

ASSET ALLOCATION AND THE EQUITY RISK PREMIUM

**Canada Pension Plan Seminar on
Demographic, Economic and Investment Perspectives for Canada
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Equity Risk Premium (ERP)

- Definition:
- Expected (ex-ante) excess return on equity over a long-term fixed income investment
- Typically based on a risk less (e.g. Government of Canada) fixed income security
- Long term Government of Canada real return bond seems more appropriate in a pension plan context as it most closely matches the variability of the pension liability

Why is the ERP Important?

- Huge implications for asset allocation strategy
- Helps plan sponsors to decide their strategic policy exposure to equity, debt and alternative investments
- For pension funds, the question is not so much what is the risk premium today, but what is the expected risk premium going forward?
- Historical evidence may not provide the best answer to the risk premium question

Meaning of Risk

- Risk is not having enough money to pay the pension promise
- Risk in the traditional definition refers to volatility of prices and returns around some long term average – the classical CAPM model
- Problem with this is that we live in a world that is non-stationary, therefore, there is no fixed or learnable distribution of returns
- Stationarity assumes the past is a good proxy for the future and fails to capture the pattern of returns resulting from an investment regime change

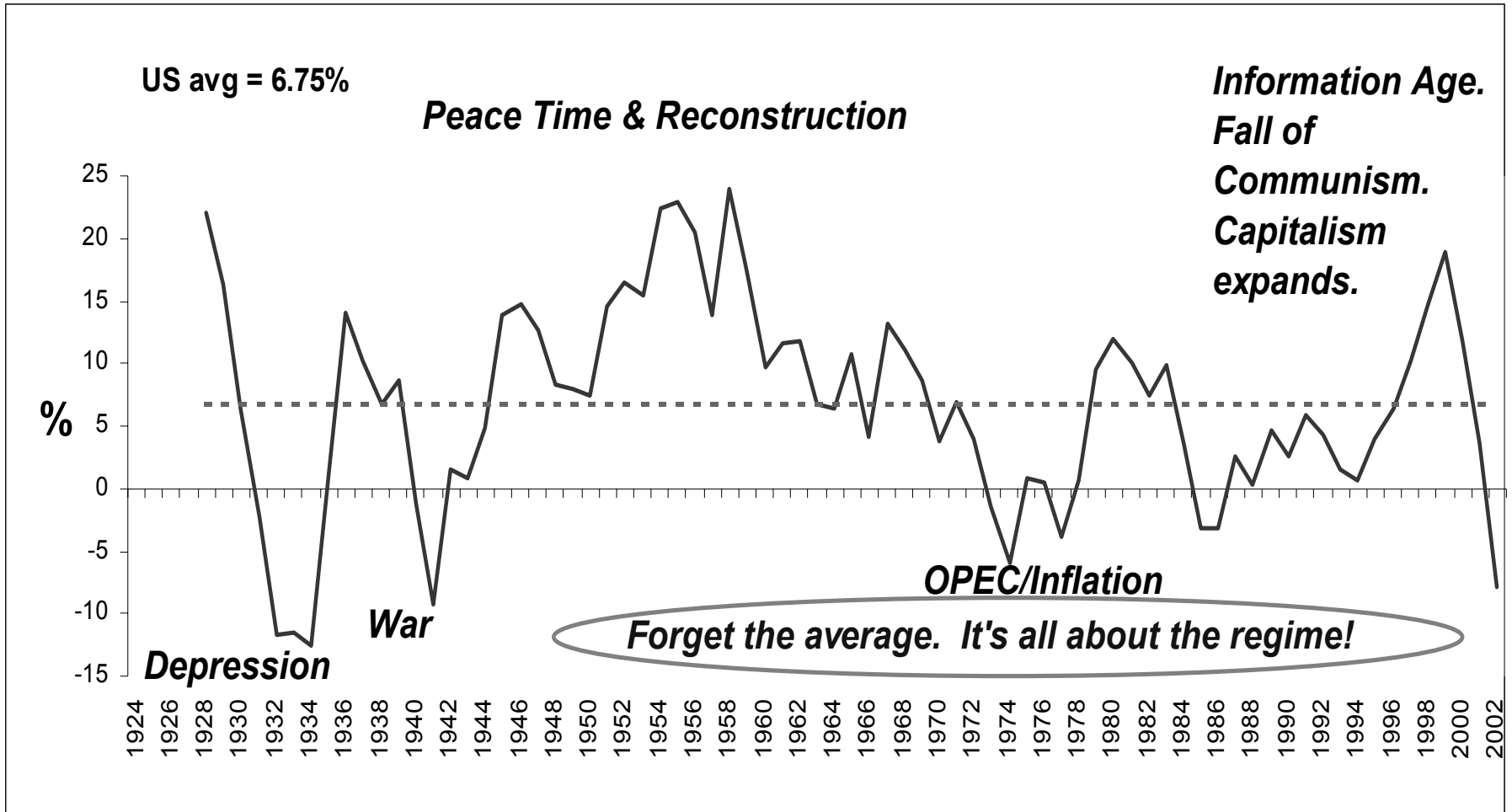
Asset Allocation

... “but the long run is a misleading guide to current affairs.
In the long run we are all dead”

“Economists set themselves too easy, too useless a task if in tempestuous seasons they can tell us that when the storm is long past, the ocean is flat again”

