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DENNIS R. CAPOZZA
UNIVERSITY OF MICHIGAN BUSINESS SCHOOL

PAUL J. SEGUIN
UNIVERSITY OF MICHIGAN BUSINESS SCHOOL

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Dennis R. Capozza
Professor of Finance and Ross Professor of Real Estate Finance
University of Michigan Business School
Ann Arbor, MI 48109-1234
313 764 1269
Capozza@umich.edu

Paul J. Seguin*
Associate Professor of Finance
University of Michigan Business School
Ann Arbor, MI 48109-1234
313 764 9286
Pseguin@umich.edu

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Managerial Style and Firm Value

ABSTRACT:

This study analyzes the effect of managerial style on firm value by partitioning general and administrative (G&A) expenses in the REIT industry into a non-discretionary "structural" component associated with the costs of asset and liability management and a discretionary or "style" component. The discretionary component is significantly related to at least one measure of style--specifically, the portfolio focus/diversification of the firm. Gross (project-level) cash flows are invariant to the non-discretionary or structural component of G&A but are positively related to the style component of G&A. The structural component has a negative impact on share price while the style component has a neutral impact. We conclude that, for this industry, creating larger, less-levered firms would result in enhanced value.

Introduction

A firm can be viewed as a portfolio of projects arising from capital budgeting decisions. Bundling projects into a corporation and then issuing exchange-traded equity can add value by creating liquid equity claims from relatively illiquid ones. However, the benefits of liquidity are realized only with the costs of the required management team. In this study, we examine these costs. Specifically, we address three empirical questions: (i) what are the determinants of the costs of management, (ii) how are these costs related to the cash flows to equity holders, and (iii) what are the effects of these costs on equity market valuation?

Our laboratory for this analysis is the real estate investment trust (REIT) industry where "projects," in this case individual properties, trade in both real estate property markets and in securitized portfolios on securities exchanges. Our sample consists of 75 publicly-traded REITs over eight years. We use reported general & administrative expenses (G&A) as our measure of the cost of management. This measure includes corporate-level asset management expenses (including salaries to the management team, corporate legal expenses, document filing and reporting costs) but excludes all property-level expenses (including property maintenance, marketing and property taxes). We identify three factors that are significantly related to G&A expenses expressed as either a dollar figure or as a percent of assets under management, and document that relative G&A is smaller when the firm is larger, less levered or more focused.

We then partition observed G&A into two components: a non-discretionary or "structural" one arising from the associated corporate assets and liabilities, and a discretionary component. We argue that the discretionary component captures a number of dimensions of managerial "style". We show that this discretionary component is significantly related to the degree to which the portfolio of properties is diversified or focused. In addition, we conjecture that this component also reflects other dimensions of "style" for which we do not have statistical measures. Specifically, the residual component also includes the costs associated with the degree to which the portfolio is actively versus passively managed development, and the costs of restructuring the company. Actively managed REITs are more likely to engage in portfolio turnover and to develop or renovate properties. An active strategy can involve adding value to underproducing properties or timing regional real estate cycles. Restructurings include changes in organizational structure (master limited partnership, REIT or corporation), size, capital structure or management.

We document that dichotomizing the costs of management into a non-discretionary or structural component and a discretionary or style component is economically meaningful since the cash flow and equity valuation effects of the two are significantly different. Specifically, we find that one additional dollar of structural G&A results in a one dollar reduction in corporate level net cash flows available to shareholders. In contrast, an additional dollar of the style component of G&A has no impact on concurrent corporate-level cash flows available to equity holders.

We next examine the relationship between the components of G&A expenses and firm value while controlling for net-asset-value (NAV). Consistent with the hypothesis that discretionary managerial decisions are zero net-present-value (NPV) ones, we find that higher levels of the managerial style component of G&A are not associated with significantly higher levels of value. In contrast, we find that higher levels of the structural component are significantly negatively related to firm value.

The implications of the analysis are clear. Corporate organization and exchange listing provide enhanced liquidity; but the added liquidity occurs at a cost. The results indicate that general and administrative costs are related to the structural features of the firm that are usually determined at formation, but can be subsequently altered at a cost. Substantial value can be added by creating (or reorganizing into) larger, less levered firms.

Aside from its direct relevance to the literature on costs and valuations, this study sheds light indirectly on executive compensation. Despite considerable effort, past research has found only an economically trivial relationship between executive compensation and firm performance. For example, Jensen and Murphy (1990a) argue that one of the most documented empirical regularities in finance is a manager who increases shareholder wealth by $1000 is rewarded with only $2 in additional compensation[1].

Despite the claim of Golz (1993) that REIT analysts pay particular attention to the level and form of compensation offered managers, evidence linking pay to the performance or value for REITs is limited. While Cannon and Vogt (1995) and Howe and Shilling (1990) demonstrate that performance is related to the organizational form of the REIT, with self-administered REITs outperformed advisor-administered REITs, they find little evidence that compensation is related to performance. Similarly, Golec (1994) finds a link between compensation determination and performance; when the compensation package is determined by a trust's board, the trust, on average, outperforms trusts where compensation packages are determined by a formula. However, Golec provides no evidence that performance or value is related to the level of compensation.

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[1]See also Coughlin and Schmidt (1985), Murphy (1985), Antle and Smith (1986), Abowd (1990), Jensen and Murphy (1990b), Lewellen *et al* (1992), and Sigler and Haley (1995) for evidence of an economically trivial relation between changes in shareholder wealth and changes in executive compensation.

Solt and Miller (1985) find a relationship between advisor compensation and accounting measures of performance, but, again, report no evidence linking compensation to equity performance or value. Finally, Chopin, Dickens and Shelor (1995) find that pay is related to total revenues for their sample, but find no reliable relationship between compensation and profitability.

This study provides two additional insights into compensation. First, studies typically measure the compensation to one or a few senior corporate executives. A more important measure is the total cost of the entire management team. This measure is more relevant since it captures not only compensation to the senior managers, but also compensation to their staff. Thus, if the leaders of a management team are correctly remunerated, but their team is too large (perhaps due to an executive's excess consumption of the perquisite "staff"), then concentrating on the compensation to senior managers will miss an important dimension of compensation.

Secondly, and perhaps more importantly, it is difficult to assess managerial performance without measuring the change in the value of underlying assets. Measuring changes in the market value of equity between two points is a noisy measure of manager performance since the value of the underlying assets also changes between the two points. Of course, some of the changes in these assets are due to managerial decisions; however, a significant portion is attributable to factors beyond the manager's control, like shifts in discount rates or movements through the business cycle. In this study, we do not measure managerial performance as the change in equity or assets between two points. Instead, we relate stock prices to the value of the underlying assets at a single point in time. This technique, which is similar to studies that use Tobin's *q*, allows for a more powerful analysis of shareholders' assessments of the net present value of the costs of management[2].

[2]See Lang and Stulz (1994) for a similar, yet more thorough, argument. Tobin's q is the ratio of the market value of assets to the replacement value. Our measure of replacement value is the market value of the properties in the local real estate markets.

In the next section, we provide the theoretical underpinnings of our empirical results. The third section describes our dataset and defines the key variables. In the penultimate section, we describe our empirical results. Conclusions appear in the final section.

The Model

The model underlying our empirical specification is the fundamental dividend discount relationship. If V_t is the value of a share of stock at time t, D_t is the dividend paid at time t and r is the discount rate we have

$$V_t = \int_t^{\infty} D_t e^{-rt} dt \tag{1}$$

For REITs, the cash flow available to be distributed to shareholders, C_t, is simply the cash flow from properties, Y_t, minus any interest expense, I_t, and corporate overhead expenses, G_t.

$$C_t = Y_t - I_t - G_t \tag{2}$$

If REITs pay out 100% of corporate level cash flows we have (from (1))

$$V_t = \int_t^{\infty} (Y_t - I_t - G_t) e^{-rt} dt \tag{3}$$

If property cash flows, Y, are expected to grow at rate g^y, and corporate expenses to grow at rate g^g, and if investors are risk neutral, then we can write (from(3))

$$V_t = \frac{Y_t}{r-g^y} - \frac{I_t}{r} - \frac{G_t}{r-g^g} \tag{4}$$

Note that the first two terms on the right side of (4) are the value of the assets minus the value of the debt. this is the net asset value of the firm. Therefore the value of the firm can be decomposed into the net value of the underlying assets minus the value of management expenses.

The basic hypothesis in this paper is that corporate expenses can be dichotomized into discretionary, G^d and non-discretionary expenses, G^n with

$$G = G^n + G^d. \tag{5}$$

Using (5) with (4) and denoting g^n as the expected growth of non-discretionary expenses and g^d as the growth of discretionary, we have

$$V = N - \frac{G^n}{r-g^n} - \frac{G^d}{r-g^d} \tag{6}$$

where N is the net asset value.

Non-discretionary or "structural" G&A expenses arise from the basic costs associated with asset and liability management so that we can write

$$G^n = G^n(A, L)$$

Where A is the dollar value of assets under management and L is the value of liabilities of the firm. If there are economies of scale in asset and liability management, this function will be concave in both assets and liabilities.

Discretionary or "style" G&A expenses, on the other hand, arise from explicit managerial decisions intended to increase shareholder value. This implies that

$$C = C(G^d) \tag{7}$$

and from (2) above we also have

$$\frac{\partial C}{\partial G^d} = \frac{\partial Y}{\partial G^d} - \frac{\partial I}{\partial G^d} - 1 \tag{8}$$

That is, the effect of discretionary G&A expenditures on corporate cash flow must arise either from the effect on property cash flow or from more favorable financing.

