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Abstract

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 the REIT has a concentrated ownership structure. In summary, this paper validates the employment of the regional characteristics and usage type of real estate assets as proxies for asset liquidation value, and confirms that these proxies are related to the liability structure of J-REITs. This connection is possibly intensified by the perception of block shareholders as sponsor firms by market participants.

JEL Classification Code: L85, G30, G32
Keywords: REIT, Liability Structure, Capital Structure

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 a 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 regarding 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. In this regard, recent literature has focused on how asset liquidity influences capital structure and debt term structure.

In addition, preliminary interviews of REIT practitioners conducted by the author 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 blockholders promotes the convergence of shareholder interests and improves a firm's corporate performance. Therefore, this paper employs a sample of data obtained from J-REITs in order to verify the above hypotheses concerning 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.

The next section reviews the literature on the relationship between the degree of asset liquidity in the debit side of the balance sheet and the structure of the credit side of the balance sheet. It also explains how this study contributes to the existing body of literature on REITs. The third section describes our 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 study's empirical methodology and results. 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 on 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 works have shown that a change in a firm's asset liquidation value influences its capital structure. Fama and French (2002) organize theories relating to capital structure and categorize the determinants of capital structure according to trade-off theory and pecking order theory. As noted previously, trade-off theory suggests that corporate capital structure is determined by the 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 these tools create.

Based on these prominent writings, 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 invest aggressively 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.

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 using data from the commercial mortgage-backed securities (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 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 in this methodology information regarding zoning regulations, while Giambona et al. (2008) have considered the possibility of liquidation and the term structure of the rental and lease agreements.

Our 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 lessor or tenant, so the value thus yielded, though 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 academia. The reason for this 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 it uses may be arbitrary.

3. Hypothesis

The previous sections attest to the abundance of literature concerning the capital structure and liability structure of REITs. Against this backdrop, this paper employs a new methodology for estimating 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, we regard the concentration and dispersion of real estate investment assets as important factors of liquidation value. We 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), we 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, our 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 the REIT's assets are concentrated in a highly liquid region. We 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. We included qualitative information of zoning regulations in our regional and usage concentration data. Since the Tokyo metropolitan area has a high real estate transaction frequency per unit area, we 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, we 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 blockholders improves a firm's managerial discipline because it mitigates the divergence of interests among the firm's shareholders. We assume that market participants regard blockholders of J-REITs, in particular, as de facto sponsors and providers of financial assistance should the REIT become insolvent. This is because Japanese

real estate industries and trust banks 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). Most market participants recognize this historical process and understand that some REITs are strongly supported by their parent companies.

Our study considers the relationship between liability structure and ownership concentration, which the literature discussed in the previous section does not do. Our 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 each REIT's top five investment assets are taken from the Japanese Annual Securities Financial Report. The data cover the period of 2003 to 2008. Data on real estate asset regionality is available from the Japanese Ministry of Finance, which supervises the Japanese Annual Securities Financial Report and requests that all REITs disclose complete information on each individual property. However, since regional classification sometimes differs from REIT to REIT, we re-categorized and re-aggregated the data according to the following categories: (1) the 23 wards of Tokyo, (2) the Tokyo metropolitan area, excluding the 23 wards of Tokyo plus neighboring prefectures, and (3) other local cities. The 41 REITs in the report share common classifications for the usage type of their real estate assets. Therefore, we used this data in its original form to calculate the REITs' purpose of use concentration ratios for (1) residential buildings, (2) office buildings, (3) commercial facilities, and (4) hotels and others. In addition, we 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.

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. We used the concentration of the top five real estate assets as a proxy for the inverse value of asset liquidation. The data suggests that some J-REITs own a limited number of real estate properties, that is, a few big properties, while others own many small properties. The former group has a high ratio of the concentration of the top five real estate assets and the latter has a low ratio for the same. Our hypothesis is that J-REITs with many small properties are allowed to sustain higher debt-to-equity ratios and liabilities of longer maturity than are J-REITs with a few big properties. This hypothesis assumes that debtors can request managers to either liquidate the firm's assets or reallocate their existing portfolio because the firm's real estate assets are traded in small lots when its asset concentration ratio is low. Prominent works 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, we employed the following equation model:

$$ShortDebt = const + \phi_1 DER + \phi_2 Concentration + \phi_3 Ownership + \varepsilon \quad (5.1)$$

$$DER = const + \theta_{11} ShortDebt + \theta_{12} ROA + \theta_{13} MBR + \theta_{14} FirmSize + \zeta_1 \quad (5.2)$$

