INTERNATIONAL REAL ESTATE REVIEW

2013 Vol. 16 No. 3: pp. 252 – 273

Real Estate Securitization and the Debt Maturity Structure: Evidence from J-REITs[1]

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This paper investigates the relationship between real estate asset liquidity and the liability structure of Japanese real estate investment trusts (J-REITs). It employs data on the regionality and usage of real estate assets as new proxies for the liquidation value of these assets, and arrives at the following conclusions. First, J-REITs with high ratios of real estate investment assets in highly liquid regions, that is, regions where the trade frequency per unit area is high, have high debt-to-equity ratios and debts of long-term maturity. Second, J-REITs with high concentration ratios of small real estate assets that are traded as residential properties also have high debt-to-equity ratios and debts of long-term maturity. In addition, the above relationships are enhanced when these REIT shave a concentrated ownership structure. In summary, this paper empirically validates the employment of regional characteristics and usage type of real estate assets as proxies for asset liquidation value, and confirms that these proxies are related to the capital and liability structures of J-REITs. This connection is possibly intensified by the perception of block shareholders as sponsor firms by market participants.

Keywords

Real Estate Investment and Trust; Liability Structure; Capital Structure

[1] The author thanks various seminar participants for their helpful comments and suggestions. This research is financially supported by a grant-in-aid from the Ishii Memorial Securities Research Foundation.

1. Introduction

Much of the recent empirical literature on real estate investment trusts (REITs) focuses on the determinants of capital structure. However, REIT sample data are better suited to an examination of theoretical hypotheses because REITs have only one type of asset, that is, real estate. Generally, firms are in a complex line of business and their fixed assets are owned for various types of production. REITs are one of the few industries with a simple asset structure, which is why recent literature has preferred to use them as a basis for empirical studies in this field.

The existing literature has discussed the determinants of capital structure for a long time. The trade-off and pecking order theories are two prominent theories of capital structure. The trade-off theory holds that capital structure is determined by the balance between the benefits and costs derived from a firm's selected funding schemes. Conversely, the pecking order theory maintains that the cost of information imposed on corporate outsiders influences managerial choices with regards to debt and capital. Capital structure also influences corporate fixed assets. Creditors wish to avoid risky investments when financial leverage is high, thus creating an underinvestment problem for the firm.

Recent literature has pointed out that fixed asset investment and other investment activities are influenced not only by capital structure, but also by asset liquidity. For instance, it is said that underinvestment is mitigated when asset liquidity is high, even if financial leverage is also high. This is because creditors can liquidate a highly liquid asset should their borrower become insolvent, and means that, under conditions of high financial leverage, a firm with lower levels of asset liquidity must fund itself via short-term debt tools. This theoretically suggests that the financial constraints are conversely eased as all assets owned are concentrated to a few liquid properties and prevent asset diversification. In this regard, the recent literature has focused on how asset liquidity influences capital and debt term structures.

In addition, preliminary interviews of REIT practitioners conducted by the author have produced a common and consistent testimony: a concentrated ownership structure is a unique feature of Japanese REITs (J-REITs), and one that might strongly influence their liability structure. The literature on REITs also supports the proposition that the existence of block holders promotes the convergence of shareholder interests and improves the corporate performance of a firm. Therefore, this paper employs a sample of data obtained from J-REITs in order to verify the above hypotheses in terms of the relationships among asset liquidity, liability structure, and ownership concentration. In other words, it aims to contribute to the existing literature by ascertaining the influence of ownership concentration on liability structure and asset liquidity that existing literature do not verify.

The next section reviews the literature on the relationship between the degree of asset liquidity on the debit side of the balance sheet and the structure of the credit side. It also explains how this study contributes to the existing body of literature on REITs. The third section describes my hypothesis in the context of the literature and recent trends in the J-REIT market. The fourth section presents the data, while the fifth elucidates the empirical methodology and results of the study. The sixth and seventh sections discuss and draw conclusions from the results.

2. Existing Literature

Real estate securitization is the process of issuing securities for commercial purposes. Generally, all firms face refinancing risks every time external borrowing repayments are due. The main purpose of real estate securitization is to increase a firm's funding schemes and minimize its refinancing risks. Real estate securitization enables a firm to access funds depending not on its own creditworthiness, but real estate value, which is independent of its creditworthiness. Consequently, REITs can collect a number of retail funds from individual investors in a financial market.

Many work carried out by researchers have shown that a change in the asset liquidation value of a firm influences its capital structure. Fama and French (2002) have organized theories related to capital structure and categorized the determinants of capital structure according to the trade-off and pecking order theories. As previously noted, the trade-off theory suggests that the corporate capital structure is determined by a balance between the costs and benefits of a firm's funding schemes. Examples of the costs are a high probability of underinvestment and the cost of liquidation, while the benefits include mitigation of the free cash flow problem and decreasing tax expenditure. However, Myers (1977) and Hart (1993) suggest that the cost of information also influences the corporate capital structure, and that firms choose funding tools depending on the degree of information asymmetry that these tools create.

Based on these prominent writings, the recent literature has focused on both financial leverage and the term structures of a firm's liabilities. Barclay et al. (2003) emphasize that a firm is likely to face underinvestment when it is highly levered. This is because creditors do not want managers to aggressively invest when a firm is highly levered, even if the investment is expected to be highly profitable. In such cases, risk-adverse creditors may prevent professional managers from seeking out highly profitable investment projects. Williamson (1988) underlines the role of asset liquidity in the relationship between financial leverage and investment. In contrast to Barclay et al. (2003), he suggests that a firm with highly liquid assets is able to choose from various funding tools even if it is highly levered (Williamson 1988). In such

cases, the cost of liquidation is low, even if the debtor becomes insolvent. Shleifer and Vishny (1992) support this argument and further propose the existence of a positive relationship between asset liquidation value and financial leverage. In addition, they find that an increase in asset liquidation value mitigates the principal-agent problem (Shleifer and Vishny 1992).

