Influence of Transaction costs and real options on firms' own-or-rent decision for building resources in Mekelle, Ethiopia

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Abstract
Commonsense suggests that buildings are the most primary resources that most organized business commends. Importance aside, firms however obtain building resources via two broad alternative paths or a combination of both: ownership and rental. Based on secondary data on 79 companies in Mekelle, Ethiopia, this paper investigates the influence of transaction cost and real option factors on firms' own or rent decision for building resources. Empirical results suggest that both transaction cost and option factors have significant influence on firms' own or rent decision. High asset specificity combined with sales uncertainty or high small numbers condition or high growth opportunities individually increase likelihood of ownership, while high sales uncertainty for firms' products increase likelihood of rental.

Key words: transaction cost economics; real option theory; own-or-rent decision; business buildings

INTRODUCTION

Commonsense suggests that most organized businesses require building resources outlay before they are undertaken. Firms may obtain building resources via alternative institutional arrangements of which rental and ownership are the main ones. Because neither of these alternative arrangements is superior in all dimensions and situations (Masten et al, 1991), firms' choice between rental and ownership presumably involves comparison of the net advantages of one over the other.

When a firm commits to possess its own building resources, it dedicates significant

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financial resources upfront and hopes to use the building resources to full capacity, which is uncertain. Still, building ownership may not come so easily even when a firm has the financial resources. In Ethiopia, for instance, it may take months to years to get a land lease contract and a building construction permit. This has its own direct costs. But indirect costs are also incurred if profitable opportunities are missed while waiting to secure land and building permits. Nevertheless, putting up a building after all these hurdles may be idiosyncratic to a firm. Idiosyncratic building resources have by definition little value in alternative uses (Williamson, 1985).

However, rental is not a cost free means to acquire building resources. Rental often introduces contractual impasses especially when the rental contract is undertaken under circumstances of small numbers bargaining condition (Klein, Crawford, and Alchian, 1978). Due to the highly structured nature of rental contracts, firms in rented buildings also have less chance to capture incremental growth opportunities through, for instance, utilization of extra space or addition of rooms attached to their current buildings.

The above are in fact only a few of the possible ups and downs of the two sourcing options for building resources. Clearly, several factors may influence firms' decision to own or rent buildings. In fact, a number of alternative theoretical models have been suggested to explicate on factors that influence firms' sourcing decisions in general (Garrouste and Saussier, 2005). This paper develops a conceptual framework that draws on transaction costs (Klein, Crawford, and Alchian, 1978; Williamson, 1985) and real option theories (Leiblein, 2003; Leiblein and Miller, 2003) and empirically tests the influence of transaction costs and real option factors on firms' own or rent decision for building resources using secondary data on a sample of 79 companies in Mekelle, Ethiopia.

The paper contributes to the literature in important ways. First, the paper contributes to redress the empirical gap on sourcing decisions of firms in developing countries. Second, while evidence is accumulating that many sourcing phenomena have transaction cost explanations, many would give up to technological indivisibility arguments when it comes to "core" inputs such as building resources (Williamson (1985) was among the exceptions). This paper provides empirical evidence which confirms that transaction cost factors indeed have significant influence on firms' own-or-rent decisions for building resources. Finally, the paper responds to Leiblein (2003)'s call for integration of transaction cost and real option theories by empirically testing the

significance of each in explaining firms' sourcing decisions.

The empirical section of the paper reveals the relevance of both models in explaining firms' decision to own or rent building resources. In line with TCE, firms' building own-or-rent decisions are significantly influenced by transaction level factors. Buildings are more likely to be owned either when high small numbers condition or high asset specificity joined with sales uncertainty is high. In line with real option analyses, firms with high sales uncertainty for their products are more likely to rent buildings, while firms with high growth or expansion opportunities are likely to possess their own

The rest of the paper is organized as follows: In the next section, we discuss the two theoretical models used to develop our conceptual framework. Next, we develop testable hypotheses based on the two theoretical models. We then present our research design. In the empirical section, we present statistical results. The final section discusses the results and concludes the paper.

LITERATURE REVIEW

Transaction costs theory

Transaction costs economics (TCE) commends that the own-or-rent decision be casted in a general contractual schema (Williamson, 1985). Contracts are often incomplete because of the bounded rationality of actors (Simon, 1947; Saussier, 2000). However, incomplete contracts call for ex post renegotiation which in turn exposes the transaction to costly haggling (Williamson, 1981). This follows from the observation that some actors are given to opportunism which "complicates sub goal pursuit by introducing strategic efforts to gain local advantage at the expense of the larger group to which the transaction is a part" (Williamson 1991, 313).

One or both parties to the contract may make adaptation difficult once incomplete contracts are signed. They do so to amass extra rents not specified in the original contract. Hence, left unspecified or poorly specified contracts will expose contracting parties to potential opportunistic hazard (Williamson, 2002).However, the potential exposure of the contracting parties to opportunistic hazards depends on the specific attributes of the transaction. Specifically, if the item being transacted is one for which a competitive market is available and if there are no costs to switching partners, there is less problem. Problems arise when there are few alternative users or uses to the item and when there are investments on specific assets for which uses in other than the original contract are limited (Williamson, 1979). Under these circumstances, the

parties are locked in to the transaction in that if the relationship fails for any reason, they may have no better recourse than scrapping their investments at depressed value (Joskow, 1987; Masten et al 1991). But, knowledge of the lock in situation that the other party is in encourages each party to demand more of everything that is to its advantage. The opportunity for opportunistic hazards, therefore, depends on the nature of the investments at stake: "After a specific investment is made and such quasi rents are created, the possibility of opportunistic behavior is very real" (Klein, Crawford, and Alchian, 1978, 298).

