

P/E's and Pension Fund Ratios

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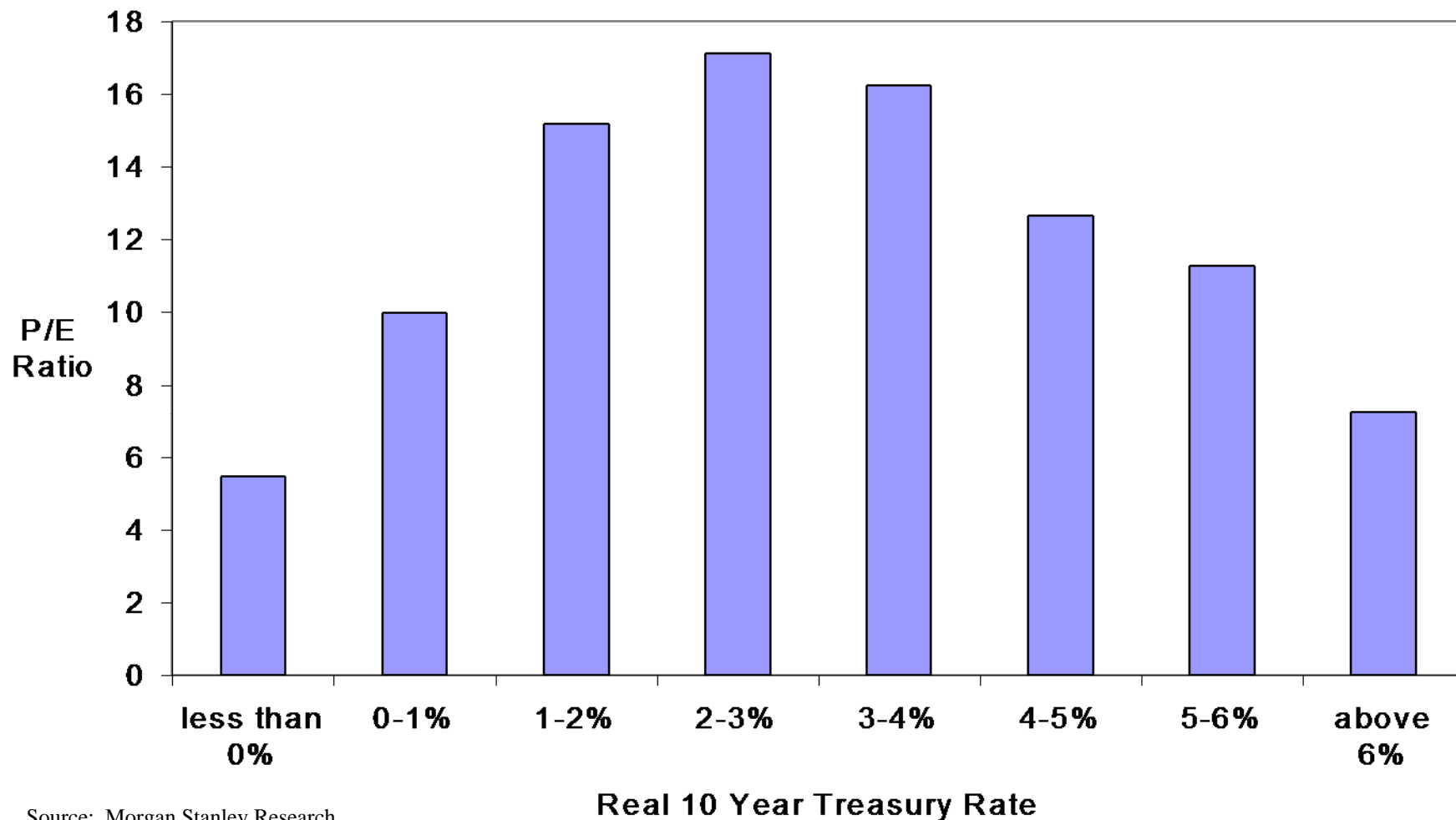
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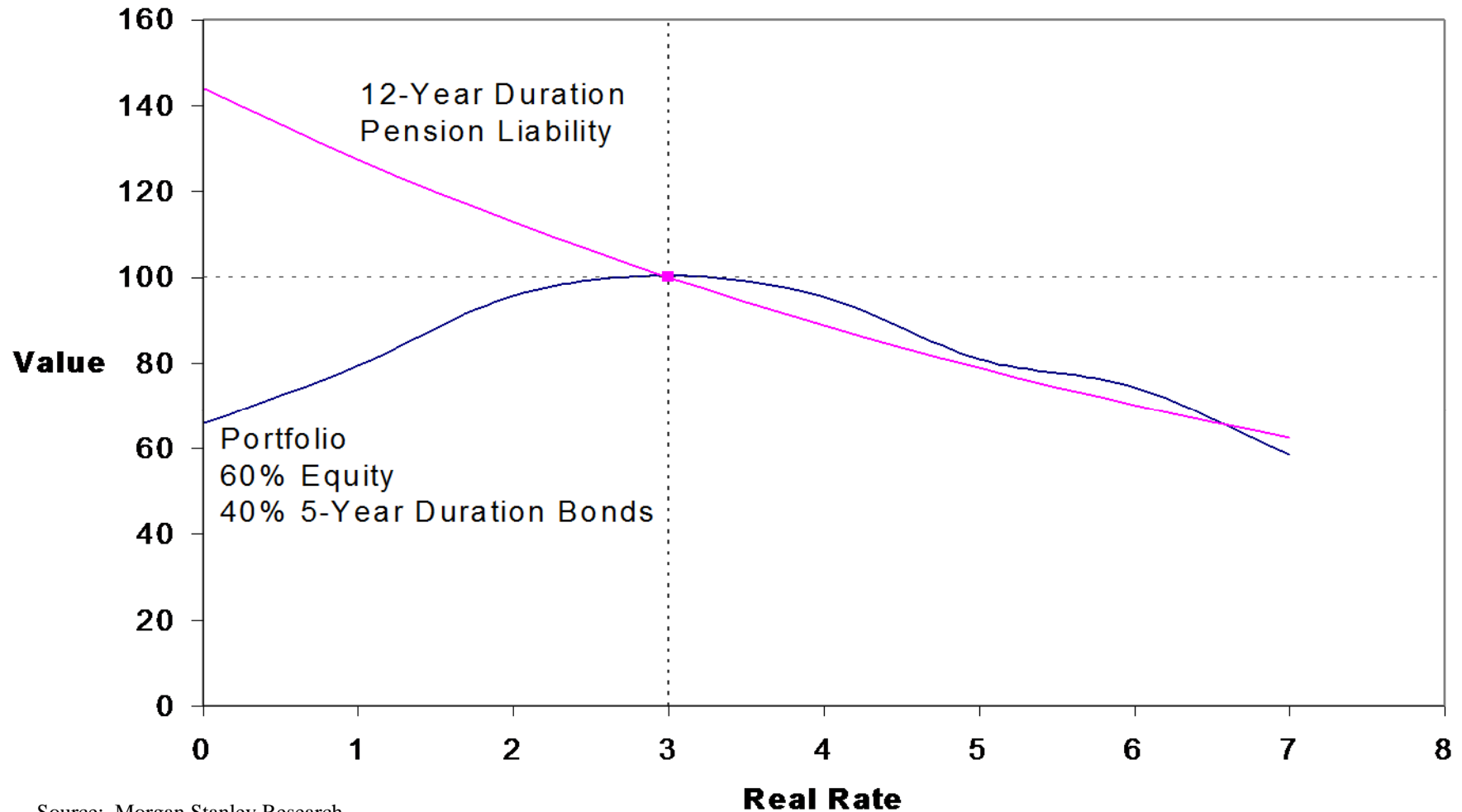
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Histogram of Real Rate vs. P/E Ratios 1978-2004