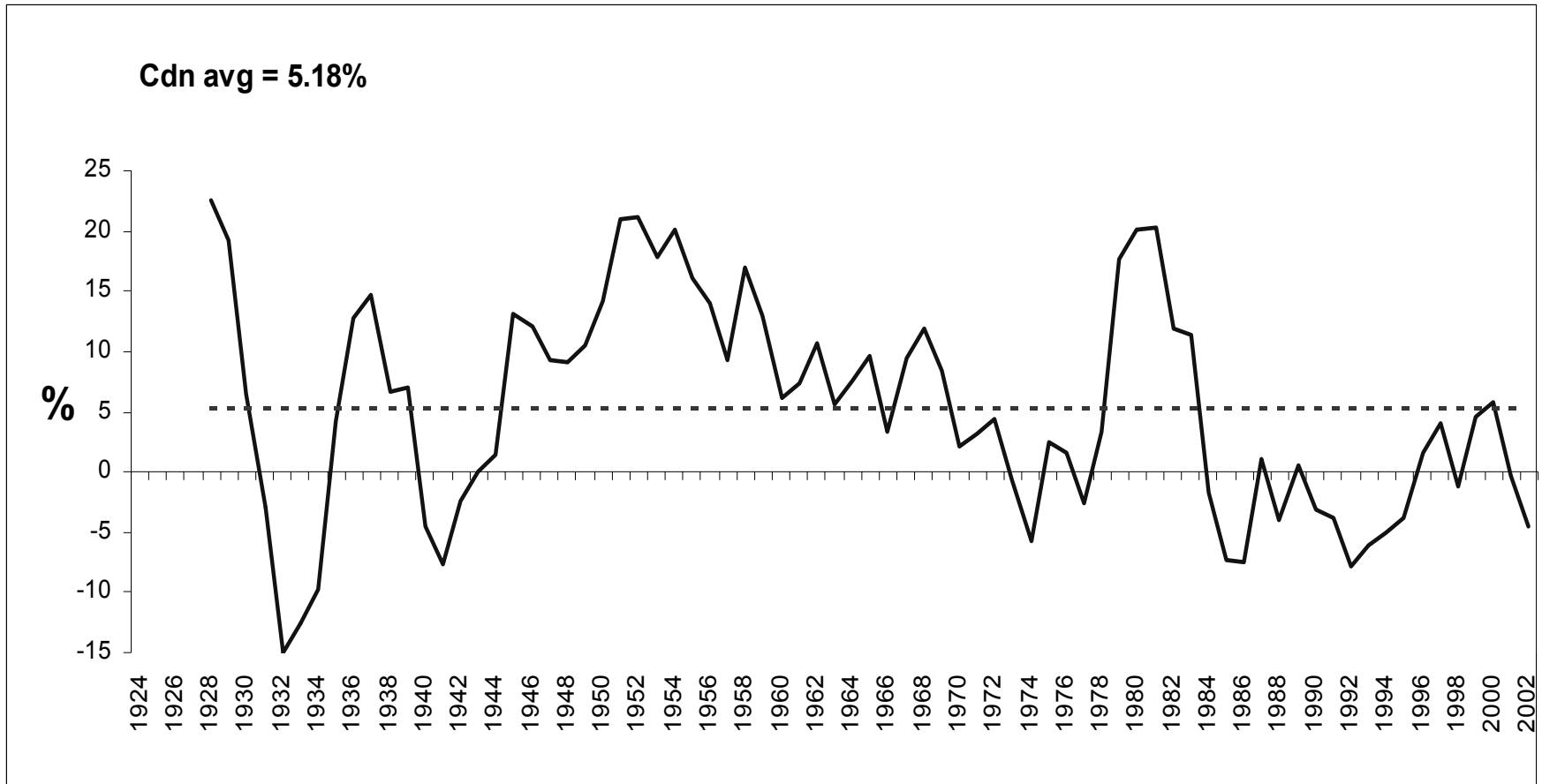
- John Maynard-Keynes

U.S. Equity Risk Premium (rolling 5-year avg.)



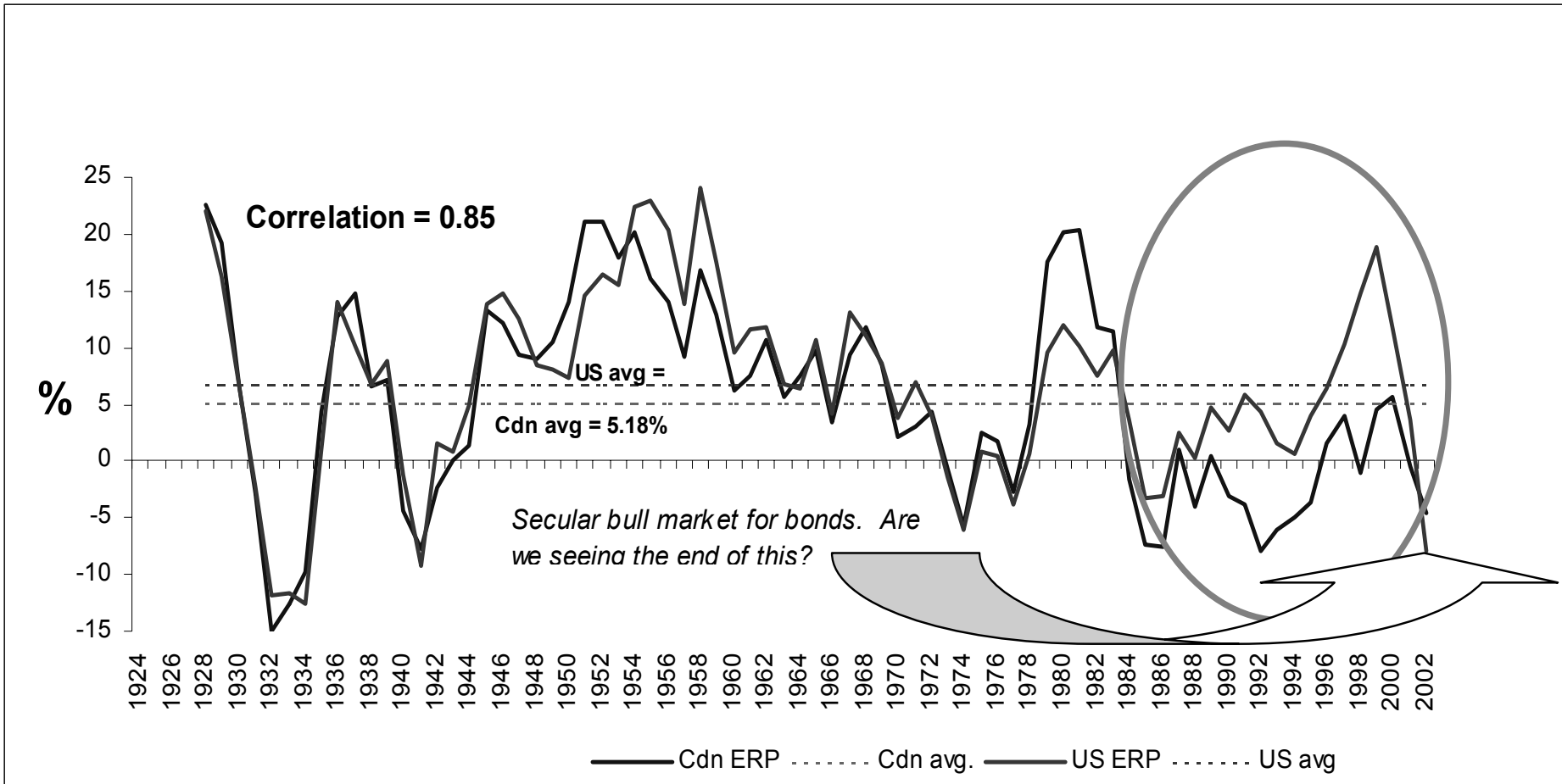
Data Source: Canadian Institute of Actuaries & Russell/Mellon

Canadian Equity Risk Premium (rolling 5-year avg.)



Data Source: Canadian Institute of Actuaries & Russell/Mellon

Equity Risk Premium Canada Vs. U.S. (rolling 5-year avg.)



Data Source: Canadian Institute of Actuaries & Russell/Mellon

Capital Market Expectations

- Let's see if we can build a return framework for equities, bonds and the resulting ERP
- To do this we must first build a scenario for the most likely investment regime over the next 5 to 10 years
- The issue is that when “boom” turns to “bust”, the unpleasant memory can remain for a while with a generation of investors who endured the pain.
- Central to our analysis are the assumptions of lower investor expectations (coming off the excesses of the 90's) and of modest economic growth for the next few years.

Changing Capital Markets

	Period	Number of Years	Consumer Price index	Real GDP		Real Wage Growth	RRB* Yields	RRB*	Returns			
				per Employed					91-Day T-bills	SCM Universe Bond**	Canada Long Bonds	Canadian Equities
Boom	1924-28	5	(0.2)	3.7	1.1	3.2	3.1				6.0	28.2
Depression	1929-32	4	(5.5)	(4.6)	2.7	4.3	(1.3)				10.6	(18.2)
Recovery	1933-38	6	0.8	3.2	1.5	3.3	7.8	(0.6)			6.3	17.4
War	1939-45	7	2.6	7.2	1.9	2.5	4.1	(2.0)			0.9	5.5
Reconstruction	1946-51	6	7.7	1.0	0.6	1.6	3.2	(6.7)			(5.9)	8.2
High Growth	1952-56	5	0.5	6.3	4.4	1.9	0.5	1.2	1.6		1.8	14.9
Stable Growth	1957-65	9	1.8	2.2	2.1	2.7	1.1	1.8	2.2		1.2	6.8
Inflation Pressure	1966-74	9	5.4	2.8	2.6	3.9	2.3	0.3	0.0		(2.1)	(2.2)
Stagflation	1975-82	8	9.4	0.1	0.6	4.6	3.8	2.2	(0.9)		(1.6)	6.4
Tight Money	1983-91	9	4.3	0.4	0.1	4.7	4.9	6.0	8.3		8.6	5.9
Fiscal Restraint	1992-99	8	1.5	1.5	0.2	4.3	5.3	3.6	7.3		8.9	12.3
??????????	2000-2002	3	2.6	(0.2)	(0.6)	3.5	7.7	1.5	6.3		6.7	(8.7)

