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Nature, Nurture & Economic Growth
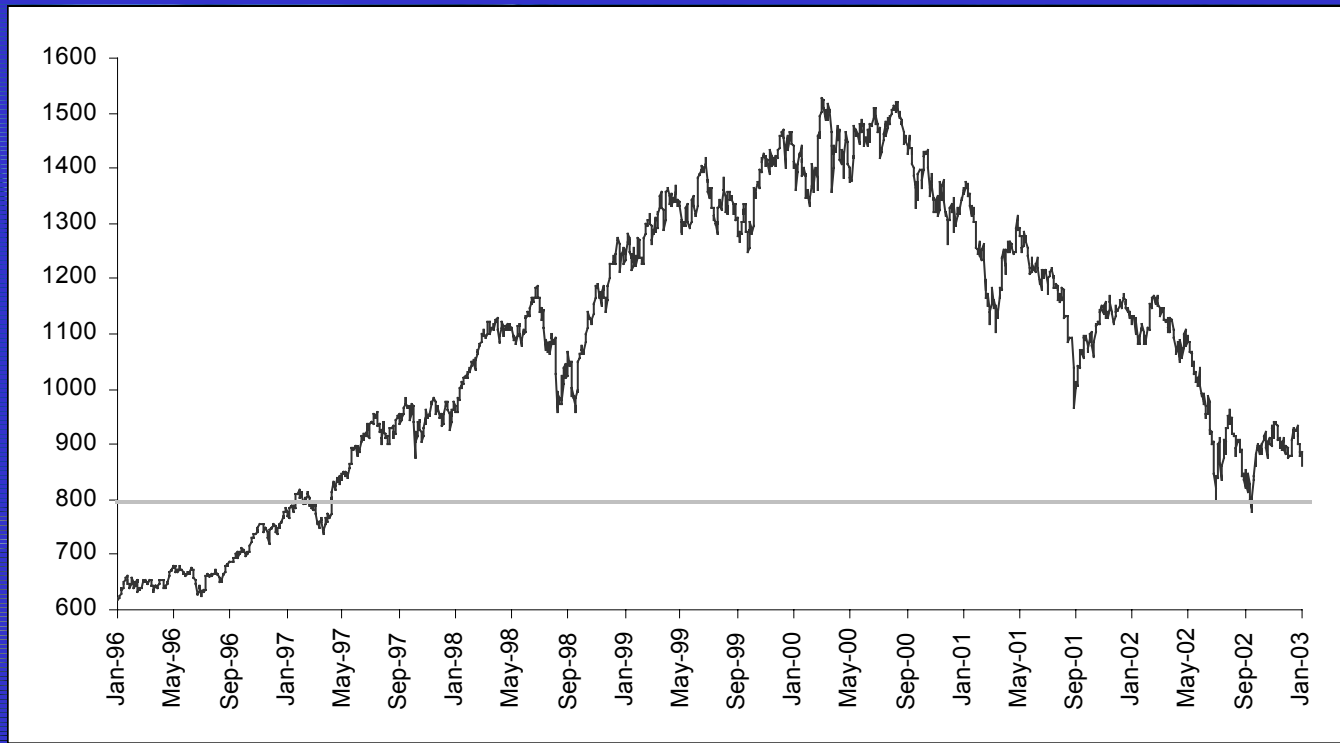
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**Centre for Financial Research Seminar Judge Institute of Management 28 February 2003**

An Unpleasant Recent Past for the US Equity Market

Creative Destruction or Just Destruction???

