



War, Legacy Debt, and Social Costs As Catalysts For a U.S. Inflation Cycle

For 130 years, paper assets (stocks) have alternated price leadership with hard assets (commodities, land), corresponding to disinflation and inflation cycles, respectively. For the first time since the early 1970s, commodities have beaten stocks for 2+ years (since mid-2000), and real estate has generally outperformed as well.

We see a new up-trend for inflation and commodity prices, beginning gradually, with occasional reversals within trend. We do not believe the current, paltry level of nominal GDP growth is sufficient to meaningfully grow profits, jobs, tax revenues, or service the debt mountain. Since these inflation and disinflation cycles average over a decade in length, they require a major generational shift in “consensus” thinking.

We note that disinflation drives secular bull markets for stocks (i.e., 1921-1929, 1949-1968 and 1983-2000), and inflation drives secular bear markets for stocks (i.e., 1906-1920, 1933-1948 and 1968-1982). Machinery stocks and other commodity industry (or country) producing and serving issues outperform during inflation eras.

Inflation cycles are fostered by prolonged wars, immense social programs and the temptation to inflate-away extreme levels of debt. How much actual authority or choice monetary and treasury authorities have in such matters has always been a subject of debate. Suffice to say, inflationary policies appear to be reactive, whereas disinflation requires a proactive stance. No nation chooses a reactive stance – it just happens.

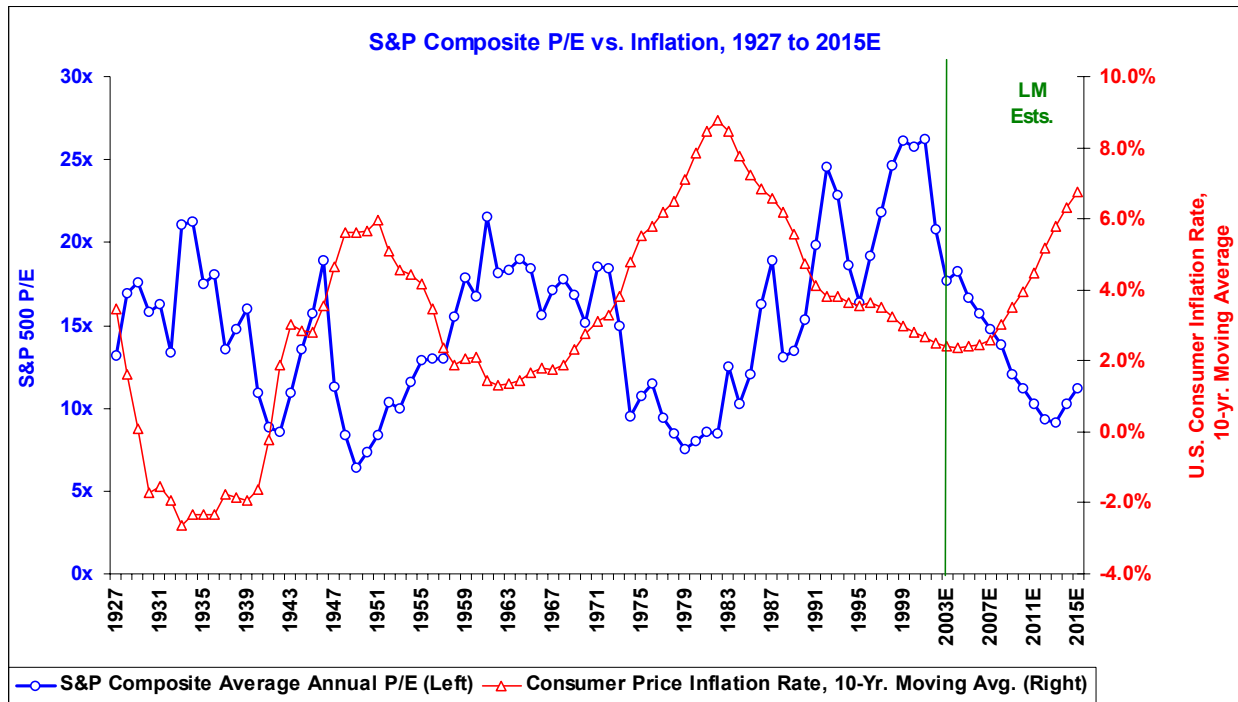
In the next decade we see: costly Wars of Inclusion, the interrelated War on Terrorism, and immense and unfunded Medicare & Medicaid burdens. So, despite aggregate U.S. debt already being equal to a record 3x GDP, we see a great deal more U.S. debt in the future, which may have the effect of devaluing that debt and the U.S. dollar.

This is a study of the catalysts for inflation, and a follow-up to our report “The Inflation Cycle of 2002 to 2015,” dated April 19, 2002. Besides machinery, other plays on inflation include energy, chemicals, agriculture, real estate, mining, and other hard assets. Pricing power benefits high fixed cost, vertically integrated, asset-heavy companies.

Barry B. Bannister, CFA
Legg Mason – May 16, 2003

All relevant disclosures and certifications appear on page 14 of this report.

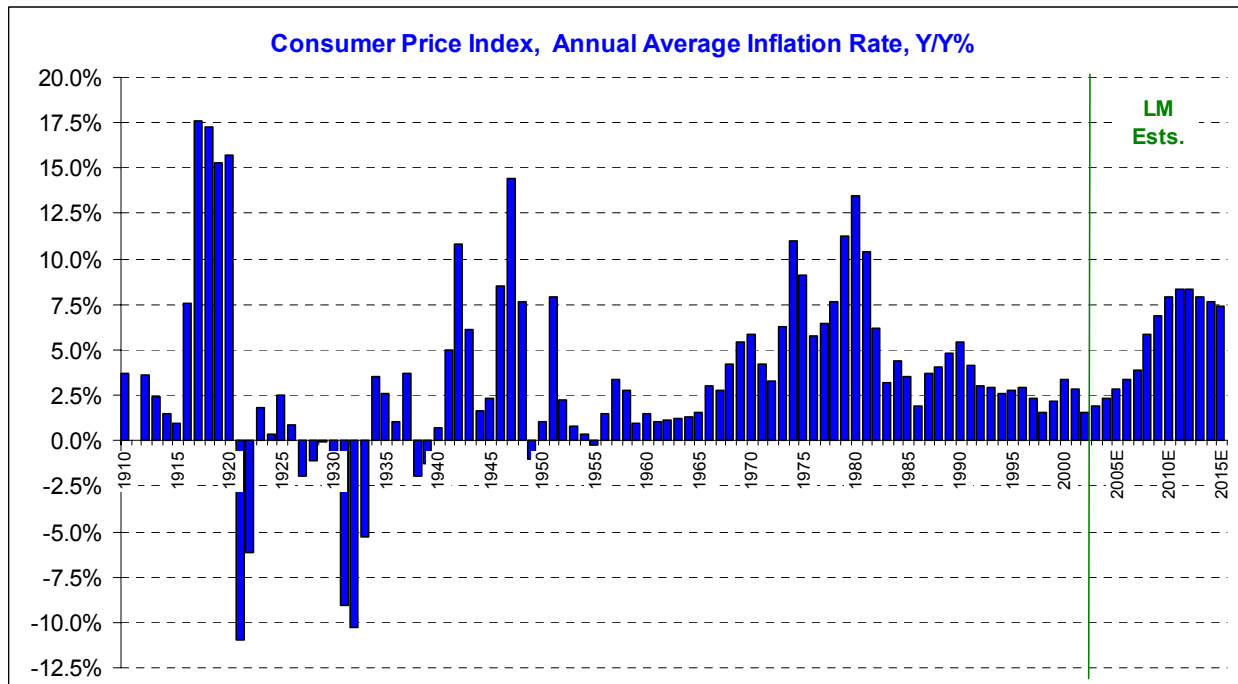
Inflation reduces the present value of future cash flows, thus lowering the P/E ratio for the S&P 500. P/E ratios have swung between 10x and 20x for a century, and “fair value” of 15x is just a way station.



A

Source: U.S. Census Bureau and government data, S&P, LM estimates 2003-15E.

