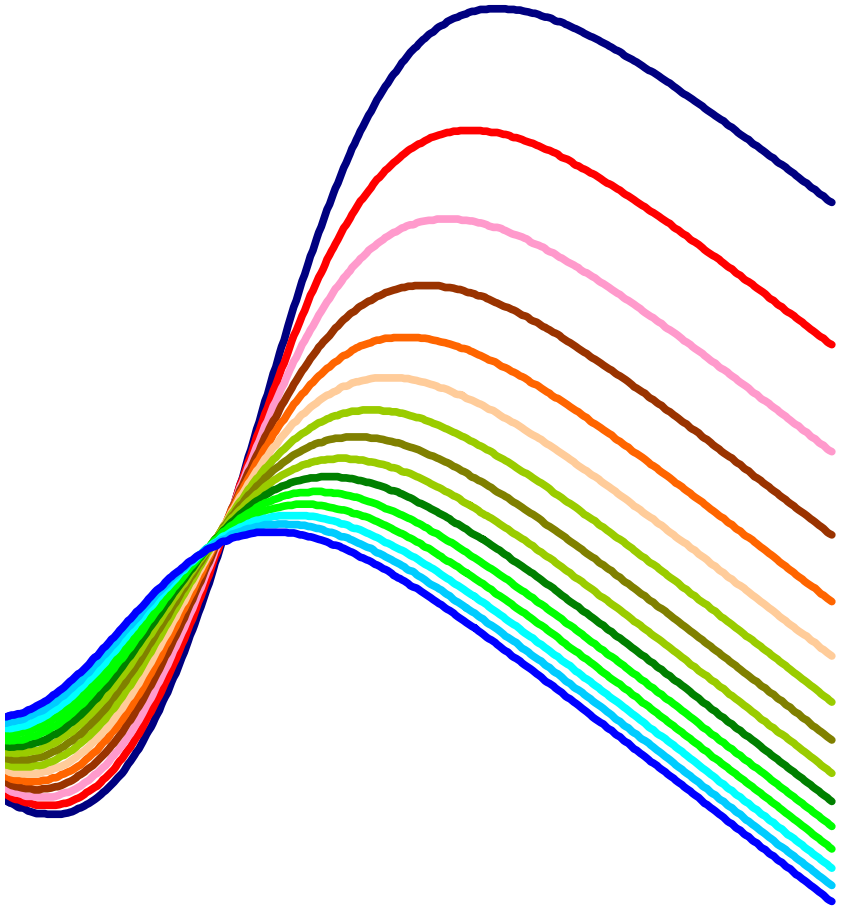

Managing Interest Rate Risk:

ALM, Franchise Value, and Strategy

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Executive Summary

The objective of asset-liability management (ALM) is to measure and manage the degree to which the economic value of an insurer is adversely exposed to changes in interest rates. ALM is therefore a component of Enterprise Risk Management, which considers the impact of changes in other variables as well. As practiced by most insurers, ALM fails to take into account the existence of franchise value – the economic value to the firm of future renewals. Franchise value is not recognized by accounting rules, but can be a significant portion of an insurer's total economic value, which is reflected in its market value.

Incorporating franchise value into ALM is certainly essential, but it also poses a problem. For firms that have substantial franchise value, strategies that limit or minimize economic risk from changes in interest rates can create rating agency or regulatory problems, since these entities view the firm from an accounting point of view. The problem, then, is to identify a strategy that limits a firm's exposure to interest rate risk while simultaneously limiting its exposure to accounting rules that could jeopardize its solvency or its ratings. The solution presented here lies in adopting a pricing strategy that controls the interest rate exposure of future cash flows from new business. This solution substantially extends the analysis first presented in Panning (1994).

