

# VALENS RESEARCH



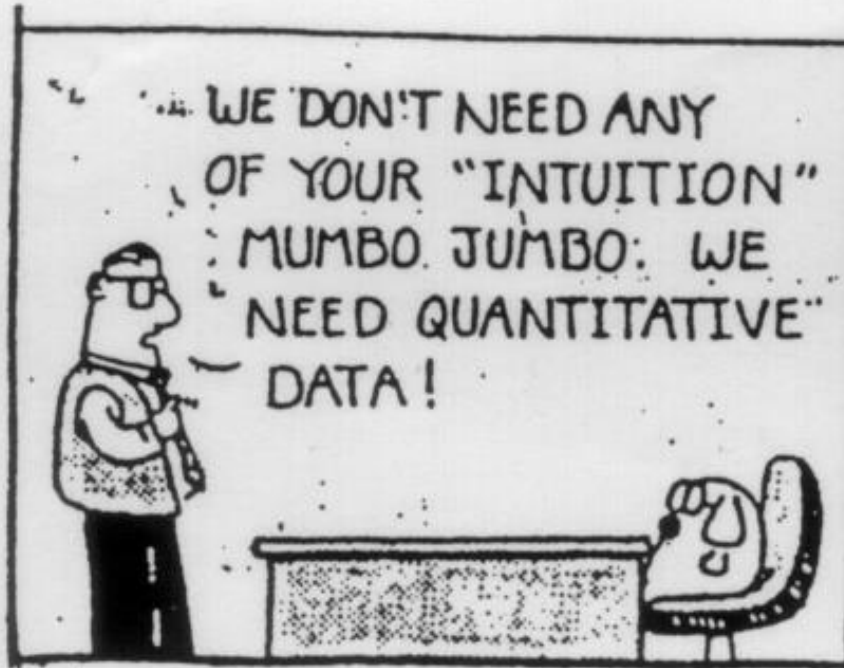
## Cost of Capital and Market Multiples

Professor Joel Litman  
September 2016

Valens Securities, Inc. and The Institute of Strategy & Valuation  
425 5<sup>th</sup> Avenue, New York, New York 10016 | PSE Centre, 2404-B, Pasig City, Philippines  
[joel.litman@valens-securities.com](mailto:joel.litman@valens-securities.com)

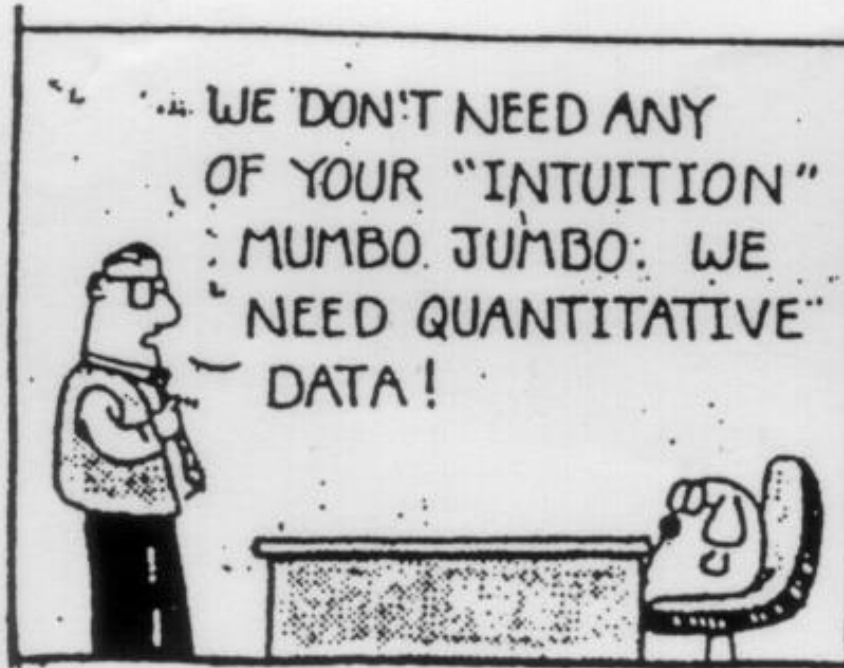
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# DILBERT by Scott Adams

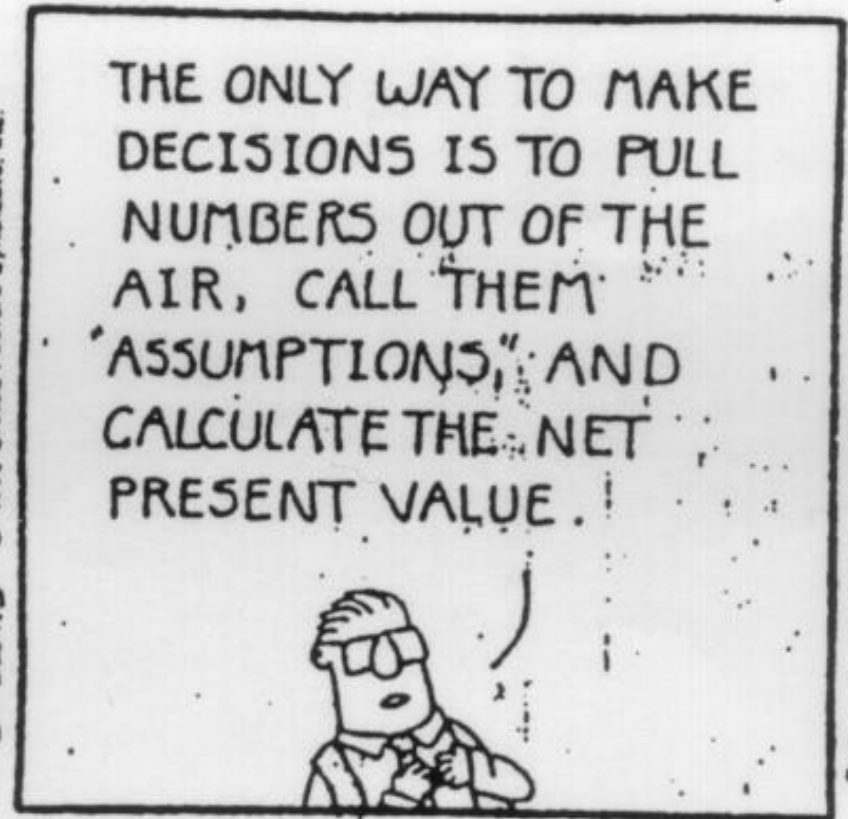


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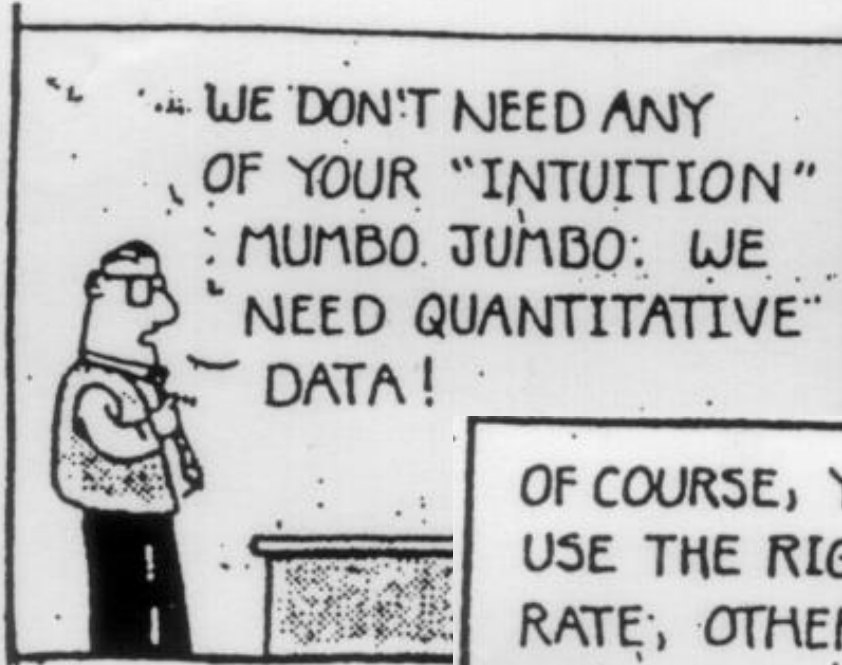


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Internet: ScottAdams@aol.com

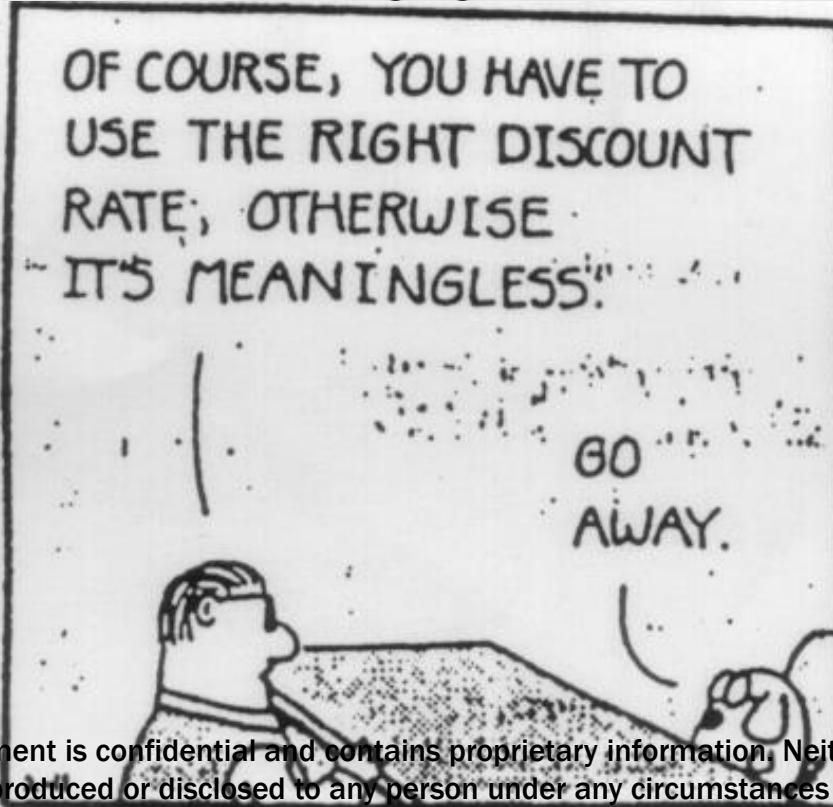
# DILBERT by Scott Adams



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THE ONLY WAY TO MAKE DECISIONS IS TO PULL NUMBERS OUT OF THE AIR, CALL THEM "ASSUMPTIONS," AND CALCULATE THE NET PRESENT VALUE.

Internet: ScottAdams@aol.com



Cost of Capital

Discount Rate

Hurdle Rate

Required Rate of Return

Opportunity Cost of Capital

# What is the CAPM calculation for the Cost of Equity?

# What is the CAPM calculation for the Cost of Equity?

$$R_f + \beta (R_m - R_f)$$



Nominal risk  
free rate

Beta, volatility  
based measure  
of risk

Equity risk premium

# Which of these companies has a higher level of riskiness?

- Company A: Cost of Capital 12%  
Inflation expectations at the time: 6%
- Company B: Cost of Capital 10%  
Inflation expectations at the time: 2.5%
- Location?
- Time?

