

RECORD OF SOCIETY OF ACTUARIES 1995 VOL. 21 NO. 2

USING EQUITIES FOR LONG-TERM LIABILITIES

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Recorder: CINDY L. FORBES

Panelists will discuss the following topics: rates, pricing implications, derivatives, valuations and cash-flow testing, and risk-based capital (RBC) implications.

MS. CINDY L. FORBES: We're addressing the issue of whether equities are an attractive asset class to support long-term liabilities. We're fortunate to have three excellent speakers. Our first speaker, Mr. Yuan Chang, will discuss the attractiveness of equities from an economic point of view. Yuan is currently the vice president responsible for Met Life's Multiple Employer Foundation and Trust Investment Management. He is a lawyer as well as an actuary and currently serves on the Society of Actuaries' Board of Governors. Next, Mr. Frank Sabatini will discuss the practical difficulties and disadvantages of equities as an asset class in the U.S. regulatory environment. Frank is a partner with Ernst & Young and is director of its Asset/Liability Management Practice. Prior to joining Ernst & Young he was chief executive officer (CEO) and vice president of Connecticut Mutual's Pension Operations. Finally, Mr. Simon Curtis from Manulife Financial will discuss using equities in the Canadian environment from economic and regulatory points of view. Simon is financial vice president of the U.S. Operations and is an active member of the Canadian Institute of Actuaries Investment Practice Committee. He has been a major contributor to a number of the Canadian Institute of Actuaries Investment Practice guidelines. And now, our first speaker, Mr. Yuan Chang.

MR. YUAN CHANG: I want to tell you about why I think equity is definitely an attractive class of asset. Very recently Professor Siegel wrote a book called *Stocks For The Long Run: A Guide to Selecting Markets for Long-Term Growth* [Jeremy J. Siegel, Irwin Professional Publishing, Burr Ridge, IL: 1994]. A few days ago *The Wall Street Journal* had an article referring to this book. The book made the point that over the long run, equities could be expected to return 10%. Professor Siegel studied returns back to 1802 and discovered that the only distortion occurred during the Civil War. His point was that history seems to be a fairly reliable guide as far as the stock market is concerned. Well, 10% or not, it's still an attractive asset class.

However, let's first talk about why fixed income is attractive to us. Why are we so enamored with fixed-income assets? What will you say if you ever get called before the Board and asked, "Look at those pension funds, and those endowments, they all have 60% or more equities. Why don't we have many equities?" What will you say? Some endowments actually go up to 80%. If you look at insurance companies, you will find that very few ever get up to 5%. Why is the industry so enamored with fixed income? Well, I think the answer you might give to your Board is, first of all, we have mostly fixed-income liabilities. Fixed-income assets are, therefore, the appropriate asset to back our liabilities.

Now that's always been a good argument and it still sounds very good. If you had a new baby or a new grandchild, and you wanted to put away some money for his or her eventual education, in what would you invest? Let's assume you believe it will cost \$200,000 in 20 years to pay the child's education expenses. It might take an investment of \$50,000 today in a 20-year zero coupon bond to reach your objective. You could save a large sum by investing a little over \$30,000 in equities. Which investment will you make? I don't think we ought to go through all the mathematics. The point is that hardly anyone would be thinking about just investing in fixed income.

I think also a number of things have changed from the past. One of the answers you might have given to your Board is that the law says that we cannot have more than 20% of our assets invested in equities. Of course, none of us is anywhere close to 20%. The real issue is probably an accounting one. That is, we are concerned about the fluctuations in both income and surplus. If you're in assets, which tend to fluctuate more, it's possible that we won't see the steady state in income and surplus that we enjoy seeing. But to some extent that is really just an appearance. Granted there are laws which say that if your assets fall below your liabilities, you're insolvent, but I think with any practical limit on equities, you would never get to that point, but you will see a great deal more fluctuation. The question then is whether avoiding fluctuation is more important than enhancing economic value. The ultimate risk after all for the insurance company is not being able to discharge the liability when that last dollar is due. That does not require all the accounting steadiness in between. I think all of us are under much more pressure for profit. In the old days you could just go ahead and make an investment that returned a little more than what you were crediting and take the spread. Many of us today still believe that we are in the spread business. Risk should be defined not as the standard deviation around the mean but as the downside deviation. Higher profits or returns reduce the level of risk. Therefore, the pursuit of profit through an investment margin is an integral part of minimizing the risk of the pursuit. Now I'd like to suggest that we have to make a paradigm shift from first controlling risk and then looking for profit, to looking for profit first and then trying to control risk. The current state is to control risk and then maximize value. The alternative is to maximize value and then control the risk.

