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A Capital Structure Financial Analysis and Unmeasured Effect of each Countries Regime: the Real Estate Companies (REITS)

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Abstract:

This article investigates the capital structure of Real Estate companies (REITS) and how it is connected with key financial ratios. Financial analysis provides significant insight of the company capital structure.
Existing financial models accumulate the dynamics of different key factors that enhance or diminish the capabilities of a company to extend the debt finance. Previous literature review in trade-off theory, pecking order theory, agency costs and market timing hypothesis postulate the relation of capital structure with several financial measurements.
The contribution of this research is to link debt to capital ratio with independent variables, which are important within the real estate business context.
Panel data analysis of an adequate sample, from 2005 to 2010, of 371 international listed real estate companies', materialize our assumptions of this linkage of debt ratio. The unmeasured effect of each countries regime is inherited into the equation with the incorporation of dummy variables.
This valuation methodology is an easy accessible tool for professionals and practitioners engaged in real estate business.

Key Words: *Capital structure, financial ratios, REITs*

JEL Classification codes: *G32; M41; R30.*

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Introduction

In the real estate industry, traditional players partially finance the acquisition of property assets with debt. Preservation of leverage exposure in low levels is a cautious measure to the cyclic profile of the industry and the risk associated with the volume of capital invested in assets. REITs can be a source of steady cash flows, hedging any risk related with the industry, which is an accepted strategy among investors in real estate. If the cash flow earnings potentials are satisfactory to cover any finance cost, then capital structure can be separated in equity and debt. Shareholders equity in a company's capital structure means extensive control of the management decisions. Therefore, management has to figure what is the optimal combination of debt and equity to provide attractive returns to shareholders. Optimal capital structure obviously affects the continuity of the company and the turnovers from the invested capital.

Modigliani & Miller (1958, 1963) tried to solve the complex decision of investment financing, but without providing any assessment of their theories. However, their research was the initial stimulation for pecking order theory, trade-off theory, free cash flow and agency costs theory and market timing theory. There is large and growing literature on the various aspects of capital financing.

Real estate developments in economies present tight working capital, low liquidity, slow payback, capital-intensive outflows that are not immediately recovered, and short to medium construction times. For the long run, these investments are attracting the interest of a banking sector, searching for more attractive returns and the diversification if its portfolio.

There are also several uncertainties related to demand, sale prices, land costs, unsold inventories, and regulatory and local government risks (authorizations, occupancy permits, etc.), which increase the investors' perceived risk. It is necessary to have good expertise of a constantly changing regulations on rent, taxes, project licenses, etc., which increases the administrative costs of projects.

In this research we propose a methodology that associates financial theories for leverage with real estate differentiations. Also we introduce a variable for urban and economic environment of a country.

This presented article covers the gap between financial theories with common practice, theories and differentials of real estate industry for leverage.

We apply in the model pooled least squares and general least squares method with cross section weights that adapts for heteroskedasticity and autocorrelation problem.
This research is organized as follows. The first section provides an overview of previous research on capital structure, effect of leverage in profitability and, finally, reciprocal analysis of financial statement indicators or ratios. Also, as presented the

theories and practices of real estate industry. Section two presents an investments model for this industry and the financial data that are used for our research. The third part describes the econometric background for assessing our model. The fourth section provides and finally presents the results of this research and provides reasoning within the business context of real estate industry.

Literature Review

The most acknowledged theories in the field of finance and capital structure, which analyze the leverage ratio are (Ang et al. 1982; Leland & Pyle 1977; Ross 1977, Titman and Wessels 1988, Marsh, 1982,Graham (2000),Myers (1984), Harris and Raviv (1990),Titman and Wessels (1988) and Rajan et al. (2000), Williamson (1988) and Jensen (1986) , Fischer et al. (1989)).

Trade- off theory suggests that equity and leverage ratio is closely linked with maximization of market value and tax benefits of debt (Bradley, Jarrell, & Kim, 1984). However, this theory does not provide a possible methodology to estimate that ratio.

Stiglitz (1973) suggests that the company should prefer the retained earnings and in case that they are not adequate, to cover the excess capital needs with debt financing (Leary and Roberts (2005)).

There are several financial ratios that measure leverage. According to studies and theories mentioned above for any kind of firms (finance approach) the below relationships are existed:

- ✓ Firms that have a high market-to-book ratio tend to have low levels of leverage.
- ✓ Firms that have more tangible assets tend to have more leverage.
- ✓ Firms that have more profits tend to have less leverage.
- ✓ Larger firms (as measured by book assets) tend to have high leverage.

