the adoption.

Even though it is the quality of an occupant that underpins real estate value (Mooney et al., 1998; Parker, 1994), much supply-side research does not explore this further. There seems to be an assumption that this premise is so obvious that the particulars of that quality do not

warrant further investigation. So long as the cash flows and the investment value is maintained, one quality occupier is substitutable with another. Such sentiments do overlook that investment value ultimately depend on meeting the preferences of these tenants (Heywood & Kenley, 2010; Niemi & Lindholm, 2010). There are few studies that investigate distinct firm characteristics on office choice. Those that do usually investigate single characteristics such as firm size (Dent & White, 1998a; Leishman & Watkins, 2004; Levy & Peterson, 2013), the industry to which the firm belongs (Dent & White, 1998a; Nunnington & Haynes, 2011; Robinson, Simons, Lee, & Kern, 2016; Rymarzak & Sieminska, 2012), and geographic markets served by the firm (local, national or regional) (Leishman & Watkins, 2004). Few investigate multiple characteristics and the one that does (Leishman & Watkins, 2004) are not sure whether their results are peculiar to their location or are a more general phenomenon.

The demand-side's own research adds to this nascent area of research by investigations into less objective firm characteristics such as:

- The role of organisational priorities in corporate real estate management (de Jonge et al., 2000);
- Corporate governance (Heywood & Kenley, 2010, 2017);
- Internal relationships with business units (O'Mara, Page III, & Valenziano, 2002; Omar & Heywood, 2014);
- CREM's level of strategic evolution (Joroff, Louargand, Lambert, & Becker, 1993);
- CRE's level of strategic-ness (Kaya, Heywood, Arge, Brawn, & Alexander, 2004);
- The role of CRE in firm economies (Heywood and Kenley 2013) and how this is put into effect to achieve firm value; and
- National and personal culture traits in workplace design (Plijter, et al, 2014).

Many of these ideas are integrated into a model that represents how the demand-side relates, as a client and user of supply-side products and services (Heywood & Kenley, 2017). Further, additional factors such as occupier loyalty have substantial investment implications. Besides value for money rent and service charges, occupier loyalty is a function of an amicable leasing process, the property manager's professionalism and the landlord's sense of corporate social responsibility (Sanderson & Edwards, 2016).

As evidenced in the preceding literature, understanding corporate occupier requirements and the variability of these requirements across firms, is important. Often this recognition appears in real estate research with concern for the physical aspects of buildings. Occupier characteristics that reflect their quality and which inform office quality preferences are less intensively studied even though they are likely to affect occupiers' CRE leasing requirements. This research seeks to fill that gap by studying the effects of specific firm characteristics – industry, company size, and geographic reach, on the quality of accommodation leasing decisions of ASX300 corporate tenants in Melbourne. This extends the earlier work of Leishman and Watkins (2004) in Edinburgh and also tests whether their findings are specific to that location or more generally applicable.

3. Data and methodology

This is a quantitative study that, as previously mentioned, is based on Leishman and Watkins (2004) Edinburgh study. For comparison purposes, we sought to maintain the

integrity of the original study to the greatest degree possible. However, some modifications have been made to the corporate occupier characteristics (independent variables) that reflect the nuances of the Melbourne market and the type of data available. First, Leishman and Watkins categorize office space into four product types, whereas this research employs two, prime and non-prime. We do this for two reasons. Firstly, while Leishman and Watkins list their property types numerically the products' quality descriptions are not ordinal. That is, 1 does not equate to the highest quality and 4 the lowest. Indeed, 4 is the highest quality product but then the list is not reverse ordinal in its descriptions. We adopt an ordinal basis here, albeit one with two categories that are widely recognized in industry. Second is that higher quality occupiers that are thought critical to property value are most likely to have or seek accommodation in higher quality (prime) offices.

Second, unlike the previous study, we also test interactions among the independent variables to further explore the relationship between firm type and the prime/non-prime accommodation decision. [Table 1](#) provides a definition for each of the individual variables that are used – firm size, geographic reach, industry and prime/non-prime. A detailed description of each variable follows it.

Melbourne was selected for two reasons. First, Australian corporate headquarters are overwhelmingly concentrated (approximately 70 per cent) in two markets – Melbourne (27.8%) and Sydney (43.0%). The second reason was a convenience one as the researchers were located in Melbourne and are inherently more familiar with that market.

3.1. Independent variables

3.1.1 Firm size

Firm size is measured by market capitalization. The companies examined are publicly listed and are categorized into small cap (*SMALLCAP*; below \$2b in market capitalization), mid cap (*MIDCAP*; \$2b to \$10b in market capitalization) and large cap (*LARGECAP*; more than \$10b in market capitalization), reflecting generally accepted standards in the financial community.