Now we come to equity as a performance asset class. Chart 1 shows equity and Treasury bond returns over rolling 30-year investment periods. The equity performance over any 30-year holding period is relatively steady, although you see a slight downward movement. The 30-year Treasury return is also fairly steady but substantially less than the equity return.

Chart 2 shows equity and Treasury returns over 15-year holding periods in comparison to 30-year holding period returns. Again equities outperform Treasuries for all periods, but the volatility of equity returns is starting to show. Another way of looking at it is the probability of stocks underperforming Treasuries.

As you can see from Chart 3, it's a matter of holding periods. At zero, you have 35% probability of underperforming Treasuries. But as you see, the probability drops to about 3% or 4% for a 20-year holding period and as your holding period extends to 25 or 30 years, it approaches zero.

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CHART 1 TREASURIES VS. EQUITIES

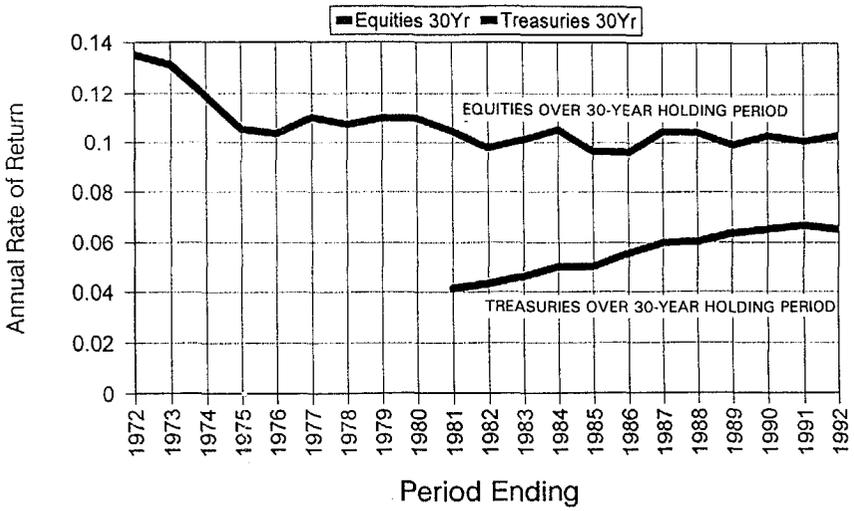


CHART 2 TREASURIES VS. EQUITIES

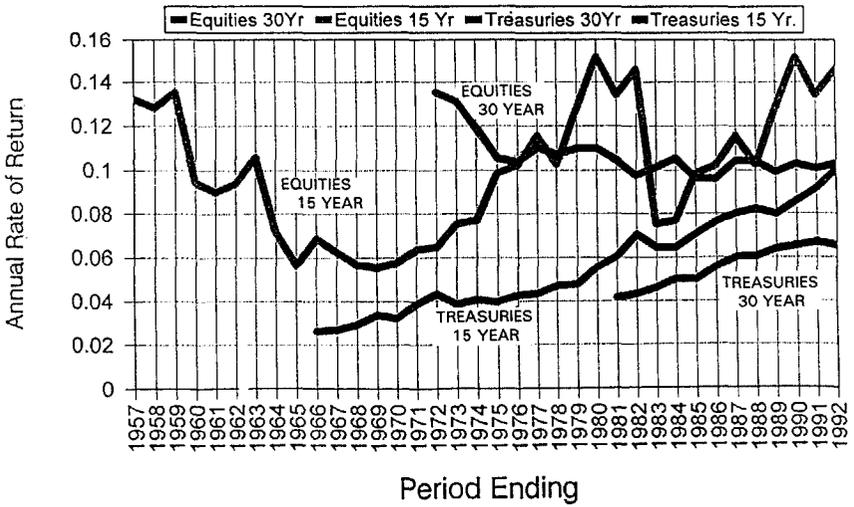
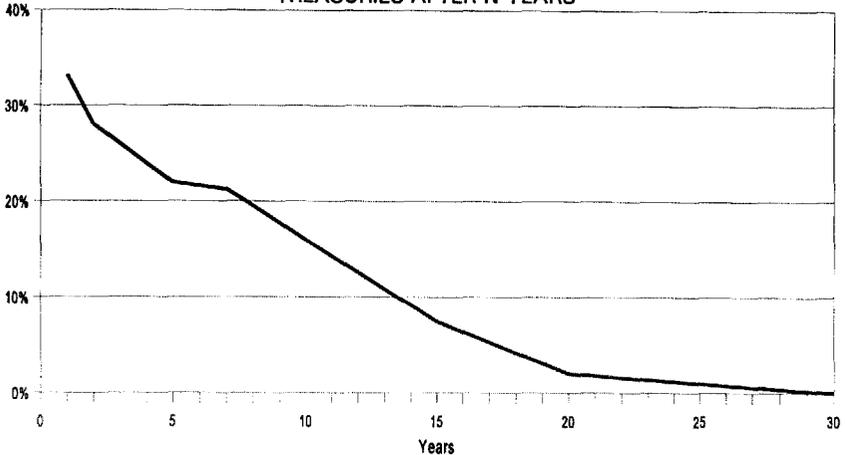