Without converting to Real terms (not nominal),  
cost of capital is incomparable across time and across countries



# What is the correct equity risk premium for a CAPM based WACC calculation?

- Four financial service advisors provided their suggested equity risk premiums to a CFO (a client)

Management Consulting Firm	6%
Investment Bank #1	3%
Academic Advisor	8%
Investment Bank #2	4.89%

# What is the correct equity risk premium for a CAPM based WACC calculation?

- The Damodaran online survey... over 15,000 submissions

**Take the Poll**

**What is your estimate of the equity risk premium for a mature equity market?**

More than 10%

8-10%


6-8%

4-6%

2-4%

<2%

[View Stats](#)

 Bravenet

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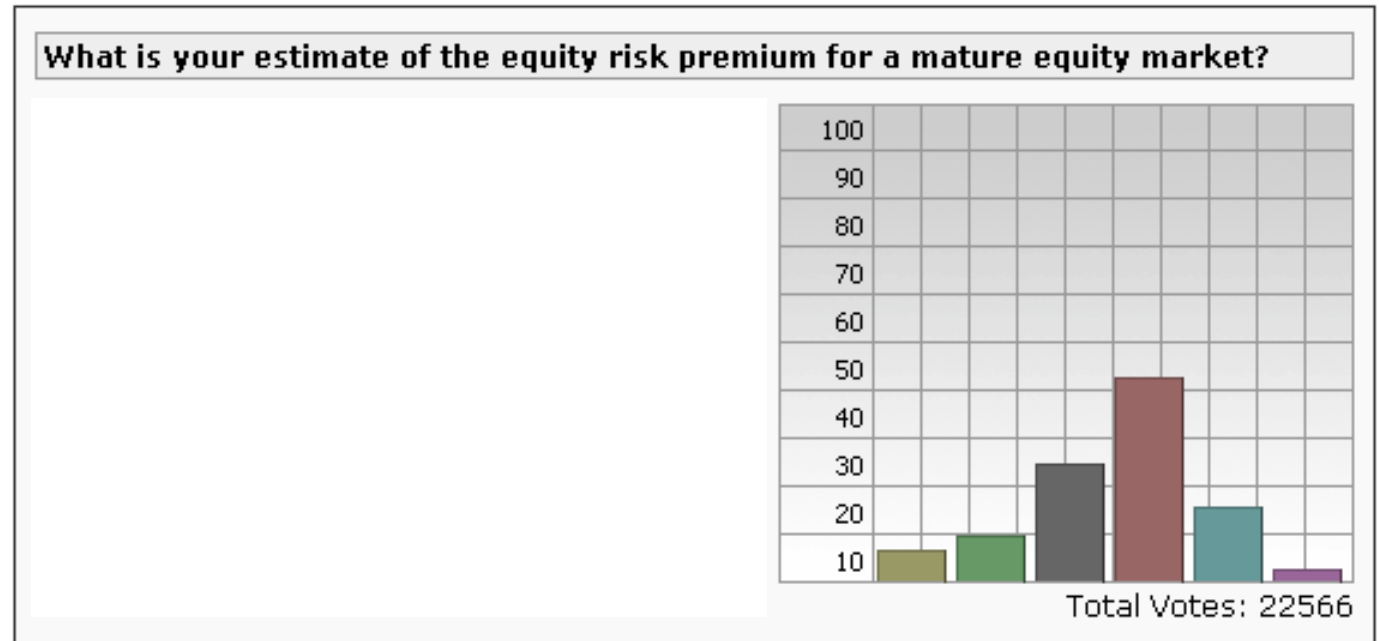
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Damodaran Online, <http://pages.stern.nyu.edu/~adamodar/>

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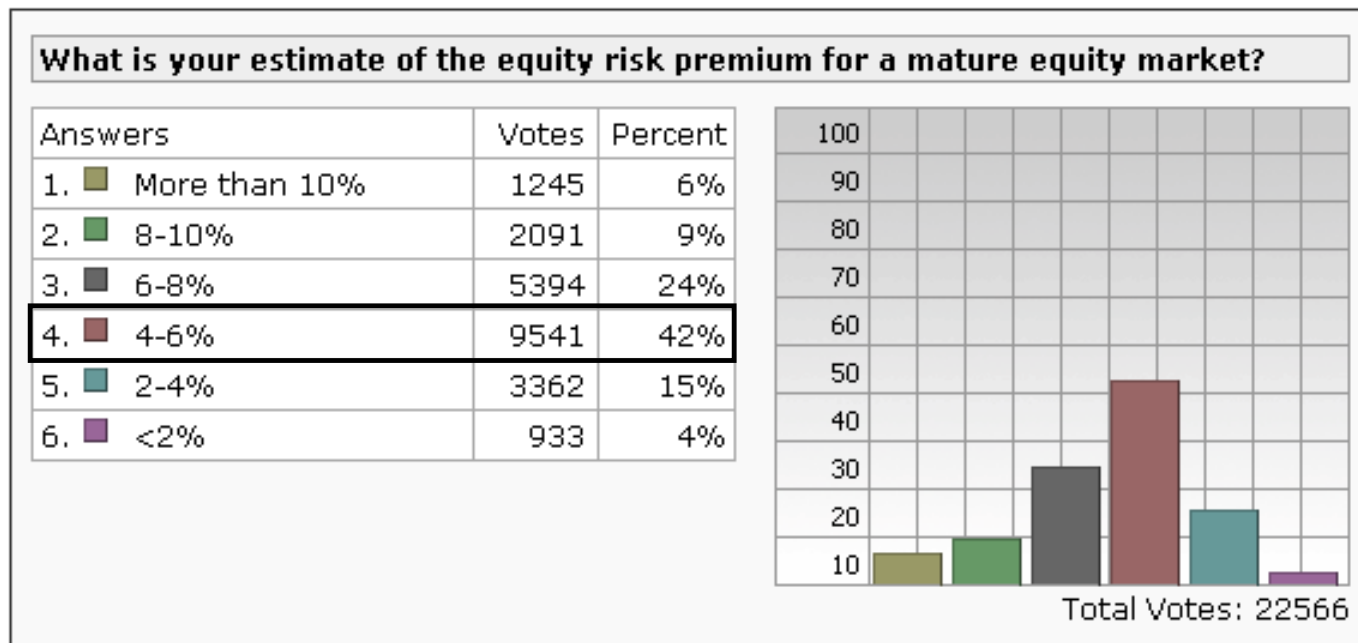
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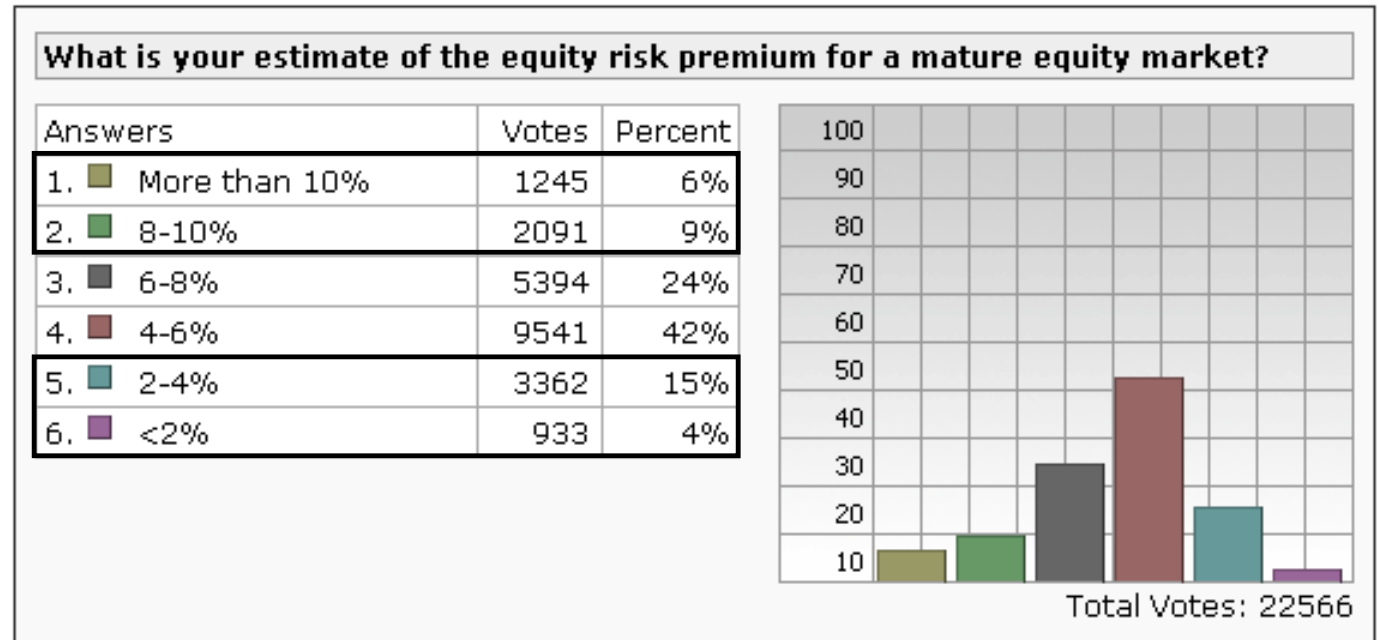
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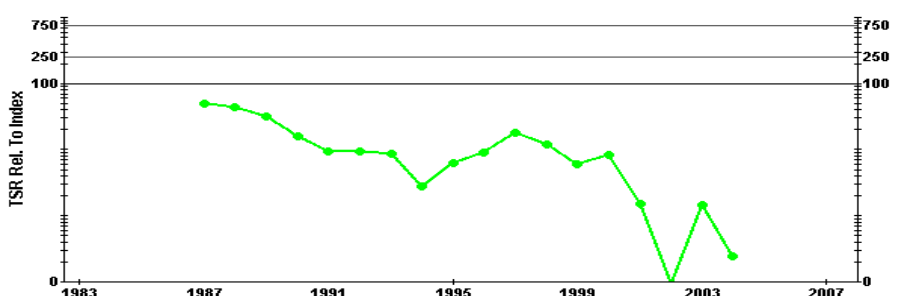
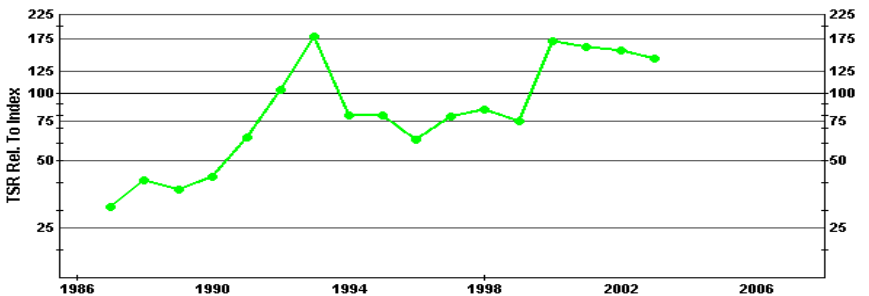
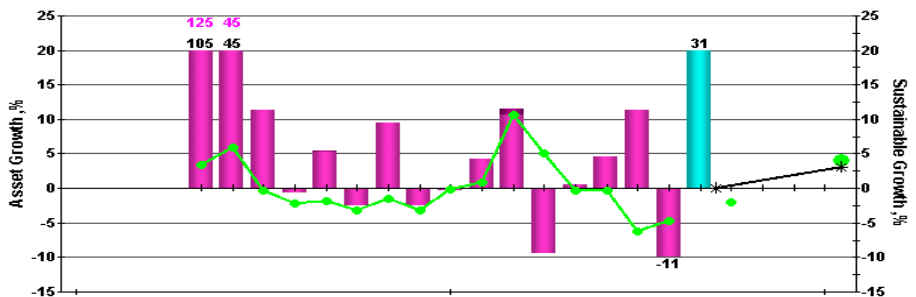
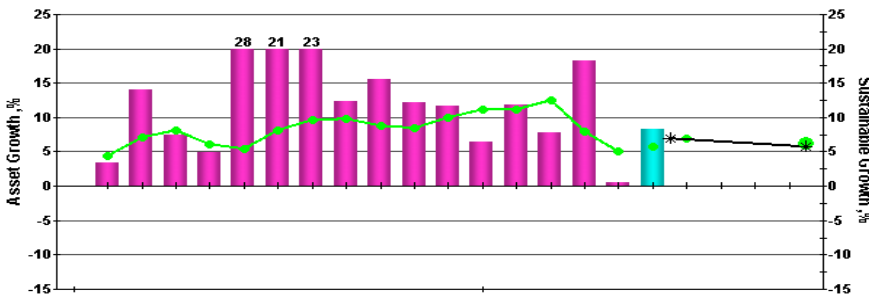
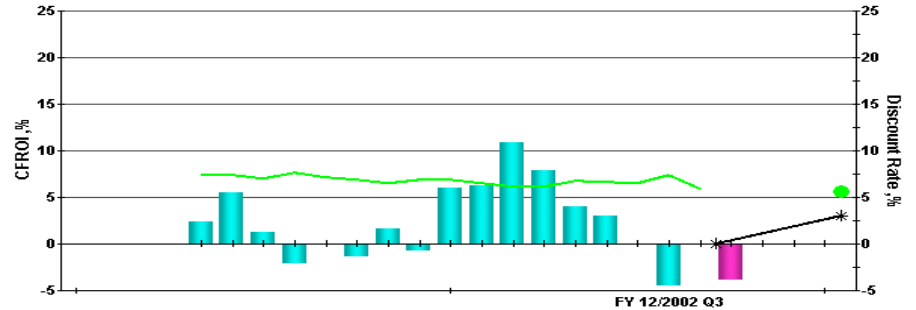
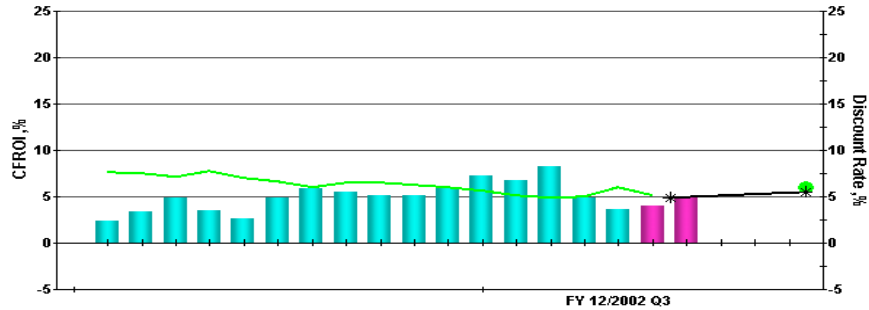
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# What is the correct Beta for a CAPM WACC calculation?