'Head & Shoulders' above the rest, 6 yrs & back to the old S&P 500 levels

From a Financial Engineering Standpoint the Process of Adjustment has been Difficult
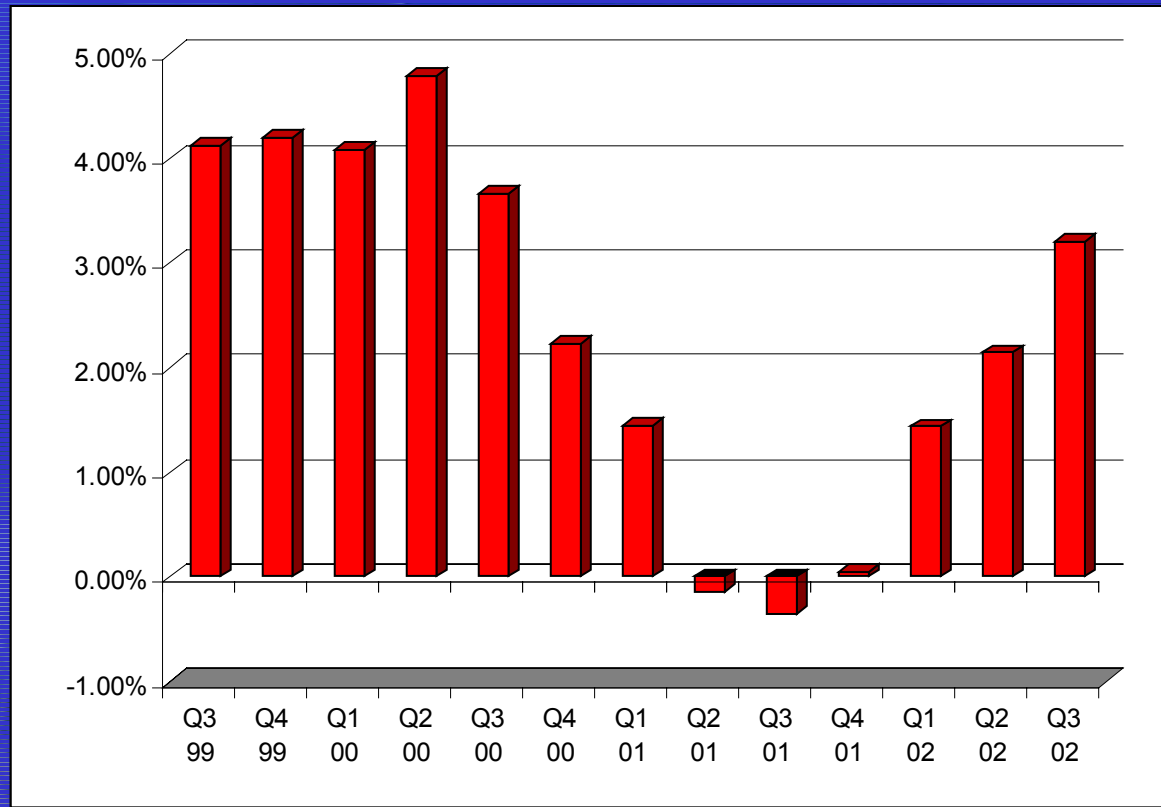

Daily Movements > Shaded Area Should Only Occur Once per 120yrs!!
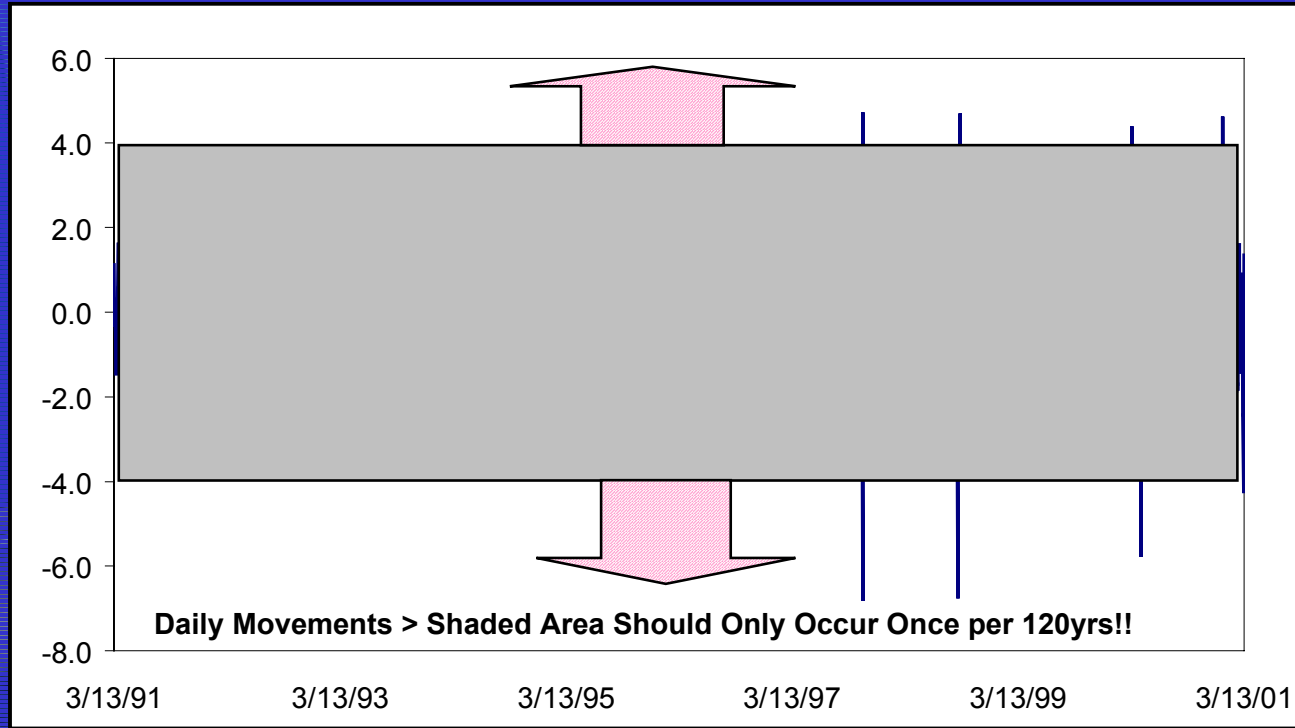
'Fat-Tails' in S&P 500 Distribution Implies Standard VaR is Misleading

