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Investments in the Current Market Environment

Moderator:

Michelle Berklacich, State of California

Speakers:

James Sia, Wellington Management Company, LLP
Kamila Kowalke, Dow Jones Indexes

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Director, Dow Jones Indexes
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What did 2008 bring?

- Large losses for most strategies
  - DJIA down 33.84%
  - One major 2010 Target date fund down 42%
  - REITs down 39.2%
  - Commodities down 35.65%
  - Hedge Funds
    - some down over 50%
    - some restricted withdrawals
    - some out-of-business
- Large stimulus package with uncertain consequences for the future

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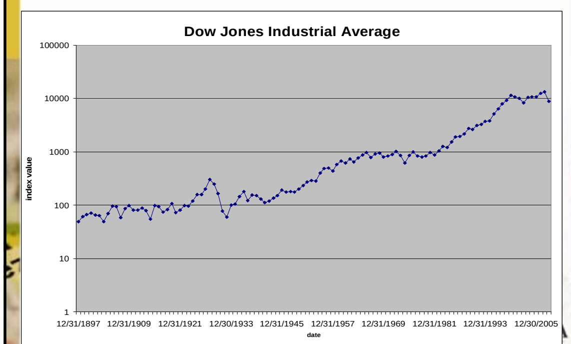
2008 - Should we have been surprised?



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What does it mean?

If you had the right strategy, stick to it
If you had a wrong strategy, changes are needed

How do you know if it was right?
When you know your Plan B and you can live with it.

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Defined Contribution Strategies in a Risky World

RISKS
- Market
- Inflation
- Longevity

STRATEGIC DECISIONS
- Contributions
- Withdrawals
- Investments

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Inflation Risk

3% for 25 years = 50% reduction in standard of living
5% for 25 years = 70% reduction in standard of living
10% for 3 years = 25% reduction in standard of living

Uncertain effect of stimulus package

Will an inflation surprise affect your standard of living?

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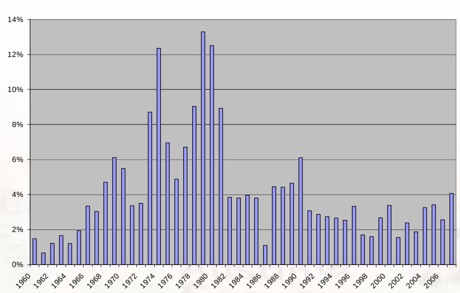
CPIU Measured for the Last 48 Years



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How do you hedge unexpected inflation?

Complete inflation hedge
- laddered TIPS

Partial inflation hedge
- TIPS
- Commodities
- Real Estate through REITs/RESI
- Stocks

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Longevity Risk

Life expectancy at age 65 = 22 years

50% will live past 87

23% will live past 95

Will you run out of money?

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Minimum risk retirement strategy

- 100% replacement ratio (after SSN and retirement contribution)
- Plan to live till age 100 (no longevity risk)
- Laddered TIPS maturities (no inflation or investment risk)

Savings needed?

23% contribution rate for 35 years = unacceptable standard of living = 23% pay cut

* Reinvestment risk after 30 years

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Example of a Very Aggressive Strategy

- 100% Equity
  - 8% return
  - 2% inflation
- 8% constant contributions

- RESULTS
  - Market risk
  - Post retirement inflation risk

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PLAN B for Aggressive Strategy

- 30% equity loss at age 45
  - increase contribution from 8% to 12%
  - postpone retirement to age 69
  - reduce income replacement to 83%
  - accept longevity risk past age 84
- 30% equity loss at age 65
  - postpone retirement to age 71
  - reduce income replacement to 75%
  - accept longevity risk past age 79
- 2% unexpected inflation during retirement
  - Income replacement falls gradually to 50%

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Target Date Strategy

- 100% Equity at age 30, 0% equity at age 65
- 100% replacement ratio to age 100
- 19% constant contributions

- RESULTS
  - Market risk
  - Post retirement inflation risk
  - Minimal longevity risk (plan to age 100)
  - tolerable contribution rate?