Keywords: *Asset liability management, ALM, solvency, franchise value, interest rate risk, hedging, Enterprise Risk Management, ERM, duration, pricing strategy*

1 Introduction

In the property-casualty industry there is a fundamental gulf between what CEO's and CFO's believe they are doing and what they actually are doing in managing their firm's exposure to interest rate risk. They believe that they are managing the value of the firm. What they actually are doing is managing the portion of their firm's value that is visible to them. For many firms – although not all of them – a considerable portion of their firm's value is invisible or only dimly visible to the firm's senior officers, because that value is not included in the accounting numbers upon which they rely. The discipline of Asset Liability Management (ALM) can achieve its stated objective of protecting the value of the firm only if it recognizes this invisible portion of a firm's value, makes it visible to senior management, and helps them to understand how to manage it effectively. Adopting this more sophisticated ALM, which succeeds in accomplishing these objectives, will distinguish successful insurers and reinsurers from unsuccessful ones.[1]

I can demonstrate this thesis with an example from my own experience. More than two decades ago I left the academic world to join a large property-casualty insurer as a quantitative analyst. At that time the CEO was establishing a direct-marketing subsidiary to sell automobile and homeowners insurance as an affiliate of a major national organization. Unfortunately, the business plan numbers – and this was a firm that lives and dies by accounting numbers – were stubbornly inconsistent with the return on equity that the CEO had promised to the board. Although the plan had been revised several times in an attempt to increase forecast returns, in each case the results were worse than before. And time was running short – the new facilities would soon be opening, and the overall plan numbers soon had to be reported to the board.

Because of these tight deadlines, I was assigned to the project, with the expectation that I would be able to speed up the recalculations of projected financial results. This was because I had a "portable" computer (it weighted 25 pounds) and knew how to use a then-new invention called a spreadsheet, which permitted complex business plans to be revised and recalculated quickly. Fortunately, I was assigned to report to the CFO for this new operation, who appreciated the difference between economics, with which I was familiar, and accounting, about which I knew very little. He assigned me to create an economic model of the new business, which his accounting team would then translate into accounting results, in accordance with Generally Accepted Accounting Principles (GAAP). This focus on economic realities ultimately led to a solution of the CEO's problem of insufficient returns on a massive investment.

The economic realities are as follows. Selling an insurance policy by direct marketing, as in this new business venture, costs considerably more than selling that same policy through an agent, who receives a sales commission – so much more, in fact, that the expected profit for the directly-marketed policy is negative. But by selling that first policy at a loss, one obtains a customer who is highly likely to repeatedly renew his or her policy. This resulting series of renewals will be highly profitable, since they will require no marketing costs or agent commissions at all. As a consequence, the loss incurred in the selling the first policy will be more than offset by the future profits from subsequent renewals.

From an economic standpoint, the prospective renewals obtained by selling the initial policy are a valuable asset. In Panning (1994) I call this asset ***franchise value***, a term subsequently utilized by Babbel and Merrill (2005). But accounting rules

[1] This and the next several paragraphs rely heavily on remarks previous published in Panning (2003).

typically do not recognize franchise value,[2] so that this valuable asset and its link to the initial sale are hidden. Instead, the accounting focus was on the overall financial results, which consisted of losses in the early years of the plan and profits later on. To accountants, then, it seemed obvious that the program's return would be increased by reducing sales volume during the loss-producing early years of the plan and increasing sales during the profitable later years of the plan. But implementing this change turned out to simply make matters worse.

By contrast, the newly created economic model demonstrated conclusively that a far better strategy was to grow the business as quickly as possible in the early years, despite the accounting losses, so as to maximize profits from renewals later on. The result was a revised strategic plan that met the CEO's promises to the board. More than two decades later, this economic planning model – now vastly elaborated and improved -- still remains the foundation of strategic planning for that business division.

This experience has several crucial implications for ALM. First, it demonstrates that franchise value is real. Policy renewals have real economic value even though accounting rules refuse to recognize that fact. The existence of such franchise value is typically, although imperfectly, reflected in an insurer's stock price. One American automobile insurer, for example, has some $12 billion in high quality short-term assets, and $9 billion in short-duration liabilities, so that its book-valued surplus of $3 billion is roughly equivalent to the economic value of its current balance sheet. But the stock of this highly profitable and rapidly growing firm is worth $14 billion, or some $2 billion more than its total assets – a remarkable example of franchise value!