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 employed two-stage least squares estimations within a simultaneous equation system. In this model, top five asset concentration was an instrumental variable, and short-term debt divided by total liability and the debt-to-equity ratio were endogenous variables. The Hausman specification test showed that the fixed effects model should be used, and The following conclusions were derived from its estimations. First, our results indicate that REITs with high debt-to-equity ratios are statistically dependent on short-term borrowing. Second, 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 our hypothesis that the dispersion of real estate assets contributes to an increase in long-term liabilities.

Table 1 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

Our 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 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, we regard regional investment concentration as a proxy for asset liquidation value; that is to say, asset concentration in Tokyo metropolitan area is high when asset liquidation value is high. To verify the relationship between the variable of regional investment concentration and liability structure, the following empirical equation model was employed:

$$LongDebt = const + \alpha_1 DER + \alpha_2 AREA + \alpha_3 Ownership + \alpha_4 AREA * Ownership + \alpha_5 (AREA)^2 + \alpha_6 (Ownership)^2 + v \quad (5.3)$$

$$DER = const + \theta_{21} LongDebt + \theta_{22} ROA + \theta_{23} MBR + \theta_{24} FirmSize + \zeta_2 \quad (5.4)$$

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 excluding the 23 Wards of Tokyo plus Neighboring Prefectures divided by Total Investment Assets (previous year), *AREA*- 3) *Local City:* 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).

We also employed two-stage least squares estimations for the simultaneous equation system for this eimprical model. Hausman specification statistics suggested 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 employing the two-stage least squares estimation method. Therefore, Table 2reports 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. We employed both long-term borrowing and short-term borrowing divided by total liability as dependent variables, but report the former because it produces better overall results. The results are as follows:

The results of the random effects 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, excluding the 23 wards of Tokyo plus neighboring prefectures, possess long-term liabilities. The existence of a blockholder also prolongs debt term structure ofREITs that owns high ratio of real estate assets in the Tokyo metropolitan area excluding the 23 wards of Tokyo plus neighboring prefectures. Conversely, the parameter of Local City 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 2. 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 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) note that the liquidation value of real estate assets differs according to the assets' intended use. 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 Financial 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 employed these categories to examine the relationship between the investment ratios for the foregoing types of usage and liability structure, allowing for the influence of ownership structure.

$$LongDebt = const + \beta_1 DER + \beta_2 Type + \beta_3 Ownership + \beta_4 Type * Ownership + \beta_5 (Type)^2 + \beta_6 (Ownership)^2 + \sigma \quad (5.5)$$

$$DER = const + \theta_{31} LongDebt + \theta_{32} ROA + \theta_{33} MBR + \theta_{34} FirmSize + \zeta_3 \quad (5.6)$$

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 estimations produce the following results. As in previous sections, we used fixed effects estimation in our model and gauged the appropriateness of the methodology by looking at the results of the Hausman specification test. The statistics suggested that we should employ fixed effects estimation in models (a) to (d). The results of the fixed effect model show that the parameter of the residential usage ratio was significantly positive and also that the parameter was significant when the variable was intersected with ownership concentration. This means that REITs investing 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 3. 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 our understanding of the liability structure of J-REITs. Pound (1988) and Palia and Lichtenberg (1999) assert that the existence of a blockholder mitigates the divergence of interests among shareholders and strengthens managerial discipline. We hypothesize that high levels of ownership concentration by real estate businesses with a high asset liquidation value influences the business's liability structure. In other words, we assume that

foreign investors and other parent companies that hold a large amount of a J-REIT's shares 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.

$$LongDebt = const + \chi_1 DER + \chi_2 AREA(orType) + \\ + \chi_5 Ownership\_1 + \chi_6 Ownership\_2 + \chi_7 Ownership\_3 + \eta \quad (5.7)$$

$$DER = const + \theta_{41} LongDebt + \theta_{42} ROA + \theta_{43} MBR + \theta_{44} FirmSize + \zeta_4 \quad (5.8)$$