The theoretical approaches outlined above have also been applied to empirical studies. Benmelech (2005) uses a funding scheme for a nineteenth-century railroad project to examine the relationship between asset liquidity and financial leverage. Benmelech et al. (2005) employ commercial mortgage loan data to verify the relationship between residential mortgage loan maturities and zoning regulations. As well, studies increasingly exploit data from the REIT market to substantiate the theoretical frameworks submitted by Williamson (1988) and Shleifer and Vishny (1992). For example, Brown and Riddiough (2003) and Giambona et al. (2008) employ REIT data to explore the relationships among asset liquidation value, the debt-to-equity ratio, and liability structure. All of these literature sources employ U.S. REIT data.

Existing studies on the relationship between asset liquidation value and liability structure focus on the estimation of asset liquidation value, for which there are three methodologies. Geltner and Miller (2001) equate the liquidation value of real estate assets with the lease contract period of REIT properties and evaluate the influence of this period on the liability structure of the firms to which the properties belong. They stress that when asset liquidity is high, managers can improve the profitability of a property through renovation and other maintenance efforts by raising additional funds (Geltner and Miller 2001). Therefore, highly liquid REITs can safely engage in high levels of financial leverage (Geltner and Miller 2001). The second methodology estimates real estate asset value by using data from the commercial mortgage-backed security (CMBS) market, from which researchers can now directly obtain data on asset liquidation prices. Recent statistical development in this market has contributed to the further improvement of this methodology.

The third approach calculates indicators of asset liquidation value by using various types of quantitative and qualitative information on real estate assets. This information includes real estate prices, zoning regulations, and the probability of future liquidation. Since this methodology includes comprehensive qualitative information that others do not, the indicators are considered useful by researchers. This methodology was first developed by the Society of Industrial Realtors (SIOR) (1984) and the Urban Land Institute (ULI) (1982). In recent years, Benmelech et al. (2005) have incorporated information on zoning regulations into this methodology, while Giambona et al. (2008) have considered the possibility of liquidation and the term structure of rental and lease agreements.

My views on the methodologies for the definition and calculation of asset liquidation value are as follows. The first methodology, which uses the term structure of lease maturity as a proxy for asset liquidation value, is very objective. However, the term of the lease or rental contract is often determined by the individual less or or tenant, so the value thus yielded, although objective, may not always represent universal market liquidity. The second methodology, which uses CMBS market data to estimate asset liquidation value, is frequently used by the media and credit rating agencies such as Standard & Poor's (S&P) and Moody's Investors Service, but not by the academia. The reason is that only a limited number of real estate assets are transacted in the CMBS market, and illiquid real estate is not traded at all; therefore, the data could contain sample biases. The third methodology makes use of very comprehensive information on real estate assets, but the indicators that it uses may be arbitrary.

3. Hypothesis

The previous sections attest to the abundance of literature on the capital and liability structures of REITs. Against this backdrop, this paper employs a new methodology to estimate real estate asset liquidation value and examines the relationship between this value and liability structure. In addition, this paper also dissects the ownership structure of J-REITs. The existence of blockholders is one of the unique characteristics of J-REITs and has evolved with the development of the J-REIT market. However, market participants believe that a concentrated ownership structure influences liability structure.

First, I will regard the concentration and dispersion of real estate investment assets as important factors of liquidation value. I hypothesize that J-REITs with a low concentration ratio of the five largest real estate assets, as calculated in terms of face value, generally have high liquidation values. Accordingly, they find it easier to convert some of the real estate assets to cash compared to J-REITs with a few big real estate assets.

Second, based on a series of discussions by Barclay et al. (2003), Williamson (1988), and Shleifer and Vishny (1992), I hypothesize that a firm's real estate asset regionality and use of REIT also influence its debt-to-equity ratio and the term structure of its liabilities. In other words, my hypothesis is that REIT creditors who monitor the repayment capability of their debtors allow REIT managers to maintain a high debt-to-equity ratio when REIT assets are concentrated in a highly liquid region. I employ the new proxies for asset liquidation value (regional characteristics and usage type), and examine the influence of these on liability structure. Benmelech et al. (2005) regard zoning regulations as an element of real estate asset liquidity. I included qualitative information of zoning regulations in my regional and usage concentration data. Since the Tokyo metropolitan area has a high real estate transaction

frequency per unit area, I will assume that a concentration of real estate assets in this region enables a REIT to hold a high debt-to-equity ratio and liabilities of long maturity.

Third, as a unique feature of J-REITs, I hypothesize that ownership concentration influences liability structure and liquidation value. Pound (1988), Brickley et al. (1988), McConnell and Servaes (1990), and Palia and Lichtenberg (1999) contend that the existence of block holders improves a firm's managerial discipline because it mitigates the divergence of interests among the firm's shareholders. Generally, real estate investment assets are established by sponsor firms, i.e., principals, and asset management companies manage these real estate investment assets as agents. While several years have passed since the many J-REITs were established, sponsors still remain as block holders and those principals frequently facilitate the asset management business of the agents. I hypothesize that the block holders of J-REITs not only mitigate the divergence of interests among the firm's shareholders, but also directly strengthen managerial performance.

Japanese real estate industries and trust banks especially collaborated in the development of the REIT industry in its earliest days, at the request of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). I accordingly assume that market participants regard block holders of J-REITs, in particular, as de facto sponsors. Most market participants recognize this historical process and understand that some REITs are strongly supported by their sponsor firms, i.e., parent companies. My study accordingly considers the relationship between liability structure and ownership concentration, which is neglected in the literature discussed in the previous section. My hypothesis is that REITs with high asset liquidation values and concentrated ownership structures are allowed to have debts of long maturity.

