

Escalation: How Much is Enough?

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2007 AACE International

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Complex Subject

- Escalation is a very complex subject
 - Basic principle - Supply and Demand
- Many variables to consider
 - Economy overall health
 - Cost of Oil
 - Environmental regulations (global warming)
 - Illegal immigrant crackdown
 - ~25% of all construction workers illegal
 - 55% of all concrete workers foreign born Hispanics
 - 22% of all painters illegal
 - 10% increase in worker supply = 3% decline in local wages
 - 50% increase in worker supply = 15% decline in local wages
 - Many more
 - 29% Increase in minimum wage

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Complex Subject

- Construction is large part of our economy
 - When economy is strong construction generally increases faster than overall economy
 - Inversely when economy weakens construction generally slows faster



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New Twists

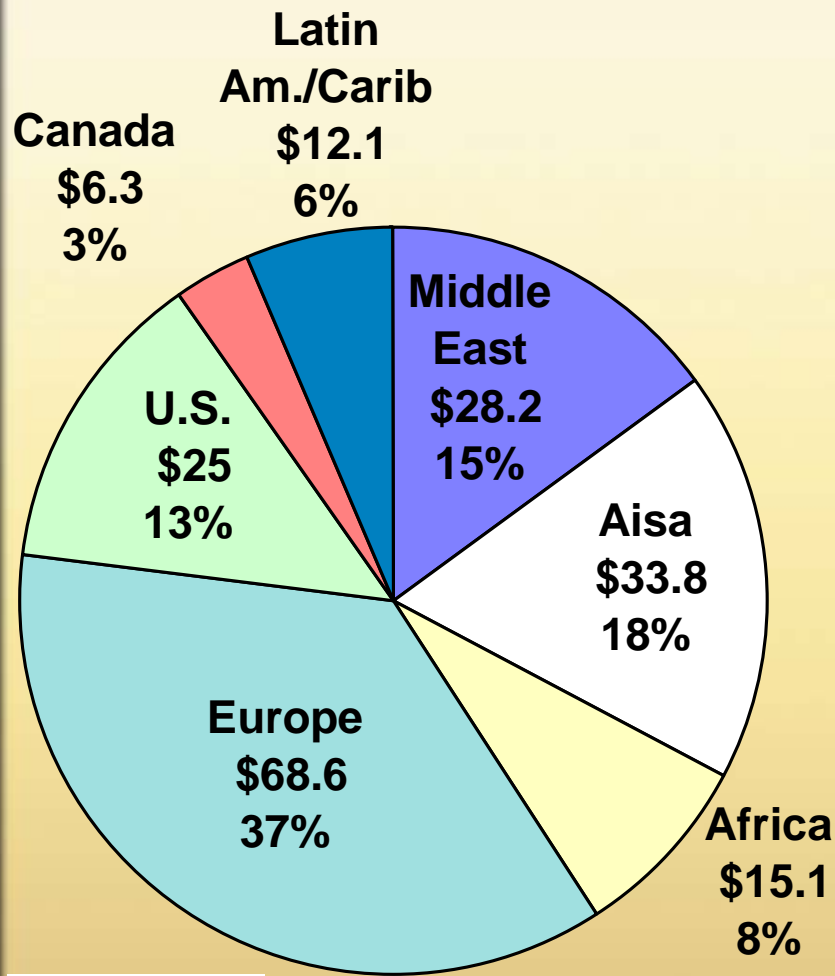
- Commodity Markets & Hedge Funds increase costs due to speculative bidding
- Many major U.S. projects will not stop as result of economic slowdown
 - Hurricane Recovery
 - Casinos, Homes, Infrastructure
 - Global Warming (Environmental)
 - Nuclear Power Plants
 - Airport Upgrades
 - World Trade Center

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2005 Construction Billings by Market



In Billions

- Historically U.S. construction costs primarily product of U.S. economy
- Global economy driving many increases
 - Emerging markets in massive construction boom
 - Beijing China has 1.7 Billion SF under construction @ 10,000 sites \$180+ Billion
 - Demand absorbed ships
 - Imports cost more

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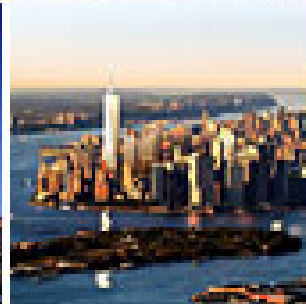
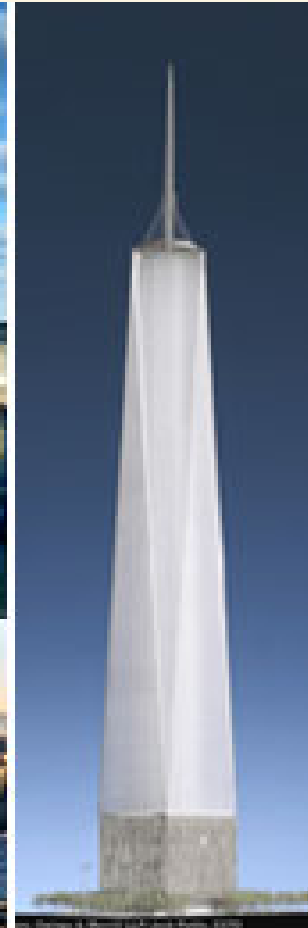
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Hurricane Recovery - Billions



World Trade Center – \$21 Billion



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Nuclear Power

- Nuclear Power Plants
 - 20-29 new units planned
 - Source ENR
 - 19+ new units in approval process
 - Source Nuclear Energy Institute 9-06 Report
 - \$300-\$500 Million Per Plant + Reactor Cost
 - All will not be approved

Company	Plant Sites	Application File
Dominion	Va.	2007
Duke and Southern	SC	2007
Entergy	La	2008
NuStart (Entergy)	Miss.	2007/2008
NuStart (TVA)	Ala.	2007
Progress Energy	Fl.	2007/2008
S.C. Electric & Gas/ Santee Cooper	S.C.	2007
Southern Co.	Ga.	2008
UniStar	N.Y.	2008
Amarillo Power	TX	2007
Texas Utilities	TX	2007
NRG Energy	TX	2007
FP&L	TBD	2009
Several More	Varies	Varies

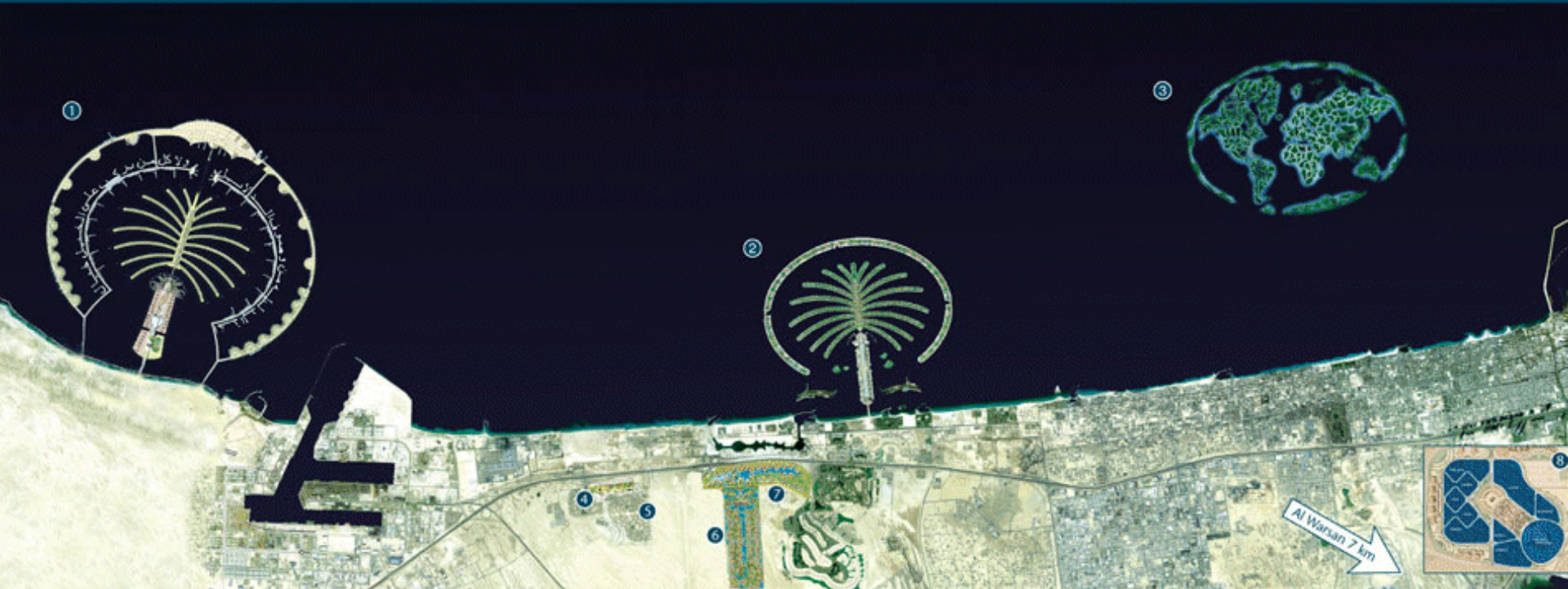
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Dubai \$100+ Billion Construction