Real estate companies invest the majority of the capital in fixed asset acquisition. Trade off theory suggests that companies with balance sheet dominated by fixed assets have lower risk profile. Bradley et al. (1984) associates the ownership of fixed assets with debt financing. More specific, researchers suggest that fixed asset intensive companies have access to more debt liquidity and lower cost. Real estate mortgage provides the owner the ability to raise more loan capital (Harris and Raviv 1990; Rajan and Zingales 1995; Frank and Goyal 2003).

Information asymmetry is the key factor to select among debt and equity financing (Myers and Majluf 1984; Eckbo et al. 1990). Managers are reversed and tactical, disliking the idea of internal control. Undoubtedly, they are the only one aware of the actual value of an investment and the company. This might be also a reason of preference of debt over equity issuance (Myers, 2003). If the market conditions are

favorable and the stock of a company is in overpriced levels, Ritter (2002) argues that this is the right timing for equity raise, unless the finance cost is low. The efficient market timing is what a manager always accounts in order to select between stock issue and debt finance ((Baker, Stein, and Wurgler, 2003; Baker and Wurgler, 2002).

Capital structure is associated with the value based management and especially with the firm value. Liapis (2010) suggest that the financial statements provide enough information to evaluate a company. He considers the EVA metrics as value base management measurement, which provides valuable information about the returns from the asset invested in the company. However, EVA measurement has the drawback that the estimation process is becoming perplexed with the continuous adjustments need deed in order to derive net operating profit after taxes and capital ((Keys, Azamhuzjaev, and Mackey, 2001; Liapis, 2010). Liapis (2010), associates the value creation from management decisions measured with the value based management and the investor's valuation of the company with market capitalization. Penman (1991) suggests that return on equity is a profitability measure, but is not sufficient to interpret future profitability but correlates with information other than earning to predict profitability of the stock. Researcher suggests that decomposition might improve forecast results. Fairfield and Yohn (2001) uses disaggregation on common financial ratios and suggests that this methodology provides incremental information for simple financial rations and improve profitability forecasts.

In the field of real estate Williams (1991) studied the optimal timing for development and abandonment of the property as well as the optimal density in the presence of uncertainties about price/m2 and cost/m2.

According to Ling & Naranjo (1999), REITs that have a high market-to-book ratio tend to have low levels of leverage.

Mueller & Pauley, (1995) show that REITs that face high cost of debt tend to have less leverage. The main object that differentiates the point of view for real estate companies, based on supply and demand of loans, additional with the reason that revenues (especial the rents) remains stabile in sort and medium period. From the other hand according to Rocha, et al., (2007), Williams, (1991), REITs that have more assets turnover (gross income on assets) and not profits (net income after tax for the company) tend to have less leverage. Generally, the revenues (capital gains and rents) strongly related with firm's invested assets, also, according to real options theory.

Chaney et al., (2010) Larger REITs (as measured by book assets) tend to have high leverage because have more assets used as collaterals to cover credit facilities
Real estate industry affected from the geographical (Geraedts, van der Voordt, 2003), social such as local government risks as political and social situation, authorizations, occupancy permits, etc., and finally, economic environment of each

country as implementing tax regime or other economic or business limitations. Many factors also have impact on real estate industry according to scientific field of urban economics which presenting in work of DiPasquale & Wheaton, (1996).

Model specification and data

Real estate industry and special REITs according to real estate specialties an theories and for necessities of our model, the above factors are transformed to:

- ✓ REITs that have a high market-to-book ratio tend to have low levels of leverage, for REITs market affects leverage (Ling & Naranjo 1999)
- ✓ REITs that face high cost of debt tend to have less leverage because their revenues (especial the rents) remains stabile in sort and medium period (Mueller & Pauley, 1995). From the other hand:
- ✓ REITs that have more assets turnover and not profits tend to have less leverage, because the revenues (capital gains and rents) strongly related with firm's invested assets according to real options theory (Rocha, et al., 2007, Williams, 1991). Businesses are reluctant to share with the banks proceeds from a property assets with good revenues.
- ✓ Larger REITs (as measured by book assets) tend to have high leverage (Chaney et al., 2010)
- ✓ REITs affected from Urban and Economic environment of their country (DiPasquale & Wheaton, 1996).