# And Asset Allocation is Back in Vogue......
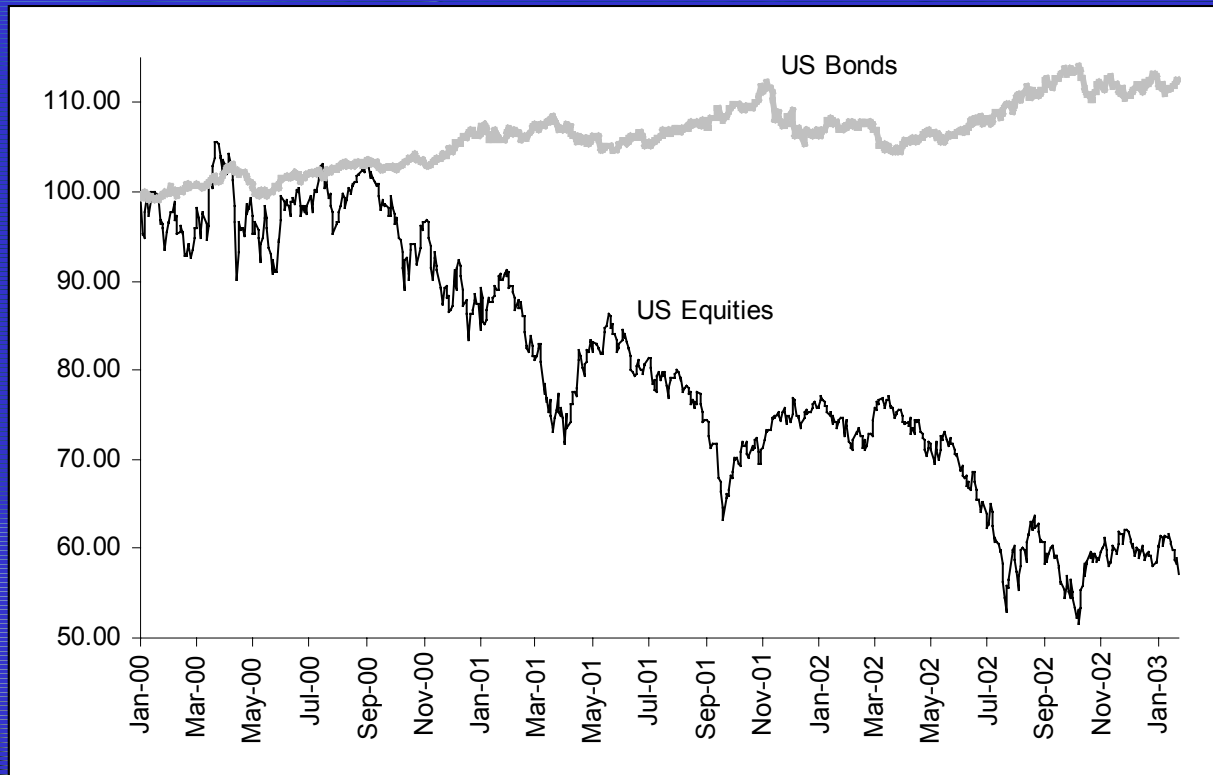
Value dichotomy Implies that Bonds vs Equity Call has been Crucial for 3yrs

This is Little Wonder Given the Recent Pattern of Economic Growth......