CHART 3
 PROBABILITY OF STOCKS UNDERPERFORMING
 TREASURIES AFTER N YEARS



There's another reason we have not been venturesome in looking at assets other than fixed income. I think a good part of it is our early adoption of duration matching. I think most of us, in our investment process, are still using duration matching to a large extent. I don't think duration matching itself, even though the purpose is to remove interest rate risk, is doing the kind of job you think it is doing. For one thing there's a good deal of movement in yield curves. You'll never find a parallel shift in the first place, which is a required condition for duration matching to eliminate interest rate risk.

Second, you have a great deal of convexity risk in your assets. It may be because you can't find enough assets with convexities similar to your liabilities. Be that as it may, it's in there. It doesn't quite protect your surplus. You may find, if you look carefully, that there is hidden convexity in your liabilities as well. When rates move beyond 2% or 3% at any point in time, you begin to see the impact of liability convexity. Look at single-premium deferred annuities (SPDAs). There is not a six- or seven-year duration. Depending on customer behavior, it could be a one-year duration liability. For that type of liability you have to question how good a duration-matching investment process is. At the same time, duration-matching makes us vulnerable to spread squeeze. As financial markets get more efficient, spreads are going to get thinner and thinner. Doing a pure spread business is going to be tough going forward.

Let me run very quickly through a concept that I call the "just-in-time match," but remember that the ultimate risk is to be able to discharge the last dollar. My definition of "just-in-time-matching" is: a process that guarantees the discharge of nearby liabilities for a specific time period, and through a second process enables the extension of the time period for which the discharge of liabilities is guaranteed. So, if you are duration-matched for ten years, and you also know that for the next ten years you can always reproduce ten-year matching, then in fact you are matched for 20 years. The idea then is to cash match for a very short period of time (because you need that to pay claims or expenses) and then duration match for the next period of time. The duration-matching process goes on

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infinitely today, and I'm suggesting that we curtail the matching and then take the rest into free assets. The investment of these free assets would then be governed under efficient frontier concepts, now that is not in itself enough. There needs to be a bridge between the duration-matched period and the liabilities supported by the free assets because you need to ensure that you can always move into fixed income in order to affect an overall duration match. This may require restricting certain types of assets. And, if you go back to my original definition of "just-in-time matching," you must be able to extend the period the liability payments are guaranteed over and over.

MR. FRANCIS P. SABATINI: Yuan had the fun part. I've tried to make what I have to say as interesting as possible, and I promise to spend as little time as possible on accounting. The bottom line is that current statutory and GAAP accounting treatment for equities makes them unattractive investments despite their long-term returns and their potential use in supporting long-term liabilities. Both statutory and GAAP treatment require mark to market on the balance sheet, with any change in value recognized in surplus for statutory statements and in income and equity for GAAP statements. This assumes you're holding your common stocks in a *FAS 115* trading account.

For companies holding material equity positions, the year-to-year return volatility could have a dramatic impact on statutory surplus and GAAP income and equity. Most life companies today hold relatively small amounts of equities, if any at all, primarily because of the potential impact on surplus.

The 1987 market crash led to fairly dramatic reductions in most company positions. You all remember when the rating agencies were running around comparing equity positions to surplus. A company with 10% of assets invested in equities and a 10% capital position would only need a 10% decline in equity values to produce a 10% decline in capital. Think about it. Last year, depending on what kind of equities you held, you likely experienced a negative return and would have experienced a negative hit to statutory surplus if you held a substantial position. So the exposure to surplus fluctuation for material holdings of equities has and continues to prohibit their use. Rating agency views on equities have and will continue to reinforce the reluctance to invest in them.