	1924-74	51	2.2	3.0	2.1	2.9	2.7				1.5	6.7
	1975-2002	28	4.8	0.6	0.2	4.4	5.0	3.8	5.1		5.5	6.1
	1924-2002	79	3.1	2.1	1.4	3.5	3.4				2.9	6.5

* Real Return Bond(RRB) yields and returns simulated prior to 1992, using Mercer's Interest Rate Model
 ** Canada 5-10 Year Bond returns prior to 1980
█ Best performing Canadian Asset Class
 Source: Mercer's

Economic Eras

1957-65: Stable Growth

The explosive growth of the early 1950's subsides to an era of steady and comfortable economic growth, low inflation and low interest rates. Wage earners and shareholders both thrive under these ideal conditions. Equity returns look extremely attractive compared to fixed income investments.

1966-74: Inflation Pressures

The expanding economy is faced with increasing capital demands to expand social programs and provide schooling and jobs for the first wave of baby boomers reaching adulthood. The US finances expanding social programs, the Vietnam War, and the space program. Rising inflation pressures and rising real interest rates culminate with the oil crisis and the 1973-74 bear market which reprices equities for a high real interest rate environment. Cash looks attractive on a risk adjusted basis compared to stocks and bonds.

1975-82: Stagflation

The affects of the oil crisis lead to a period of persistent high inflation. Combined with higher real interest rates, this ushers in a long period of sharply lower economic growth which we are still dealing with today. Equities provide an effective hedge against inflation while bonds continue to depreciate in inflation adjusted terms.

1983-91: Tight Money

In an effort to reduce inflation pressures, the Bank of Canada maintains short term real interest rates at historically high levels. Falling inflation expectations boost bond returns as nominal interest rates begin a slow, choppy decline. But rising government deficits and debt keep real interest rates on long bonds at historically high levels.

1992-99: Fiscal Restraint

Increasing recognition and response to government deficit and debt issues facilitates the easing of monetary policy. Inflation falls to 1957-65 levels and reduced inflation expectations spur spectacular bond and stock performance. The first signs of Declining real interest rates and recovering economic growth begin to appear.

Source: Mercer's

Setting Assumptions

Here's our base case expectations for the next 10 years:

Inflation	3.0%
Real GDP Growth	3.0%
Real Interest Rates	3.5%

Upward pressures and moderate growth (BOC talking of a tighter bias,) should keep inflation at the upper end of the BOC range. Higher inflation, above 3%, means failure on the part of the Bank of Canada and this seems unlikely

Setting Assumptions cont.

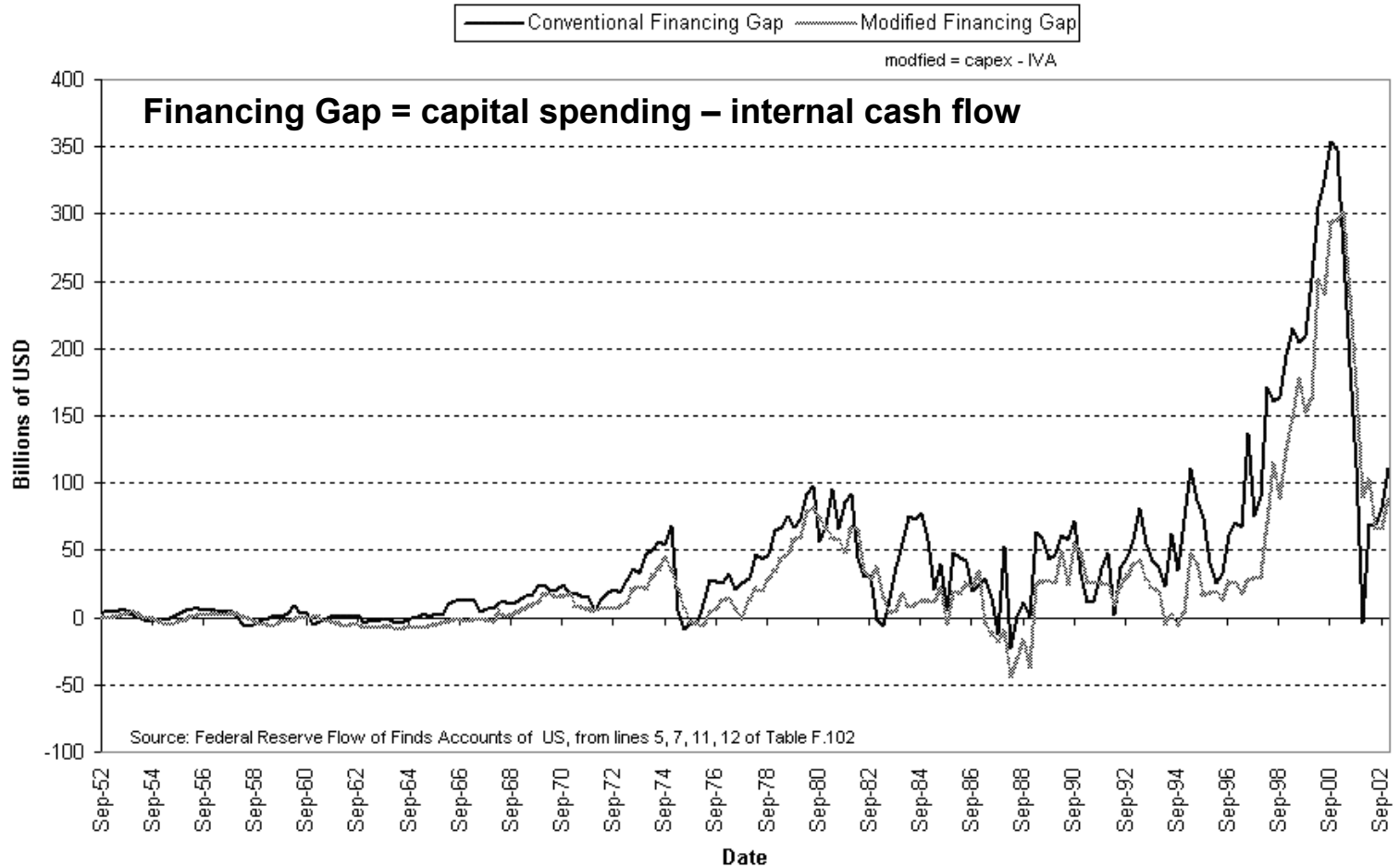
- Real Economic growth is a function of:
 - Productivity Growth
 - Labour Force Growth

Setting Assumptions cont.

- Just under 2% real productivity growth in the past 40 years. Could be slightly higher going forward as investment spending picks up modestly after slowing from 1990's levels. Corporate deleveraging seems to be coming to an end. (See chart)
- Labour expected to grow in line with population growth of approximately 1% per annum
- Over longer periods, moderate economic growth, and increased spending on technology should put upward pressure on the cost of capital causing real yields to increase.