[2] An important exception occurs when a firm is sold for more than its book value, in which case the excess is booked by the purchaser as an asset called goodwill.

Second, because franchise value consists of the present value of expected future cash flows from renewal business, it is exposed to interest rate risk. Despite this fact, ALM as typically practiced ignores franchise value and focuses instead on assets and liabilities recognized by accounting rules.

Third, despite its potential importance to many firms, franchise value is typically invisible to the senior executives of most firms, and therefore remains unmeasured, unreported, and consequently unmanaged. Until franchise value is recognized, measured and reported, ALM will remain incomplete because it fails to assist firms in managing this significant but invisible component of their total economic value.

My objective in this paper is to quantify franchise value and demonstrate how it can be effectively managed. Here I extend the results of an earlier paper (Panning, 1994) by quantifying the economic significance of franchise value, measuring its sensitivity to changes in interest rates, demonstrating a significant challenge to the effective management of this interest rate risk, and then showing how firms can solve that problem by adopting an appropriate pricing strategy.[3]

2 A simplified insurance firm

Financial models are indispensable both for creating understanding and for applying that understanding to actual situations. But the models we build for these two purposes differ. For creating understanding, simple models are best. Their transparency enables us to readily appreciate their virtues as well as their flaws. By contrast, the models we build to apply this

[3] The notation and assumptions used here differ slightly from those used in that earlier paper.

understanding to actual situations are necessarily far more complex, for they incorporate many more aspects of reality. For example, one can most easily understand interest rate risk from examples using zero-coupon bonds with annual compounding. But applying that understanding to actual bonds must take into account such inescapable realities as coupons, semi-annual compounding, and a wide variety of other details. In this paper our purpose is understanding rather than application, and so I shall provide a rather simple model that legitimately ignores many realistic but irrelevant complexities of an insurance firm.

The questions I address with this simplified model of an insurance firm are the following:

(a) how significant is franchise value as a component of a firm's overall value?

(b) how sensitive is franchise value to interest rate risk?

(c) what effective strategies can firms use to protect franchise value from interest rate risk?

(d) which of these strategies is best?

This model has the following characteristics:

(a) The firm writes all of its business on January 1 of each year.

(b) It pays all expenses for the year on that same day.

(c) On December 31 of each year it learns the true value of the losses (and associated loss adjustment expenses) on the policies it wrote in January, and it pays those losses that same day. Note that the first and third assumptions imply that accident year, policy year, and calendar year are identical for this company.

(d) The firm's expenses and expected losses are identical every year.

(e) If the firm has made a profit, it immediately dividends that amount to its shareholders. If, by contrast, it has incurred a loss for the year, it immediately raises equity to restore its surplus to the amount it held initially. Consequently, its surplus is identical every year. Since my concern here is ALM rather than solvency, I will ignore the possibility of losses sufficient to make the firm insolvent (a subject treated in a forthcoming paper). Similarly, I will ignore taxes, the fact that loss payments typically occur over multiple years, and the potential costs of raising capital. The model can easily be elaborated to take these realities into account, but doing so here would make the results more realistic and complex without adding insight.

(f) The model assumes, for convenience, that the term structure of interest rates is flat.

(g) The model assumes that all calculations described below occur on January 1, right after the firm has written its new business for the year.

The model incorporates the following notation:

P = the written premiums on policies that the firm writes every year; P can vary yearly;
E = the expenses, ***in dollars***, that the firm pays each year; E is constant;

L = the loss and loss adjustment expenses, ***in dollars***, that the firm expects to pay each year; it is constant;

y = the risk-free interest rate, applicable to calculating the income from the firm's assets and for discounting the firm's future cash flows; default risk is considered in a separate forthcoming paper;

S = the firm's surplus, which is the same every year (due to dividends and recapitalization);

k = the firm's target return on surplus;

cr = client retention, the percentage of clients who renew their policies from one year to the next;[4]

F = the firm's franchise value, the present value of cash flows from future renewals;

C = the firm's current economic value, the present value of surplus and business already written.