YoY % US GDP Performance through the Dip

# And now the Traditional Bond/Equity tradeoff has once more reasserted itself.....

Past 3yrs Global Bond/Equity Tradeoff

Hypothetical Zero Diversification Benefit

1990's Global Bond/Equity Tradeoff
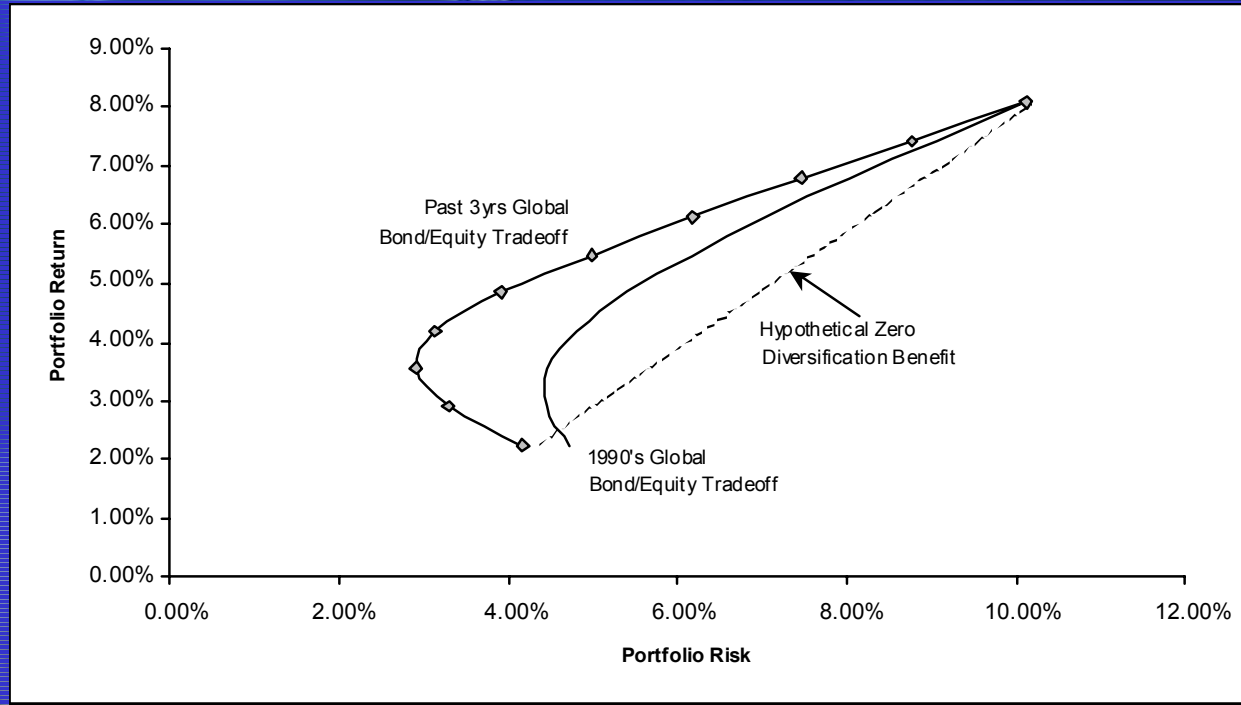
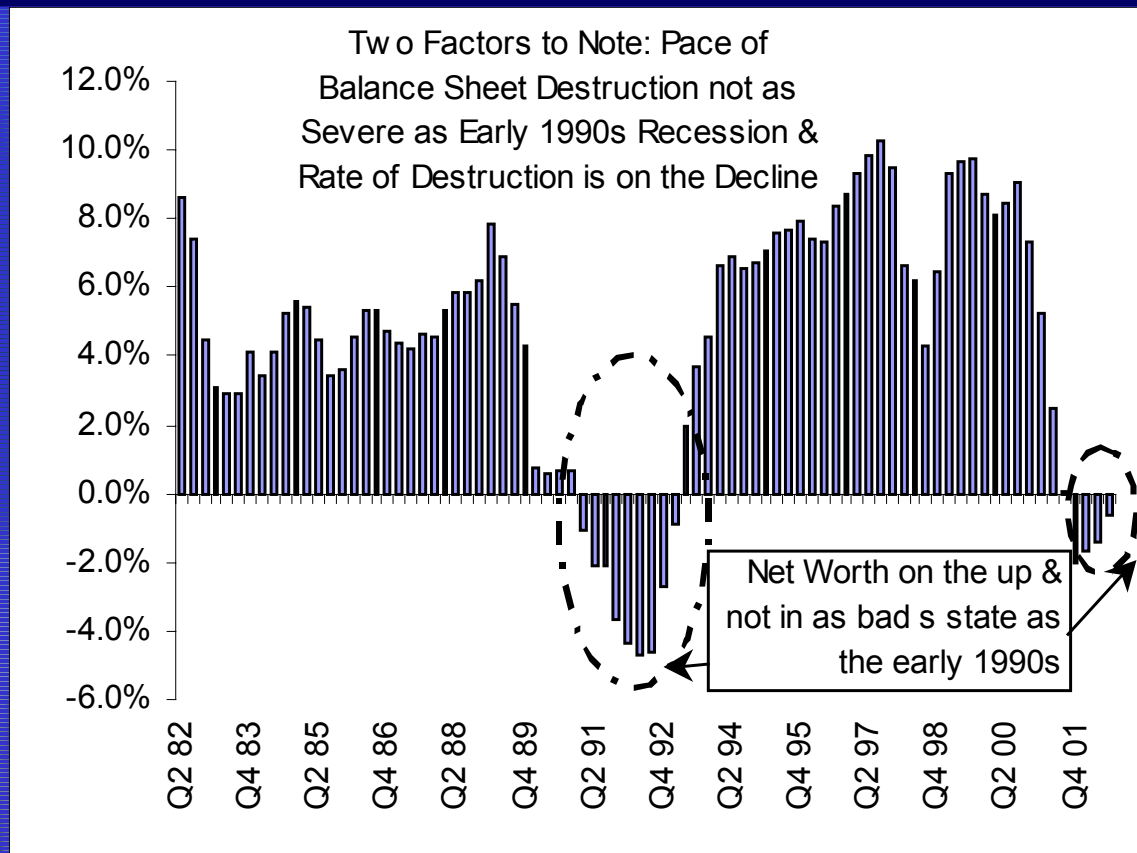# Curvature on Bond/Equity Efficient Frontier has once more Started to Appear

Is the turnaround Just Down the Road?