High environmental uncertainty further complicates transactions involving specialized investments. Uncertainty calls for frequent contractual renegotiation as contingencies unanticipated in the original contract are apt to arise (Kim and Mahoney, 2005). This in turn forces the parties into costly haggling as each party wants to exploit the lock in situation the other party is in. Without some institutional arrangements that mitigate such hazards put in place, inefficient outcomes obtain (Williamson, 1981).

Transaction costs theory suggests that alternative institutional arrangements, such as rental and ownership, differ in their efficacy to coordinate transactions possessing different attributes. It is this observation of variations in the hazards posed by attributes of transactions and the differences in the competence of alternative governance mechanisms that gives force to Williamson's efficient alignment hypothesis (Williamson, 1979) which says that "transactions, which differ in their attributes, are aligned with governance structures, which differ in their cost and competences, so as to effect a (mainly) transaction cost economizing outcome" (Williamson, 2009, 465). In general, when small numbers (ex post or ex ante kinds) and uncertainty increase, the competence of coordination via market interfaces declines and ownership gets the upper hand (Riordan and Williamson, 1985). Hence, there is a place for each arrangement and the matching of each with the right transaction lies at the heart of the make-or-buy decision.

Several studies have provided support to the main propositions of TCE (Anderson 1985; Caves and Bradburd, 1988; Globerman and Schwindt, 1986; John and Weitz, 1988; Joskow, 1987; Mayer and Salomon, 2006; McDonald, 1985; Masten et al, 1991; Monteverde and Teece, 1982; Poppo and Zenger, 1998; Saussier, 2000; Walker and Weber, 1984; for a review see Macher and Richman, 2008; Shelanski and Klein, 1995).

Real Options Theory

Real options theory has its roots in the analysis of financial options. The theory indicates that when investments are surrounded by uncertainties, their present values as evaluated by traditional cash flow discounting models may underestimate the value of investments because these models don't factor follow on opportunities that investments embed (Fabozzi and Peterson, 2003; Leiblein, 2003).

Leiblein (2003) notes two important insights of real option analysis that have relevance to strategy. The first insight is that initial commitments on specialized investments may undermine a firm's flexibility. Committing to specialized investments that have little value in alternative uses is risky when disturbances in market demand or technology make these investments outdated and the ability to defer such commitment until uncertainty is resolved may be highly valuable. Under high environmental uncertainty, the ability to defer investments may, therefore, be highly valuable. The second lesson is that some initial investments provide follow-on growth or expansion options. Thus, in spite of possible short run diseconomies, some initial investment commitments may be valuable because of the expansion options they engender later on.

These insights have direct implications to the make-or-buy decision. When a firm decides to internalize a given stage of production, the firm may have to commit to investments on various resources (e.g. machines). Committing to such investments under high environmental uncertainty may be risky. Since the value of deferring such investment is high under greater environmental uncertainty, it is efficient to outsource the supply of the relevant input instead of committing to the investments associated with integration (Mahoney, 1992; Poppo and Zenger, 1998). On the other hand, even if internal supply of a given input is not necessary when viewed in ex post opportunistic terms, it may be the case that the investments associated with integration offer valuable expansion options later on especially if a firm has ample growth opportunities. Hence, exploiting high growth opportunities later on may require firms to integrate initially.

HYPOTHESES

In this section, we develop five empirically testable hypotheses based on the concepts discussed above.

Small numbers bargaining

Small numbers bargaining arises when there are a few suppliers and/or customers for a given product. In the extreme, this may take the form of bilateral monopolistic relationships that may expose contracting parties to contractual problems (MacDonald, 1985). Under this situation "the terms of transactions, especially price, are determined by the balance of power between buyers and sellers-a balance that is unpredictable and unstable." (Stuckey and White, 1993, 307)

When the number of alternative suppliers/customers for an item is few, the monopolist party may wield better bargaining power and may force contracts to its own advantage (Bucheli et al, 2010). Any one of the parties may also fail to live up to agreements knowing that the other party has no better option than to live with the terms of trade dictated by the powerful party. Thus, when there are only a few suppliers or customers, the efficient solution is to possess own building resources. Our first hypothesis is, therefore, that:

H1: Increase in small number condition increases the likelihood that firms possess their own building resources.

Asset specificity

Nonetheless, even on the presence of large number of potential suppliers and customers ex ante, market coordination may not be efficient. This will be the case when there are specific investments made by one or both parties to a transaction. Williamson (2000) observes that in the presence of such investments what was a competitive market ex ante will be transformed into a bilateral monopolistic relation. Both the customer and the supplier are thereby locked in to the transaction.

This exposes both parties to opportunistic hazards. On the supplier side, if the building is constructed and situated specifically to suit the needs of a firm, and if the building has little use for other customers, the owner will be dependent on the continuing relationship with the current customer in order to appropriate her rents. But, the customer knows that the other options open to the owner of the building are limited and may try to expropriate the owner by demanding, for

instance, lower rental charge (Cook, 1997). Similarly, if the renting firm has specific assets at stake associated with the building, it will also be locked in to the transaction. Unless mechanisms to protect the rents that accrue to the specific investments are in place, the firm will be exposed to hazards of opportunism (John and Weitz, 1988, 340). In the presence of high specific investment commitments by one or both parties to a transaction, therefore, centralized ownership of building resources is a better solution.

