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# How Large is the Equity Premium Today?



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## The equity premium

- The equity premium is the expected excess return on a broad stock index over a safe bond market investment
- To measure it, we need to make choices:
  - What stock index? (I will emphasize the World index but also show results for the US and Canada)
  - What safe investment? (I will use long-term inflation-indexed bonds)
  - What starting point? (I will use current conditions)
  - What investment horizon? (I will discuss forecasting methods suitable for a 5-10 year holding period)
  - What kind of expectation? (I will use a geometric average)

## Key questions

- Do we believe that the equity premium has declined since 1950?
  - If so, then the historical mean return over-states future returns
- Do we believe in mean reversion? Price-earnings ratios are at historically high levels. Do we think they will fall?
  - If we believe in mean reversion, then we should be extremely pessimistic about stock market returns over the next five years
  - If we do not believe in mean reversion, then regression-based forecasts of the equity premium are overly pessimistic
- Corporate profits are at historical highs. Do we believe they will remain high?

## **Alternative ways to estimate the equity premium**

Two extreme approaches:

1. Take an average of historically realized excess returns.
2. Estimate the historical relationship between realized excess returns and valuation ratios. Example: regress returns on the earnings yield.

I prefer two compromise approaches:

3. Adjust historical averages to reflect the decline in market valuation ratios.
4. Predict the equity premium with valuation ratios. Use logic rather than historical statistics to determine the predictive model.

## 1. Historical average excess returns

- This gives you a high number
  - Dimson, Marsh, and Staunton (DMS, 2006) report geometric averages of 4.7% for the world, 5.5% for the US, and 4.5% for Canada over the period 1900-2005
  - The numbers are even higher in the late 20<sup>th</sup> Century
- Problem: you need a long historical sample because stock returns are noisy, but over a long period it is plausible that the equity premium changes
  - With 100 years of data and 15% standard deviation of returns per year, the standard error of the estimate is 1.5%
  - Since stock prices rise when the equity premium falls, a decline in the equity premium leads you to increase your estimate just when the true number is falling