3.1.2 Industry

The *industry* variable is defined by the Global Industry Classification Standard (GICS), a widely used classification scheme that categorizes publicly traded companies into 11 separate sectors (MSCI, 2017). For the purpose of this research, the 11 sectors are streamlined into four industry categories based on the nature of the clientele, an alignment based on the original intent of the GICS to be market-defined rather than product-defined (DST Systems, Inc, 2016). The four market categories include, Mass Consumer (*MASSCON*; Consumer Discretionary, Consumer Staples, Healthcare), General (*GEN*; Energy, Telecommunication, Utilities), Specialised (*SPEC*; Materials, Industrials, Information Technology) and Institutional (*INST*; Financial, Real Estate). The definitions for the GICS sectors are specified in [Table 1](#).

Table 1. Variable definitions and categories.

Variable	Measurement/Definition	Categories for Logistic Regression Analysis
Firm Size	Market Capitalization	<i>SMALLCAP</i> – Small cap below \$2b <i>MIDCAP</i> – Mid cap \$2b to \$10b <i>LARGECAP</i> – Large cap greater than \$10b
Industry	Sector that the ASX300 firm belongs to according to the Global Industry Classification Standard (GICS)	<i>MASSCOM</i> – Mass Consumer Market Sectors catering to the regular everyday person, that is, the mass consumer. GICS Sectors included: Consumer Discretionary, Consumer Staples and Health Care <i>GEN</i> – General Market Sectors catering to the general market of both consumers and businesses. Fundamentally, they are basic needs required for the running of homes and businesses. GICS Sectors included: Energy, Telecommunication, and Utilities <i>SPEC</i> – Specialised Market Sectors catering to highly specialised markets. GICS Sectors included: Materials, Industrials, and Information Technology <i>INST</i> – Institutional Market Sectors which may cater to the everyday consumer through retail banking or residential sales but in terms of revenue and significant transactions, institutional clients make up their key customers or markets. GICS Sectors included: Financial, and Real Estate
Geographic Reach	Geographic extent of the firm's interests comprising of assets, offices, operations, parent companies, subsidiaries	<i>GEOINT</i> – International firm with interests outside of Australasia <i>GEOREG</i> – Regional firm with interests within Australia, New Zealand or Papua New Guinea <i>GEODOM</i> – Domestic firm with interests limited to Australia
Prime/non-prime	This dependent variable examines whether the firms have selected a prime or non-prime corporate office	<i>PRIME</i> – Corporate office is situated in a Premium or Grade A office building (according to Property Council of Australia's (2012) office building grading system) in Melbourne CBD, Southbank or Docklands
Corporate Office		<i>NP</i> – Corporate office is situated in an office building that does not fall under the definition of <i>PRIME</i>

3.1.3 Geographic reach

Because e-commerce has enabled any company to serve overseas markets through online sales channels and distribution partners, the geographic markets served by a company, as defined by Leishman and Watkins (2004), are not necessarily representative of a company's geographic scale. Consequently, we have defined *geographic reach* as the geographic scope of each firm's interests including operations, assets, offices, parent companies and subsidiaries. As this study is based in Australia, "domestic" geographic reach is limited to Australia (*GEODOM*), while "regional" encompasses Australasia

including Papua Guinea and New Zealand (*GEOREG*), and “international” extends beyond Australasia (*GEOINT*).

3.2. Dependent variable

Last, a prime (*PRIME*) corporate office is defined as an office situated in a building that is categorized as Premium or Grade A according to Property Council of Australia’s (PCA, 2012) Office Building Quality classification standard and is also located within the Melbourne CBD, Southbank or Docklands. PCA’s office building grades cover a range of building quality factors (Ho et al., 2005) with Premium and Grade A signifying buildings of the highest quality. Further, offices in the CBD, Southbank and Docklands are generally regarded as the prime locations for investment and development in Melbourne (Knight Frank Australia, 2017; Savills Australia, 2017). In cases where a firm occupies multiple locations, if one of its addresses is located within a prime corporate office, the firm is regarded as having a prime corporate office. Furthermore, it is assumed that these ASX300 office occupiers’ current corporate office locations reflect their latest leasing preferences, and there has been no significant shift in their preferences since the lease commenced. However, if a firm is known to have entered into a pre-lease in a different location, then the new location serves as the reference point for this analysis. Non-prime (*NP*) is defined as any property that fails to meet the standards for *PRIME*.