The untaxed net income for this simplified firm is

$$P - L - E + (S + P - E)*y = k*S.$$

The first three terms reflect underwriting income, and the remaining terms represent the fact that interest income is earned during the year on the firm's assets, which consist of surplus and premiums less expenses, which are paid immediately when premiums are written. Although expected losses and expenses are constant from year to year, the firm varies its premiums from year to year (if necessary) so as to achieve a target dollar return on surplus, represented by $k*S$, where k is the target percentage rate of return. The fact that premiums can vary plays an important role in our analysis of the firm's exposure to interest rate risk.

The firm will achieve its target return on surplus by setting the premiums it charges to

$$P = [S*(k-y) + L]/(1+y) + E.$$

3 The value of the firm

The firm's ***current economic value***, C, the economic value of its current balance sheet on January 1, is the value of its current assets, consisting of surplus plus premiums less expenses, less the discounted value of its expected losses. If $S = 50$, $L = 75$, $E = 25$, and $y = 5\%$, the premium required to achieve an expected year-end return on surplus of $k = 15\%$ is 101.19. Then C, the current value of the firm is

$$S+P-E-L/(1+y),$$

which equals 54.76. (This representation ignores a number of issues concerning risk premiums, which are important but more appropriately treated on another occasion.)

[4] My intention here is to focus on franchise value and its implications for managing interest rate risk. I explicitly contrast franchise value, which is the present value of future renewals, from the firm's current economic value, consisting of the economically adjusted values on its current balance sheet, as defined by accounting rules. I refer to the combination of current economic value and franchise value as the firm's total economic value. This is slightly misleading, however, since the firm's total economic value, as imperfectly represented by its market value, includes a third component that consists of the present value of its growth prospects. This third component is in fact recognized in Panning (1994), and in a forthcoming paper on Enterprise Risk Management. But demonstrating the conclusions presented here did not require that growth prospects be explicitly considered as well. Introducing them here would have added complexity at the potential expense of clarity. This footnote is simply a warning that the model presented here may need some elaboration if applied to a firm that is growing rapidly.

Now suppose that we calculate the firm's ***franchise value***, *F*, the present value of cash flows from its future renewals, taking into account both the time value of money and the firm's client retention rate *cr*. If interest rates and the target return on surplus remain unchanged, then the values of *P*, *L*, and *E* in a given year will be followed by the values *P*cr*, *L*cr*, and *E*cr* in the subsequent year. So to find the present values of these cash flows we must take customer retention into account as well as the time value of money. To do this we create a multiplier $d = cr/(1+y)$. Provided that interest rates remain unchanged, the present value of future premiums equals $P*(d+d^2+ \ldots + d^n)$.

As $n \rightarrow \infty$, the present value of future premiums converges to $P*d/(1-d)$, or, equivalently, $P*cr/(1+y-cr)$. Note that when $cr = 1$, this is identical to the formula for the present value of a perpetuity. Similarly, the present value of future expenses associated with retained business is $E*d/(1-d)$. Losses are paid a year later than premiums and expenses, so their present value is $[L*d/(1-d)]/(1+y)$. These three components of future renewals can be combined to give the firm's franchise value as

$$F = [P-E-L/(1+y)]*d/(1-d).$$

For the parameter values given above, and with a client retention $cr = 90\%$, the firm's franchise value *F* is 28.57. If we add franchise value to the firm's current economic value we obtain the ***total economic value*** of the firm, 83.33. Here and throughout, we consider this to be identical to the firm's ***total market value*** or ***market capitalization*** provided that it is publicly traded. If this firm's stock price fully reflected its total market value, then its ratio of market value to (economically adjusted) book value would be approximately 1.5. As one would expect, this ratio is sensitive to several underlying assumptions. Figure 1 shows how the market-to-book ratio varies with client retention, with all other variables kept constant. Note that t high retention levels the ratio climbs rapidly.