Corporations do not separate G&A expenses into discretionary and non-discretionary categories; however, since we expect basic asset and liability management to be a concave function of assets and liabilities, we can first regress G&A expenses on a quadratic of assets and liabilities to estimate the non-discretionary component. The residuals from this regression then become a measure of the discretionary or style-related expenses. Therefore our measure of discretionary expenses is

$$G^d \equiv G - G^n(A, L) \quad (9)$$

where

$$G^n(A, L) = a_0 + a_1 A + a_2 A^2 + a_3 L + a_4 L^2 \quad (10)$$

and we expect $a_1, a_3 > 0$, $a_2, a_4 \leq 0$.

Data

The data are drawn from the equity REIT database described in Capozza and Lee (1995). This database is a subset of the 209 REITs listed in the 1992 NAREIT (National Association of Real Estate Investment Firms) source book, which lists all member REITs as of December 31, 1991. This database focuses on equity REITs and excludes all mortgage, hotel, restaurant, and hospital REITs; REITs that do not trade on the NYSE, AMEX, or NASDAQ; and REITs for which property information is not available. Applying these exclusions results in a sample of 75 REITs, which are listed in Table 1. Of the 75 equity REITs, 32 appear in all eight sample years from 1985 to 1992, with the remaining appearing for at least one year. This leads to a total of 416 potential observations.

Firm specific information was gathered from 10-K reports, annual reports to shareholders, and proxy statements augmented with stock price data from the CRSP daily return file. The database includes balance sheet, income statement, and property variables from the 10-K reports.

We use two proxies to measure focus in this study. Both are Herfindahl indices, one for property type focus and one for regional focus. For each company, the property type index is calculated as $\sum_{i=1}^{4} S_i^2$, where S_i is the proportion of a firm's assets invested in a particular product line (office, warehouse, retail or apartment). Higher levels of concentration by property type lead to higher levels of the index: If the firm is highly focused along one dimension, the index is close to one; while the index approaches .25, if the firm's portfolio of properties is equally diversified across the four property types. The regional Herfindahl is similarly defined as $\sum_{r=1}^{8} S^2{}_r$ where S_r is the proportion of a firm's assets invested in each of eight economic regions as defined in Hartzell, Shulman and Wurtzbach (1987): New England, Middle Atlantic, Southeast, Midwest, Plains, Southwest, South Pacific, and North Pacific. This concentration variable can vary from one for a geographically focused REIT to .125 for a REIT with holdings equally diversified across the eight regions.

The database also provides estimates of the market value of properties held and the net-asset-value (NAV) on a per share basis. The estimates are described in detail in Capozza and Lee (1995). The net asset values were estimated by subtracting liabilities from estimated property assets plus other assets. Additional adjustments were make for joint ventures, differences between coupon rates and market yields on debt, and property turnover. While these estimates for net asset value are the most sophisticated available we recognize that like all estimates they contain measurement error.[3]

Table 2 contains mean, standard deviation and extreme value information on variables used in this analysis that were culled from the database. There is a large dispersion in the size of the firms considered here; book values of the property portfolios vary from $2.1 million to about $486 million, while book values of all assets vary up to $604 million. The weighted-average capitalization rates used to construct estimates of property values vary between 7.4% and 10.6%. Their estimates of portfolio market values generally lie above reported book values, with a mean book-to-market ratio for properties of about 85%. There is considerable variation in the use of debt in the capital structure, with debt representing anywhere from zero percent to 94.4% of the capital structure. Both property type and regional diversification vary in the cross-section, with both variables virtually spanning their feasible ranges. Of perhaps greatest importance here are the G&A figures, which vary from $66,000 to $5.04 million, or, expressed as a fraction of assets, from zero to 7.5% with a mean of 1.1%.

[3] An alternative to calculation NAVs is to use the appraised values provided by some REITs as in Damodaran and Liu (1996). Appraised values, however, are not without problems. First only a few REITs provided appraisal values during the sample period. Second these values lack consistency since appraisers use diverse approaches and data. Finally there is great potential for upward bias in some appraised values when the motivation for managers to obtain appraised values arises from management contracts specifying compensation as a percentage of the appraised value. The advantages of the Capozza/Lee NAVs are the broad coverage and the consistent and accurate estimates for portfolios of property despite the limitations of the publicly available data in 10-Ks.

Results

In this section we conduct our investigation of the sources and valuation consequence of G&A expenses. We begin by estimating the basic relationship between G&A expenses and assets and liabilities. We then partition observed G&A into a component that is associated with these "structure" variables and the residual, which we attribute to managerial style. We show that the residual component is significantly related to at least one measure of "style" by relating this component to our measures of regional and property-type focus. We then investigate the effects of G&A and its two components on cash flows at both the property level (before interest and G&A expenses) and the corporate level (net of interest and G&A). Finally we explore the relationship of G&A expenses to equity valuation..

Structural G&A Expenses

Our hypothesis is that for any portfolio of real estate assets, basic asset and liability management is essential but does not enhance value. On the other hand, when managers undertake expenses beyond the basic level cash flow and value can be enhanced. We also argue that there are economies of scale in managing both assets and liabilities. As a result larger, less-levered firms should be able to reduce these basic structural expenses when measured as a percentage of total assets under management.

While the costs of asset management are widely recognized, the cost of debt management is often overlooked. With debt added to the capital structure, additional financial management, reporting and filing requirements ensue. These debt-related costs are also subject to economies of scale. Thus, we expect a concave relationship between G&A expenditure and the amount of debt in the capital structure

To capture this feature, we include both linear and quadratic terms for the market value of assets and liabilities in a regression with G&A expenditures as the dependent variable.

Since we expect G&A to increase with total assets and liabilities, but at a decreasing rate, we anticipate coefficients on the linear terms to be positive and those for the quadratic terms to be negative.

For our sample of 298 usable observations, we regress annual G&A expenses reported in thousands of dollars against total assets and liabilities and their respective squares. To accommodate cross-sectional heteroskedasticity, estimation is done via weighted-least-squares (WLS), with the market value of assets used as the weighting variable. The results appear in the first column of Table 3.

As predicted, there is a positive and concave relationship between G&A expenditures and both assets and liabilities. For very small firms, an increase in the size of the asset pool increases expenses by just under .8% of the size of the increase. However, consistent with the existence of economies-of-scale, this measure of marginal administrative costs declines with firm size. For example, for a firm with assets equal to our sample average, the estimated average and marginal administrative costs are .8% and .7% of assets, respectively; for the largest firm in our sample, estimated average and marginal administrative costs are only .6% and .2% of assets.

We use the fitted values from this regression as our measure of structural G&A expenses. The residuals from the same equation are our measure of style G&A expenses.

Style G&A Expenses

The second half of our hypothesis is that discretionary spending by managers will be undertaken when it is likely to be value enhancing. Since income statements do not separate the expenses into discretionary and non-discretionary categories we must infer which expenses are discretionary from the data. Earlier we argued that the types of expenditures that are discretionary includes, among other things, expenses associated with diversifying the portfolio. As a manager diversifies, a larger opportunity set becomes available and therefore, if the manager chooses projects with the most promising returns from the wider set, there is potential for higher total returns on assets. At the same time diversifying either by property type or by region will add to overhead expenses as travel, office locations and/or personnel are added. We view the decision to diversify as discretionary or style related.

To confirm that this style variable is related to G&A expenses we add focus variables to the first regression. Column two of Table 3 displays the results. As hypothesized, greater diversification is associated with higher G&A expenses. The property focus variable enters the equation significantly but the regional focus variable is insignificant. The coefficient on the property focus variable indicates that a fully focused firm will have G&A expenses that are, on average, $357,000 lower than a firm fully diversified by property type (1*476 - .25*476). In column 3 of Table 1, we regress the residuals from the first column on the two focus variables. The implications for focus are similar to those from column two.

Managerial Expenses and Property Cash Flows

To examine the relationship between G&A expenditures incurred within a given fiscal year and cash flows during that year, we examine property-level cash flows (PCF), which are gross cash flows from operations (rents) less any property level expenses, including maintenance, property management and property taxes (see Exhibit 1). We then regress this measure of gross income on G&A expenditures. Since dollar income should increase with the size of the income generating asset pool, the market value of assets is also included in the specification.

The slope coefficient associated with the market value of assets provides an estimate of the gross yield or return on assets. Of greater importance, however, is the slope coefficient associated with G&A expenses, which estimates the relationship between investment in G&A and subsequent cash flows to that investment. If the coefficient is one, then a $1 increase in management fees would, on average, lead to a $1 increase in gross cash yields, and hence, a zero change in net or corporate cash flows (CCF, or gross cash flows less interest payments and less G&A expenditures). Using this reasoning, a coefficient reliably greater than one would imply that an increase in G&A on average leads to increases in net cash flows available to shareholders. A second key benchmark is whether the slope differs from zero. If the slope coefficient is zero, then G&A expenditure is wasted, since an increase in G&A does not lead to any increase in gross cash flow, and hence, is a deadweight loss in corporate cash flows.

Using our sample of 298 usable observations, and including intercepts that vary by calendar year, we estimate the relationship using WLS with the market value of assets as weights. The first column of Table 2 displays the results.

The coefficient associated with the market value of assets indicates that a firm with zero administrative expenses earns, on average, a gross return on assets of about 8.2% per year. The coefficient associated with G&A expenses is reliably greater than zero indicating that increases in G&A expenditures are on average associated with increases in concomitant gross cash flows from properties. It is not clear whether this increase in gross cash flows is sufficient to offset the higher expense, however. The t-statistic associated with the null that the slope equals one is -1.88 with an associated one-sided p-value of 0.06.

