Describing REIT Prices and the Real Estate Bubble Using the Dividend Growth Model

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Abstract

During financial bubbles, investors often disregard fundamentals and buy assets at any price, latter confirmed with deflating real estate values. The rationale was that real estate would continue to appreciate, enabling investors to sell for ever-higher prices, but the bubble burst. The dividend growth model (DGM) helps students (and investors) re-focus on the fundamentals. Using it, students can examine the price of real estate without dealing with the inefficiencies associated with the real estate market. One of the most attractive features for finance students with any classroom effort is the clear link between that effort and the real world. This is accomplished with an assignment we design where students use the dividend growth model to value real estate investment trusts (REITs) before and after the real estate bubble.

INTRODUCTION

Authors differ on the details, but the origins of the current economic downturn can be defensibly attributed to a bubble, and then a collapse, in residential real estate values in the United States. This bubble, in turn, can be traced back to federal tax and banking policy from the time of Jimmy Carter through Bill Clinton and the first term of the second George Bush; Carter promulgated the Community Reinvestment Act in 1977, it was underscored by Bill Clinton in the late 1990's and was reaffirmed by George Bush in 2003 and 2004. Each of these US presidents intended merely to open wider the door to home-ownership. However, those good intentions of the past several presidents, of the Federal Reserve and of the US Congress contributed to the bubble and the resulting current economic contraction.

Coupled with these presidential encouragements were a number of factors that added fuel to this economic fire. These factors include congressional mandates to assist the least creditworthy and Wall Street willingness to subdivide and resell (to willing buyers) the riskiest subprime loans. Credit-rating agency complicity with AAA ratings of soon-to-collapse mortgage backed securities set the markets up for the corrections that followed. The willingness of credit-providers to overlook striking examples of poor credit among prospective borrowers was noteworthy. When funds from mortgages stopped flowing, real estate values collapsed.

The real estate market is characterized by the illiquidity of the traded assets, restricted information flows, heterogeneity of the products, high transaction costs, elevated government regulations and a limited number of buyers and sellers. A broad literature will no doubt soon evolve that documents the significant losses borne by the individual and institutional real estate investor in the several years ending in 2010, but anecdotal evidence already exists that affirms those losses. From condominium prices that fell from $1 million to a fifth of that in north Florida, to shopping mall values that slipped from close to $100 per square foot in the

Midwest to less than $20, any experienced real estate investor can inventory dramatic (and unprecedented) falls in investment real estate values in the last few years. This real estate bubble and its subsequent correction invite the finance student and instructor to reflect on the adequacy of contemporary financial theory in describing the still-evolving real estate valuation debacle.

Does any financial theory or model anticipate or describe the overvaluations in real estate that developed over several years and were correcting by late 2007? We consider this question in the following pages, and invite the finance student to reflect on the power of the dividend growth model to describe the development of the real estate bubble, and its correction.

BACKGROUND

An efficient market is one where prices broadly reflect available and relevant information. Efficient markets have a much greater flow of information, far lower transaction costs, much greater product liquidity, less government interference and far more buyers and sellers than the real estate market. Each of these factors contributes to the greater likelihood that the prices of the goods traded on the efficient market accurately reflect available and relevant information. It is almost self-explanatory; one would expect something trading among thousands of traders many times a day to almost immediately reflect changes in relevant information (like a change in the price of oil, or interest rates). This is far less true for real estate that may trade every ten years, and then only at a cost of thousands of dollars in commissions and fees, and only after meeting a plethora of government filing and tax requirements. As Penny (1982) suggests, the very inefficiency of real estate actually can be part of its attraction to some investors.

Given those costly imperfections like restricted information flows, real estate practitioners, finance instructors and real estate authors broadly agree that real estate investment does not lend itself easily to traditional financial or economic theory (Graham and Hall, 2001). Further, Clayton, Ling and Naranjo (2009), extending Baker and Wurgler (2007), note that the very frictions (such as illiquidity and restricted information flows) that often exclude real estate from financial modeling, might also exacerbate pricing extremes.