3.3. Data collection

The specified research problem necessitated the creation and verification of a unique data set from several sources. It is characteristic of Australian real estate research with an occupier focus that there are very limited data sets that allow for quantitative analysis. Where such data sets exist they may be specific to particular states, for example, the requirement to register commercial leases in New South Wales creates a data set that could be used to examine some questions as in Gabe and Rehm (2014).

The data set creation began with downloading the ASX 300 list of companies (current as of 1 April 2017) from the Australian Stock Exchange (ASX) website (ASX300list.com, 2017). The preliminary dataset includes information on industry and company size based on market capitalization. Data on the geographic reach of the firms was added from content analysis of corporate websites and annual reports.

To select the Melbourne firms that lease their office accommodation, three steps were undertaken. Firstly, Melbourne office addresses were located through a comprehensive investigation across multiple sources and websites, including CityScope – an established commercial property database (RP Data Pty Ltd, 2017), annual reports, the ASX website, industry association corporate member directories, developer websites and online news portals. Second, leasehold accommodation was established by identifying from the CityScope database or in annual reports the companies that own their corporate office portfolios. These were removed from the analysis. Third, to establish that they were office properties, company locations were also verified against the Victoria State Government’s Planning Schemes for zoning and where the property’s zoning was industrial or non-commercial, it was assumed that the address was not a corporate office and hence

excluded. The final dataset consisted of 127 ASX300 companies with leased corporate offices in Melbourne.

The relationship between firms' office CRE and other possible operational CRE was not considered here for two reasons. First, corporate office locations (as here) typically represent legacy decisions from firm establishment (Tonts & Taylor, 2010). Second, while not fully applicable here because relatively few ASX 300 firms are global corporations, decoupling between control (corporate offices) and production (other CRE) of global firms is evident (Bartlett & Hedlund, 1996; Phelps, 1993; Tonts & Taylor, 2010). Given Australia's continental geographic scale and its state-based markets a similar decoupling would be expected here, though to our knowledge, this has not been tested empirically.

3.4. Model

Because the dependent variable of a prime or non-prime corporate office selection is binary, logistic regression was used to analyze the data. The aim of logistic regression is to predict the outcome of a binary dependent variable based on the construction of a model that includes independent variables theoretically related to the outcome. It is a test of probability where, in this case, the dependent variable *PRIME* is equal to 1 and changes in the value of the independent variables lead to an increase or decrease in the likelihood of *PRIME* occurring. The equation representing this is

$$P(Y = 1|X_1, X_2, \dots, X_k) = \frac{1}{1 + e^{-\left(a + \sum_{i=1}^k \beta_i X_i\right)}}$$

where X_i represents the series of independent variables including industry, firm size and geographic reach, β is the coefficient for the respective variable and $P(Y = 1)$ represents the probability of a prime accommodation choice given differences in X_i (Hu & Lo, 2007).

In this research the logistic regression was conducted in two stages. In the first stage, the independent variables of industry, firm size and geographic reach were regressed against the prime/non-prime dependent variable. Variables and summary statistics are shown in Table 2.

In the second stage a set of interaction variables were created and regressed against the dependent. For example, *MASSCON* and *SMALLCAP* independent variables were combined into mass consumer small cap (*CONSMALL*). Subsequent models analyzed the

Table 2. Stage 1 variables and summary statistics.

Variable	Definition	Number of Observtions	Percent of Total
<i>PRIME</i>	Prime office space = 1	63	49.6%
<i>NP</i>	Non-prime office space = 0	64	50.4%
<i>MASSCON</i>	Consumer Discretionary, Staples, Health Care	32	25.2%
<i>GEN</i>	Energy, Utilities, Telecommunications	12	9.4%
<i>SPEC</i>	Materials, Industrials, IT	45	35.4%
<i>INST</i>	Finance, Real Estate	38	29.9%
<i>SMALLCAP</i>	Market Cap: < \$2 billion	66	52.0%
<i>MIDCAP</i>	Market Cap: \$2 to \$10 billion	41	32.3%
<i>LARGECAP</i>	Market Cap: > \$10 billion	20	15.7%
<i>GEODOM</i>	Within Australia	40	31.5%
<i>GEOREG</i>	Australasia	18	14.2%
<i>GEOINT</i>	Beyond Australasia	69	54.3%

PRIME is the dependent variable; total N = 127.

Table 3. Stage 2 variables and summary statistics.