As we argued above, actual G&A expenditures can be partitioned into two components: those expenditures that are associated with basic asset and liability management, and a component associated with management style. We estimated these components as the fitted values and the residuals, respectively, from the regression of G&A on quadratics of both assets and liabilities. To determine whether the cash flow implications of G&A expenditures vary between these two types of G&A, we re-estimate the above specification, this time regressing cash flows from properties on the two components of total G&A:

The results appear in column 2 of Table 4 and indicate asymmetric relationships between contemporaneous gross cash flows and the two components of G&A expenditure, with the coefficients associated with the two components of G&A reliably different from each other ($F = 8.35 > F_{(1, \infty, .05)} = 2.71$). The coefficient associated with structure is insignificant, indicating that cross-sectional differences in the structural component of G&A expenditure result in no predictable differences in gross cash flows. Expenditures on the structural component of G&A are essentially dead-weight losses.

In contrast, the coefficient associated with managerial style is reliably positive. The magnitude of this coefficient indicates that a one dollar increase in this expense component leads to an eighty-six cent increase in concomitant gross revenues; however, we cannot reject the null hypothesis that this coefficient equals one. That is, increases in the style component of G&A expenses lead to little change in cash flows net of G&A expenses.

Corporate Cash Flow

Since the impact of managerial decisions can affect all cash flows, not just property cash flow, we repeat the preceding analysis, but instead we use net, or corporate level cash flows (CCF). From Exhibit 1, corporate cash flows are calculated as the gross cash flows less both G&A and interest expenditures and represent the funds from operation available to shareholders. Since interest expenses are deducted, we also include the book value of liabilities in this specification. The coefficient associated with debt is an estimate of the average yield offered on the debt. Estimation via WLS yields the results in column 3 and 4 of Table 4.

In the third column of Table 4 we report the results of a specification similar to column 1 with the exception of the addition of liabilities. This coefficient which is estimated to be -.067 indicates that on average the debt has an effective yield of 6.7%. Of primary importance, however, is the fact that the coefficient associated with total G&A is reliably negative. This result is consistent with the belief that investment in additional G&A lead to lower cash flows available for shareholders.

In the final column, we dichotomize G&A into its components, analogous to column 2. Estimates of the cash flow implications of the two components of G&A expenditures are consistent with those in the previous specification. The coefficient associated with the style component of G&A, though negative, is not statistically different from zero, indicating that increases in this component of G&A appear to be offset by higher revenues, leading to a neutral net effect on cash available for shareholders. In contrast, the coefficient associated with the corporate structure of G&A is significantly negative and not statistically different from -1.

Managerial Expenses and Firm Value

Much research in the efficient market hypothesis literature suggests that investors look beyond current cash flows, and consider a stream of future flows when valuing equity. Therefore, the final analysis we conduct involves investigating the relationship between stock valuation and G&A expenditures.

The value of equity in a REIT derives from the cash flows on the underlying properties but is reduced by the interest expense and G&A expense. Therefore, from (4), the value of shareholder equity equals the net asset value (market value of the assets minus the value of the debt) plus the net present value of G&A expenses. We can estimate the net asset value per share, as the per share difference between the market value of the properties and the value of the debt claims (see Capozza and Lee(1995)). Although we can measure G&A expenditures in a given year, we cannot measure the present value of future G&A claims. Instead, we estimate the discount factor, $\frac{1}{r - g^{g}}$, used by the market for valuing these claims. Specifically, we estimate the linear regression in column 1 of Table 5 via WLS with total assets as weights.

The R^2 indicates that eighty percent of the cross-sectional variation in prices is explainable by these factors, suggesting that this simple specification is quite successful in modeling the actual valuation process. The coefficient associated with net asset value is positive and highly significant. The fact that this coefficient is significantly above one indicates that, absent the G&A cost associated with the REIT organizational form, the liquidity enhancing benefits of REITs increase the market value of the underlying assets by about 15%. Of primary importance, however, is the coefficient associated with G&A expenditures, which is negative but insignificant.

It may be tempting to conclude that current G&A expenses are not relevant in the valuation process. However, if the two components of G&A have differing implications for valuation, then including the sum of the two (or, equivalently, by forcing the coefficients of the two to be equal), we are creating a misspecification. To examine this possibility, we again partition G&A per share into its corporate structure component and its management style component. When both are included, estimation yields the results displayed in column 2 of Table 5.

As in the contemporaneous cash flow specification, we can reject the hypothesis that the coefficients associated with the two components of G&A are equal ($F = 9.78 > F_{(1, \infty, .01)} = 4.45$). These findings are consistent with the hypothesis that investors can and do distinguish between G&A attributable to corporate structure and the portion attributable to managerial style. The style portion is not significantly related to equity value. In marked contrast the structure-related component of G&A has a statistically and economically significant impact market equity. A one dollar reduction in the structure related component of G&A is, on average, associated with an increase in shareholder equity of $15.62. Again the coefficient associated with NAV is significantly above one. The coefficient suggests that the liquidity enhancing benefits of the organizational form are about 27%.

It is informative to compare the relationship between the components of G&A and contemporaneous cash flows to the relationship between the components and value. Consider first the style G&A results. Our evidence suggests that an increase in style-related G&A leads to an increase in concurrent property-level or gross cash flows. However, the increase in current style-related G&A leads to no discernible increase in concurrent corporate-level or net cash flow, and an insignificant increase in shareholder equity. Therefore, investors value those discretionary actions captured in style G&A as if they were zero NPV projects.

In contrast, the evidence indicates that the same $1 increase in structural G&A has no effect on concurrent project-level cash flow, reduces concurrent corporate-level net cash flow by about $1, and reduces shareholder equity by $15.6. Therefore, investors value increases in the structural component of G&A as if they were negative NPV projects. One scenario that is consistent with these estimates is one where a $1 increase in the structural component signals a perpetuity of future expenses. The coefficient (15.6) implies a current capitalization rate for structural G&A expenses of 6.4% (=1/15.6), similar to the historical average real rate of return on equities.

Conclusions

Securitization is frequently cited as a way to provide liquidity to an otherwise illiquid class of assets. However, there can be substantial costs associated with realizing such liquidity gains. In this study, we examine the determinants and valuation effects of these costs, which, in the case of REITs, are designated as general and administrative (G&A) expenses. We find that G&A expenses can be dichotomized into two distinct components. One component is a non-discretionary or structural and arises from basic asset and liability costs. This component increases with size and the use of leverage in the capital structure of the firm. Although this component increases with assets and liabilities under management, it does so at a decreasing rate, which suggests economies-of-scale in managing.

The second component captures the costs associated with managerial style. Whether a REIT chooses to focus or diversify, active management such as developing or rehabilitating properties, and organizational restructuring are costs that would be captured by this component.

We find that the two components of G&A expenditures have very different impacts on both contemporaneous cash flows and on firm valuation. Indeed, our estimates suggest that investors rationally distinguish between the two components of G&A. Specifically, the estimates show that increases in the style-related component lead to increases in contemporaneous project-level gross cash flow, but no change in contemporaneous net corporate cash flows or shareholder equity. These estimates are consistent with the hypothesis that investors view this component as a zero NPV project.

In contrast, cross-sectional differences in the structural component have no discernible effect on contemporaneous property-level cash flows, but have a strong negative effect on corporate level cash flows and on valuation. These estimates are consistent with the hypothesis that investors view increases in this component as signaling the equivalent of a long-lived, negative NPV project.

We conclude that corporate structure and managerial style choices have significant impacts on the valuation of these firms, since different structures and strategies imply different levels of the two components of G&A expenses. Further, the large valuation effects associated with the structural component suggest that there are substantial wealth enhancing opportunities available by reorganizing existing firms into firms with lower structural components of G&A, by merging into larger firms or eliminating the use of debt in the capital structure.[4]

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[4] Some recent anecdotal evidence suggests that at least a few agents in the REIT industry have discovered this prescription for enhanced value. For example, Landsing Pacific, facing large G&A expenses and a low stock price, simply liquidated and distributed proceeds to shareholders by selling its portfolio of properties to a larger REIT (Bedford Properties). Property Trust, on the other hand, chose to increase its size dramatically from under \$100m to over \$1 billion by issuing equity. Duke Realty and Southwest Property Trust engaged in major capital and management restructurings by internalizing the advisory function, issuing additional equity and using a portion of the proceeds to retire long term debt. In all the above cases the changes were value enhancing. However, the large number of small, levered REITs in existence suggests that numerous opportunities for value creation remain.

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Table 1. The Equity REIT Sample

The sample of REITs, drawn from the equity REIT database described in Capozza and Lee (1994). This database is constructed from the 1992 NAREIT (National Association of Real Estate Investment Trusts) source book, which lists all publicly traded REITs (209 REITs) as of December 31, 1991. The database excludes all mortgage, hotel, restaurant, and hospital REITs, REITs that do not trade on NYSE, AMEX, nor NASDAQ, or for which property information is not available. These exclusions lead to a sample of 75 REITs, which are listed here. Given this list, the researchers then attempted to construct one observation per REIT for each of the years between 1985 and 1992. Of the 75 equity REITs, 32 appear in all eight years and are annotated with a star (*), with the remaining appearing for at least one year.