- 1 The Palm, Jebel Ali
- 2 The Palm, Jumeirah
- 3 The World
- 4 Gardens Shopping Mall
- 5 The Gardens
- 6 Jumeirah Islands
- 7 Jumeirah Lake Towers
- 8 Dubai International City



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Global Warming

- “Global warming will cost the world up to seven trillion dollars in the next decade unless governments take drastic action soon.”
 - “Failure to act quickly will trigger a global recession.”
- Driving changes
 - LEED
 - 2007 Regulations increase diesel truck costs by 10% and reduced gas mileage.
 - Truck sales expected to plummet by 40% in 2007

Source: Sir Nicholas Stern's 700 Page British Government Report

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Many Short Term Indicators

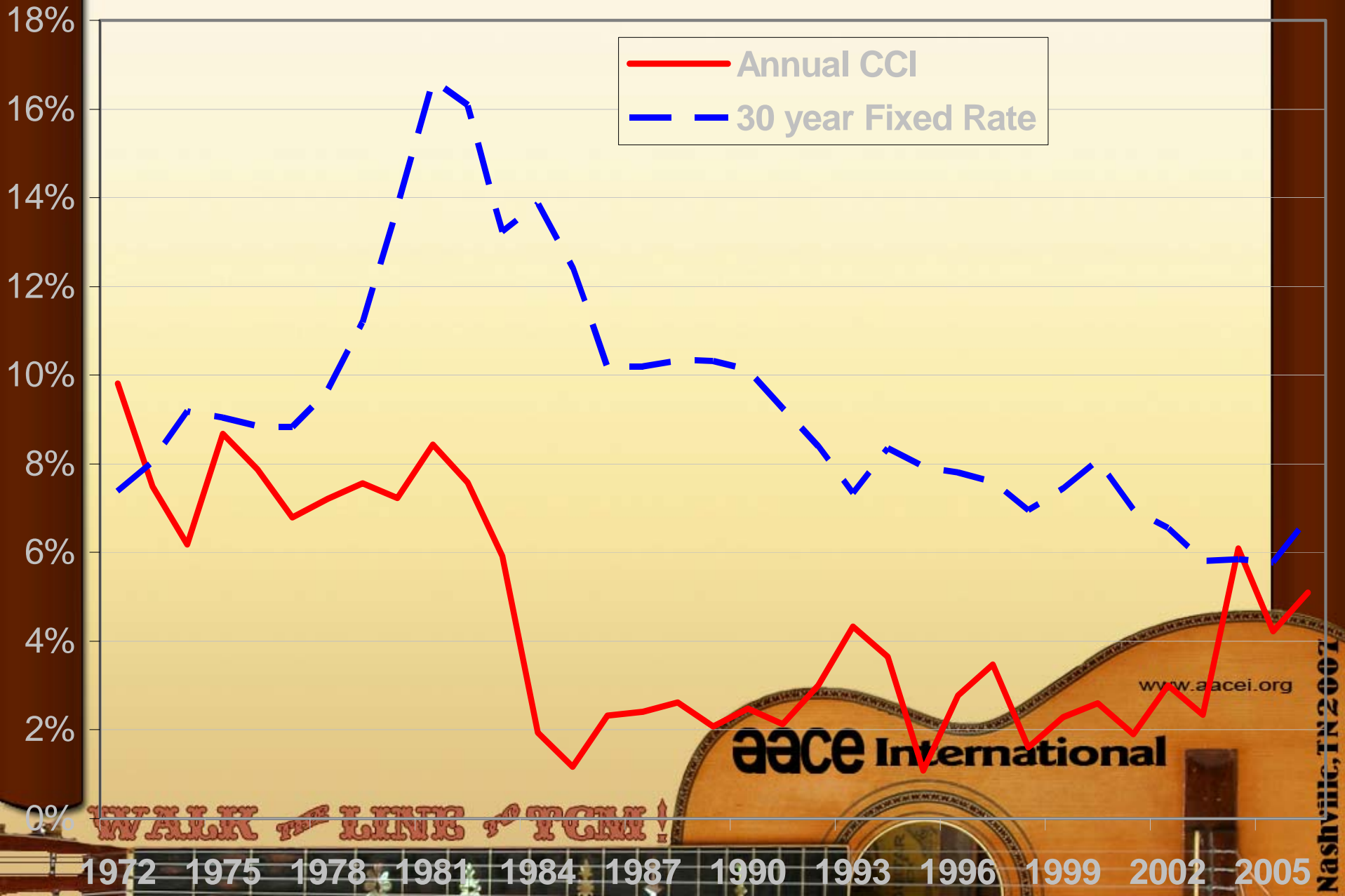
- Engineering News Record (ENR)
 - Annual Forecast 2007 Prediction
 - Decrease of Material Costs
 - Increase Labor Costs
- Interest Rates
 - Inverse relationship to construction costs
- Architectural Billings Index (ABI)
 - Tracks workload of 300 U.S. architectural firms
- Baltic Dry Index (BDI)
 - Tracks cost of transporting raw materials
- Prior 12 Months increase of cost indexes
 - Number of Bids submitted on recent projects
 - Many more
- All require tracking, analysis & interpolation

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Interest Rates



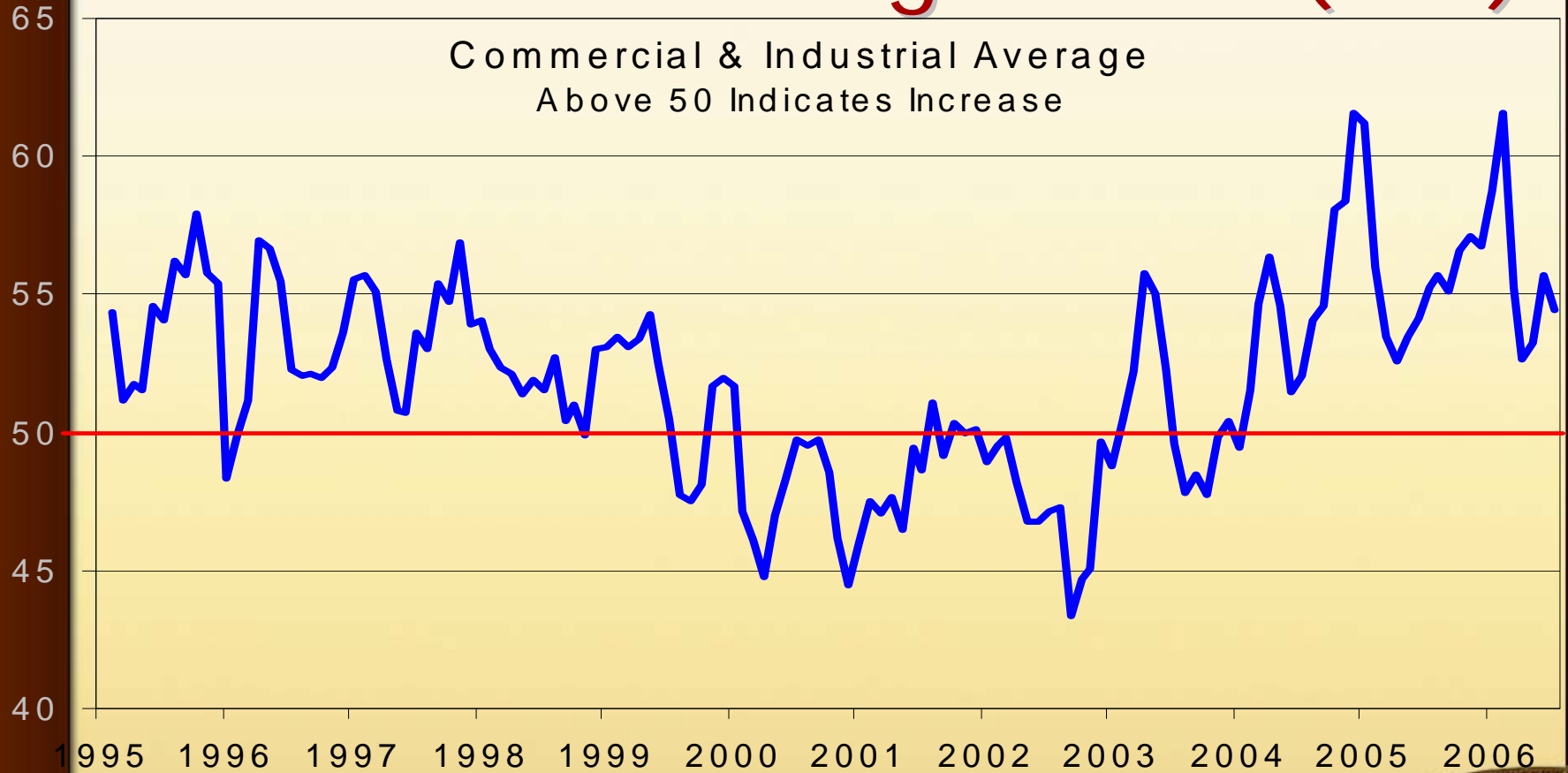
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1972 1975 1978 1981 1984 1987 1990 1993 1996 1999 2002 2005