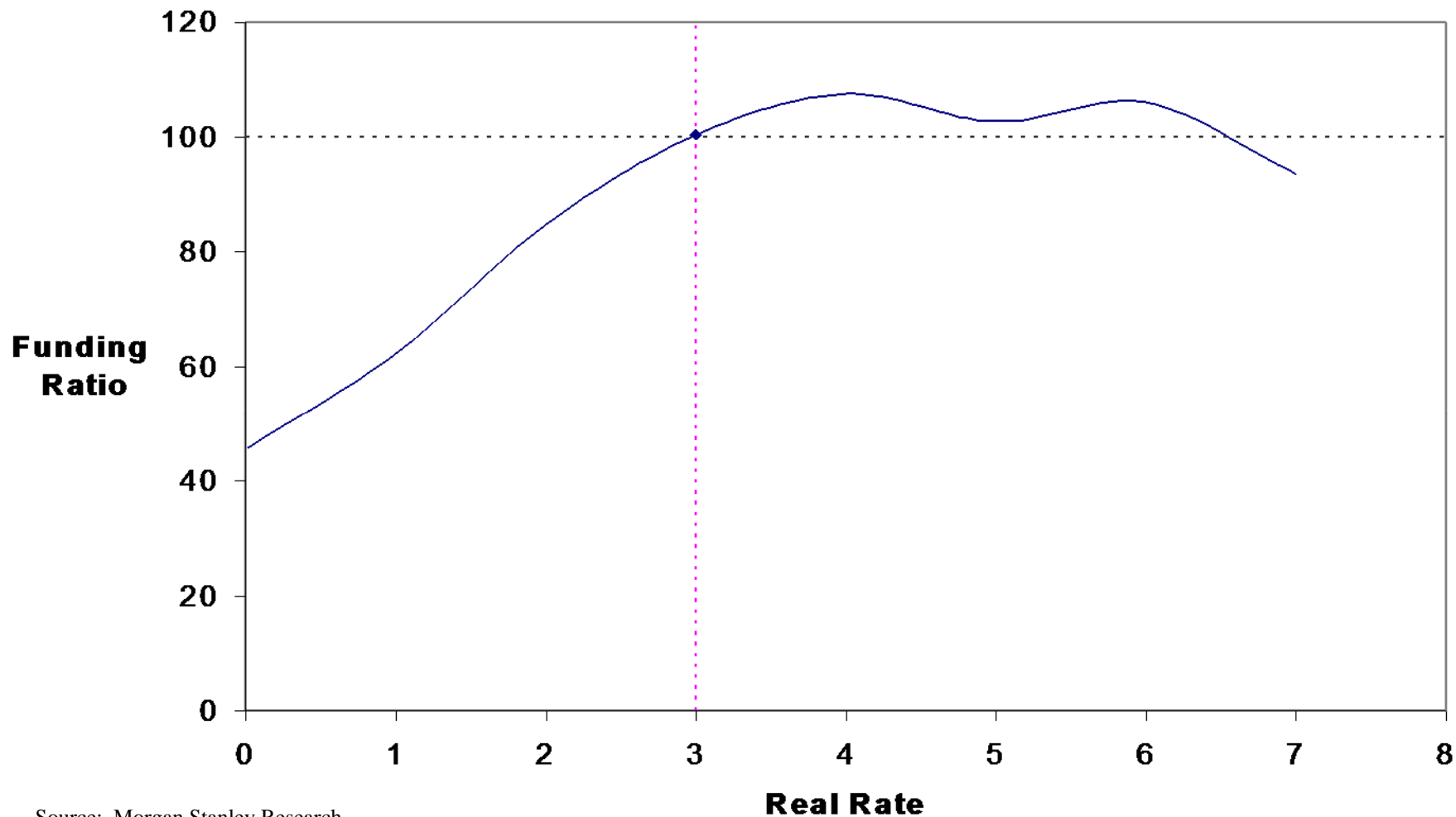
Source: Morgan Stanley Research

Effect of Real Rates on Portfolio and Liability Values



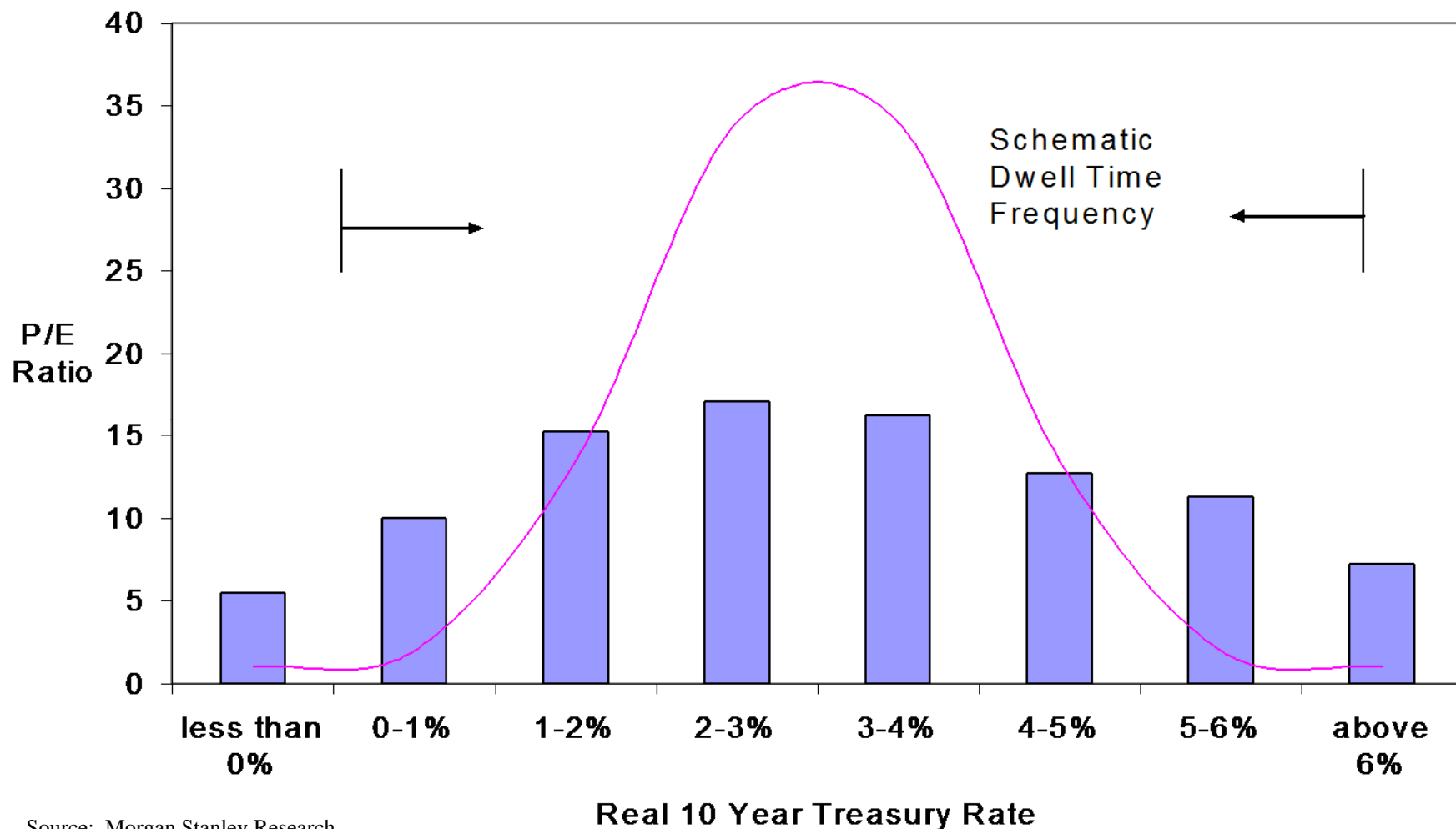
Source: Morgan Stanley Research

Effect of Real Rates on Funding Ratio



Source: Morgan Stanley Research

Sweet Spot for Real Rates



Source: Morgan Stanley Research

Franchise Value Model

$$P = TV + FV$$

$$TV = e \frac{E_c}{k}$$

$$FV = \left(\frac{R - k}{rk} \right) \left(\frac{g}{k - g} \right) E_c$$

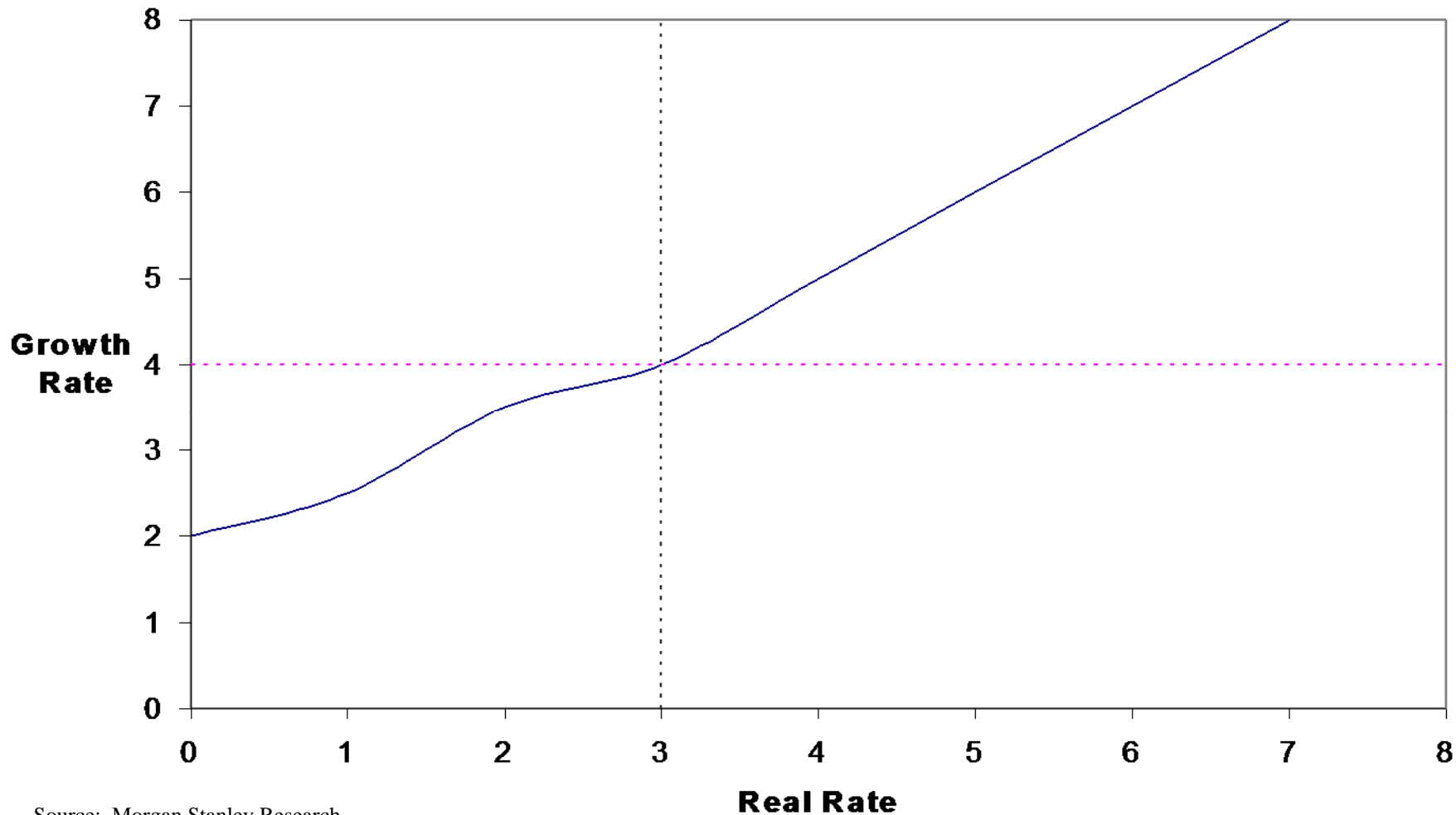
Source: Morgan Stanley Research

Summary of Representative Values

	Very Low Rates 0-1%	Sweet Spot 2-3%	Very High Rates 6% +
Financial/Economic Environment	Dismal	Balanced	Overheated
Equity Risk Premium	High (6%)	Lowest (4%)	High (5%)
Discount Rate/Cost of Capital	Medium (7%)	Medium (7%)	High (11%)
Real Growth Rate	Very Low (2.5%)	Good/Steady (4%)	Too Much (7%)
New Investment Profitability	Good When Available (6%)	Good (6%)	Squeezed (2%)
Sustainability of Current Earnings	Fair (.4)	Fair (.4)	Good (.7)
Franchise Value Term	Low (4.8)	High (11.4)	Low (3.2)
Tangible Value Term	Fair (5.7)	Fair (5.7)	Fair (6.4)
Theoretical P/E	Low (10.5)	Peak (17.1)	Low (9.6)
Probability of Occurrence	Low	High	Low
Persistence	Hopefully Brief	Sustainable	Almost Surely Brief