Figure 1: Effect of Client Retention on a Firm's Market-to-Book Ratio

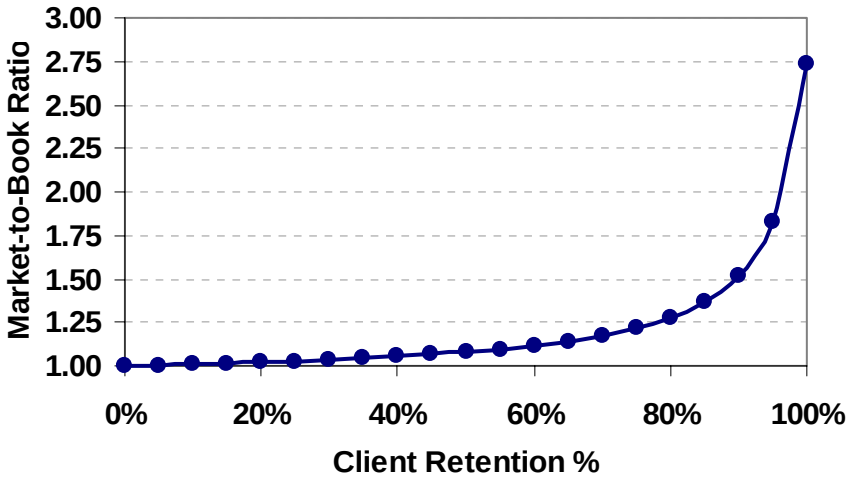


Figure 2: The Effect of Client Retention on Franchise Value

Another way to view the potential importance of franchise value is to illustrate it as a percent of the firm's total market value, $F + C$, as in Figure 2. Note that when client retention is 80% or greater, franchise value comprises a significant percentage (20% or more) of the firm's total market value.

The numbers shown in Figures 1 and 2 are illustrative, since they assume that variables other than client retention remain constant. In fact, as we shall see, franchise value is significantly affected by the level of interest rates, by the firm's target return on surplus, and, most important, by its pricing strategy.

4 The interest rate sensitivity of franchise value

We have now established that franchise value is significant, and that at high levels of client retention it can comprise a considerable percentage of a firm's total economic value. Next we demonstrate that franchise value is sensitive to interest rate risk, by calculating the duration of the firm's franchise value. However, because the premium component of a firm's franchise value depends on the firm's pricing policy, which in turn can depend on the level of interest rates, we must first describe how the firm's target return on surplus, k, is determined.

The firm modeled here sets its premiums so that its expected net income equals $k*S$, where k is the firm's target return on surplus. The model assumes that the firm has rationally chosen its surplus amount S, and prices its business according to a fixed rule. The return on surplus k may be fixed or may depend on current interest rates. Here we assume that $k = a + b*y$, where a and b are constants for a given firm but may differ from one firm to another, and y is the spot interest rate corresponding to the maturity of the firm's liabilities (in this case one year). If $b = 0$, then the target dollar return on surplus is simply $a*S$, where a is some constant percentage. For example, a number of CEOs simply set their target return on surplus at 15%. Their policy can be represented by setting $b = 0$ and $a = 15\%$.

Setting a fixed target return can be problematic, however, since interest rates may rise to exceed that level (as they briefly did in the early 1980's). A more pragmatic pricing policy may therefore be to set the target return as a risk-free rate of interest plus some risk premium, so that $b = 1$ and a is the risk premium, say, 10%, so that with y = 5% the target return on surplus is again 15%.