Following the above thought we specify our model. The variables that used are:
Depended variable is leverage financial ratio LEV = Debt / Equity + Debt.
Independents variables are:

- ✓ COSTDEBT = Interest/debt
- ✓ ASSTURN = Sales / Assets
- ✓ LNTA = Log(Total Assets)
- ✓ MBRATIO = Market Value / Book Value
- ✓ COUNTRY = Dummy variable

LEV = a*LNTA + b*COSTDEBT + C*MBRATIO + d*ASSTURN + @expand (COUNTRY)

In this research, we use a sample of 371 REITs listed over the years 2005 – 2010 for 20 countries. Panel dimension: 371 x 6. Range: 2005 2010 x 371 = 2226 observations. The data are from the annual financial statements and the numbers are percentages financial ratios. The sample is unbalanced, with some observations missing due to lack of data in any stock exchange (Data source: DataStream).

Methodology

The methodologies we employ include descriptive statistics, regression analysis (analyzing determining factors) and multivariate cluster analysis (analyzing differences and similarities).

Ordinary least squares estimation of these individual equations provides consistent and significant results (Baltagi, 2005). There are several techniques to obtain estimation of parameters, which will be consistent, significant and accurate. A different technique addressing correlation patterns in disturbance terms between equation is the method of Seemingly Unrelated Regressions, proposed by Zellner (1962). However, there are cases that the econometric model estimated might be affected by non-numerical factors. The use of dummy variables provides a sufficient and easy procedure to quantify these non-numerical factors. The non-numerical effect might vary for different possible outcomes of qualitative effects. Those qualitative effects might occur in a certain time period or to be a seasonal effect. There are three procedures to insert a seasonal dummy variable in an equation; a) using a constant dummy, b) using a slope dummy, c) using both dummies together:

$$Y_i = \beta_1 + \beta_2 X_{2t} + \beta_3 D_{it} + u_i \quad (1)$$

$$Y_i = \beta_1 + \beta_2 X_{2t} + \beta_3 D_{it} X_{2t} + u_i \quad (2)$$

$$Y_i = \beta_1 + \beta_2 X_{2t} + \beta_3 D_{it} X_{2t} + \beta_4 D_{it} + u_i \quad (3)$$

Where,

$$D_{it} = \begin{cases} 0, for\ t = 1,2, \dots, n \\ 1, for\ t = 1,2, \dots, T \end{cases}$$

Dummy variables can be considered as a test of the structural stability of an equation. If a set of dummy applies in an equation, it gives the opportunity to check whether an estimated equation might have alternative forms, depending on qualitative characteristics. Therefore, previous models can be extended with more dummy's, some of which may have more than one category.

E-views command @expand automatically creates a set of dummy variables in any unique data series. This command can be combined with seasonal dummy variable command (@year) or even for trend based dummies (@trendc). In each previous case, @drop command can omit any value or time period that dummy variable is obsolete.

In this research, we introduce a categorical dummy variable (wet, dry, container) and a seasonal dummy variable for the ‘’boom years’’, both affecting the intercept. In this case we have the following models.

LEV = a*LNTA + b*COSTDEBT + C*MBRATIO + d*ASSTURN + @expand (COUNTRY)

Another suitable method for our analysis is the Single sample case and Multi sample case of Cluster analysis (Mardia et al., 1979). In our analysis, we used the Multi sample problem of Cluster analysis:

Let, $x_{ij}, i = 1, \dots, n_j$, be the observation in the *jth* samples, j=1,2,…,m.

The aim of cluster analysis is to group the m samples into g homogeneous classes where g is unknown, g ≤ m.

The clustering methods are optimization partitioning techniques since the clusters are formed by optimizing a clustering criterion. According to these hierarchical methods, once an object is allocated to a group, it cannot be reallocated as g decreases, unlike the optimization techniques. The end product of these techniques is a tree diagram (Dendrogram).

In our study, we used the max similarities within groups and min similarities between groups as hierarchal methods.

These techniques operate on a matrix of distances $D = (d_{ij})$ between the points $x_1, \dots, x_n$ rather than the points themselves.
We used two choices for the distant matrix:
Euclidian distance

$$d_{ij}^2 = \sum_{k=1}^{p} [(x]_{ik} - x_{jk})^2 = |x_i - x_j|^2 \quad (1)$$

Where **X** is an (n x p) data matrix where n are the twenty countries of the sample and p are the estimated financial ratios-independent variables=@expand (country) and dummy variable of the proposed econometric model.