Tobin's q - the traditional GEM link between the Finance Sector & the Real Economy.....
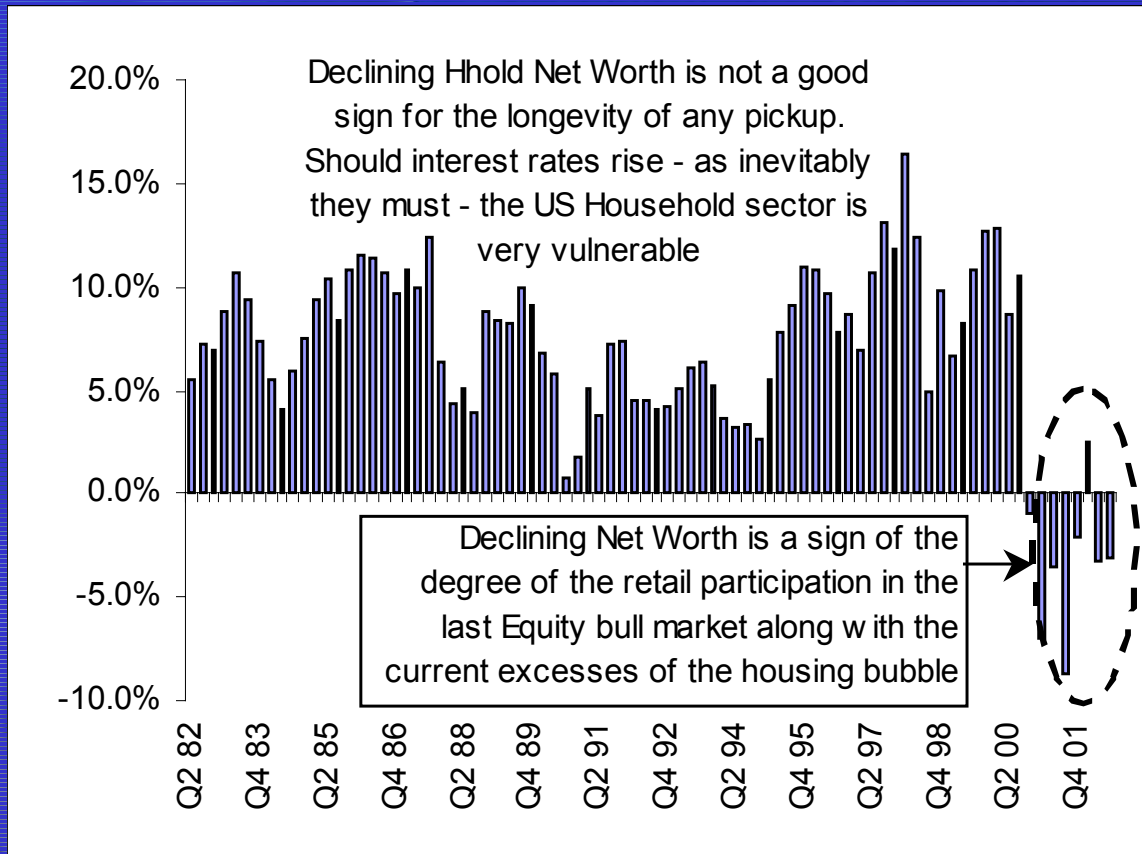