4. Data

This paper uses REIT financial statements and ownership data from Thomson Reuters. The real estate investment asset values of each REIT, categorized by region and usage type, and the total value of the top five investment assets of each REIT are taken from the Japanese Annual Securities Report. The data cover the period of 2003 to 2008. Data on real estate asset regionality are available from the Japanese Ministry of Finance, which supervises the Japanese Annual Securities Report and requests that all REITs disclose complete information on each individual property. However, since regional classification sometimes differs from REIT to REIT, I have re-categorized and re-aggregated the data according to the following categories: (1) the 23 wards of Tokyo, (2) the Tokyo metropolitan area, which excludes the 23 wards of Tokyo plus neighboring prefectures, and (3) other local cities. The 41 REITs in the report share common classifications in terms of the usage type of their

real estate assets. Therefore, I have used this data in its original form to calculate the concentration ratios of the REITs' purpose of use for (1) residential buildings, (2) office buildings, (3) commercial facilities, and (4) hotels and others. In addition, I used the REIT ownership data from Thomson Reuters to calculate the REITs' top five ownership ratios and foreign ownership ratios as proxies for ownership concentration. Table 2 suggests that the standard deviations of the REIT ownership ratio vary across the sample REITs from year to year, but the degree of change is not significant. Foreign ownership ratio changes are larger than those of real estate firms.

Table 1 Number of REITs Analyzed Per Year

	Number of REITs Analyzed	Number of Delisted REITs
2003	10	0
2004	15	0
2005	32	0
2006	37	0
2007	38	0
2008	37	1

5. Empirical Analysis

5.1 Asset Concentration and Liability Structure

This section examines the relationship between the concentration of real estate investment assets and the liability structure of J-REITs. I used the concentration of the top five real estate assets as a proxy for the inverse value of asset liquidation. The data suggest that some J-REITs own a limited number of real estate properties, that is, a few large properties, while others own many small properties. The former group has a high ratio of concentration in the top five real estate assets and the latter has a low ratio for the same. My hypothesis is that J-REITs with many small properties are allowed to sustain higher debt-to-equity ratios and liabilities of longer maturity than those with a few large properties. This hypothesis assumes that debtors can request managers to either liquidate firm assets or reallocate their existing portfolio because real estate assets are traded in small lots when its asset concentration ratio is low. Prominent research work by Barclay et al.(2003) and Williamson (1988) assert that a firm with a high debt-to-equity ratio is likely to face an underinvestment problem. This assumes that creditors will adjure managers to make risk-adverse investments. To examine the above hypothesis, I employed the following equation model:

$$ShortDebt = const + \phi_1 DER + \phi_2 Concentration + \phi_3 Ownership + \varepsilon \quad (1)$$

$$DER = const + \theta_{11} ShortDebt + \theta_{12} ROA + \theta_{13} MBR + \theta_{14} FirmSize + \zeta_1 \quad (2)$$

ShortDebt: Outstanding short-term borrowing divided by total liability (current year)*, DER:* Total liability divided by market Value of capital (current year), *Concentration*: Top five investment asset concentration divided by total investment assets (previous year), *Ownership*: Top five ownership ratio (previous year), *ROA:* Return on total assets (previous year)*, MBR*: Total liability plus market value of capital divided by book value of total assets (previous year), *Firm Size:* Natural logarithm of total assets (previous year).

This analysis has employed two-stage least squares estimations within a simultaneous equation system. I employed the current year data of the dependent variables and previous data for other variables to minimize potential endogeneity problems. As suggested by Benmelech et al. (2005), the REIT debt term structure and the level of debt-to-equity ratios are possibly correlated. To overcome this potential endogeneity, they employ two-stage simultaneous equation models and I have also taken over their empirical strategy in this study. In this model, top five asset concentration is an instrumental variable, and short-term debt divided by total liability and the debt-to-equity ratio are endogenous variables. I first employed both short-term and long-term debts for the above empirical model as dependent variables, but report the former as it shows better performance. I did not employ the cost of debt as an independent variable since it is also endogenously correlated with the level of DER and ROA. Firm size may also be correlated with other variables, but I employed this because it is necessary to control the relationship between the REIT asset size and the degree of asset diversification. The Hausman specification test showed that the fixed effects model should be used, and the following conclusions were derived from its estimations. First, my results indicated that REITs with high debt-to-equity ratios are statistically dependent on short-term borrowing. This implies that the REIT debt term structure is empirically related to debt-to-equity ratios. The annual securities reports of high debt-to-equity ratio REITs indicate that these rarely issue public or private placement debt securities. The external finance of these REITs accordingly depends on short-term bank borrowings. Second, the parameter of top five concentration is significantly positive in Model (a) (See Table 1). In other words, REITs with many small properties can obtain finance through long-term borrowing. This is consistent with my hypothesis in which the dispersion of real estate assets contributes to an increase in long-term liabilities.

Table 2 Descriptive REIT Statistics

	(A) All REITs (N=38)		(B) Long Maturity Debt REITs (N=12)		(C) REITs Owned by Real Estate Firms (N=17)	
	Mean	s.d.	Mean	s.d.	Mean	s.d.
(a) Liability Structure						
DER	1.089	1.477	0.905	0.213	1.747	1.553
LongDebt	0.575	0.246	0.827	0.085	0.514	0.187
ShortDebt	0.239	0.192	0.077	0.071	0.318	0.141
(b) Proxies of Asset Liquidation Value						
Concentration	0.474	0.233	0.435	0.024	0.543	0.249
Tokyo23	0.523	0.282	0.508	0.295	0.470	0.374
MetroArea	0.064	0.140	0.102	0.210	0.052	0.120
LocalCity	0.215	0.239	0.169	0.170	0.289	0.328
Residence	0.316	0.474	0.524	0.631	0.352	0.431
Office	0.079	0.233	0.133	0.300	0.096	0.274
Hotel	0.011	0.042	0.009	0.029	0.010	0.022
Commerce	0.545	0.612	0.422	0.896	0.392	0.445
(c) Ownership Ratio						
Real Estate Firms	0.102	0.082	0.057	0.101	0.242	0.191
Foreigners	0.198	0.213	0.176	0.219	0.236	0.247
(d) Other Variables						
ROA	0.029	0.009	0.028	0.009	0.030	0.006
MBR	1.117	0.257	1.051	0.232	0.924	0.019
FirmSize	11.709	0.746	11.604	0.791	11.756	0.453