Financing Gap

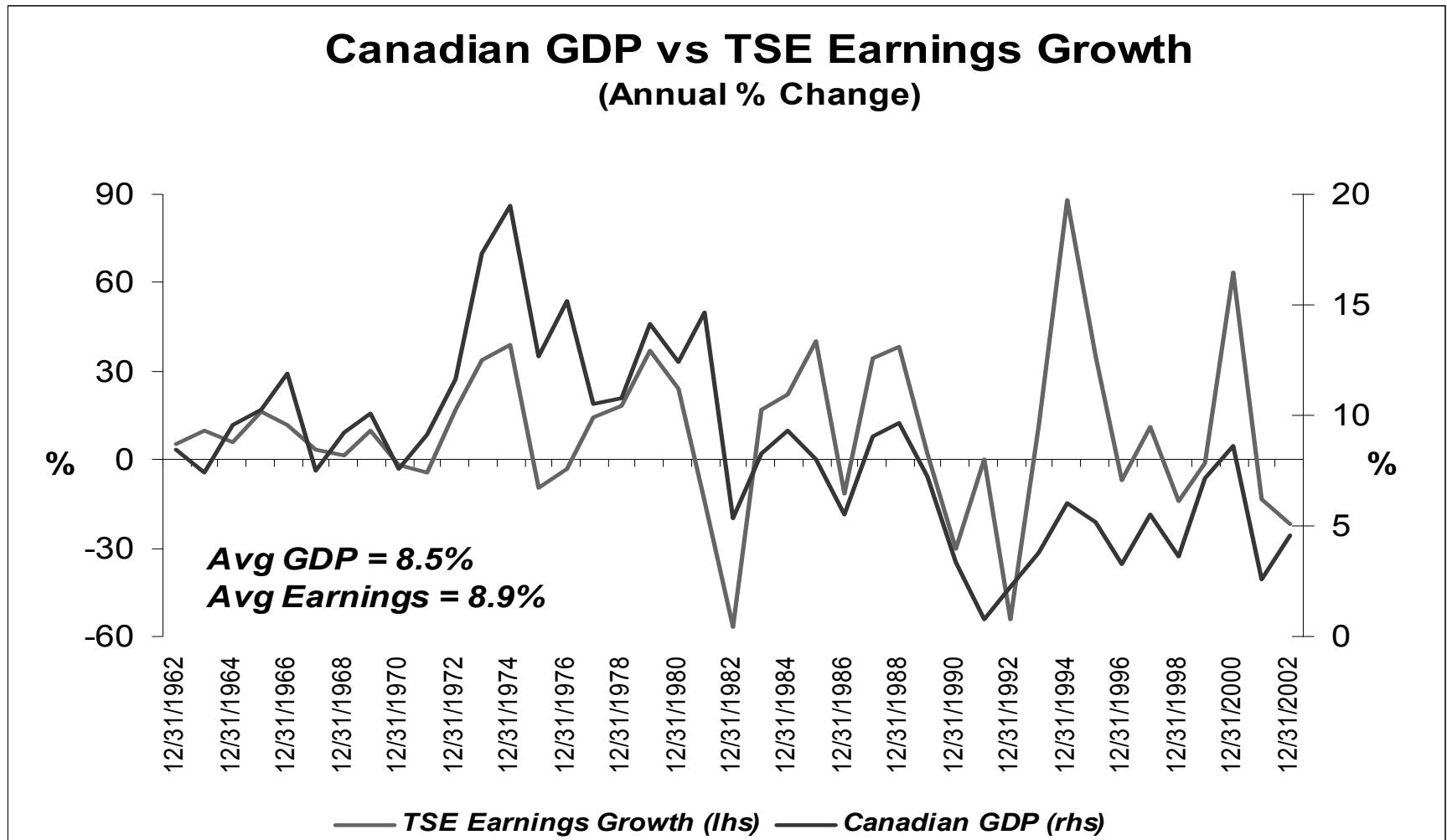
Trending in the right direction?



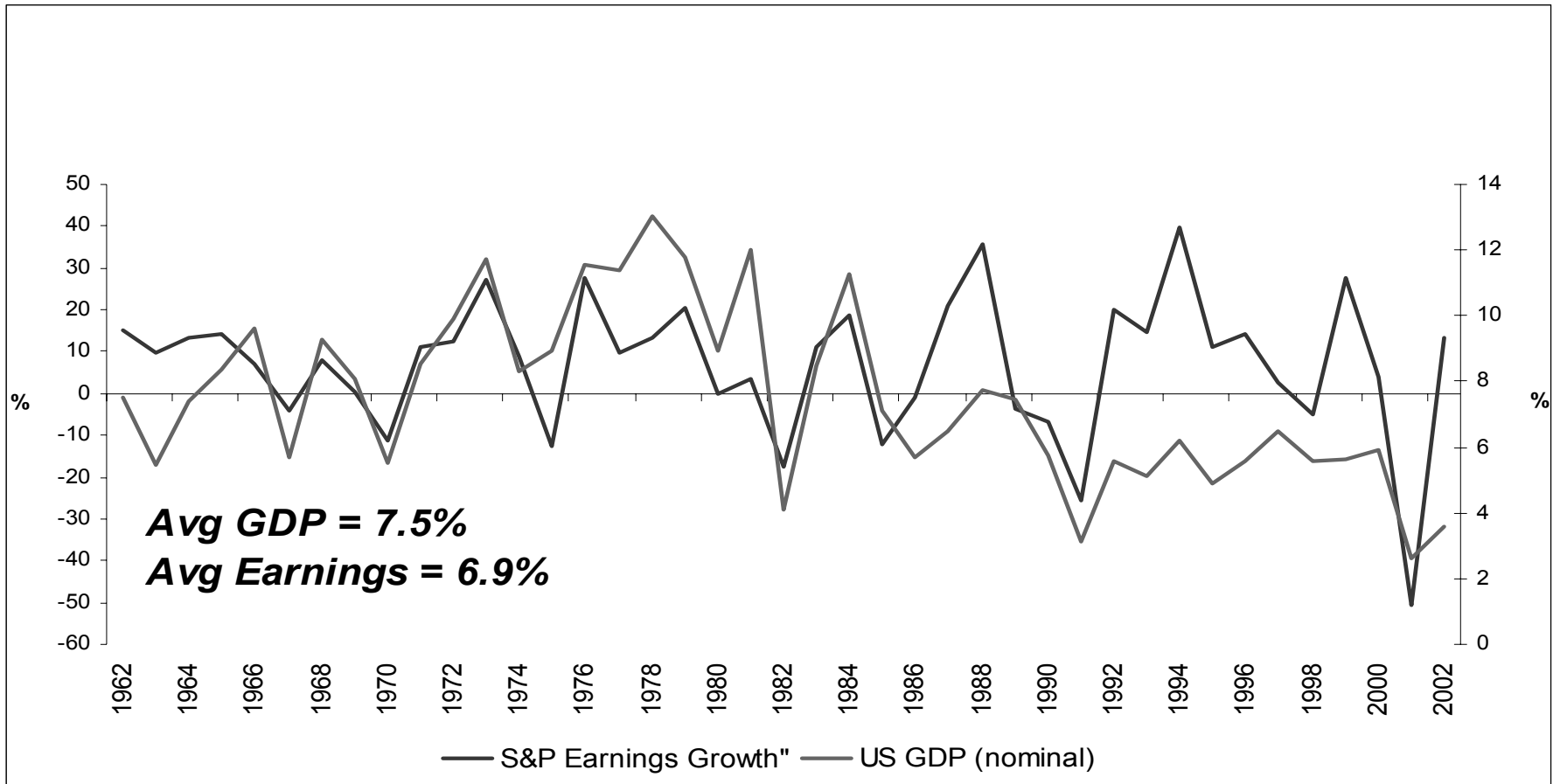
Determining a Forward Looking ERP

- Very difficult to calculate with any precision. Like trying to forecast currencies
- High “model uncertainty”. One can only try to get a comfort level.
- No wonder this is such a contentious issue. Recent articles by leading academics come up with an expected ERP anywhere between -1% to 4.25%
- Beyond 5 to 10 years, one can only pretend to look at this (ERP and asset class returns) in a serious way. Career risk for CIO's and committee members and pressure from stakeholders will dictate a shorter focus (with historical averages and educated guesses used for the longer term)