*B R E Properties Inc.
Berkshire Realty Co. Inc.
*Bradley Real Estate Trust
Burnham Pacific Properties Inc.
*California Real Estate Invt Tr
Cedar Income Fund Ltd.
Cedar Income Fund 2 Ltd.
Chicago Dock And Canal Trust
*Clevetrust Realty Investors
*Continental Mortgage & Eqty Tr
Copley Property Inc.
Cousins Properties Inc.
Dial Reit Inc.
Duke Realty Investments Inc.
*E Q K Realty Investors 1
*Eastgroup Properties
*Federal Realty Investment Trust
*First Union Real Est Eq&Mg Invts
Grubb & Ellis Realty Inc. Trust
*H R E Properties
*I C M Property Investors Inc.
*I R T Property Co
Income Opportunity Realty Trust
Koger Equity Inc.
Landsing Pacific Fund
Linpro Specified Pptys
*M G I Properties Inc.
*M S A Realty Crop
*Meridian Point Realty Tr 83
*Meridian Point Realty Tr 84
Meridian Point Realty Trust IV
Meridian Point Realty Trust VI
Meridian Point Realty Trust VII
Meridian Point Realty Trust VIII
*Merry Land & Investment Inc.
Monmouth Real Estate Invt Crop
*New Plan Rlty Trust
*Nooney Realty Trust Inc.
*One Liberty Properties Inc.
P S Business Parks Inc.
Partners Preferred Yield Inc.
Partners Preferred Yield II
Partners Preferred Yield III
*Pennsylvania Real Est Invt Tr
*Property Trust Amer
*Prudential Realty Trust
Public Storage Properties VI
Public Storage Properties VII
Public Storage Properties VIII
Public Storage Properties IX Inc.
Public Storage Properties X Inc.
Public Storage Properties XI Inc.
Public Storage Properties XII
Public Storage Properties XIV
Public Storage Properties XV Inc.
Public Storage Properties XVI
Public Storage Properties XVII
Public Storage Properties XVIII
Public Storage Properties XIX
Public Storage Properties XX
*Real Estate Investment Trust Ca
Realty South Investors Inc.
*Santa Anita Rlty Enterprises
Sizeler Property Investors Inc.
*Trammell Crow Real Estate Invs
*Transcontinental Rlty Invstrs
*U S P Real Estate Investmt Trust
*United Dominion Realty Tr Inc.
Vanguard Real Estate Fund I
Vanguard Real Estate Fund II
Vinland Property Trust
*Washington Real Est Invt Tr
*Weingarten Realty Investors
*Western Investment Real Est Tr
Wetterau Properties Inc.

Table 2. Summary Statistics

This table reports means, standard deviations and extreme values for a number of summary statistics calculated across our sample of 416 observations for 75 firms. Total assets and property assets are book values. Total market assets are measured by estimated market value of properties + other assets. The leverage ratio is defined as total liabilities / (total liabilities + market value of the equity).

Variable	MEAN	MAX	MIN	STD. DI
Total Assets ($ Mil.)	126.8	603.8	2.1	110.2
Property Assets ($ Mil.)	94.7	485.7	2.1	85.3
Book to Market Ratio Of Property (%)	85.2	201.0	14.0	33.0
Book to Market Ratio Of Total Assets (%)	87.0	166.0	20.0	26.0
Weighted Capitalization Rate (%)	8.9	10.6	7.4	0.5
Net Income ($ Thou)	3,963	49,446	(58,609)	9,209
G&A Expenses ($ Thou)	1,315	5,038	66	1,137
Cash Flow Per Share	1.03	4.76	0	0.64
G&A / Total Assets (%)	1.1	7.5	0.0	1.1
Cash Flow Yield (%)	8.9	58.0	0.0	5.1
Leverage Ratio (%)	36.8	94.4	0.0	25.0
Herfindahl Index for Region (%)	58.2	100	15	28.0
Herfindahl Index for Property Type. (%)	66.7	100.0	26.0	24.1

Table 3. General and Administrative Expenses

Estimates from weight-least-squares regressions, with replacement or real-estate market value of assets used as weights. Indicator variables capturing calendar year are used as intercepts, but estimates of their associated coefficients are not reported. The market value of assets are estimates of replacement or real-estate market values, based on Capozza and Lee (1996). Liabilities are book values of total liabilities. Property-type focus is a Herfindahl coefficient generated by summing the squared proportions of a firm's assets invested in each of four real estate types. Regional-focus is similarly, a Herfindahl index computed across nine geographic regions. Asterisks indicate whether these test-statistics exceed the 10% (*), 5%(**) or 1%(***) critical values.

	1 Total G & A		2 Total G & A		3 Style G & A	
Average Year dummy	96		533		361	
Assets (000)	7.9 (6.8)	***	7.5 (6.4)	***		
$Assets^2$ (000,000)	-.0045 (1.9)	*	-.0037 (1.5)			
Liabilities (000)	5.2 (2.2)	**	4.0 (1.7)	*		
$Liabilities^2$ (000,000)	-.02 (2.3)	**	-.016 (1.8)	*		
Property Focus			-476 (3.6)	***	-415 (3.4)	***
Regional Focus			-100 (.9)		-109 (1.0)	
Adjusted R^2	.14		.18		.01	

Table 4. The Effect of G & A Expenses on Property and Corporate Cash Flow

Estimates from weight-least-squares regressions, with replacement or real-estate market value of assets used as weights. Indicator variables capturing calendar year are used as intercepts, but estimates of their associated coefficients are not reported. The market value of assets are estimates of replacement or real-estate market values, based on Capozza and Lee (1996). Liabilities are book values of total liabilities. Structural G&A is the fitted values from column 1 of Table 3 and Style G&A is the residuals from the same regression equation. Property-type focus is a Herfindahl coefficient generated by summing the squared proportions of a firm's assets invested in each of four real estate types. Regional-focus is similarly, a Herfindahl index computed across nine geographic regions. Asterisks indicate whether these test-statistics exceed the 10% (*), 5%(**) or 1%(***) critical values.

	1 Property Cash Flow		2 Property Cash Flow		3 Corporate Cash Flow		4 Corporate Cash Flow	
Average Year dummy	-72		203		-45		201	
Assets	.082 (59.8)	***	.091 (27.6)	***	.078 (40.7)	***	.086 (24.1)	***
Liabilities					-.067 (18.6)	***	-.067 (18.8)	***
Total G & A	.70 (4.5)	***			-.39 (2.5)	**		
Structural G & A			-.64 (1.3)				-1.6 (3.3)	***
Style G & A			.86 (5.3)	***			-.25 (1.5)	
Adjusted R^2	.90		.90		.81		.81	

Table 5. Valuation and G&A Expenses
Estimates from weight-least-squares regressions, with replacement or real-estate market value of assets used as weights. Indicator variables capturing calendar year are used as intercepts, but estimates of their associated coefficients are not reported. Net asset values are estimates of replacement or real-estate market values of assets minus the market value of the liabilities, based on Capozza and Lee (1996). Structural G&A is the fitted values from column 1 of Table 3 and Style G&A is the residuals from the same regression equation. Asterisks indicate whether these test-statistics exceed the 10% (*), 5%(**) or 1%(***) critical values.

Dependent Variable = Market Equity				
Average Year dummy	-6400		-3407	
Net Asset Value	1.15 (37.9)	***	1.27 (26.9)	***
Total G&A Expense	-3.0 (-1.3)			
Structural G&A			-15.6 (-3.4)	***
Style G&A			1.1 (0.4)	
Adjusted R^2	.80		.81	

Exhibit 1

Real Estate Investment Trust

Pro Forma Income Statement

	Revenues from Properties *Rents, tenant reimbursements*
–	Property-level Cash Expenses *Maintenance, Advertising, Property Management fees, Property Taxes*
=	Property Cash Flows (**PCF**)
–	Interest Expenses
–	General and Administrative (G&A) Expenses *Corporate level salaries, filing costs*
=	Corporate Cash Flows (CCF)
–	Depreciation (non-cash) Expense
=	Net Income (**NI**)

transaction costs of refinance. In the absence of refinance costs, any decrease in interest rates would lead to refinance.

X = deadweight refinancing costs that are a function of the loan size (e.g. the commonly used one point origination fee for a mortgage),

F = deadweight fixed refinancing cost (*e.g.* cost of a property survey or credit check),

MB_t = the mortgage balance at time t,

Pmt = the monthly mortgage payment,

$P_t^w(H_t,r_t)$ = the present value of the loan assuming the decision maker makes the contractual mortgage payment and thus continues the mortgage at least one more period. This is the expected discounted future value of the loan given that the house price and interest rate changes next period according to the processes noted.

δ_t = the one period discount factor for the current spot interest rate.

The model is revised to allow for events which are exogenous to the optimizing decision as described thus far. These events cause premature termination of the mortgage, in the sense that when it is not otherwise optimal to choose to default or prepay, an exogenous event may precipitate one of these decisions. The exogenous event is assumed to follow the pattern established by the PSA[6] function though it may be scaled by a chosen multiple. When an exogenous event occurs, the decision maker decides whether it is better to prepay or to default by simply assessing what is best at this instant as there is no future to be considered. The best choice is the minimum cost choice - either to pay off the mortgage balance, or to default if the house price plus transaction costs of default are lower than the mortgage balance. Equation (A1) is modified to allow for exogenous events as:

$$P_t(H_t,r_t) = Min(P_t^d(H_t,r_t)\,,\, P_t^r(H_t,r_t),\,(1-\lambda_t)\,P_t^w(H_t,r_t) + \lambda_t\,Min[MB_t\,,\,H_t + TC]) \quad \text{(A5)}$$

where:

λ_t = the exogenous event rate at period t.