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PLAN B for Target Date Strategy

- 30% equity loss at age 45
  - increase contribution from 19% to 22%
  - postpone retirement to age 68
  - reduce income replacement to 92%
- 30% equity loss at age 65
  - no impact (100% bonds at age 65 assumed)
- 2% unexpected inflation during retirement
  - Income replacement falls gradually to 50%

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Target Date

- General Misperceptions*
  - Guaranteed returns
  - Secure investment with minimum risk
  - Comfortable retirement
- Target Date vs. Lifetime
  - Lifetime – glidepath ends when one dies not retires
  - Large equity allocation in lifetime funds at retirement date
  - One needs a plan B for such a fund

** Source: Behavioral Research Associates, www.behavioralresearch.com*

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Hedge Funds

- Many failed or performed poorly
- Absolute return strategy is still based on skill
- Hard to evaluate skill if there is no reasonable expectation for return (as opposed to index funds)
- Fees exorbitant
- Liquidity issues

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What does it mean for plan sponsors?

- Plan design needs to facilitate participants acting as their own fiduciaries
- Auto-enrollment default needs careful consideration
  - What is the criteria for selection
  - What is the expected outcome for a participant and for the whole plan population
  - Why this criteria
  - How is it disclosed to participants

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Conclusion

- RISKS
  - markets are risky
  - unexpected post retirement inflation is serious
  - longevity is serious
- STRATEGY
  - Understand your risks
  - Know you Plan B
- PLAN DESIGN
  - Facilitate clear and sound portfolio set up
  - Default option selection justified and its consequences communicated

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James Sia
Director, Defined Contribution
Business Development
Wellington Management Company, LLP

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Looking Back to 2008
Equity Standard Deviation Comparisons

	US Large Cap	Non-US Equity	US Small Cap	Emerging Market Equity
	S&P 500	**MSCI EAFE**	**Russell 2000**	**MSCI EM**
1 Year 2008	21.0%	27.1%	28.5%	37.5%
5 Years 2004 – 2008	12.9%	16.5%	18.1%	25.2%

Core → Satellite

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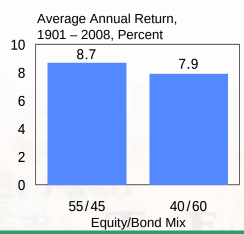
Looking Back to 2008
2010 Funds – What is the Objective?



Frequency of Outperforming Other Mix	65%	35%

Largest Annual Outperformances By a 40% Equity/60% Bond Fund

Year	Return
2008	6.3%
1931	6.3
1937	5.7
1930	5.0
2002	4.9

Sources: S&P, Barclays Capital, Ibbotson

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Target Date Glidepaths – Process for Analyzing Glidepath Tradeoffs, Historical Simulation

Determined retirement outcomes using various equity/bond mix glidepaths for rolling 43-year periods from 1942 to 2008 (e.g., beginning work in 1901 and retiring in 1942, beginning work in 1902 and retiring in 1943, etc.)

Modeled "average" worker with the following assumptions
- Initial income of US$25,000
- Real income growth of 1% annually
- Average savings rate of 11%, beginning at 7% (including match)

Employed various glidepath approaches

	Equity Allocation by Age		
	Age 23 – 40	**Age 65**	**Age 80**
Aggressive	95%	65%	35%
Moderate	90	55	30
Conservative	85	40	20