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Architectural Billings Index (ABI)



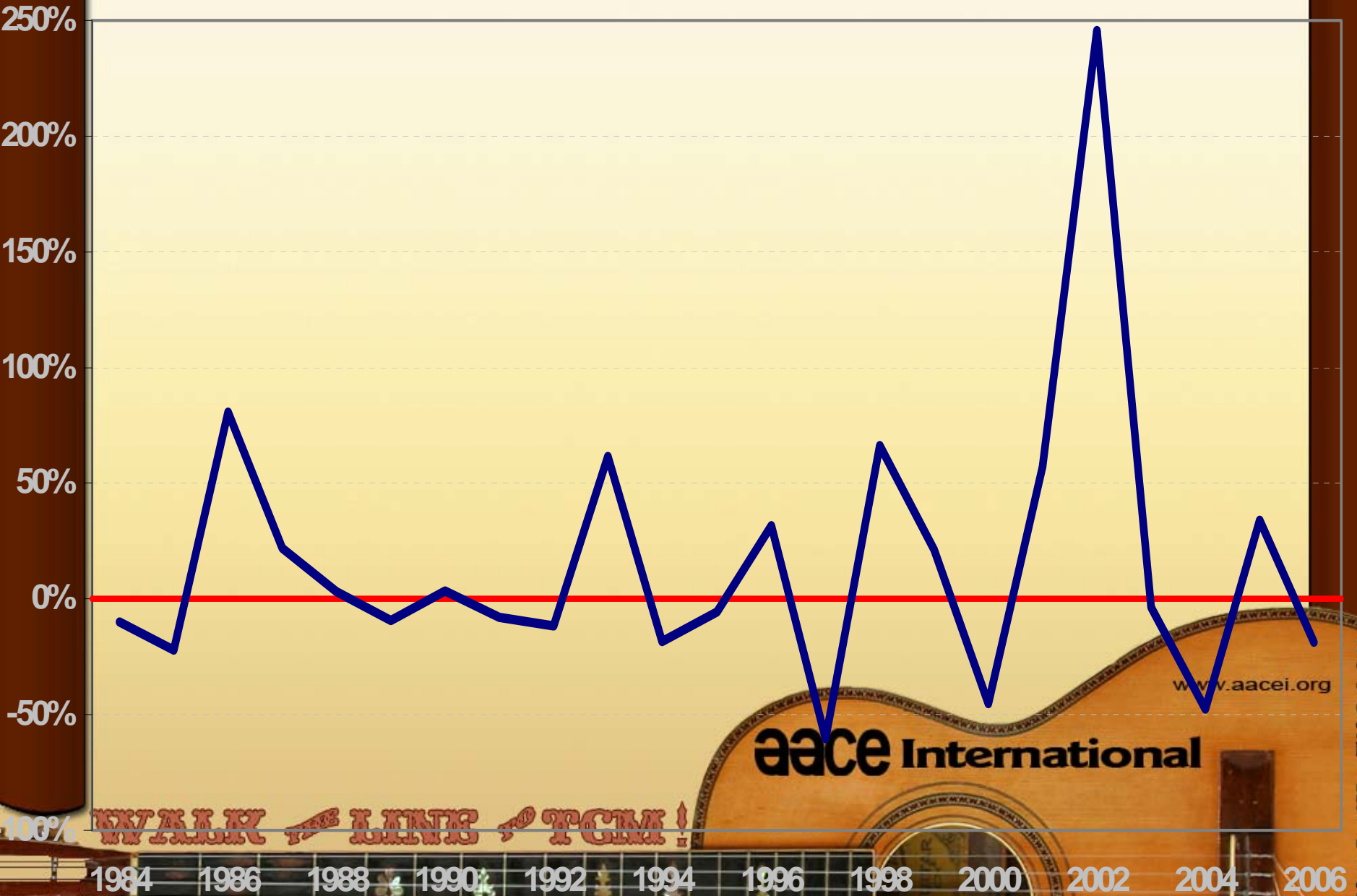
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Baltic Dry Index (BDI)



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Few Long Term Indicators

- Federal Government OMB
 - Bears weight of political agendas
 - Free!
- McGraw-Hill Construction Market Forecasting Service (CMFS)
 - 1 & 5 Year Forecasts for specific areas
 - \$400 - \$1,700 Each
- Building Cost Information Service (BCIS)
 - 5 Year Forecasts for United Kingdom
 - £150 Each
- Accuracy Uncertain



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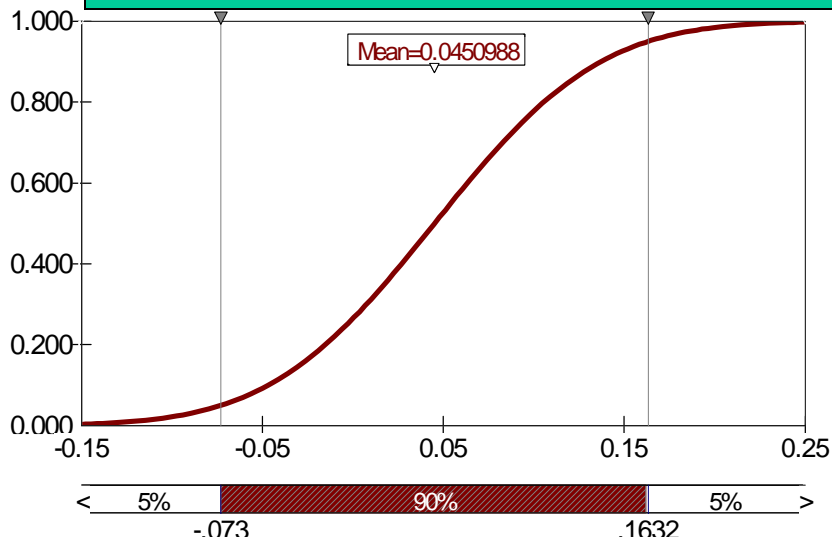
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Contrary to Popular Opinion

- Recent Inflation **not that unusual**
 - ENR CCI annual average increase past 103 years
 - Over 3% - 60%
 - Over 4% - 51%
 - Over 5% - 35%
 - Over 6% - 31%
 - Over 7% - 23%
 - Over 8% - 16%
 - Over 9% - 13%
 - Over 10% - 10%**