To complete the model one must specify the appropriate boundary condition at maturity. In the final period, the wait choice vanishes. The value of the mortgage, if default is chosen, is the value of the house plus transactions costs. The alternative is to payoff the mortgage by making the final payment. The mortgagor chooses the lower cost alternative, which in general is to make the final mortgage payment. The mortgagor will make the final mortgage payment if the transaction cost of default exceeds the mortgage payment. The boundary equation at maturity is:

$$P_T(H_T, r_T) = Min(H_T + TC\ ,\ Pmt). \tag{A6}$$

Solving for the optimal decision sequence and values is by backward induction starting with equation (A6) and working to the present. It is not appropriate to prepay a mortgage the instant it is taken out (one would wait at least one month in this discrete time model) and one does not make a payment on a mortgage until the first month. The value of a mortgage at initiation is thus the present value of the mortgage one period from now less a payment which need not be made at initiation:

$$P_0(H_0, r_0) = P_t^W(H_0, r_0) - Pmt \tag{A7}$$

The model is appropriate for determining the optimal decision at each stage (time period) and for computing the value of the loan. The primary purpose of this modeling, however, is to learn about default probabilities, which requires the use of lattice process probabilities to compute projected default rates. Because default at any stage is conditional on what has happened in the past, this computation is made as a forward recursion on the lattice using the optimal default and prepayment boundaries as stopping points for the process. While hedging arguments provide that the default option, and optimal stopping boundary are determined using the risk neutralized house price process of equation (2), determining the probability of default is done using the actual house price process of equation (1). To implement the computation of the default probabilities, the probability of an upstate in house prices is computed using the same CRR equation, but with the gross return to housing used in place of the risk free interest rate, that is:

$$\pi_u = \text{actual probability of an upstate} = \frac{\exp[(g-\gamma)\Delta t] - d}{u - d}.$$

Operationally, the model is run; and the optimal default and prepayment hitting boundaries are stored. Then starting with a probability of 1 from the initial node, the probability of reaching each interest rate and house price node in the next period is computed. If that node involves a prepayment, the probability of reaching that node is credited to the probability of a prepayment, and then the probability of that node is set to zero. A similar approach is used for default nodes. For nodes for which neither a prepayment or default is chosen, their probability is reduced by the exogenous termination rate. The exogenous event probability is credited to either prepayment or default, depending on whether the mortgage balance exceeds the house value plus transaction cost of default. The process is then continued for another stage. The correct conditional probabilities are computed because nodes where a default or prepayment has occurred have their probability set to zero, so forward movements from these nodes are made with zero probability. The probability of default at each stage is computed by summing the probabilities of all default nodes at that stage.

Table 1. Base case parameters for numerical modeling.

Initial House Price	$H_0 = \$100{,}000$
Initial Loan Amount	$MB_0 = \$90{,}000 = P_0(H_0, r_0)$
Contract Mortgage Rate	0.850% monthly (10.2% annual rate)
Monthly Mortgage Payment	$Pmt = \$803.15$
Initial Spot Interest Rate	r_0 =0.797% monthly (10% effective annual yield, 9.57% annual rate)
Gross Return To Housing	$g = 0.11$
House Rental Rate (dividend)	$\gamma = 0.05$
House Price Volatility	$\sigma_H = 0.1$
Reversion Parameter	$\beta = 0.1$
Interest Rate Equilibrium	$\alpha = r_0 = 0.10$
Interest Rate Volatility	$\sigma_r = 0.01$
Deadweight Refinance Costs	$F = \$500$
	$X = 0.5\%$ of loan balance
Transaction Cost Of Default	$TC = \$5{,}000$
Prepayment Rate	$\lambda_t = 50\%$ PSA

Figure 1. MCLTV and Default

The figure plots the default probability over the next year for three spot interest rates as market current loan to value varies for a 5 year old loan and for a book current loan to value ratio = 1.0. Model parameters are as given in Table 1 with the following exceptions: i) House value = loan balance = \$100,000; ii) Mortgage coupon rate varied from about 2% below indicated spot rate to 2% above indicated spot rate to vary the market current loan to value. The figure illustrates that MCLTV does not fully capture the effect of interest rate changes on default.

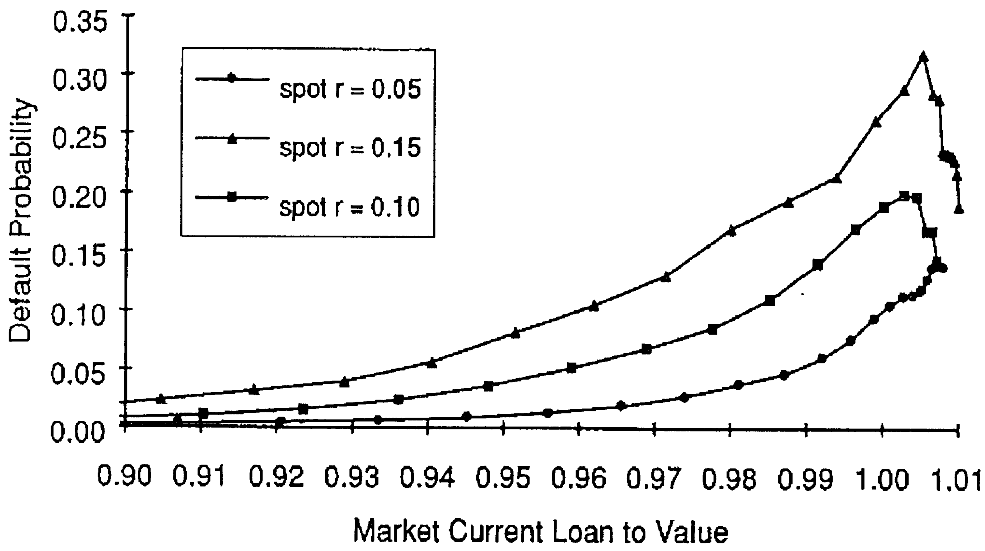


Figure 2. The effect of house price volatility.
The three panels of this figure depict the effect of house price volatility on default for a 5 year old mortgage and three BCLTVs. Base case parameters are given in Table 1. Solid line is the default probability for the next year and the dashed line for the next 10 years.

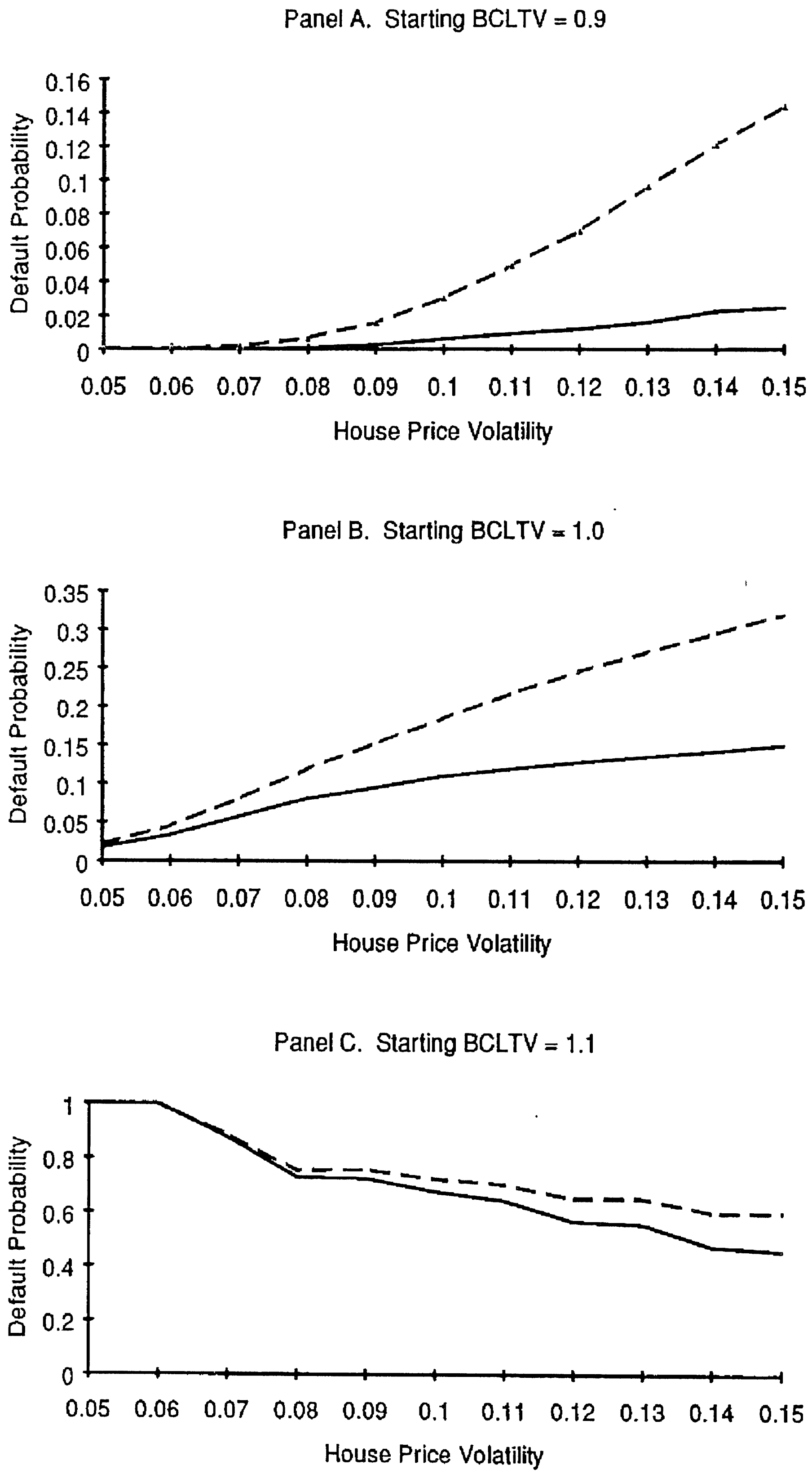


Figure 3. The effect of the rent to price ratio.
The three panels of this figure show the effect of the rent-to-price ratio on default for a 5 year old mortgage and three BCLTVs. Base case parameters are given in Table 1. Solid line is the default probability for the next year and the dashed line for the next 10 years.