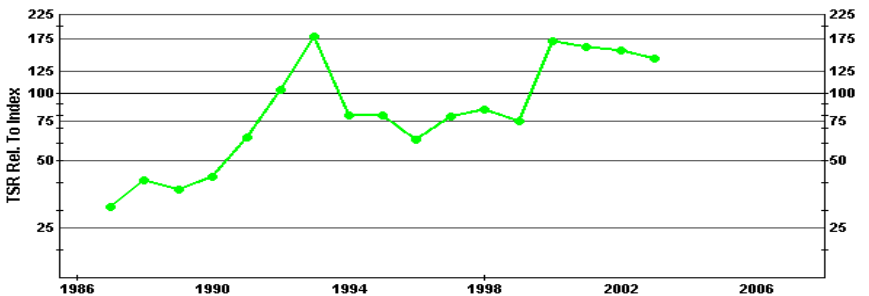
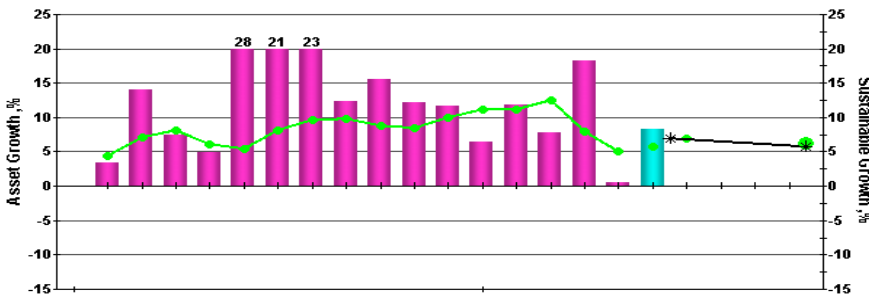
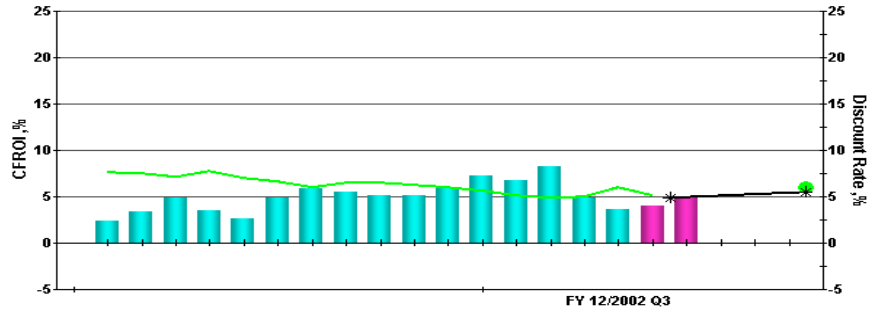


Source: ValueSearch™ 7.

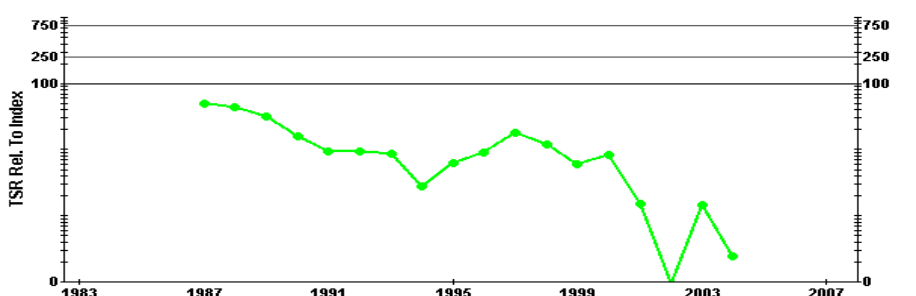
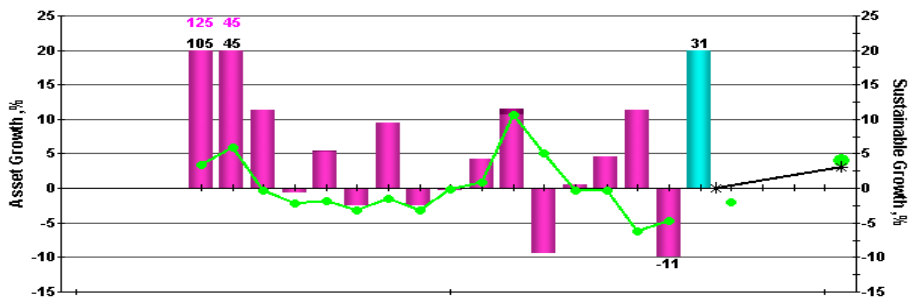
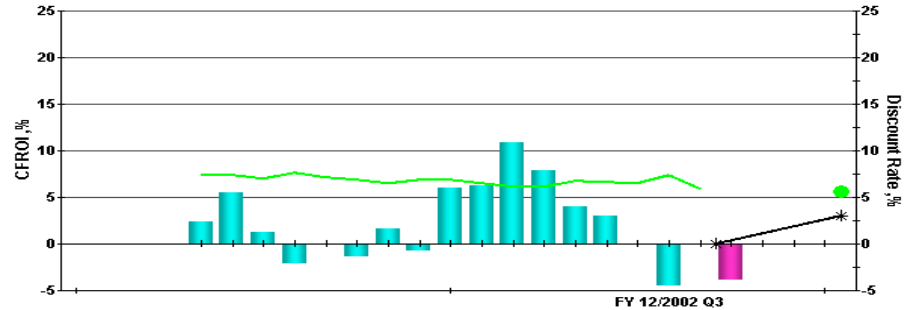
\*Beta as of December 31, 2002

# What is the correct Beta for a CAPM WACC calculation?

## LUV



## 3UAIRQ



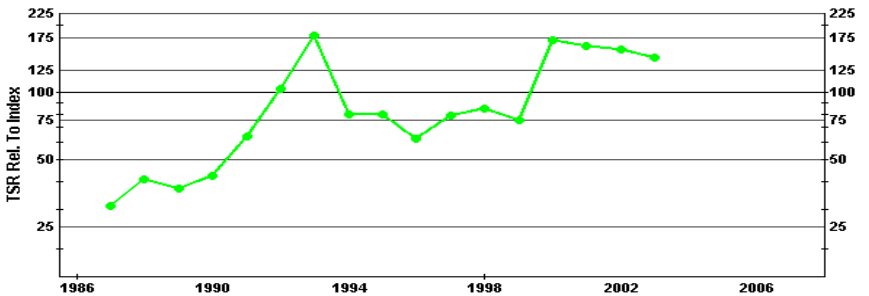
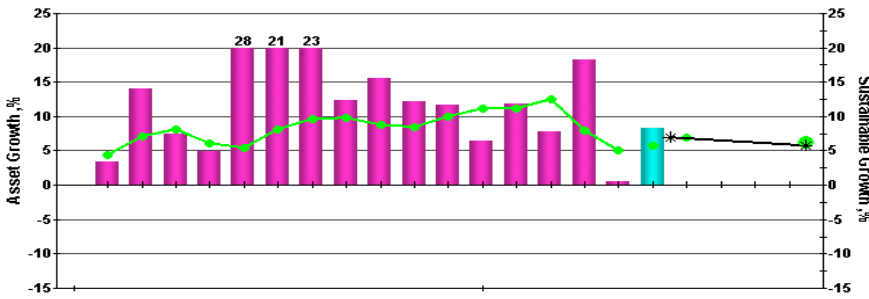
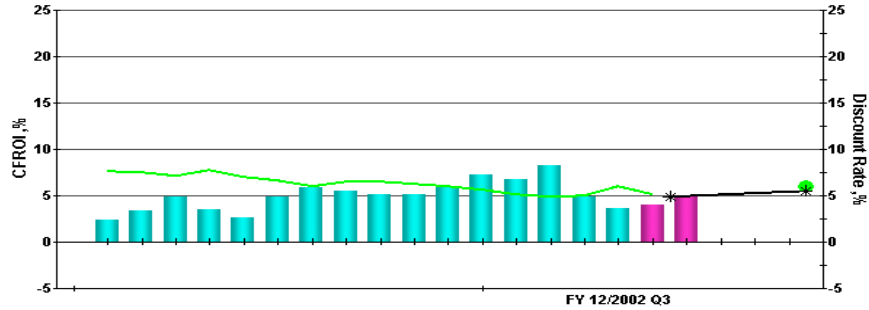
Source: ValueSearch™ 7.

\*Beta as of December 31, 2002

# What is the correct Beta for a CAPM WACC calculation?

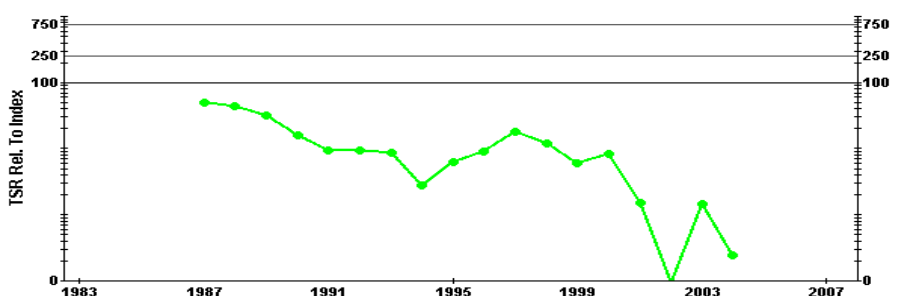
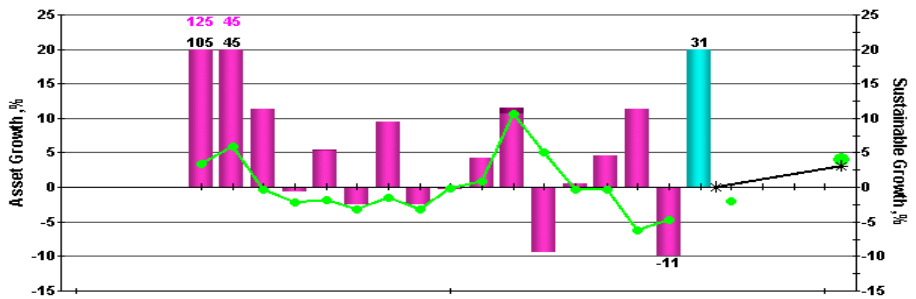
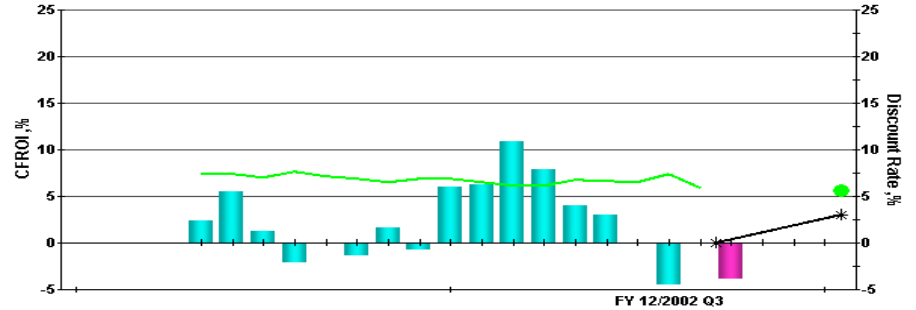
**LUV**