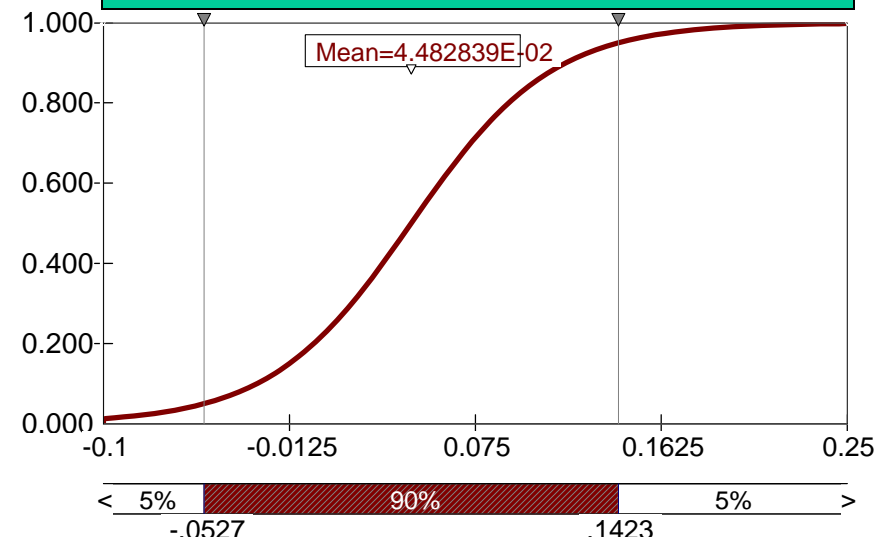
1915-2005 Escalation Normal

90% of time between -7.3% & 16.3%

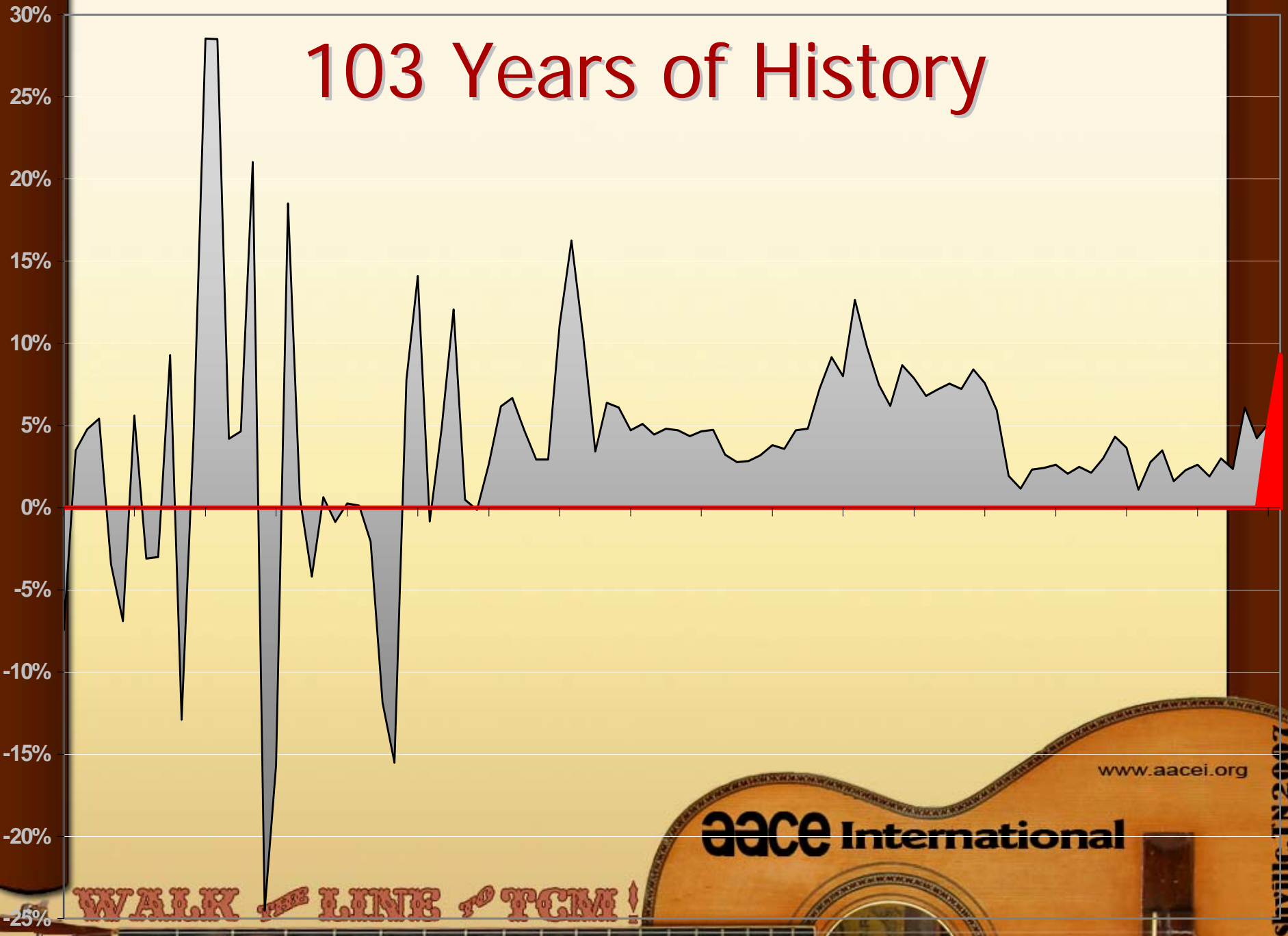


1915-2005 Escalation Logistic

90% of time between -5.2% & 14.2%



103 Years of History



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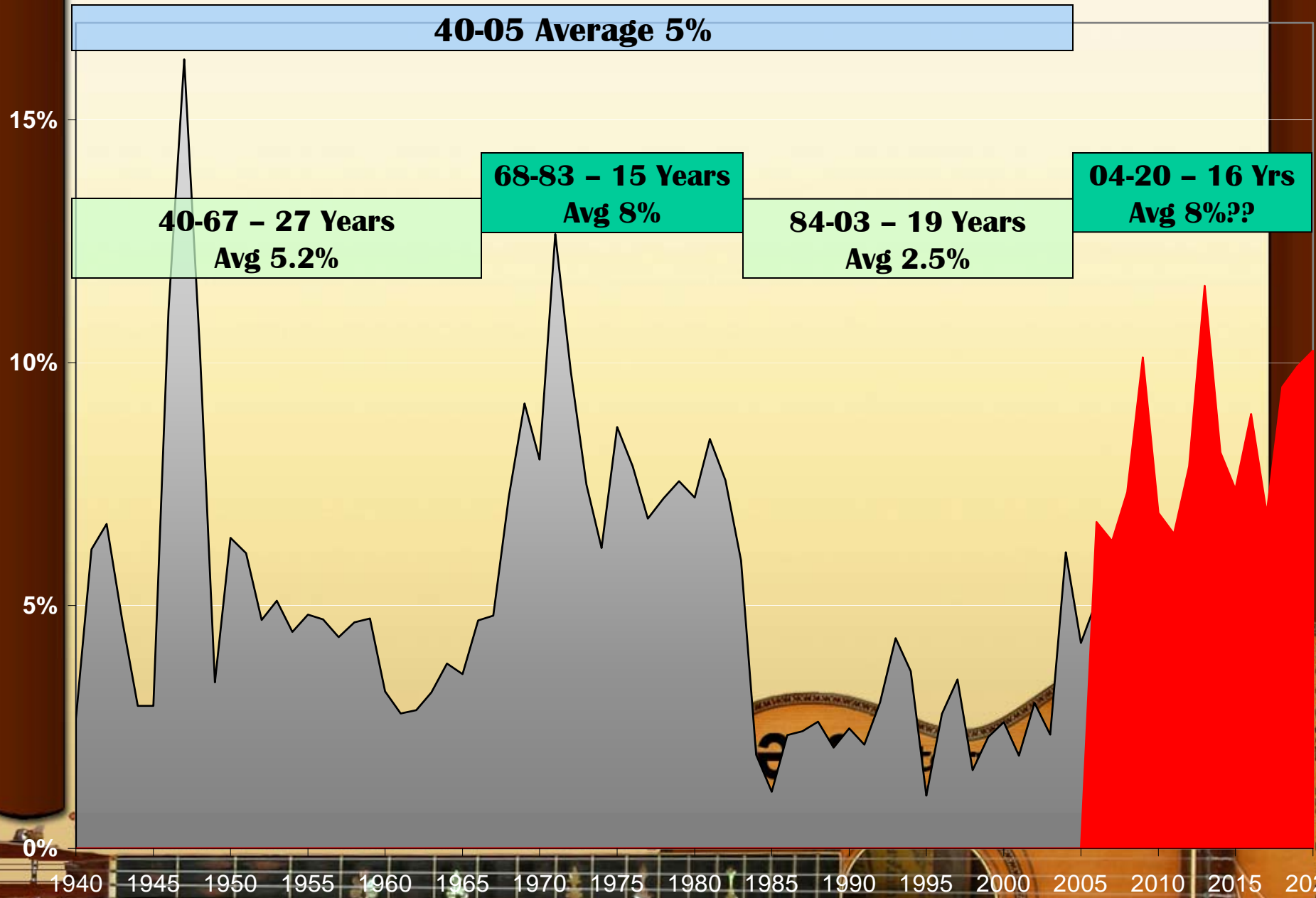
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1904 1910 1916 1922 1928 1934 1940 1946 1952 1958 1964 1970 1976 1982 1988 1994 2000 2006