If relatively small frictions in the securities markets, such as those for Nasdaq stocks in the early 21st century, could contribute to that security-price bubble, then the far greater frictions in real estate could manifest themselves in the real estate bubble observed later on. Baker and Wurgler (2007) allow that errant estimates of future cash flows and the growth in those flows could contribute to an overly optimistic sentiment among securities investors, leading to a bubble. Camerer (2002) notes that the behavioral underpinnings of those sentiments contributed to the Nasdaq bubble of the late 90's. Such sentiments sometimes also exist in real estate.

Imperfections outlined above, ranging from the illiquidity of real estate to the onerous transaction costs suffered in its purchase and sale, seem to exclude the real

estate market from a traditional financial analysis. However, beginning with even the most prosaic attempts to model the returns profiles of sundry investments, there has been room for the description of real estate values and real estate returns within the confines of those models. Given the attraction of most real estate investors to the cash flows or dividend streams thrown off by real estate, various dividend discount models have shown the greatest applicability to real estate investment. Given the special frictions suffered by the real estate market in rendering it far less efficient than the securities markets, the use of traditional models, like the dividend growth model or DGM, to frame real estate returns is problematical, but hardly impossible.

Parks (2006) considers the ability of investors to forecast the stock market bubbles in the US and Japan, in the late 1980's and late 1990's respectively; he uses the dividend growth model with some modest descriptive success. His work anticipates its use to describe the real estate bubble in the United States.

In this light, Lu, Wu and Ho (2009) affirm the continuing desire of investors to develop greater understanding of real estate returns with financial models, but do not consider the dividend growth model per se; they used a series of functions to describe the maximum expected loss of a REIT investor over a given holding period at a specified confidence level. Baker, Powell and Veit (2002), however, implicitly underscore the attractiveness of the dividend growth model for real estate valuation with their focus on the importance of continuing cash flows - dividends – to support security values. Their intuition was anticipated by Cannaday and Colwell in 1986.

In Gordon's (1959) seminal work describing security value as a function of the discounted present value of a future dividend stream, the focus was upon security valuation. Extensions of Gordon's work first by Molodovsky and Chottiner (1965), and later by Farrell (1985) and Norgorniak (1985), affirm the tenuous nature of the discount rate and future cash flow projections imbedded in the DGM. The tenuousness of future cash flow projections – whether stock dividends or rental income streams with real estate - and the discount or capitalization rates, are issues plaguing any asset valuation.

These authors might anticipate the potential of a dividend growth model to describe real estate returns, and potentially the real estate bubble. Given that, we first introduce the dividend growth model and how it might be used to prosaically describe real estate returns. We then use the model to portray the pricing extremes with REITs in the early 2000's, and their correction and return to normal as the Great Recession unwound.

APPLYING THE DIVIDEND GROWTH MODEL

As noted earlier, and affirmed countless times by the real estate investor, real estate investments do not lend themselves easily to traditional financial or economic theory. However, *one traditional theory or model* does have applications in the real estate world. This is the dividend growth model. Without investing pages of text into a description of this model, which is the minimum in traditional introductory finance texts, suffice it to say that the dividend growth model suggests

that an investment's income is comprised of dividends and capital gains. This is also true of most real estate investments, where the investor is pursuing a dividend yield and a capital gains yield, as with a share of stock. The dividend is provided by the net operating income (this reduced by costs of financing) and the capital gain by the appreciation of the real estate over time. The dividend growth model formally predicts that:

$$R = D_1/P_0 + G \quad (1)$$

Where R is the overall required rate of return, D_1 is the first year's dividend (or cash flow before taxes), P_0 is the purchase price of the asset or the value of the equity investment (or gross purchase price of the real estate if no financing is used) and G is the expected growth rate in the dividend (or growth rate in the value of the property and/or its net operating income).

Applying Equation (1) to an actual real estate investment, suppose an investor buys a condominium in 2010 for $35,000 cash, expects rental income of $6,000 per year ($500 per month), annual operating expenses of $2,500 and net operating income of $3,500 ($6,000 - $2,500). Assume the buyer paid cash and no financing was used. Net operating income is the property's effective dividend. If the investor expects this dividend to grow at five percent per year, he also expects the property's value to increase five percent per year. Using equation (1), the return on the property is:

R_r = $3,500/$35,000 + .05 or .10 + .05 or 15 percent.