Results

The descriptive statistics of our variables are:

Table 1. Descriptive statistics

	LEV	LNTA	COSTDEBT	MBRATIO	ASSTURN
Mean	0,48044	14,33216	0,05467	1,11773	0,11178
Median	0,48467	14,32759	0,05260	1,03959	0,09126
Maximum	1,58774	20,59516	0,88679	10,80420	1,21965
Minimum	0,00024	8,63640	0,00015	0,17599	0,00016
Std, Dev,	0,21331	1,91526	0,04593	0,40252	0,08931
Skewness	0,17821	0,34887	9,67256	8,42824	5,46730
Kurtosis	3,38027	3,99010	142,17040	186,35960	50,66954

In order to test the independence between variables we provide the matrix of correlation

Table 2. Matrix of correlations

	LEV	LNTA	COSTDEBT	MBRATIO	ASSTURN
LEV	1				
LNTA	0,117892	1			
COSTDEBT	-0,136303	-0,234716	1		
MBRATIO	0,084754	0,027879	0,031051	1	
ASSTURN	0,046179	-0,124789	0,193027	0,277078	1

Using a dummy variable for each year we estimate the average ratio per year for each variable that used (Variable = @expand (year)).

Table 3. Average ratio per year

	2005	2006	2007	2008	2009	2010
LEV	29,00%	37,00%	31,00%	39,00%	27,00%	24,00%
LNTA	13,300	14,000	14,100	14,300	14,200	14,200
COSTDEBT	5,42%	5,58%	5,50%	5,60%	5,89%	5,33%
MBRATIO	1,110	1,120	1,270	0,890	0,700	0,820
ASSTURN	10,78%	11,03%	10,67%	11,14%	11,06%	10,90%

The global impact of the financial crisis on real estate market appears to leverage and market to book ratio.
Using a dummy variable for each country we estimate the average ratio per country for each variable that used (Variable = @expand (country)).

Table 4. Average ratio per country

	LEV	LNTA	COSTDEBT	MBRATIO	ASSTURN
AUSTRALIA	37,98%	13,95103	6,89%	96,45%	8,33%
BELGIUM	34,36%	12,83914	3,29%	102,89%	7,83%
BULGARIA	31,24%	9,74176	8,40%	93,38%	15,28%
CANADA	64,72%	13,45494	5,64%	123,01%	13,74%
FRANCE	47,95%	13,28937	4,80%	113,26%	8,85%
GERMANY	46,28%	11,08514	5,88%	115,05%	9,03%
GREECE	14,31%	11,90680	4,07%	81,75%	6,72%
HONG KONG	32,86%	16,14714	3,51%	81,66%	4,73%
JAPAN	38,70%	19,00873	1,26%	112,75%	7,15%
MALAYSIA	23,31%	12,75514	2,87%	87,42%	7,79%

NETHERLANDS	36,38%	14,07450	4,38%	96,27%	7,18%
NEW ZEALAND	32,20%	13,62123	6,59%	96,15%	8,43%
SINGAPORE	32,53%	14,63734	3,53%	94,24%	6,21%
SOUTH AFRICA	13,10%	15,43369	8,80%	102,06%	10,96%
SOUTH KOREA	69,21%	20,48368	5,97%	102,59%	16,09%
TAIWAN	24,92%	15,71930	2,27%	88,33%	4,78%
THAILAND	4,05%	14,76580	2,52%	82,21%	9,82%
TURKEY	18,97%	11,40455	8,27%	128,50%	11,13%
UK	39,86%	13,83844	6,23%	97,14%	6,60%
US	56,93%	14,35593	5,96%	121,84%	13,74%

The diversification of the country's environment that a REIT activates is obvious in relation to the variables of our model.

Finally, we test our model using Panel EGLS Method (Cross-section weights)
LEV = a*LNTA + b*COSTDEBT + C*MBRATIO + d*ASSTURN + @expand (COUNTRY)