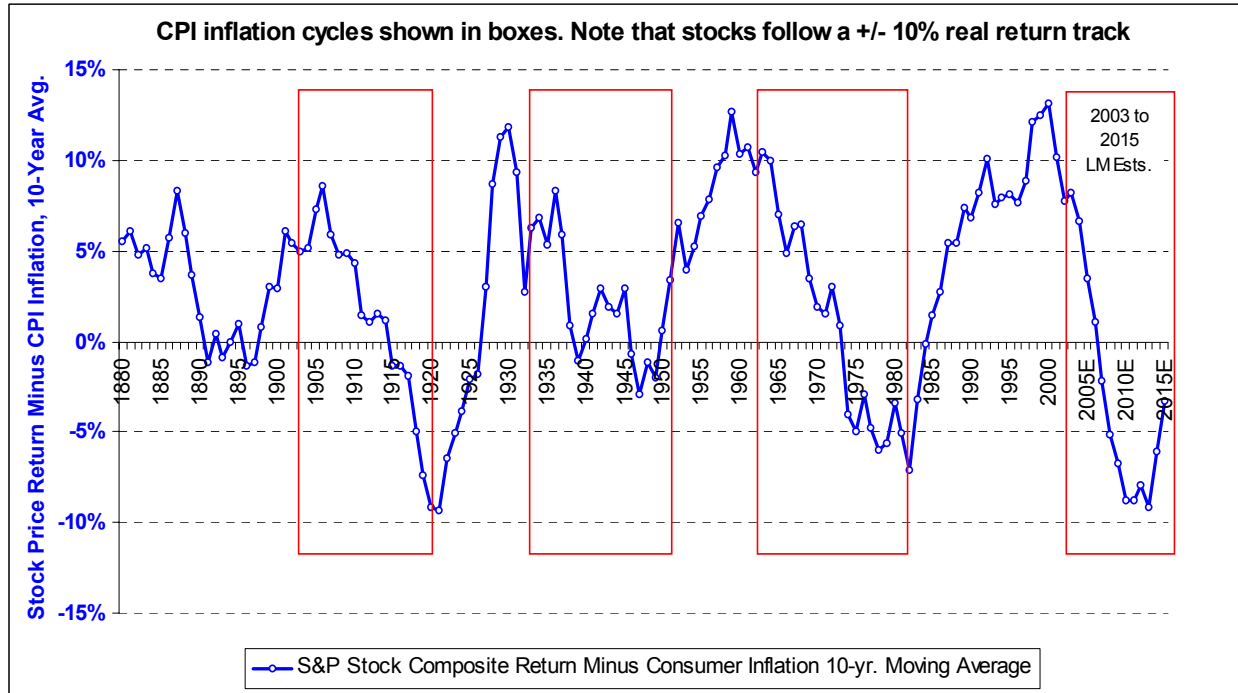
This is annual U.S. consumer inflation, from 1910 to our 2015E.



B

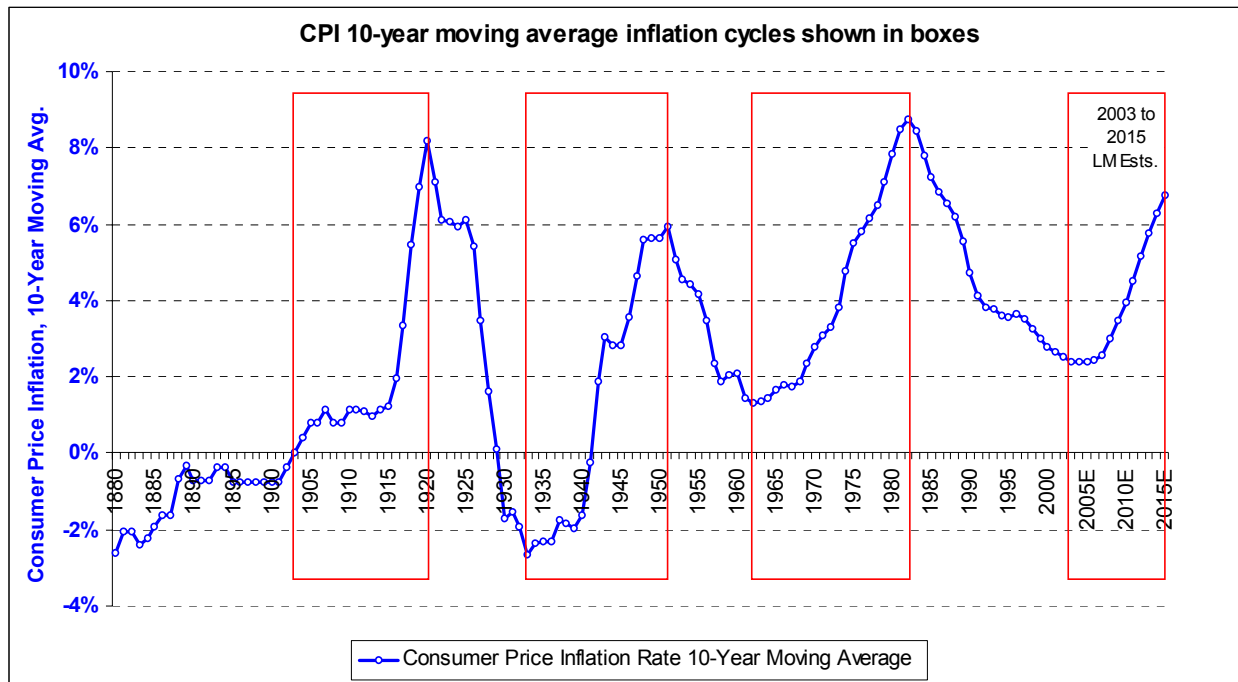
Source: U.S. Census Bureau and government data, S&P, LM estimates 2003-15E.

Every secular bull market (i.e., 10+ years of >10% CAGR price returns) began as inflation peaked and ended as inflation bottomed. The real price-only (ex-dividends) return of stocks has been about 3% +/- 10%.



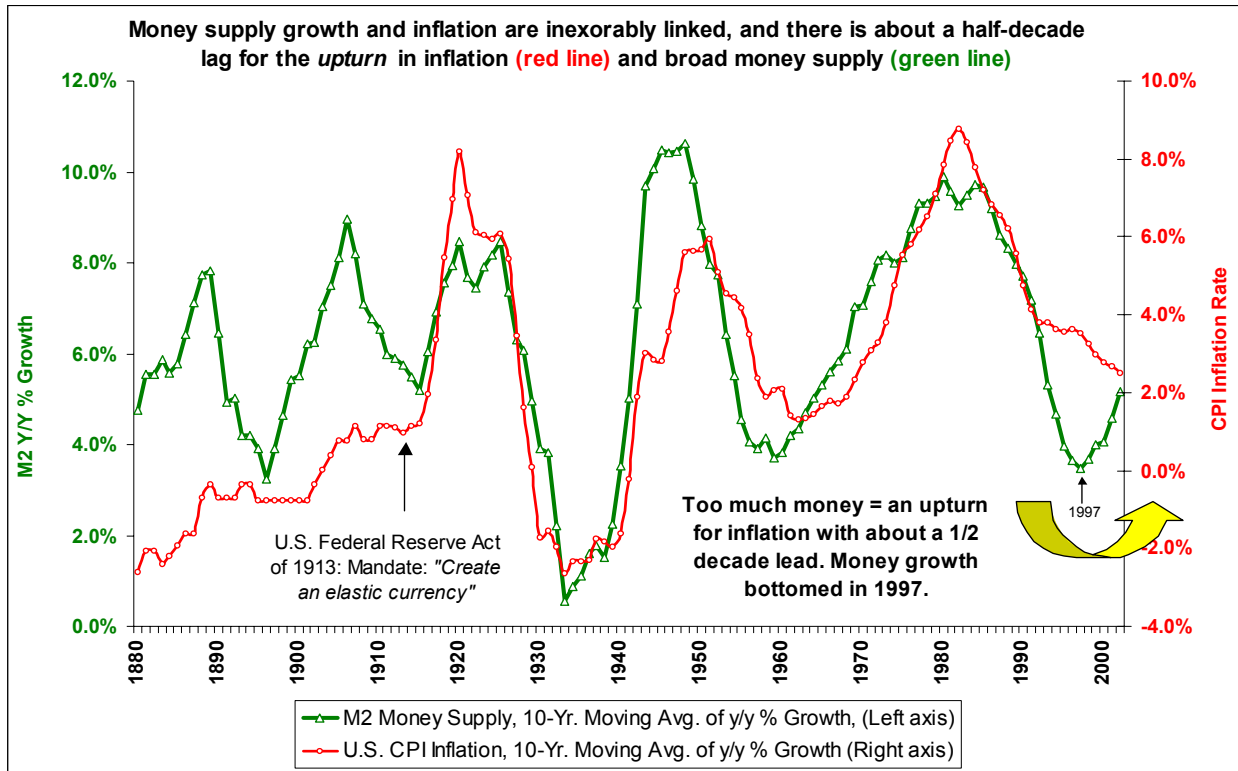
Source: U.S. Department of Commerce, U.S. Bureau of the Census, Standard & Poor's Corp., Legg Mason estimates for 2002 to 2015.