Two important remarks need to be made. First, the dividend yield (the net operating income divided by the property's price or overall value) is exactly the same as the cap rate or discount rate, R_c, employed with the income approach to real estate valuation. Second, R_r is the sum of R_c plus the expected growth rate in dividends. The expected growth rate in dividends measures the expected capital gains yield. Given this, a property's value is simply the NOI divided by the cap rate, ($V=NOI/R_c$). With this condominium example, the value is $3,500/.10 (using a cap rate of 10 percent), or $35,000.

The overall expected or required return, R_r, is greater than the R_c cap rate, since R_r also includes the capital gains yield. In other words, when an investor is said to cap a property's overall NOI of $3,500 at 10 percent to arrive at an estimate of value of $35,000 ($3,500/.10 = $35,000), he is not limiting himself to an expectation of only a 10 percent return. On the contrary, this cap rate is merely representative of the expected dividend yield. The dividend growth rate or capital gain yield of 5 percent is also a part of his overall expected rate of return.

Extensions of this model to the finance or real estate classrooms are fairly straightforward, and as Ali, Derina and Zurbruegg (2009) note – students are motivated better when they can directly perceive a link between studying financial theory and its practical application. Such can be the case with the dividend growth model, and with applications such as the one above.

The real estate and securities markets, starting with a bubble in real estate, exhibited a broad contraction in most investment values in the several years ended in early 2009. These patterns provide a foundation for an application of the dividend growth model. It can be used to describe the retrenchment in real estate values, and the beginning of a possible recovery in those values, such values captured by the prices of widely traded REIT stocks.

A CASE USING THE DIVIDEND GROWTH MODEL TO VALUE REITS

The real estate bubble is illustrated in Figure 1. There, we plot various REIT indices from September 1981 – September 2009. We show the Equity REIT total index, Mortgage REIT total index, Hybrid REIT total index and the All REIT total index. Figure 1 reveals that mortgage and hybrid REIT indices did not have a large run up in price over this period. The real estate bubble was largely limited to Equity REITs. The Equity REIT index went from $2,539 in January 1997 to $10,526 in January 2007. The index fell over the next few years to a low of $3,337 in February 2009 and closed at $5,963 in September 2009. Declinations in value from peak-to-trough of over two-thirds were observed.

Real estate investment trusts provide a good vehicle to teach students about valuing real estate. Table 1 provides a summary of the performance of REITs and other major stock indices. Real estate investment trusts decreased 47.51% in 2008; this compares to a 36.75% drop in the DJIA. Over a three and five year period, REITs have underperformed stock indices. However, REITs have out-performed other stock indices over longer time frames such as 5, 10, 15, 20, 25, 30 and 35 years. Over the past 35 years, the equity REIT index reflected an annual return of 11.43% compared to a 9.76% return for the S&P 500. The REITs genuinely appear to earn a higher return over the long term. However, this comparison ignores potential differences in the risk level of the average REIT and the S&P 500.

Returns in Table 1 ignore taxes. Under current tax laws, REIT dividends are taxed at a higher rate than dividends from the S&P 500 dividends. In addition, the capital gains from the S&P 500 can be deferred indefinitely. The lower tax rates for investors in the S&P 500 can explain the lower return for the S&P 500. In fact, if an investor had a marginal tax rate of 14.6% then their after-tax return would be equal for REITS and the S&P 500. This comparison assumes that all of the income from the S&P 500 can be deferred and that all of the REIT income is taxed. For any investors with a marginal tax > 14%, the S&P 500 would dominate.

As discussed in the prior section, the dividend discount model provides a basic model to examine the performance of REITs. In this section, the model is used to estimate the intrinsic value (price) of the underlying REIT. Rearranging equation (1) results in the following.

$$P_0 = D_1 / (R - G) \qquad (2)$$

In theory the model is very straightforward; however, it is difficult to

estimate the variables in the real world. Quantifying the growth rate that will occur indefinitely and the required return is a very subjective process. Most analysts recognize the difficulty in quantifying these figures; for this reason valuation is considered both a science and an art. Notwithstanding the subjectivity, analysts must determine if a given REIT is fairly priced. A student can use the actual long-term historical return on REITs presented in Table 1 as a proxy for the required return. The dividend growth rate on REITs from 1997 – 2008 is presented in Figure 2. The average over this period is 5.66%.