Outcomes based on equity and bond market results from 1901 – 2008

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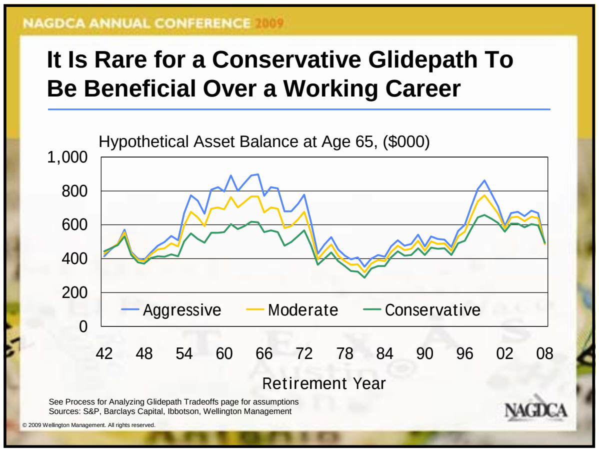
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It Is Rare for a Conservative Glidepath To Be Beneficial Over a Working Career
Hypothetical Asset Balance at Age 65, ($000)
1,000
800
600
400
200
0
Aggressive
Moderate
Conservative
42 48 54 60 66 72 78 84 90 96 02 08
Retirement Year
See Process for Analyzing Glidepath Tradeoffs page for assumptions
Sources: S&P, Barclays Capital, Ibbotson, Wellington Management
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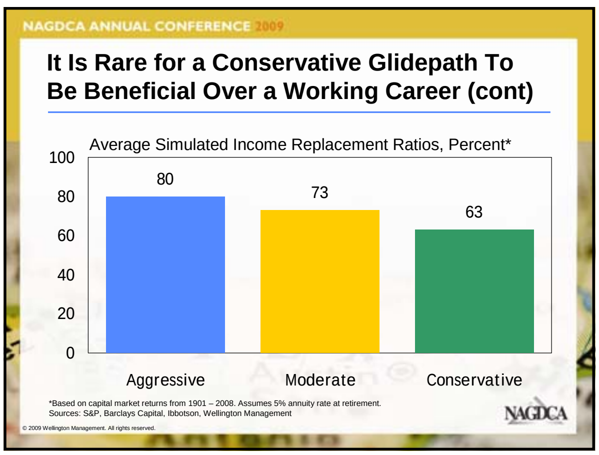
NAGDCA ANNUAL CONFERENCE 2009
It Is Rare for a Conservative Glidepath To Be Beneficial Over a Working Career (cont)
Average Simulated Income Replacement Ratios, Percent*
100
80
60
40
20
0
80
73
63
Aggressive
Moderate
Conservative
*Based on capital market returns from 1901 – 2008. Assumes 5% annuity rate at retirement.
Sources: S&P, Barclays Capital, Ibbotson, Wellington Management
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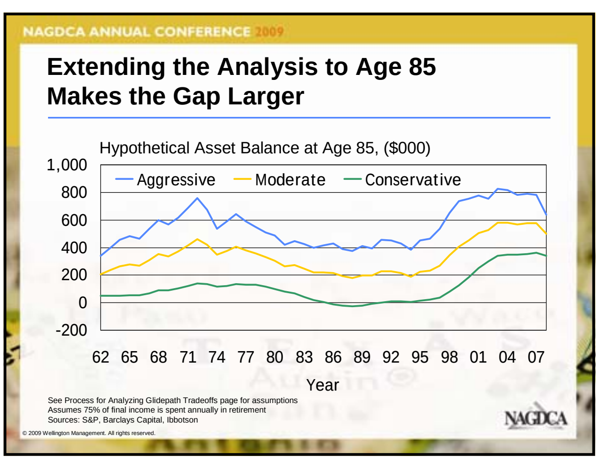
NAGDCA ANNUAL CONFERENCE 2009
Extending the Analysis to Age 85 Makes the Gap Larger
Hypothetical Asset Balance at Age 85, ($000)
1,000
800
600
400
200
0
-200
Aggressive
Moderate
Conservative
62 65 68 71 74 77 80 83 86 89 92 95 98 01 04 07
Year
See Process for Analyzing Glidepath Tradeoffs page for assumptions
Assumes 75% of final income is spent annually in retirement
Sources: S&P, Barclays Capital, Ibbotson