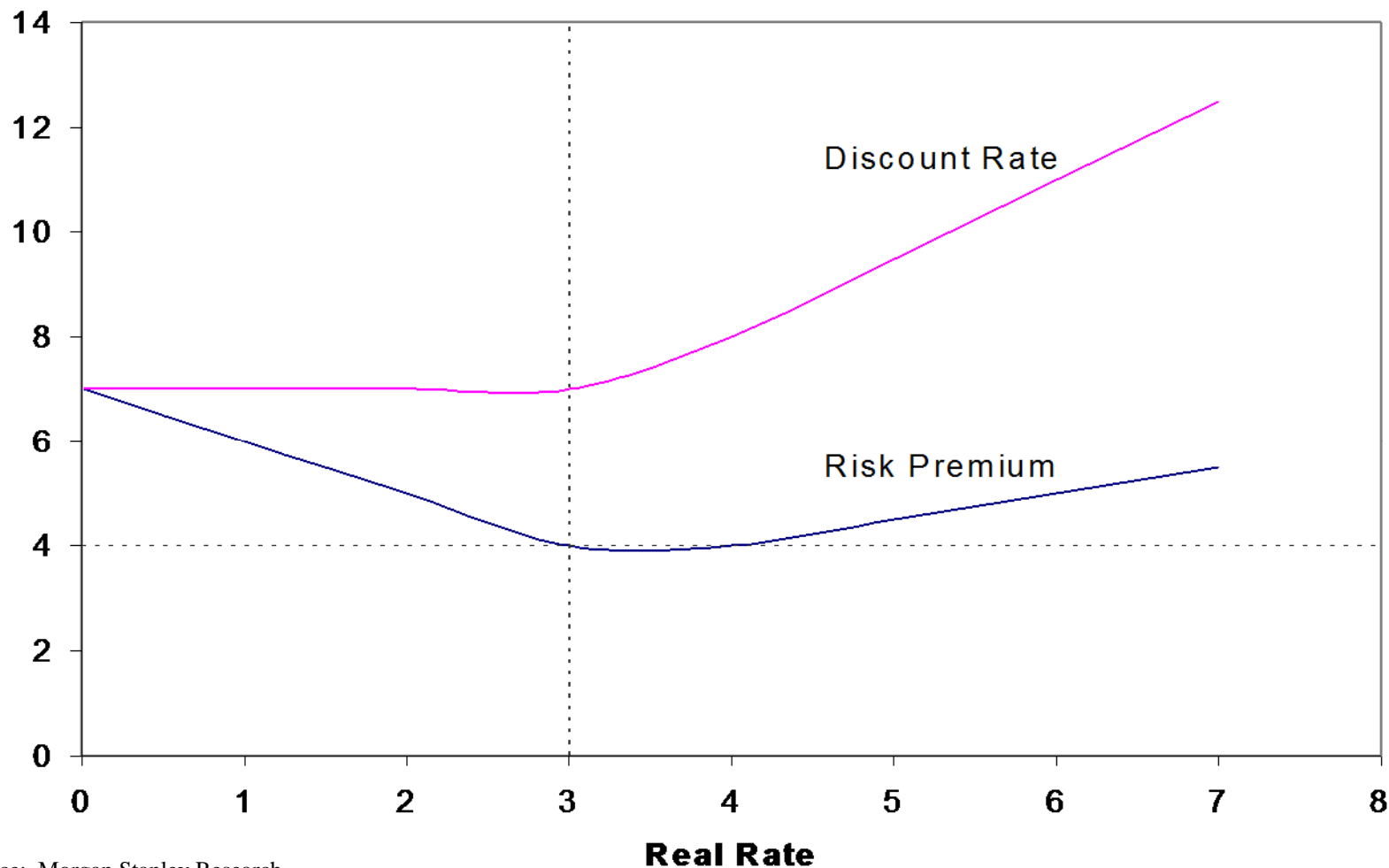
Source: Morgan Stanley Research

Growth as a Function of Real Rates



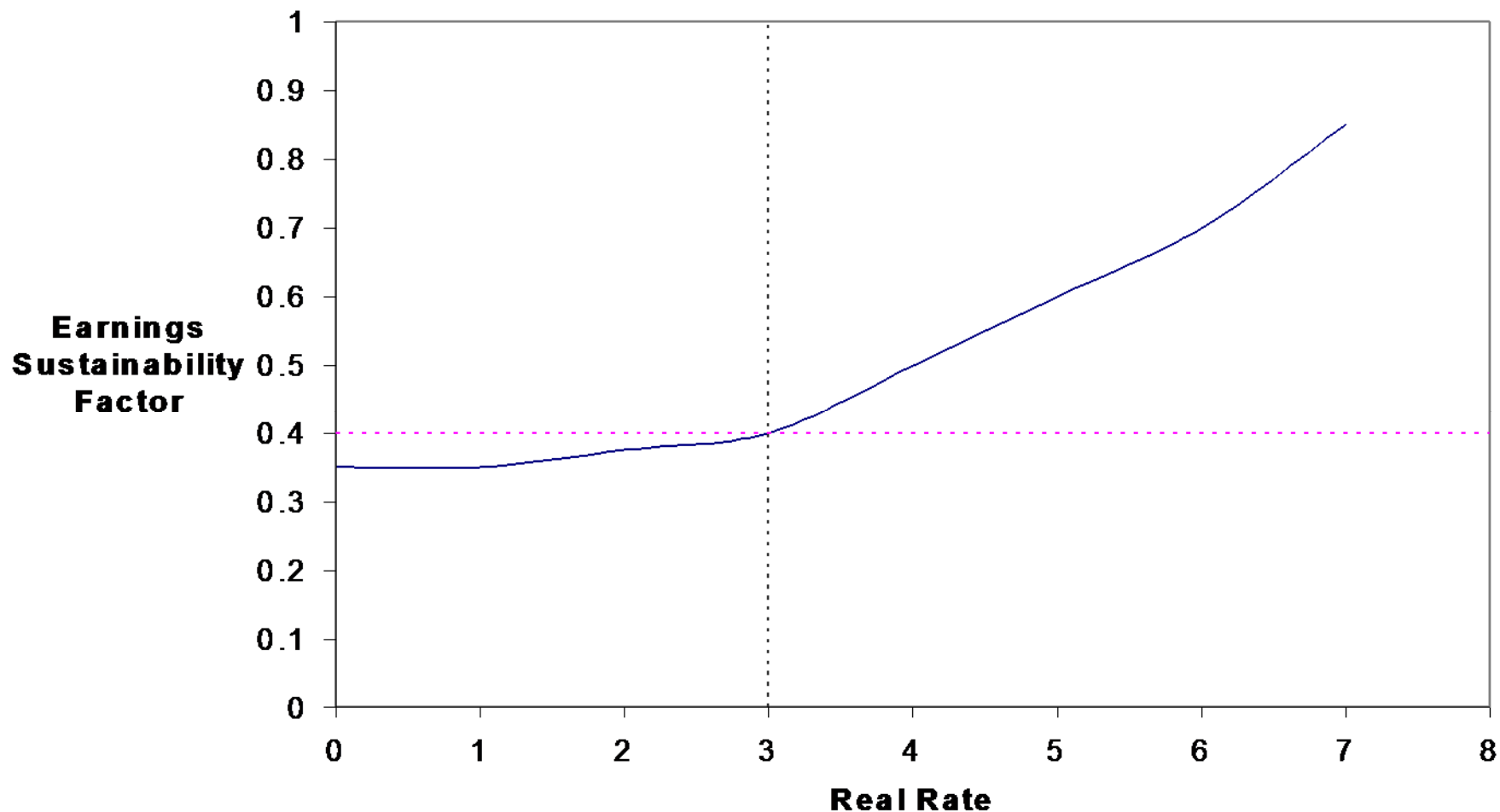
Source: Morgan Stanley Research

Risk Premium and Discount Rates



Source: Morgan Stanley Research

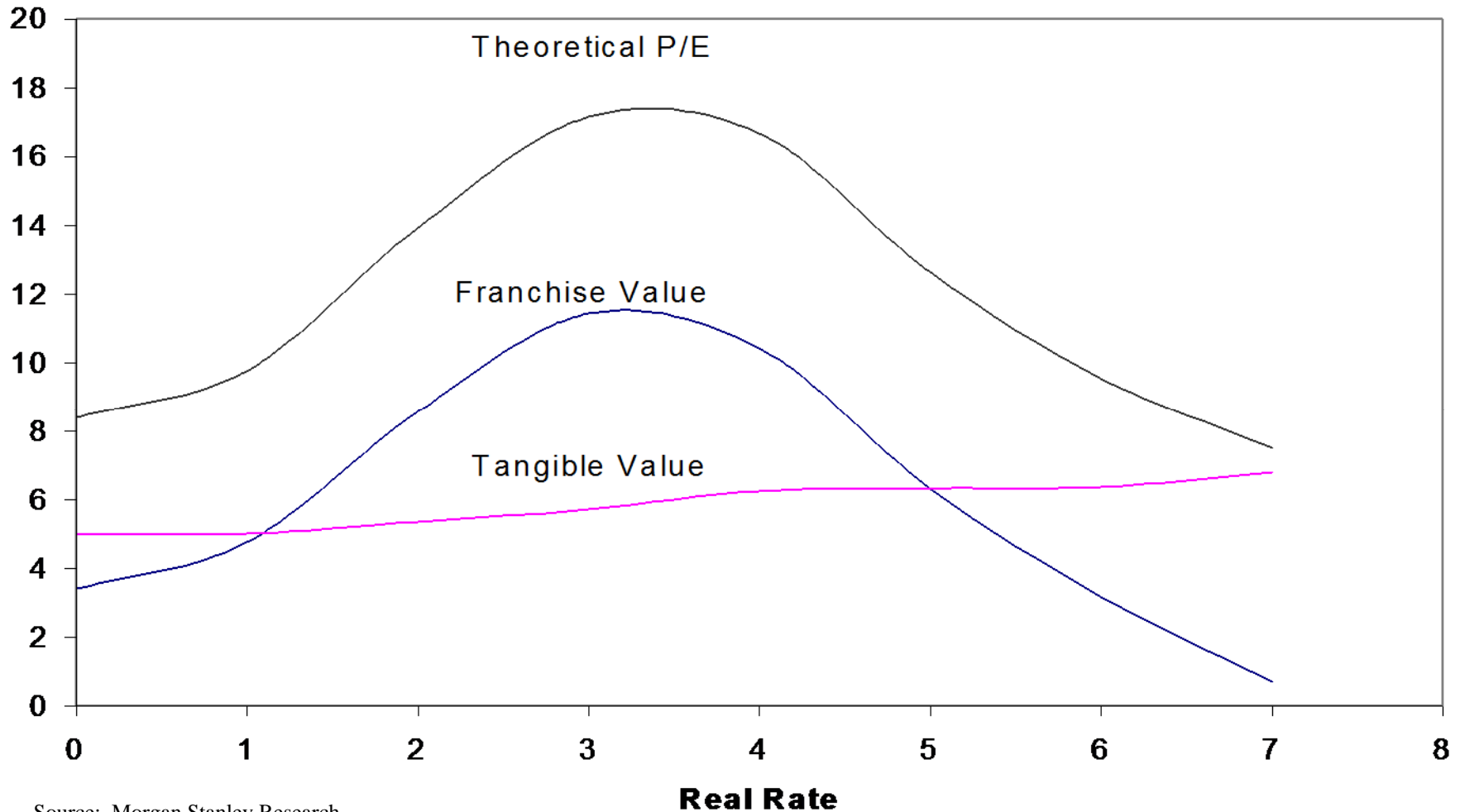
Earnings Sustainability Factor vs. Real Rates



Source: Morgan Stanley Research

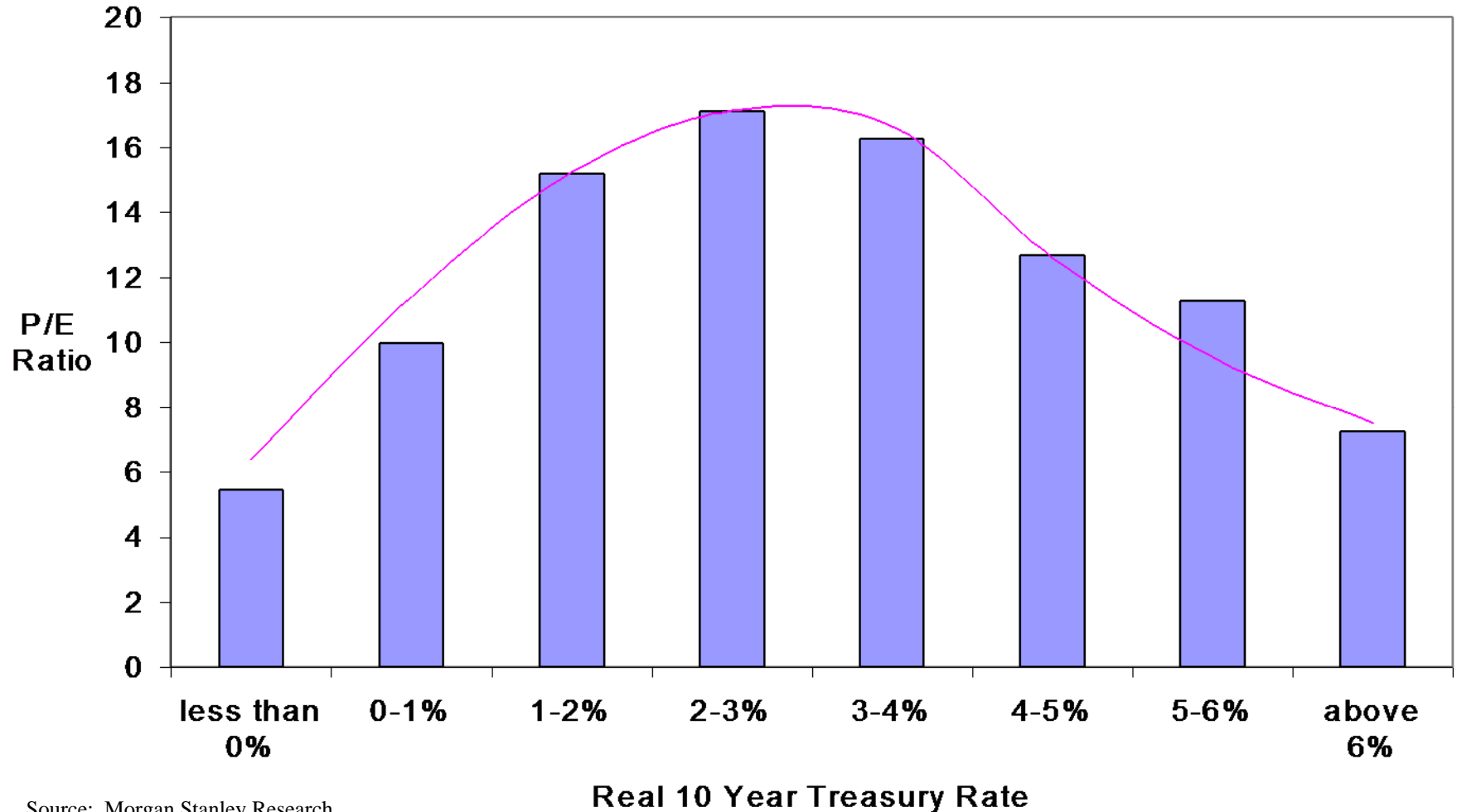
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Theoretical P/E as Sum of FV and TV



Source: Morgan Stanley Research

Theoretical P/E vs. Actual P/E



Source: Morgan Stanley Research

Summary of Representative Values

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Probability of Occurrence	Low	High	Low
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Source: Morgan Stanley Research

The Discount Rate with Inflation Effects

Natural Nominal = $\text{Min} \{ \text{Natural Real} + \text{Inflation}, 0 \}$

Market Nominal = $\text{Min} \{ \text{Natural Nominal} + \text{Intervention}, 0 \}$

Market Real = $\text{Market Nominal} - \text{Inflation}$

Real Discount = $\text{Market Real} + \text{Risk Premium}$

Source: Morgan Stanley Research

Inside the Discount Rate

<u>Natural</u> <u>Real</u>	<u>+</u>	<u>Expected</u> <u>Inflation</u>	<u>=</u>	<u>Natural</u> <u>Nominal</u>	<u>+</u>	<u>Intervention</u>	<u>=</u>	<u>Nominal</u> <u>Market</u>	<u>Real</u> <u>Market</u>	<u>+</u>	<u>Risk</u> <u>Premium</u>	<u>=</u>	<u>Real</u> <u>Discount</u>
4.0	+	2.5	=	6.5	+	0.5	=	7.0					
	=	2.5						+ 7.0	=	4.5	+	4.0	= 8.5
1.0	+	0.0	=	1.0	+	-1.0	=	0.0					
	=	0.0						+ 0.0	=	0.0	+	6.0	= 6.0