H2: The higher the level of specific investments associated with a building the higher the likelihood that a firm possesses its own building resources

Uncertainty

The other factor in TCE is uncertainty (Mahoney, 1992; Williamson, 1981). Unlike asset specifity and small numbers condition, however, the empirical evidence on the influence of uncertainty on make-or-buy decision is not clear cut (Cho, 2009). More, uncertainty is in fact even more central to real option theory.

As per TCE, uncertainty increases contractual incompleteness and the need for renegotiation. But, in the absence of specific investments that expose parties to expropriation, there is no compelling reason to internalize activities merely because there is high uncertainty. As far as alternative suppliers can be found easily, risk of expropriation is minimal in this case.

On the other hand, the real option theory proposes that when uncertainty is high, the gains from flexibility increase (Leiblein, 2003). But, since vertical integration increases a firm's commitment on specific investments, vertical integration decreases a firm's flexibility exactly when it is valuable (McIvor, 2009). Miller and Shamsie (1996) suggest that in an uncertain environment, property-based resources are better leased on short term contract than long-term contract: "Long-term leases on retailing space may be more of a liability than an asset when the targeted customers shift to another type of store or location (Geroski&Vlassopoulos, 1991)" (Miller and Shamsie, 1996, 524). Lieblien (2003) sums up the predictions of real option theory noting that:

> Real option theory recognizes the expected value associated with … flexibility and indicates that, under uncertainty, it may be optimal to utilize market like mechanisms that provide greater flexibility. The value associated with the option to defer is greatest when uncertainty is high and the immediate cash flows lost due to postponing investment are relatively small.
>
> (p. 949)

In sum, what real option theory argues is that uncertainty requires more flexibility which in turn

requires firms to take short positions in specific investments (Wernerfelt and Karnani, 1987). But, vertical integration increases the stakes in such investments and therefore decreases flexibility (Mahoney, 1992, 570). Hence, under high uncertainty market like solutions are desirable. We propose that:

H3: The higher the level of sales uncertainty for a firm's product, the higher the likelihood that a firm would rent its building resources

Asset specificity and uncertainty

TCE relies less on uncertainty and more on the joint effect of uncertainty and asset specificity on firms' ownership decisions (Mahoney, 1992). Williamson (1985) also notes that the role of uncertainty in TCE is one of second order. He points out that in the absence of significant specialized investments; uncertainty alone is not a compelling reason for integration. Higher environmental uncertainty calls for more renegotiation of contracts since the chance that conditions not covered in the original contract increase with higher environmental uncertainty. When specific investments are at stake, such frequent renegotiations exacerbate the holdup problem. Hence, high uncertainty, accompanied by high asset specificity, leads to vertical ownership. In their study of the US semiconductor industry, Leiblein and Miller (2003) found that uncertainty alone increased the likelihood of outsourcing; asset specificity alone had no significant relation with the make-or-buy decision while the interaction of high uncertainty with asset specificity significantly increased the likelihood of vertical integration. Thus, we hypothesize that:

H4: Uncertainty will have a positive effect on ownership of building resources for transactions involving high asset specificity

Growth opportunities

Consider, for instance, that a newly formed enterprise is considering whether to own or rent its building resource and the site associated with it. Assume that there is high growth potential of demand for the firm's product. In this instance, owning one's own building, perhaps even with excess capacity that may not be used effectively considering short-run demand conditions, may confer the firm the option to expand its operation without the need to change to a new site or the need to obtain building from independent owners when demand for the firm's

product necessitates an expansion in space and operation.

Ownership offers flexibility to quickly respond to increased demand for the firm's product (Leiblein and Miller, 2003; Leiblein, 2003). If a firm instead chooses to operate in a rented building that effectively meets the firm's existing scope of operation, the firm's short run costs may be lower, but the chance that the firm will miss growth opportunities increases. It is possible that finding a building that accommodates the firm's greater scope of operation in the future may be difficult and erecting one's own building in response to expansion opportunities may take time and force the firm to miss significant revenue opportunities in the process. More, the value of initial investment commitments on building resources and site development is higher the more the growth opportunities of a firm's sales. The value of the underlying investments is higher the more the chance that the investment can be used to capacity by accommodating future expansion needs to exploit growing demand for the firm's products. Thus, consideration of future expansion options suggests ownership as the better solution.

H5: The higher the growth opportunities of firms, the higher the likelihood that firms will possess their own building resources

METHODOLOGY

Sample

Our sample frame was a database of firms that were reporting with the Ethiopian Revenue and Customs Authority (ERCA), Mekelle Branch Office. Of the total number of 771 firms that were listed in this database, we selected firms as follows. First, we excluded firms whose main operations were outside Mekelle. This left us with 556 firms whose main offices were in Mekelle, the capital of the Tigray region. Next, we excluded firms that were commenced after 2006. Inclusion of very newly established firms may not give us a true picture of firms' building own-or-rent decision given the significance of the decision. More, this allowed us to obtain at least four years of data for each company. This criterion reduced the remaining firms to 84 firms. Finally, five firms were excluded because of incomplete data. This reduced the final sample of firms to 79.