DER: Total liability divided by market value of capital, *LongDebt:* Long-term debt divided by total liability, *ShortDebt*: Short-term debt divided by total liability, *Concentration*: Top five investment asset concentration divided by total investment assets, *Tokyo23*: Real estate assets owned in the 23 wards of Tokyo divided by total investment assets, *MetroArea*: Real estate assets owned in the Tokyo metropolitan area which exclude the 23 wards of Tokyo plus neighboring prefectures divided by total investment assets, *LocalCity:* Real estate assets owned in local cities other than those in Tokyo23 and MetroArea divided by total investment assets, *Residence*: Real estate assets used as retail residences divided by total investment assets, *Office:* Real estate assets used as office buildings divided by total investment assets, *Hotel*: Real estate assets used as hotels divided by total investment assets, *Commerce*: Real estate assets used as commercial facilities divided by total investment assets, *Real Estate Firms*: Ownership ratio of the top real estate firm, *Foreigners*: Ownership ratio of the top foreigner, *ROA:* Return on total assets, *MBR*: Total liability plus market value of capital divided by book value of total assets, *FirmSize:* Natural logarithm of total assets.

Note 1: Long maturity debt REITs are defined as those in which long-term debt divided by total liability is more than 75 percent.

Note 2: REITs owned by real estate firms are defined as those owned more than 10.0 percent by real estate firms.

Table 3 Empirical Result 1: Real Estate Asset Concentration and Liability Structure

	(a) Dep. Var .= ShortDebt		(b) Dep. Var. = DER	
	Fixed Effects Model		Fixed Effects Model	
Endogenous Variables				
ShortDebt			1.320	(0.640)
DER	0.046 **	(2.020)		
Instrument Variables				
ROA			-0.819 ***	(-6.650)
FirmSize			0.875 ***	(3.970)
MBR			1.844 ***	(3.670)
Concentration	0.001 **	(2.200)		
Ownership	-0.004 ***	(-2.770)		
Dum04	0.135	(0.560)	-1.727	(-0.340)
Dum05	0.122	(0.640)	-1.908	(-0.460)
Dum06	0.111	(0.550)	-0.826	(-0.280)
Dum07	0.119	(0.580)	-0.932	(-0.450)
Const	-4.668	(-0.520)	13.835	(0.340)
F Statistic	2.420 ***		2.440 ***	
Hausman Specification Test	20.420 *		22.520 **	
Observations	111		111	
Firms	38		38	

Note 1: ***, ** and * indicate statistical significance at 1 percent, 5 percent, and 10 percent levels, respectively.
Note 2: Dum04—Dum07 are year dummy variables.
Note 3: Sample includes bankrupt REITs.

5.2 Regional Concentration as Asset Liquidation Value

My second hypothesis pertains to the relationship between regional concentration of real estate investment assets and liability structure. According to the White Paper on Land, Infrastructure and Transport and Tourism in Japan (2007), 1.6 million real estate transactions were performed in 2005, and Tokyo accounts for more than 30 percent of this total. In addition, the average size of area traded was 4,600 square meters; while in Tokyo, it was one-fifteenth of the all-Japan average. In other words, 42.7 deals were closed per square meter in Tokyo. This is four times the number of deals per hectare averaged by Japan. Intuitively, these statistics suggest a high asset liquidation value for real estate in the Tokyo metropolitan area. This section examines the relationship between regional concentration of real estate investment assets and the term structure of liabilities. Here, regional investment concentration is regarded as a proxy for asset liquidation value; that is to say, asset concentration in the Tokyo metropolitan area is high when asset liquidation value is high. To verify the relationship between the variables of regional investment concentration and liability structure, the following empirical equation model was employed:

$$LongDebt = const + \alpha_1 DER + \alpha_2 AREA + \alpha_3 Ownership + \alpha_4 AREA * Ownership + \alpha_5 (AREA)^2 + \alpha_6 (Ownership)^2 + v \quad (3)$$

$$DER = const + \theta_{21} LongDebt + \theta_{22} ROA + \theta_{23} MBR + \theta_{24} FirmSize + \zeta_2 \quad (4)$$

LongDebt: Long-term debt divided by total liability (current year),*DER:* Total liability divided by market value of capital (current year), *AREA*- 1) *Tokyo23*: Real estate assets owned in the 23 wards of Tokyo divided by total investment assets (previous year), *AREA*- 2) *MetroArea*: Real estate assets owned in the Tokyo metropolitan area which exclude the 23 wards of Tokyo plus neighboring prefectures divided by total investment assets (previous year), *AREA*- 3) *LocalCity:* Real estate assets owned in local cities other than those in Tokyo23 and MetroArea divided by total investment assets (previous year), *Ownership*: Top five ownership ratio (previous year), *ROA:* One-year lagged return on total assets (previous year),*MBR*: Total liability plus market value of capital divided by book value of total assets (previous year), *FirmSize:* Natural logarithm of total assets (previous year).

I have also employed two-stage least squares estimations for the simultaneous equation system in this empirical model. The Hausman specification statistics suggest that Model (c) (see Table 2), but not Models (a) and (b) should be estimated by the fixed effects model. The Breusch-Pagan test cannot be used on a simultaneous equation system by employing the two-stage least squares estimation method. Therefore, Table 2 reports the results of the error component for the two-stage least squares estimations of the random effects model. The results of another possible methodology, ordinary least squares (OLS) pooling estimates, are shown in Appendix 1. I employed both long-term and short-term borrowing divided by total liability as dependent variables, but report the former because it produced better overall results. I estimated the models by including and excluding quadratic terms and report the result of the former. The results are as follows.

The results of the random effects in Models (a) and (b) suggest that the parameters of Tokyo23 and MetroArea are significant. In particular, the intersected variables between regional concentration and ownership for Model (b) are significantly positive. This means that REITs with a high investment ratio in the 23 wards of Tokyo or the Tokyo metropolitan area that excludes the 23 wards of Tokyo plus neighboring prefectures possess long-term liabilities. The existence of a block holder also prolongs the debt term structure of REITs which own a high ratio of real estate assets in the Tokyo metropolitan area that excludes the 23 wards of Tokyo plus neighboring prefectures. Conversely, the parameter of LocalCity and the intersected variable with ownership for Model (c) are insignificant. This means that investment concentration in local cities is not related to liability structure.