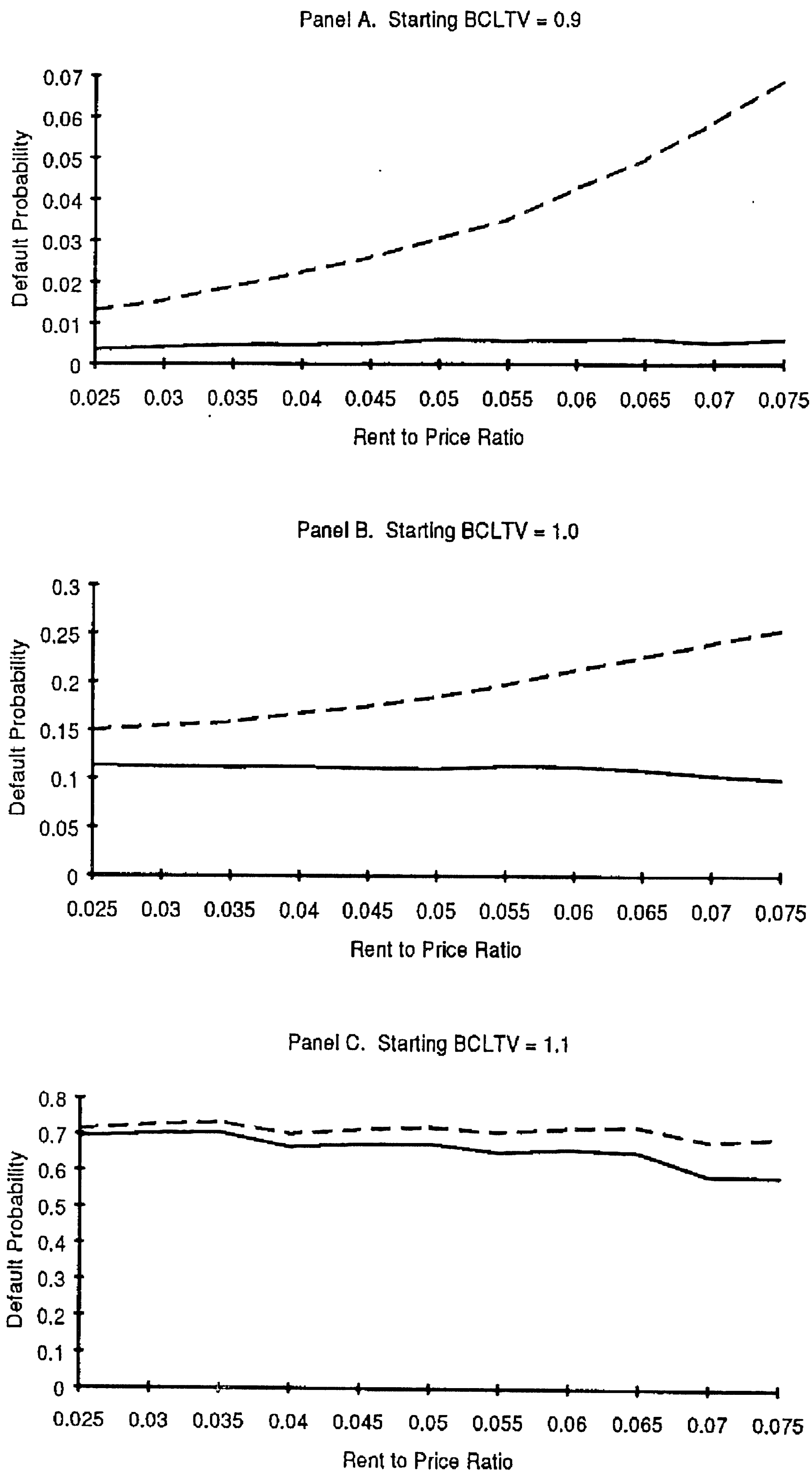


Figure 4. The effect of interest rate changes.
The three panels of this figure illustrate the effect of interest rate changes since origination on default for a 5 year old mortgage and three BCLTVs. Base case parameters are given in Table 1. Solid line is the default probability for the next year and the dashed line for the next 10 years.

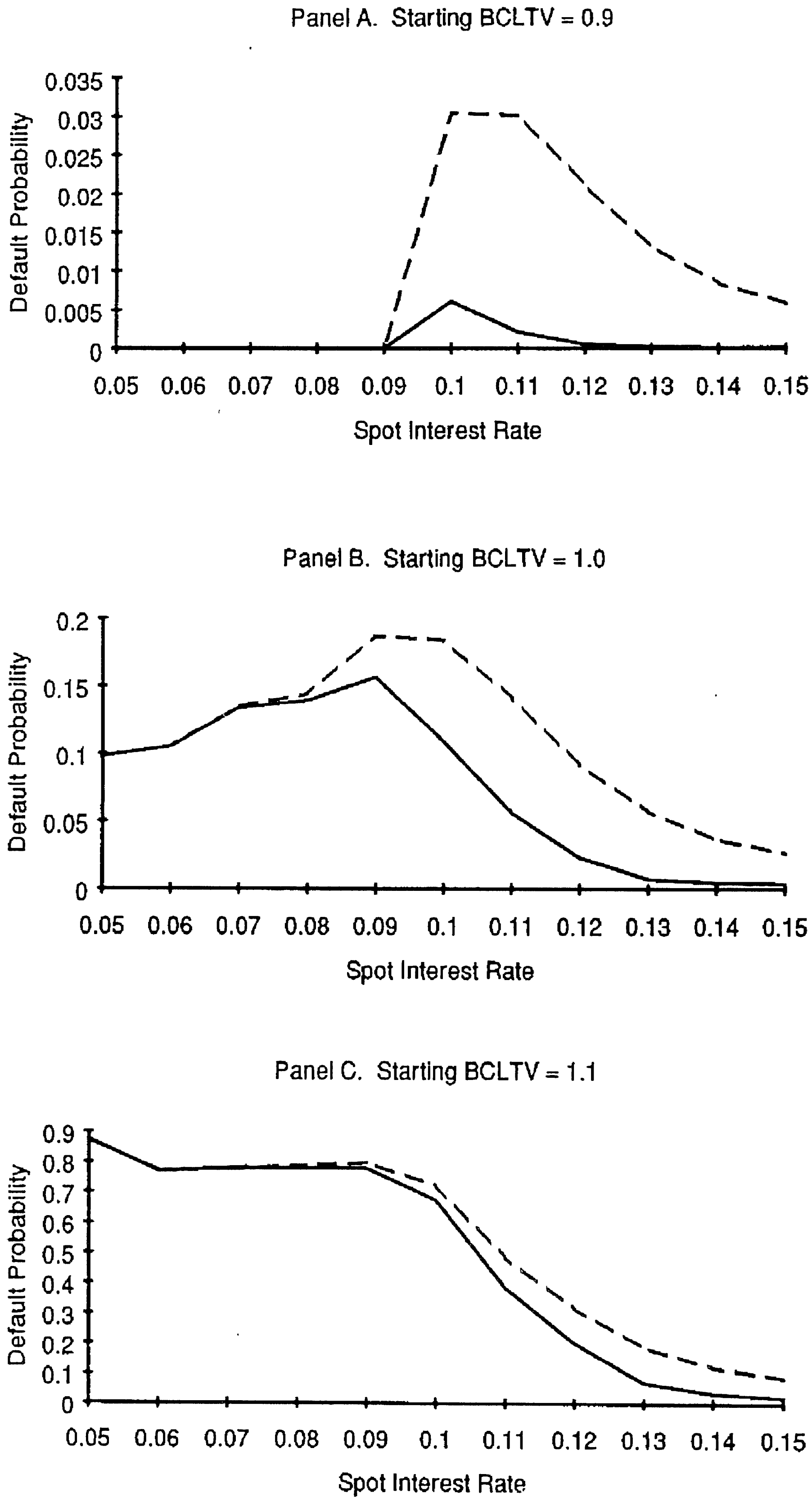


Figure 5. The effect of interest rate volatility.
The three panels of this figure present the effect of interest rate volatility on default for a 5 year old mortgage and three BCLTVs. Base case parameters are given in Table 1. Solid line is the default probability for the next year and the dashed line for the next 10 years.