The study was then undertaken based on these 79 firms which were about 14 percent of the total 556 firms in Mekelle identified in the ERCA database. In order to evaluate whether the sample firms were representative of sector wise as well as location wise distribution of firms'

main offices in Mekelle, exploratory analyses were undertaken. The results suggested that the sample companies were largely representative of sectors and locations. Of the 18 sector groups we identified, firms from 15 sectors were included in the sample. From the 18 administrative Kebelles in Mekelle, firms whose main offices were located in 14 of the Kebelles were included in the sample.

Data collection

A significant amount of the data related with the sample companies were obtained from the financial statements of the companies kept with ERCA, Mekelle branch office. The Ethiopian Revenue and Customs Authority is the institution responsible for the regulation and administration of the tax system in Ethiopia. The authority has the power to collect and administer different kinds of taxes from business enterprises in the country. Each company registered with the authority is expected to present evidence of its annual financial condition in a professionally prepared financial statement along with a host of primary transactional evidences including sales and purchase invoices. The financial statements are required to be prepared by an accredited accounting professional or institution. Reported financial statements are brought to scrutiny when the authority's auditing team reviews reported financial statements for fidelity and accuracy. Suspect reports have to undergo additional review including an audit of the company by professional auditors from the authority.

From the financial statements of the companies, we took figures for annual sales, annual building rental costs, annual advertising expense, and annual labor costs, the gross and net book value of buildings, machines and plants, office facilities, computers, vehicles and other fixed assets. We also obtained end of the year balance of total fixed and current assets, total assets, equity capital, current and long term liabilities. A registration form that companies filled when registered with the authority also provided very useful information. The form contained information on each company's main office address, branches, form of ownership, industry group, main operations, and date of commencement.

Model specification

We estimate the regression model which is specified as

$$\text{Ownership} = B_0 + B_{1\text{-}3}\text{Controls} + B_2\text{Small Numbers} + B_3\text{Sales Uncertainty} + B_4\ \text{Asset Specificty} + B_5\text{Asset Specificty*Sales Uncertainty} + B_6\text{Growth} + \varepsilon$$

We expected a positive sign for coefficients of growth, small numbers, asset specificity and interaction of asset specificity and uncertainty. We expected a negative sign for the coefficient of sales uncertainty.

Measurement of variables

Small Numbers

Ex ante small numbers in the building rental market context is a function of several factors. These factors can be regulatory or location specific characteristics. Consider municipality regulations regarding the location of different kinds of businesses. Firms that belong to industries that are allowed to site their operations in a few selected zones in a town have limited site option. This discrepancy causes differential small numbers bargaining conditions to be faced by firms in the same town.

Location specific characteristics also determine the extent of small numbers condition facing building owners and firms. Consider the effect of demand and supply conditions. Other things constant, building owners face high possibility of ex post opportunism, the less the demand for buildings in the area where the owners have sited their buildings. For instance, demand for buildings is low in peripheral than downtown areas of many towns. Opportunistic hazards, therefore, are higher in the former than in the latter, all else equal.

In view of these observations, we measured small numbers condition by the interaction of three terms. That is,

$$\text{SMALLNUMBER}_i = \text{INDUSTRYCONC}_i \times \text{LOCATIONALCONC}_i \times \text{KEBELLECONC}_i \ldots\ldots (2)$$

Where SMALLNUMBER_i is the measure of small number bargaining in reference to firm$i$. The first term is sector concentration ratio computed as the inverse of the number of firms belonging to a firm's sector. That is,

$$INDUSTRYCONC_i = \frac{1}{N_i}$$

$INDUSTRYCONC_i$ is the measure of concentration of firm $i's$ sector group. N_i is the number of firms in the firm's sector group in Mekelle as of 2010.

The second term measures the extent to which firms in a firm's sector group are located in specific Kebelles in Mekelle. It is measured as

$$LOCATIONALCONC_i = \sum_{k=1}^{18} \left(\frac{n_{ik}}{N_i}\right)^2 \quad \text{..... (4)}$$

The higher $LOCATIONALCONC_i$, the higher the concentration of a firm's sector group in a few specific Kebelles. If firms in a sector are located in one or two Kebelles, it implies that these firms have limited site options and their chance of facing small numbers bargaining conditions is high. This may be due to both municipality regulations and the nature of the business in that sector.

The third term in the small numbers measure is an index of concentration of specific sectors in firm i's main office Kebelle and it is computed as:

$$KEBELECONC_i = \sum_{s=1}^{17} \left(\frac{n_s}{M_i}\right)^2 \quad \text{..... (5)}$$

$KEBELECONC_i$ measures concentration of specific business sectors in a firm's main office Kebelle and n_s is the number of firms in a given sector in the specific Kebelle where firm i's main office is located while M_i is the total number of firms observed in the Kebelle where the firm's main office is sited. Thus, the maximum concentration value that a firm's main office Kebelle can score is one and the minimum is zero. If a firm's Kebelle is occupied by only one or two sector groups it implies that the Kebelle was suited only to a few types of firms. This in turn indicates a small numbers bargaining situation against potential building owners. Since the Kebelle is suitable to only a few types of firms, the chance of finding alternative users for buildings sited in that Kebelle is presumably low.