Canadian GDP vs. TSX Earnings Growth

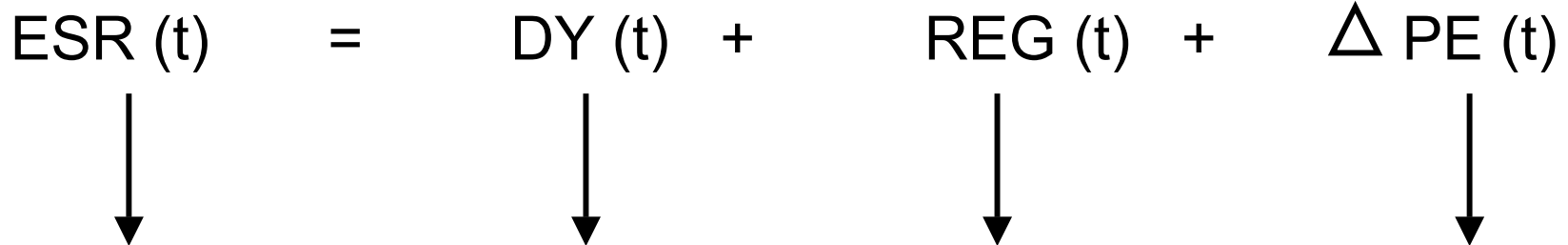


U.S. GDP vs. S&P Earnings Growth (Annual % change)



Expected Real Returns

Equities

$$\text{ESR (t)} = \text{DY (t)} + \text{REG (t)} + \Delta \text{PE (t)}$$


Expected real stock
market returns
at time "t"

Starting dividend
yield at time "t"

Real earnings
growth starting
at time "t"

Valuation change
starting at time "t"

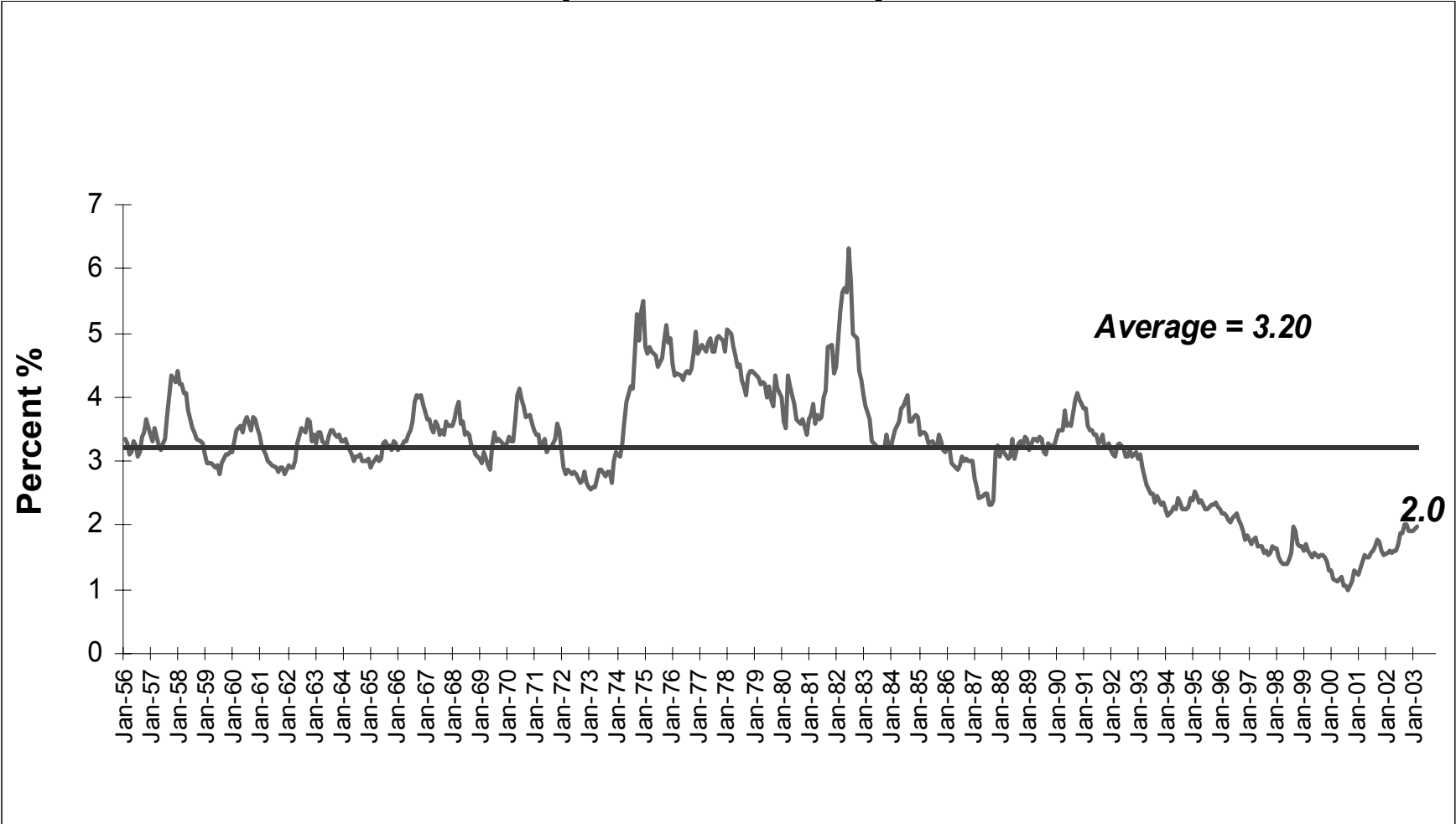
BONDS

An increase in expected inflation from 2% to 3% over 10 years causes the value of a real return bond (current 3% coupon) to drop from \$100 to \$91 with a resulting return of 5.4%