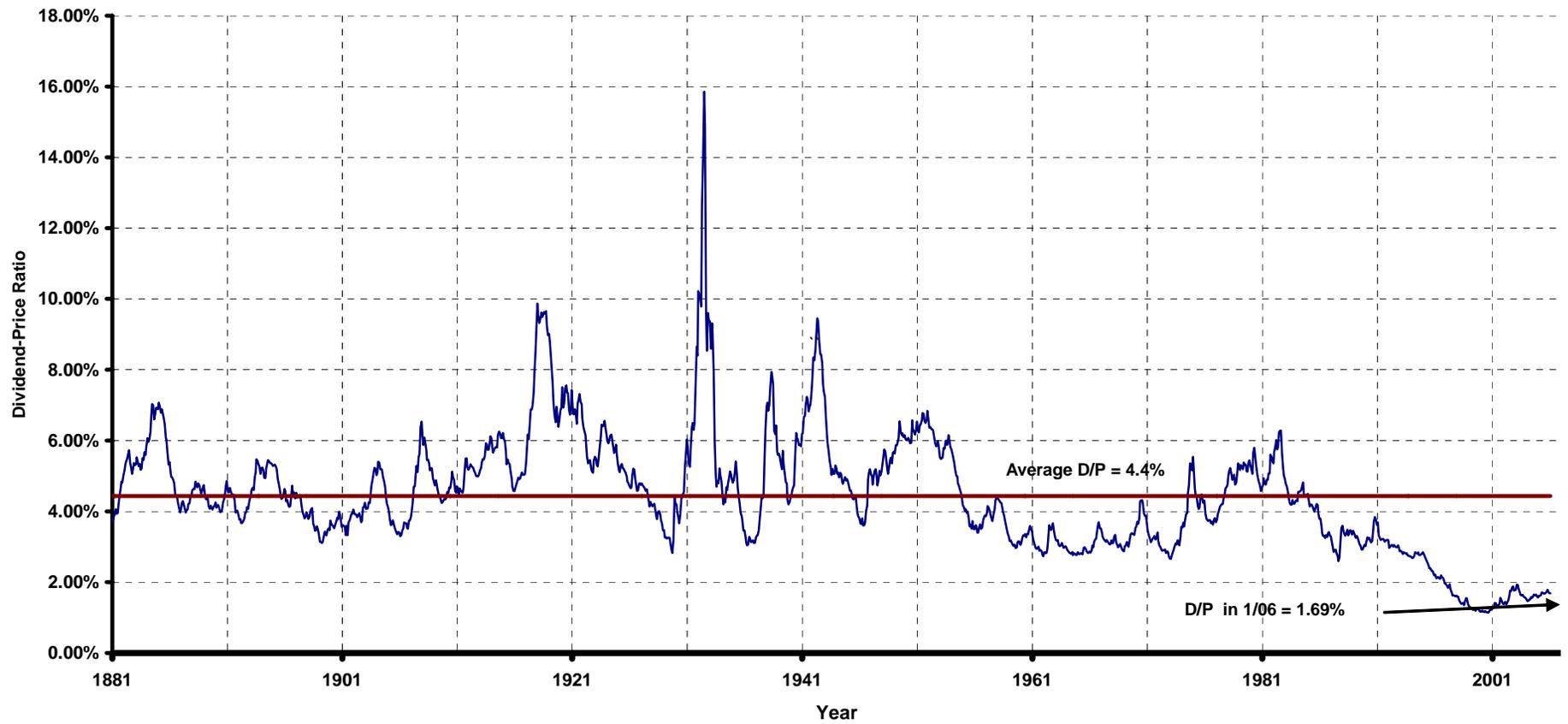
## 2. Predict the market with yields

- In the US, the dividend-price ratio (dividend yield) is close to a historic low, and the smoothed earnings-price ratio (smoothed earnings yield) is also low relative to its 20<sup>th</sup> Century average
- Regression results in US data, 1881-2006:
  - Realized Annual Premium =  $-.05 + 2.52 \times \text{Prior Dividend Yield}$
  - Realized Annual Premium =  $-.06 + 1.78 \times \text{Prior Earnings Yield}$
- This predicts very low premia!
  - World dividend yield currently 1.8% → premium is -.5%
  - World earnings yield currently 4% → premium is 1.1%