The 10-yr. moving average of U.S. consumer inflation, to our 2015E.



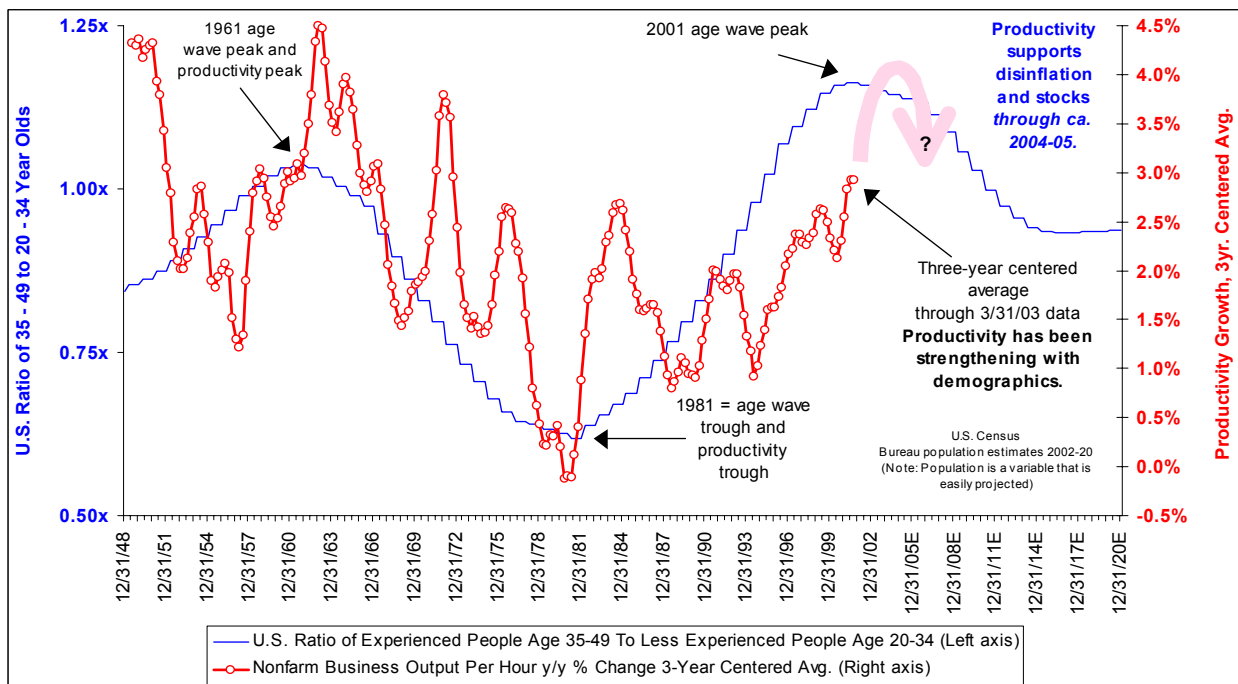
Source: Source: U.S. Department of Commerce, U.S. Bureau of the Census, Standard & Poor's Corp., Legg Mason estimates for 2002 to 2015.

Inflation is caused by excessive money supply growth, with a lag.



Source: National Bureau of Economic Research macroeconomic database, U.S. Federal Reserve for M2 (seasonally adjusted) 1959 to present, for M2 prior to 1959 we add M1 + time deposits in banks + bank vault cash + monetary gold stock + mutual savings bank deposits + S&L deposits as provided in the U.S. Census publication "Historical Statistics of the United States, Colonial Times to 1970." Legg Mason format.

The good news is that strong productivity mitigates inflation *near term*. But does that simply *facilitate* an inflationary U.S. policy shift?



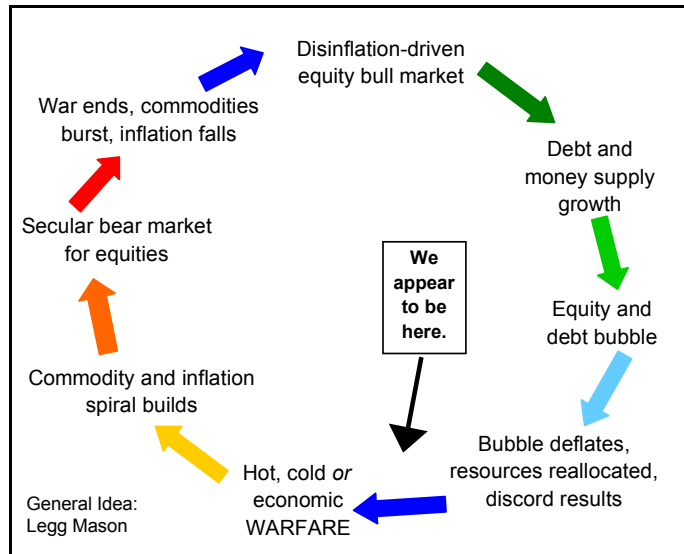
Source: U.S. Bureau of Labor Statistics, U.S. Bureau of the Census.

Stock and commodity prices trade-off on a 18-year (+/- 5) cycle.

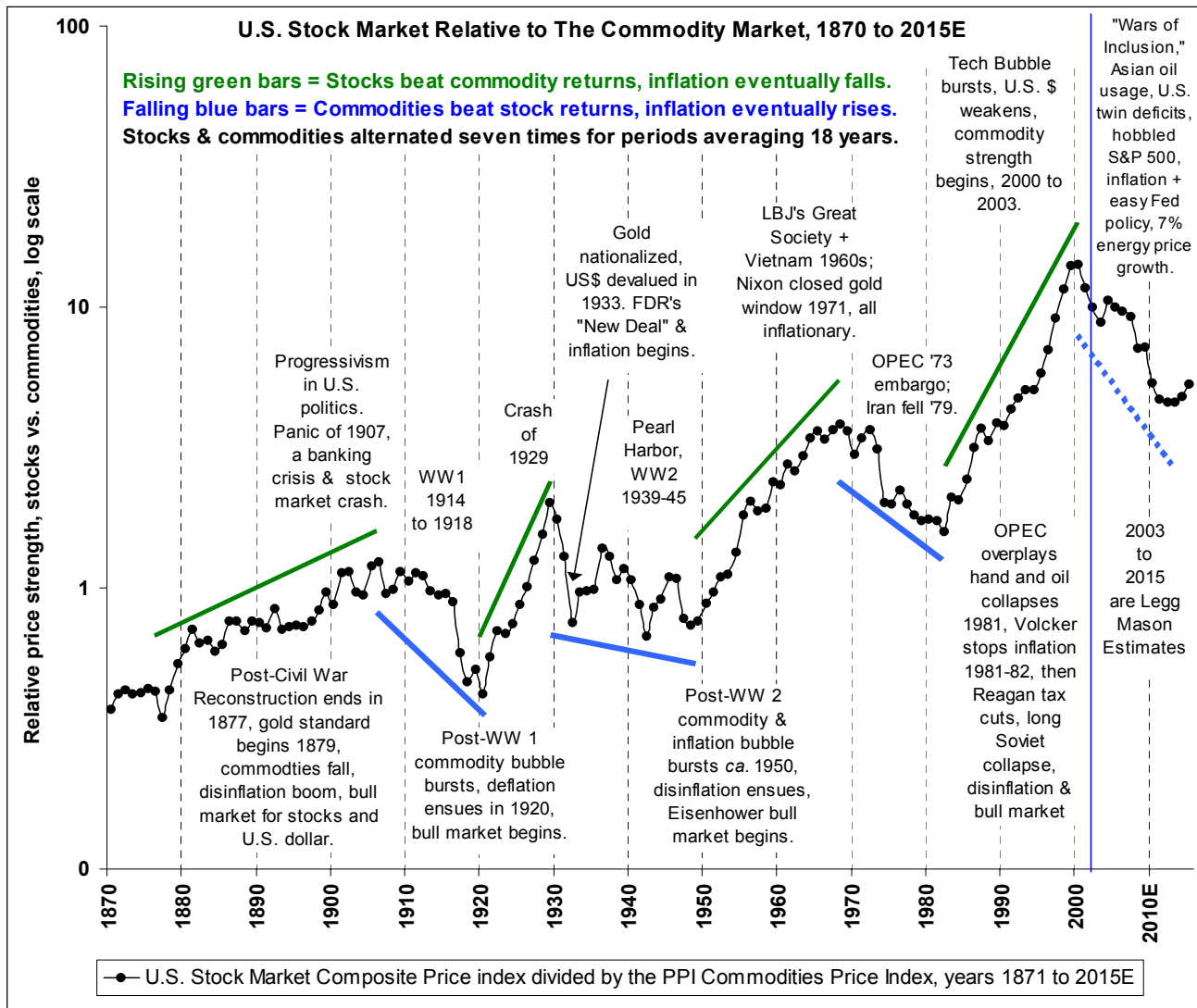
In three commodity bull markets (See below), 1906-1920, 1933-1948 and 1968-1982, commodities rose at an average y/y rate of 7.0%, 3.0% and 7.7%, respectively, and stocks 0.0%, 1.7%, and 2.5%, respectively.