The point of representing the firm's pricing policy in this way is that the premiums it charges may not be fixed but may instead, with pricing policies where $b \neq 0$, vary with the level of interest rates. This relationship must be specified so that it can be taken into account when we calculate the duration of the firm's franchise value. Note that the values of the parameters a and b are behavioral assumptions intended to reflect what the firm actually does, and not necessarily what it professes to do (since these may differ materially).

Given this specification of k, the firm's target return on surplus, we can now restate the value of the firm's franchise value, as follows:

$$F = \frac{cr * S * (a + (b-1) * y)}{(1+y) * (1+y-cr)}.$$

Note that for combinations of a and b that give a target return on surplus of 15%, this equation produces the same franchise value as that given earlier.

By definition, the *duration* of F with respect to changes in interest rates is $D = -1*(dF/dy)/F$, which is the negative of the first derivative of F with respect to y, as a percentage of the current

value of F. A series of tedious calculations produces the following result:

$$D = \frac{a - b + 1}{(1+y)*(a+by-y)} + \frac{1}{1+y-cr}.$$

For the parameters P, E, L, and S used earlier, and for a = 15% and b = 0, D = 17.6.

To see why the duration of franchise value is so high, it is helpful to see the components from which it is calculated, as shown in Table 1. The dollar duration of franchise value is the product of premium present value and its duration, less the comparable products for losses and expenses, which is equal to 607.14*7.85 - 428.57*7.62 – 150.00*6.67, or 503.40. Finally, the duration of franchise value is equal to its dollar duration divided by its present value, or 17.62. (The key here is to first calculate the PV and Dollar Duration of the total, and to divide the latter by the former to obtain the Duration of the total.)

Table 1: PV and Duration of Franchise Value

	Annual Value	Present Value (PV)	Duration (D)	Dollar Duration (PV*D)
Premiums	101.19	607.14	7.85	4,768.71
Losses	-75.00	-428.57	7.62	-3,265.31
Expenses	-25.00	-150.00	6.67	-1,000.00
Total		**28.57**	**17.62**	**503.40**

We see from these calculations that the duration of future premiums is significantly higher than the duration of losses and expenses. How is this possible when we know that premiums and expenses are received and paid simultaneously, at the beginning of each year, and losses are paid a year later?

The explanation for this is that premium cash flows are interest-sensitive. When interest rates rise, premium cash flows become smaller due to the particular pricing policy we have assumed in our example (where the target return on surplus is a constant 15%). When premiums are interest-sensitive, a rise in interest rates has a double impact. Not only does the present value of each dollar of future premiums decline, but the number of dollars of future premiums also declines. ***The first of these two effects is unavoidable when interest rates change. But the magnitude of the second effect can be changed by adopting a different pricing strategy.*** As we shall see, this last point is crucial for effectively managing the interest rate risk attributable to a firm's franchise value.

5 Managing the interest rate risk of franchise value

A principal goal of ALM is to measure and manage the sensitivity of a firm's total economic value to changes in interest rates. To continue the example used here, let us assume that the modeled firm has invested its current assets, consisting of surplus plus written premiums less expenses, in a portfolio with a duration of one year. Its liabilities also have a maturity of one year and a duration just less than one year. Consequently, the duration of its current economic value (54.76) is one year.

But taking its franchise value of 28.57 into account means that the firm's total economic value is 83.33, or 52% larger than its current economic value, and this additional component has a duration of

17.62. The firm's total economic value therefore has a duration of (54.76*1+28.57*17.62)/83.33, or 6.70.

Suppose that the firm believes that this duration of its total economic value is too large. How can it go about reducing that duration? One way, the traditional approach, would be to reduce the duration of its invested assets. This could be done either by changing the composition of the firm's investment portfolio, or by purchasing derivative securities that modify the firm's asset duration. Let's suppose that our example firm chooses the first alternative, and reduces the duration of its invested assets to zero. This would reduce the duration of its total economic value to 5.18, which the firm may still consider unacceptably high. If the firm had a higher client retention percentage, 95% rather than the 90% assumed here, the problem would be even greater. Franchise value would comprise an even greater portion of its total economic value, and reducing the duration of its invested assets to zero would reduce the duration of its total economic value from an initial 10.03 to 8.76, a value that many executives would still regard as too high.