Table 4 Empirical Result 2: Regional Asset Concentration and Liability Structure

	(a) Dep. Var. = LongDebt		(b) Dep. Var. = LongDebt		(c) Dep. Var. = LongDebt	
	Random Effects Model		Random Effects Model		Fixed Effects Model	
Endogenous Variable						
DER	-0.015 ***	(-4.320)	-0.016 ***	(-4.280)	-0.015 ***	(-4.350)
Instrument Variables						
Tokyo23	0.178 **	(2.330)				
MetroArea			0.012 **	(2.070)		
LocalCity					-0.410	(-0.880)
Ownership	0.112 *	(1.800)	0.110 *	(1.810)	0.111 *	(1.810)
Ownership*Tokyo23	0.222	(0.710)				
Ownership*MetroArea			0.307 ***	(2.660)		
Ownership*LocalCity					1.744	(0.370)
{Tokyo23}^2	0.112	(0.470)				
{MetroArea}^2			0.044	(0.810)		
{LocalCity}^2					0.100	(0.740)
{Ownership}^2	-0.322	(-0.770)	-0.321	(-0.870)	-0.344	(-0.910)
Dum04	0.085	(0.980)	0.069	(0.920)	0.067	(0.970)
Dum05	0.026	(0.860)	0.018	(0.740)	0.017	(0.720)
Dum06	0.033	(0.780)	0.046	(0.760)	0.034	(0.920)
Dum07	0.041	(0.970)	0.042	(0.960)	-0.047	(0.910)
Const	-1.026	(-1.420)	-0.916	(-1.060)	-0.897	(-1.040)
F Statistic					7.510 ***	
Hausman Specification Test	15.260		16.020		35.960 ***	
Observations	119		119		119	
Firms	38		38		38	
	(a)' Dep. Var. = DER		(b)' Dep. Var. = DER		(c)' Dep. Var. = DER	
	Fixed Effects Model		Fixed Effects Model		Fixed Effects Model	
Endogenous Variable						
LongDebt	-2.111	(-0.410)	-2.111	(-0.410)	-2.111	(-0.410)
Instrument Variables						
ROA	-0.774 ***	(-5.450)	-0.774 ***	(-5.450)	-0.774 ***	(-5.450)
FirmSize	0.747 ***	(3.440)	0.747 ***	(3.440)	0.747 ***	(3.440)
MBR	1.119 ***	(3.970)	1.119 ***	(3.970)	1.119 ***	(3.970)
Dum04	-0.004	(-0.050)	-0.004	(-0.050)	-0.004	(-0.050)
Dum05	-0.019	(-0.370)	-0.019	(-0.370)	-0.019	(-0.370)
Dum06	0.041	(0.610)	0.041	(0.610)	0.041	(0.610)
Dum07	0.029	(0.790)	0.029	(0.790)	0.029	(0.790)
Const	0.176	(0.490)	0.176	(0.490)	0.176	(0.490)
F Statistic	5.420 ***		5.110 ***		5.420 ***	
Hausman Specification Test	39.210 ***		39.210 ***		39.210 ***	
Observations	119		119		119	
Firms	38		38		38	

Note 1: ***, ** and * indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
Note 2: Dum04—Dum07 are year dummy variables.
Note 3: Sample includes bankrupt REITs.

5.3 Value Usage of Real Estate Assets as a Proxy for Asset Liquidation Value

This section focuses on the relationship between a REIT's usage of its real estate assets and its liability structure. Giambona et al. (2008) have noted that the liquidation value of real estate assets differs according to the intended uses. They place real estate assets into four categories: industrial usage, apartments, hotels, and offices, in descending order of asset liquidation value (Giambona et al. 2008). Although the Japanese Annual Securities Report uses different categories from those of Giambona et al. (2008), the following categories are common to both: residential real estate, offices, commercial usage, and hotels. Accordingly, this paper has employed these categories to examine the relationship between the investment ratios for the foregoing types of usage and liability structure, which allows for the influence of ownership structure.

$$LongDebt = const + \beta_1 DER + \beta_2 Type + \beta_3 Ownership + \beta_4 Type * Ownership + \beta_5 (Type)^2 + \beta_6 (Ownership)^2 + \sigma \quad (5)$$

$$DER = const + \theta_{31} LongDebt + \theta_{32} ROA + \theta_{33} MBR + \theta_{34} FirmSize + \zeta_3 \quad (6)$$

LongDebt: Long-term debt divided by total liability (current year), *DER:* Total liability divided by market value of capital (current year), *Type-Residence*: Real estate assets used as retail residences divided by total investment assets (previous year), *Office:* Real estate assets used as office buildings divided by total investment assets (previous year), *Hotel*: Real estate assets used as hotels divided by total investment assets (previous year), *Commerce*: Real estate assets used as commercial facilities divided by total investment assets (previous year), *Ownership*: Top five ownership ratio (previous year), *ROA:* Return on total assets (previous year),*MBR*: Total liability plus market value of capital divided by book value of total assets (previous year), *FirmSize:* Natural logarithm of total assets (previous year).

The models were also estimated by excluding quadratic terms, but report on the result which included quadratic terms. The estimations produced the following results. As in previous sections, I used fixed effects estimation in my model and gauged the appropriateness of the methodology by looking at the results of the Hausman specification test. The statistics suggested that fixed effects estimation should be employed in Models (a) to (d). The results of the fixed effect modeling show that the parameter of the residential usage ratio is significantly positive and also that the parameter is significant when the variable was intersected with ownership concentration. This means that REITs that invest in residential properties are able to procure finance by taking on long-term debts. In contrast, the parameters of the office and commercial usage ratios are insignificant. The parameters of these variables are also insignificant when intersected by ownership concentration. Lastly, the parameter of the hotel ratio is also insignificant.