Conversely, in three equity bull markets, 1921-1929, 1949-1968 and 1983-2000, stock prices rose at an average y/y rate of 17.1%, 10.9% and 14.2%, respectively, and commodities (0.2)%, 1.4%, and 1.6%, respectively.

In the 2002-2015 period, we expect an S&P 500 average y/y price return of 1.8% (dividends add an additional return) and a PPI Commodities average y/y return of 6.9%.



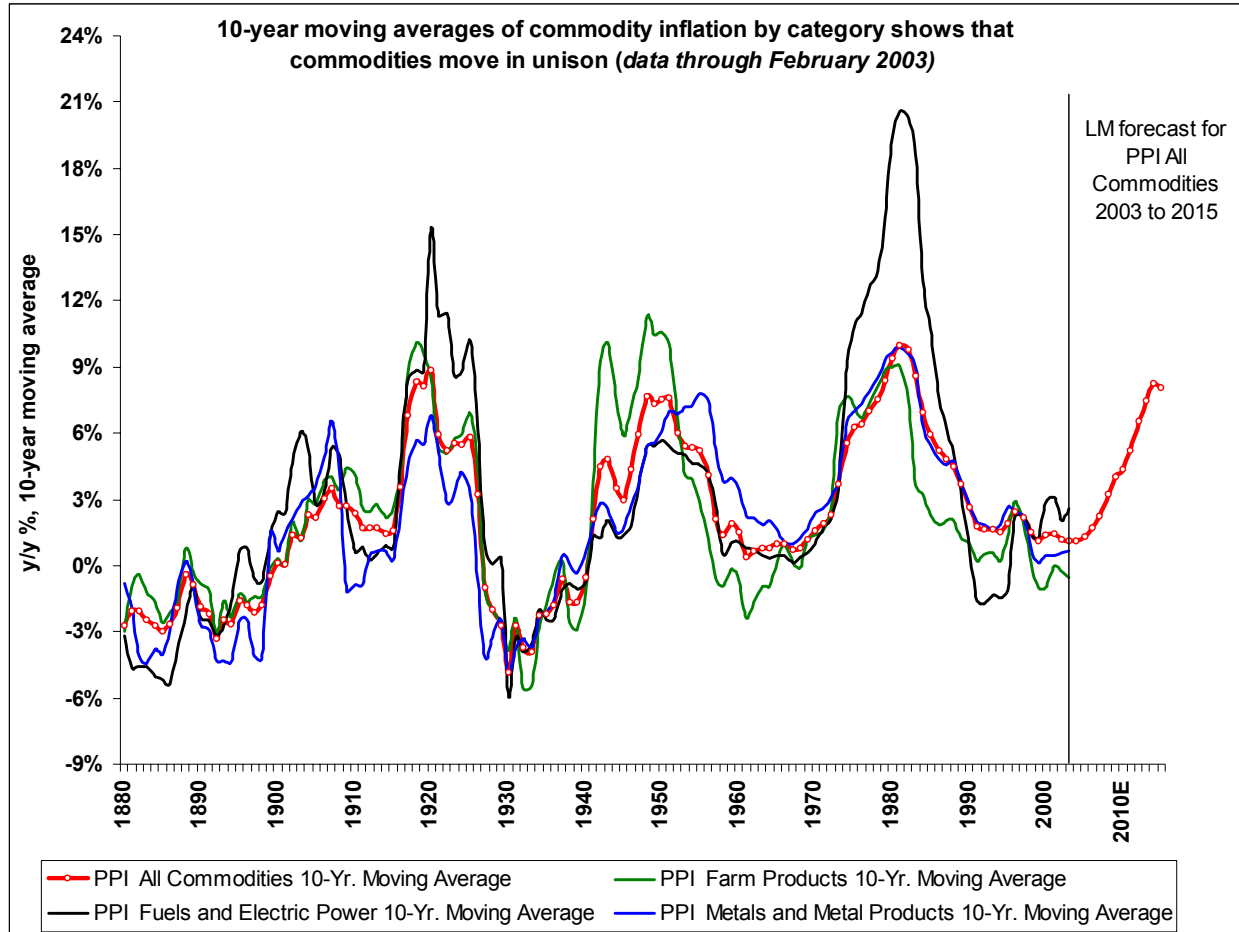
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Source: National Bureau of Economic Research Macroeconomic database, U.S. Dept. of Commerce, U.S. Bureau of Economic Analysis, Legg Mason format and Legg Mason estimates for 2003 to 2015.

Energy is core to inflation, and commodities tend to inflate and deflate in unison. That is because all of nature has an energy content, and energy is a *required* input to create order from disorder.



Source: U.S. Dept. of Commerce, U.S. Census publication "Historical Statistics of the United States, Colonial Times to 1970," Standard & Poor's Corporation, National Bureau of Economic Research macroeconomic database, Legg Mason estimates for 2002 to 2015 and format.

Our research shows a fascinating, repeating symmetry with respect to energy inflation cycles, following this chain of events:

Oversupply, price capitulates ☞ Oil producer instability ☞ Low exploration & discovery ☞ Wars,
with oil a key issue ☞ The "synthetic" oil pipe dream ☞ New oil demand hub ☞
War ends, oil falls ☞ Process begins again ☞

We explore this chain in the next few pages, incorporating current events in the Middle East.

Before we explore that chain of events, however, we must dispel the myth that energy doesn't matter in a "service" economy.

We see (5) reasons why energy matters a great deal to *any* economy:

(1) It is not so much the portion of GDP attributable to fuels (oil, gas, coal), but the *elasticity of demand* (responsiveness of buyers to changes in price). The rising percentage of oil used for transportation, for which there are no economical alternatives (Have you seen any hydrogen filling stations recently?), means that oil demand is quite inelastic today.

(2) The prolonged period of low oil prices (albeit a normal 18-year disinflation cycle) from 1982 to 2000 caused the average miles per gallon efficiency for the aggregate U.S. fleet (cars, minivans, SUVs, pickups) to reach a 20-year low. Meanwhile, Fed accommodation has enabled cheaper vehicle financing rates, pushing down the fleet age. Thus, we do not believe consumers are in a position to trade-down to a "Honda hybrid," etc.

(3) The average size in square feet of a *new* U.S. single-family home has increased about 33% since energy costs began to plummet around 1982. U.S. demographics created a *desire* for larger homes, but we believe cheap energy made it *possible* to afford those large residences. We reiterate that energy demand in the U.S. may be more inelastic now than it was 20 years ago.

(4) The U.S. merchandise trade deficit as a percentage of GDP has expanded from approximately zero in 3Q 1980 to *minus* 4.5% of GDP as of 4Q 2002. Since oil is priced in U.S. dollars, and imports of goods from developing countries often require more energy in their manufacture per our research, we believe economists fail to add back this *energy content* embedded in the U.S. merchandise trade deficit.

(5) For now, China is content to run a massive current account surplus. By also pegging its exchange rate, China's currency (the yuan) may be undervalued as a result. China may be doing this to "import inflation" and build currency reserves by stimulating the production and export side of the economy in an effort to reduce exposure to troubled state-owned industries and banks. In essence, to build up equity. Eventually, however, we believe China will seek to become more of a consumer, to include imported oil (which is denominated in U.S. dollars) and then float the yuan. Such an event may cause exceptional U.S. dollar weakness later this decade.

