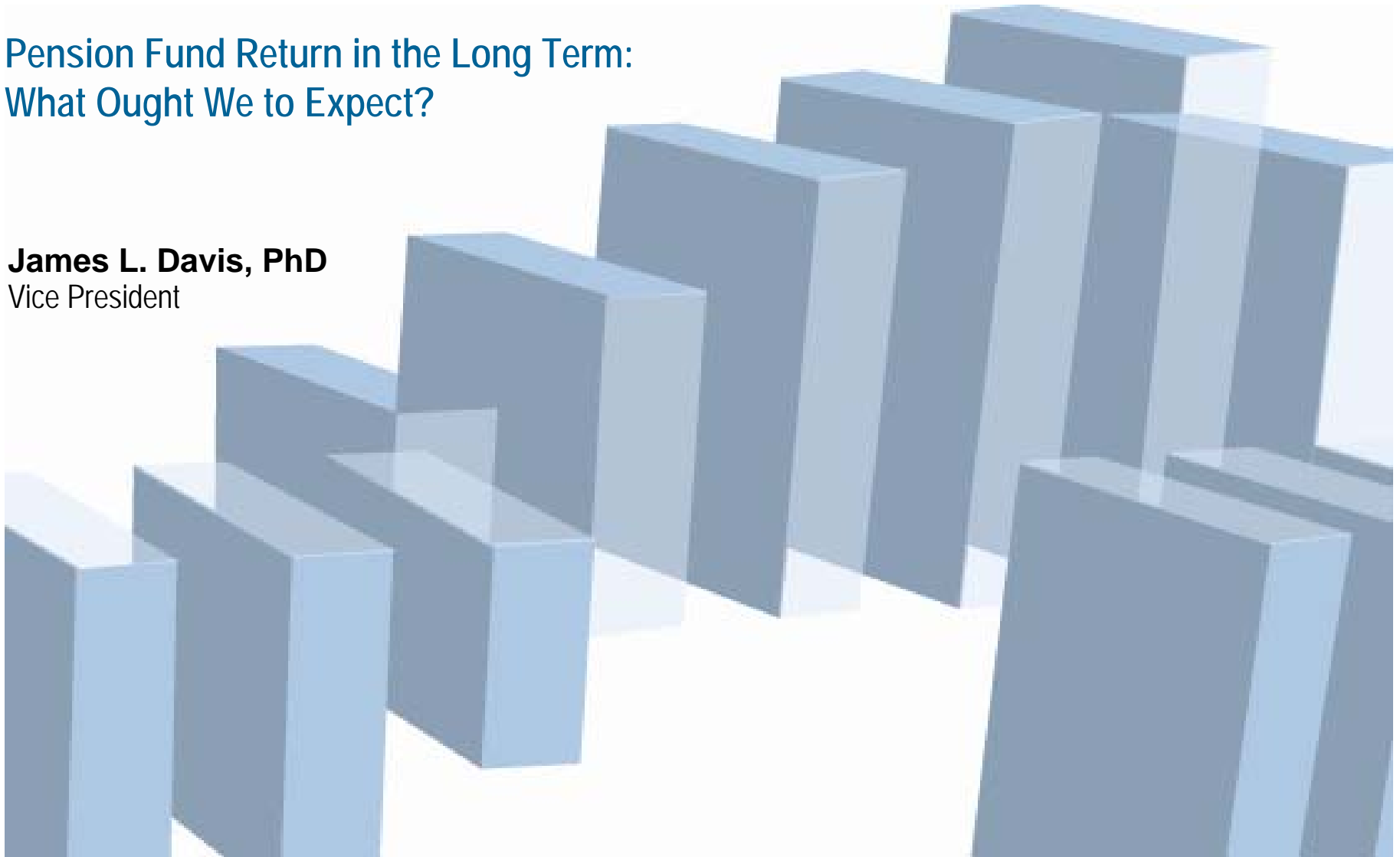


## Pension Fund Return in the Long Term: What Ought We to Expect?

**James L. Davis, PhD**  
Vice President



Expected portfolio returns are linear combinations of asset class expected returns:

$$E(R_p) = \sum w_i E(R_i)$$

*Given portfolio weights*, the problem reduces to the estimation of asset class expected returns.  
For this presentation, the focus is on equities.

## A Disclaimer

Estimates of expected equity returns are inherently imprecise.

- Equity returns are noisy random variables.
- Ignoring this lack of precision is a costly mistake.

## Guiding Principle

Expected equity return and cost of equity capital are two sides of the same issue.

- Securities with similar risk characteristics should have similar expected returns.
- The same applies to countries.
- This simplifies the analysis, since in the long run we can focus on equilibrium relations.

## Methodological Issues

- Nominal, real, or premium?
- Conditional or unconditional?
- Emerging/developed dichotomy?
- Statistical precision and sample size.
- Survival bias.

## Unconditional Estimates: Historical Averages

To increase statistical precision, researchers like to use long time series of clean, uninterrupted data.

- This has typically focused attention on the US.
- The historical average for the US is probably an upwardly biased estimate.
  - Survival bias.
  - Declining cost of capital (Fama and French, 2000).
- Alternative: Include other countries and live with the associated data issues.

Conditional estimates require selection of a *model* and an *information set*:

## The Model

Many researchers base their estimates on the dividend discount model:

$$P_0 = \frac{E(D_1)}{R - E(g)} \Rightarrow E(R) = \frac{E(D_1)}{P_0} + E(g)$$

Conditional estimates require selection of a *model* and an *information set*:

## The Information Set

How should we estimate the real growth rate  $g$ ?

- Historical dividend growth.
- Historical earnings growth.
- Historical GDP growth.
- Historical capital appreciation.

The dividend discount model probably gives a downward biased estimate:

- There are other ways to get cash to shareholders.
- Not all firms pay dividends.
- $D_0 / P_0 < D_1 / P_0$ , on average.
- Offsetting these is the creation of new businesses.

Call these the “DDM bias” issues.

## Data Sources

US stock returns	→	CRSP
Non-US stock returns	→	MSCI, Jorion (2003)
Inflation	→	CRSP, BEA
Dividend growth	→	BEA
Earnings growth	→	BEA
GDP growth	→	BEA
Dividend yields	→	Wilshire Associates

## Unconditional Estimates of Real Equity Returns

Description	Estimate	Biases and Concerns
Average real US return, 1926-2005	8.9%	Survival, cost of capital change.
Average real US return less ME/BE appreciation, 1926-2005	7.9%	Survival.
Average MSCI Global, 1970-2005	7.2%	Relatively short sample.
Average emerging-developed return difference, 1921-1996	1.2%	Definition of emerging/developed.

## Conditional Estimates: Dividend Discount Model

$D_0 / P_0$  for the US market is currently about 1.8%.

<u>Real Growth Estimator</u>	<u>E(g)</u>	<u>E(R)</u>	<u>Biases and Concerns</u>
Real dividend growth, 1930-2004	3.6%	5.4%	DDM bias.
Real earnings growth, 1930-2004 (geometric average)	3.3%	5.1%	DDM bias; geometric avg. is biased.
Real GDP growth, 1930-2004	3.6%	5.4%	DDM bias.
Developed country capital appreciation, 1921-1996	4.2%	6.0%	Part of DDM bias; definition of emerging/developed.

## Summing Up

- Unconditional estimates of real equity returns for developed markets are in the range of 7% to 8%.
- Conditional estimates are mostly in the range of 5% to 6%.
- An unbiased estimate may be a weighted combination of the two.
- No estimate is immune to bias.
- It seems appropriate to add about 1% to 1.2% for emerging markets.