Using the long-term historical growth rate of 5.66% and the long–term required return of 11.43% in model (2), along with the actual dividends on equity REITs, results in an estimate of the intrinsic value.[1] This value from the dividend growth model and the actual prices of the REITs from January 1996 – September 2009 are presented in Figure 3. This figure shows that although the actual price of the equity REIT increased to over $600, the intrinsic value barely exceeded $400. This suggests that the market either required a significantly lower return than in the past and/or the market expected significantly more growth. In hindsight, these expectations were unrealistic and the price ultimately moved toward the intrinsic value. Consistent with this condition, in June 2009 the intrinsic value and the price were nearly synced: the price was $242 and the intrinsic value was $247.[2]

Students would benefit by applying the dividend discount model to actual REITs. The following is a possible assignment for students:

a. Select an actively traded REIT that is listed in the S&P 500 (Table 2 provides a list of REITS that are in the S&P 500.)
b. Download price and dividend information for the REIT.
c. Calculate the required return on the REIT (Students can use the CAPM or the historical returns on REITs.)
d. Estimate the growth rate or capital gains yield of the DGM using the historical growth rate of the dividends paid by the REIT. (Students can use any time frame they think is reasonable. More advanced students could use a moving average to reflect the markets changing expectations about future growth.)
e. Calculate the long-term average intrinsic value of the REITS using the model.
f. Plot the average intrinsic values of the REIT from the model over the past ten years on a graph and contrast that value with the actual price of the stock. It could be argued that the greater vertical deviations (+ and -) from

[1] The assumptions of constant growth are not satisfied since the REITS growth rates vary annually. However, the purpose of this exercise is to allow students to see the complexity of applying the simple constant growth model to the real world and learn the art of valuation.

[2] In September 2009, the price jumped to $320.19 and the intrinsic value actually decreased to $223. Is this the start of another bubble?

the trend line indicate a greater likelihood of irrational exuberance or pessimism.

g. A potential extension for the professor or student would be to create confidence intervals around REIT values.

We apply this process to one REIT (Prologis), in Figure 4. The average growth rate for Prologis from 1987 - 2008 was 4.63%. Over the past 35 years, equity REITs returned an average of 11.43% per year. Using these variables and the dividend in each year yields the intrinsic value of Prologis. These values are presented in Figure 4. From 1996 – 2002 the intrinsic value from the dividend growth model for Prologis was fairly close to the actual price. However from 2003 – 2007, the price of Prologis increased to $63.38 while the intrinsic value was $33.69. In 2009, the intrinsic value and price were once again relatively close.

The above example assumes that 11.43% is the appropriate discount rate throughout the entire period of time. However, this is inaccurate; ample evidence exists of time varying risk premiums. In fact, it is rational to change the required return in different business cycles. The variation in price can be in part attributed to this variation. These factors, misevaluation of price and changing required returns, occur simultaneously and jointly drive our results. We assumed that the discount rate was constant and the market's assessment of risk as reflected in the required return was inaccurate. Accordingly, the price of the REITs did not reflect the intrinsic value of the firm. Our example shows that using the historical average return on REITs as a required return might have helped an investor avoid the real estate bubble.

CONCLUSION

We examine the real estate bubble using the dividend growth or dividend discount model. The model relies on the fundamentals that are often largely ignored or under-weighted during bubbles. We provide an assignment for students that gives them the opportunity to apply the DGM to an actual REIT and learn about the art of valuation and the observable nature of bubbles. The student will recognize and learn that the market may inflate and be irrational for short periods of time, but ultimately the market regresses back to a reasonable value. The reasonable value of the asset is generally driven by the historical growth rate, required return and expected dividends, and the model reveals these relationships for the student.