Long-run Average
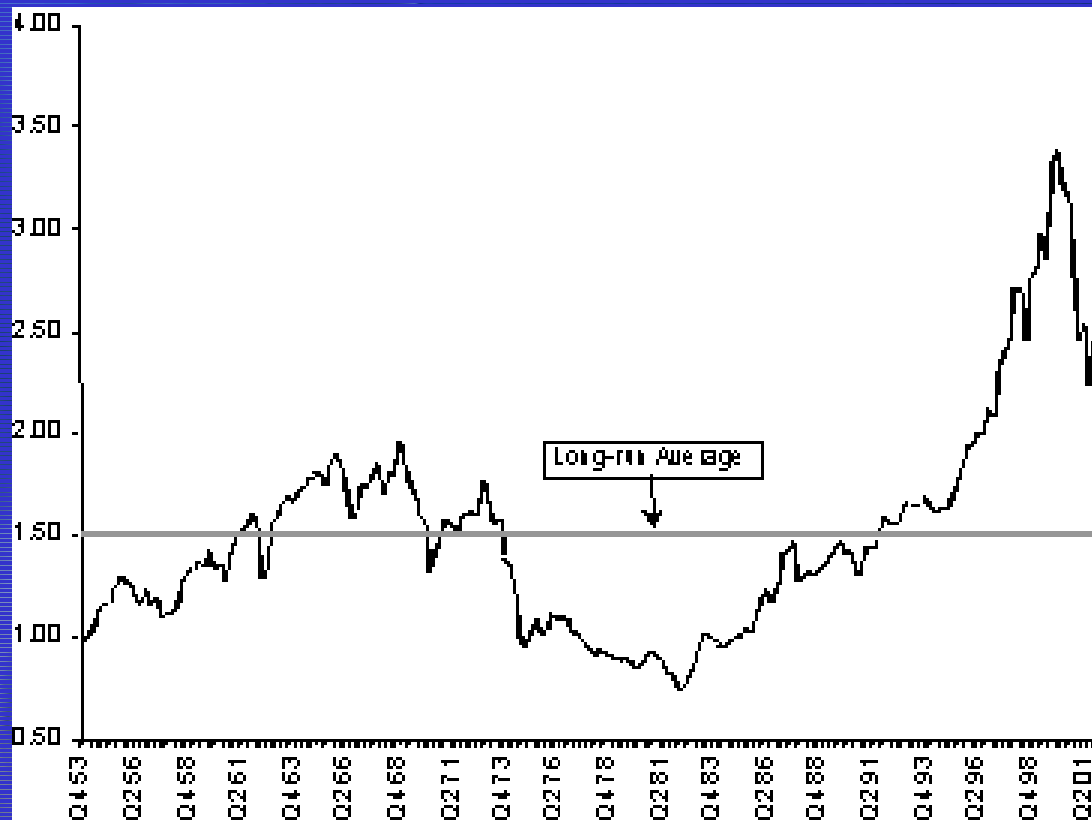
Still Signaling an Investment Turn
But averages don't equal marginals

The Good News is that the US Business Sector Balance Sheet is under an Advanced State of Repair

Two Factors to Note: Pace of Balance Sheet Destruction not as Severe as Early 1990s Recession & Rate of Destruction is on the Decline

Net Worth on the up & not in as bad s state as the early 1990s

3rd Quarter Flow of Funds Data are Encouraging

# The Bad News is that the US Housing Sector Balance Sheet has gone from Bad to Worse

Declining Hhold Net Worth is not a good sign for the longevity of any pickup. Should interest rates rise - as inevitably they must - the US Household sector is very vulnerable

Declining Net Worth is a sign of the degree of the retail participation in the last Equity bull market along with the current excesses of the housing bubble

Eventually, these 'chickens' must come home to 'roost'

History illustrates that not all the Recent Bubble Experience is Necessarily Exceptional

But What's all the fuss About? Kindleberger (1978) illustrates that Market Bubbles are Not Uncommon

- **Kindleberger labeled financial crises ' A Hardy Perennial.**

- **Periodicity: in the 1st half of the 19th century about every 10yrs – 1816, 1826, 1837, 1847, 1857, & 1866.**

- **Objects of Desire: Metallic Coins (1618-23), tulips (1636-40), Gilts (1763), Sth Sea Bubble (1720), British East India Company (1772), Dutch East India Company (1772, 1783), Various Commodities (1799, 1836, 1847, 1857, 1861), English Country Banks (1750s, 1793, 1824), Canals (1793, 1820s, 1823), Foreign Bonds (1825, 1888, 1924), Foreign Mines (1825, 1850), Building Sites (1825, 1830-42, 1843-62, 1853-77, 1878-1933, 1872-3, 1925, 1970, 1980)............**