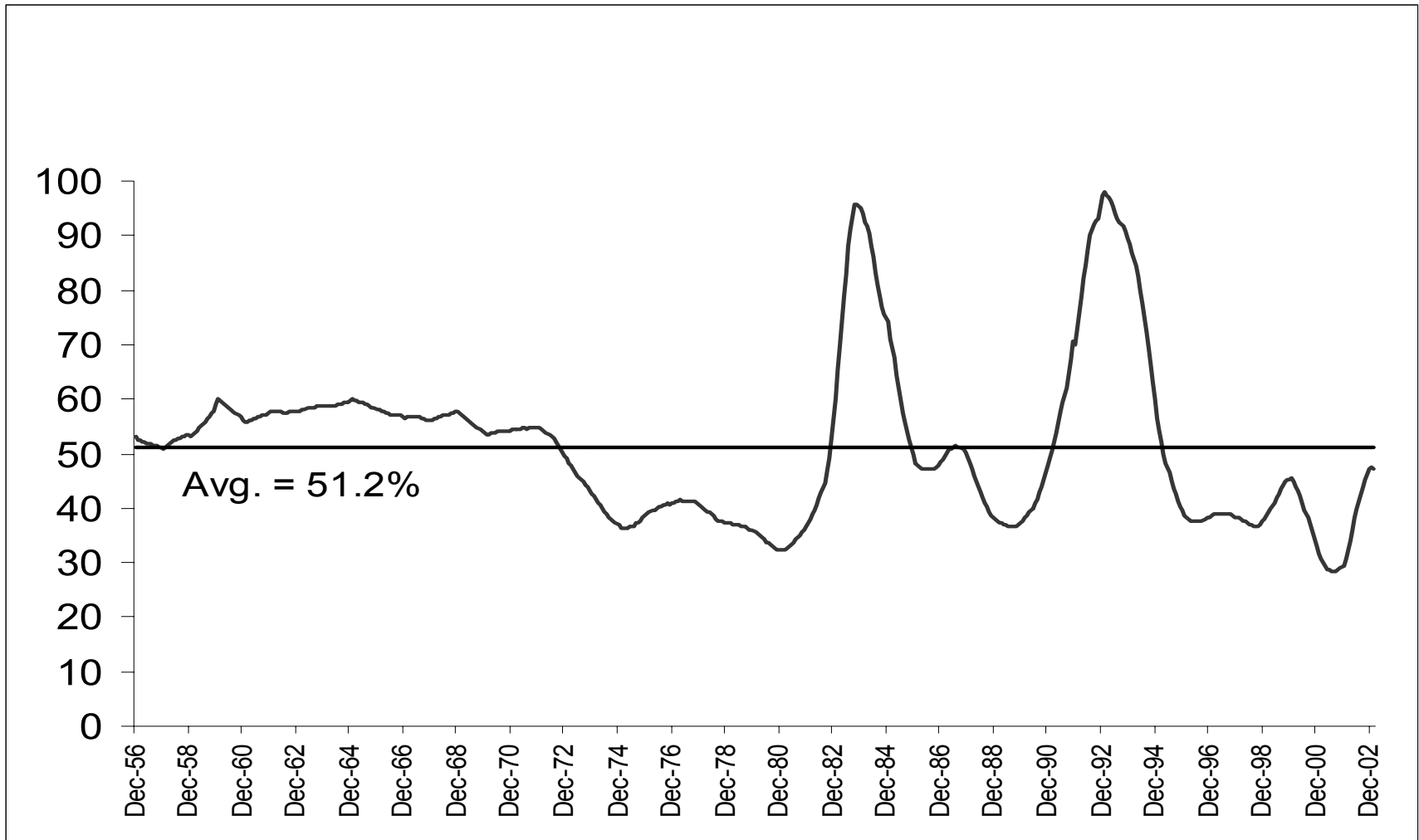
Expected Real Returns

- Net share repurchase (particularly the banks) and investors' preference for more "up front" return should cause dividend yields to increase over time.
- Earnings cannot grow faster than the overall economy over any sustainable period of time. But the TSX is not representative of the Canadian economy and its earnings tend to grow somewhat faster.
- For valuation, a P/E contraction can be expected - consistent with past bubble investor behavior

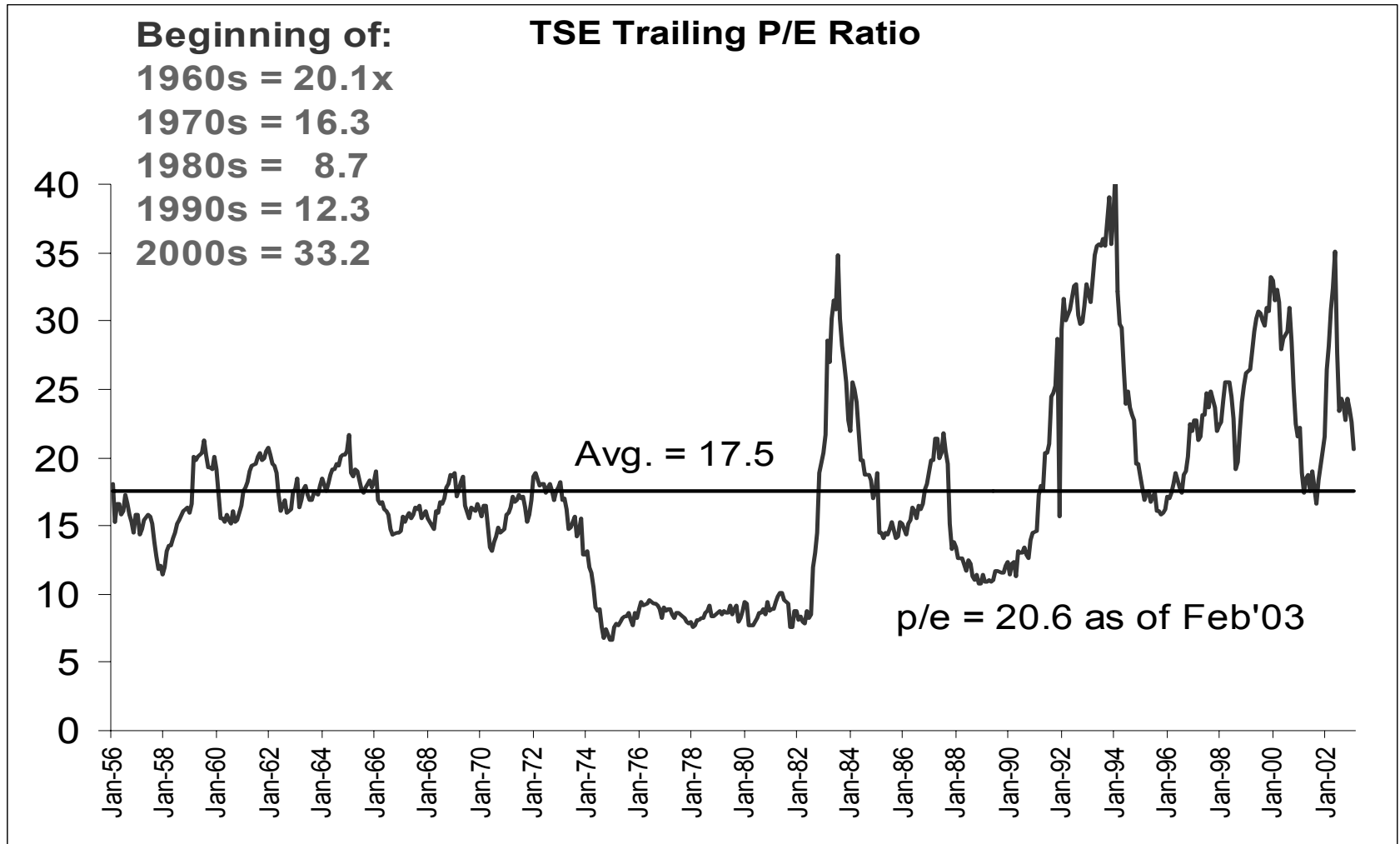
TSX Dividend Yield (1956-2002)