These results present a practical dilemma that has two aspects. First, the greater the franchise value of a firm, the more difficult it is for that firm to manage the interest rate risk of its total economic value by reducing the duration of its investment portfolio. A firm with significant franchise value would have to reduce the duration of its invested assets to zero or even below zero, which is infeasible in practice although possible in principle. Second, a further problem with such a strategy is that the potential benefits of implementing it would be totally invisible to regulatory authorities and rating agencies, who see only the accounting numbers of a firm. Indeed, given their information, regulators and rating agencies might well see actions intended to protect total economic value as increasing a firm's risk rather than reducing it, or, even worse, as jeopardizing the firm's solvency and financial ratings. The key fact here is that managing the interest rate risk of franchise value and total economic value can be quite problematic if the rationale for doing so remains invisible to rating agencies and regulatory authorities.[5]

6 Using pricing strategy to manage total economic value

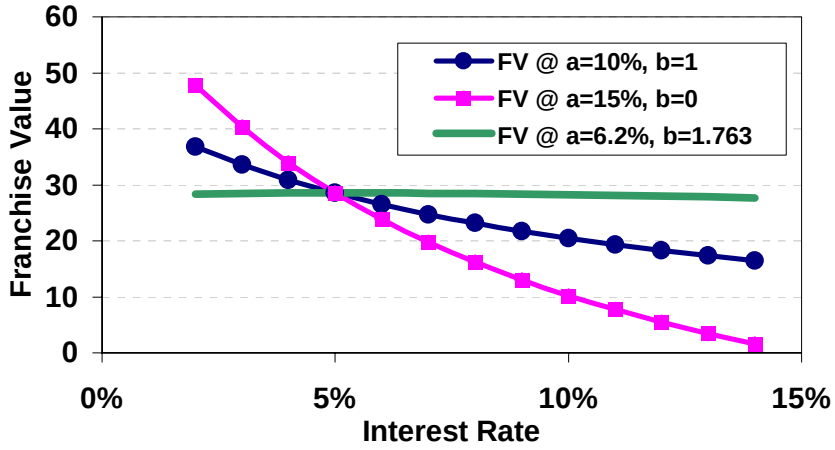
Fortunately, there is a solution to the dilemma just posed. It consists in adopting a pricing strategy that substantially alters the sensitivity of a firm's total economic value to changes in interest rates. In the example give earlier, where $a = 15\%$ and $b = 0$, the duration of the firm's franchise value and total economic value are 17.62 and 6.70, respectively. But suppose we alter the firm's pricing policy by changing these parameters to $a = 10\%$ and $b = 1$. In this case the target return on surplus remains at 15% (given that the risk-free yield remains at 5%), but the durations change from 17.62 to 7.62 for franchise value, and from 6.70 to 3.27 for total economic value. The key insight here is that **a firm's pricing strategy can significantly affect the duration of its franchise value and, consequently, the duration of its total economic value.**

This insight suggests a more systematic approach to managing the duration of total economic value: find a combination of the strategy parameters a and b such that the return on surplus and the duration of total economic value are both acceptable. This can be

[5] This problem could in fact be avoided if the information that regulators require was more thorough, more consistent, and more focused on economic values. The reality is that statutory information is woefully incomplete and incredibly inconsistent, so that one cannot reliably reconstruct even the simplest relationships between an insurer's income statement, balance sheet, and cash flow statement.

done either by systematic numerical search or by constrained optimization procedures. For example, if the firm in our example wanted a target return on equity of 15% but a total economic value with a duration of zero, it should implement a pricing strategy with the parameters a = 6.2% and b = 1.763 to achieve those objectives. The consequences of this and the two previously mentioned pricing strategies are shown in Figure 3 for the three different pricing strategies just described.