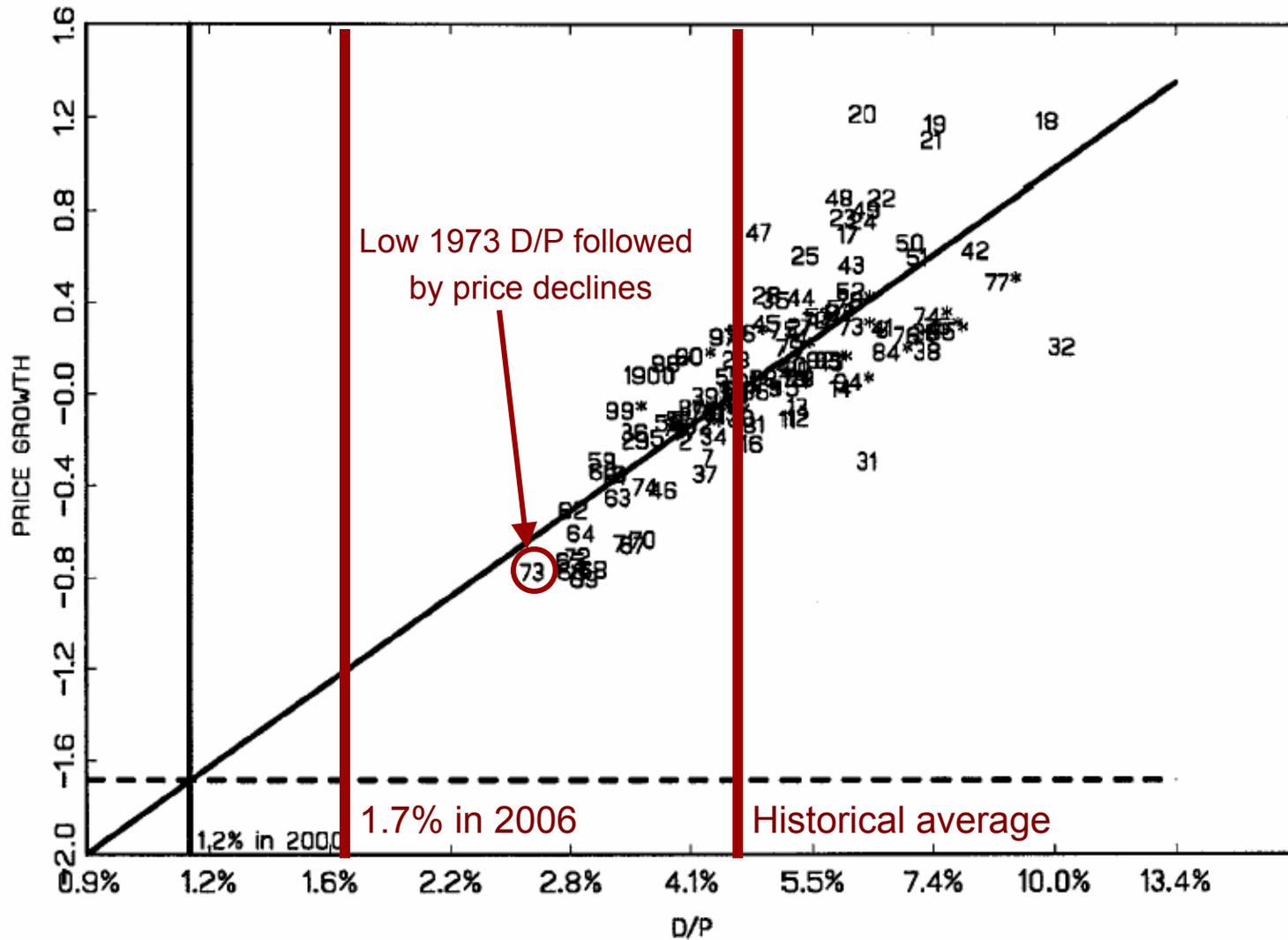
## 2. Predict the market with yields

- Extrapolating from the historical relationship between yields and subsequent returns gives a very gloomy view
- Why are the regression coefficients greater than 1?
  - Realized Annual Premium =  $-.05 + 2.52 \times \text{Prior Dividend Yield}$
  - When the dividend yield falls by 1%, the equity premium falls by 2.52%. Why is the effect so large?
- Historically, low dividend yields hurt you two ways
  - You earned low dividends
  - *Mean reversion*: dividend yields tended to rise back to historical norms through price declines
- Suppose that there has been a permanent shift in valuations, so we never return to historical norms
  - Then we get low dividends, but do not expect price declines
  - If we do not expect mean reversion, then the future is okay

S&P 500 10-Year Average Dividend/ Price



PRICE GROWTH till the next time D/P crosses its mean



## Two flawed approaches

- The equity premium may have fallen
- When the equity premium falls, the historical mean becomes unreasonably bullish
- When the equity premium falls, forecasts based on the historical relationship between returns and yields become unreasonably bearish
- What I advocate: use yields to forecast the equity premium, but do not assume mean reversion. Low dividend yields mean low dividends, but do not mean that prices will collapse

### 3. Adjusting the historical average

- DMS and Fama-French (2002) propose the following:
- Historical average returns:  
$$\text{Avg}\{\text{stock returns}\} = \text{Avg}\{\text{dividend yield}\} + \text{Avg}\{\text{price growth}\}$$
- Adjusted estimate:  
$$\text{Avg}\{\text{stock returns}\} = \text{Avg}\{\text{dividend yield}\} + \text{Avg}\{\text{earnings growth}\}$$
- What's the idea?
  - If the equity premium falls, historical price growth will be higher than in the future. Historical earnings growth will not be similarly overstated
  - Suppose that the price-earnings ratio is expected to be stable (so no mean reversion). Then going forward, average price growth equals average earnings growth
  - We estimate price growth going forward by averaging over historical earnings growth

### 3. Adjusting the historical average

- Adjustment to the 1900-2005 average returns give us a geometric equity premium of 4.0% for the world, 4.8% for the US, 3.5% for Canada
  - This adjustment lowers the historical average by about 0.7% in the US and globally, and about 1% in Canada
- We can further adjust the estimate using today's dividend yield:
  - $\text{Avg}\{\text{stock returns}\} = \{\text{Today's dividend yield}\} + \text{Avg}\{\text{earnings growth}\}$
  - This adjustment leads to a geometric equity premium of 2.5% for the world, 3.3% for the US, 2% for Canada
- The adjustments lead to lower but still sizeable equity premiums

## 4. Steady-state valuation models

- The simplest steady-state model is the Gordon growth model:  $R = D/P + G$
- That is, returns come from income and capital gains, which in steady state must equal dividend growth
- Use current  $D/P$  and an estimate of  $G$  to infer  $R$
- The problem with this is that US firms have shifted from dividends to share repurchases, which has altered  $G$  in a way that is hard to estimate
- Campbell and Thompson (2006) find that an earnings-based approach works better

## 4. Steady-state valuation models

- Use two facts:
  - $D/P = (D/E)(E/P)$
  - $G = (1-D/E) \text{ ROE}$ , where ROE is accounting return on equity
- Get an earnings-based formula:
  - $R = (D/E)(E/P) + (1-D/E) \text{ ROE}$
- The rate of return is a weighted average of the earnings yield and profitability, where the payout ratio is the weight on the earnings yield
- In practice, you need to smooth earnings, ROE, and payout ratio to eliminate short-run cyclical noise
- Finally, to get an equity premium number you must subtract an estimate of the real interest rate