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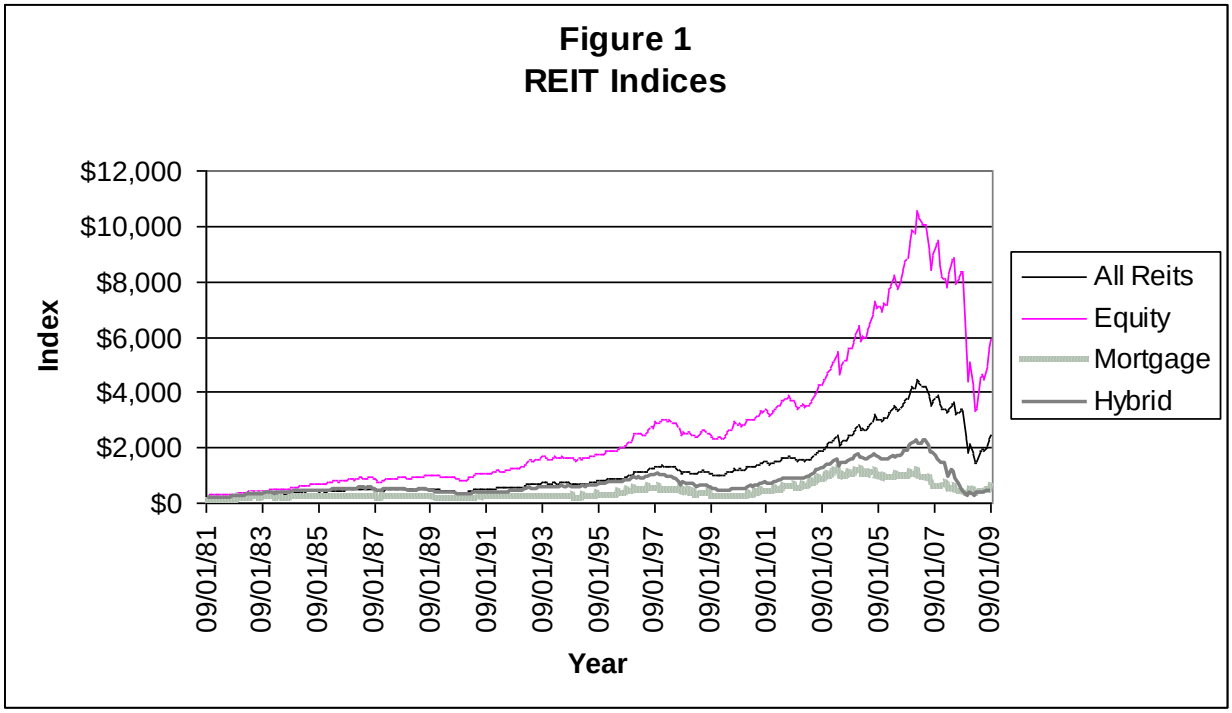
Figure 1
REIT Indices
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
Index
09/01/81
09/01/83
09/01/85
09/01/87
09/01/89
09/01/91
09/01/93
09/01/95
09/01/97
09/01/99
09/01/01
09/01/03
09/01/05
09/01/07
09/01/09
Year
All Reits
Equity
Mortgage
Hybrid

Table 1
Calendar Year Ending Returns for Periods Ending December 31, 2008

	FTSE NAREIT All REIT	FTSE NAREIT Equity REIT	S&P 500	Russell 2000	Nasdaq Composite	Dow Jones Industrial Average
1-Year	-47.51%	-47.97%	-38.63%	-36.84%	-38.22%	**-36.75%**
3-Year	-18.57%	-18.25%	-11.78%	-14.31%	-13.81%	**-9.70%**
5-Year	-4.80%	**-3.67%**	-4.25%	-4.06%	-6.50%	-5.27%
10-Year	5.13%	**5.62%**	-2.65%	1.68%	-5.15%	-1.56%
15-Year	6.16%	**6.64%**	5.60%	4.84%	4.17%	4.77%
20 - Year	6.73%	**7.84%**	7.56%	6.99%	6.73%	6.33%
25 - Year	6.87%	8.87%	**9.42%**	7.44%	7.06%	7.81%
30- Year	9.41%	**11.14%**	10.51%	10.04%	8.55%	7.81%
35-Year	9.13%	**11.43%**	9.76%	NA	8.16%	6.60%

Note: The return for the Nasdaq and DJIA are price only returns. The highest total return for the period is in bold. The data is for periods ending December 31, 2008.