Current statutory capital requirements as defined by RBC or the rating agencies make equities difficult to justify, even on a return basis (Table 1). Equities continue to be avoided because of return volatility and the introduction of RBC, and rating agency requirements only reinforce that view. The return required to fund the 250% of company action level RBC, assuming a 15% after-tax cost capital, and an 8% return-on-invested capital exceeds 11%. When compared to historical equity returns which are in the 12–16% range, a capital-adjusted return of less than 5% is the result.

By comparison a National Association of Insurance Commissioner (NAIC) two-rated bond yielding 7.8% has a 38-basis-point capital requirement and a capital-adjusted return in excess of 7.4%. Ignoring the return volatility issues, current RBC requirements make equities terribly unattractive on a capital-adjusted return basis. Even if you use a lower capital requirement, say 200% RBC, and a lower cost of capital, say 12%, the capital-adjusted return for equity still doesn't come close to bonds.

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TABLE 1
CAPITAL CONSTRAINTS*

	NAIC 2 Bonds	Equities
RBC Factor	1.00%	30.00%
Return to fund 250% RBC capital requirement, assuming 15% cost of capital	0.38%	11.31%

*Historical long-term equity returns of 14–16% not sufficient to justify cost of capital.

Is there an alternative? Equity-linked notes are an alternative (Table 2). I've illustrated two-note structures here. The first receives a 4.25% coupon-protected rate which is recognized as income on a statutory and GAAP basis. At maturity the note returns par plus an index payment equal to 50% of the percentage change in the S&P 500 Index, over the period, times par. The zero-coupon structure provides no current income but a greater market upside. I've shown a 300% index payment at maturity. Note that it doesn't return 300% but three times the increase in the S&P 500 Index over the term of the note. Both structures guarantee principal and both have ten-year terms. That's probably as long a term as you'll see in the structured note market today, although I believe Wall Street is working on producing even longer term structures. More typically you'll see five-year structures. Let's assume a 10% annualized return for the equity markets over a ten-year holding period, which is the maturity of these notes. The coupon-protected note would return 9.4% assuming the coupons are reinvested within the note, which isn't an entirely fair assumption. The zero-coupon note would return slightly in excess of 11%. This is a fairly attractive return today, relative to the yields that you could capture on ten-year investment grade bonds.

TABLE 2
EQUITY-LINKED NOTE—AN ALTERNATIVE?

	Coupon Protected	Zero Coupon
Maturity	10 years	10 Years
Coupon	4.25%	0.00%
Index	S&P 500	S&P 500
Index Payment	50%	300%
Principal Guarantee	Yes	Yes

The question is, do we know whether or not equities over a ten-year holding period will produce a 10% annual return? Ten-year holding period returns for equities have exceeded 10% on average. Since 1960, ten-year returns exceeded 10% in 19 out of the 34 calendar-year periods and 7% in 25 of the 34 periods. The lowest return was slightly higher than 1% in the 1965–74 period. So this suggests that a positive return should be expected but there is some return volatility. In addition, the major point is that the return expectation is probably higher than current coupon bonds. Now, buying a single note is clearly a bet on equity market performance. There are two issues. First the actual date you buy the note has consequences since you could be buying it when the market is high relative to where it will be at maturity. Also, buying one note locks the purchaser into a single ten-year period, which may provide a sub-par return. This leads you to conclude that routine purchases throughout market cycles would increase the likelihood that historical performance would

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be realized. The expected additional return needs to be assessed in any case versus the risk profile for the equity markets and compared to the risk profile for traditional bond investments.

Equity-linked notes are treated like bonds for accounting and RBC purposes. The guarantee of principal is a driving force in determining accounting treatment. It should be noted that the accounting treatment for the zero-coupon note is still somewhat gray and unclear. There is no risk to surplus from equity market performance on a year-to-year basis, and the cost of capital is not an issue, since these notes are usually highly rated receiving NAIC One treatment. Hence, the absence of equity market year-to-year return volatility and concurrent removal of potential surplus hits, plus the lack of capital constraints makes equity-linked notes attractive. Basically these structures remove some of the long-standing objections insurance companies have had to equities. These notes, however, still present a couple of problems.