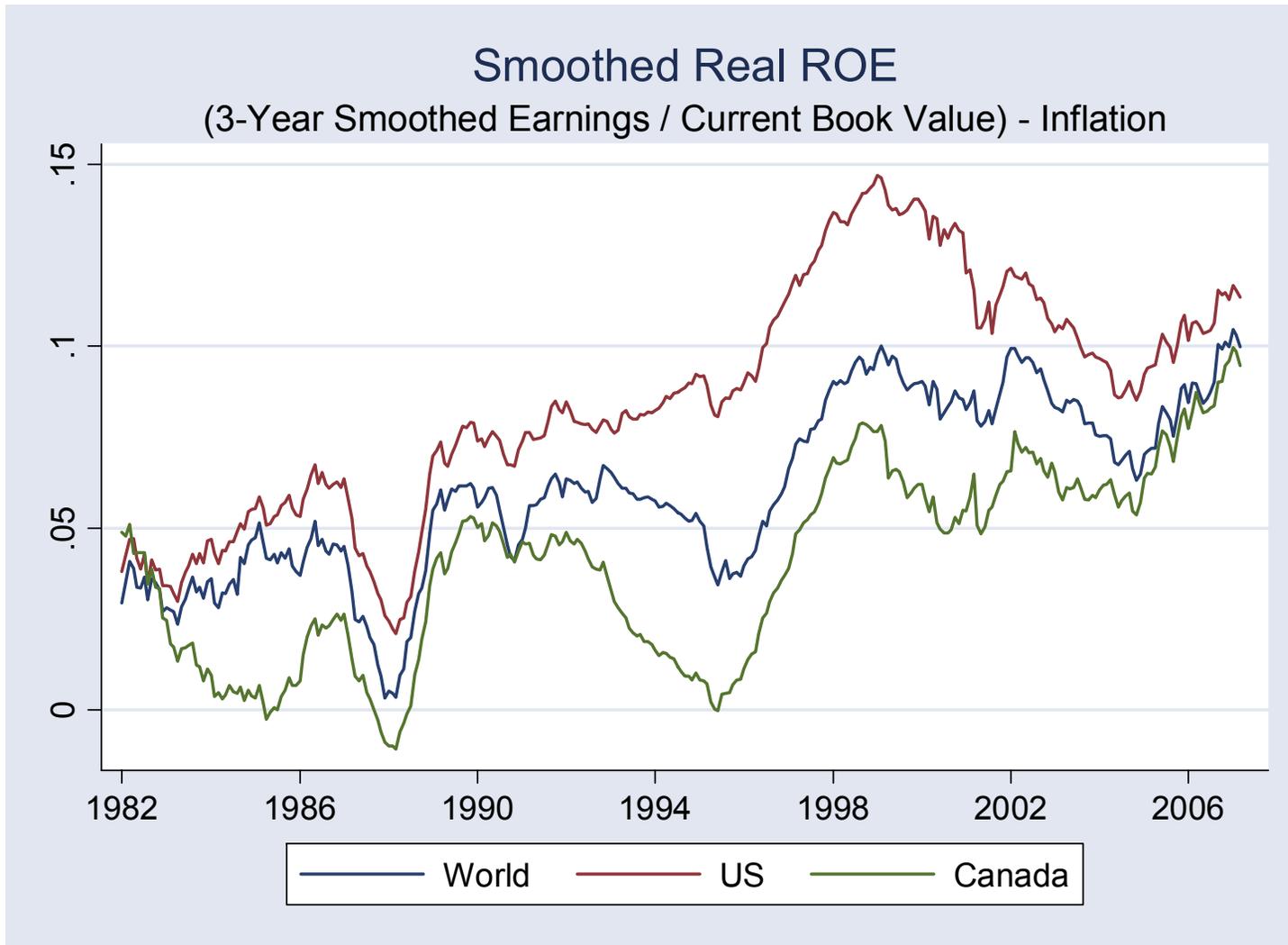
## 4. Steady-state valuation models

- Steady-state approach vs. regression
  - Assume that  $ROE = E/P$ . The steady-state prediction is  $R = E/P$
  - Recall the regression results:  
 $R = -.06 + 1.78 \times E/P$
  - The steady state approach over-rides the regression coefficients of  $-.06$  and  $1.78$  with  $0$  and  $1$ .
- The steady-state approach uses logic rather than historical statistics to determine the relationship between valuation and future stock returns
- The steady-state approach assumes no mean reversion
- Campbell and Thompson (2006) find that in historical data the steady-state approach leads to more accurate stock forecasts than regression-based approaches