**B = 1.17\***



**3UAIRQ**

**B = 0.30\***

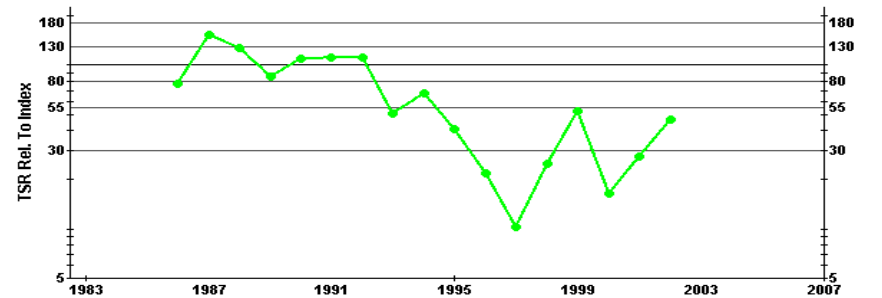
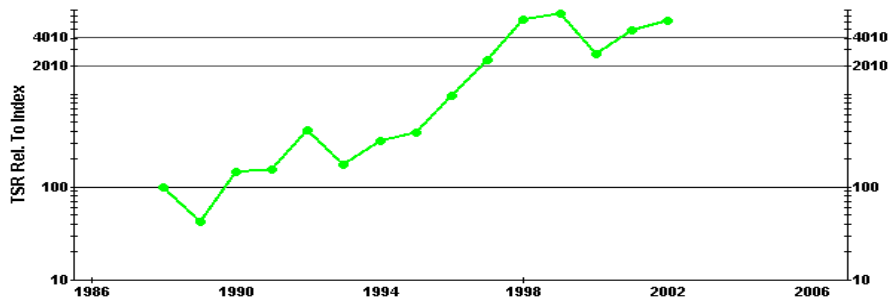
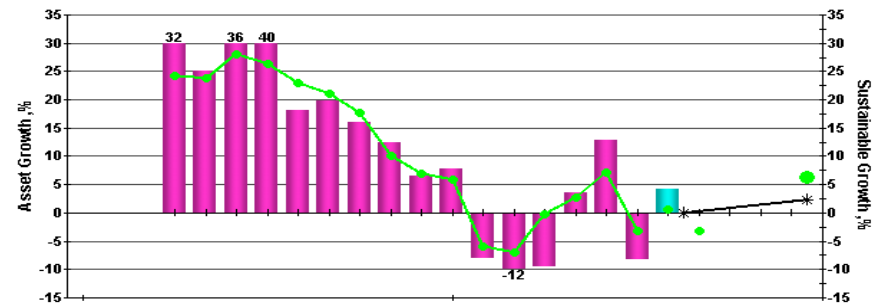
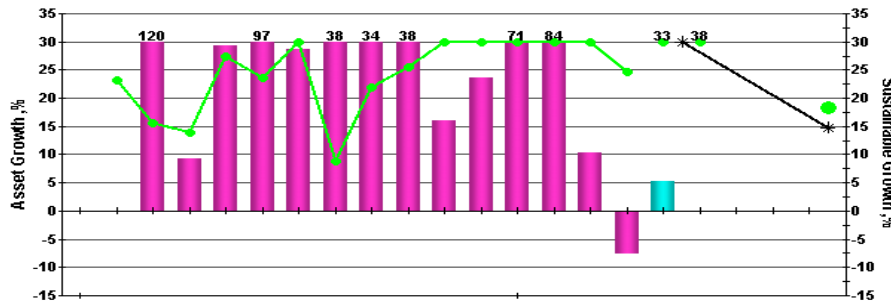
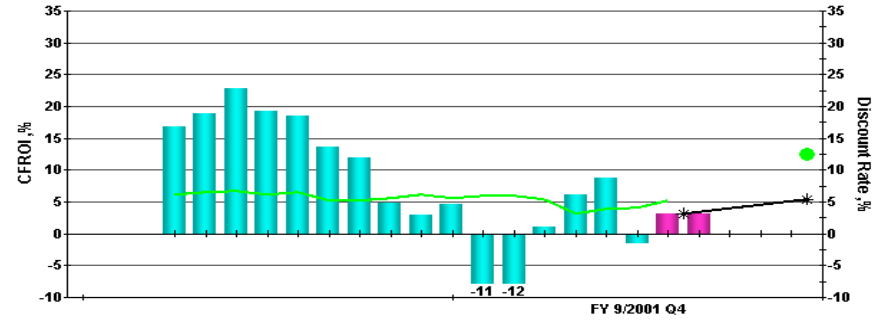
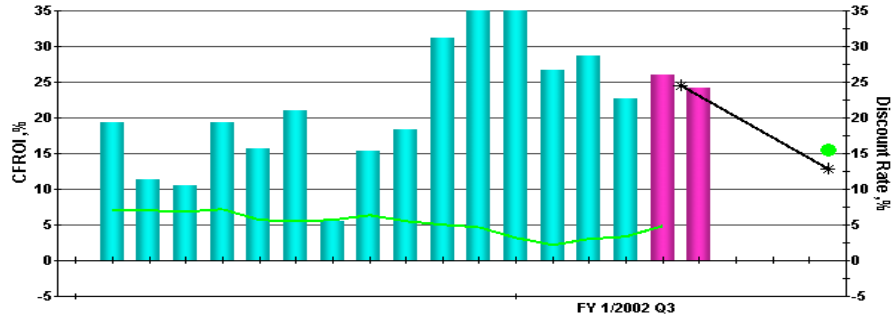


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# What is the correct Beta for a CAPM WACC calculation?

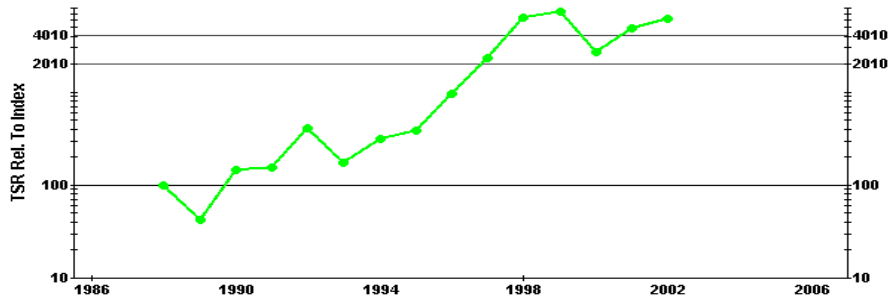
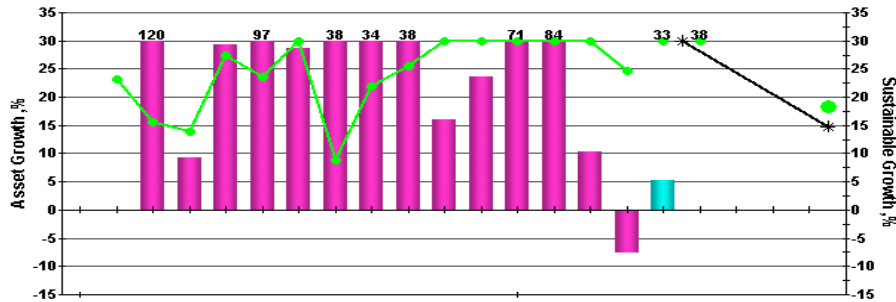
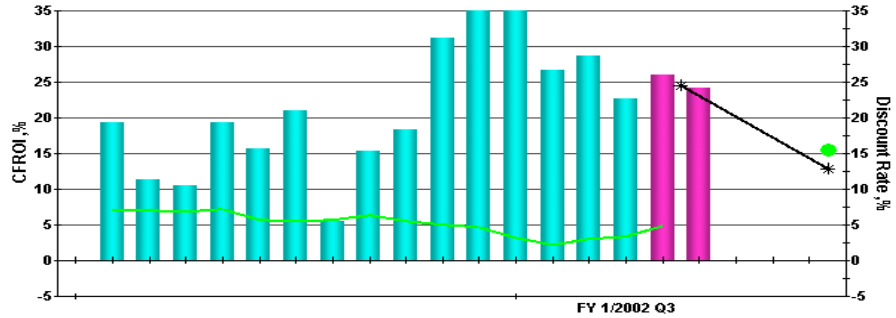


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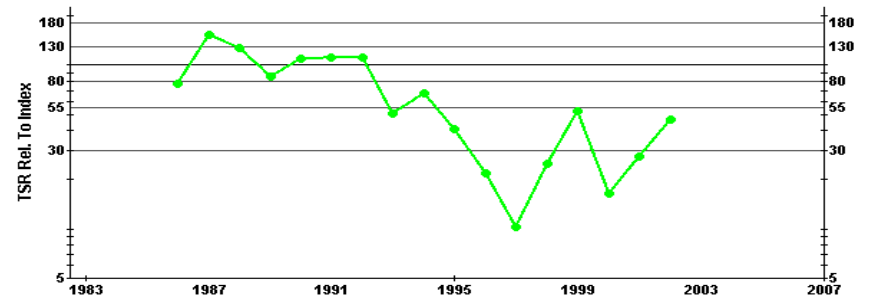
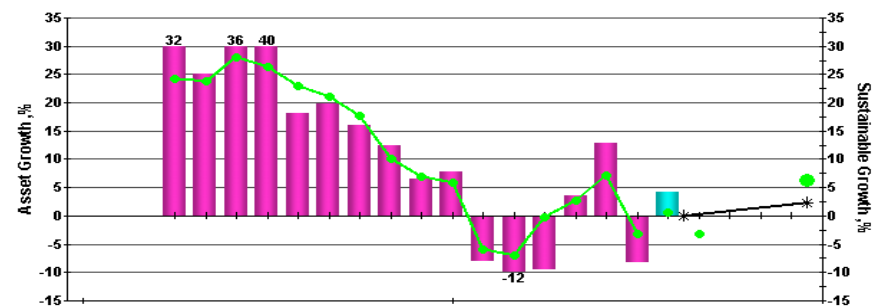
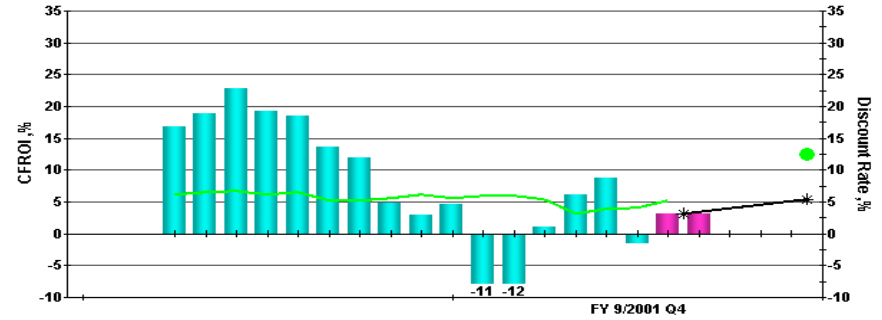
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# What is the correct Beta for a CAPM WACC calculation?