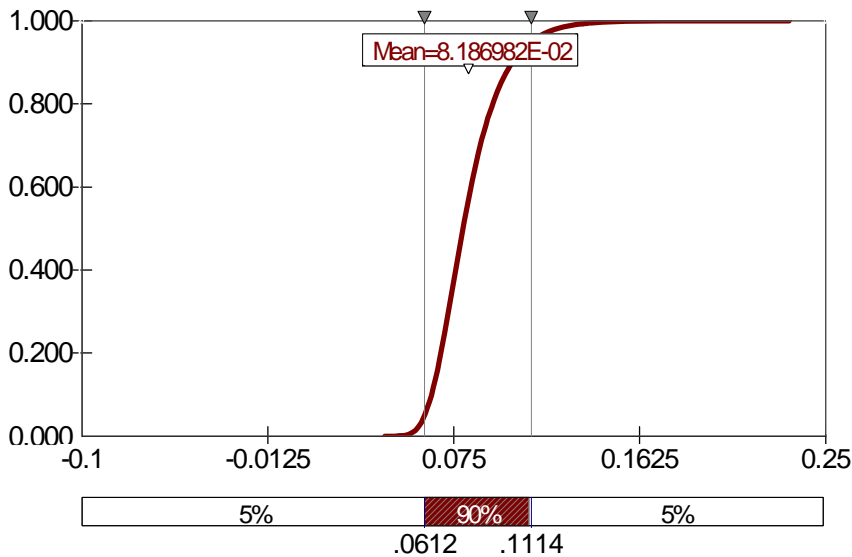
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65 Years of History

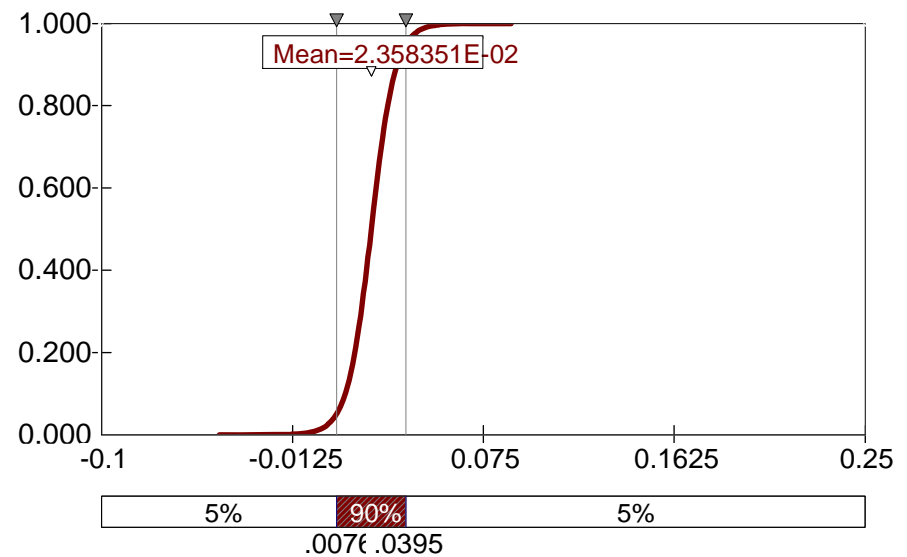


Distinct Cyclical Periods

1968-1982 Escalation
90% of time between 6.1% & 11.4%



1983-2003 Escalation
90% of time between 0.8% & 4%



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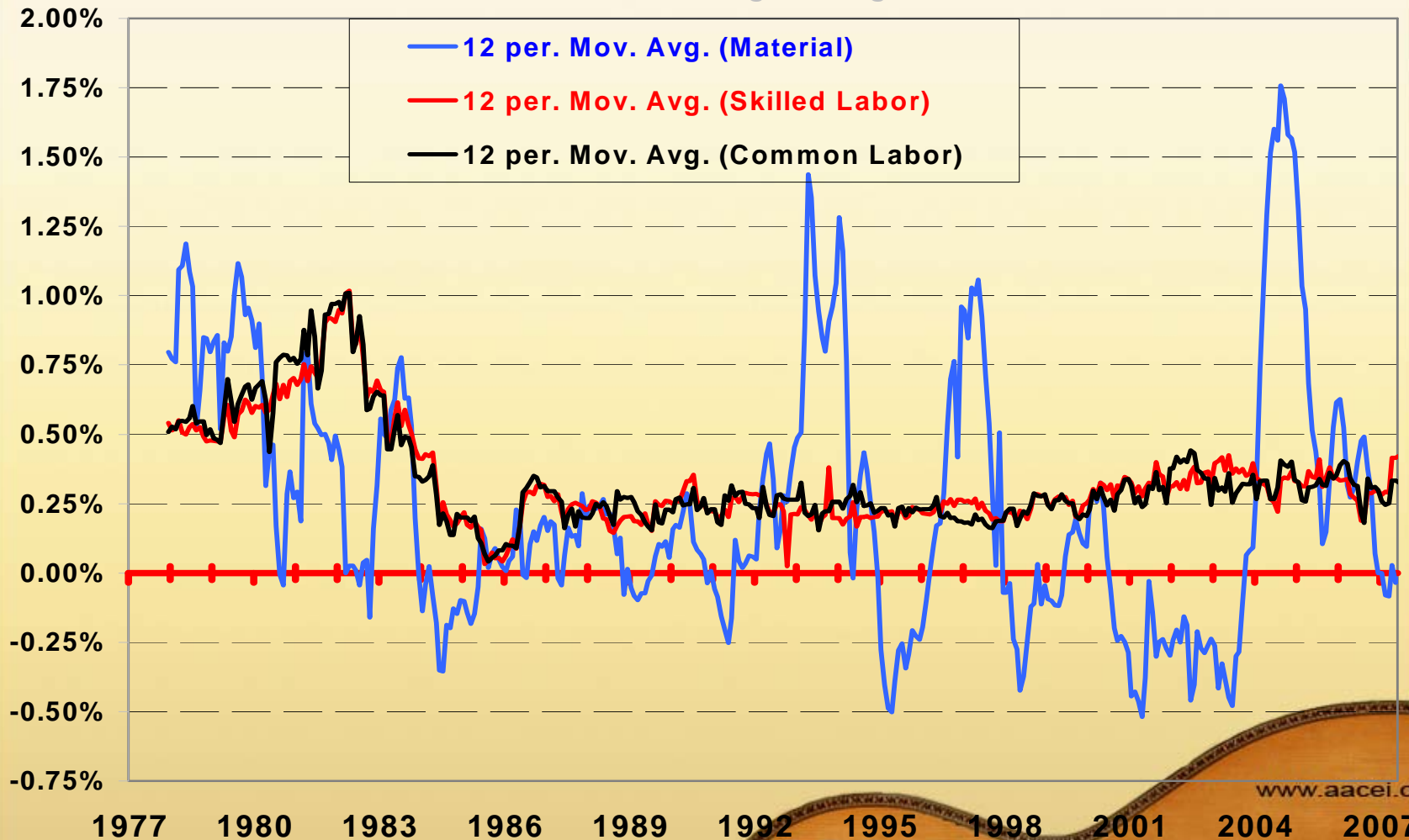
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CCI Monthly Change