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 excluding 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 Firm (previous year), *Ownership 2*: Ownership Ratio of the Top Financial Institution (previous year), *Ownership 3*: 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, excluding the 23 wards of Tokyo plus neighboring prefectures, and the ratio of investment in residential real estate property as proxies for asset liquidation value. Three 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 largest ownership ratio of financial institutions to the total stock issued. The third was the ratio of foreign ownership concentration to the total stock issued. 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 4. 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	-0.011	***	(-4.520)	-0.011	***	(-5.000)
Instrument Variables						
MetroArea	0.169	**	(2.220)			
Residence				0.004	**	(2.100)
Ownership by Real Estate	0.992	***	(4.200)	0.989	***	(3.020)
Ownership by Financial Institutions	-0.141		(-0.840)	-0.090		(-1.100)
Ownership by Foreigners	0.400		(0.810)	0.745		(0.410)
Dum04	-0.170		(-1.280)	-0.185		(-1.430)
Dum05	-0.291		(-0.710)	-0.293		(-0.720)
Dum06	-0.371		(-0.760)	-0.375		(-0.780)
Dum07	-0.125		(-0.780)	-0.128		(-0.820)
Const	0.634		(0.780)	0.649		(0.790)
F Statistic	8.820	***		8.550	***	
Hausman Specification Test	31.860	***		32.040	***	
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. Liability Structure and Ownership Concentration: An International Comparison

This study tries to determine whether the results for the relationship between ownership structure and liability term structure also apply to other REIT markets. This section employs financial data on individual REITs from the United States of America (US), Canada, Australia, and Singapore, which are the world's four largest REIT markets. While there were 41listed REITs in Japan at the end of December 2008, there were 151 in the US, 31 in Canada, 69 in

Australia, and 20 in Singapore. Of course, the larger the sample of countries the better the comparison of international results. Although the REIT markets in the United Kingdom (UK), Malaysia, and Hong Kong are relatively large, the number of listed trust funds in these countries came to less than 20. Therefore, we excluded these three jurisdictions and incorporated the aforementioned markets in addition to Japan.

As with the analyses in other sections, we obtained both financial and ownership data from Thomson Reuters. The simultaneous equations are as follows:

$$ShortDebt = const + \phi_1 DER + \phi_2 MBR + \phi_3 Ownership + \phi_4 MBR \times Ownership + \phi_5 MBR^2 + \phi_6 Ownership^2 + \vartheta \quad (5.9)$$

$$DER = const + \theta_{51} ShortDebt + \theta_{52} ROA + \theta_{53} MBR + \theta_{54} FirmSize + \zeta_5 \quad (5.10)$$

ShortDebt: Short-term Debt divided by Total Liability (current year), *DER:* Total Liability divided by Market Value of Capital (current year), *Ownership*: Top Five Shareholder Ownership Concentrations (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).

For Japan, Canada, and Australia, fixed effects models were employed because the Hausman specification tests for these were significant. For the US and Singapore, Table 5 shows the results of random effects estimation; the OLS pooling results for these two countries are indicated in Appendix 2. The results suggest that the parameter of the top five ownership concentrations are significantly negative in Japan, the US, Canada, and Singapore. Australia is the only exception. While this paper has assumed that ownership concentration in the REIT market is a unique characteristic of J-REITs, these results suggest that it also influences liability term structure in other major REIT markets.

Table 5. Empirical Result 5: Liability Term Structure and Ownership Concentration