**B = 1.24\***



**B = 1.08\***



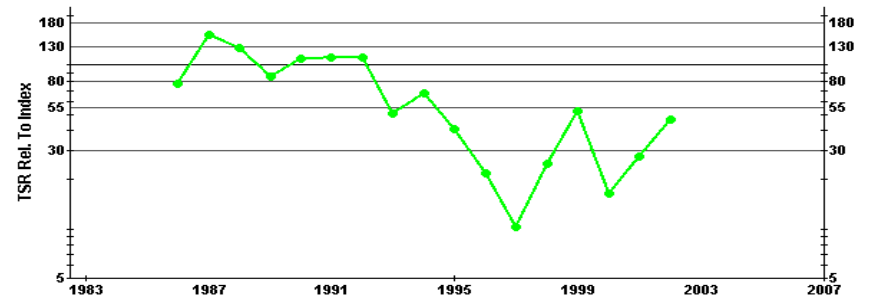
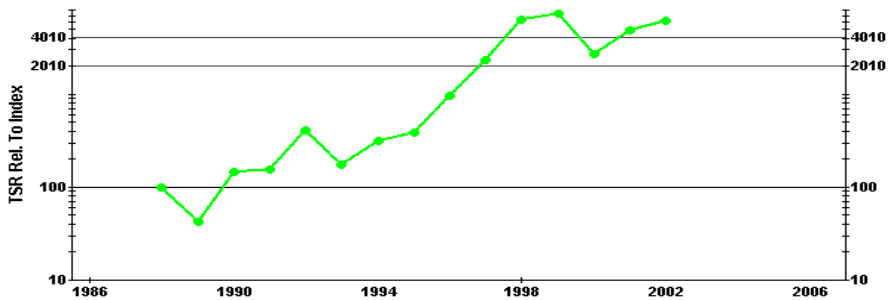
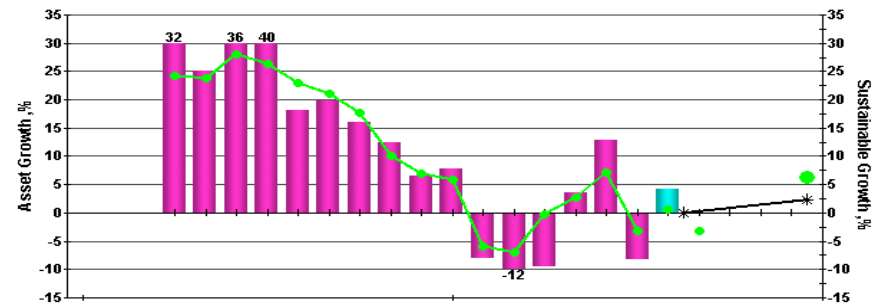
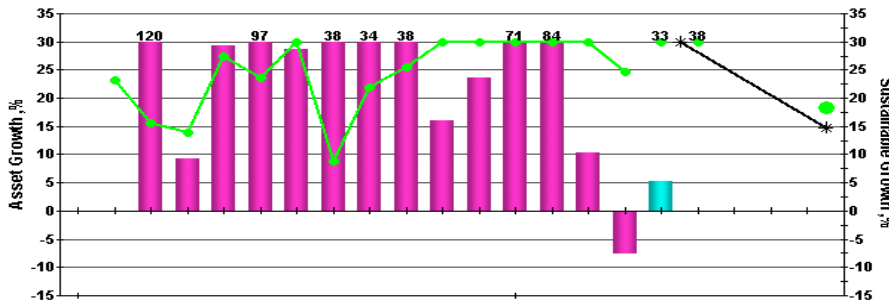
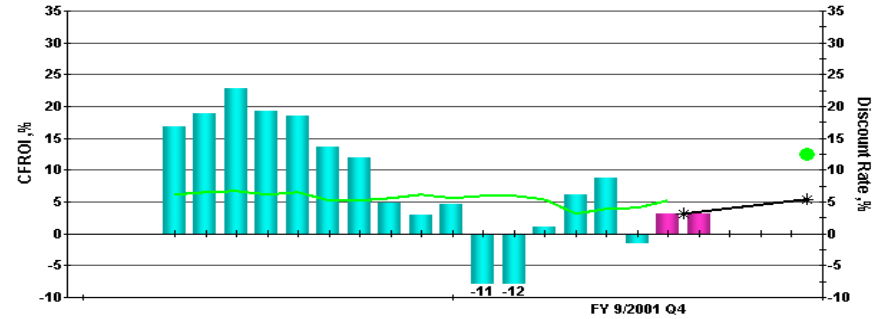
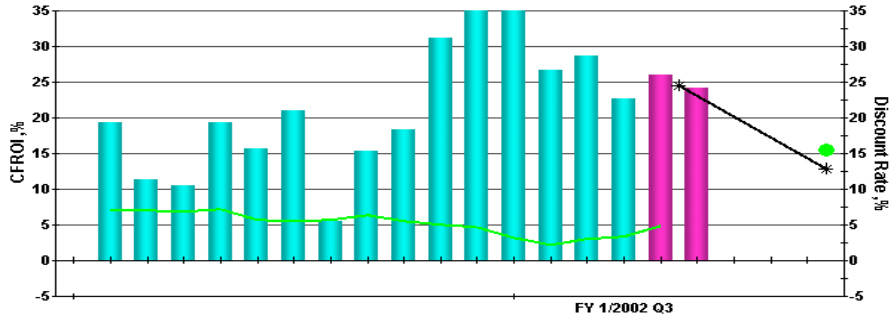
Source: ValueSearch™ 7.

\*Beta as of December 31, 2002

# What is the correct Beta for a CAPM WACC calculation?

**DELL**  
**B = 1.24\***

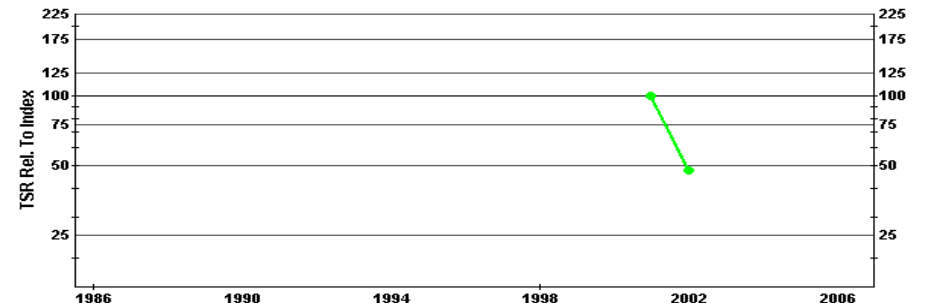
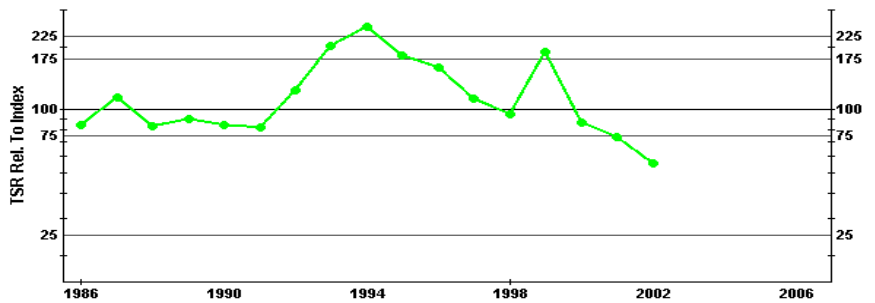
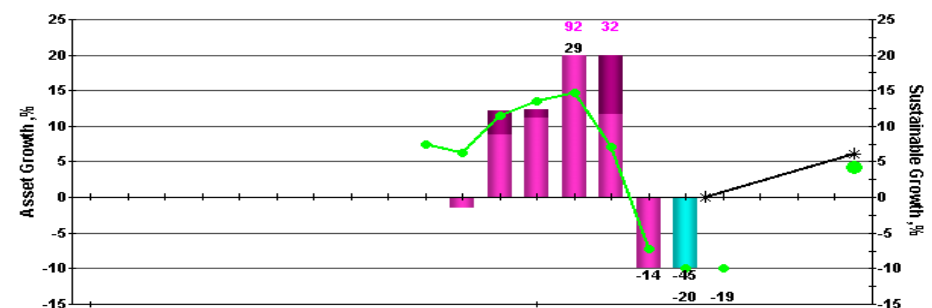
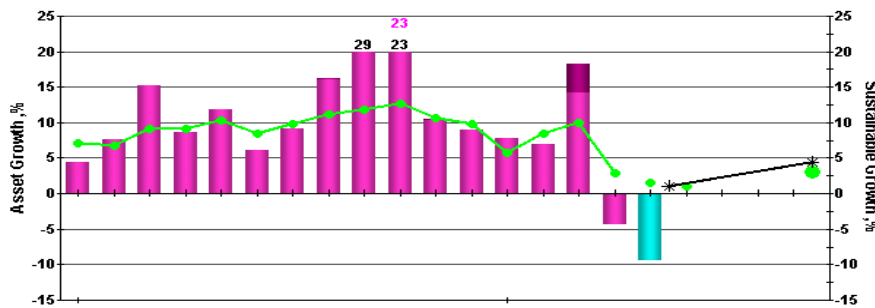
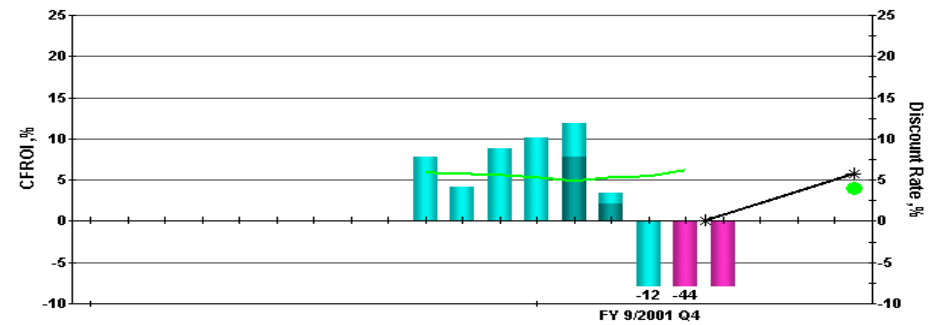
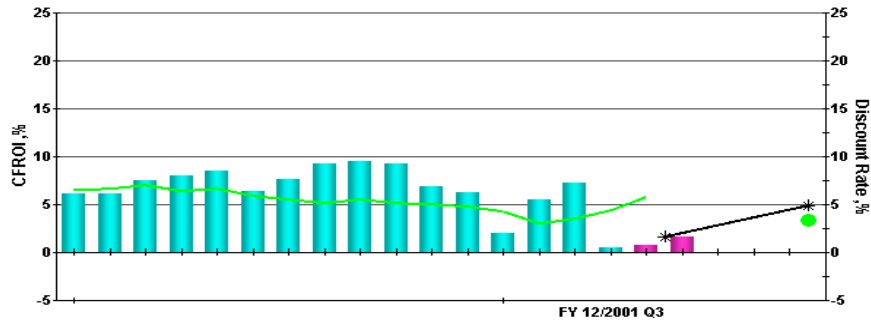
**AAPL**  
**B = 1.08\***



Source: ValueSearch™ 7.