Variable	Definition	Total Number of Observations	Number of Prime Observations	Percent of Prime Observations	Number of Non-Prime Observations	Percent of Non-Prime Observations
Industry/Company Size Interactions						
<i>CONSMALL</i>	Mass consumer small cap	23	6	26%	17	74%
<i>CONMID</i>	Mass consumer mid cap	9	2	22%	7	78%
<i>GENSMALL</i>	General market small cap	3	2	67%	1	33%
<i>GENMID</i>	General market mid cap	6	4	67%	2	33%
<i>GENLARGE</i>	General market large cap	3	3	100%	0	0%
<i>SPECSMALL</i>	Specialised small cap	23	6	26%	17	74%
<i>SPECMID</i>	Specialised mid cap	15	7	47%	8	53%
<i>SPECLARGE</i>	Specialised large cap	7	5	71%	2	29%
<i>INSTSMALL</i>	Institutional small cap	17	12	71%	5	29%
<i>INSTMID</i>	Institutional mid cap	11	8	73%	3	27%
<i>INSTLARGE</i>	Institutional large cap	10	9	90%	1	10%
Industry/Geographic Reach Interactions						
<i>CONDOM</i>	Mass consumer domestic	13	3	23%	10	77%
<i>CONREG</i>	Mass consumer regional	6	1	17%	5	83%
<i>CONINT</i>	Mass consumer international	13	4	31%	9	69%
<i>GENDOM</i>	General domestics	4	3	75%	1	25%
<i>GENINT</i>	General international	8	6	75%	2	25%
<i>SPECDOM</i>	Specialised domestic	5	3	60%	2	40%
<i>SPECREG</i>	Specialised regional	8	1	13%	7	88%
<i>SPECINT</i>	Specialised international	32	14	44%	18	56%
<i>INSTDOM</i>	Institutional domestic	18	13	72%	5	28%
<i>INSTREG</i>	Institutional regional	4	3	75%	1	25%
<i>INSTINT</i>	Institutional international	16	13	81%	3	19%
Company Size/Geographic Reach Interactions						
<i>SMALLDOM</i>	Small cap domestic	27	11	41%	16	59%
<i>SMALLREG</i>	Small cap regional	12	2	17%	10	83%
<i>SMALLINT</i>	Small cap international	27	13	48%	14	52%
<i>MIDDOM</i>	Mid cap domestic	8	6	75%	2	25%
<i>MIDREG</i>	Mid cap regional	4	1	25%	3	75%
<i>MIDINT</i>	Mid cap international	29	14	48%	15	52%
<i>LARGEDOM</i>	Large cap domestic	5	5	100%	0	0%
<i>LARGEREG</i>	Large cap regional	2	0	0%	2	100%
<i>LARGEINT</i>	Large cap international	13	10	77%	3	23%

PRIME is the dependent variable. There were zero observations for mass consumer large cap and general market regional firms.

interactions between industry and geographic presence as well as company size and geographic presence against the probability of a prime accommodation choice to gain a deeper understanding of the significance of the firm characteristics. Correlation coefficients for these variables were also examined. The summary statistics for the variables in these models are shown in [Table 3](#).

3.5. Data limitations

When dealing with relatively small data sets such as this, variable interactions may result in categories with few or even no observations. Further, sufficient volume and variation within the categories are necessary to conduct a rigorous analysis, otherwise results may be biased, difficult to interpret or simply incorrect. Our data set suffered from some of these problems. Zero observations existed in the Mass consumer Large cap and General market Regional firm categories, so these variables are untested. Other variables were purposely removed from the models due to lack of variation within the category. For

Table 4. Pearson's correlation coefficients – Stage 2.

Variable 1	Variable 2	Coefficient	Shared Observations
<i>CONSMALL</i>	<i>CONDOM</i>	0.7181	13
<i>CONMID</i>	<i>CONINT</i>	0.6154	7
<i>GENSMALL</i>	<i>GENINT</i>	0.5999	3
<i>GENMID</i>	<i>GENINT</i>	0.5533	4
<i>GENLARGE</i>	<i>GENDOM</i>	0.5657	2
<i>SPECINT</i>	<i>SPECMID</i>	0.5182	13
<i>INSTSMALL</i>	<i>INSTDOM</i>	0.5033	10

Only those values exceeding ± 0.5 are reported. Full results are available upon request.

example, 100% of the observations in the *DOMLARGE* and *GENLARGE* categories are in prime locations whereas all of the *LARGEREG* are in non-prime locations. It should also be noted that, although they are tested in our models, individually *GENDOM*, *SPECDOM*, *INSTREG*, and *MIDREG* constitute a very small portion of the overall data set with less than six observations in each category.