(12 Month Moving Average)



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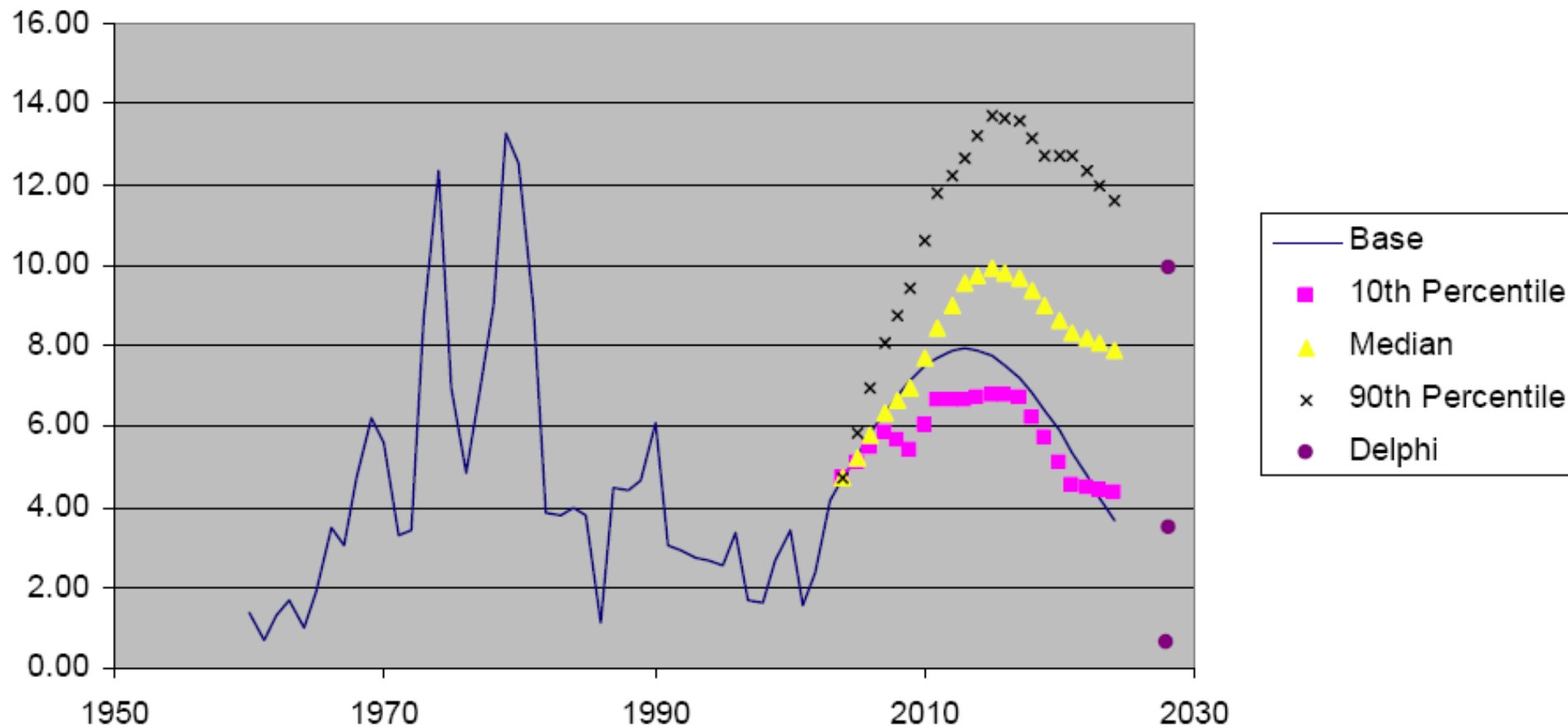
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Society of Actuaries – Delphi Study

- Historically CPI Underruns CCI 68% of the time

CPI Annual Change (%)



Another Way

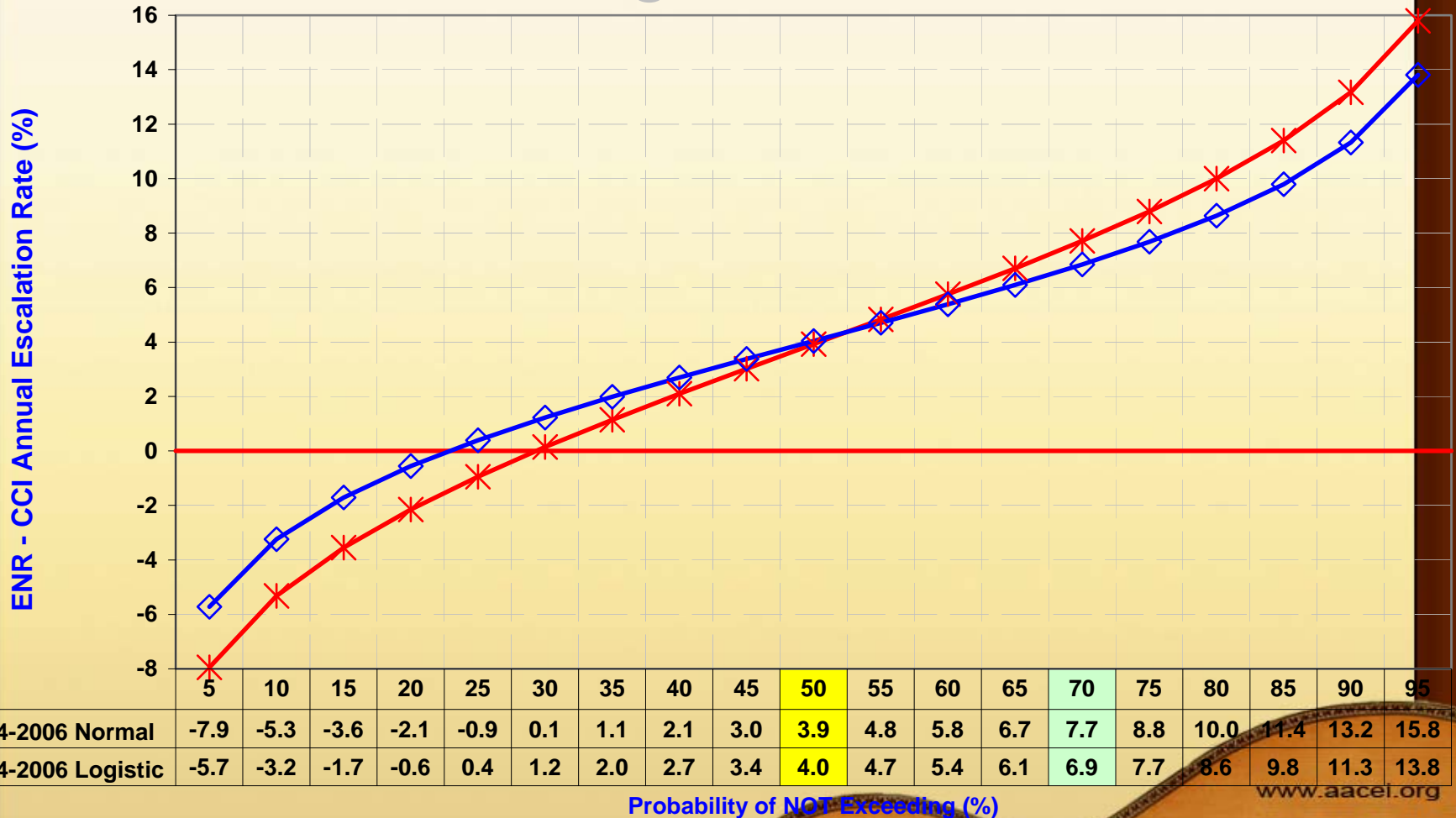
- Management generally understands risk.
 - Allow them to decide how much risk they are willing to accept.
- Monte Carlo Simulation is an widely accepted method to deal with risk.