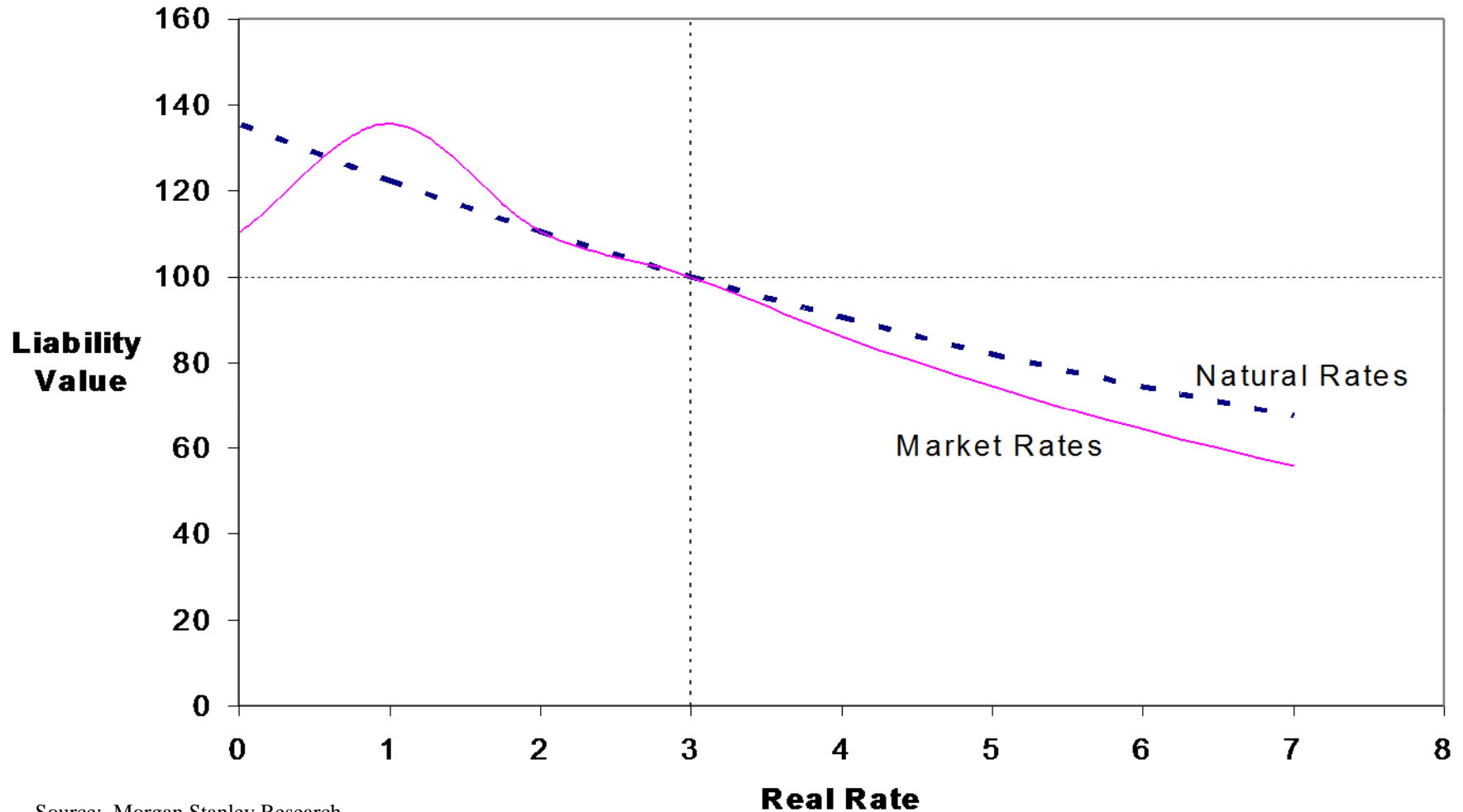
Source: Morgan Stanley Research

Inside the Discount Rate

Natural Real	Expected Inflation	Natural Nominal	Intervention	Nominal Market	Real Market	Risk Premium	Real Discount
0.0	-2.0	-2.0	-2.0	0.0	2.0	7.0	9.0
1.0	0.0	1.0	-1.0	0.0	0.0	6.0	6.0
2.0	1.5	3.5	0.0	3.5	2.0	5.0	7.0
3.0	2.5	5.5	0.0	5.5	3.0	4.0	7.0
4.0	2.5	6.5	0.5	7.0	4.5	4.0	8.5
5.0	3.0	8.0	1.0	9.0	6.0	4.5	10.5
6.0	3.5	9.5	1.5	11.0	7.5	5.0	12.5
7.0	4.0	11.0	2.0	13.0	9.0	5.5	14.5