	(a) Japan			(b) United States			(c) Canada			(d) Australia			(e) Singapore		
	Fixed Effects Model			Random Effects Model			Fixed Effects Model			Fixed Effects Model			Random Effects Model		
Endogenous Variable															
DER	0.044	**	(2.020)	0.120	***	(4.950)	0.332	***	(3.680)	0.441	***	(2.940)	0.110	***	(4.550)
Instrument Variables															
MBR	1.022		(0.440)	-0.116		(-0.310)	0.043		(0.440)	0.026		(0.170)	-0.556	*	(-2.000)
Ownership	-0.006	**	(-2.360)	-9.977	***	(-3.390)	-0.418	*	(-1.770)	0.432		(0.320)	-1.719	*	(1.990)
Ownership*MBR	0.908		(0.710)	0.034		(0.670)	-0.064	*	(-1.930)	-1.166		(-0.950)	-0.417		(-0.460)
Ownership^2	-0.152		(-0.490)	4.499		(1.450)	-0.406		(-1.560)	1.365	*	(1.900)	-1.153		(-1.080)
MBR^2	0.024		(0.260)	0.010	*	(1.850)	0.037		(1.470)	-1.036	*	(-1.680)	0.020		(0.140)
Dum01				1.158	*	(1.880)	-0.216	**	(-2.400)	0.862	***	(3.810)	-0.144		(-0.100)
Dum02				-1.017	*	(-1.740)	0.103		(1.610)	0.309		(1.400)	-0.230		(-0.840)
Dum03				-0.931		(-1.630)	0.021		(0.340)	0.041		(0.200)	-0.470		(-0.930)
Dum04	0.119		(0.440)	-0.842		(-1.560)	-0.012		(-0.220)	0.095		(0.049)	-0.147		(-0.660)
Dum05	0.141		(0.540)	-0.643		(-1.280)	-0.033		(-0.650)	0.123		(0.680)	-0.075		(-0.370)
Dum06	0.159		(0.520)	-0.399		(-0.850)	-0.061		(-1.260)	0.154		(1.020)	-0.105		(-0.540)
Dum07	0.146		(0.510)	-0.223		(-0.500)	-0.068		(-1.630)	0.069		(0.570)	-0.030		(-0.200)
Const	-4.298		(-0.700)	4.771	*	(2.020)	0.224		(1.340)	-2.874	**	(-2.540)	2.372	*	(1.860)
F Statistic	2.320	***					1.740	*		1.460	*				
Hausman Specification Test	30.750	***					56.650	***		57.730	***				
Observations	120			923			89			134			42		
Firms	41			149			18			34			16		

	(a) Japan			(b) United States			(c) Canada			(d) Australia			(e) Singapore		
	Fixed Effects Model			Random Effects Model			Fixed Effects Model			Fixed Effects Model			Random Effects Model		
Endogenous Variable															
ShortDebt	0.920		(1.020)	-0.011		(-0.520)	-0.040		(-0.120)	0.711		(0.890)	1.810		(0.710)
Instrument Variables															
ROA	-0.818	***	(-4.650)	-0.295	**	(-2.280)	-0.252	**	(-2.080)	1.726	**	(2.470)	0.125		(0.690)
FirmSize	0.628	***	(2.780)	-0.085		(-0.320)	0.638		(0.470)	1.454		(1.550)	1.081		(1.040)
MBR	1.636	***	(2.860)	-0.171		(-0.550)	0.004		(0.210)	0.023		(0.270)	-0.378	*	(-2.130)
Dum01				1.873	***	(3.670)	-0.086		(-1.030)	0.436	***	(2.770)	-0.110		(-0.550)
Dum02				-0.413		(-0.830)	0.122	*	(1.910)	-0.024		(-0.150)	-0.021		(-0.460)
Dum03				-0.398		(-0.810)	0.059		(1.080)	-0.216		(-1.330)	-0.300		(-0.140)
Dum04	-1.735		(-0.440)	-0.372		(-0.720)	0.021		(0.440)	-0.139		(-0.890)	-0.082		(-0.370)
Dum05	-1.834		(-0.340)	-0.283		(-0.620)	-0.010		(-0.200)	-0.068		(-0.460)	-0.054		(-0.280)
Dum06	-0.867		(-0.180)	-0.170		(-0.380)	-0.045		(-1.000)	0.005		(0.040)	0.026		(0.160)
Dum07	-0.968		(-0.510)	-0.088		(-0.200)	-0.042		(-1.000)	-0.044		(-0.380)	0.081		(0.660)
Const	13.537		(0.410)	2.518	***	(3.330)	0.121		(1.340)	-0.377		(-0.580)	0.815		(1.510)
F Statistic	1.920	***					1.740	*		1.460	*				
Hausman Specification Test	30.450	***					56.650	***		57.730	***				
Observations	120			923			89			134			42		
Firms	41			149			18			34			16		

Note 1: ***, ** and * indicate statistical significance at the 1 percent, 5 percent and 10 percent levels, respectively.
Note 2: Dum01—Dum07 are year dummy variables.
Note 3: Sample includes bankrupt REITs.