First of all, for companies needing current income these notes do not pay comparable bond type coupons. In my example the annual coupon is 4.25% for the coupon-protected note while the zero-coupon structure pays no current income. From a cash flow and accounting perspective, the note appreciation is not realized until maturity. Meanwhile, you have liability interest costs that are incurred each year without any offsetting investment return. Hence, the deferral of income on the note, and equities in general, presents an income timing problem that a company may not be willing to accept. The return volatility also presents pricing issues. Notably, what returns should be assumed? It's not an impossible problem but one that must be dealt with. When considering straight equities or equity-linked notes, let's remember that the notes or equities would be used in conjunction with traditional investments. The return uncertainty and income deferral issues should be viewed in that context. I don't think Yuan was suggesting that you put 100% in equities. The cost of capital for equity-linked notes is only 11 basis points, the same as a NAIC One bond.

In summary, equity-linked notes appear to present a possible alternative to straight equities; surplus impacts and cost of capital are not a problem; deferral of income is an issue that each company must consider; historical equity returns suggest a capital-adjusted return advantage along with return volatility. These notes tend to have maturities, even at ten years, that are shorter than needed to support long-term liabilities such as immediate annuities and structured settlements. Finally, routine purchases are needed to overcome some of the year-to-year return volatility, even if you're holding over ten-year periods.

As a last point I did want to touch on asset adequacy considerations. The bottom line here is the minute you introduce equities, you complicate your life. For every interest rate scenario, in theory, you should have a correlated equity scenario and our software models today just can't handle that. You also must worry about dividends being reinvested. It would be a lot easier to model equity-linked notes, but even then you'd need correlated equity scenarios. So the bottom line is, until the accounting and RBC treatment changes, equities are terribly unattractive and depending on your intestinal fortitude and your appetite for risk, equity-linked notes might provide a good alternative.

MR. SIMON R. CURTIS: I'll tell you my three main points up front. The first is that, similar to the U.S. situation, if you look at Canadian yield histories over long holding periods, there's a substantial yield pickup to holding stocks with very limited probability of that return going below bonds. The second thing you'll see is that the yield pick up is less than in the U.S. market. Conversely, the third point I'll make, and this is perhaps the most interesting, is that the regulatory treatment in Canada is much kinder to equity holdings than in the U.S. In fact, when you factor in the various capital and reserve requirements, stocks actually are an asset class that are worth holding on a capital-adjusted basis.

Table 3 shows numbers that you've seen for the U.S. in the previous slides, but I also factored in the Canadian yields. What I've shown here is the equity pick up over Treasury bill yields. I didn't just go straight to the pure stock yields because obviously what you're interested in is the difference between a fixed-interest asset and the equity asset. You can see that over the two holding periods I've chosen here, which were all 20- or 10-year periods since 1950, you pick up an excess return in the Canadian market that's close to 3%. The Canadian numbers work out nicely so that the excess return is rather independent of the holding period. The U.S. number looks funny with higher excess returns for ten-year holding periods, but this is just because I chose intervals since 1950. Thus, numbers in the ten-year holding period have more weight given to recent-year returns. You can see that the actual gross equity yields are quite similar between Canada and the U.S. The reason the excess yield is lower in Canada is because fixed-interest yields are higher. This is due to a whole host of reasons including higher inflation in Canada and generally the need to have higher fixed-interest yields compared to the U.S. to attract capital.

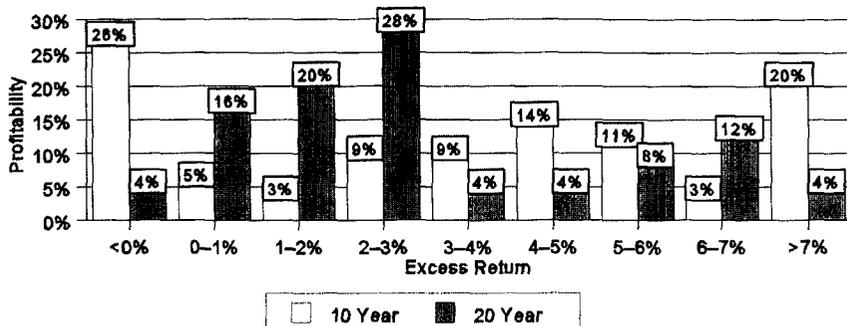
TABLE 3
AVERAGE ANNUALIZED RETURNS SINCE 1950

	Canada	U.S.
20-Year Periods		
Common Stocks	9.96	9.47
T-Bills	7.03	5.71
Excess Stock Return	2.93	3.76
10-Year Periods		
Common Stocks	10.54	10.97
T-Bills	7.12	5.65
Excess Stock Return	3.42	5.32