\*Beta as of December 31, 2002

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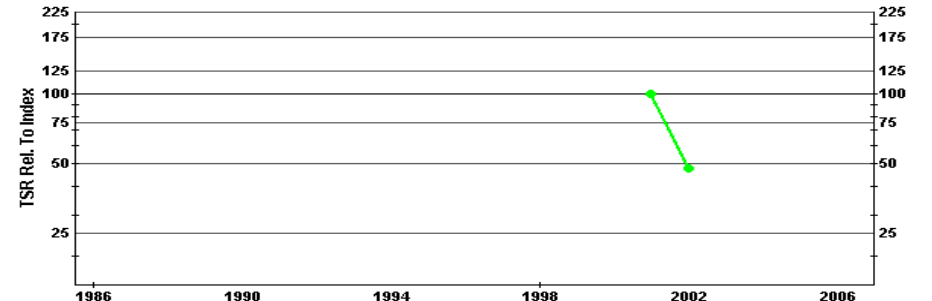
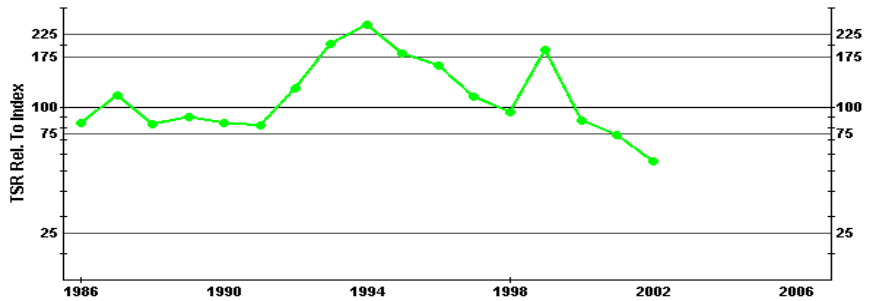
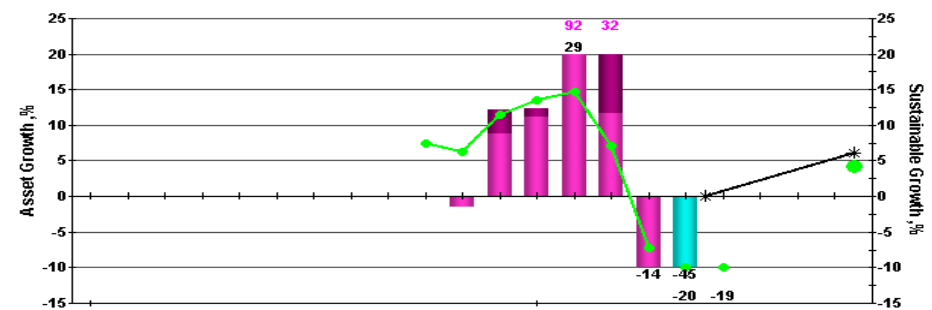
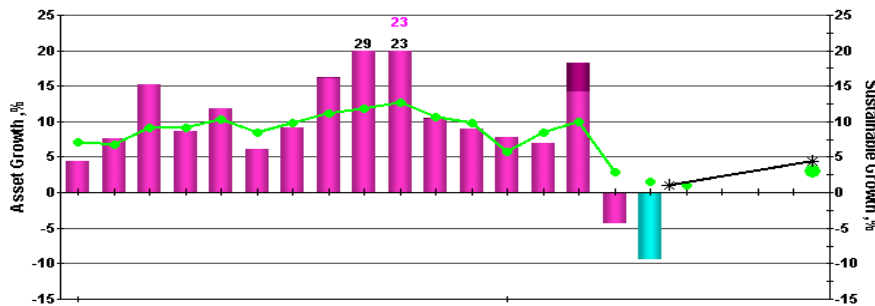
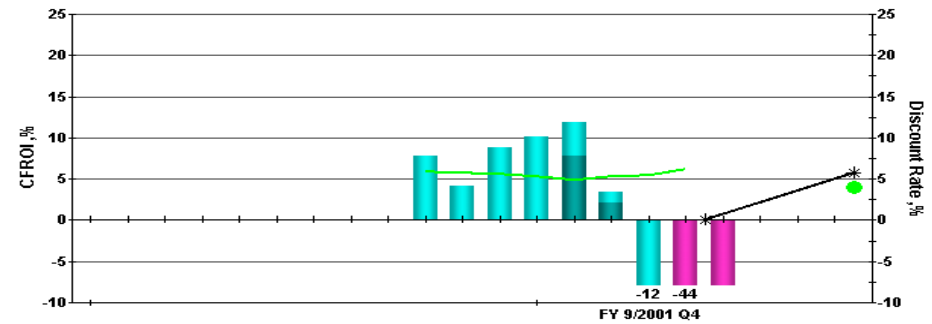
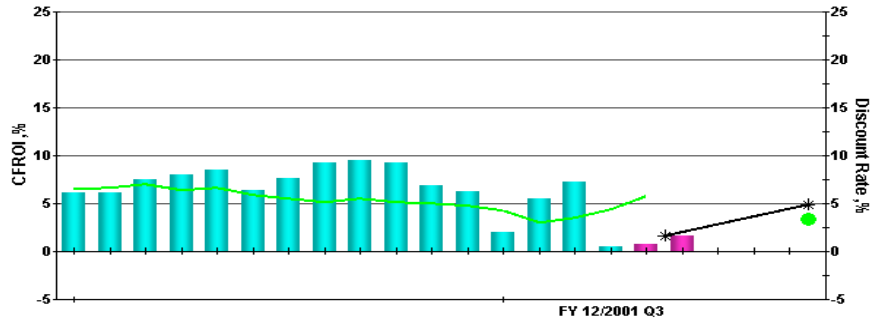


Source: ValueSearch™ 7.  
\*Beta as of December 31, 2002

# What is the correct Beta for a CAPM WACC calculation?

**MOT**  
**B = 1.48\***

**LU**  
**B = 1.14\***



Source: ValueSearch™ 7.  
\*Beta as of December 31, 2002

# The most cited research papers in the history of finance

THE JOURNAL OF FINANCE • VOL XLVII, NO 2 • JUNE 1992

## **The Cross-Section of Expected Stock Returns**

EUGENE F. FAMA and KENNETH R. FRENCH\*

### **ABSTRACT**

Two easily measured variables, size and book-to-market equity, combine to capture the cross-sectional variation in average stock returns associated with market  $\beta$ , size, leverage, book-to-market equity, and earnings-price ratios. Moreover, when the tests allow for variation in  $\beta$  that is unrelated to size, the relation between market  $\beta$  and average return is flat, even when  $\beta$  is the only explanatory variable.

THE ASSET-PRICING MODEL OF Sharpe (1964), Lintner (1965), and Black (1972) has long shaped the way academics and practitioners think about average returns and risk. The central prediction of the model is that the market

# The most cited research papers in the history of finance

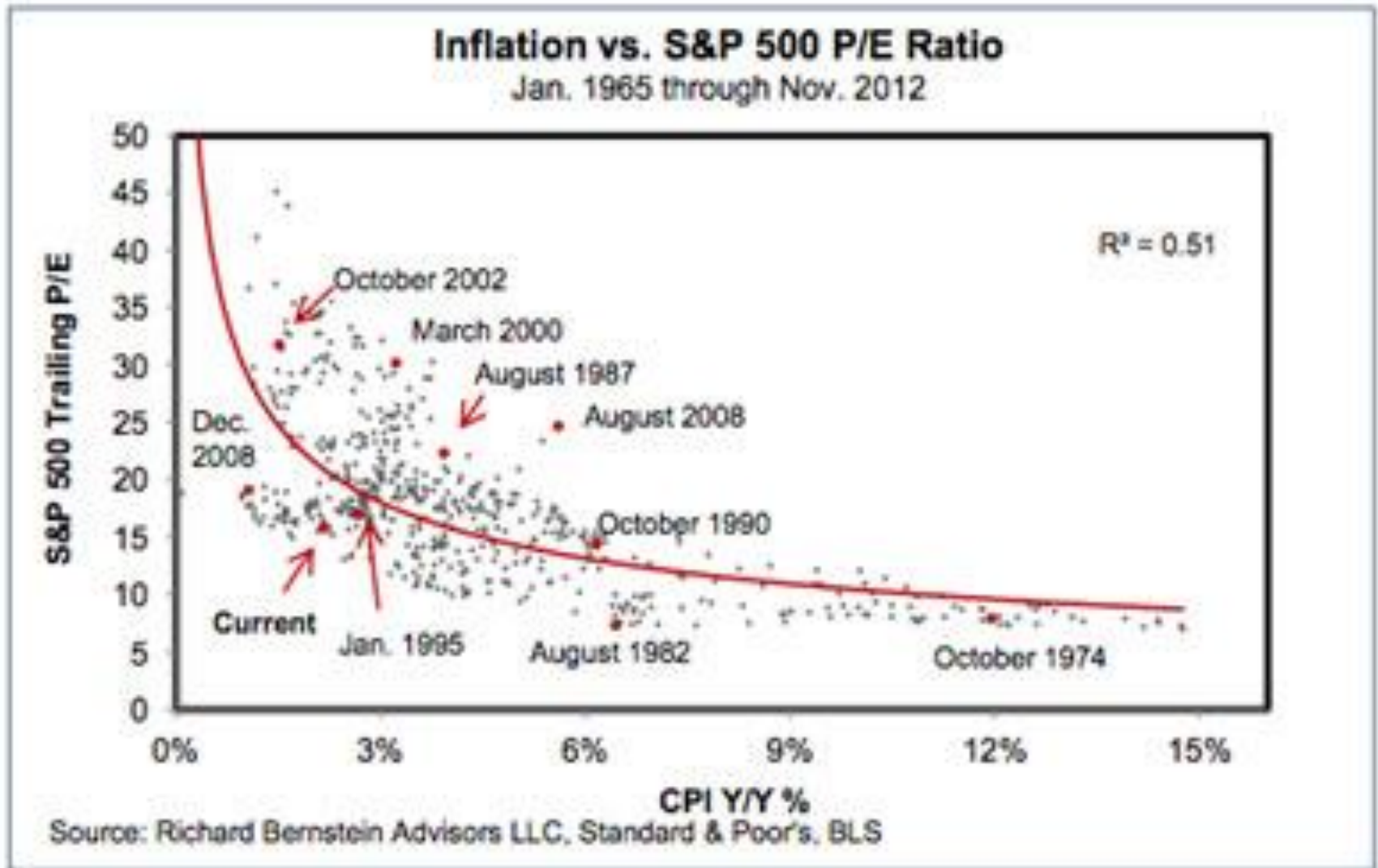
## ABSTRACT

Two easily measured variables, size and book-to-market equity, combine to capture the cross-sectional variation in average stock returns associated with market  $\beta$ , size, leverage, book-to-market equity, and earnings-price ratios. Moreover, when the tests allow for variation in  $\beta$  that is unrelated to size, the relation between market  $\beta$  and average return is flat, even when  $\beta$  is the only explanatory variable.