7. Discussion

This section discusses the implications derived from the preceding sections. First, based on the results of section 5.2 and 5.3, we conclude that the proxies of regional characteristics and usage type for asset liquidation value are appropriate. Historically, as shown by the MLIT, Tokyo (including the 23 wards and other districts) has had the highest frequency of real estate transactions per unit area. There is no doubt that real estate assets in this area have been easy to convert to cash when needed. Another important inference is that small assets can easily be converted to cash. Real estate assets belonging to J-REITs in Tokyo's 23 wards are mostly office buildings and commercial facilities. It is more difficult to liquidate these large assets than it is to liquidate small residential properties. Small REITs cannot hold a complex of office buildings, but can hold a number of residential apartments. Our analysis confirms the significance of the positive relationships among the ratio of investment in the Tokyo metropolitan area (excluding the 23 wards of Tokyo plus neighboring prefectures), residential property assets, and liability maturity.

At the beginning of this study, we found the Japanese Annual Securities Financial Report had not disclosed enough information about the trust contract period of real estate properties. Therefore, we could not employ the same proxies as those used in other studies. However, we also found that the proxies these studies used for the trust contract period were not always appropriate estimates of asset liquidation value. For instance, traditional business practices and the existence of individual factors between lessor and lessee can also influence the trust contract period thereby making these proxies unreliable. In contrast, the regional investment ratio and usage of assets are suitable proxies for asset liquidation value because they contain various types of qualitative information. These ratios not only include information on the frequency of transactions, but also the effects of zoning regulations, individual factors, traditional business practices, and other factors that may influence asset liquidation value.

Another contribution of this paper is its finding that the existence of large shareholders is an important factor in influencing the relationship between the debit and credit sides of the J-REIT balance sheet. Our results suggest that J-REIT managers can obtain funds by undertaking debt of long maturity when ownership is concentrated in a real estate parent company. The historical process of J-REIT market development may have influenced the importance placed on ownership concentration by a real estate firm. Market participants regard these real estate firms as sponsors and even as real estate suppliers, even though there is no financial transaction between owners and REITs.

Our results also reveal that foreign investors who account for more than 70 percent of J-REIT market turnover in the Tokyo Stock Exchange (TSE) do not influence the capital structure and debt maturity of J-REITs. We 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 the 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. We obtained information on the arbitrage activities of foreign investors from our 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 blockholders influence internal management, foreigners transact in the secondary market and do not intervene in internal affairs.

Furthermore, the following conclusions can be drawn from our 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, our 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-REIT with large assets can participate in the concentrated office building market. Despite this, asset liquidity in the Tokyo metropolitan area (excluding the 23 wards plius neighboring prefectures) is high, and concentration of investment in these areas influences the

liability structure of J-REITs. The existence of a blockholder is an important prerequisite for a linear relationship between a J-REIT's asset liquidation value and its liability structure.

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 we applied alternative variables to our 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 the 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, we explored these factors in our research. We sampled J-REITs because it was impossible to obtain detailed data on the real estate assets of REITs in other countries. However, we expect that future research will reexamine the relationship between the 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, we 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 we assume that the liquidation of these fixed assets could also influence their liability structure. In recent years, secondary markets have developed for commodities such as semiconductors, liquid crystal panels, and flash memory devices. Secondary markets for basic materials have also expanded dramatically. We 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 1: 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.

Appendix 2: OLS Pooling Results for Short-term Debt and Ownership Concentration

	(b) United States			(e) Singapore		
	OLS Pooling Model			OLS Pooling Model		
Endogenous Variable						
DER	0.097	***	(3.220)	0.419	***	(5.150)
MBR	-0.094		(-0.710)	-0.552		(-1.140)
Instrument Variables						
Ownership	-6.967	***	(-4.350)	-1.261	***	(2.410)
Ownership*MBR	0.061		(0.410)	-0.223		(-0.410)
Ownership^2	10.121		(0.910)	-0.921	**	(-2.200)
MBR^2	0.009		(1.410)	0.009		(0.150)
Dum01	1.100	*	(1.810)	-0.210		(-0.140)
Dum02	-1.011	*	(-1.800)	-0.187		(-0.950)
Dum03	-1.170		(-1.440)	-0.514		(-0.880)
Dum04	-1.040		(-1.390)	-0.185		(-0.470)
Dum05	-0.740		(-1.170)	-0.114		(-0.140)
Dum06	-0.690		(-0.170)	-0.212		(-0.140)
Dum07	-0.100		(-0.410)	-0.151		(-0.850)
Const	7.140	*	(1.910)	3.327	**	(2.120)
F Statistic	2.262	***		3.755	***	
R-squared	0.041			0.074		
Observations	923			42		