Chart 4 shows the dispersion of the excess returns of the 10- and 20-year holding periods. The dark bars show the 20-year holding periods and the light bars show the ten-year holding periods. You can see that in Canada over a ten-year holding period, over 20% of the time you're not going to outperform by holding short-term treasury notes. However, over a 20-year holding period, that number decreases to 4%. Similarly, at the other end of the scale, you can see that over shorter holding periods, you have a much more substantial chance of getting very big returns. As you go to the longer holding periods, the good thing is that your results get less dispersed and you can see that your excess returns are much more consistently in the 0-4% range. This builds on a theme that, if you're looking at using equities, they are a long holding period asset class.

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CHART 4
DISTRIBUTION OF ANNUALIZED EXCESS RETURNS—CANADA



U.S. results are shown in Chart 5. You can see that when you're looking at 10-year holding periods (light bars) versus the 20-year holding periods (dark bars), you get a nice confluence of expected excess returns with limited volatility in the 2-4% range over the 20-year holding periods. But if you're looking at ten-year holding periods, you can see that you wouldn't have that much confidence at all that you're going to be able to outperform holding Treasury bills. You see in the U.S., over the ten-year holding periods, the probability of underperforming Treasury bills is 20%.

CHART 5
DISTRIBUTION OF ANNUALIZED EXCESS RETURNS—U.S.A.

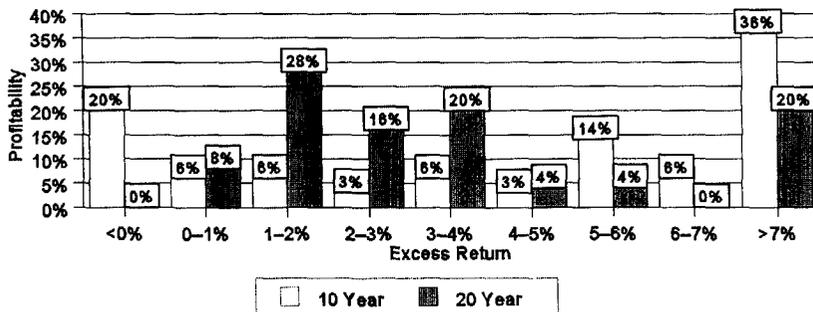
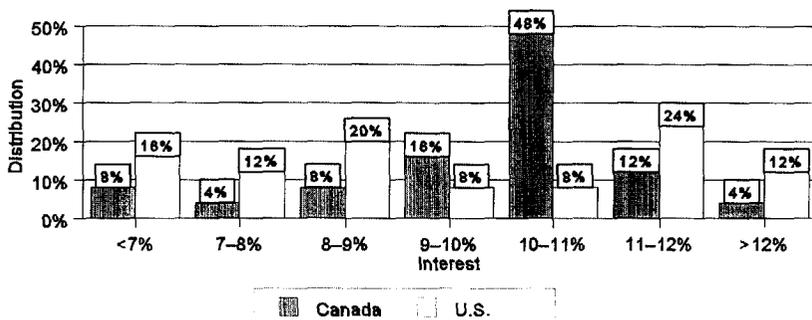


Chart 6 just presents the numbers another way. The reason I did this is because I'm going to talk later about structured annuities, and this is a more relevant graph to that discussion. You can see that this is just a straight distribution of the annualized 20-year holding period returns for stocks. Again, the holding periods begin in 1950. You can see that the results are reasonably disbursed particularly in the U.S.

Now I'll give everyone an overview of the Canadian regulatory environment and how it's different from the U.S. The first point is that in Canada we have a formula called the minimum continuing capital and surplus requirements (MCCSR). It does the same thing as RBC, but the most important difference is that the equity factor is only 15%, not 30%. That immediately makes the marginal cost of capital for using equities substantially lower.

CHART 6
20-YEAR ANNUALIZED RETURNS



The second thing that eases the analysis in Canada is that you're only dealing with one reporting basis—GAAP and the statutory basis in Canada are the same. The third point is that the unrealized capital gain treatment in Canada is generally the same as realized gains. If you're using equities to back a new money annuity, gains are effectively capitalized into income 100%. If you're dealing with a portfolio or an insurance type product, generally gains are amortized into income and surplus at 15% a year.