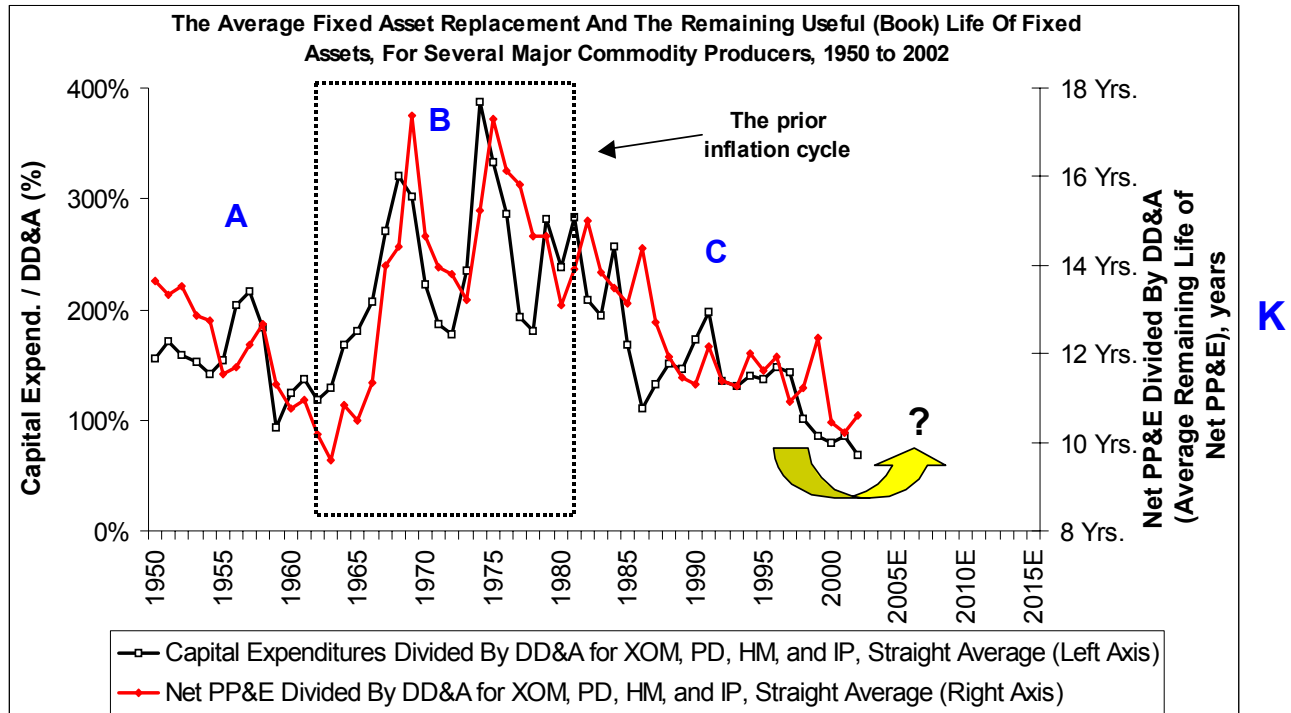
So we think oil and gas prices matter a great deal.

This is the “seven-step program” we think oil prices follow. Thus, we are quite wary of the current goal of remaking the Middle East...

1932 to 1949 Oil Inflation Cycle	1972 to 1981 Oil Inflation Cycle	1999 to ? Oil Inflation Cycle
(A) Oversupply, price capitulates East Texas' "Black Giant" field was discovered October 3, 1930, and by June 1931, it was producing 500,000 bbl/day. Rampant overproduction sent oil prices tumbling.	(A) Oversupply, price capitulates Alaska's Prudhoe Bay, at 1.5x the size of East Texas' oil, was discovered in December 1967. A Libyan discovery in 1966 vaulted that country to the 6th-largest oil producer in just three years.	(A) Oversupply, price capitulates Demand for OPEC's oil plunged by about 43% from 1979 to 1983 in a supply glut , and 24% of incremental oil capacity from 1981 to 2001 came from Europe's new North Sea discoveries .
(B) Oil producer instability: Mexico nationalized PEMEX in 1938, western oil firms fought the action. Russian Bolshevik producers in the Caspian expropriated and mismanaged fields.	(B) Oil producer instability: Libya and Iran blazed the trail for nationalization , and Saudi Aramco did the same in 1976 in response to U.S. support for Israel in the 1973 War (The U.S.S.R. backed Egypt and Syria).	(B) Oil producer instability: Crumbling U.S.S.R. oil production fell 28% from 1981 to 2001. Iraq invaded Kuwait in 1990. Saudi Arabia's (official) finances were in peril by 1999. Venezuela, Nigeria problems .
(C) Low exploration & discovery: The late-1920s/early-1930s saw large new oil discoveries <i>even as prices fell</i> , but exploration declined in the mid-1930s to mid-1940s <i>as oil prices rose</i> (i.e., Development lags price).	(C) Low exploration & discovery: Total 1973 global spare capacity was only 1.5 million barrels/day (mb/d), or 3% of demand. "Available" capacity was 0.5 mb/d, or 1% of demand. Low prices stunted exploration .	(C) Low exploration & discovery: Global oil importer's consumption in excess of domestic production rose by 40% to 31.2 mb/d from 1981 to 2001, yet non-OPEC reserves-to-production fell by 25% from 1982 to 2002.
(D) Wars, with oil a key issue: Imperial Japan was importing 93% of its oil by the late 1930s, and coveted its neighbor's oil. Germany desired Rumanian and Russian fields. The Axis' desire for oil helped define WW2.	(D) Wars, with oil a key issue: From 1970 to 1973, U.S. oil imports rose 94% to 6.2 mb/d. The 1973 War and tight supply (strong demand & low investment) magnified the 1973 OPEC Embargo . The 1979 Iran Revolution continued the pressure.	(D) Wars, with oil a key issue: Wars of Inclusion (such as Iraq) to convert Islamic theocracies or dictatorships into secular, capitalist democracies. Oil is key, since such countries often possess fabulous oil reserves that the West imports.
(E) The "synthetic" pipe dream: In 1937, Japan set out to obtain 50% of its oil from synthetics by 1943, but failed and invaded the oil-rich Dutch East Indies. Germany did succeed in extracting 46% of its oil needs from coal by 1940, but war increased their " need ," and they invaded oil-rich neighbors, only to be stopped cold in Russia.	(E) The "synthetic" pipe dream: Exxon answered President Carter's " Moral equivalent of war " by investing billions of dollars in shale oil , but terminated the project in 1982 when the cost estimates rose to an astounding \$120,000 to \$160,000 of capital required <i>per barrel of potential production</i> . A lesson was learned.	(E) The "synthetic" pipe dream: We believe fuel cells result from frustration with control over energy. The alternative is militarism to control resources. In our view, the first is not economical until oil is expensive for a long time (chicken & egg), and the latter may cascade with unintended military & diplomatic inflationary consequences.
(F) New oil demand hub: The war sharply increased oil use (airplanes, heavy armor), and submarines sunk supply. Planes hummed on 100 octane, and oil demand was insatiable. Both Patton and Rommel blamed lack of fuel for stopping their record of wartime successes.	(F) New oil demand hub: The 1965-80 sharp rise in oil demand was driven by the U.S. lifting its oil import quotas when East Texas hit 100% of capacity in 1971, by Baby Boomers' desire for fuel, by Europe switching away from coal as a fuel, and by Japan's post-war economic/industrial transformation.	(F) New oil demand hub: Oil demand is not linear with income . If the coastal 1/3 of China reaches Japan's & Korea's current 16 bbls./capita per year of oil consumption (as we expect), the incremental oil needed would be about 20 mb/d, or a 26% increase in world oil production.
(G) War ends, oil falls: The Middle East oil concessions signed before WW2 began to be explored, and even the U.S. grew its domestic proved reserves by 21% from 1946 to 1950. Oil prices leveled after 1950.	(G) War ends, oil falls: Iraq invaded Iran in 1980, but did not trigger a "third" oil shock because oil in storage came to market; OPEC tried to fix prices in 1981, but failed and never again succeeded. Oil crashed after 1980 .	(G) War ends, oil falls: Do the Wars of Inclusion extend beyond Iraq? War destroys capital via higher interest rates and lower P/E multiples, as it did <i>up</i> to both 1950 and 1980. For a new generation of investors, the "rhyme" of history awaits...