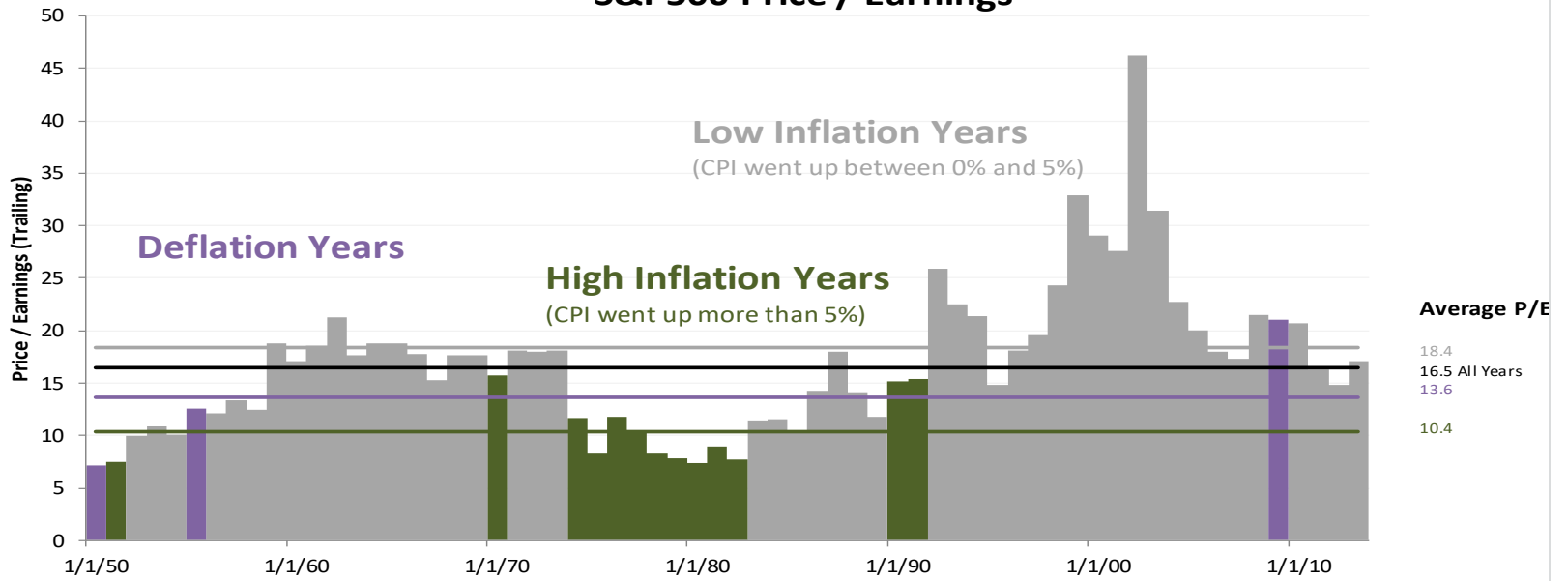
# Terminal Values and Absolute Values



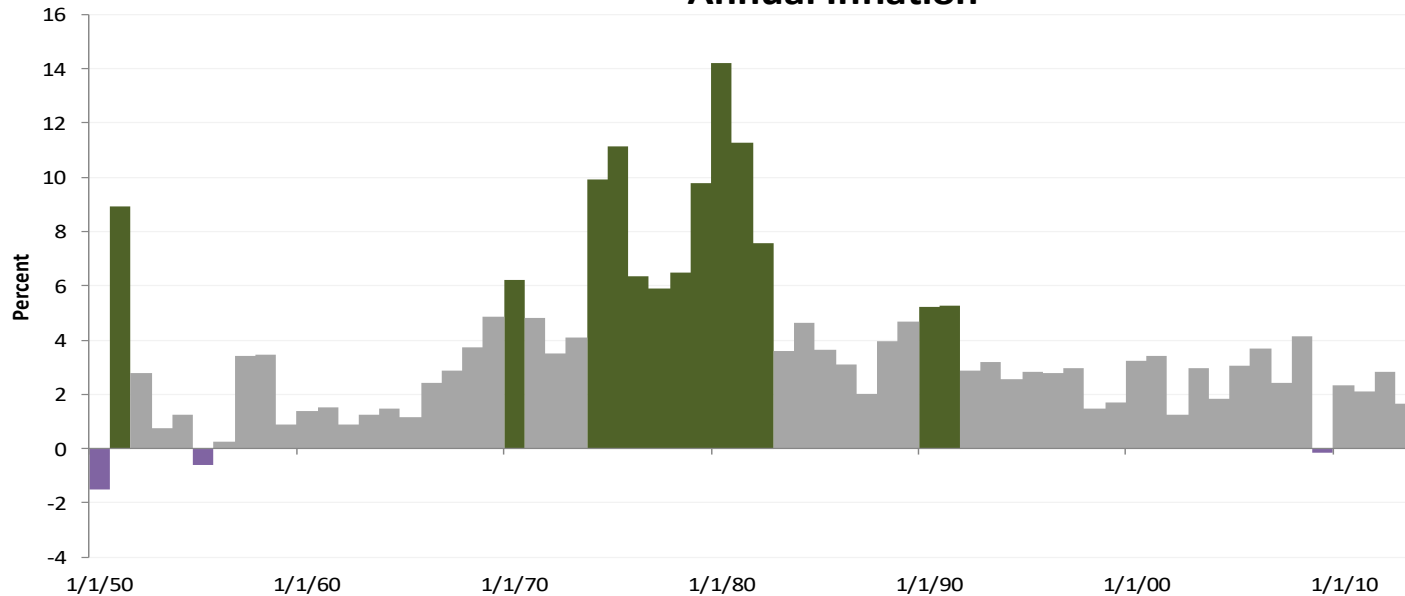
**Chart 6: However Equities appear quite inexpensive**



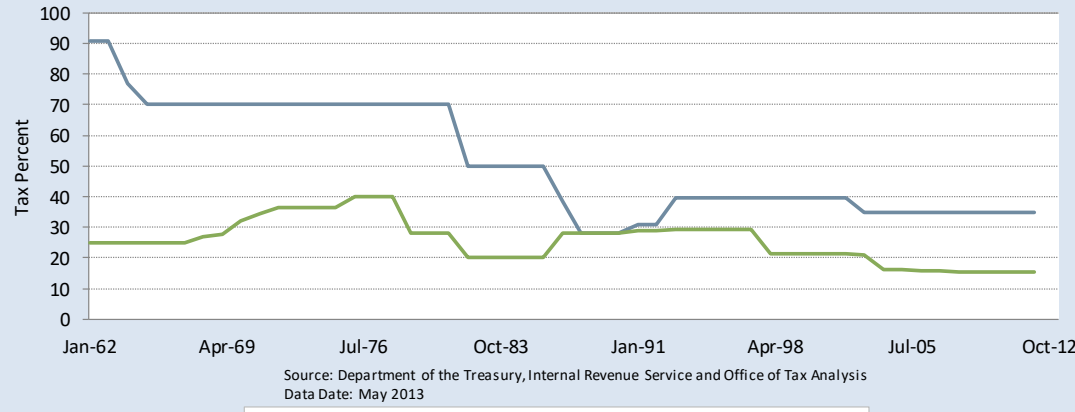
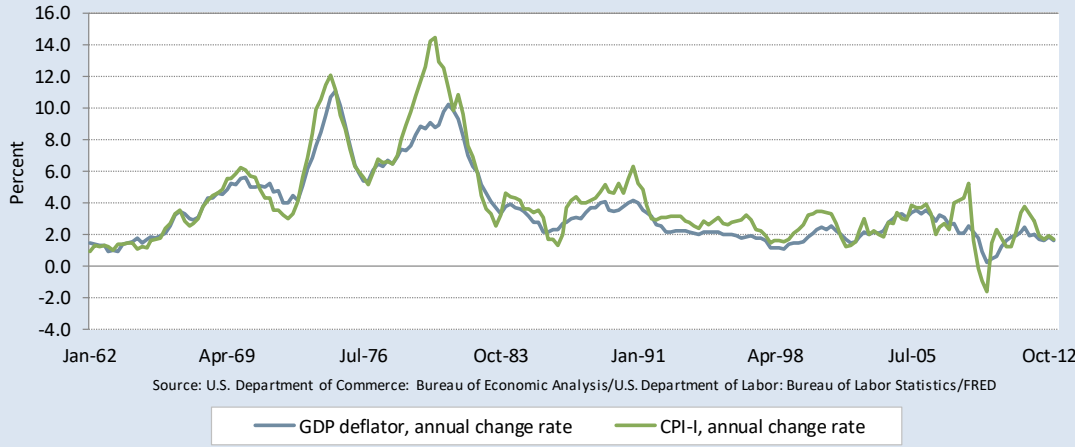
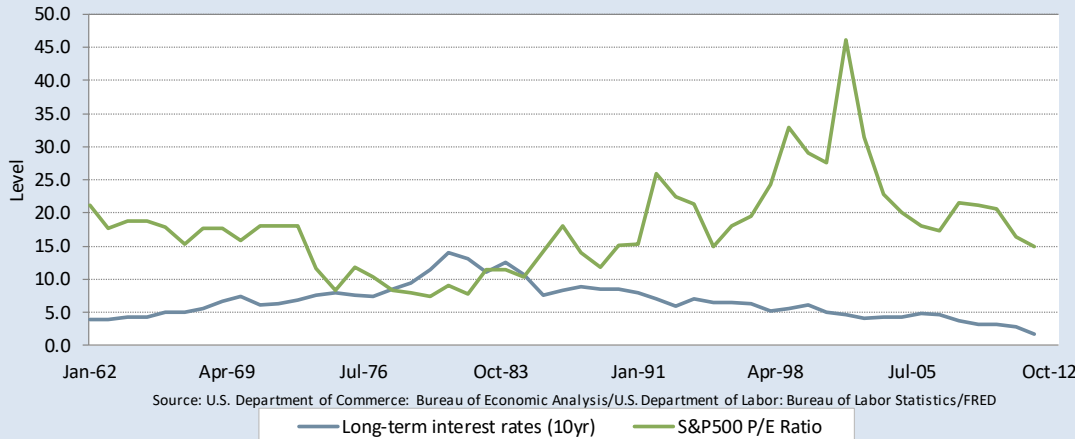
# S&P500 Price / Earnings



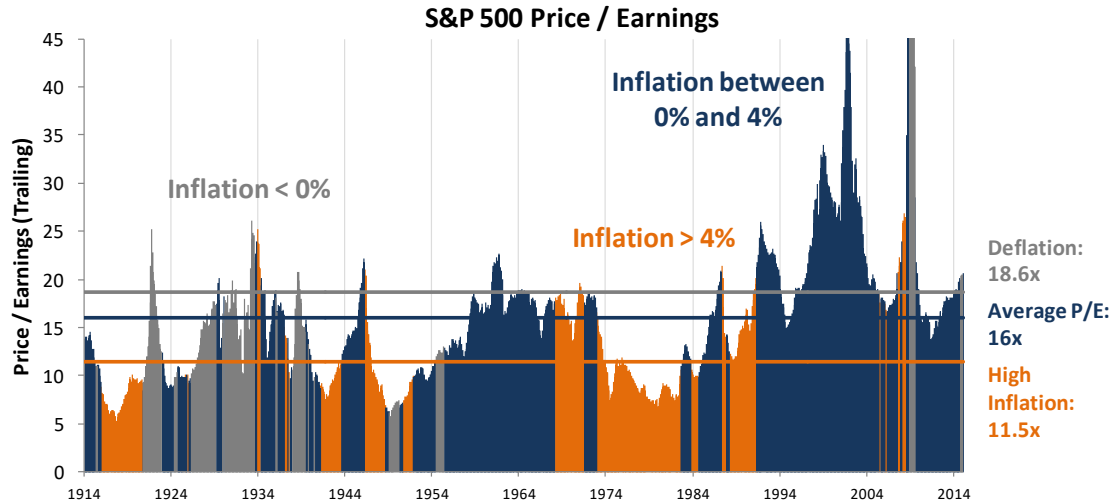
# Annual Inflation



Source: Standard & Poors  
Data Date: May, 2013



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Inflation	Dividend and Capital Gains Tax	Years	Average P/E
>4%	Low Tax	5	13.5x
	High Tax	26	11.2x
0%-4%	Low Tax	22	20.1x
	High Tax	32	16.3x
<0%	Low Tax	9	22.3x
	High Tax	5	12.4x

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%				
Nominal Gain		\$8.63				

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%				
Nominal Gain		\$8.63				
Tax		20%				

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%				
Nominal Gain		\$8.63				
Tax		20%				
Actual tax		\$1.73				



Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%				
Nominal Gain		\$8.63				
Tax		20%				
Actual tax		\$1.73				
Real take home		\$4.77				

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%		4.0%		
Nominal Gain		\$8.63		\$10.76		
Tax		20%				
Actual tax		\$1.73				
Real take home		\$4.77				

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%		4.0%		
Nominal Gain		\$8.63		\$10.76		
Tax		20%		28%		
Actual tax		\$1.73		\$3.01		
Real take home		\$4.77				

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%		4.0%		
Nominal Gain		\$8.63		\$10.76		
Tax		20%		28%		
Actual tax		\$1.73		\$3.01		
Real take home		\$4.77		\$3.49		

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%		4.0%		10.0%
Nominal Gain		\$8.63		\$10.76		\$17.15
Tax		20%		28%		
Actual tax		\$1.73		\$3.01		
Real take home		\$4.77		\$3.49		

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%		4.0%		10.0%
Nominal Gain		\$8.63		\$10.76		\$17.15
Tax		20%		28%		40%
Actual tax		\$1.73		\$3.01		\$6.86
Real take home		\$4.77		\$3.49		

Capital		\$100.00		\$100.00		\$100.00
Return		6.5%		6.5%		6.5%
Real Gain		\$6.50		\$6.50		\$6.50
Inflation		2.0%		4.0%		10.0%
Nominal Gain		\$8.63		\$10.76		\$17.15
Tax		20%		28%		40%
Actual tax		\$1.73		\$3.01		\$6.86
Real take home		\$4.77		\$3.49		(\$0.36)

	1960-1963
<b>Years for calculation</b>	<b>1</b>
<b>Expected Real Annual Gain</b>	<b>6.4%</b>
<b>Inflation expectations</b>	<b>3.0%</b>
<b>Beginning Capital</b>	<b>100</b>
<b>Expected Real Gain in Dollars</b>	<b>6.4</b>
<b>Nominal Gain</b>	<b>9.4</b>
<b>Capital gains taxes</b>	<b>25%</b>
<b>Tax on nominal gain</b>	<b>2.4</b>
<b>Real effective tax rate</b>	<b>37%</b>
<b>Investor Real Required</b>	
<b>After-Tax Return Rate</b>	<b>3.0%</b>
<b>Req Return in Dollars</b>	<b>3.0</b>
<b>Plus Inflation</b>	<b>3.0</b>
<b>Plus Taxes</b>	<b>2.4</b>
<b>Nominal Req Return Dollars</b>	<b>8.4</b>
<b>Nom. Req Return Rate (CoCap)</b>	<b>8.4%</b>
<b>Less Expected Corporate Growth</b>	<b>3.0%</b>
<b>Implied Earnings Multiple</b>	<b>18.5</b>