The relevant point which does have a very big impact is that the reserves are set using best estimate assumptions for all variables, plus explicit valuation margins. In other words, the Canadian valuation method is equivalent to a gross premium valuation with provision for adverse deviation (PADs) built in to set your statutory reserves. The asset assumptions are based on the actual asset expected yields and that's what you end up using to do most of your discounting. The one thing that leads to, and this is really the only complicated point that I'm going to make, is that this approach of using an explicit valuation actually helps you when you're trying to use equities to the extent you have included a cost of capital for using equities into your product pricing. You get credit for it in the reserves. So you actually get quite a reserve reduction for any capital charges in your pricing.

We've developed strategies for using equities because the Canadian environment penalizes them less. The first area I'll address is in investment portfolios supporting insurance products. I think if you looked at Canadian companies' balance sheets, certainly for par insurance, you'd find a number of companies have an equity position. We've done some modeling of the Canadian environment compared to the U.S., particularly for our U.S. business because our internal management basis is the Canadian basis but we report on an NAIC RBC basis as well. When we put in our hurdle rates and the RBC levels we would have to hold, and when we factored everything into our pricing programs, we found that the "cost" of the hurdle rate for holding equities versus bonds was only 1.25-1.5% on the Canadian basis. But when we looked at it on the RBC basis, we were getting marginal additional requirements of over 5%. These numbers are different from Frank's numbers, but I think the message is clear. In Canada, holding equities is still efficient when you factor in reserve and capital considerations. Whereas on the U.S. basis, if the cost is 5%, equities don't make sense on a capital-adjusted basis.

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Another benefit in dealing with insurance products in Canada is that the Canadian approach smooths the stock returns. You get a fair amount of smoothing in both your surplus account and income statement by having the difference between the market value and what we call the adjusted book value amortized at 15% a year. Effectively you're writing up (or down) your stocks at 15% a year for any difference between market value and your current statement value.

The last point I want to make, which reflects the negative side of any type of smoothing formula, is that although it does stabilize your results, it does tend to defer the recognition of that stock premium into income. If you were modeling a startup stock portfolio on the Canadian basis, it would take about 10–20 years before you would start realizing the full stock premium over bonds and income. This has a very significant impact. If you already have a position in stocks, the formula is not particularly penalistic. But to decide to increase your stock position for a number of years, you're going to have to increase your capital cost and it's going to take a long time before you actually get that stock premium coming through your income account. It's a wrinkle that I think you get with any type of smoothing approach.

Another area we've looked at is using equities to back long annuity tails. Again, in Canada you've got the same beneficial impact of the 15% MCCSR formula reducing the cost of capital. But, in Canada you do have an interesting phenomenon on the new money side, which is that we tend to capitalize most of the asset gains and losses into income right away through the reserve formula. That makes using equities more problematic. When we went through our analysis, we found that when you're dealing with annuity tails where you've got a locked-in payment that you have to make over some scheduled period, let's say 30 years, and you're looking at payments that are maybe 20 or more years out into the future, your call to use stocks is rather tactical. At the end of the day, the key driving factor is the level of current bond rates. There is sort of a threshold you can set where, if current bond rates in the market go below $x\%$, you want to liquidate your bond position and put the funds into equities. We found that this occurred when long bond rates were in the 6–7% range. However, if bond rates are up at around 10% or 11%, you're probably better off to go out and buy the bonds and lock in that bond yield for as long as you can. This goes back to that earlier slide where we were showing the dispersion of results. It's very unlikely that over a 30-year holding period, you're going to have much chance of earning, with any confidence, a stock yield of more than 10% or 11%, and therefore, it makes intuitive sense that you would be better off holding bonds.

I have a quick summary here and then Yuan will make for his last comments. In Canada, if capital is not scarce (obviously, if capital is very scarce you might not be able to even put up any capital), stocks are generally economically efficient on a risk-adjusted basis. If capital is scarce, your stocks still are efficient given the Canadian regulations if you can afford to put up the additional capital. The amortization formula in Canada for par insurance does reduce the volatility but it does cause delayed income emergence. In tactical moves, the timing of the movement into stocks and your expected holding period are both very critical.

MS. FORBES: Yuan, did you want to make some comments about the Met Life proposal and then we'll open it up to questions?

MR. CHANG: Let me start by saying that I've gone through the logic over and over again that you can make an economic case for equities. If you're looking at the risk side of the situation, you can make a case for efficient risk in the sense that the marginal increase in return is well worth the marginal increase in actual risk. You can use Sharpe ratios or you can use any kind of a regression analysis and you will still find a compelling case. Yet regulation has almost preempted the use of equities, something is wrong.