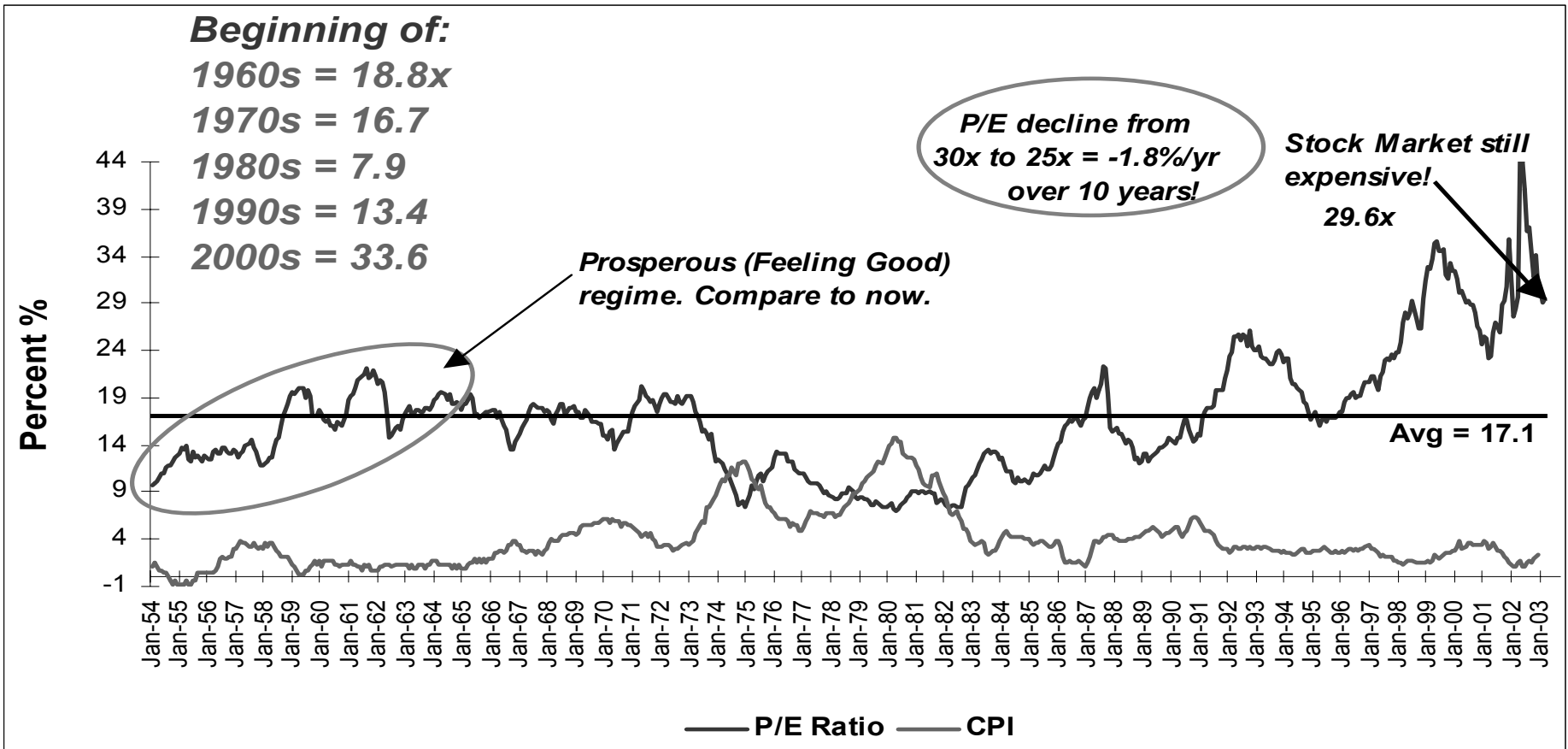
TSX Pay-Out Ratio (4 year rolling average)



TSX Trailing P/E Ratio



S&P 500 Trailing P/E Ratio Vs. Inflation



Lower Expectations?

- Trailing P/E at the end of February 2003 was 25.9 X. The previous five decades started out with P/E's of:

1960	20.1 X
1970	16.3 X
1980	8.7 X
1990	12.3 X
2000	33.2 X

$$P = P/E \cdot E$$

Assuming E remains constant a drop in P/E from 20.6 to just 18 will result in stocks declining slightly more than 1.0% per year for the next 10 years in Canada. Worse outlook for the S&P 500

Estimated ERP

Dividend yield (+ net share repurchase)	2.50%
Real Earnings Growth	3.25%
P/E Change	<u>(1.0%)</u>
Real Stock Return	4.75%
Inflation	<u>3.0%</u>
Nominal Stock Return	7.75%
Less Real Return Bond Nominal Return	<u>5.40%</u>
Expected ERP	2.35% *

* Less than half the Canadian long term average

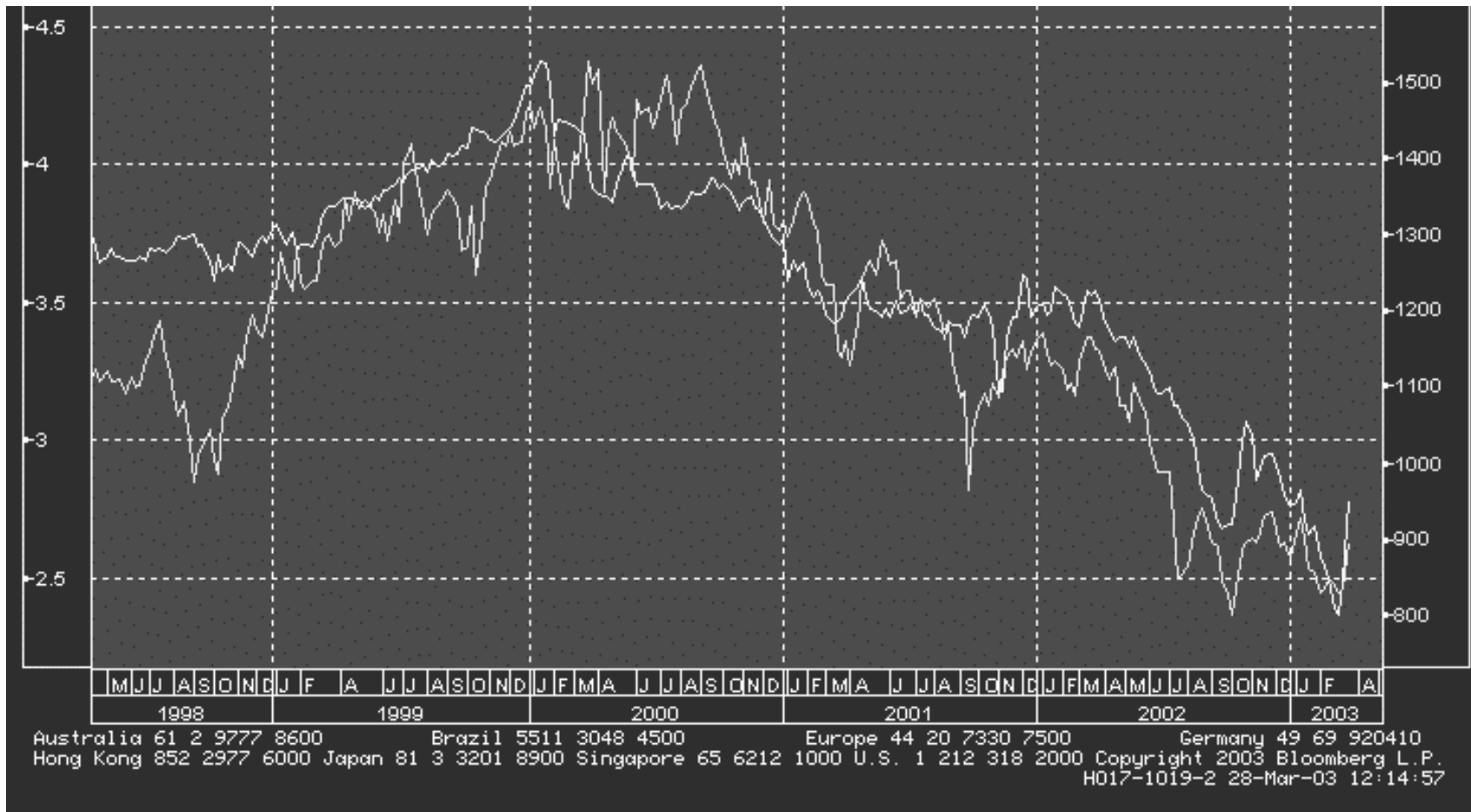
Different Approach, Same Answer?