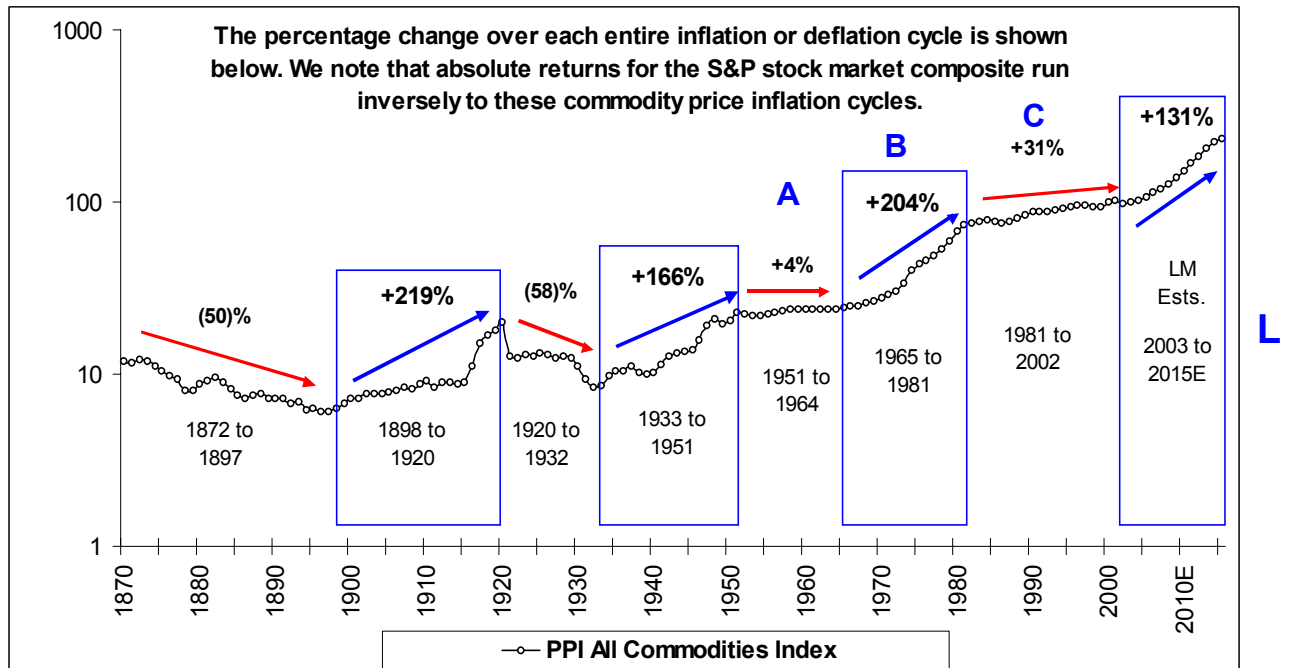
Source: Historical factual data ca. 1920 to 1990 from "The Prize – The Epic Quest for Oil, Money and Power" by Daniel Yergin, post-1990 oil supply & demand data from EIA and BP, Legg Mason format, theory and opinions.

Producer underinvestment and tight capacity + new demand hub = energy pricing power. We see both now. First, underinvestment:



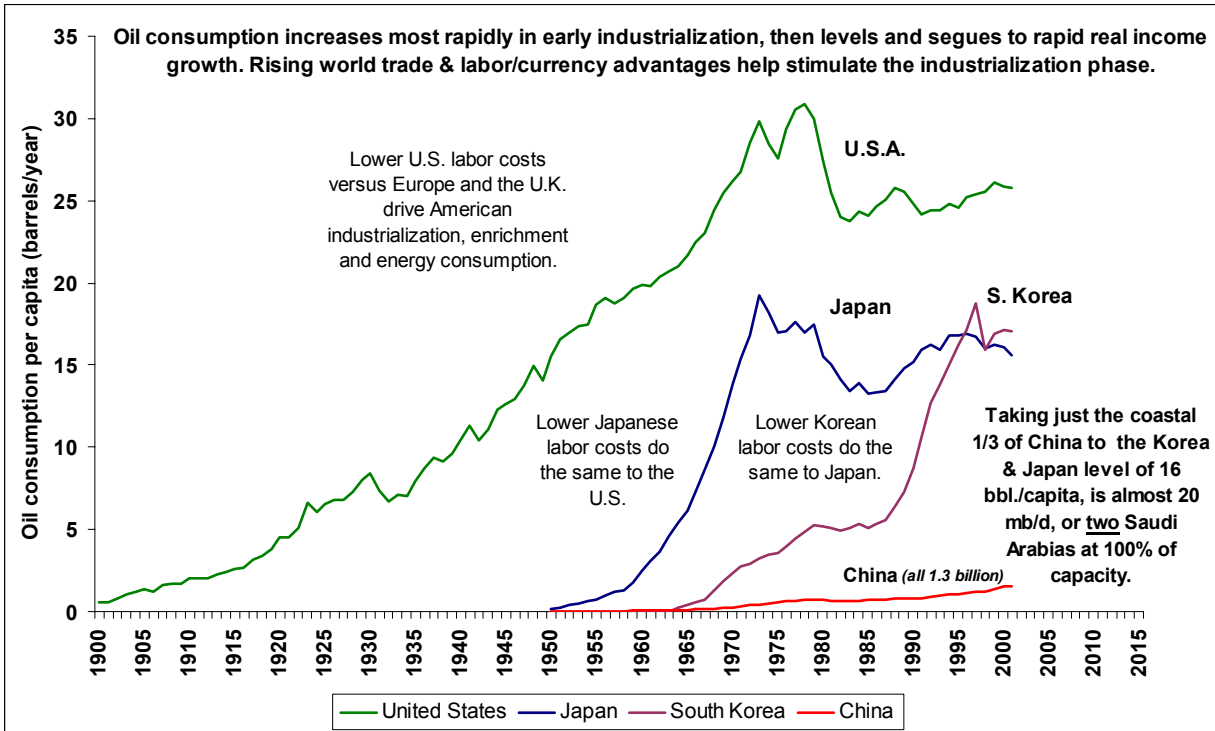
Source: Company SEC Filings (Bruno Business Library Annual Report Collection), HM data for 2001 and 2002 are ABX, the successor company.
 Note: This chart depicts Western companies, which are often higher cost producers. Developing country producers often have lower costs, but many have under-invested due to factors that range from war to government skimming of profits to outright corruption.

Note that the investment cycles (A, B & C, above) correspond to pricing power for commodity producers.



Source: U.S. Dept. of Commerce, U.S. Census publication "Historical Statistics of the United States, Colonial Times to 1970," Standard & Poor's Corporation, National Bureau of Economic Research macroeconomic database, Legg Mason estimates for 2003 to 2015.

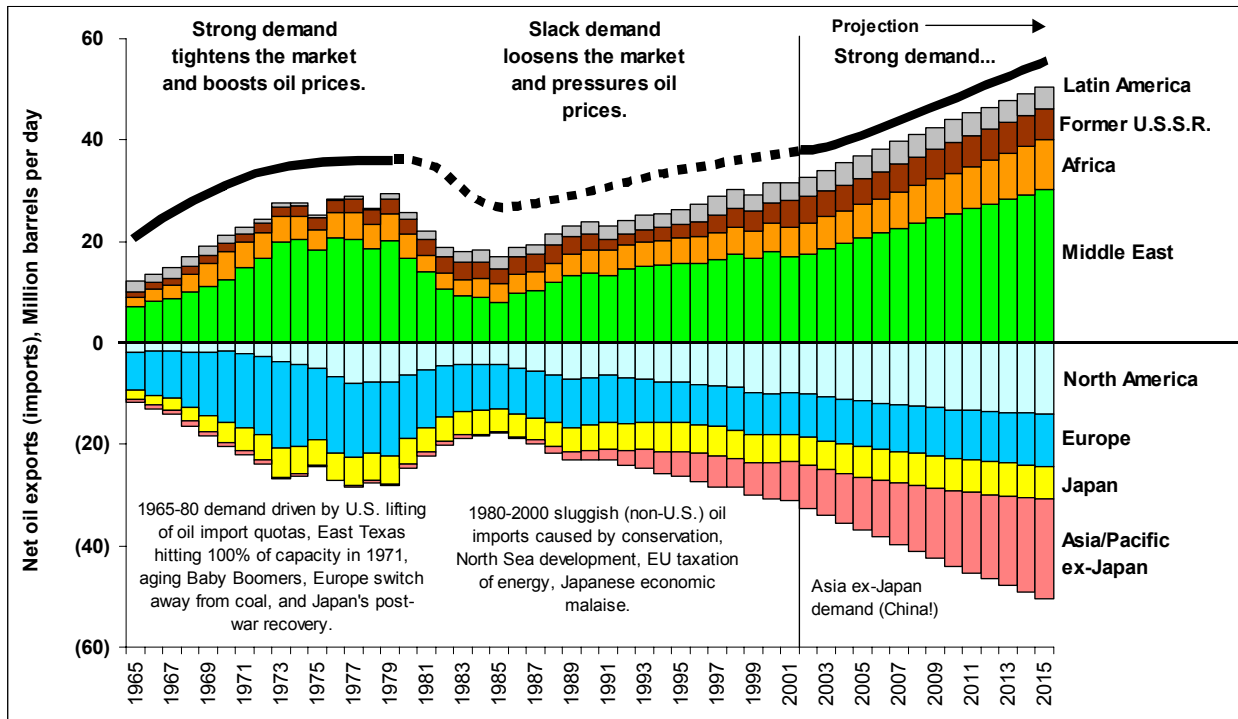
Second, we see demand. The new oil demand hub may be China.