Figure 3: Effect of Interest Rates and Pricing Strategy on Franchise Value



Managing the duration of total economic value by choosing appropriate pricing policies has limitations as well as advantages. An important limitation is that any desired combination of a target return on surplus and target duration of total economic value can rigidly be maintained only for a rather narrow range of interest rates. Large changes in interest rates will necessarily disrupt the combination initially established. But this same limitation is virtually ubiquitous in ALM due to the nonlinearity of prices relative to interest rates. For example, the duration of a bond portfolio will change as interest rates change. In managing franchise value as in managing bond portfolios, achieving very ambitious ALM goals requires more complex strategies than the relatively simple duration management strategies considered here.

But despite this limitation, the strategy identified and evaluated here has a very important virtue: it avoids the potential rating agency and regulatory risk associated with strategies that focus on managing the duration of the firm's invested assets as a means of managing the risk to its franchise value and total economic value. This key advantage results from the fact that implementing a pricing strategy is nearly as invisible to these external audiences as the franchise value it is intended to protect.

A key problem here is that financial service firms are not very transparent to outsiders such as rating agencies, stock analysts, and regulators, who tend to rely heavily upon rules of thumb and sometimes innocent but, in their view, alarming details of the almost idiosyncratic data available to them through statutory reports. I vividly recall a meeting with state regulators where I was grilled at length about a single municipal bond that had been downgraded to junk status. This bond in fact comprised about 0.1% of the total bond portfolio, but was treated as if it were somehow crucial to the firm's solvency. Under the circumstances I simply promised that we would sell that bond and reinvest the proceeds in an investment-grade security. Making that commitment totally changed the atmosphere of the meeting, which proceeded absolutely smoothly from then on. Nonetheless, I was disturbed by the fact that none of the crucial questions for which I had prepared thorough answers was asked. I left that meeting wondering whether some of our competitors might in fact be taking actions that could jeopardize their solvency -- thus exposing our firm to potential guarantee fund assessments -- but nonetheless be undetected by regulators.

7 Conclusion

It has long been recognized that a firm's exposure to interest rate risk depends on the assets and liabilities on its balance sheet and the volatility of interest rates. In this paper I have attempted to broaden our understanding of interest rate risk and of asset-liability management by providing two additional insights. The first is that relying on traditional accounting rules to identify a firm's economic assets and liabilities can blind us to the importance of franchise value, the present value of an insurer's future renewals. Here I have demonstrated the importance of franchise value by showing that it is an essential factor in the direct marketing of personal lines insurance, and by quantifying its economic value for plausible combinations of parameters. I also quantified the sensitivity of franchise value and of total economic value to changes in interest rates and identified some of the potential difficulties in attempting to protect franchise value by changing the duration of invested assets.

Conventional understanding also recognizes that the way to manage a firm's exposure to interest rate risk is to select or alter the composition of its assets and liabilities. Here I have provided a second new insight, namely, that the firm's exposure to interest rate risk can also depend on a third variable, the pricing strategy adopted by the firm. An appropriately chosen pricing strategy can avoid the potential difficulties in protecting franchise value, and can likewise be flexible in achieving a targeted duration and a targeted return on surplus. Although pricing strategy has its limitations as a tool for asset-liability management, these limitations arise from pricing nonlinearities that likewise afflict the more conventional methods typically employed. In an earlier paper (Panning, 1999) I demonstrated that the risk of an equity portfolio can be substantially altered by the use of an appropriate dynamic investment strategy. The second insight presented here is a generalization of that conclusion to the potential use of a dynamic pricing strategy to manage the interest rate risk of a firm's franchise value.

My hope is that these two insights will enable insurers to recognize, quantify, and begin to manage an important but invisible asset – franchise value. Franchise value comprises a potentially significant portion of a firm's total economic value and, if the firm is publicly traded, its market valuation. But managers can manage only what is visible to them. I hope that this analysis will make franchise value more visible and ultimately enable insurers to manage what is now invisible.

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