Expected Equilibrium P/E	18.0 X	
Earnings Yield (inverse of P/E)	5.5%	
Normalized Payout Ratio	50%	
Dividend Yield		2.75%
+ Expected real earnings growth		3.25%
- P/E Contraction		<u>(1.0%)</u>
- Expected real equity return		5.0%
- RRB Real Return		<u>2.4%</u>
Expected ERP		2.6%

TIPS vs. S&P 500

CORR 0.88

R² 0.78



Inflation Indexed Bond Yields can rise 100 bps over 5 years with a 7% rise in the S&P (850-1200)

Three Post War Investment Regimes

	Regimes		
	1949-1966	1967-1981	1982-1999
S&P 500 Index (Real Return)	8.3%	- 4.0%	11.9%
Bond Index (Real Return)	0.3	- 2.2%	7.8%
ERP	8.0%	- 1.8%	4.1%

Source: SED

Three Post War Investment Regimes

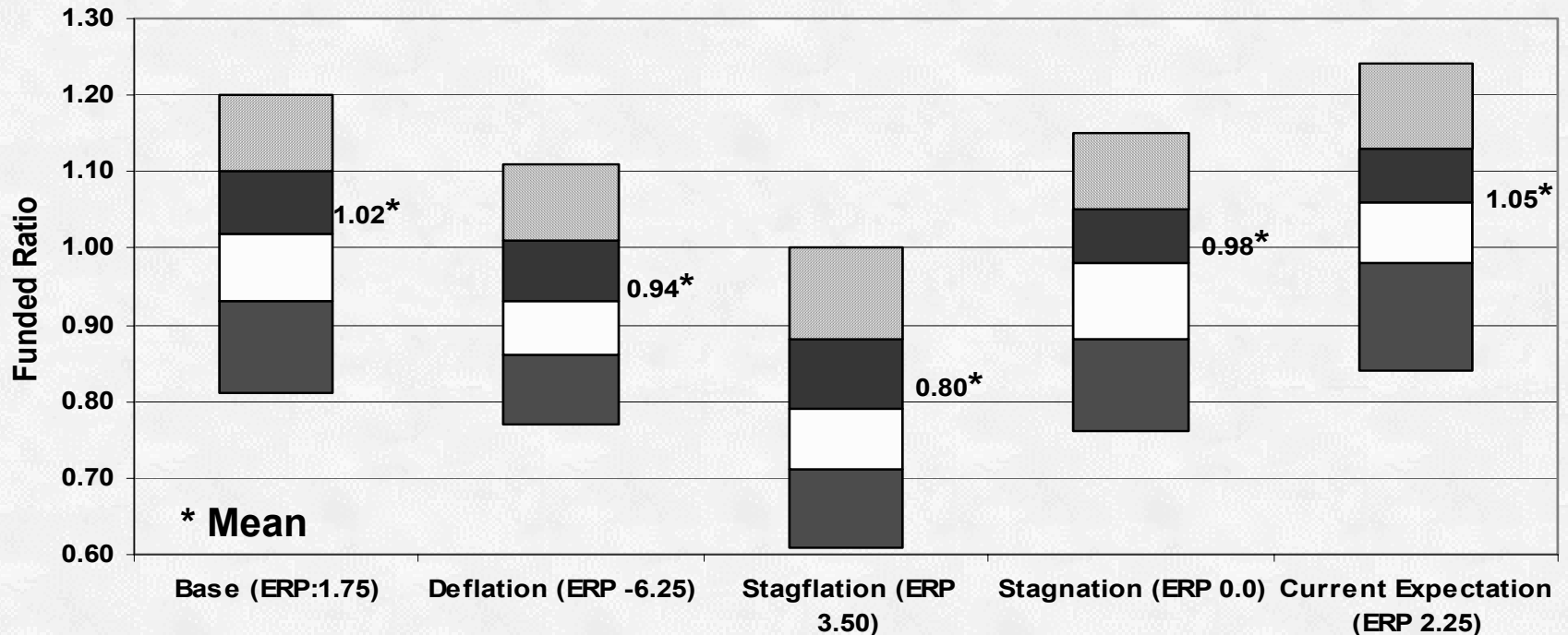
- The point is capital market returns can change dramatically and last for a long time from one regime to another
- Investor optimism of the '80's and '90's is behind us. Diminished expectations are shaping the mindset of investors early in the new century
- Question is how long will this last? And would investors bail out of riskier equities for bonds if there is no commensurate reward?
- Possibly, but over the long term, stocks (because of their inherent risks) will command a premium over bonds. Otherwise, capitalism will suffer

Asset and Liability Behavior

- Given the debate and controversy surrounding the “correct ERP”, how should plan sponsors assess the impact of a high/low ERP?
- Theory suggests that a lower ERP will shift the efficient frontier downwards i.e. lower return for the same risk in a mean variance world
- Some fiduciaries may decide to reduce their equity exposure in favour of bonds. Not so fast!

Typical Public Sector Pension Plan Funded Ratio – (Year 10)

You would think that with an
Equity Risk Premium of 3.5% your
Funded Ratio should be relatively
safe looking forward!



It's more about outcomes (on funded status)
than absolute ERP's

Asset and Liability Behavior

- Examine the possible outcomes on the plan's funded ratio for a base case and various stress testing scenarios
- A low ERP does not necessarily mean a bad thing. Look at the base case scenario with an ERP of 1.75%. More than half of the outcomes have a funded ratio above 102%, probably because both stocks and bonds have high absolute returns
- Compare this to an ERP of 3.5% in stagflation. All of the outcomes are below 1%

Asset and Liability Behavior

- A useful guide for fiduciaries is to place more emphasis on the lower part of the distribution of outcomes that arise from a high/low premium, i.e. pay attention to the “tails” of the distribution. Penalize those outcomes that do not meet your initial risk/return objectives
- Pay attention also to the year to year change in the funded status. May be o.k. to live with an undesirable outcome for one year. Question is how long can you or your plan members (political pressure) put up with long periods of under-funding
- As a fiduciary, understanding both the economic/investment regime confronting you for the next several years and the assumptions underlying the various scenarios is key

Is There A Recovery Policy?



How deep a decrease can the Board withstand , and how quickly do they want to recover?

Looking Down the Road

- For CPP and many public sector pension plans, returns from traditional assets in the current investment regime may not be sufficient to meet the required pension promise (regardless of the absolute value of the ERP)
- Need to consider other types of investments. Think of prospective returns as a multiple of the required pension return over the next 5-10 years

Looking Down the Road

- Assuming a nominal equities return of 7.5%, the following inputs may be used (as examples) for the efficient frontier asset mix decision:

Stocks	0.9 X - 1.0 X *
Bonds	0.5 X - 0.7 X
Real Estate	1.0 X - 1.2 X
Private Equity	1.0 X - 2.0 X
Infrastructure	1.1 X - 1.5 X
Absolute Return Strategies	1.0 X - 1.2X

* expected multiple of required return

Summary

- These are difficult times for plan sponsors. Risk seem inordinately high – economic and geopolitical
- The equity risk premium is an important issue. Going forward, it may well be below historical averages. As fiduciaries, you should understand the consequences and the impact on the plan's funded status
- A lower ERP does not mean stocks are all bad, only that the outcome may not be as favourable as anticipated
- More important, understanding both the current investment regime and the assumptions underlying the asset allocation process is crucial. Too often, this is blindly delegated to the actuary/consultant who smoothes things out with naïve assumptions over very long periods of time, thereby missing shorter term financial shocks and contribution volatility.