Asset specificity

Asset specificity refers to investments on assets that can't be easily redeployed to other uses or users ex post. There are various instances of asset specificity (Klein, Crawford, and Alchian, 1978; Williamson, 1985; Joskow, 1987). One instance of asset specificity is site specificity which involves a cheek-by-jowl positioning of relevant assets for successive stages of production with the aim of minimizing transportation and inventory costs (Williamson, 1979; Joskow, 1987). What makes such investments site specific is that once committed to the specific site, the investments are highly immobile. If contractual breakdowns occur after site specific investments are made, the contracting parties will find it expensive to move their assets to alternative sites where use of the assets can be made.

As for buildings, however, it is indeed the inherent nature of buildings that they can't be moved from one site to another once built on a specific site. Investment on buildings is site specific by the very nature of buildings: *buildings are immovable properties*. Thus, even if site specificity may apply to both building owners and firms, it is more a fact to building owners than to business customers. Owners have no choice of moving their buildings to other sites, while firms, even if at high costs, can still move to other buildings if the need arises.

However, design related and other conditions that make a building specific to a transaction, a building can be rented to alternative users as far as users can move from one site to another. Thus, we commonly observe that a general purpose building in a population center occupied by different businesses at different times. Even if the building is immovable in nature, its users may not be so affixed to it. Hence, the immovable nature of buildings is not problematic in its own right. Problems arise when there are factors that limit the alternative uses a building can be applied to.

The design of a building is one important factor. If a building is designed to suit only a specific type of operation, then the owner of such a building would face high ex post small numbers condition as she can't easily transfer the building to alternative users. It is customary to hear such an expression as general purpose buildings. But to say some buildings are general purpose is to say that there are other specific purpose buildings. General purpose buildings can be easily turned from one business use to another without significant customization. On the other hand, some buildings are designed and constructed such that they can be used only for a specific

type of operation. Buildings of this type are designed such that other than the type of business operations contemplated for them initially, the buildings can't be cheaply turned to alternative users/uses or the costs of transferring these buildings to alternative uses are high.

Similarly, opportunistic hazards facing a firm depend on whether the firm's operation is designed in line with the design of the building. A firm that rents a specifically designed building from independent owners will face significant hazards because the firm's chance of finding buildings that suit its operation is limited.

Other factors are also important. For instance, a firm may depend on an important input that is extracted from the current site, and relocation from the current site may entail a huge cost to the firm. It may also be the case that the current site of a firm may be the most convenient place for an important share of the firm's customers. This advantage may be lost if the firm has to move to a new site due to impasses with the owner of the current building.

While all these are important considerations that await precise measurement in future research, we, for data limitations, mainly focus on two factors that capture asset specificity conditions on both sides of the bargain. These factors are related to the number of employees and fixed assets of firms'. Consider the number of employees; If we assume that employees' number reflects square footage size and cost of the building in which a firm houses its operations, opportunistic hazards in rental of buildings by firms with larger numbers of employees would be high because finding alternative users for large buildings is difficult and expensive for the proprietors of larger buildings. Building size may be seen as an instance of dedicated asset specificity which refers to general investments that are made by the exchanging parties in anticipation of continuing relationship (Joskow, 1987). Thus, even if the investments per se are not specialized, the fact that effective use of them is premised on the continuation of the contract, premature breakdowns of the contract will leave the owners with excess capacity that will be difficult to find use for, at least temporarily. Owners of buildings would find it more costly if contractual breakdowns occur when their properties are large because even slight interruption of the current contractual relation will be expensive as it keeps huge investment idle.

Similarly, opportunistic hazards facing firms with large number of employees are presumably high. First, employees develop specific patterns regarding transportation and residential location which would be disrupted when a firm has to relocate. Therefore, the

possibility of contractual breakdowns is a more serious problem for firms with larger number of employees. For one thing, relocation would be more disruptive and costly the larger the number of employees that have to adjust to a new location. Second, finding alternative buildings for firms with larger number of employees is even more difficult, especially when available alternative buildings tend to be smaller in size. In fact, our own initial analysis distribution of firms by number of initial employees in Mekelle confirmed this point. We found that the larger the number of the employees, the fewer is the number of firms in Mekelle. Hence, the possibility of finding alternative buildings elsewhere is more difficult for firms' with large number of employees.

A crucial factor that determines a firm's relocation costs is investments on machineries, equipments or other infrastructures that are attached with and housed in a building. Such investments involve huge implantation costs which can be recovered only through time. The costs of removing and relocating these fixed assets is also higher if a firm is obliged to move to another building due to contractual breakdowns with the current building owner.

On these two considerations, we measured asset specificity as the product of two terms: a firm's immovable assets (plants, machines and equipments) and the number of its employees (which in fact was approximated by annual labor costs). In the balance sheet statements of the sample companies, five categories of fixed assets are identified: machines and plants, office equipments, vehicles, buildings, others. We use the figures for machines and plant assets because we deem these are real indicators of relocation costs. From the income statements of the companies, we obtained figures for annual labor costs. Since both the employee and immovable assets measures capture the same construct, i.e. exposure to ex post lock in, we use the log of the product of the two variables.[3]

Sales uncertainty

We regress the log transformation of four years sales data of each company on time and time squared (Leiblein and Miller, 2003) and use the mean error sum from the regression to proxy for sales uncertainty.

Growth option

[3] Initial analysis based on UDIBT data on initial employees' size suggested that employee number and total annual labor cost were highly correlated for a random draw from the sample companies. The labor cost data were readily available for all sample companies and hence the use made of it. In relation to this note that both employee number and immovable assets capture relocation costs and the use of the product of the two terms to form the single measure for asset specificity is the appropriate formulation. Also, we changed the asset specificity measure to consist only immovable fixed assets (plants and office assets) and controlled for the effect of size (log of sales), the results are largely similar to those reported here.