	(b)' United States			(e)' Singapore		
	OLS Pooling Model			OLS Pooling Model		
Endogenous Variable						
ShortDebt	-0.085		(-0.420)	1.622		(0.610)
Instruments Variables						
ROA	-0.127	***	(-3.220)	0.092		(0.590)
FirmSize	-0.072		(-0.140)	0.921		(0.990)
MBR	-0.355		(-0.410)	-0.298		(-1.440)
Dum01	1.222	***	(4.110)	-0.170		(-0.510)
Dum02	-0.415		(-0.840)	-0.015		(-0.390)
Dum03	-0.384		(-0.760)	-0.240		(-0.210)
Dum04	-0.377		(-0.840)	-0.079		(-0.410)
Dum05	-0.314		(-0.580)	-0.041		(-0.310)
Dum06	-0.225		(-0.410)	0.019		(0.200)
Dum07	-0.110		(-0.170)	0.088		(0.760)
Const	2.112	***	(3.420)	0.851		(1.310)
F Statistic	3.620	***		2.260	***	
R-squared	0.032			0.024		
Observations	923			42		

Appendix 3: Descriptive REIT Statistics

(A) J-REITs

	(A) Liability Structure			(B) Proxies of Asset Liquidation Value				
				(a) Concentration		(b) Area		(c) Use
	DER	LongDebt	ShortDebt	Concentration	Tokyo23	MetroArea	LocalCity	Residence
mean	1.089	0.575	0.239	0.474	0.523	0.064	0.215	0.316
s.d	1.477	0.246	0.192	0.233	0.282	0.140	0.239	0.474
max	13.608	0.992	0.955	1.000	1.000	1.000	0.976	1.000
min	0.039	0.000	0.000	0.130	0.000	0.000	0.000	0.000

	(c) Use			(C) Ownership Structure		(D) Other Independent Variables			
	Office	Hotel	Commerce	Real Estate Firms	Financial Institutions	Foreigners	ROA	MBR	FirmSize
mean	0.079	0.011	0.545	0.268	0.222	0.198	0.029	1.117	11.709
s.d	0.233	0.042	0.612	0.239	0.201	0.213	0.009	0.257	0.746
max	1.000	0.235	0.892	1.000	0.799	0.875	0.053	2.077	13.495
min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.449	9.676

(B) REITs in major international markets

		ShortDebt	MBR	ROA	FirmSize	Ownership
(a) Japan (N=41)	mean	0.239	1.117	0.029	11.709	0.474
	s.d.	0.192	0.257	0.009	0.746	0.223
	max	0.955	2.077	0.053	13.495	1.000
	min	0.000	0.000	0.000	9.676	0.000
(b) United States (N=149)	mean	0.340	2.152	0.011	6.683	0.319
	s.d.	0.298	11.603	0.690	2.005	0.254
	max	0.981	293.541	5.159	10.961	1.000
	min	0.000	0.000	-20.494	-5.065	0.000
(c) Canada (N=18)	mean	0.085	1.122	0.000	6.143	0.443
	s.d.	0.112	0.547	0.117	2.025	0.349
	max	0.841	4.194	0.190	10.139	1.000
	min	0.000	0.000	-1.416	-1.752	0.000
(d) Australia (N=34)	mean	0.145	1.029	0.026	6.228	0.412
	s.d.	0.312	0.386	0.144	2.091	0.315
	max	0.968	4.901	0.359	10.928	1.000
	min	0.000	0.028	-1.907	-0.227	0.000
(e) Singapore (N=16)	mean	0.165	0.921	0.056	6.791	0.684
	s.d.	0.218	0.429	0.114	1.320	0.273
	max	0.971	4.358	0.848	9.510	0.988
	min	0.000	0.217	-0.444	1.630	0.000

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 excluding 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, *Financial Institutions*: Ownership Ratio of the Top Financial Institution, *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.