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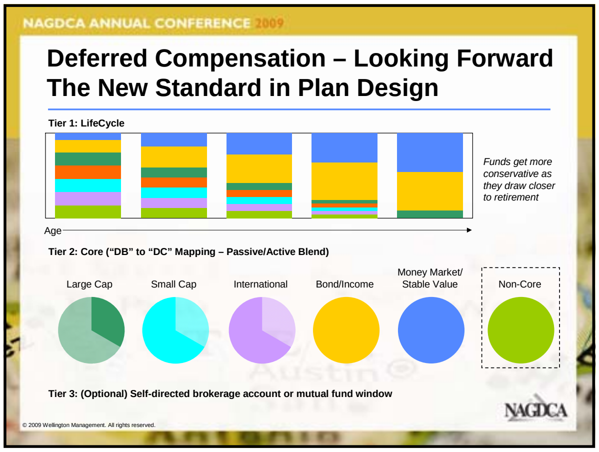
NAGDCA ANNUAL CONFERENCE 2009
Deferred Compensation – Looking Forward
The New Standard in Plan Design
Tier 1: LifeCycle
Funds get more conservative as they draw closer to retirement
Age
Tier 2: Core ("DB" to "DC" Mapping – Passive/Active Blend)
Large Cap
Small Cap
International
Bond/Income
Money Market/ Stable Value
Non-Core
Tier 3: (Optional) Self-directed brokerage account or mutual fund window
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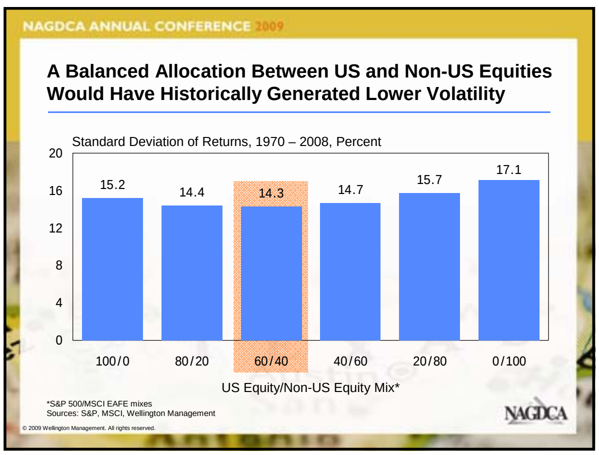
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A Balanced Allocation Between US and Non-US Equities Would Have Historically Generated Lower Volatility
Standard Deviation of Returns, 1970 – 2008, Percent
20
16
12
8
4
0
15.2
14.4
14.3
14.7
15.7
17.1
100/0
80/20
60/40
40/60
20/80
0/100
US Equity/Non-US Equity Mix*
*S&P 500/MSCI EAFE mixes
Sources: S&P, MSCI, Wellington Management
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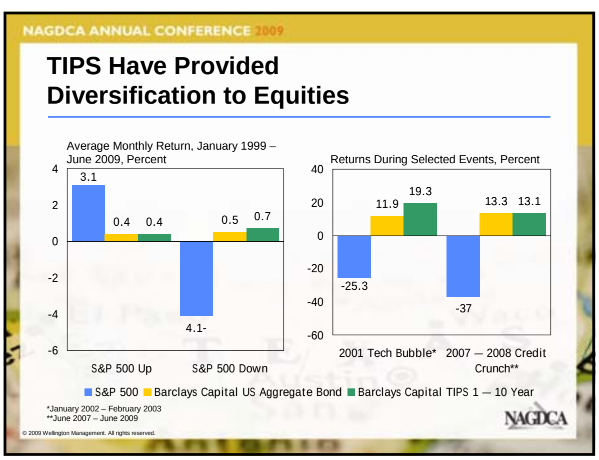
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TIPS Have Provided
Diversification to Equities
Average Monthly Return, January 1999 – June 2009, Percent
4
2
0
-2
-4
-6
3.1
0.4
0.4
0.5
0.7
4.1-
S&P 500 Up
S&P 500 Down
Returns During Selected Events, Percent
40
20
0
-20
-40
-60
11.9
19.3
13.3
13.1
-25.3
-37
2001 Tech Bubble*
2007 — 2008 Credit Crunch**
S&P 500
Barclays Capital US Aggregate Bond
Barclays Capital TIPS 1 — 10 Year
*January 2002 – February 2003
**June 2007 – June 2009
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Looking Forward
The Risk of Inflation