We used the geometric mean of sales growth for three consecutive years to proxy for growth opportunities of firms.

Control variables

We also controlled for the effect of other factors. In the main model, we controlled for leverage, ownership form and sector. Leverage was measured as the ratio of total debt to total assets. Given the many peculiar features of share companies, a dummy variable for share companies was taken as a control for ownership form. Finally, we include a dummy variable that controls for firms from education sector.

Dependent variable

Our main model has a binary dependent variable coded as 1 if a firm owns its building and as 0 if a firm rents its building. Nonetheless, there were twenty four firms in the sample that had their own as well as rented buildings. It was necessary to fix a procedure which can be used to assign these firms to own or rent categories.

Two alternative procedures generated similar results except in three cases. The first approach makes use of information on whether a firm owns its main office building in Mekelle. Alternatively, we computed the ratio of annual building deprecation cost plus one to annual rental cost plus one for all 79 firms and conducted a cluster analysis which groups firms into two categories based on their score on this ratio. The results from this analysis were consistent with the results from the first approach except in three cases.

The exceptional cases included three firms which were assigned to the own group by the second procedure but to the rent group by the first procedure. Since our interest was on the own-or-rent decision of the sample companies for their main office buildings in Mekelle, we assigned these firms to the rent group based on the first procedure.

METHODOLOGY

We estimated a binary logit regression model via maximum likelihood. One statistical issue at this stage was the possibility of endogenity. We tested for endogenity of the main independent variables through the Hausman test. We were unable to reject the null that growth was exogenous to the own or rent model. To correct the endogenity of growth, we regress growth on two instrumental variables (advertising to sales ratio and a dummy variable that indicates whether a company has submitted financial statement for the year 2010) and used the predicted

values from this regression in place of the original growth rates of the sample companies (see Winkelmann and Boes, 2006). We estimated a logit model via maximum likelihood technique using STATA V. 10 to determine the sign and significance of the coefficients of each of the variables on ownership decision of firms for building resources.

Results

Table 1 in the appendix shows zero-order correlation and summary statistics of variables used in regression analyses. The results of the logit regression model estimation are displayed in Table 2 in the appendix. The table shows likelihood tests and goodness-of-fit statistics in the model summary rows. The model correctly classified 86 percent of firms' own-or-rent decisions. Its fit to the data is significant.

The estimated coefficients along with the standard errors for each of the variables are also shown. By specification, a positive coefficient indicates an increase in the likelihood of ownership of building resources. Consistent with hypothesis I which stated that increases in small numbers condition would increase firms' choice to own than rent their buildings, the likelihood of building ownership increased as small numbers bargaining intensified. This result accords with findings in other applications (Caves and Bradburd, 1988; McDonald, 1985; Leiblein and Miller, 2003). The current study found no strong support for hypothesis II, which stated that increases in asset specificity would increase the likelihood of firms' ownership of buildings. While directionally as expected, asset specificity has insignificant influence on firms' own-or-rent decision.

Consistent with transaction cost theory, the joining of asset specificity and uncertainty has a significant and positive effect on firms' ownership of buildings. Also, the joint effect of uncertainty and asset specificity is stronger than the effect of asset specificity alone. On the face of large immovable assets and employees to be relocated in the event of contractual impasses, firms preferred to own their buildings, but more significant was this preference when high sales uncertainty for the firms' products is joined with high relocation costs. Consistent with hypothesis III, uncertainty alone increased the likelihood that firms rented building resources. Finally in line with Hypothesis V which stated that the higher the growth opportunities of firms the more the likelihood that firms would own building resources, growth has a significant positive effect on the likelihood of firms' ownership of their buildings.

We also estimated other models to evaluate robustness of these results. To see if our results were affected by inclusion of hybrid mode firms we estimated the binary logit model after excluding hybrid mode firms. We also classified the sample firms into three categories: own, hybrid and rent. Since no natural ordering is implied in this classification, the reference category was arbitrarily chosen as the rent category such that the base outcome ($y = 0$)refered to firms that operated purely in rented buildings. Then, we estimated a multinomial logit model via maximum likelihood technique. To check if our results were affected by the inclusion of firms with operations in more than one location, we estimated our model after controlling for and excluding these firms. The results from all these model estimations assured us the robustness of the results reported above. Finally, to the satisfaction of our colleagues who suggested to us that we should control for manufacturing firms and firm size, we estimated our model after replacing ownership form and education sector dummies by firm size and a dummy for manufacturing firms. None of these control variables has significant effect whatsoever and the effect of the main variables remains intact save slight changes in significance.

DISCUSSION

Our findings confirm the usefulness of Williamson's (1985) precept that any problem that can be casted as a contractual problem is better approached in transaction cost economizing terms. Overall, the results support the main theoretical predictions of transaction cost economics. As the theory would anticipate, we found that increases in small numbers condition increase likelihood of ownership of building resources. The results therefore imply that firms own their buildings to protect themselves from opportunistic hazards. Thus, when firms had their operations located in a Kebelle that is suited to a few kinds of businesses and when their businesses can be located only in specific sites, both because of operational and regulatory restrictions, and when they belong to a concentrated sector group, they tended to own their buildings. This would have allowed the firms to save on haggling costs they would be forced to incur had they depended on rented buildings.