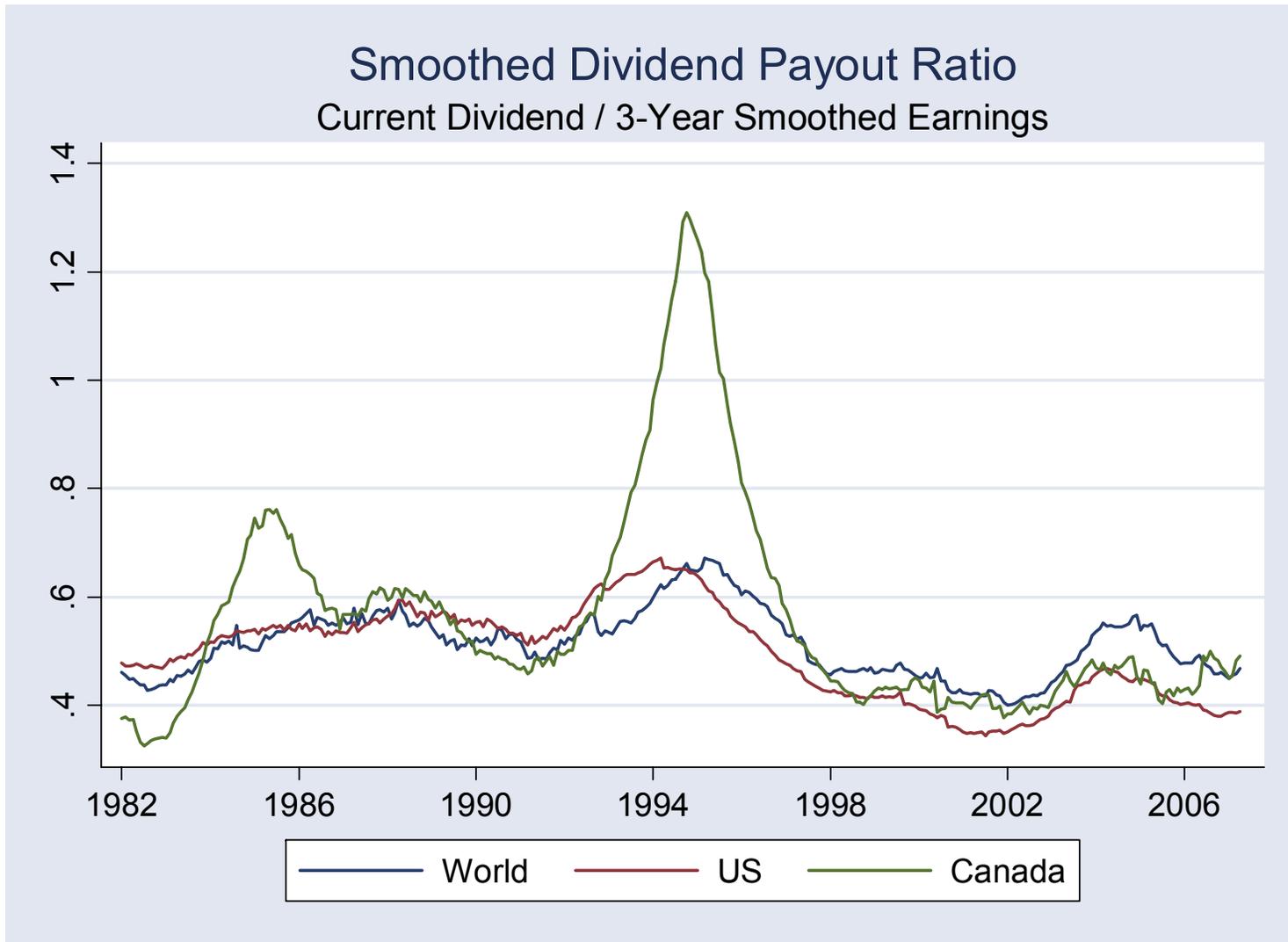
# Earnings yield



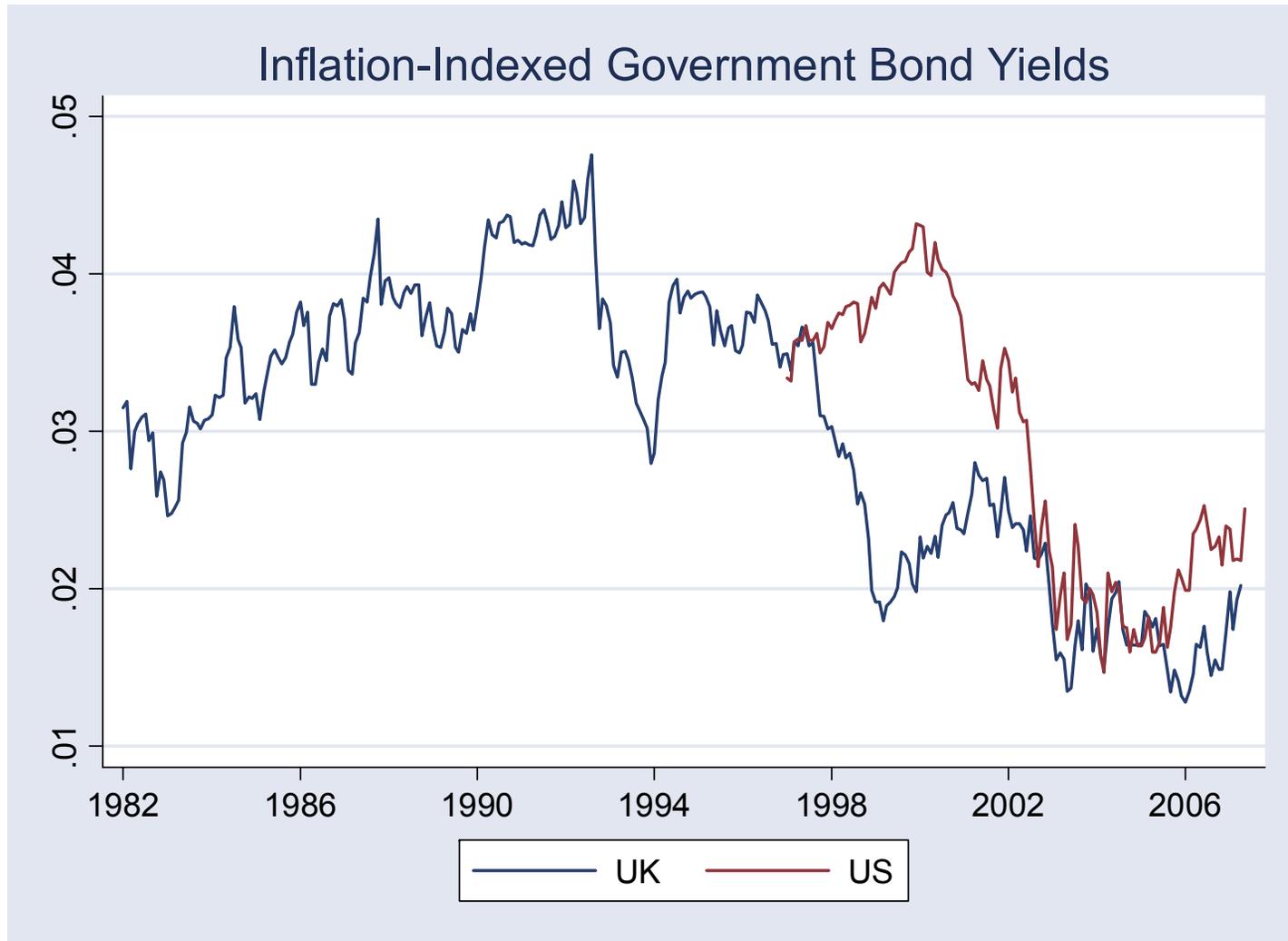
# Profitability



# Payout ratio



# Real interest rate



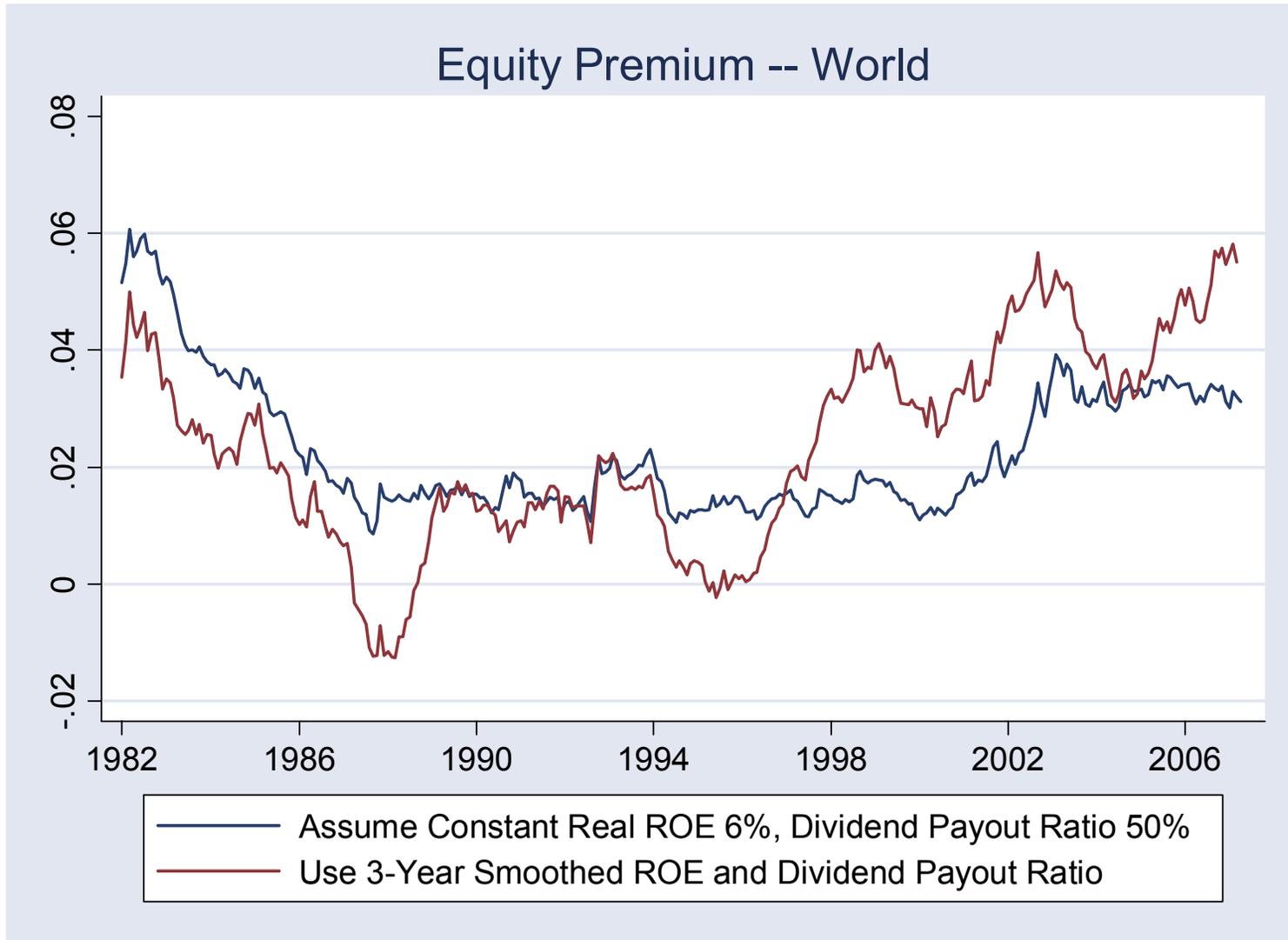