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	1960-1963	1975-1978
<b>Years for calculation</b>	<b>1</b>	<b>1</b>
<b>Expected Real Annual Gain</b>	<b>6.4%</b>	<b>6.4%</b>
<b>Inflation expectations</b>	<b>3.0%</b>	<b>9.0%</b>
<b>Beginning Capital</b>	<b>100</b>	<b>100</b>
<b>Expected Real Gain in Dollars</b>	<b>6.4</b>	<b>6.4</b>
<b>Nominal Gain</b>	<b>9.4</b>	<b>15.4</b>
<b>Capital gains taxes</b>	<b>25%</b>	<b>40%</b>
<b>Tax on nominal gain</b>	<b>2.4</b>	<b>6.2</b>
<b>Real effective tax rate</b>	<b>37%</b>	<b>96%</b>
<b>Investor Real Required</b>		
<b>After-Tax Return Rate</b>	<b>3.0%</b>	<b>3.0%</b>
<b>Req Return in Dollars</b>	<b>3.0</b>	<b>3.0</b>
<b>Plus Inflation</b>	<b>3.0</b>	<b>9.0</b>
<b>Plus Taxes</b>	<b>2.4</b>	<b>6.2</b>
<b>Nominal Req Return Dollars</b>	<b>8.4</b>	<b>18.2</b>
<b>Nom. Req Return Rate (CoCap)</b>	<b>8.4%</b>	<b>18.2%</b>
<b>Less Expected Corporate Growth</b>	<b>3.0%</b>	<b>1.0%</b>
<b>Implied Earnings Multiple</b>	<b>18.5</b>	<b>5.8</b>

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	1960-1963	1975-1978	1980-1983
<b>Years for calculation</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Expected Real Annual Gain</b>	<b>6.4%</b>	<b>6.4%</b>	<b>6.4%</b>
<b>Inflation expectations</b>	<b>3.0%</b>	<b>9.0%</b>	<b>5.0%</b>
<b>Beginning Capital</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Expected Real Gain in Dollars</b>	<b>6.4</b>	<b>6.4</b>	<b>6.4</b>
<b>Nominal Gain</b>	<b>9.4</b>	<b>15.4</b>	<b>11.4</b>
<b>Capital gains taxes</b>	<b>25%</b>	<b>40%</b>	<b>40%</b>
<b>Tax on nominal gain</b>	<b>2.4</b>	<b>6.2</b>	<b>4.6</b>
<b>Real effective tax rate</b>	<b>37%</b>	<b>96%</b>	<b>71%</b>
<b>Investor Real Required</b>			
<b>After-Tax Return Rate</b>	<b>3.0%</b>	<b>3.0%</b>	<b>3.0%</b>
<b>Req Return in Dollars</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>
<b>Plus Inflation</b>	<b>3.0</b>	<b>9.0</b>	<b>5.0</b>
<b>Plus Taxes</b>	<b>2.4</b>	<b>6.2</b>	<b>4.6</b>
<b>Nominal Req Return Dollars</b>	<b>8.4</b>	<b>18.2</b>	<b>12.6</b>
<b>Nom. Req Return Rate (CoCap)</b>	<b>8.4%</b>	<b>18.2%</b>	<b>12.6%</b>
<b>Less Expected Corporate Growth</b>	<b>3.0%</b>	<b>1.0%</b>	<b>2.0%</b>
<b>Implied Earnings Multiple</b>	<b>18.5</b>	<b>5.8</b>	<b>9.4</b>

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	1960-1963	1975-1978	1980-1983	1998-2000
<b>Years for calculation</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Expected Real Annual Gain</b>	<b>6.4%</b>	<b>6.4%</b>	<b>6.4%</b>	<b>6.4%</b>
<b>Inflation expectations</b>	<b>3.0%</b>	<b>9.0%</b>	<b>5.0%</b>	<b>2.5%</b>
<b>Beginning Capital</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Expected Real Gain in Dollars</b>	<b>6.4</b>	<b>6.4</b>	<b>6.4</b>	<b>6.4</b>
<b>Nominal Gain</b>	<b>9.4</b>	<b>15.4</b>	<b>11.4</b>	<b>8.9</b>
<b>Capital gains taxes</b>	<b>25%</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>
<b>Tax on nominal gain</b>	<b>2.4</b>	<b>6.2</b>	<b>4.6</b>	<b>1.8</b>
<b>Real effective tax rate</b>	<b>37%</b>	<b>96%</b>	<b>71%</b>	<b>28%</b>
<b>Investor Real Required</b>				
<b>After-Tax Return Rate</b>	<b>3.0%</b>	<b>3.0%</b>	<b>3.0%</b>	<b>3.0%</b>
<b>Req Return in Dollars</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>
<b>Plus Inflation</b>	<b>3.0</b>	<b>9.0</b>	<b>5.0</b>	<b>2.5</b>
<b>Plus Taxes</b>	<b>2.4</b>	<b>6.2</b>	<b>4.6</b>	<b>1.8</b>
<b>Nominal Req Return Dollars</b>	<b>8.4</b>	<b>18.2</b>	<b>12.6</b>	<b>7.3</b>
<b>Nom. Req Return Rate (CoCap)</b>	<b>8.4%</b>	<b>18.2%</b>	<b>12.6%</b>	<b>7.3%</b>
<b>Less Expected Corporate Growth</b>	<b>3.0%</b>	<b>1.0%</b>	<b>2.0%</b>	<b>4.0%</b>
<b>Implied Earnings Multiple</b>	<b>18.5</b>	<b>5.8</b>	<b>9.4</b>	<b>30.3</b>

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	1960-1963	1975-1978	1980-1983	1998-2000	2005-2007
<b>Years for calculation</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Expected Real Annual Gain</b>	<b>6.4%</b>	<b>6.4%</b>	<b>6.4%</b>	<b>6.4%</b>	<b>6.4%</b>
<b>Inflation expectations</b>	<b>3.0%</b>	<b>9.0%</b>	<b>5.0%</b>	<b>2.5%</b>	<b>3.0%</b>
<b>Beginning Capital</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Expected Real Gain in Dollars</b>	<b>6.4</b>	<b>6.4</b>	<b>6.4</b>	<b>6.4</b>	<b>6.4</b>
<b>Nominal Gain</b>	<b>9.4</b>	<b>15.4</b>	<b>11.4</b>	<b>8.9</b>	<b>9.4</b>
<b>Capital gains taxes</b>	<b>25%</b>	<b>40%</b>	<b>40%</b>	<b>20%</b>	<b>20%</b>
<b>Tax on nominal gain</b>	<b>2.4</b>	<b>6.2</b>	<b>4.6</b>	<b>1.8</b>	<b>1.9</b>
<b>Real effective tax rate</b>	<b>37%</b>	<b>96%</b>	<b>71%</b>	<b>28%</b>	<b>29%</b>
<b>Investor Real Required</b>					
<b>After-Tax Return Rate</b>	<b>3.0%</b>	<b>3.0%</b>	<b>3.0%</b>	<b>3.0%</b>	<b>3.0%</b>
<b>Req Return in Dollars</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>	<b>3.0</b>
<b>Plus Inflation</b>	<b>3.0</b>	<b>9.0</b>	<b>5.0</b>	<b>2.5</b>	<b>3.0</b>
<b>Plus Taxes</b>	<b>2.4</b>	<b>6.2</b>	<b>4.6</b>	<b>1.8</b>	<b>1.9</b>
<b>Nominal Req Return Dollars</b>	<b>8.4</b>	<b>18.2</b>	<b>12.6</b>	<b>7.3</b>	<b>7.9</b>
<b>Nom. Req Return Rate (CoCap)</b>	<b>8.4%</b>	<b>18.2%</b>	<b>12.6%</b>	<b>7.3%</b>	<b>7.9%</b>
<b>Less Expected Corporate Growth</b>	<b>3.0%</b>	<b>1.0%</b>	<b>2.0%</b>	<b>4.0%</b>	<b>4.0%</b>
<b>Implied Earnings Multiple</b>	<b>18.5</b>	<b>5.8</b>	<b>9.4</b>	<b>30.3</b>	<b>25.6</b>

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	1960-1963	1975-1978	1980-1983	1998-2000	2005-2007	2008-2011
<b>Years for calculation</b>	1	1	1	1	1	1
<b>Expected Real Annual Gain</b>	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
<b>Inflation expectations</b>	3.0%	9.0%	5.0%	2.5%	3.0%	2.5%
<b>Beginning Capital</b>	100	100	100	100	100	100
<b>Expected Real Gain in Dollars</b>	6.4	6.4	6.4	6.4	6.4	6.4
<b>Nominal Gain</b>	9.4	15.4	11.4	8.9	9.4	8.9
<b>Capital gains taxes</b>	25%	40%	40%	20%	20%	20%
<b>Tax on nominal gain</b>	2.4	6.2	4.6	1.8	1.9	1.8
<b>Real effective tax rate</b>	37%	96%	71%	28%	29%	28%
<b>Investor Real Required</b>						
<b>After-Tax Return Rate</b>	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
<b>Req Return in Dollars</b>	3.0	3.0	3.0	3.0	3.0	3.0
<b>Plus Inflation</b>	3.0	9.0	5.0	2.5	3.0	2.5
<b>Plus Taxes</b>	2.4	6.2	4.6	1.8	1.9	1.8
<b>Nominal Req Return Dollars</b>	8.4	18.2	12.6	7.3	7.9	7.3
<b>Nom. Req Return Rate (CoCap)</b>	8.4%	18.2%	12.6%	7.3%	7.9%	7.3%
<b>Less Expected Corporate Growth</b>	3.0%	1.0%	2.0%	4.0%	4.0%	1.0%
<b>Implied Earnings Multiple</b>	18.5	5.8	9.4	30.3	25.6	15.9

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	1960-1963	1975-1978	1980-1983	1998-2000	2005-2007	2008-2011	2013-?
<b>Years for calculation</b>	1	1	1	1	1	1	1
<b>Expected Real Annual Gain</b>	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
<b>Inflation expectations</b>	3.0%	9.0%	5.0%	2.5%	3.0%	2.5%	2.0%
<b>Beginning Capital</b>	100	100	100	100	100	100	100
<b>Expected Real Gain in Dollars</b>	6.4	6.4	6.4	6.4	6.4	6.4	6.4
<b>Nominal Gain</b>	9.4	15.4	11.4	8.9	9.4	8.9	8.4
<b>Capital gains taxes</b>	25%	40%	40%	20%	20%	20%	20%
<b>Tax on nominal gain</b>	2.4	6.2	4.6	1.8	1.9	1.8	1.7
<b>Real effective tax rate</b>	37%	96%	71%	28%	29%	28%	26%
<b>Investor Real Required</b>							
<b>After-Tax Return Rate</b>	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
<b>Req Return in Dollars</b>	3.0	3.0	3.0	3.0	3.0	3.0	3.0
<b>Plus Inflation</b>	3.0	9.0	5.0	2.5	3.0	2.5	2.0
<b>Plus Taxes</b>	2.4	6.2	4.6	1.8	1.9	1.8	1.7
<b>Nominal Req Return Dollars</b>	8.4	18.2	12.6	7.3	7.9	7.3	6.7
<b>Nom. Req Return Rate (CoCap)</b>	8.4%	18.2%	12.6%	7.3%	7.9%	7.3%	6.7%
<b>Less Expected Corporate Growth</b>	3.0%	1.0%	2.0%	4.0%	4.0%	1.0%	2.0%
<b>Implied Earnings Multiple</b>	18.5	5.8	9.4	30.3	25.6	15.9	21.3

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# VALENS RESEARCH



## Cost of Capital and Market Multiples

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