I argue that such Bubbles occur because of Difficulties in Judging true Entrepreneurial Ability
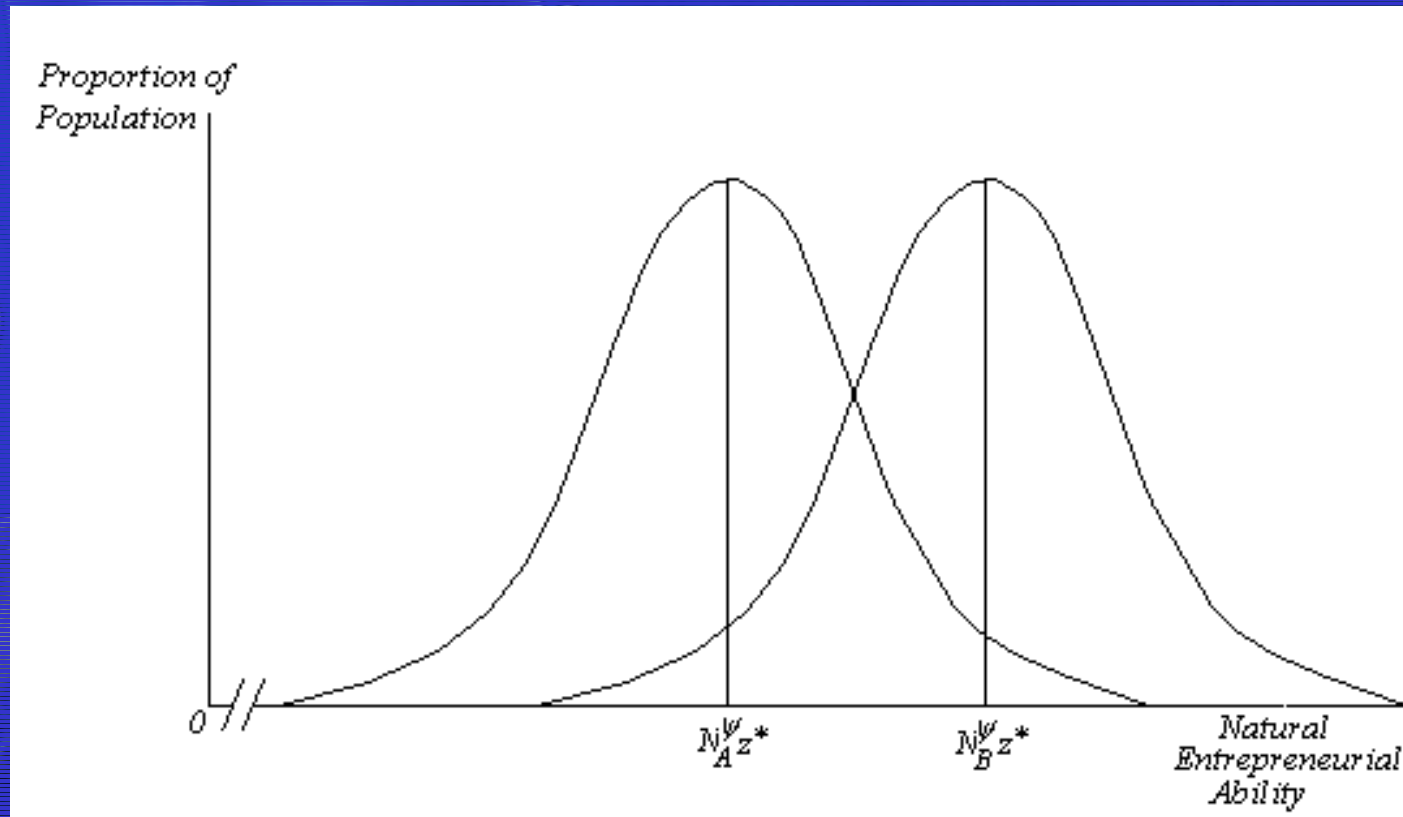
For the Financier the Problem remains where on the Distribution lies Entrepreneur

How to Endogenize the Entrepreneur within a Model of Economic Growth?

Start with the Ubiquitous Intertemporal Utility function

$$U_t = \int_t^{t+T} e^{-\rho(\tau-t)} \log D(\tau) d\tau$$

Solve for Increasing Product Diversity

$$r(t) = \rho$$

Have some pretty simple Conditions for the Production and R&D Sectors - Labor only

$$p(j) = \frac{w}{\alpha}$$

$$\dot{n} = l \eta \varpi_t$$

Model the emergence of Natural Entrepreneurial ability

$$b(k; N, z) = \binom{N}{k} z^k q^{N-k}$$

$$P\{Nz + e > Nz\} \to 0$$

Identify the Profit for Entrepreneurs from Innovation

$$\pi_A = \frac{1 - \alpha}{n}$$

And derive the stability conditions for financiers under perfect information

$$\dot{\pi}_A + v = rv$$

$$v^R(t, \tau) = \pi_A + \dot{v} = \int_t^\infty e^{-\rho(\tau - t)} \pi(\tau) d\tau$$

$$v = \frac{w}{\alpha \eta}$$

How to Endogenize the Entrepreneur within a Model of Economic Growth? - Part III

And derive the stability conditions for financiers under imperfect information (using a heuristic trading rule)

$$\pi_A = rv$$

$$v^e(t,\tau) = \int_t^\infty e^{-\rho(\tau-t)} \pi_A(t)\,d\tau = \frac{1-\alpha}{\rho n(t)} = v^e(t)$$