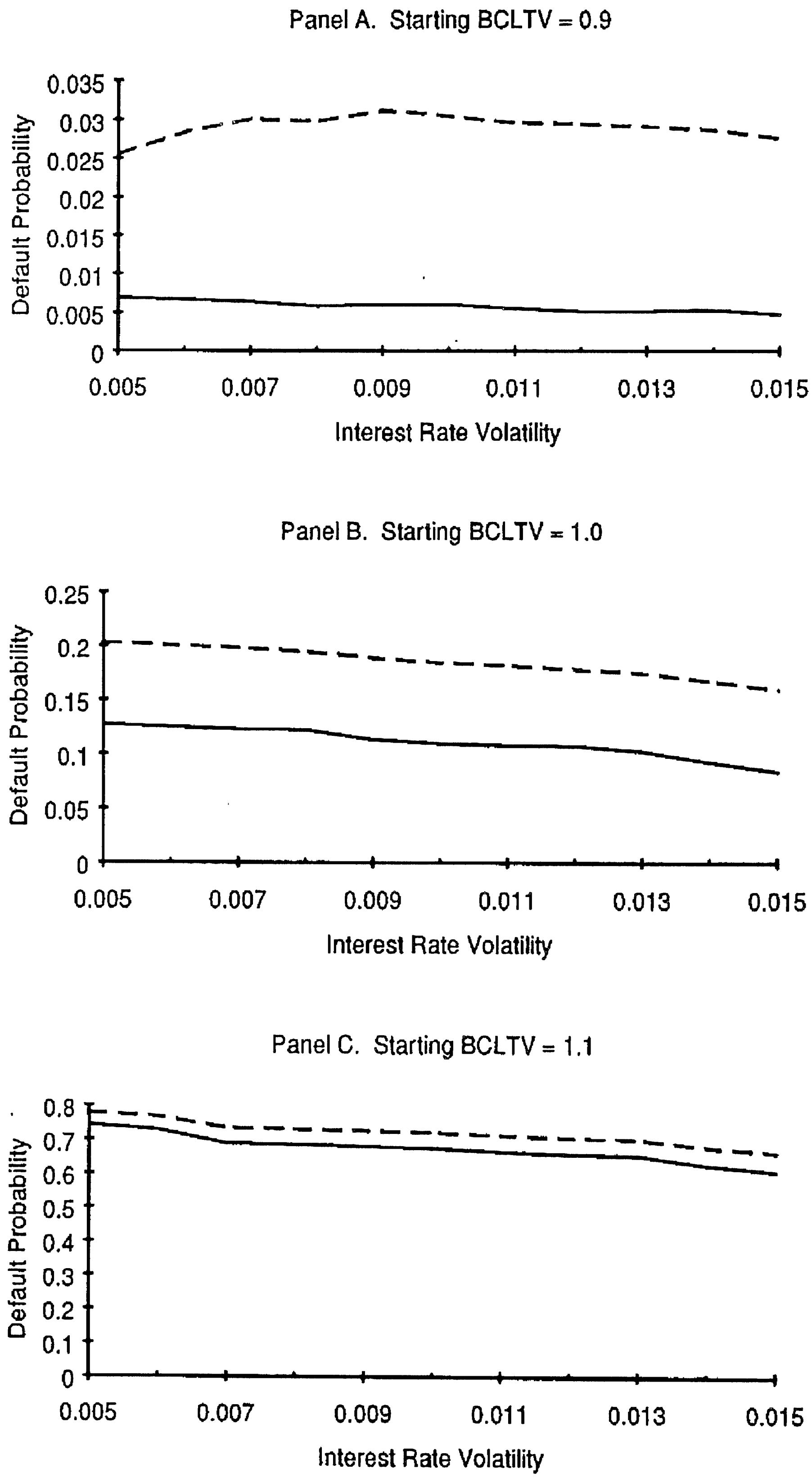


Figure 6. The effect of interest rate reversion.

The three panels of this figure show the effect of interest rate reversion on default for a 5 year old mortgage and three BCLTVs. Base case parameters are given in Table 1. Solid line is the default probability for the next year and the dashed line for the next 10 years.

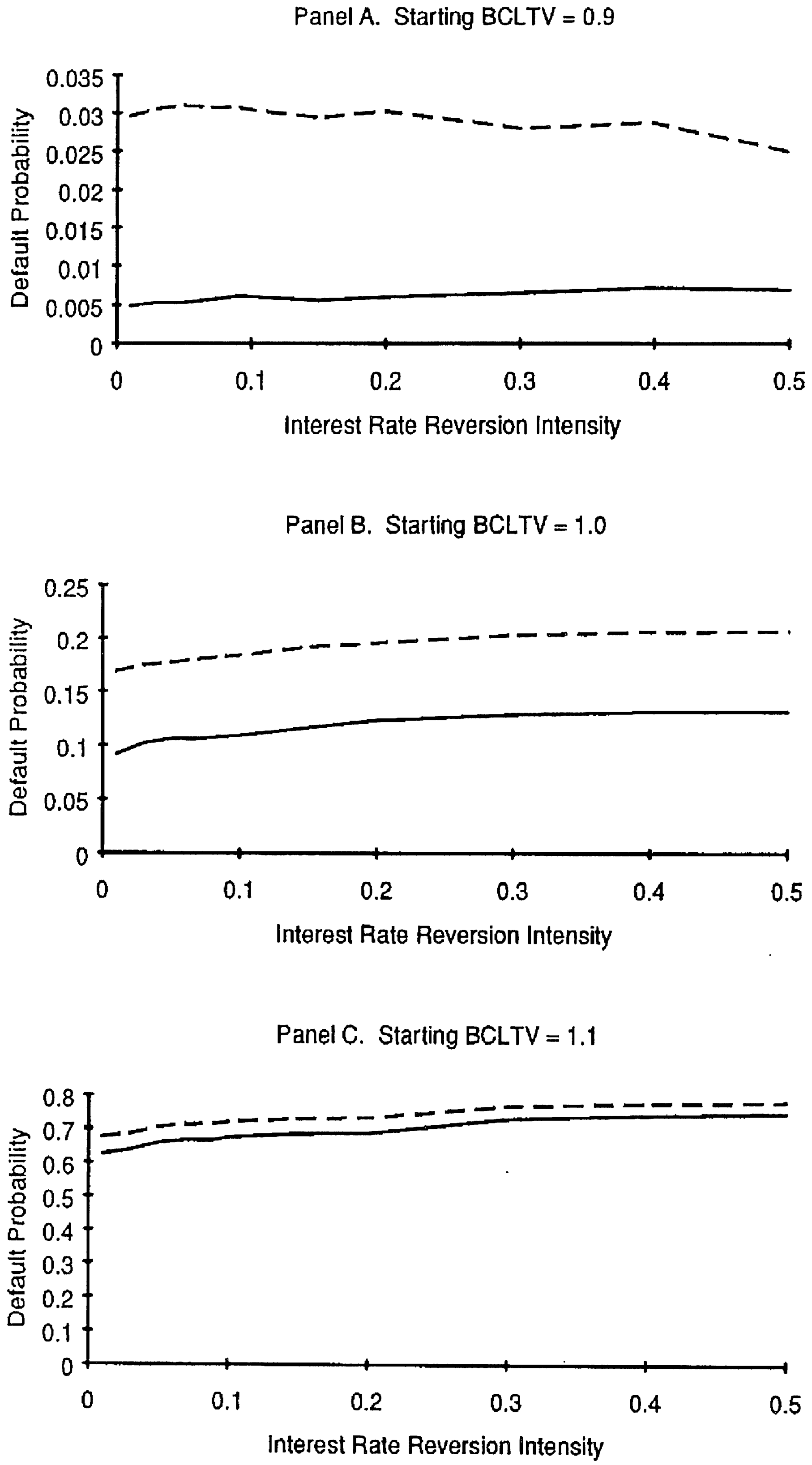


Figure 7. The effect of transactions costs of default.
The three panels of this figure illustrate the effect of default-related transactions costs on default probabilities for a 5 year old mortgage and three BCLTVs. Base case parameters are given in Table 1. Solid line is the default probability for the next year and the dashed line for the next 10 years.

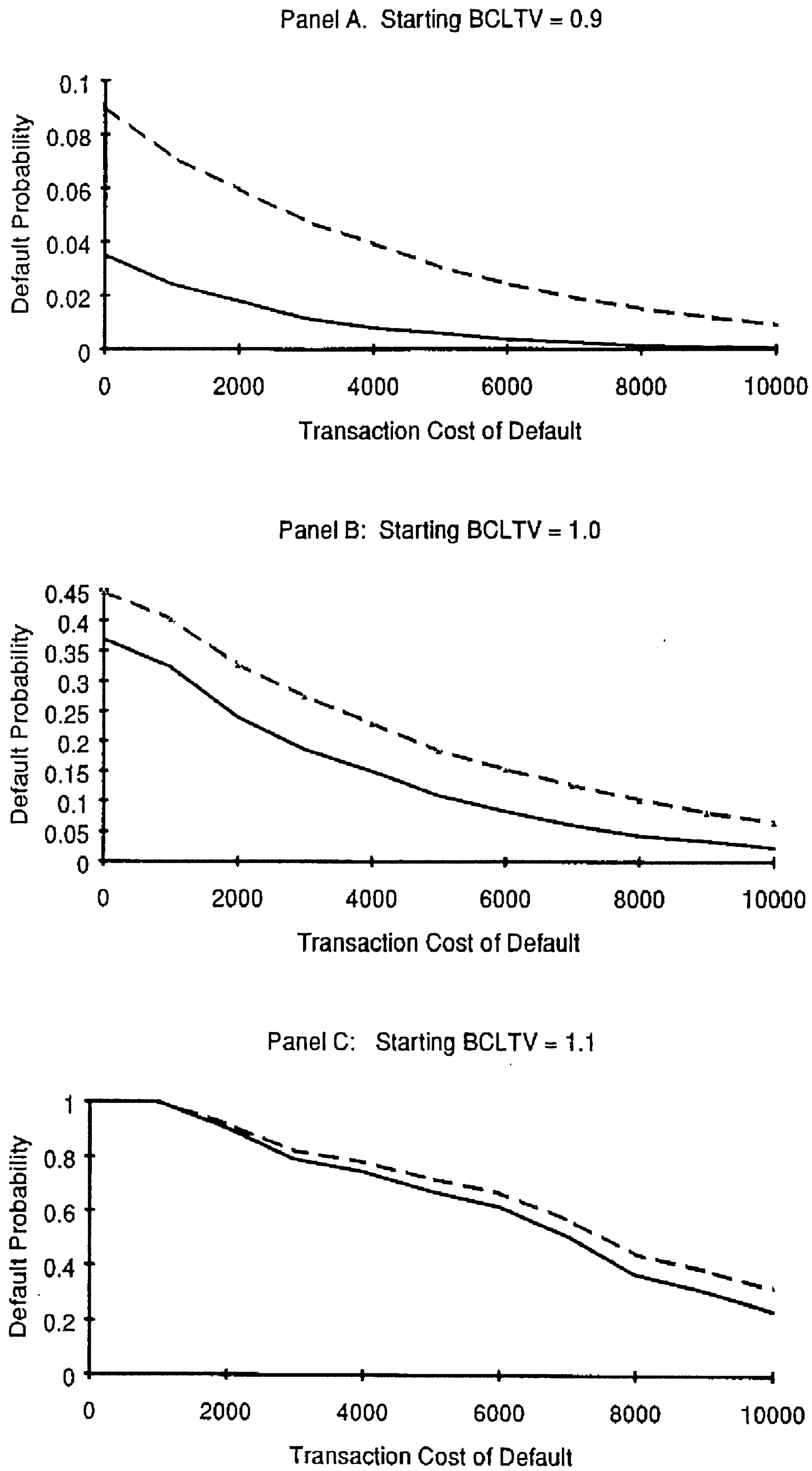
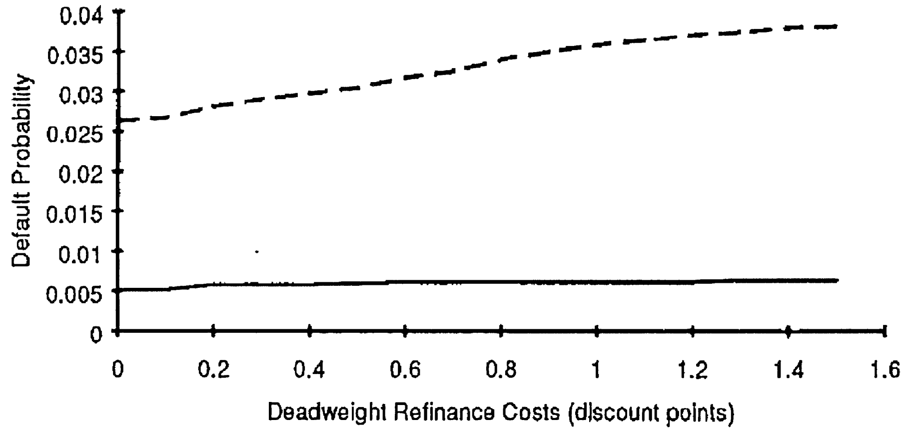
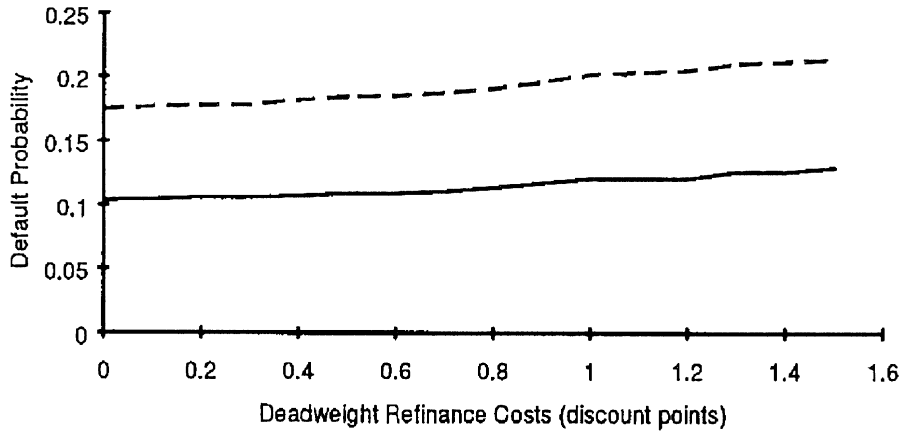