In the first stage of the research, Pearson's correlation coefficients were calculated to test the strength of the linear relationship between the different variables within each category (industry, firm size, geographic reach). Most coefficients failed to meet the ± 0.5 threshold, indicating a weak linear relationship. Those that did show a strong linear relationship, however, were contained within the same category and the relationship negative. For example, *SMALLCAP* and *MIDCAP* show a strong inverse relationship (-0.7182) as do *GEODOM* and *GEOINT* (-0.7396). These relationships are a likely a result of the disproportionately small number of observations that fell within the third category in each group, namely *LARGECAP* (15.7%) and *GEOREG* (14.2%), respectively.

Correlation coefficients were also calculated in the second stage where variable interactions are considered. Again, most relationships fail to exceed the ± 0.5 threshold, with some notable exceptions shown in Table 4. Closer examination of the data indicates potential interpretation problems due to these relationships. For example, the variable *CONDOM* includes 13 observations, all of which are also *CONSMALL* (23 observations). This leads one to question which variable is influencing the prime office accommodation decision. While results are unclear, effects can be narrowed to those two groups. These results are not unexpected in either stage of the research as the sample is relatively small. This is, of course, a function of a limited universe of properties in Melbourne from which to curate a sample.

4. Results

Overall, the final model from the first stage of the logistic regression analysis is significant as reflected by the measures shown in Table 5. The Hosmer and Lemeshow test resulted in non-significance (> 0.05) of the null hypothesis, an indication of the model's goodness-of-fit. Further, the model correctly predicted prime/non-prime corporate office selection in Melbourne in 72.4% of the cases. The Nagelkerke R^2 , with scale values ranging from 0 to 1 as adjusted from the Cox & Snell R^2 (Nagelkerke, 1991), indicates that collectively, firm size, geographic presence and industry account for 30.9% probability of prime/non-prime office selection.

Table 5. Logistic regression results 1.

Cox & Snell R ²	NagelkerkeR ²	Hosmer and Lemeshow test	
0.231	0.309	Sig .928	
Model Summary			
Predicted			
Actual	NP	PRIME	Percent Correct
NP	50	13	79.4%
PRIME	22	42	65.6%
Overall Percent Correct			72.40%

The cut value is 0.500.

In interpreting the logistic regression results, a p-value of less than or equal to 0.05 is indicative of the independent variable's significance in predicting the dependent variable outcome. The odds ratio, Exp(B), is the ratio between the odds of each independent variable resulting in prime corporate office selection and the odds of the reference category independent variable resulting in prime corporate office selection. The reference categories were selected based on the hypothesis that they are the characteristics most likely to result in a prime location. For example, in the individual firm characteristic model, the reference categories are *INST*, *LARGECAP* and *GEOINT*, as these were assumed to be the characteristics most representative of prime corporate office locations.

4.1. Individual firm characteristics

Table 6 shows the results from the individual firm characteristics model, the first stage of the research. The firm characteristic variables significant in predicting ASX300 companies' leasing decisions between prime or non-prime corporate offices are *MASSCON* (Consumer Discretionary, Consumer Staples, Health Care), *SPEC* (Materials, Industrials, Information Technology) and *SMALLCAP*. The positive coefficients indicate that firms with these characteristics are predisposed to choose prime corporate offices with *MASSCON* 6.820 times more likely and *SPEC* 4.572 times more likely than *INST* (Finance, Real Estate) companies (the reference category). *SMALLCAP* firms are 5.250 times more likely than *LARGECAP* (the reference category) to lease prime corporate offices. The geographic reach variables bear no significance on these firms' corporate office leasing decisions between prime or non-prime corporate offices. The Variance Inflation Factors (VIF) are at acceptable levels (<2.0), indicating no multi-collinearity issues.

Table 6. Logistic regression results – Individual firm characteristics.

Variables	B	S.E.	Wald	Sig.	Exp(B)
<i>MASSCON</i>	1.92	0.581	10.93	0.001***	6.82
<i>GEN</i>	0.235	0.808	0.085	0.771	1.265
<i>SPEC</i>	1.52	0.547	7.714	0.005***	4.572
<i>SMALLCAP</i>	1.658	0.723	5.257	0.022**	5.25
<i>MIDCAP</i>	1.399	0.74	3.575	0.059	4.05
<i>GEODOM</i>	0.062	0.509	0.015	0.903	1.064
<i>GEOREG</i>	0.924	0.681	1.84	0.175	2.518
Constant	-5.147	1.697	9.199	0.002***	0.006

Variables entered on Step 1: *MASSCON*, *GEN*, *SPEC*, *INST* (reference category). Variables entered on Step 2: *SMALLCAP*, *MIDCAP*, *LARGECAP* (reference category). Variables entered on Step 3: *GEODOM*, *GEOREG*, *GEOINT* (reference category); ***significant at 0.01; **significant at 0.05

Table 7. Logistic regression results – Industry/Company size interactions.