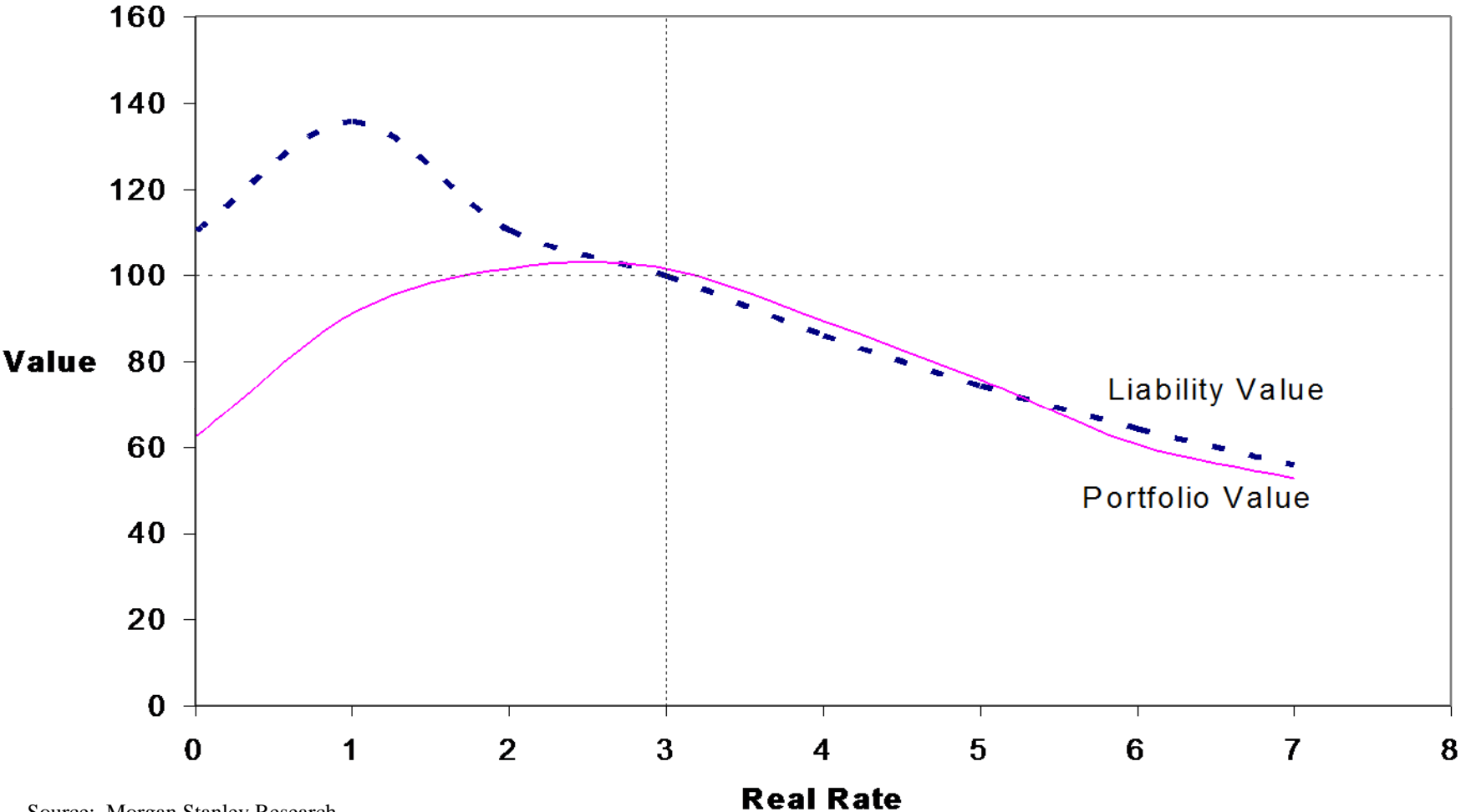
Source: Morgan Stanley Research

Liability Values: Natural vs. Market Real Rates



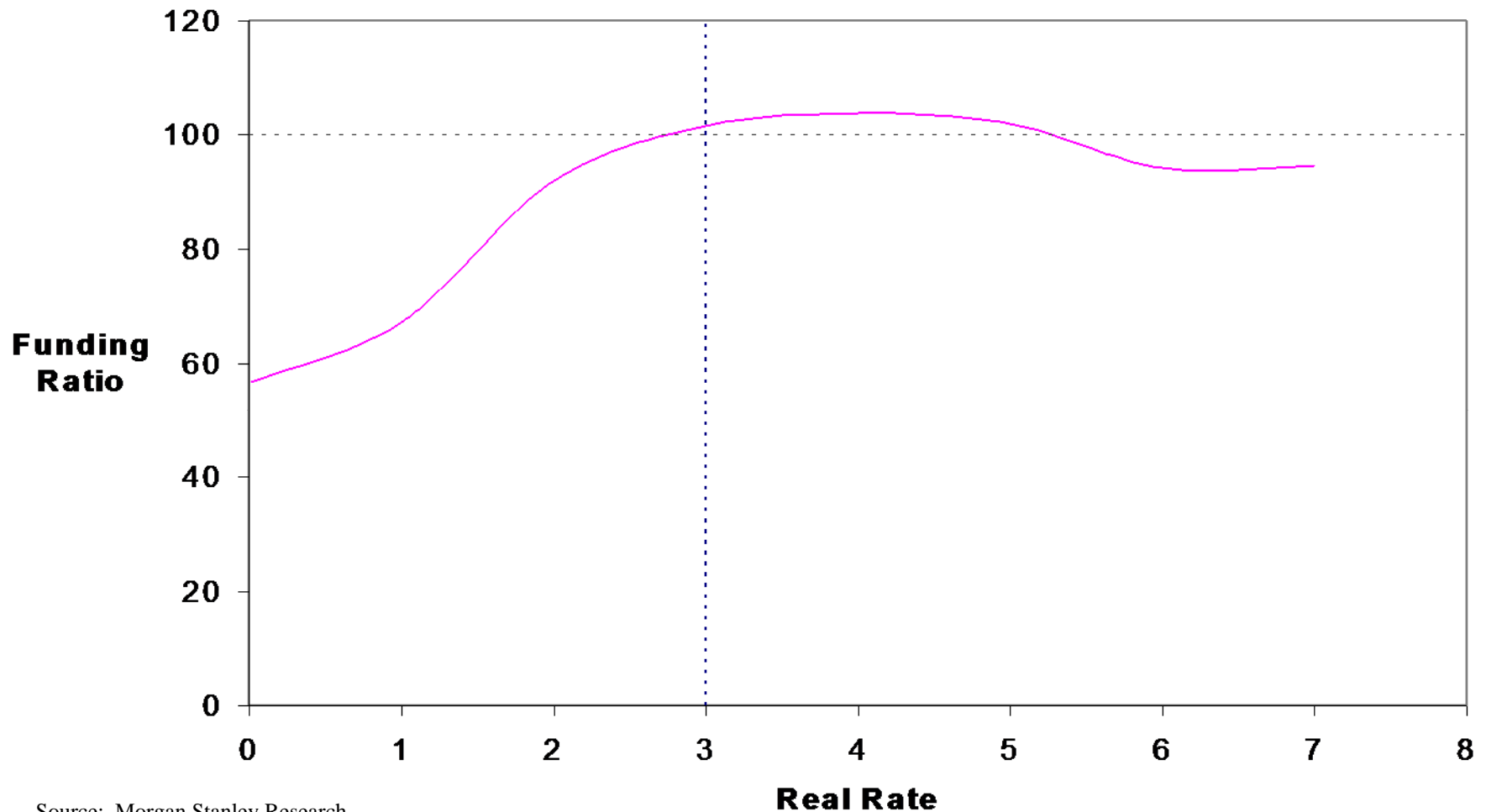
Source: Morgan Stanley Research

Effect of Market Real Rates on Portfolio and Liability Values



Source: Morgan Stanley Research

Effect of Market Real Rates on Funding Ratio



Source: Morgan Stanley Research

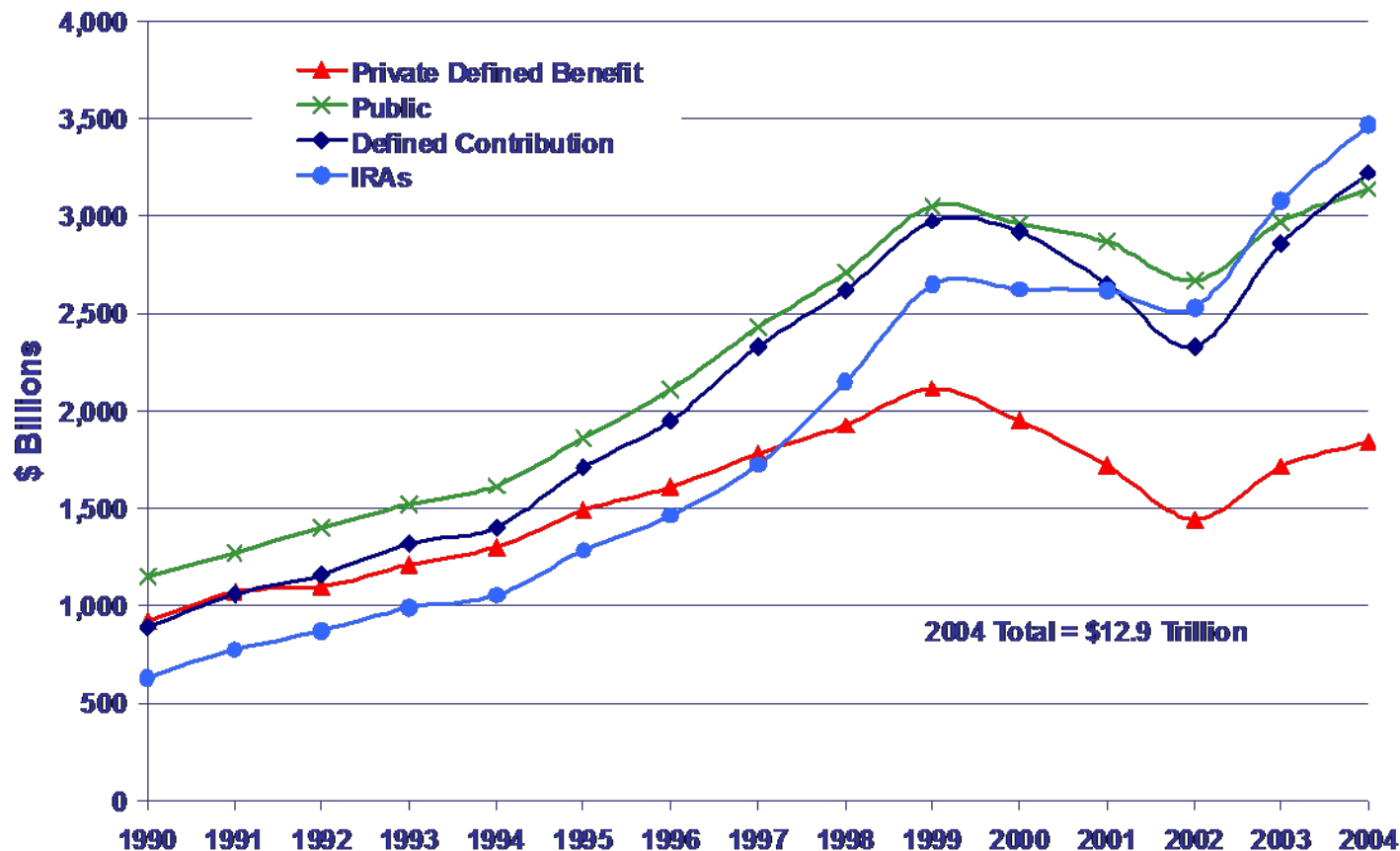
Inside the Discount Rate: Stagflation Scenarios

Natural Real	Expected Inflation	Natural Nominal	Intervention	Nominal Market	Real Market	Risk Premium	Real Discount
1.0	5.0	6.0	-2.0	4.0	-1.0	8.0	7.0
1.0	5.0	6.0	2.0	8.0	3.0	5.0	8.0