Figure 2
Dividend Growth Rate

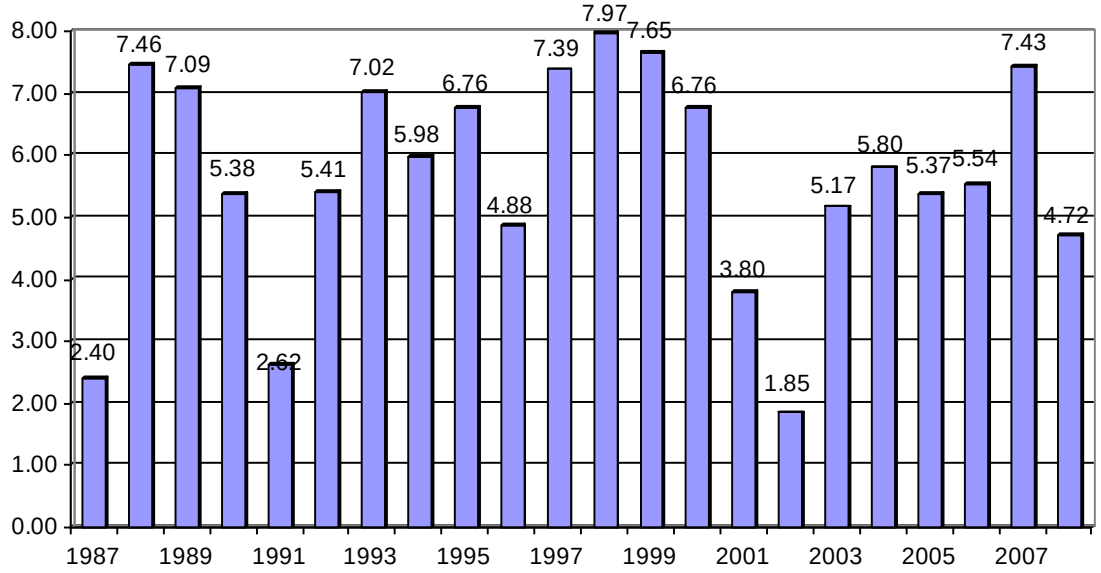

Figure 3
Equity REITs

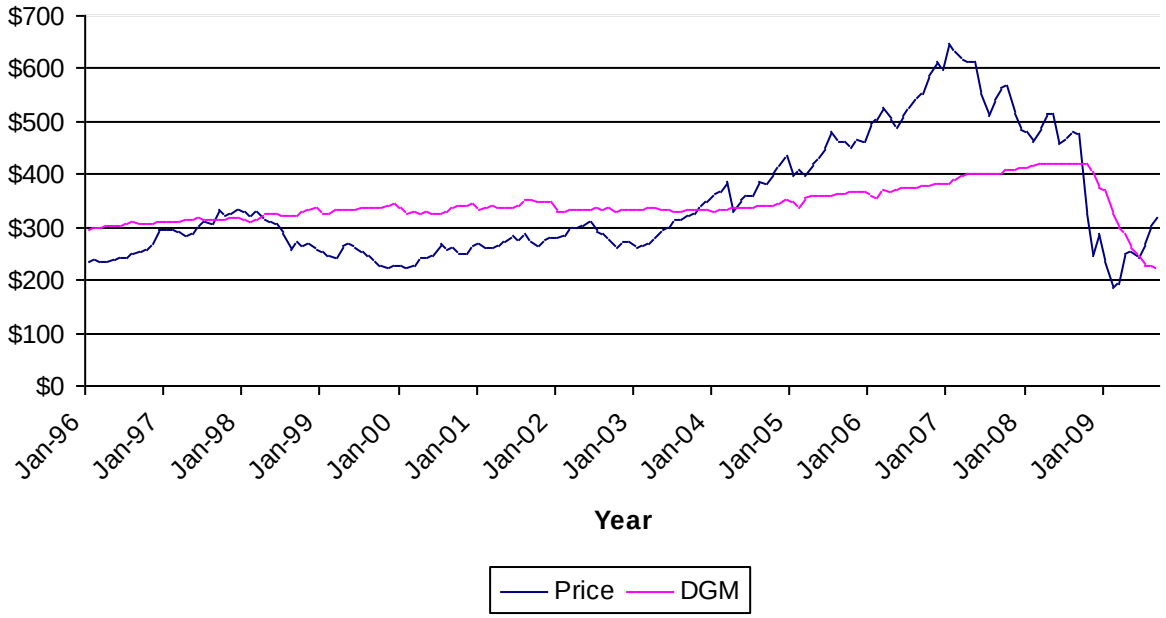

Table 2
REIT's included in the S&P 500

Company Name	Symbol	Entrance Date
AIMCO	AIV	3/13/2003
AvalonBay Communities	AVB	1/9/2007
Boston Properties	BXP	3/31/2006
Equity Residential	EQR	11/1/2001
HCP, Inc.	HCP	3/31/2008
Health Care REIT, Inc.	HCN	1/30/2009
Host Hotels and Resorts	HST	3/19/2007