Though no strong support for the independent effect of asset specificity is obtained, we found that sales uncertainty joined with high asset specificity (relocation costs) increase the likelihood that firms possess their own buildings. When firms have large amount of difficult-to-move fixed assets and large number of employees to be relocated if sites need to be changed,

they are more likely to possess their own buildings. Presumably rental under this condition would expose firms to opportunism of building owners. In this case, building owners would be tempted to expropriate the firms, for instance, by demanding high rental costs during renegotiation. In fact, as noted our results suggested that this problem is less significant in the absence of sales uncertainty for the firms' products. Adjustments to contracts are called up on only if uncertainty prevented encompassing long-term contracts ex ante. In such cases, renegotiation is apt to be frequent if the firms wanted to adjust their initial rental contracts because of changing space needs that couldn't be easily projected under high sales uncertainty. But, once relocation costs are high, the need for frequent renegotiation only aggravates the firms' exposure to expropriation by building owners. Operating in own building would be economical under this situation.

The firms' own-or-rent decisions are also significantly influenced by real option considerations. Consistent with Leiblein's (2003, 949) observation that "under uncertainty, it may be optimal to utilize market like mechanisms that provide greater flexibility" we found that firms obtained building resources via rental contracts the higher sales uncertainty for their products. On the face of high sales uncertainty, committing to investments on buildings would be antithetical to flexibility which requires firms to adjust their location and space needs as demand conditions change. Miller and Shamsie's observation anticipates this result: "Long-term leases on retailing space may be more of a liability than an asset when the targeted customers shift to another type of store or location (Geroski&Vlassopoulos, 1991)" (Miller and Shamsie, 1996, 524). In fact, more would be a liability if firms committed to investment on buildings on the face of high sales uncertainty.

At face value, this appears to contradict transaction cost theory, especially in light of claims for finding support to TCE by previous empirical work that found positive association between uncertainty and integration. Nonetheless, the negative association between building ownership and sales uncertainty doesn't contradict with elemental TCE. Williamson (1985) agrees with this point when he notes that:

> The influence of uncertainty on economic organization is conditional. Specifically, an increase in parametric uncertainty is a matter of little consequence for transactions that are nonspecific. Since new trading relations are easily arranged, continuity has little value…

> Accordingly, market exchange continues and the discrete contracting paradigm holds across standardized transactions of all kinds, whatever the degree of uncertainty (Williamson 1985, 59-60).

Hence, the negative association we found lends support to real option theory but not necessarily contradicts transaction cost reasoning. On the other, the joint effect of uncertainty and asset specificity is in agreement with TCE. Thus, while uncertainty is irrelevant in the absence of specific investments,

> That is no longer so for transactions that are supported by idiosyncratic investments. Whenever assets are specific in nontrivial degree, increasing the degree of uncertainty makes it more imperative that the parties devise a machinery to "work things out"-since contractual gaps will be larger and the occasions for sequential adaptations will increase in number and importance as the degree of uncertainty increases (Williamson 1985, 60).

Consistent with Williamson (1985,60), our result indicates that firms are more likely to possess their own buildings when high sales uncertainty is joined with high specific investments.

Finally, we found that firms with high growth opportunities tend to possess their own buildings. Ownership would presumably generate valuable option as it confers the ability to capture on high growth opportunities. By contrast, a firm that operates in a rented building has limited ability to accommodate growth opportunities quickly. For one thing expansion opportunities don't always come in discrete forms. More often growth opportunities have to be accommodated bit by bit. But a firm can't rent buildings bit by bit.

Buildings being largely indivisible resources, it is difficult to be able to accommodate incremental growth opportunities in rented buildings mainly because rental contracts are governed by inflexible terms that must be observed by the parties to the contract. A firm can't add a small room attached to its currently rented building to accommodate added space needs, for instance. This, however, is easy to do if the firm already has its own building and space. Also the possibility of finding extra unused space and the opportunity to use it for added space needs ahead are more possible when firms possess their own buildings.

Our findings suggest the wider applicability of the transaction cost theory. There are two aspects of the findings that assert the wider applicability of the contractual lens to which Williamson (1985) makes reference. First, the findings of the current study are based on the relatively unique institutional context of Ethiopia. Whereas much empirical work in

organizational structure have been largely undertaken based on firms in advanced economies, thereby making the theories to be short of evidence as to their relevance in novice institutional contexts, the current study has been able to demonstrate whether transaction cost and real option perspectives are relevant in the Ethiopian context, at least for the unit of transaction investigated.

The second aspect is related with the unit of analysis in the current study. In spite of accumulating evidence that many phenomena have transaction cost explanations underneath, many would give up to technological determinism arguments when it comes to such "core" elements as business buildings. The abundance of empirical work in intermediate product markets notwithstanding, rarely has any empirical work taken business buildings as unit of transaction and appreciated the relevance of transaction cost and related explanations in predicting firms' own-or-rent decisions for buildings.

We started by defining the transaction for the services of business buildings as the unit of analysis and by identifying the contracting aspects therewith. Parallel to Williamson's (1975) "markets and hierarchies", we identified "rent and ownership" as the two paradigmatic alternative solutions that are selectively assigned to transactions on the basis of circumstances surrounding the transactions. We then asked dimensions of the building transaction that would create contractual impasses in using the rental market. It emerged that there are indeed many instances of each of the relevant transaction dimension even if only some of them were captured for reasons of data limitation in the current study.