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Another Way – Risk Based

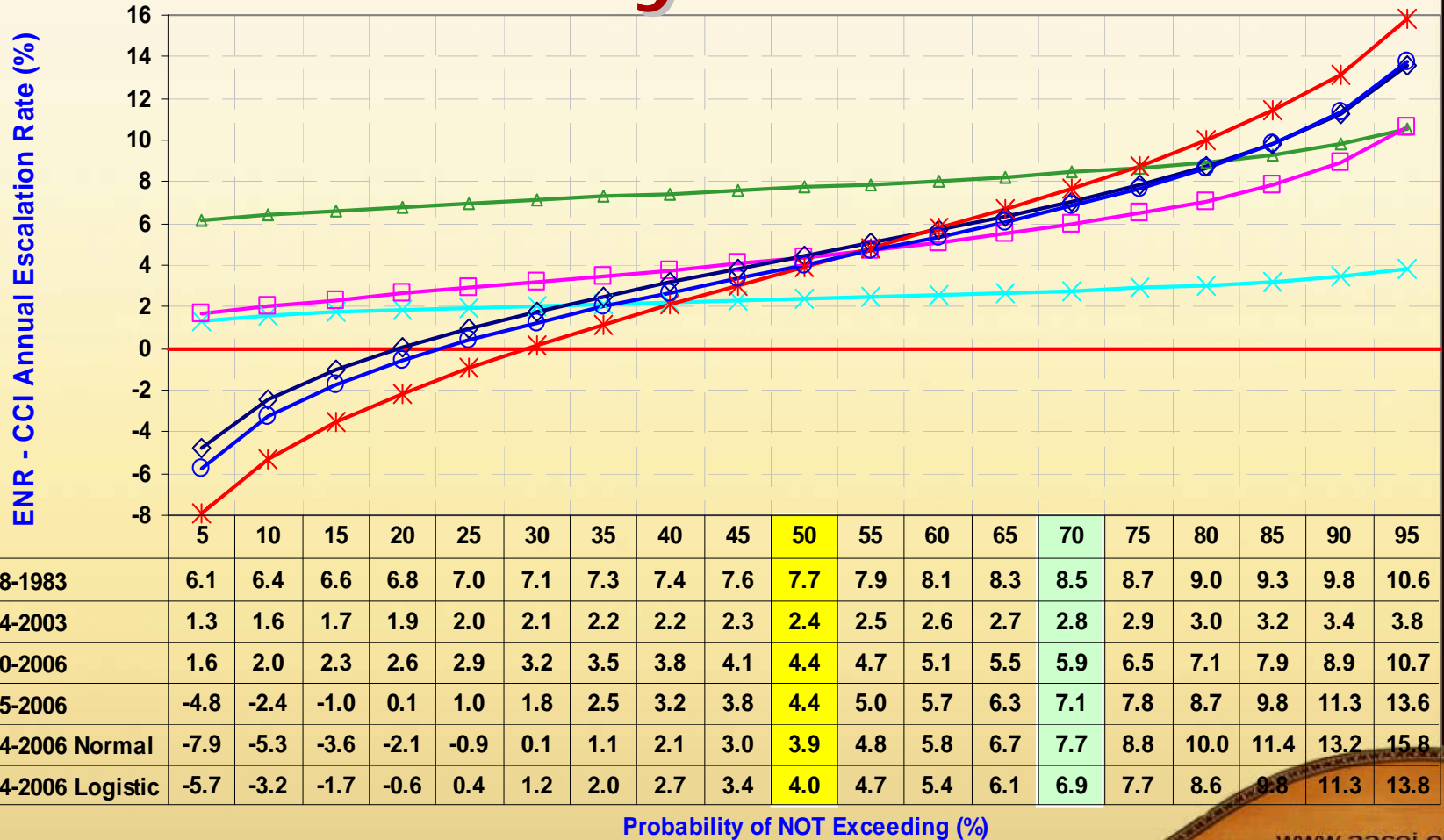


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Another Way - Risk Based



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Random Walk

- Previous analysis assumes each years escalation is totally independent from the next
- Some question the validity of this approach and suggest a Random Walk approach
 - Concept
 - Each years escalation will influence the following years of escalation.

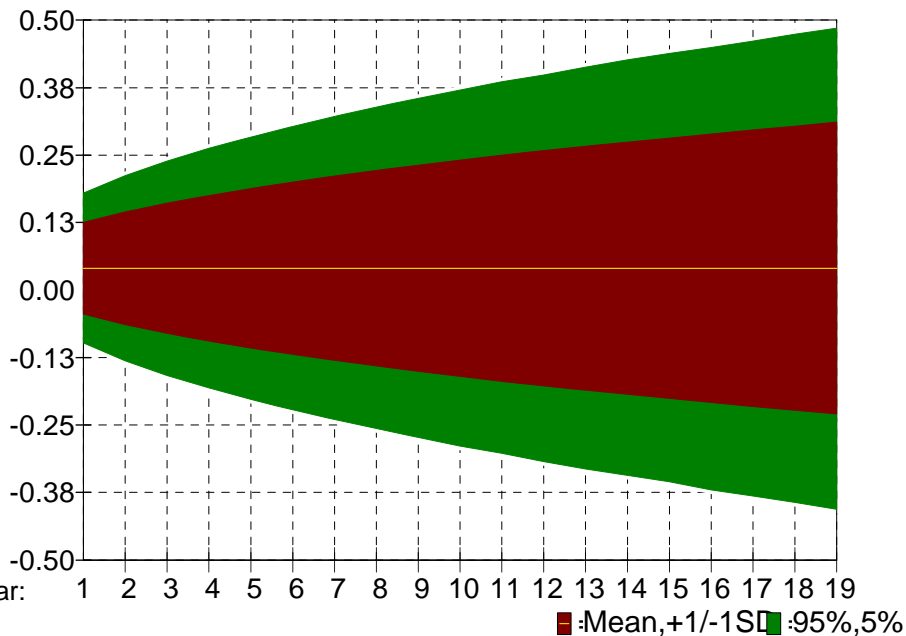
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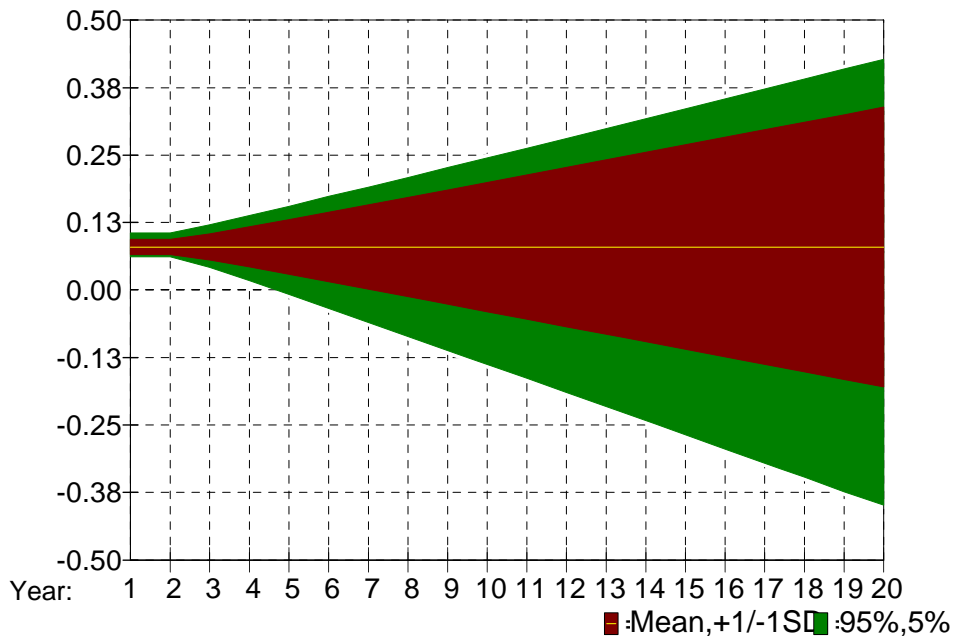
CCI 1904-2006