Moderate inflation (0 – 5%) is a good base case for developed economies

Disinflationary/deflationary pressures will dominate in the short run

Longer term outlook more uneven
- Quicker return to inflation in oil and UK
- Policymakers' behavior determines average inflation

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Looking Forward
What Gets Us Higher than Expected Inflation?

Stronger economic growth than forecast

Commodity prices (especially oil) really come back

Unwinding of quantitative easing too slow: leads to excessive cumulative money supply increases

Sustained monetization of very large fiscal deficits

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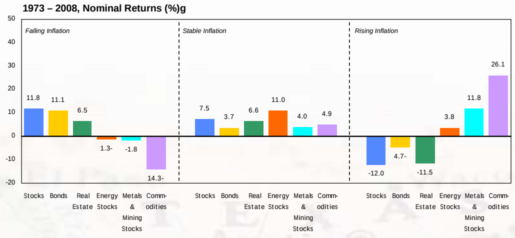
Rising Inflation
A Headwind for Stocks and Bonds

1973 – 2008, Nominal Returns (%)g



Stocks: S&P 500
Bonds: Barclays Capital US Aggregate Index
Real Estate: MSCI World Real Estate since December 1994; DataStream World Real Estate from January 1973 to December 1994
Energy: MSCI World Energy since December 1994; DataStream World Energy from January 1973 to December 1994
Metals & Mining: MSCI World Metals & Mining since December 1994; DataStream World Metals & Mining from January 1973 to December 1994
Commodities: Equal Sector-Weighted S&P Goldman Sachs Commodities Index
A rising inflation period is defined as any month when y/y US CPI rose by +0.3% or more relative to the previous month; a stable inflation period is defined as any month when y/y US CPI was between -0.3% and +0.3% relative to the previous month; a falling inflation period is defined as any month when y/y US CPI fell by -0.3% or more relative to the previous month.

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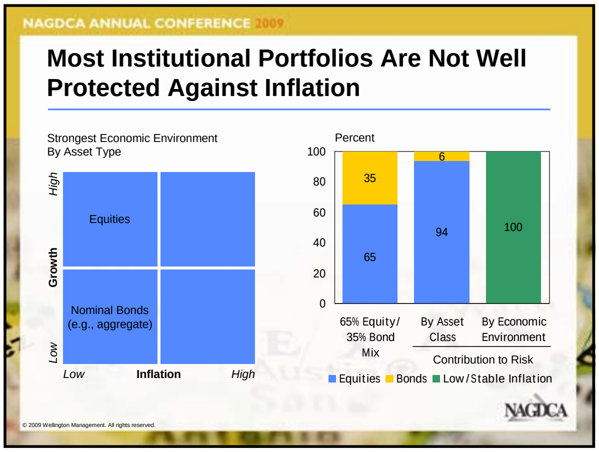
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Most Institutional Portfolios Are Not Well Protected Against Inflation
Strongest Economic Environment By Asset Type
High
Growth
Low
Equities
Nominal Bonds (e.g., aggregate)
Low
Inflation
High
Percent
100
80
60
40
20
0
35
65
6
94
100
65% Equity/ 35% Bond Mix
By Asset Class
By Economic Environment
Contribution to Risk
Equities
Bonds
Low/Stable Inflation
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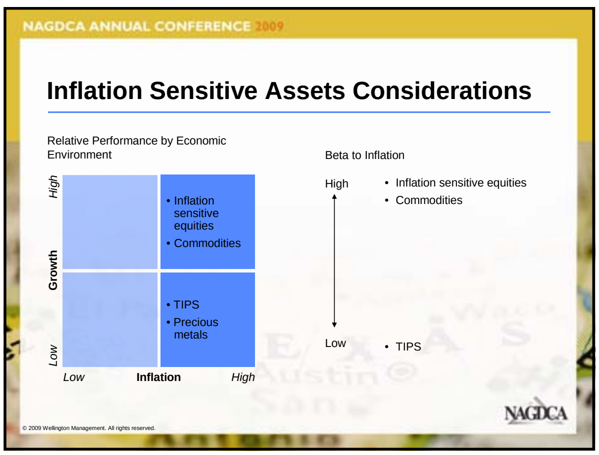
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Inflation Sensitive Assets Considerations
Relative Performance by Economic Environment
High
Growth
Low
• Inflation sensitive equities
• Commodities
• TIPS
• Precious metals
Low
Inflation
High
Beta to Inflation
High
• Inflation sensitive equities
• Commodities
Low
• TIPS
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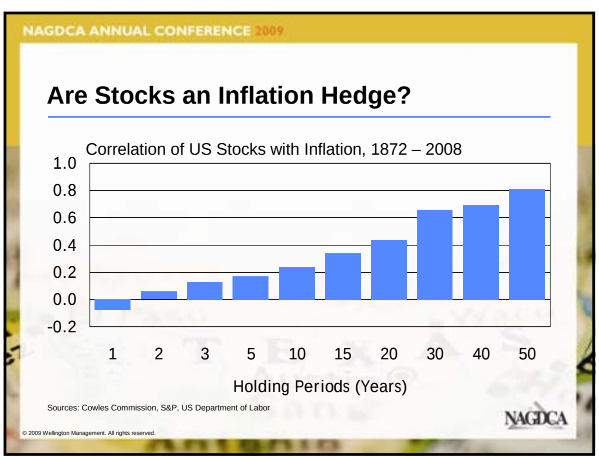
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Are Stocks an Inflation Hedge?
Correlation of US Stocks with Inflation, 1872 – 2008
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
1
2
3
5
10
15
20
30
40
50
Holding Periods (Years)
Sources: Cowles Commission, S&P, US Department of Labor
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Inflation Can Impact Spending Requirements