M

Source: U.N. Energy Statistics Database, BP Statistical Review of World Energy, U.S. DOE/EIA, U.S. Census, Legg Mason format.

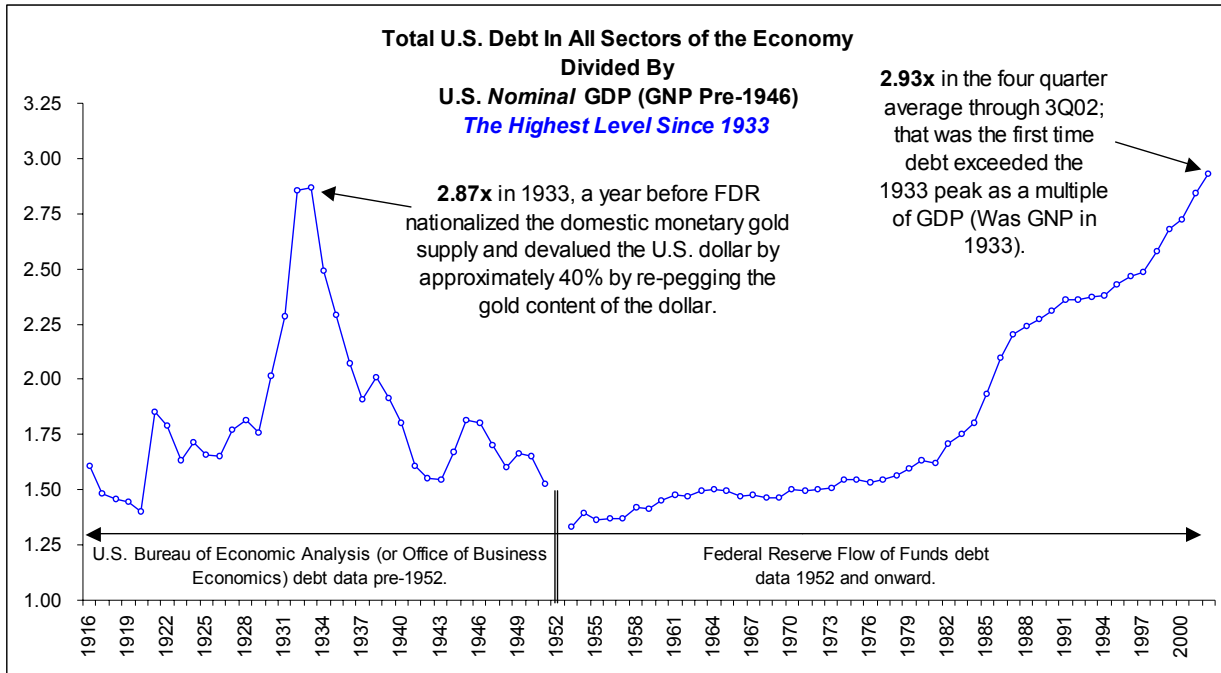
Thus, the story is not the “old” West, but rather the “new” East. Asia is rich in labor yet quite poor in energy resources.



N

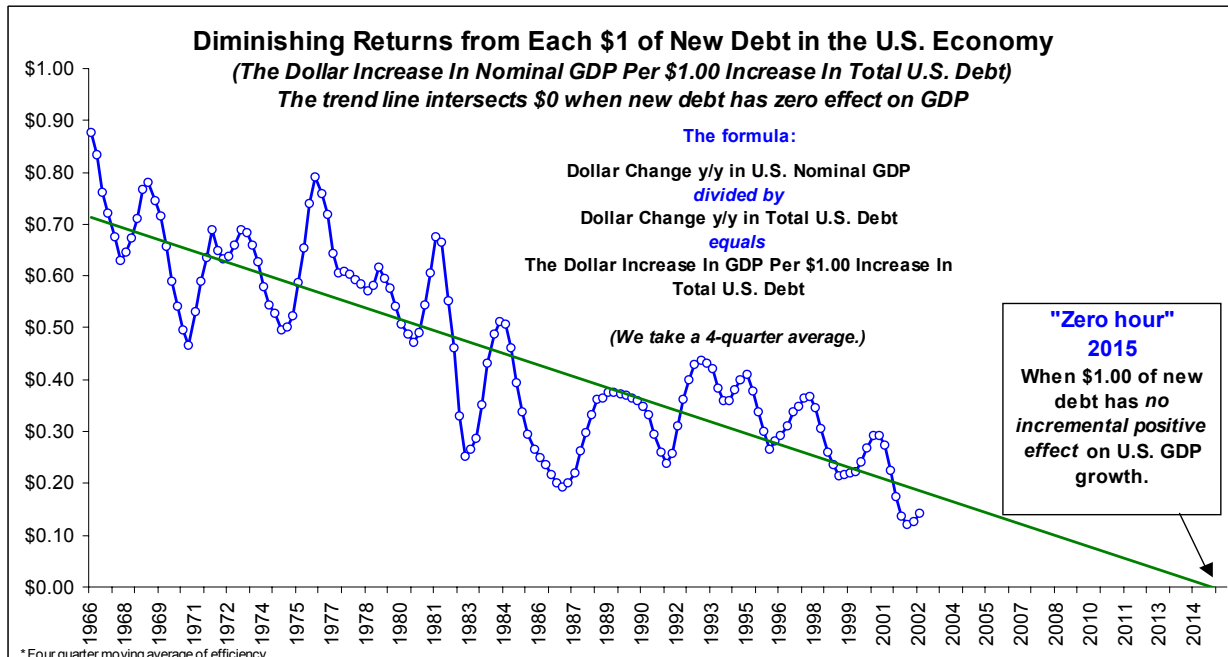
Source: Data U.S. DOE/IEA, EIA Monthly Energy Review, BP Statistical Review of World Energy, 2002-2015 Legg Mason estimates and format.

Debt may seem to be a catalyst for deflation, but when most of the debt is backed by government guarantees (actual or implicit), and the government owns the printing press, debt may warrant an inflationary response. It is a question of timing and national choice.



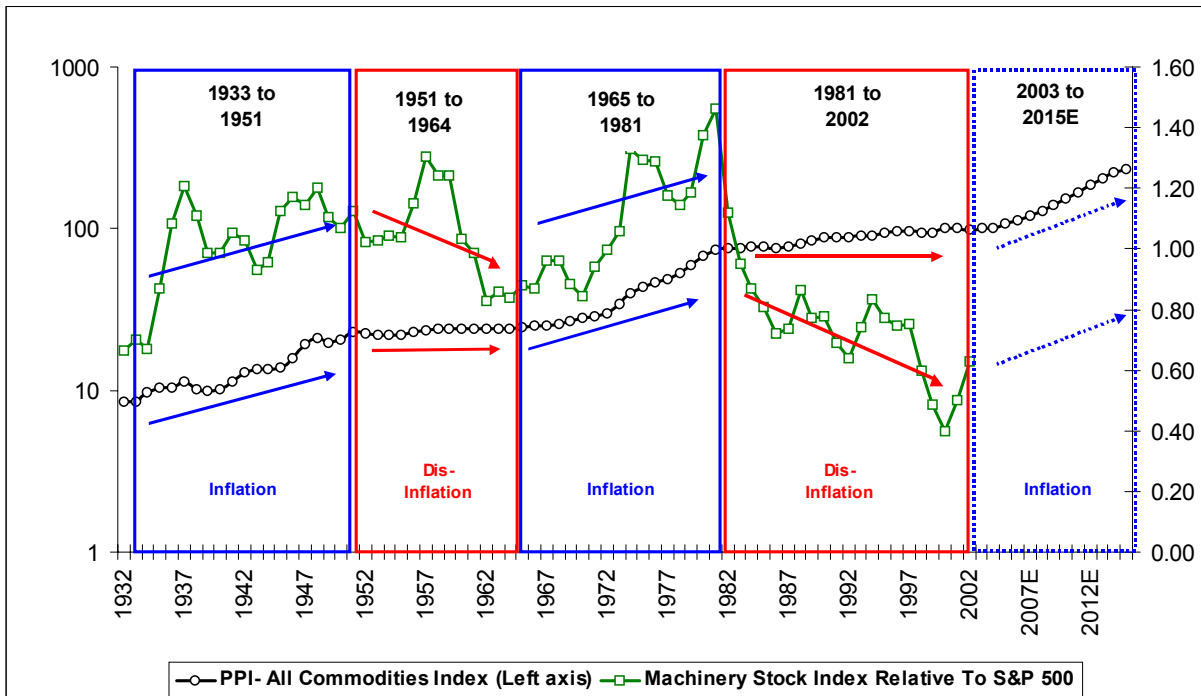
Source: Federal Reserve Flow of Funds, NIPA accounts, U.S. Bureau of Economic Analysis, Legg Mason format.