Random Walk



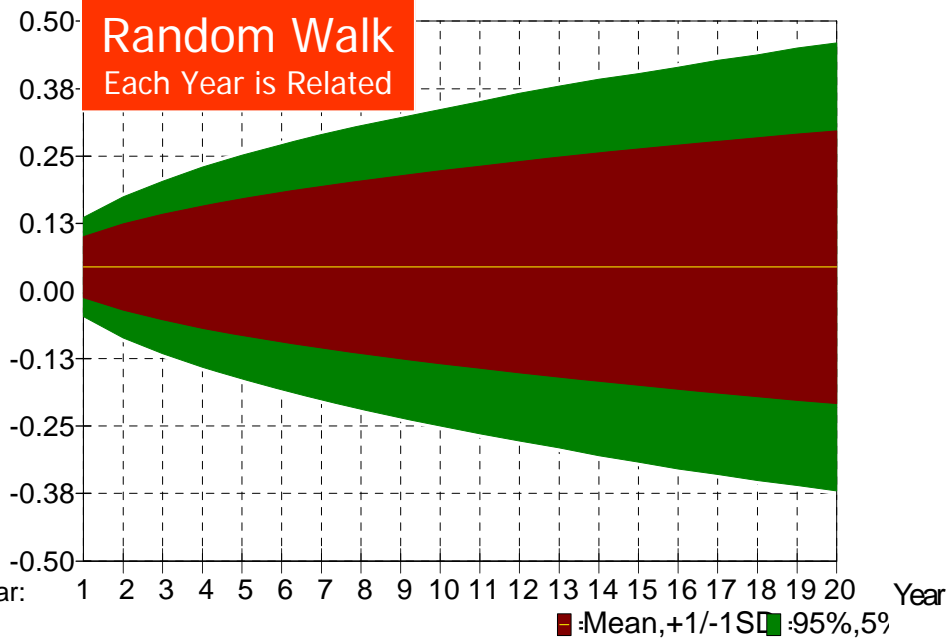
CCI 1968-1983

Random Walk



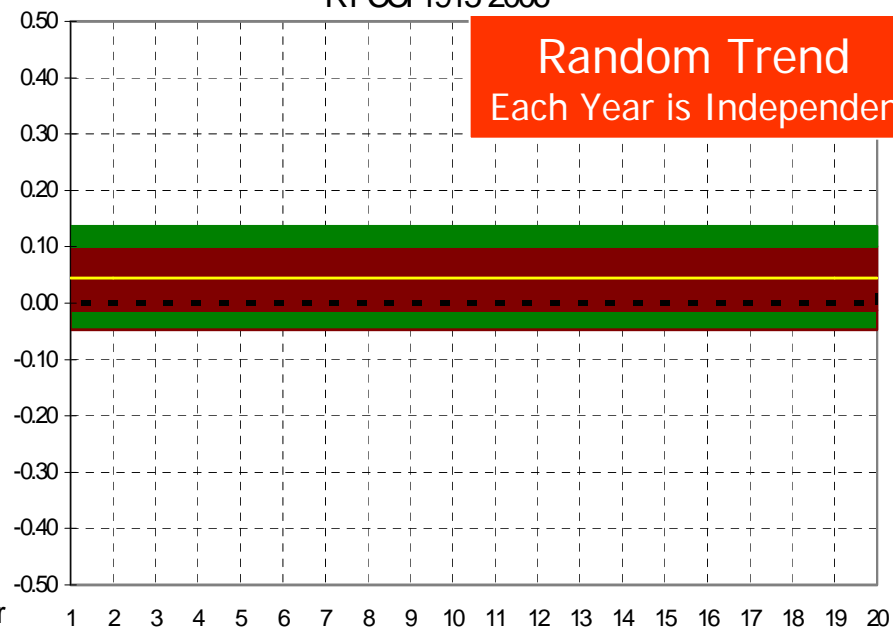
CCI 1915-2006

Random Walk
Each Year is Related



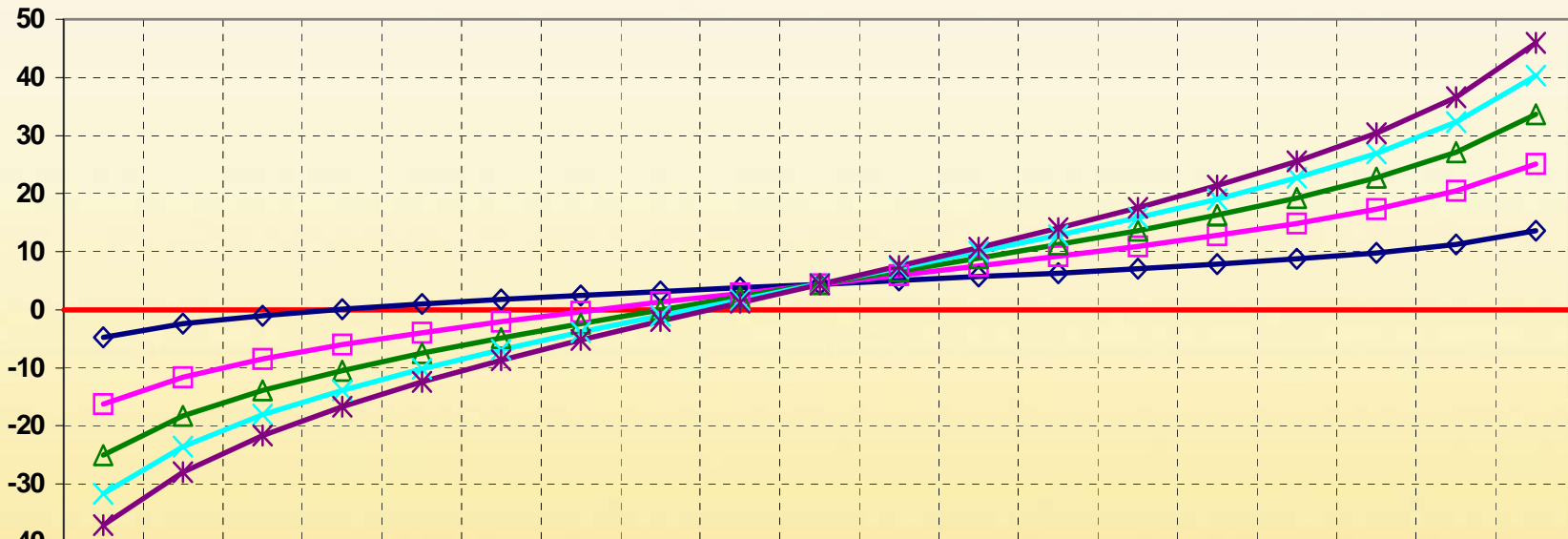
RT CCI 1915-2006

Random Trend
Each Year is Independent



ENR CCI 1915-2006 Random Walk

ENR - CCI Annual Escalation Rate (%)



	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95
Year 1	-4.8	-2.4	-1.0	0.1	1.0	1.8	2.5	3.2	3.8	4.4	5.0	5.7	6.3	7.1	7.8	8.7	9.8	11.3	13.6
Year 5	-16.2	-11.6	-8.5	-6.0	-3.9	-2.1	-0.3	1.3	2.8	4.4	6.0	7.5	9.2	10.9	12.8	14.9	17.3	20.5	25.1
Year 10	-25.0	-18.3	-13.9	-10.4	-7.5	-4.8	-2.4	0.0	2.3	4.5	6.7	8.9	11.2	13.7	16.4	19.3	22.8	27.1	33.6
Year 15	-31.7	-23.6	-18.1	-13.9	-10.2	-6.9	-3.9	-1.0	1.7	4.5	7.2	10.0	12.9	15.8	19.1	22.7	26.9	32.3	40.3
Year 20	-37.0	-28.0	-21.7	-16.7	-12.4	-8.6	-5.1	-1.9	1.3	4.4	7.5	10.7	14.1	17.6	21.4	25.5	30.4	36.6	45.9

Probability of NOT Exceeding (%)

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Conclusion

- Escalation
 - Prediction is difficult, if not impossible.
 - Has been abnormally mild in recent history
 - Has been underrunning historical averages
- Material prices
 - Have been primary driver in recent cost increases
- Labor prices
 - Anecdotal evidence is indicating substantial pressure on wages.
 - The current trend of high costs and low wages can not continue.
 - Either material costs will decline or labor costs will increase.
- We appear to be entering a period of increased volatility.
- Federal Reserve Study
 - Suggests best indicator of next year's inflation is last year's inflation rate
 - Perhaps 12-month moving average of favorite index will prove a valid short term indicator of the current trend.
- World economy is changing
- **Analysis excludes market factors**

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Questions and copy of presentation

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