Kimco Realty Corporation	KIM	4/3/2006
Plum Creek Timber, Inc	PCL	1/16/2002
Prologis	PLD	7/16/2003
Public Storage, Inc.	PSA	8/18/2005
Simon Property Group	SPG	6/25/2002
Ventas, Inc.	VTR	3/4/2009
Vornado Realty Trust	VNO	8/11/2005

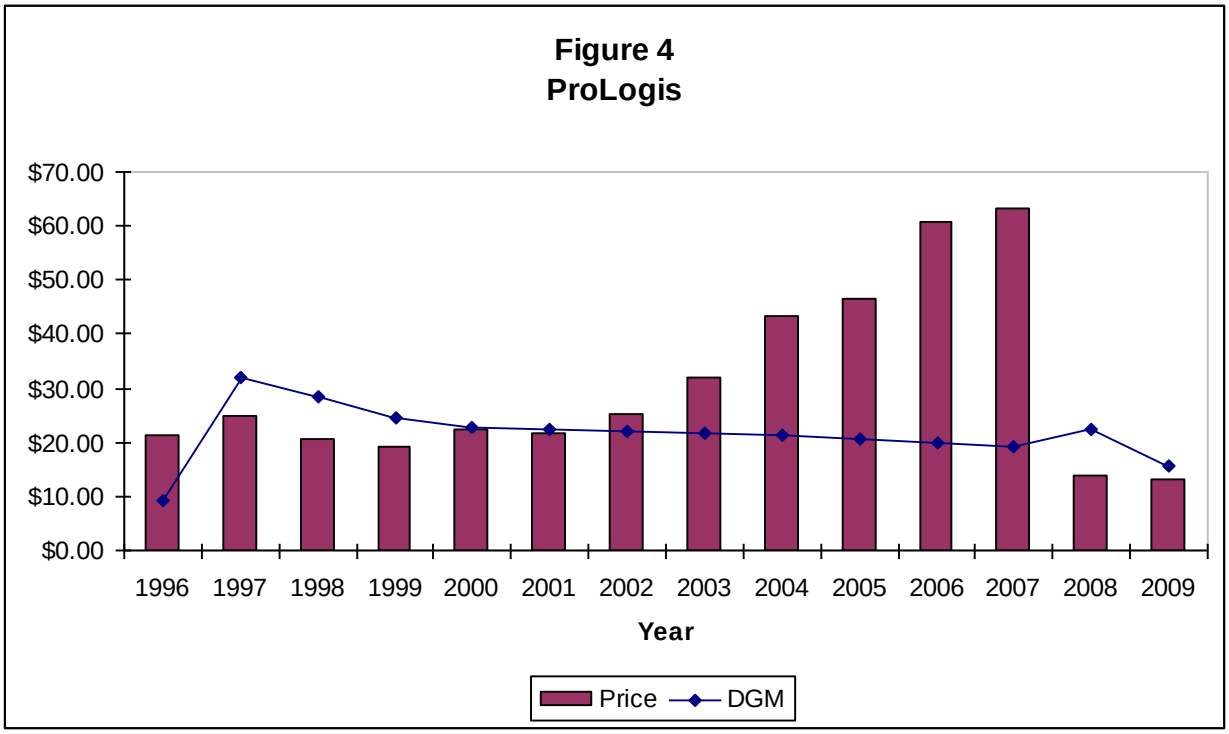
Figure 4
ProLogis
$70.00
$60.00
$50.00
$40.00
$30.00
$20.00
$10.00
$0.00
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Year
Price
DGM