Table 5 Empirical Result 3: Asset Concentration by Usage and Liability Structure

	(a) Dep. Var .= LongDebt		(b) Dep. Var. = LongDebt		(c) Dep. Var. = LongDebt		(d) Dep. Var. = LongDebt	
	Fixed Effects Model		Fixed Effects Model		Fixed Effects Model		Fixed Effects Model	
Endogenous Variable								
DER	-0.011 ***	(-4.410)	-0.010 ***	(-4.980)	-0.014 ***	(-4.810)	-0.012 ***	(-5.010)
Instrument Variables								
Residence	0.001 *	(1.790)						
Office			-0.248	(-0.360)				
Hotel					4.758	(0.720)		
Commerce							-0.001	(-0.030)
Ownership	0.101 *	(1.880)	0.126 *	(1.710)	0.111 *	(1.900)	0.140 *	(1.810)
Ownership*Residence	0.270 ***	(2.640)						
Ownership*Office			-0.311	(-0.910)				
Ownership*Hotel					0.010	(1.100)		
Ownership*Commerce							-0.519	(-1.100)
{Residence}^2	-0.223	(-0.360)						
{Office}^2			0.154	(0.220)				
{Hotel}^2					-0.040	(-0.140)		
{Commerce}^2							-0.570	(-0.580)
{Ownership}^2	-0.444	(-0.270)	-0.764	(-0.330)	-0.649	(-0.410)	-0.991	(-0.640)
Dum04	0.061	(0.630)	0.065	(0.740)	0.086	(0.990)	0.063	(0.650)
Dum05	0.009	(0.140)	0.013	(0.210)	0.020	(0.350)	0.009	(0.150)
Dum06	0.047	(0.840)	0.056	(0.940)	0.064	(0.550)	0.077	(0.640)
Dum07	0.015	(0.960)	0.042	(0.950)	0.030	(0.700)	0.042	(0.960)
Const	-0.919 **	(-1.960)	-0.921	(-1.070)	-1.028	(-1.210)	-0.922	(-1.060)
F Statistic	6.700 ***		6.220 ***		7.200 ***		7.440 ***	
Hausman Specification Test	30.280 ***		39.160 ***		39.390 ***		38.960 ***	
Observations	119		119		119		119	
Firms	38		38		38		38	
	(a) Dep. Var. = DER		(b) Dep. Var. = DER		(c) Dep. Var. = DER		(d) Dep. Var. = DER	
	Fixed Effects Model		Fixed Effects Model		Fixed Effects Model		Fixed Effects Model	
Endogenous Variable								
LongDebt	-2.111	(-0.410)	-2.111	(-0.410)	-2.111	(-0.410)	-2.111	(-0.410)
Instrument Variables								
ROA	-0.774 ***	(-5.450)	-0.774 ***	(-5.450)	-0.774 ***	(-5.450)	-0.774 ***	(-5.450)
FirmSize	0.747 ***	(3.440)	0.747 ***	(3.440)	0.747 ***	(3.440)	0.747 ***	(3.440)
MBR	1.119 ***	(3.970)	1.119 ***	(3.970)	1.119 ***	(3.970)	1.119 ***	(3.970)
Dum04	-0.004	(-0.050)	-0.004	(-0.050)	-0.004	(-0.050)	-0.004	(-0.050)
Dum05	-0.019	(-0.370)	-0.019	(-0.370)	-0.019	(-0.370)	-0.019	(-0.370)
Dum06	0.041	(0.610)	0.041	(0.610)	0.041	(0.610)	0.041	(0.610)
Dum07	0.029	(0.790)	0.029	(0.790)	0.029	(0.790)	0.029	(0.790)
Const	0.176	(0.490)	0.176	(0.490)	0.176	(0.490)	0.176	(0.490)
F Statistic	5.420 ***		5.420 ***		5.420 ***		5.420 ***	
Hausman Specification Test	39.210 ***		39.210 ***		39.210 ***		39.210 ***	
Observations	119		119		119		119	
Firms	38		38		38		38	

Note 1: ***, ** and * indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
Note 2: Dum04—Dum07 are year dummy variables.
Note 3: Sample includes bankrupt REITs.

5.4 Liability Structure and Ownership Concentration

Sections 5.2 and 5.3 have focused on the relationship between the new proxies for asset liquidation value and liability structure. This section elaborates on the influence of ownership concentration in order to enhance understanding on the liability structure of J-REITs. As noted in the previous section, I

hypothesized that the existence of a blockholder not only mitigates a divergence of interests among shareholders, but facilitates asset management business that owners originally refer to management firms. The purpose of this section is to examine if the high levels of ownership concentration by owners with a high asset liquidation value influence the business's liability structure. In other words, I have assumed that foreign investors and other parent companies that hold a large amount of the shares of a J-REIT do not base their investment decisions on the liability structure of the J-REIT. This is for three reasons: first, the converged interests of a small number of J-REIT shareholders enable them to request the J-REIT managers to reallocate their property asset portfolios. Second, the real estate businesses that own J-REIT blocks have expertise in real estate asset allocation and can act as suppliers of such assets. Third, external investors may regard the creditworthiness of a REIT as being virtually guaranteed by the real estate businesses that own it when one of these is a blockholder.

$$LongDebt = const + \chi_1 DER + \chi_2 AREA + \chi_3 Type + + \chi_4 Ownership + \eta \quad (7)$$

$$DER = const + \theta_{41} LongDebt + \theta_{42} ROA + \theta_{43} MBR + \theta_{44} FirmSize + \zeta_4 \quad (8)$$

LongDebt: Long-term debt divided by total liability (current year), *DER:* Total liability divided by market value of capital (current year), *AREA-MetroArea*: Real estate assets owned in the Tokyo metropolitan area which excludes the 23 wards of Tokyo plus neighboring prefectures divided by total investment assets (previous year), *Type-Residence*: Real estate assets used as retail residences divided by total investment assets (previous year), *Ownership 1*: Ownership ratio of the top real estate firms (previous year), *Ownership 2*: Ownership ratio of the top foreigner (previous year), *ROA:* Return on total assets (previous year),*MBR*: Total liability plus market value of capital divided by book value of total assets (previous year), *FirmSize:* Natural logarithm of total assets (previous year).