$$v = \frac{w}{\varpi_i^e \eta}$$

Solve for the Labor market condition

$$\frac{\dot{n}}{\eta\,\varpi_C} + \frac{1}{p} = L_S$$

Throw everything together and solve under conditions of perfect information and imperfect information

$$\dot{n} = L_S\,\eta\,\varpi_C - \frac{\alpha}{v}$$

$$\dot{n} = L_S\,\eta\,\varpi_C - \frac{\alpha\,\varpi_C}{v\,\varpi_C^e}$$

$$\dot{v} = \rho v - \frac{1-\alpha}{n}$$

$$v^e(t) = \frac{1-\alpha}{n\rho}$$

How to Endogenize the Entrepreneur within a Model of Economic Growth? - Part IV

Finally, Ensure transversaility conditions are satisfied

$$e^{-\rho t}\lambda(t) = e^{-\rho t} \geq 0$$

$$e^{-\rho t}\lambda(t)W^e(t,\tau) = e^{-\rho t}\frac{1-\alpha}{\rho} \to 0$$

And link the rate of entrepreneurial innovation to economic growth

$$G \equiv p_D D + v\dot{N}$$

$$g_G = g\left[\frac{A(1-\alpha)}{\alpha} + (1-A)\right]$$
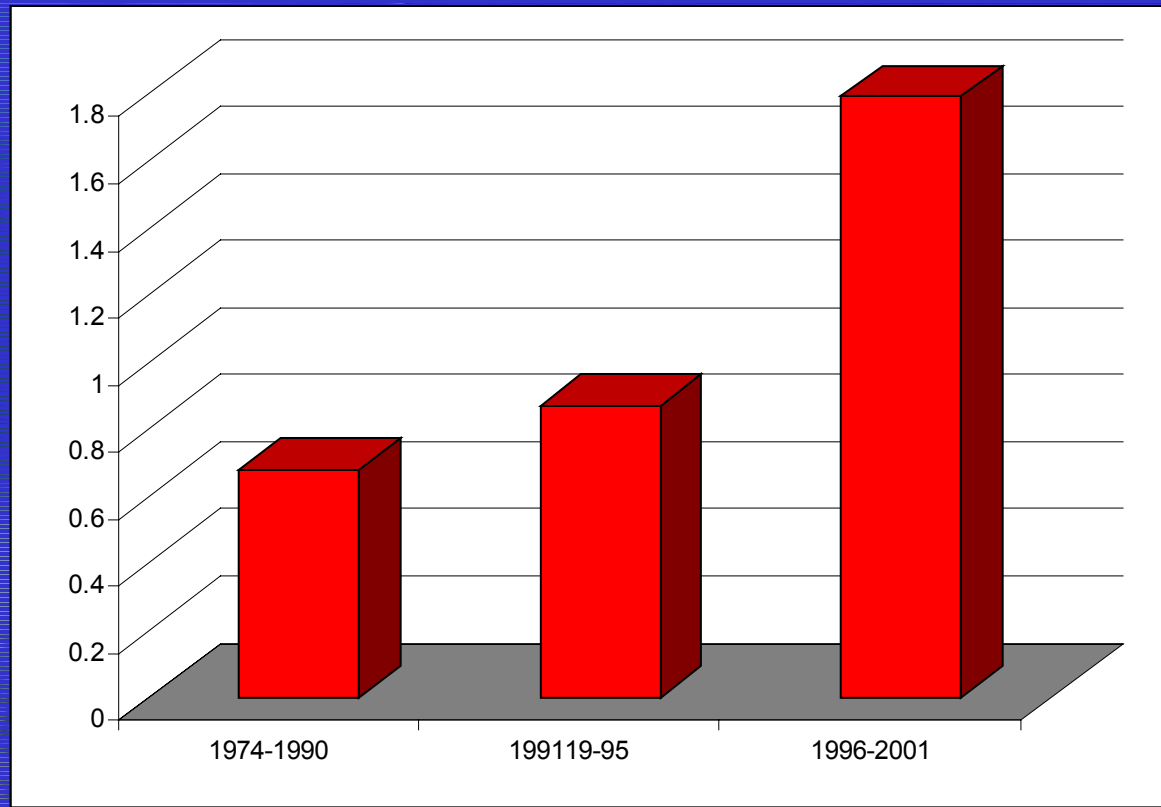
Conclusions......

- It appears as though the US Economy is on the mend but one should not expect a smooth linear trajectory - the weakness of the US household sector balance sheet remains a concern.

- Even though the order of magnitude of the present bubble (and its subsequent fallout) appears quite large, this needs to be placed within historical context.

- Undoubtedly, one should expect both bubbles and bear markets in the future. The problem with efficient resource allocation *ex-ante* versus what is appropriate *ex-post* remains a problem just so long as true entrepreneurial talent remains difficult to judge.

Disclaimer

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