Source: Morgan Stanley Research

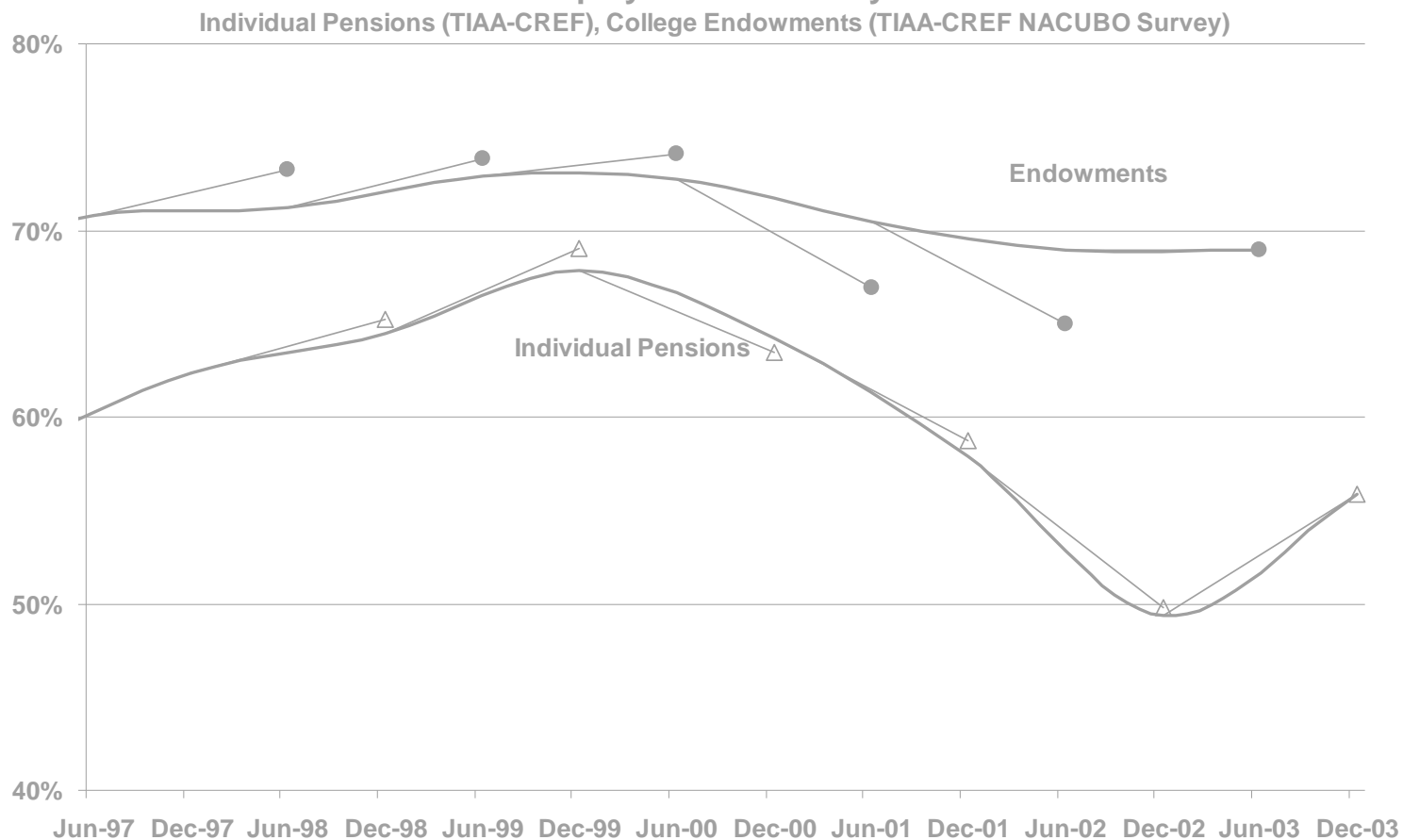
Major Forms of Retirement Investment

Source: Investment Company Institute



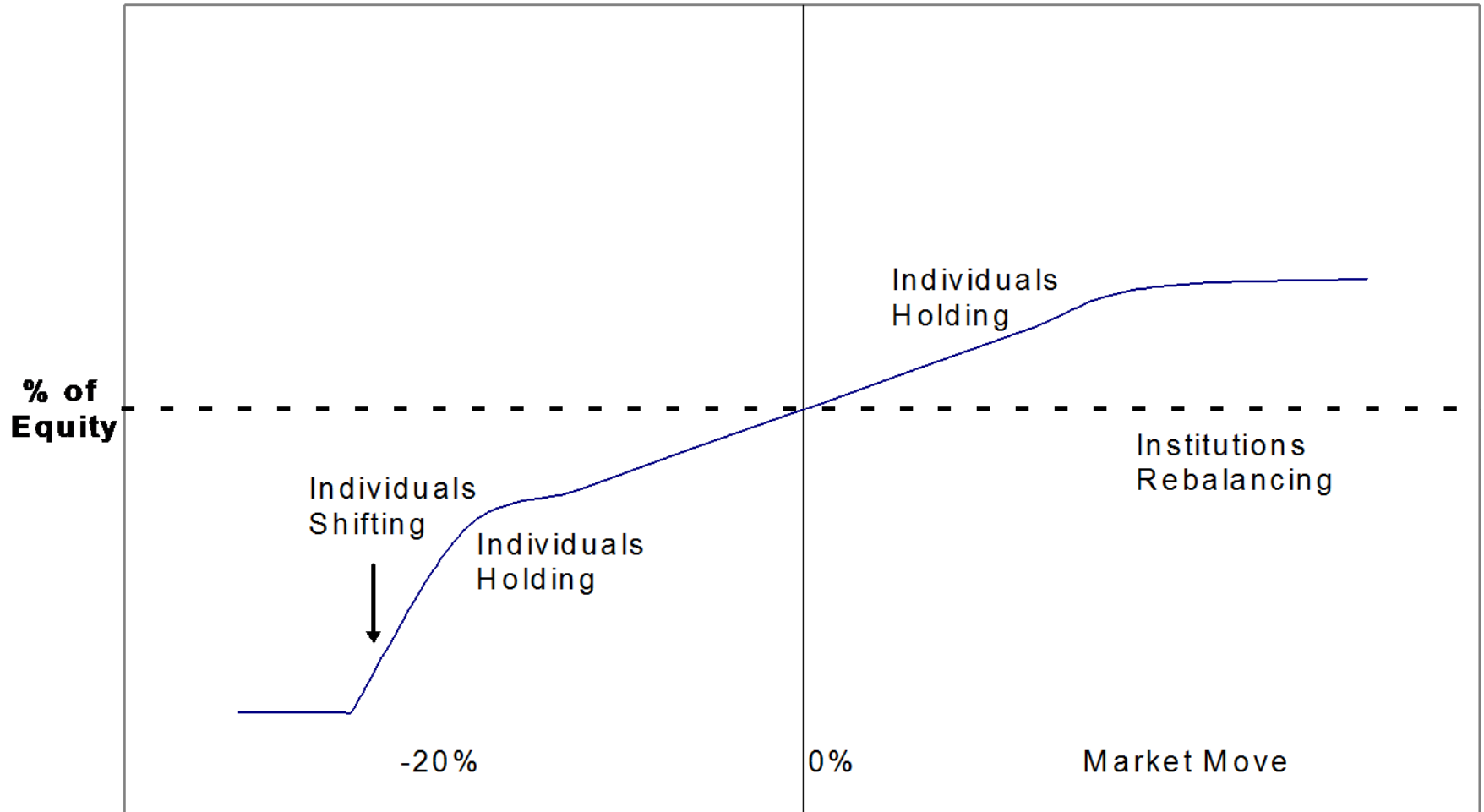
Source: TIAA-CREF

Exhibit 5 -- Actual versus Projected Equity Allocations Equity and Bond Only



Source: TIAA-CREF

Rebalancing and Shifting



Source: Morgan Stanley Research

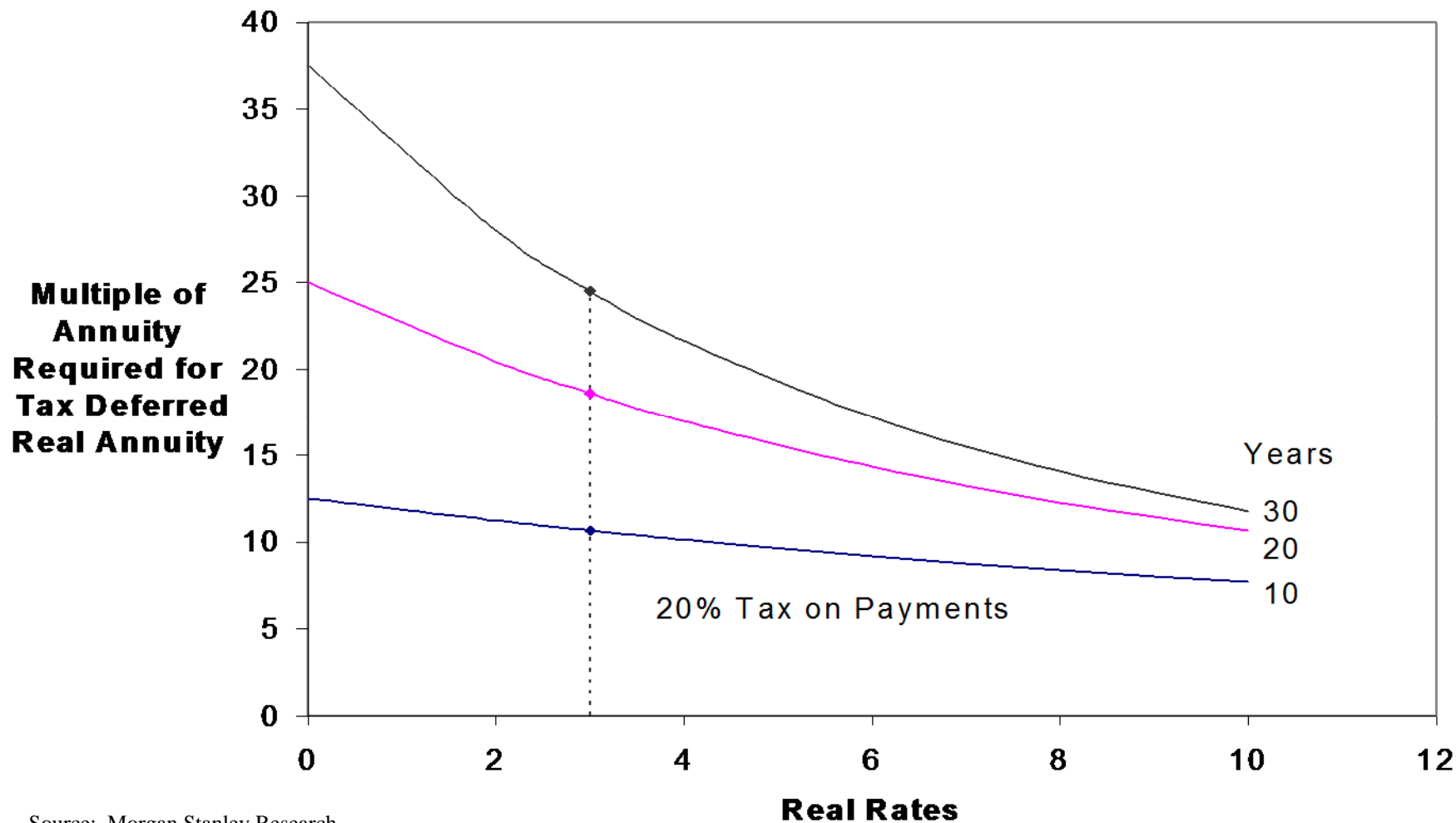
Tax-Deferred “Illusions”