Variables	B	S.E.	Wald	Sig.	Exp(B)
<i>CONSMALL</i>	3.5586	1.1649	9.3318	0.0023***	35.1136
<i>CONMID</i>	3.8020	1.3388	8.0653	0.0045***	44.7926
<i>GENSMALL</i>	2.0244	1.6347	1.5336	0.2156	7.5714
<i>GENMID</i>	1.9869	1.3717	2.0981	0.1475	7.2929
<i>SPECSMALL</i>	3.5328	1.1564	9.3332	0.0023***	34.2205
<i>SPECMID</i>	2.7334	1.1901	5.2755	0.0216**	15.3858
<i>SPECLARGE</i>	1.7850	1.3588	1.7258	0.1890	5.9598
<i>INSTSMALL</i>	1.6511	1.1883	1.9307	0.1647	5.2128
<i>INSTMID</i>	1.6754	1.2643	1.7560	0.1851	5.3410
<i>GEODOM</i>	0.1111	0.5371	0.0428	0.8362	1.1175
<i>GEOREG</i>	0.9491	0.7023	1.8263	0.1766	2.5833
Constant	-21.0924	8.8897	5.6296	0.0177**	0.0000

Variables entered on Step 1: *CONSMALL*, *CONMID*, *GENSMALL*, *GENMID*, *GENLARGE*, *SPECSMALL*, *SPECMID*, *SPECLARGE*, *INSTSMALL*, *INSTMID*, *INSTLARGE* (reference category), *GEODOM*, *GEOREG*, *GEOINT* (reference category); ***significant at 0.01; **significant at 0.05.

4.2. Variable interactions

4.2.1. Industry/company size interactions

In the second stage of the research the independent variables are interacted, beginning with the industry and company size variables. *CONSMALL*, *CONMID*, *SPECSMALL* and *SPECMID* are significant, with *CONMID* firms more likely than *CONSMALL* counterparts to select prime corporate offices. In the specialized market, *SPECSMALL* is more likely than *SPECMID* to prefer a prime office. VIF statistics for the variables fell below 2.0. Results are shown in [Table 7](#).

4.2.2. Industry/geographic reach interactions

When interacted with the Mass consumer and Specialized industries, all geographic reach variables are significant, with the exception of the interaction of *GEODOM* and *SPEC*. In the specialized market, regional firms (within Australasia) are most likely to select prime corporate offices, followed by those with an international reach. VIF statistics for the variables all fell below 3.0. Results are shown in [Table 8](#).

Table 8. Logistic regression results – Industry/Geographic presence interactions.

Variables	B	S.E.	Wald	Sig.	Exp(B)
<i>CONDOM</i>	2.1135	0.9664	4.7829	0.0287**	8.2772
<i>CONREG</i>	2.6347	1.2868	4.1920	0.0406**	13.9387
<i>CONINT</i>	1.8998	0.9033	4.4228	0.0355**	6.6844
<i>GENDOM</i>	0.6823	1.3834	0.2433	0.6219	1.9784
<i>GENINT</i>	0.1151	1.0623	0.0117	0.9137	1.1220
<i>SPECDOM</i>	0.7650	1.1707	0.4270	0.5135	2.1491
<i>SPECREG</i>	2.9439	1.2658	5.4090	0.0200**	18.9895
<i>SPECINT</i>	1.5977	0.7570	4.4539	0.0348**	4.9416
<i>INSTDOM</i>	0.1867	0.8549	0.0477	0.8271	1.2053
<i>INSTREG</i>	0.4600	1.3979	0.1083	0.7421	1.5841
<i>SMALLCAP</i>	1.6359	0.7489	4.7717	0.0289**	5.1342
<i>MIDCAP</i>	1.3123	0.7585	2.9932	0.0836	3.7146
Constant	-13.8015	6.6034	4.3683	0.0366**	0.0000

Variables entered on Step 1: *CONDOM*, *CONREG*, *CONINT*, *GENDOM*, *GENINT*, *SPECDOM*, *SPECREG*, *SPECINT*, *INSTDOM*, *INSTREG*, *INSTINT* (reference category), *SMALLCAP*, *MIDCAP*; *LARGECAP* (reference category); **significant at 0.05.

Table 9. Logistic regression results company size/geographic reach interactions.