Two variables were employed in the analysis of the data. These were the ratio of investment in the Tokyo metropolitan area, which excludes the 23 wards of Tokyo plus neighboring prefectures, and the ratio of investment in residential real estate property as proxies for asset liquidation value. I employed the above ratios as liquidation values in this section because the parameters of intersected variables between those liquidation values and ownership concentration were significant in the preceding section. Two types of ownership data were obtained from Thomson Reuters. The first was the largest ownership ratio of real estate businesses to the total stock issued. The second was the ratio of foreign ownership concentration to the total stock issued. The Hausman specification tests recommended the employment of the fixed effects model for both (a) and (b) (see Table 4). The following results are obtained from the preceding analysis.

First, the relationship between ownership concentration by real estate businesses and long-term debt as a proportion of total liability is positively significant. Conversely, the parameters of ownership concentration by financial institutions and foreigners are both insignificant.

Table 6 Empirical Result 4: Ownership Concentration and Liability Structure

	(a) Dep. Var. = LongDebt		(b) Dep. Var. = LongDebt	
	Fixed Effects Model		Fixed Effects Model	
Endogenous Variable				
DER	-0.008 ***	(-3.980)	-0.010 ***	(-4.640)
Instrument Variables				
MetroArea	0.170 **	(2.200)	0.169 **	(2.220)
Residence	0.014 **	(2.060)	0.014 **	(2.120)
Ownership by Real Estate Firms	0.898 ***	(4.410)		
Ownership by Foreigners			0.310	(0.940)
Dum04	-0.171	(-0.710)	-0.270	(-1.120)
Dum05	-0.263	(-0.660)	-0.253	(-0.820)
Dum06	-0.353	(-0.750)	-0.631	(-0.850)
Dum07	-0.119	(-0.800)	-0.137	(-0.860)
Const	0.622	(0.540)	0.661	(0.640)
F Statistic	9.112 ***		8.400 ***	
Hausman Specification Test	39.260 ***		34.960 ***	
Observations	99		99	
Firms	32		32	
	(a) Dep. Var. = DER		(b) Dep. Var. = DER	
	Fixed Effects Model		Fixed Effects Model	
Endogenous Variable				
LongDebt	-1.722	(-1.000)	-1.722	(-1.000)
Instrument Variables				
ROA	-0.661 ***	(-3.450)	-0.661 ***	(-3.450)
FirmSize	0.574 ***	(2.940)	0.574 ***	(2.940)
MBR	1.226 ***	(2.990)	1.226 ***	(2.990)
Dum04	-0.239	(-1.240)	-0.239	(-1.240)
Dum05	-0.322	(-1.450)	-0.322	(-1.450)
Dum06	-0.390	(-0.980)	-0.390	(-0.980)
Dum07	-0.135	(-0.820)	-0.135	(-0.820)
Const	0.256	(0.320)	0.256	(0.320)
F Statistic	9.100 ***		9.100 ***	
Hausman Specification Test	39.780 ***		39.780 ***	
Observations	99		99	
Firms	32		32	

Note 1: ***, ** and * indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively.
Note 2: Dum04—Dum07 are year dummy variables.
Note 3: Sample includes bankrupt REITs.

6. Discussion

This section discusses the implications derived from the preceding sections. First, based on the results of Sections 5.2 and 5.3, it can be concluded that the proxies of regional characteristics and usage type for asset liquidation value are appropriate. In the existing literature, the remaining lease contract period of real estate assets and zoning regulations are defined as real estate liquidation values. In this study, the empirical results support the hypothesis that the degree of regionality and usage of real estate assets are also eligible proxies for asset liquidation values. There is no doubt that real estate assets in the metropolitan area have been easy to convert to cash when needed. The remaining lease contract period and the zoning regulations are still important proxies, but I regard that reflecting regionality to the existing proxies also enhances the eligibility of asset liquidation values. This also infers that it is strategically possible for J-REIT managers to control their capital structures in response to the degree of regionality of real estate assets. While J-REIT managers are possibly tasked with market risk minimization by asset diversification, my results suggest that liquid asset concentration is useful for corporate financing activities in some cases.

Another important inference is that the types of usage of real estate assets are eligible for another proxy of real estate asset liquidation value. Small real estate assets can easily be converted into cash. Real estate assets that belong to J-REITs in Tokyo's 23 wards are mostly office buildings and commercial facilities. These liquidation values are high in terms of the regionality of real estate assets. On the other hand, it is not always easy to liquidate these large assets as opposed to small residential properties in the metropolitan area outside the 23 wards. Small REITs cannot hold a complex of office buildings, but can hold a number of residential apartments. My analysis confirms the significance of positive relationships among the ratio of investment in the Tokyo metropolitan area (which excludes the 23 wards of Tokyo plus neighboring prefectures), residential property assets, and liability maturity. The above implications suggest that real estate liquidation values are not always dependent upon either the rationality or the usage. In the strategic way of REIT corporate finance, this implies that REIT managers should consider several determinants that might influence the liability structure when they fund.

The third contribution of this paper is its finding that the existence of large shareholders is an important factor in influencing the liability structure of a J-REIT. In other words, liquidation values are not only the major determinant of a liability structure, as the ownership structure also influences it. My results suggest that J-REIT managers can obtain funds by undertaking debt of long maturity when ownership is concentrated. The existing literature has pointed out the existence of a blockholder mitigated divergence of interests among shareholders and this might enhance the discipline of corporate management.

On the other hand, the background of my empirical result is that block holders as sponsor firms in J-REITs directly intervene in the real estate management business. Generally, most sponsor firms establish the asset management firms of J-REITs and own them as wholly owned subsidiaries. Thus, the historical process of J-REIT market development may have influenced the importance placed on ownership concentration. Market participants frequently regard the real estate firm sponsors as real estate suppliers, even though there is no transaction between owners and the REITs. As a result, these REITs find it relatively easy to participate in the long-term funding market and prolong debt maturities by debt securities issuance. Consequently, J-REIT ownership concentration is practically related to the liability structure as the literature has theoretically pointed out.