There is a temptation to overestimate the retirement comfort that can be derived from a seemingly large amount of funds within a tax-deferred account when subject to:

- Taxes
- Inflation
- Low-interest rates
- Longer-than-expected longevity
- Life contingencies

Source: Morgan Stanley Research

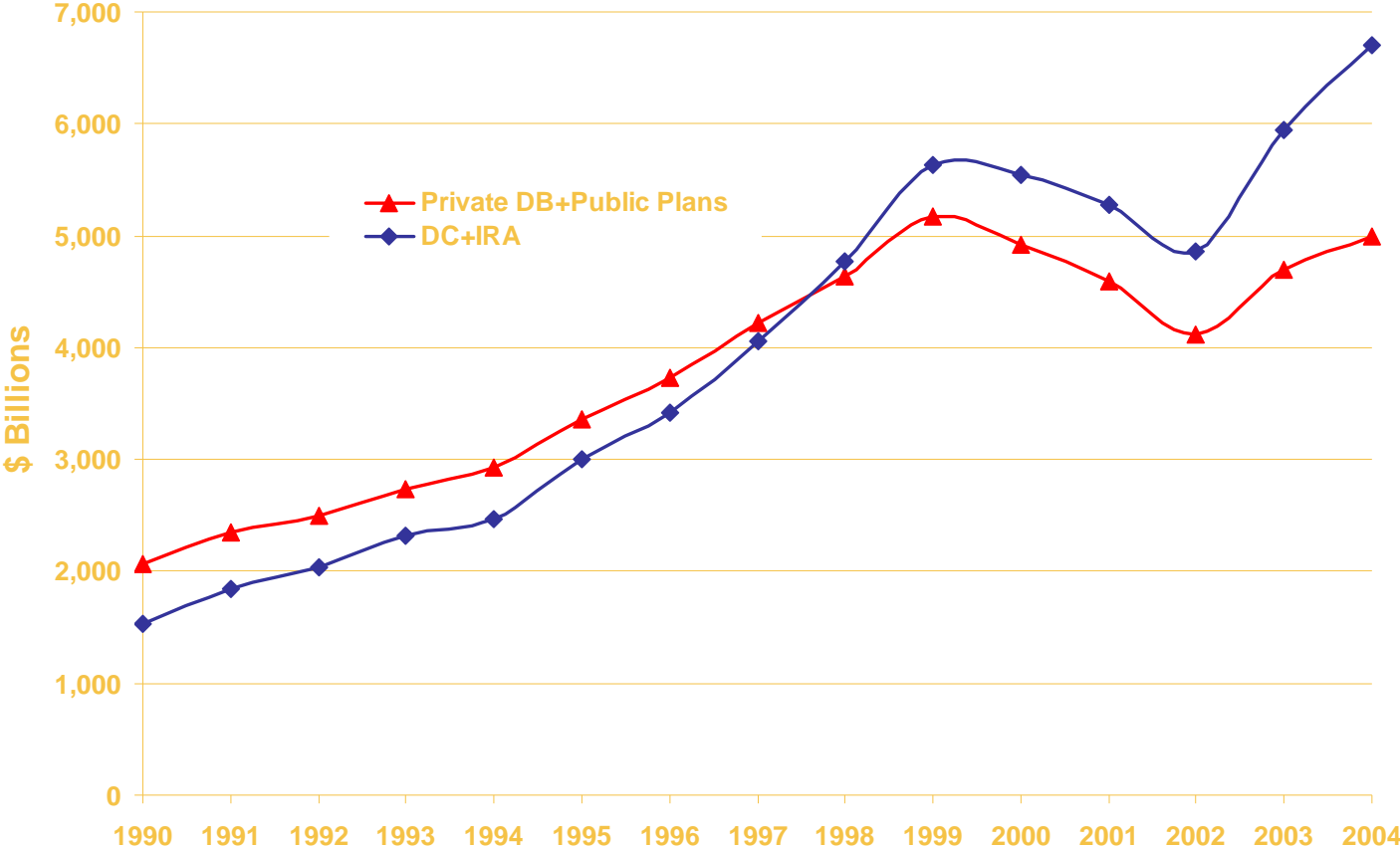
Annuity Shock



Source: Morgan Stanley Research

DC+IRA and Private DB+Public Plan Markets

Source: Investment Company Institute



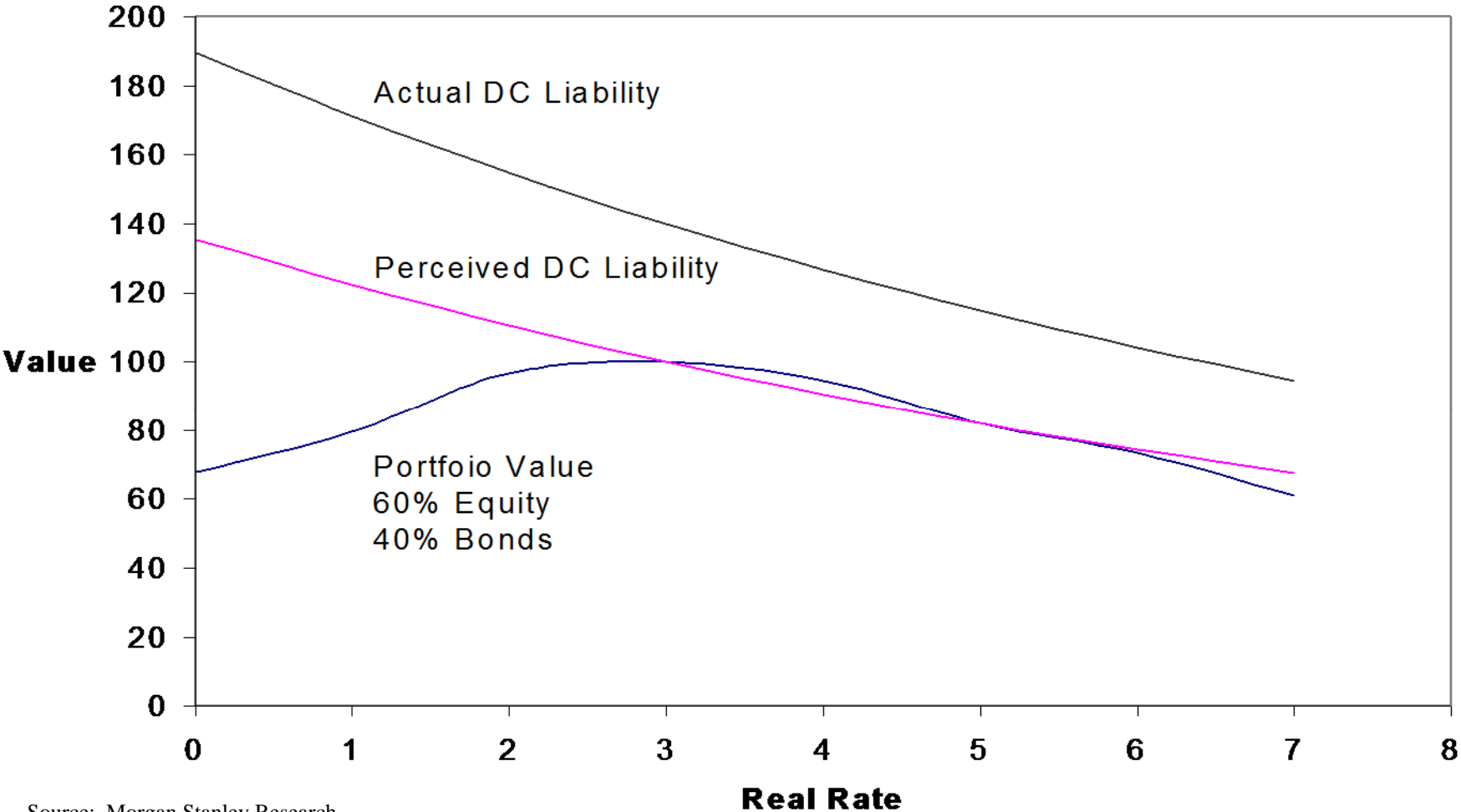
Source: TIAA-CREF

A Unique Situation

Rarely has so large a market component been in the hands of individuals with a potentially serious funding deficit relative to a stringent liability that is becoming inexorably more visible with the passage of time.

Source: Morgan Stanley Research

Discovering the Actual DC Liability



Source: Morgan Stanley Research

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(as of August 31, 2006)

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Stock Rating Category	Coverage Universe		Investment Banking Clients (IBC)		
	Count	% of Total	Count	% of Total IBC	% of Rating Category
Overweight/Buy	784	39%	294	44%	38%
Equal-weight/Hold	888	44%	297	45%	33%
Underweight/Sell	332	17%	74	11%	22%
Total	2004		665		

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