Figure 8. The effect of deadweight refinancing costs.
The three panels of this figure depict the effect of deadweight refinancing costs on default for a 5 year old mortgage and three BCLTVs. Base case parameters are given in Table 1. Solid line is the default probability for the next year and the dashed line for the next 10 years.

Panel A. Starting BCLTV = 0.9



Panel B. Starting BCLTV = 1.0



Panel C. Starting BCLTV = 1.1

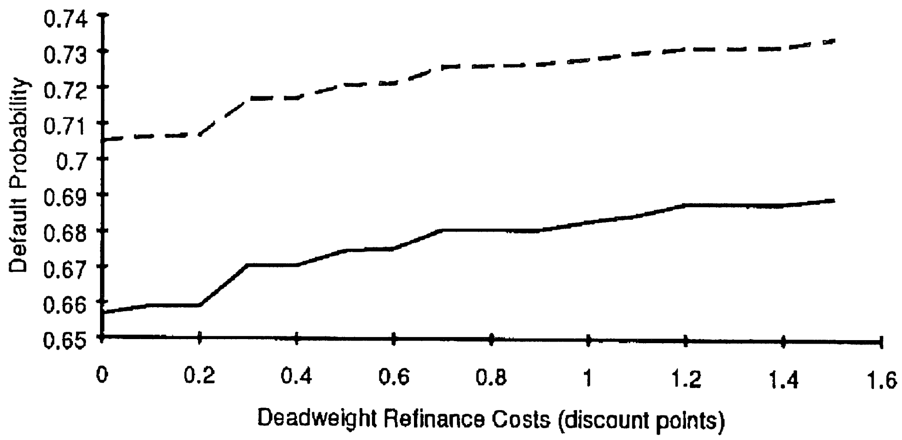
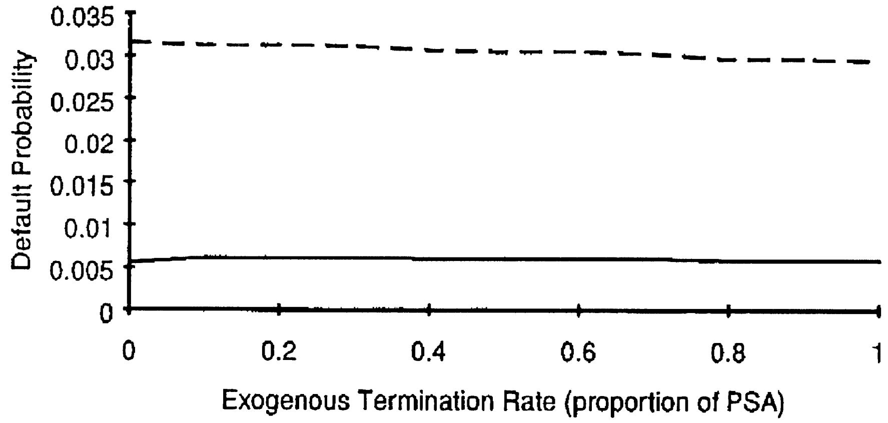
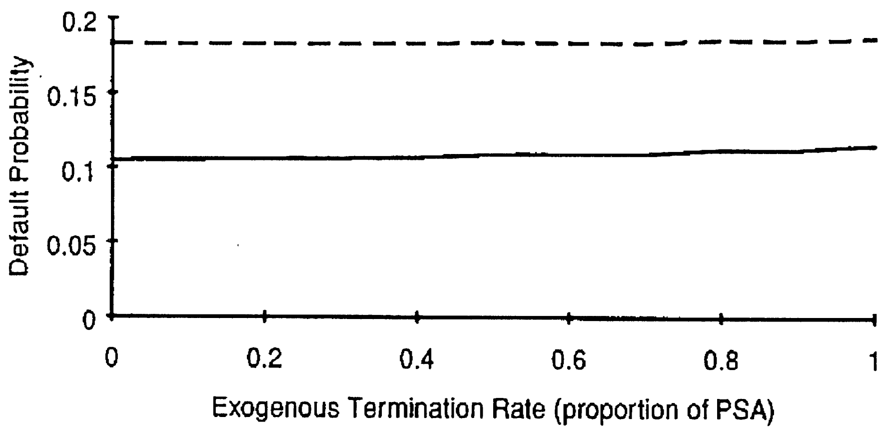


Figure 9. The effect of exogenous terminations.
The three panels of this figure show the effect of exogenous terminations on default for a 5 year old mortgage and three BCLTVs. Base case parameters are given in Table 1. Solid line is the default probability for the next year and the dashed line for the next 10 years.

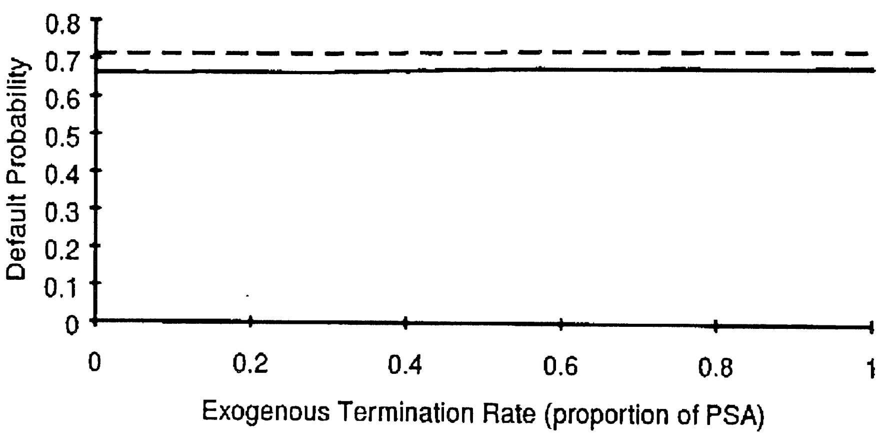
Panel A. Starting BCLTV = 0.9



Panel B. Starting BCLTV = 1.0



Panel C. Starting BCLTV = 1.1



Endnotes

[1] See Kau, Keenan and Kim 1994, for an elaboration.

[2] Negative interest rates are permitted in this model; but they are not important since the optimal refinance boundary, except when the loan is almost fully repaid, occurs at positive interest rates for realistic parameter values.

[3] As Kau, Keenan and Kim (1994) point out, these terminations may be suboptimal from the point of view of the model, but be the optimal decision for the mortgagor who chooses to terminate for reasons exogenous to the model.

[4] The computation uses more than five minutes of CPU time of on a Sun 670MP. 50,000 computations would require about six months of CPU time.

[5] Kau and Kim (1994) show that the reason one delays a current default, even if it is "in the money," is that house prices may fall in the future so that the present value of defaulting in the future may exceed the value of immediate default.

[6] The PSA model is the prepayment model produced by the Public Securities Association which projects the prepayment rate as rising linearly from 0 to 6% per annum over the first 30 months of the loan and then remaining at 6% per annum for the remainder of the loan. The monthly PSA model of prepayments can be written as:

$$\lambda_t = (0.005/30)\ t \qquad t = 1, 2, 3, \ldots, 29$$
$$\lambda_t = 0.005 \qquad t = 30, 31, 32, \ldots, 360.$$