My results also reveal that foreign investors who account for more than 70 percent of the J-REIT market turnover in the Tokyo Stock Exchange (TSE) do not influence the liability structure of J-REITs. This result is consistent with that of Kang and Stulz (1997) who have focused on Japanese non-financial firms in the 1990s. I find that foreign investors prefer and purchase J-REITs with high asset liquidation values in the secondary market, but they do not determine the managerial issues of these J-REITs. This must be a consequence of the behavior of foreign institutional investors. Foreign investors most likely feel that the profitability of J-REITs with high liquidation values is implicitly guaranteed by parent companies within the real estate industry, and that the creditworthiness of such J-REITs often exceeds that of the parent companies. For instance, foreign institutional investors compare the stock prices of Hankyu REIT, Inc. and its owner, Hankyu Realty Co. Ltd. I obtained information on the arbitrage activities of foreign investors from my interviews at Chuo-Mitsui Trust Corp, Ltd. on April 3, 2009. The results of the survey reveal that foreign owners do not intervene in the management of the REITs due to their focus on the secondary market. In summary, while the primary market of J-REITs is historically involved in the real estate industry and J-REIT block holders influence internal management, foreigners transact in the secondary market and do not intervene in internal affairs.

Furthermore, the following conclusions can be drawn from my results. First, the continuing excessive concentration of J-REIT assets in the Tokyo real estate market also increases the asset liquidity of J-REIT balance sheets. These high levels of liquidity have encouraged potential participants to join the concentrated market. However, this study shows that the central part of the Tokyo metropolitan area does not always have the highest liquidity, because only a limited number of J-REITs with large assets can participate in the concentrated office building market. Despite this, asset liquidity in the Tokyo metropolitan area (which excludes the 23 wards plus neighboring prefectures) is high, and concentration of investment in these areas influences the liability structure of J-REITs. The existence of a block holder is an important prerequisite for a linear relationship between a J-REIT's asset liquidation value and its liability structure.

7. Concluding Remarks

This paper has drawn several conclusions from the results of its empirical analyses. Its main contribution is in finding a significant relationship between the new proxies for asset liquidation value and liability term structure. The newly employed proxies are the variables of regional characteristics and the usage of real estate property. Existing studies have selected various proxies for liquidation value, but I have applied alternative variables to my calculations. Under the recent and excessive concentration of the real estate market in the Tokyo metropolitan area, the regional characteristics and usage type of a J-REIT's real estate assets have become the most important factors in its liability structure. However, these factors are not the sole determinants of liability structure; the J-REIT's ownership structure can also facilitate its funding activities.

Although few studies have covered liability term structure and ownership structure, I have explored these factors in this research. I have sampled J-REITs because it had been impossible to obtain detailed data on the real estate assets of REITs in other countries. However, I expect that future research will reexamine the relationship between regionality and usage of real estate assets and the debt term structure of REITs by using detailed real estate data from other countries. In addition, I have focused on the REIT market in this study because REIT balance sheets show only one type of asset, that is, real estate investment assets. Manufacturing firms hold various types of assets because they invest in fixed assets, but I assume that the liquidation of these fixed assets could also influence their liability structure. In recent years, secondary markets have been developed for commodities such as semiconductors, liquid crystal panels, and flash memory devices. Secondary markets for basic materials have also dramatically expanded. I expect future studies to attempt to treat the above assets as proxies for liquidation value and verify the relationships between these proxies and the liability and ownership structure of the corresponding firms.

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Appendix

OLS Pooling Results for Regional Concentration as Liquidation Value

	(a) Dep. Var. = LongDebt		(b) Dep. Var. = LongDebt	
	OLS Pooling Model		OLS Pooling Model	
Endogenous Variable				
DER	-0.010 ***	(-7.010)	-0.009 ***	(-6.420)
Instrument Variables				
Tokyo23	0.161 *	(1.910)		
MetroArea			0.015 **	(2.100)
LocalCity				
Ownership	0.095 **	(2.220)	0.080 *	(1.830)
Ownership*Tokyo23	0.140	(0.410)		
Ownership*MetroArea			0.311 ***	(2.740)
Ownership*LocalCity				
{Tokyo23}^2	0.144	(0.350)		
{MeroArea}^2			0.034	(0.710)
{LocalCity}^2				
{Ownership}^2	-0.224	(-0.780)	-0.241	(-0.990)
Dum04	0.076	(0.910)	0.044	(0.910)
Dum05	0.019	(0.790)	0.007	(0.640)
Dum06	0.028	(0.660)	0.057	(0.510)
Dum07	0.037	(0.780)	0.085	(0.480)
Const	-0.097	(-1.310)	-0.840	(-1.040)
F Statistic	4.090 ***		3.880 **	
R2	0.039		0.044	
Observations	119		119	
	(a)' Dep. Var.= DER		(b)' Dep. Var.= DER	
	Fixed Effects Model		Fixed Effects Model	
Endogenous Variable				
LongDebt	-2.111	(-0.410)	-2.111	(-0.410)
Instrument Variables				
ROA	-0.774 ***	(-5.450)	-0.774 ***	(-5.450)
FirmSize	0.747 ***	(3.440)	0.747 ***	(3.440)
MBR	1.119 ***	(3.970)	1.119 ***	(3.970)
Dum04	-0.004	(-0.050)	-0.004	(-0.050)
Dum05	-0.019	(-0.370)	-0.019	(-0.370)
Dum06	0.041	(0.610)	0.041	(0.610)
Dum07	0.029	(0.790)	0.029	(0.790)
Const	0.176	(0.490)	0.176	(0.490)
F Statistic	5.420 ***		5.420 ***	
Hausman Specification Test	39.210 ***		39.210 ***	
Observations	119		119	
Firms	38		38	

Note 1: ***, ** and * indicate significance at the 1 percent, 5 percent and 10 percent level, respectively.

Note 2: Dum01—Dum07 are year dummy variables.