B	S.E.	Wald	Sig.	Exp(B)
1.7829	0.8235	4.6868	0.0304**	5.9469
2.8464	1.0498	7.3511	0.0067***	17.2253
1.3595	0.7761	3.0682	0.0798	3.8942
1.3287	1.0880	1.4914	0.2220	3.7762
1.8823	1.3513	1.9404	0.1636	6.5685
1.3622	0.7707	3.1243	0.0771	3.9048
1.9097	0.6072	9.8926	0.0017**	6.7509
0.3080	0.8175	0.1419	0.7064	1.3607
1.5560	0.5649	7.5868	0.0059***	4.7400
-11.8270	3.9703	8.8735	0.0030***	0.0000

Variables entered on Step 1: *SMALLDOM*, *SMALLREG*, *SMALLINT*, *MIDDOM*, *MIDREG*, *MIDINT*, *LARGEINT* (reference category), *MASSCOM*, *GEN*, *SPEC*, *INST* (reference category); *DOMLARGE* and *GENLARGE* lacked sufficient variation within the category to be tested;***significant at 0.01; **significant at 0.05.

4.2.3. Geographic reach/company size interactions

Results from the interactions between geographic reach and company size show *SMALLDOM* and *SMALLREG* to be significantly related to the prime/non-prime decision. These firms are, respectively, 5.95 and 17.2 times more likely to select a prime corporate office when compared to *LARGEINT*, the reference category. VIFs for the variables are below 3.0. Results are shown in Table 9.

5. Discussion

This research examined two things. One is the effects of firm characteristics on office accommodation choices (prime/non-prime). The second is the generalisability of these characteristics beyond a single market where they have been studied previously. Such concerns intersect the interests of both demand (CRE) and supply-side (IRE) in real estate. For the demand-side the results capture patterns, at an aggregate level, of what are at the firm level, idiosyncratic accommodation decisions. The study also examines leased accommodation decisions rather than ownership for occupation which can often be presumed when considering demand-side accommodation choices. For the supply-side the results provide granularity in assumptions about quality tenants' importance to real estate investment value. For IRE landlords and asset managers insights into firms' accommodation decisions can be useful for developing tenant retention and recruitment strategies. For instance, for a landlord-asset manager of a non-prime office property, directing these strategies towards types of firms that are more likely to rent such properties seems a more effective strategy than pursuing firms more inclined to occupy prime offices.

5.1. Firm characteristics

Firms that correspond to our reference categories (*INST*, *LARGECAP*, *GEOINT*) are, as occupiers and tenants, important demand drivers for (new) prime office accommodation in Melbourne. Collectively, they have been transformative in their demand from potential landlords for new building forms to accommodate "new ways of working". This has resulted in the development of new, horizontal "groundscraper" or "campus" style prime

properties. However, these results show that there are other categories of firms, such as Mass consumer (*MASSCON*) and Specialised markets, that are more likely than our reference industry (*INST* – finance and real estate) category to select prime office accommodation. Also, *SMALLCAP* firms are more likely than our reference *LARGECAP* to select *PRIME* offices.

Interacting individual firm characteristics offers deeper insights into the nuances of the prime/non-prime decision. For instance, as noted above, while Mass consumer (*MASSCON*) and Specialised (*SPEC*) industry variables both emerge as significant determinants, when interacted with other firm characteristics, Mass consumer mid cap (*CONMID*) firms are more likely than their Small cap (*CONSMALL*) counterparts to select prime corporate offices. The situation is reversed for the Specialized industry with *SPECSMALL* outperforming *SPECMID*. Furthermore, while Geographic reach is not a significant determinant as an individual characteristic, it is when interacted with other characteristics. For instance, in the *MASSCON* and *SPEC* categories, it is regional firms (*CONREG* and *SPECREG*) that exhibit the greatest likelihood to select prime offices when compared to the other combinations within their respective group. Also, *SMALLREG* and *SMALLDOM* firms were more likely to select prime offices than the *LARGEINT* reference category. This contradicts previous research that small companies were found to be more cost-conscious than large companies in Bristol (Dent & White, 1998b) and Auckland (Levy & Peterson, 2013). Our findings suggest that small companies in Melbourne are more likely to select prime corporate offices than their large cap counterparts.

5.2. Geographic generalisability

The results of this study suggest that the relationship between firms' characteristics and the selection of prime/non-prime office space differs across markets. In this research we find that firm size, industry affiliation and geographic reach account for 30.9% of the variation in prime or non-prime corporate office selection in Melbourne. Using the same statistical measure (Nagelkerke R^2), Leishman and Watkins (2004) study of 119 office occupiers in Edinburgh concludes that similar variables account for 51.6% of tenant selection variation. Leishman and Watkins (2004) also find that geographic markets constitutes a significant determinant in office quality selection, a finding at odds with our Melbourne-based research of ASX300 office occupiers. These variations point toward the heterogeneous nature of corporate office decision-making across different geographic markets. This suggests that more research is required to establish whether and how generalisable firm characteristics are as explanatory variables in office accommodation choices.