Table 5: The estimation of our model, Dependent Variable: LEV

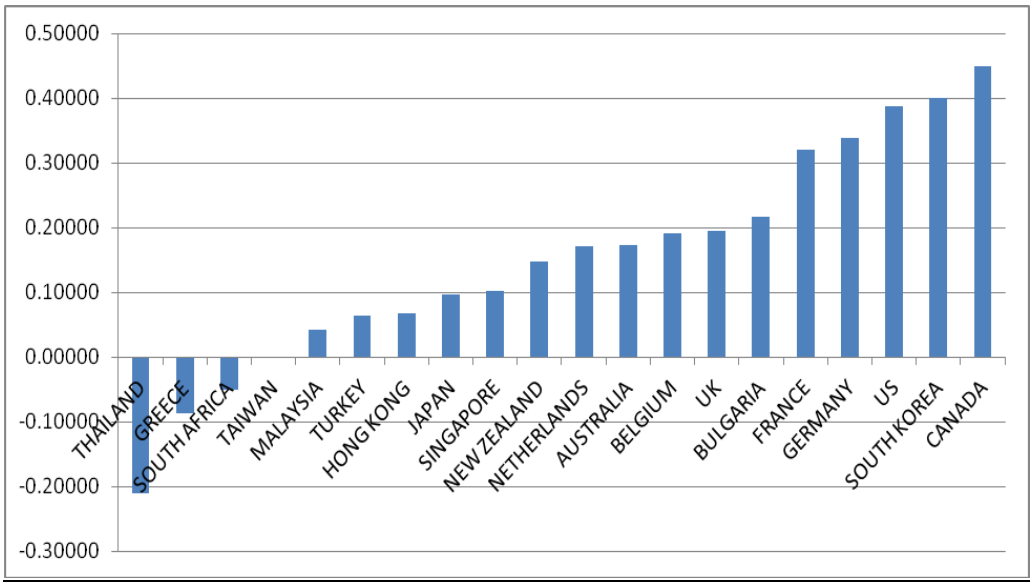
Variable	Coefficient	Std, Error	t-Statistic	Prob,
LNTA	0,01842	0,00132	13,95893	0,00000
COSTDEBT	-0,62417	0,07767	-8,03637	0,00000
MBRATIO	-0,02702	0,00538	-5,02503	0,00000
ASSTURN	-0,12882	0,02772	-4,64715	0,00000
Dammy variable effect				
AUSTRALIA	0,17371	0,02166	8,01847	0,00000
BELGIUM	0,19137	0,01897	10,08935	0,00000
BULGARIA	0,21587	0,03196	6,75505	0,00000
CANADA	0,44955	0,02087	21,54356	0,00000
FRANCE	0,32053	0,02050	15,63232	0,00000
GERMANY	0,33834	0,02319	14,58970	0,00000
GREECE	-0,08698	0,02109	-4,12515	0,00000
HONG KONG	0,06702	0,02238	2,99532	0,00280
JAPAN	0,09663	0,02576	3,75169	0,00020
MALAYSIA	0,04188	0,02194	1,90821	0,05650
NETHERLANDS	0,17176	0,02149	7,99200	0,00000
NEW ZEALAND	0,14698	0,02115	6,94825	0,00000
SINGAPORE	0,10178	0,01986	5,12538	0,00000

SOUTH AFRICA	-0,05154	0,02217	-2,32478	0,02020
SOUTH KOREA	0,40054	0,03728	10,74474	0,00000
TAIWAN	-0,00040	0,02150	-0,01853	0,98520
THAILAND	-0,21066	0,02241	-9,40083	0,00000
TURKEY	0,06469	0,03857	1,67727	0,09370
UK	0,19547	0,02142	9,12727	0,00000
US	0,38728	0,01977	19,59090	0,00000