Limited Impact ⟷ Significant Impact

Corporate Defined Benefit Plans
- Liability driven by discount rate
- Inflation reduces future liability through discount rate

Public Defined Benefit Plans
- Inflation surprise increase liability only marginally

Defined Contribution/ Endowments & Foundations
- Spending needs are "real" and therefore inflation has large impact

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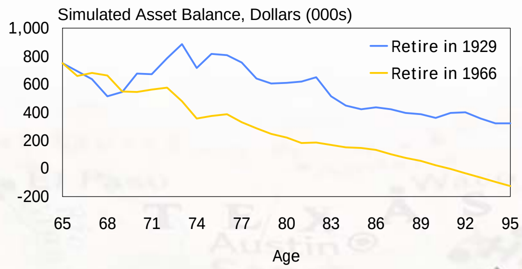
Inflation Has Caused the Most Painful Times to Retire



Assumes $750,000 beginning asset balance with $30,000 annual withdrawals
Source: Wellington Management

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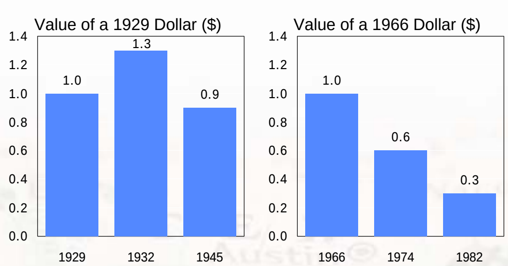
Inflation Erodes Spending Power While Contributing to Weak Asset Class Returns



Sources: US Bureau of Labor, Wellington Management

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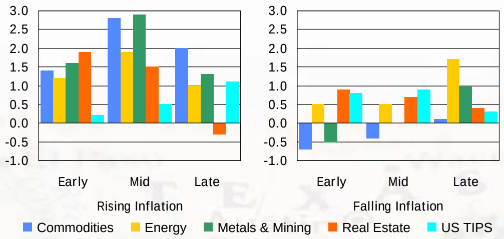
Inflation Hedging Assets Move Well Ahead of CPI

Average Monthly Returns, February 1973 – December 2008, Percent



Periods of rising inflation are defined as periods with an increase in the year over year percent change in US CPI: August 1972 – November 1974, December 1976 – April 1980, July 1983 – March 1984, December 1986 – October 1990, September 1998 – March 2000, June 2002 – July 2008. Periods between these date ranges are defined as falling inflation for this analysis. Each data range was divided into 3 periods of equal length to determine Early, Mid, and Late stage classifications. Energy: MSCI World Energy since December 1994; DataStream World Energy from January 1973 to December 1994. Metals & Mining: MSCI World Metals & Mining since December 1994; DataStream World Metals & Mining from January 1973 to December 1994 Agriculture: MSCI World Food Producers 75%, World Forestry and Paper 25% Commodities: Equal Sector-Weighted S&P Goldman Sachs Commodities Index US TIPS: Barclay's US TIPS Index (originally Lehman Brothers US TIPS Index) since May 2000, Barclays US TIPS Index from March 1997 to May 2000, proprietary WMC US TIPS Model from January 1973 to September 1997

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Inflation-Sensitive Assets Risk/Return Expectations

	Inflation-Sensitive Equities	Commodities*	TIPS
Expected return	CPI +6%	CPI	CPI +2%
Expected volatility	15%	15 – 20%	5.5%
Correlation with S&P 500	0.8	0.1	0.0
Correlation with CPI	0.2	0.3	0.2
Beta to expected inflation	High	High	Low

*Based on equal-weighted Goldman Sachs Commodity Index

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Summary Viewpoints

Inflation is an important risk for pensions, endowments and foundations (E&Fs), and DC plans

- Creates difficult capital markets
- Increases spending needs for DC plans and E&Fs

A range of assets and strategies exist to create greater portfolio balance in inflationary periods

Asset allocation for DC plans and E&Fs should include inflation-sensitive assets while DB plans may consider it more opportunistically

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