5.2.1. Role of subjective firm characteristics in accommodation decisions

In this paper we examine the effects of objective firm characteristics – firm size, industry and geographic reach, on office selection among ASX300 Australian corporate occupiers in Melbourne. These characteristics have been specifically identified as influencing office selection in earlier research (Leishman & Watkins, 2004) or have been tangentially acknowledged in other research (Dent, 1998; Levy & Peterson, 2013; Nunnington & Haynes, 2011; Robinson et al., 2016; Rymarzak & Sieminska, 2012). The final model's Nagelkerke R^2 of

0.309 indicates that these characteristics account for 30.9% of the variation in the prime/non-prime decision, leaving nearly 70% of the variation unexplained.

There are several possible sources for the variation observed in this research, both objective and subjective. An objective firm characteristic not examined here is firm profitability. Given that accommodation decisions are past choices then this suggests that past profitability or long-run profitability could be a variable that influences accommodation choices. First, the unique data set created for this research is a “snapshot” of the ASX 300 at the date of downloading the list of companies. Profitability at that given point in time would, in all likelihood, not account for past accommodation decisions. Second, a study that captures long-run profitability encounters challenges with changes in the composition of the ASX 300 over time as market capitalizations changes who qualifies for the 300, their position within the list, their size of capitalization and their existence due to merger and acquisition activity. Also, we have considered above the possibility that the objective relationship between firms’ (head) office and other production CRE influences the office choice and discounted that as being influential.

Other demand-side studies suggest there are additional characteristics that influence corporate real estate demand that are not accounted for in our model (de Jonge et al., 2000; Heywood & Kenley, 2010, 2017). A number of more subjective characteristics have been identified including the role of internal relationships, corporate governance and corporate real estate management practices (Heywood & Kenley, 2010, 2017), the regard accorded internally to the corporate real estate department (O’Mara et al., 2002), organisational priorities as shaped by a firm’s mission and vision (de Jonge et al., 2000), corporate branding (Appel-Meulenbroek, Havermans, Janssen, & van Kempen, 2010; Khanna, Koppels, & van der Voordt, 2013), corporate culture (Plijter et al., 2014) and agglomeration effects where there are benefits from industry firms co-locating within specific geographic locations and possibly specific properties. The latter is quite plausible for *SMALLCAP* and *MIDCAP* firms targeting prime offices seeking benefits of co-locating with larger cap firms. There are also subjective effects within leasing transactions such as an amicable leasing process, a property manager’s professionalism (Sanderson & Edwards, 2016) that have also been shown to contribute to corporate real estate decisions. The subjective variables are most evident at an individual firm level where they can be examined in case studies. Aggregating these for quantitative analysis is challenging due to issues with data availability. This suggest that further research into the relevance of these factors in the Melbourne market may help clarify which additional characteristics (objective and subjective) are relevant to at least some of the unexplained variance in our study.

6. Conclusion

The current body of commercial real estate research with an occupier focus primarily addresses tenant requirements regarding the physical and locational attributes of real estate rather than the nature of tenant demand originating from the occupying firm’s organizational characteristics. This paper has demonstrated that certain industry types and company size and characteristics are significant influences on the prime/non-prime accommodation decision. While the assumption that quality occupiers are very important is not challenged, this research shows that there are nuances in different quality occupiers’ preferences for grades of property. This is beyond the

large cap, institutional, international firms that would readily be taken as quality occupiers, suggesting that occupiers are not homogeneous and substitutable when all that matters is their rental income; that income is founded in firm characteristics.

This research also lends support to the geographic heterogeneity of office markets by comparing results from Melbourne in Australia to Edinburgh in the United Kingdom. This study shows that the same firm characteristics provide different explanations for the variation in prime/non-prime accommodation decisions. Replicating this work in other locations will help establish the generalizability of the phenomenon. These results also lead us to conclude that future research should embrace more organization-specific approaches where firms heterogeneity is examined further. We also suggest that research into additional firm characteristics is warranted and will be valuable to understanding the demand for corporate real estate.

Note

1. This paper grapples with the semantics and potential hegemonic qualities of terms for the paper's relevant entity. "Tenant", which is often used by the supply-side, reflects a landlord perspective where the focus is on incomes from the aforesaid tenant. "Customer" is becoming used in landlord language to reflect a different, more responsive relationship. Demand-side vocabulary refers to themselves as "occupiers" or "end-users" (CoreNet Global, 2015). This paper privileges "occupier" but other terms are used where they reflect source documents.

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No potential conflict of interest was reported by the authors.

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