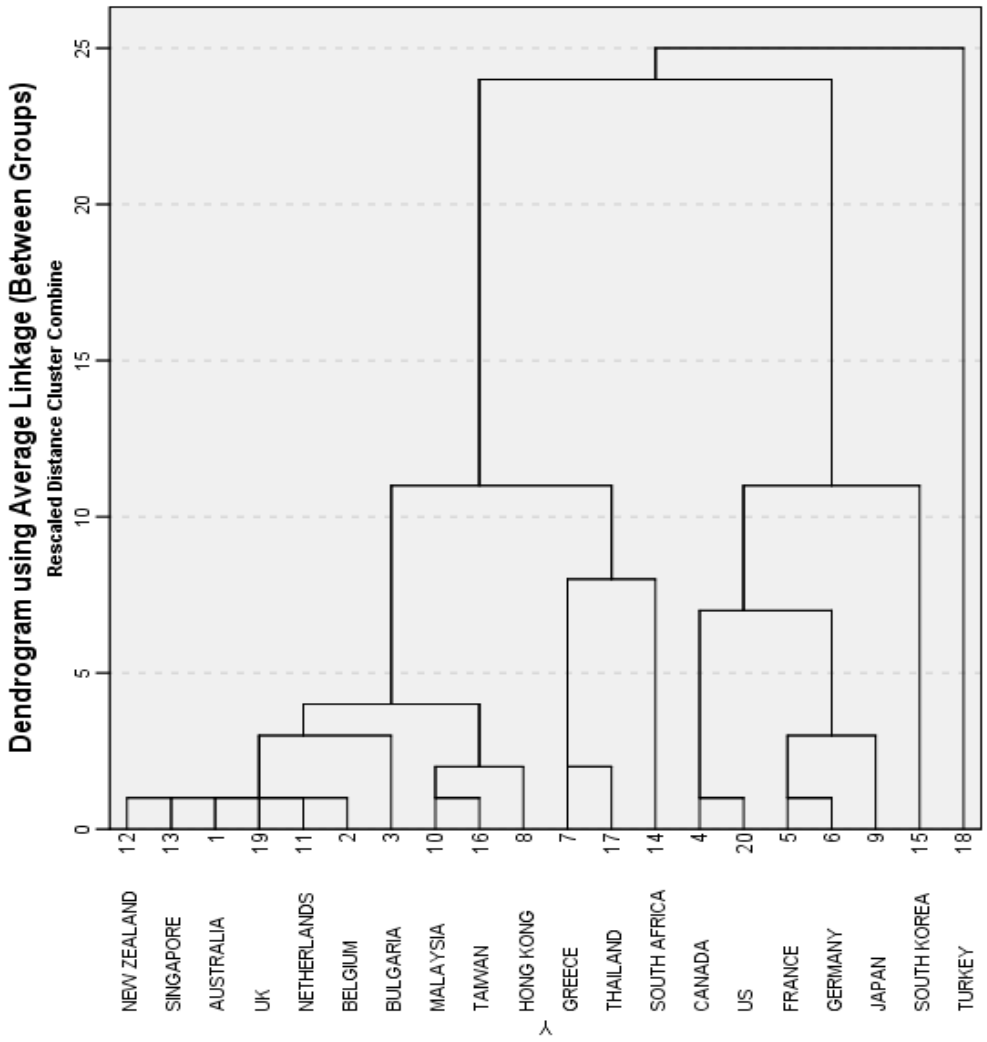
R-squared	0,93152	Mean dependent var	0,97062
Adjusted R-squared	0,93065	S,D, dependent var	0,81838
S,E, of regression	0,16892	Sum squared resid	51,78614
Durbin-Watson stat	0,60265		
	Unweighted Statistics		
R-squared	0,34733	Mean dependent var	0,48044
Sum squared resid	54,58259	Durbin-Watson stat	0,24496

According to our estimation the signs are consistent with our initial expectations and our model is fitted very accurately to reality.
Using in our model the dummy variable for geographical, social and economic environment we produce the next graph with shows that the THAILAND, GREECE, SOUTH AFRICA and TAIWAN environment have negative impact in leverage

Graph 1. The impact of environment on REITs



Graph 2. Dendrogram of cluster countries



The above results definitely reveal the common characteristics of the countries for all the characteristics mentioned above. More specific, we define that the core countries of EU (Germany and France) share common economic environment. The same can referred for United States and Canada, Malaysia and Taiwan, Greece and Thailand. Undoubtedly, the major group is shaped from the countries of common wealth United Kingdom and Netherland, Belgium.

Conclusion

According to our research REITs' leverage depends on:

- ✓ Market-to-book ratio with negative sign
- ✓ Cost of debt with negative sign
- ✓ Assets turnover with negative sign
- ✓ Size (as measured by book assets) with positive sign
- ✓ Country's Urban and Economic environment with various signs, according to the country's performance on real estate industry

The procedure of introducing a dummy variable for all other factors affecting leverage, balance our model and is a good indicator for investors in real estate in global basis.

Minor findings are:

- ✓ The confirmation that the recent financial crisis has global impacts on real estate industry:
  - o decreasing leverage
  - o increasing cost of debt and
  - o decreasing market to book ratio
- ✓ Except common factors as the independent variables of our model Country's Urban and Economic environment has:
  - o Negative impact for the countries THAILAND, GREECE, SOUTH AFRICA
  - o Positive impact for the other countries of our sample.

The value of our work lies in the transformation of financial theories and their expertise in property assets companies. Furthermore, the estimated model is a valuable tool for decision making for global investments in real estate. In the same manner, cluster analysis provides further global insight to the environment of REITS per individual country and as a group. Therefore, this is a significant parameter for an investment practitioner willing to diversify the investments in various countries.

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