If we look at the regulation and assume equities make economic sense, what are we going to do about it? Well, there are always two ways you can meet a regulatory challenge. One is to try to get around it. The way you get around it, is using equity-linked notes. You do that by paying someone else outside of the industry a whole lot of money, when they don't do a whole lot for you. When you look at it, the only reason the equity-linked note works is because there's an option in there and the hedging is done by somebody else for you. There's a third party involved adding a layer of cost. I've looked at the whole thing and asked, what is the strength of equity-linked notes? Equity-linked notes' value come from the fact that the stock market is doing better. When the stock market is at its expected mean, equity-linked notes actually aren't doing very well. So, equity-linked notes are not at all a good substitute for equities. On the other hand, as a structure by themselves, and if you're willing to make a mild bet, you can use them as a substitute for fixed income. That is, they are not very much different from a convertible. We also have to be concerned about counterparty risk on a short-term equity-linked note. Counterparty risk may be smaller, but if you're talking about 15- or 20-year notes, you do have an issue. How many U.S. corporations are willing to bet you're going to be around in 20 years? These are some of the questions. However, we have some equity-linked notes to the tune of \$250–300 million. The joke that is we're half the market, I'm not really all that enthused. You'll see us doing some more because we're pressured to do more equities and because we have no other choice. That's how to get around it.

I think the other way to look at regulatory challenge is to say, why do we have the regulation? Is there some way to change the regulation? Is there some way we can make an argument that would change the regulation? It's very difficult to confront an entire regulatory process and a whole bank of actuaries who helped write that regulation and say let's look at special situations and make a compelling case even more compelling by looking at what Simon was talking about, the long tails. If we look at the long-tail liabilities in many different types of products and if we limit our use of equities to long-tail equities, maybe we could get some mercy. This proposal was made by Met Life. The general idea, without going into detail, is to say can we have some kind of an offset to the 30% if in some way the stock is purchased and being held for long-tail liabilities. There's a series of fairly technical definitions that makes it fairly precise. It was submitted and, as far as I'm concerned, sort of summarily dismissed. I am told, however, this summary dismissal is not so much on the merit. I'm glad that it was just that they didn't want to handle any special requests and an entire group of requests were dismissed at the same time. That's our experience in submitting the proposal. I certainly don't want to see this become the end of the story, somebody is going to be heard from.

MR. JOHN T. BECK: In terms of understanding the example of the zero-coupon equity-linked note, I've seen deals as long as 20 years in addition to the ten-year deals you're talking about here. I'd like to get a better understanding of how the other side of this deal

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works—who is the counterparty, and how do they lay off the risk from the other side of these deals? Do any of you understand how it's done?

MR. SABATINI: Bottom line is that all they're doing is hedging against the guarantee that they've given you. They're taking the money that's paid in and not just throwing it into the equity markets. They're hedging against the principal guarantee and structuring what they're doing in terms of being able to meet the coupon requirement on the note.

MR. CHANG: Maybe it's easier to understand if you think about reproducing it yourself by basically buying a coupon bond and using extra coupons to buy an option on the index. But you can't do that under the law.

MR. BECK: I guess my question was who would issue a 20-year option on the S&P 500? Who would be willing to take that risk?

MR. CHANG: We have talked to several. I think these investment banks will be able to come up with different ways of hedging the option.

MR. MICHAEL D. HAWKINS: Have any of your companies examined the correlation between market values of blocks of equities and blocks of liabilities to see that they move in sync over extended periods of time?

MR. CHANG: We have. The answer is no, but that wasn't the intent. If we want to make equity behavior be in sync with a fixed-income asset, we won't be able to. I think the covariance is around 20%. Fixed-income assets and equities travel in the same direction 40–50% of the time. Maybe other times they travel in the opposite direction. The whole idea of diversification, of course, is that they don't travel in the same direction. If they did travel in the same direction, you really can't diversify them. That's portfolio theory. Now, if you are going to take equities to match your total liability and try to match it in the sense you're doing it with duration matching processes, the answer is you can't do it. It's not possible. I know there's a great deal of effort in trying to redefine duration for equities. Well, if you think about duration as the change in the market value for a given change in interest rates, there is no such formula between equities and interest rates because while we can run all kinds of linear regression analysis, it doesn't define the duration. So I'm saying that in the process we are talking about, we are getting away from matching liabilities and assets but keeping them in sync with a different process. Thus you can justify, on a diversification basis, a set of assets that we don't even think about.