## The equity premium today

### Point estimates Implied equity premium, 03/30/2007

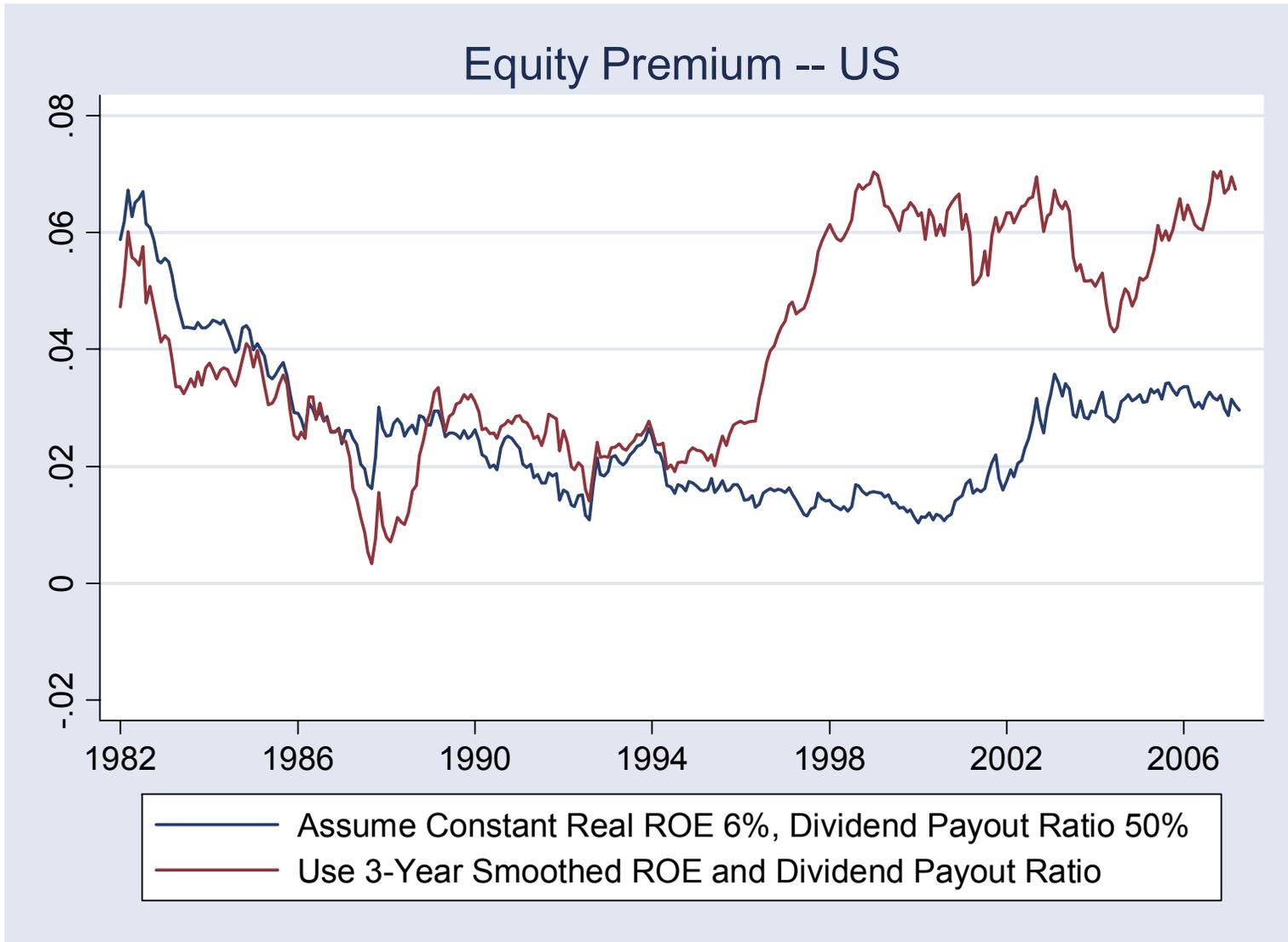
- Method 1: Assume constant real ROE of 6%, dividend payout ratio of 50%
- Method 2: Use 3-year smoothed ROE and dividend payout ratio
- **Weighted average: 75% weight on Method 1, 25% weight on Method 2**

	Method 1	Method 2	Weighted Average
World	3.20%	5.51%	3.77%
US	3.05%	6.75%	3.97%
Canada	3.02%	4.89%	3.49%