We're also worried that debt is losing its marginal effect. What's left?



Source: Federal Reserve Flow of Funds, U.S. Bureau of Economic Analysis, Legg Mason format.

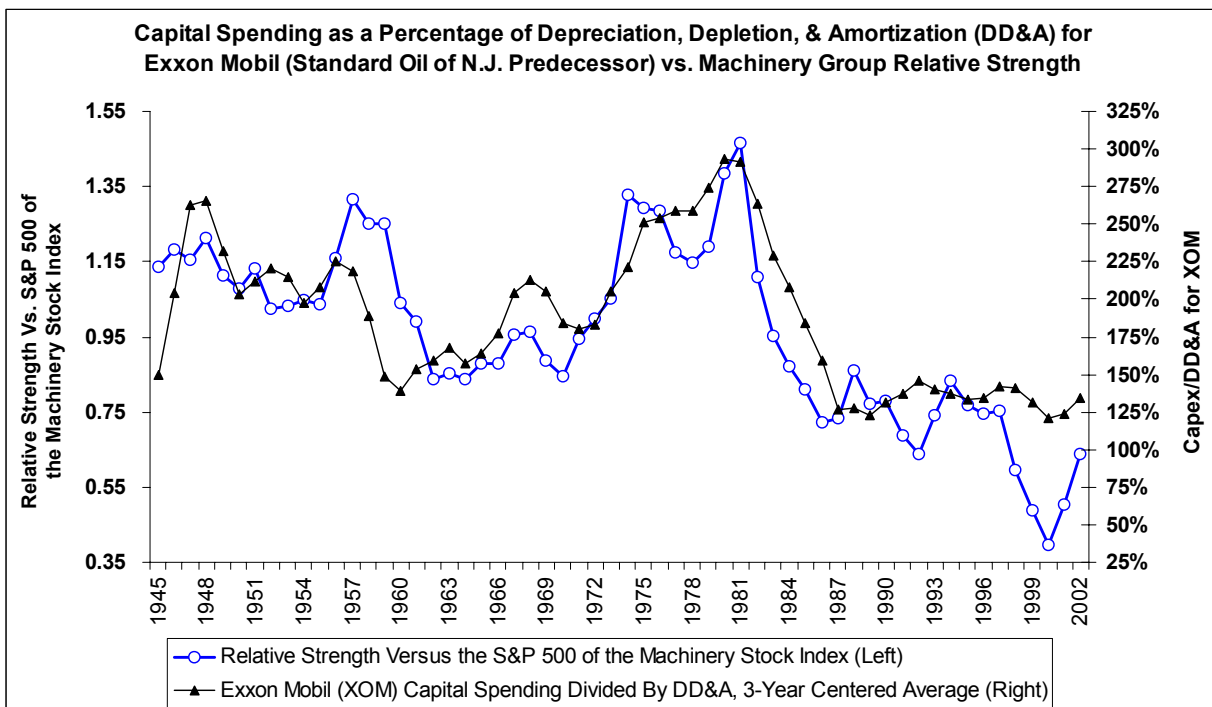
Besides machinery, other plays on inflation include energy, chemicals, agriculture, real estate, mining, and other hard assets. All perform best when they or their customers have pricing power.



Q

Source: Standard & Poor's Compustat (Factset Research Systems Inc.), U.S. Dept. of Commerce, U.S. Bureau of Economic Analysis, Legg Mason format and Legg Mason estimates for 2003 to 2015 and chart format.

To reiterate, customers buy machines when they have pricing power.



R

Source: Exxon Mobil/Standard Oil of N.J. SEC filings, EIA/API oil prices, S&P Corporation, BLS inflation, Legg Mason format.

Note: If the S&P 500 (Currently \$947) reaches \$1,100 within a year, based on a P/E of about 20x applied to FY04 S&P 500 EPS of about \$55, that same index could be \$1,100 in 2013 based on a P/E of 10x and S&P 500 EPS of \$110 (i.e., 7% CAGR) i.e., FLAT.

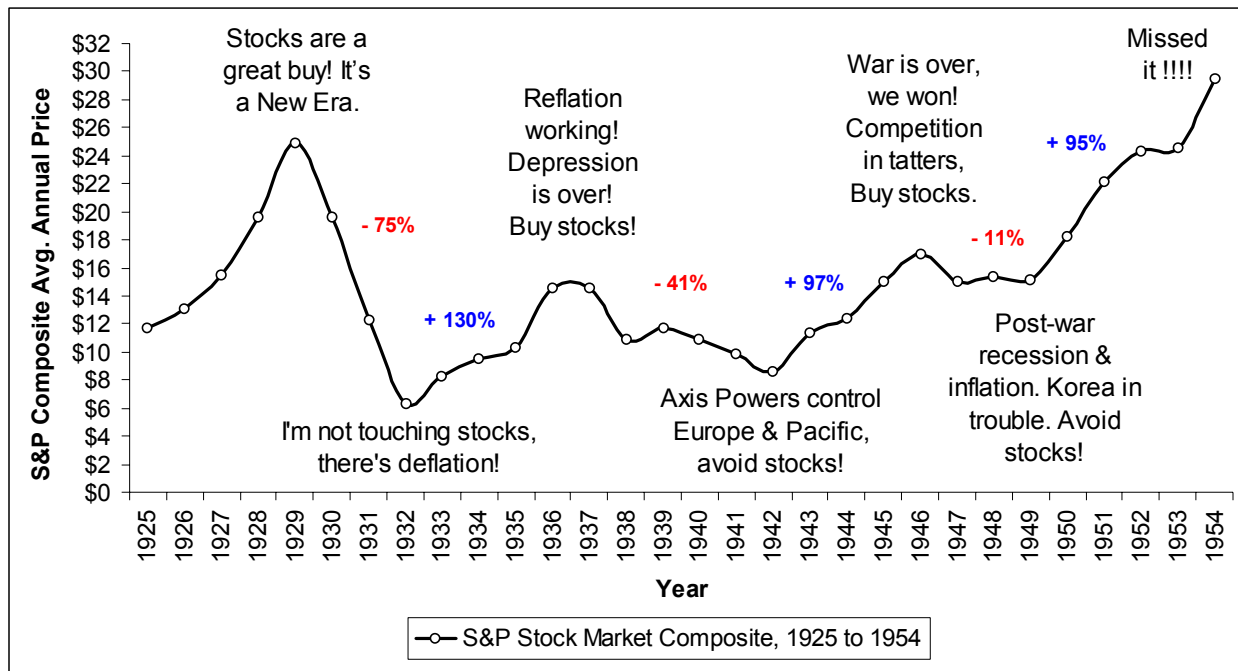
Low inflation justifies a high P/E, high inflation justifies a low P/E. Our table (S) to the right compares the average annual P/E of the S&P composite from 1927 to 2001 to the prevailing consumer price inflation rate that existed each of those years

		S&P 500 LTM Avg. Annual P/E Ratio	Consumer Price Inflation Yrly. Avg. Y/Y%
During deflation:		Midpoint 14.9x	-3.2%
During inflation, in the following ranges:			
Inflation From	Inflation To	The Avg. P/E Was	And Inflation Averaged
0.0%	1.9%	16.2x	1.2%
2.0%	3.9%	18.3x	3.0%
4.0%	5.9%	14.6x	4.9%
6.0%	7.9%	11.0x	7.1%
During high inflation, the following occurred:			
Inflation Over	Produced a P/E of	And Inflation Averaged	
8.0% +	9.2x	11.5%	

S

Source: Standard & Poor's Corp. and U.S. government inflation data, Legg Mason format.

Investors are often wary of being contrary, but in the example below (which captures one of the inflation cycles, 1933 to 1948) we show the S&P during the pre- and post-1929 Crash years. As the chart demonstrates, *not* bucking the “consensus” can be a grave error.



T

Source: Standard & Poor's Corp. price data, Legg Mason format and commentary.

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- HOLD - We expect this stock to perform within 10% (plus or minus) of the S&P 500 over the next 12 months. A Hold rating is also used for those higher-yielding securities where we are comfortable with the safety of the dividend, but believe that upside in the share price is limited.
- SELL - We expect this stock to underperform the S&P 500 by more than 10% over the next 12 months and believe the stock could decline in value.

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