Nonetheless, our findings also suggest that firms' sourcing decisions for building resources are better explained by combining the transaction cost and real option perspectives. Put otherwise, mitigating contractual hazards is not the only explanation for firms' sourcing decision. In this study we were able to include the two alternative explanations in the same empirical setting which allowed us to compare the significance of each in explaining firms sourcing decision. The value of such interdisciplinary endeavors is apparently understood when Macher and Richman (2008, 39) write that such "interdisciplinary exercises are useful in the effort to better understand complex economic phenomena and build a coherent science of organization."

CONCLUSIONS

The study started with the objective of determining whether and to what extent transaction costs and real options affect building own-or-rent decision for business buildings of

firms in Mekelle. Limitations recognized, these have been met to the extent possible. Exploratory analysis revealed the significance of building related costs (both rental and depreciation costs). The wide use of two modes of governance for business buildings, rent and ownership, among the sample companies was also shown.

The regression analysis revealed several important results. While hypothesis II was not strongly supported, regression results showed that the other four hypotheses were corroborated by the data. As per Hypothesis I, small number conditions had a significant positive effect of increasing firms' choice of ownership of buildings. Similarly, the interaction of asset specificity and demand uncertainty had the expected positive effect at significant level. In line with the two real option hypotheses, uncertainty alone had the expected negative effect on ownership. The higher demand uncertainty in firms' final product market, the more the likelihood that firms rented their buildings. Finally, growth option associated with upfront investment on buildings had the expected positive effect on ownership of building by the sample companies. Model estimation results confirmed the wide applicability of transaction cost economics while also suggesting that explanatory power is much improved by joining transaction cost and real option perspectives.

As in past studies, this study again confirms that the transaction cost framework has strong ability to explain many phenomena. In a rare application of TCE, this study found evidences that support the main theoretical predictions of transaction cost economics. As the theory anticipates, this study found that increases in small number conditions, asset specificity in the presence of high uncertainty both increase the likelihood that firms take transactions out of the market and bring them inside. In the current study, firms in Mekelle were observed to have high likelihood of owning their buildings as small number bargaining conditions increase. The same was true as asset specificity and uncertainty jointly increased. Firms own their buildings in order to protect themselves from opportunistic hazards.

This study also found that joining transaction cost explanations with other alternative explanations is a fruitful direction that must be pursued. Indeed, equally significant factors that were found to affect firms' decision to own or rent their buildings were the extent and nature of real options associated with either choice. As the study found, firms in Mekelle had high likelihood to rent buildings the more there was demand uncertainty in their product markets. Since rent, as opposed to ownership, provides greater flexibility to firms in the presence of high

demand uncertainty for their products, the value of deferring investments on buildings increased firms' preference to rent than own buildings under high uncertainty. On the other hand, the study found that in the presence of higher growth/expansion opportunities, firms tend to own than rent their buildings. In this case, their initial investments on buildings had the real option value of expansion of operations to exploit pending opportunities quickly. Both findings were in line with real option analysis.

One general implication from the findings of the study is that the sample companies' decisions were explained significantly by efficiency considerations. Though, further research may see whether other factors, such as power, also explain the firms' own-or-rent decisions, the current study found that the own-or-rent decision of firms studied has got important efficiency considerations. Hence, policy making should factor these realities. But, the more direct relevance of the findings of the study are to those policy areas related with zoning, building codes, land grant and building permits by the Mekelle Municipality.

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Appendix

Table 1 Descriptive statistics and correlation matrix of variables used in regression analyses

Variables	Mean	SD	Ownership	Leverage	Asset specificity	Education	Share company	Uncertainty	Asset specificity X uncertainty	Small number	Growth
Ownership	0.44	0.50	1.00								
Leverage	37.93	50.30	-0.05	1.00							
Asset specificity	19.80	9.66	0.48***	0.13	1.00						
Education	.203	.404	0.19	-0.18	-0.00	1.00					
Share company	.152	.361	0.19*	-0.02	0.25**	0.31***	1.00				
Uncertainty	5.42	20.24	-0.22*	-0.19	-0.31***	-0.14	-0.11	1.00			
Asset specificity x uncertainty	48.26	205.76	-0.16	-0.14	-0.12	-0.12	-0.08	0.78***	1.00		
Small number	0.20	0.59	0.30***	0.02	0.39***	-0.10	0.24**	-0.08	-0.06	1.00	
Growth(instrumented)	15.05	11.97	0.19*	0.20*	-0.02	-0.24**	-0.24**	0.02	0.05	-0.10	1.00

N=79 NB: ***p<0.01 **P<0.05 *p<0.1

Table 2: Binary logit regression estimation results

	N=79	
Variables	**Coef.**	**SE**
Constant	-4.94**	1.96
LEVERAGE	-.015	0.017
EDUCATION	2.58**	1.18
SHARE COMPANY	-1.26	1.26
ASSET SPECIFICITY	.098	.068
SMALL NUMBER	11.47**	4.89
ASSET SPECIFICITY X UNCERTAINTY	1.25**	0.61
UNCERTAINTY	-29.96**	14.98
GROWTH	.123***	0.045
-2 Log likelihood	46.50	
Nagelkerke R2	.728	
Hosmer & Lemeshow Test : chi2,df, sig	(1.77,8,.987)	
Correct Prediction	86.08	

NB: ***p<0.01, **p<0.05, *p<0.1