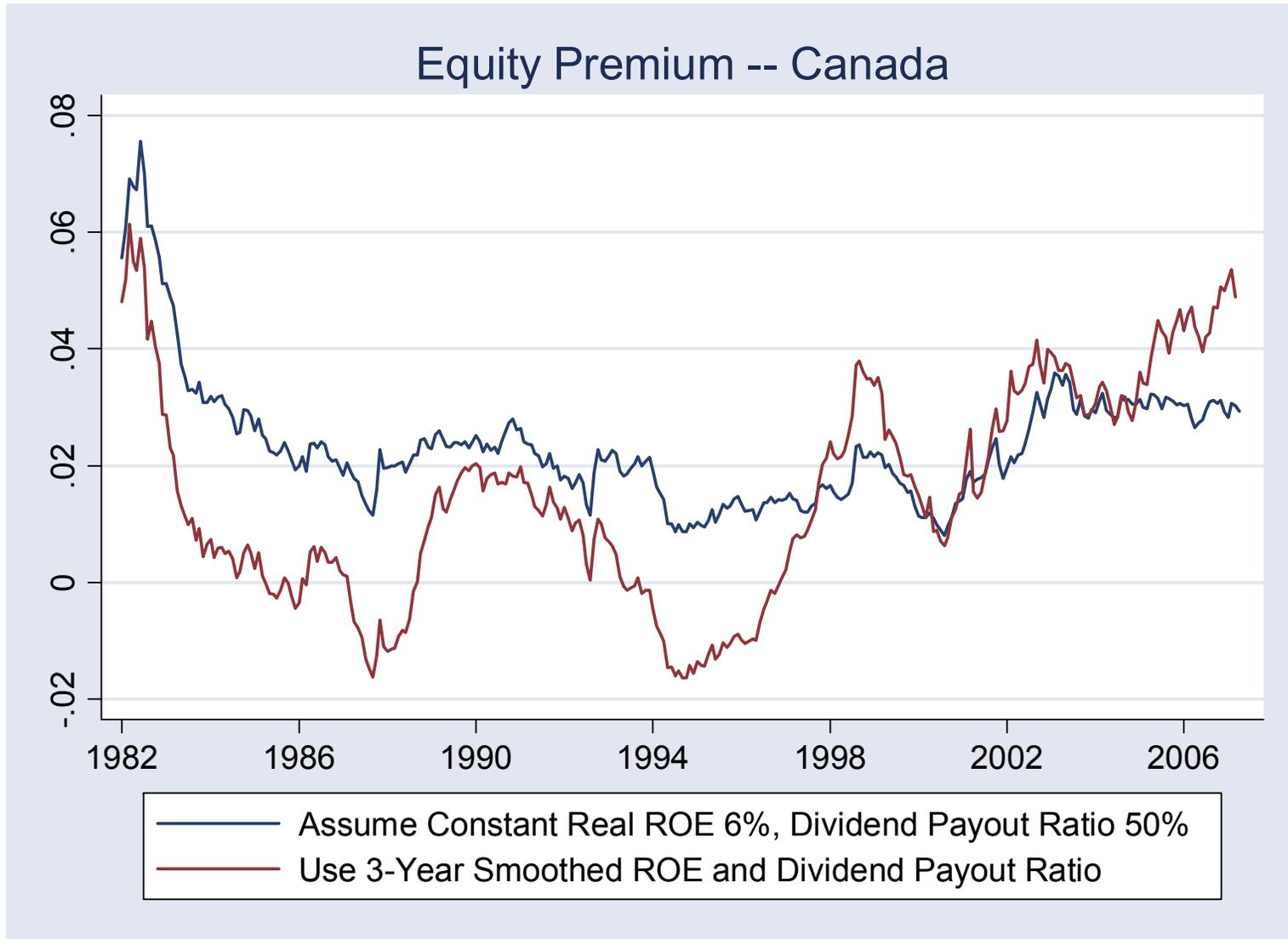
# Implied world equity premium



## Implied US equity premium



## Implied Canada equity premium



## The world equity premium today

- The steady-state approach gives results that are highly sensitive to one's beliefs about corporate profitability
- If recent profitability is sustainable, with a high reinvestment rate, then the world equity premium is 5.51%
- If profitability and reinvestment rates return to their late 20<sup>th</sup> Century averages, then the world equity premium is only 3.20%
- A reasonable compromise number is 3.8%
- This is almost one percentage point lower than the 1900-2005 historical average reported by DMS
- Note that the equity premium is this high only because long-term real interest rates are low

## The equity premium in the US and Canada

- The US numbers are even more sensitive to the assumption about profitability. In Canada the recent profit boom is smaller, so profit sustainability is less important
- In the US, the compromise number of 4% is 1.5% below the 1900-2005 historical average
- In Canada, the compromise number of 3.5% is 1% below the 1900-2005 historical average
- Thus in the US and Canada, we should not expect the future to be as good as the past
- Reality check: Graham and Harvey (2007) survey CFO's of US corporations and report a premium of 3.4%

## Conclusion

- Sensible methods for estimating the equity premium give
  - Positive, significant numbers
  - World forecasts are 3.8% today versus 4.7% historically
  - If corporate profitability reverts to long run averages, the world premium falls to 3.2%.
  - Absolute returns will be lower still: real interest rates are about 2% today versus 3.5% in the 1990s
- If we believe in mean reversion, we become very pessimistic. In the past, rising earnings yields have come from falling prices
- If equities have been permanently revalued, then we are much less pessimistic