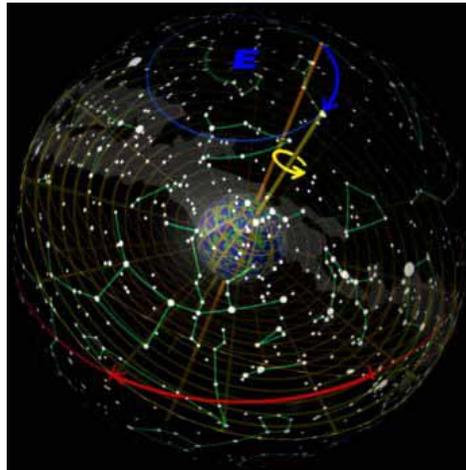


PRECESSION

In a fashionable *arrondissement* of Paris lived a well-known publisher who had made his reputation with an excellent multi-volume collection of the history of France. He was in poor health, and died when his son, León, born in September 1819, was just nine. León was also frail, with one eye myopic and the other hyperopic, giving him an awkward appearance, and he preferred to be alone most of the time. He was sent to a fine school, but his teachers thought him lazy, and his mother was forced to withdraw him and hire tutors for him at home. Indifferent to academics, León was gifted mechanically, and as a boy built sophisticated working models of a steam engine and a telegraph. His mother thought this dexterity would make him a fine surgeon, and she enrolled him in medical school where he excelled. That is, until he passed out at the first sight of blood. He soon gave up on a medical career.

One evening, León attended a talk by Louis Daguerre, the inventor of photography, and threw himself into mastering this very complicated chemical process. He invented a powerful electric light source that enabled him to take the first photographs ever taken through a microscope, and in 1845 he took the first photograph ever of the sun (providing the first visual evidence of sunspots). Five years later, he proved the wave theory of light by building a steam engine to drive a spinning mirror to show that light travels



slower in water than in air.

All of these experiments made him well-known in Paris, but still, he was an amateur, without a degree or a job, snubbed by the scientific community. He was eventually to die young, at the age of 48, probably from mercury poisoning, but not before conducting a demonstration that would confirm him as the greatest experimental scientist in history.

Proving a theory is an impressive accomplishment, but the greater significance comes from the implications of that proof. In other words, understanding our world is a huge achievement, but using that understanding to illuminate how the future may unfold, well, that's truly impressive. Experiments conducted more than a century ago are relevant to our world today, and may even help us make sense of the current economic environment.

INSIDE GRAPHS:



- *Graph 1: Capital Market Performance—page 2*
- *Graph 2: Total Delinquencies as % of Bank Capital—page 2*
- *Graph 3: Nominal Residential & Non-Residential Construction (Y/Y% change) - page 2*
- *Graph 4: Corporate Profits after Tax as % of GDP—page 2*
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- *Graph 9: Foreign Profits as Percentage of Total Corporate Profits, 1948-2006—page 4*
- *Graph 10: Technology Adoption 1000 BCE & per Capita Income 2002—page 4*
- *Graph 11: Technology Adoption 1500 & per Capita Income 2002—page 4*
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Volatility, long dormant, returned briefly in the first quarter of the year. In late February, a rumor that margin requirements were about to be raised prompted Shanghai shares to sink 9% in a day. Following the sun, markets in Asia, then Europe and finally New York were jolted, and joined in the sell-off. It had been three years since US equities declined more than 3% in a single day, the longest such stretch on record. The 3 1/2 % drop in the US market had no legs, however, and equities ended the quarter up modestly, near new record highs.

Chinese shares recovered most of their losses, but not so in Venezuela, which declined 11% in the quarter, the worst showing in the world. Best was found in Peru and Morocco, each up about 25% last quarter for reasons that are unclear to us.

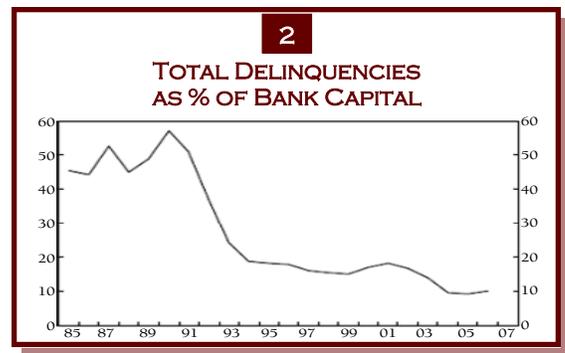
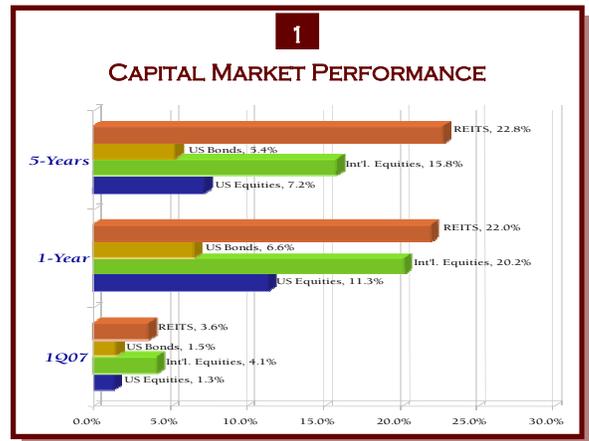
Critics will point to the many risks and imbalances in the global economy, and we'll come to them, but the fact is the world economy has been strong on many fronts. In the US, household net worth is at a record high, industrial production and capacity utilization are strong, and for all the headlines about sub-prime mortgages imploding, banks are in solid shape (see Graph 2).

Yes, residential construction activity has plunged, but commercial construction has picked up the slack (see Graph 3). Over the past 50 years, every precipitous decline in housing starts, with one exception, was followed by a recession. The exception was 1966, when inflation was contained and 10-year Treasury yields were 4.5-5%, coincidentally, an apt description of our current environment.

Corporate profits, as we've discussed before, are near record levels (see Graph 4) and profit margins are the highest in over 50 years. Corporations are directing this torrent of cash flow towards re-levering by aggressively reducing their equity (see Graph 5, pg. 3).

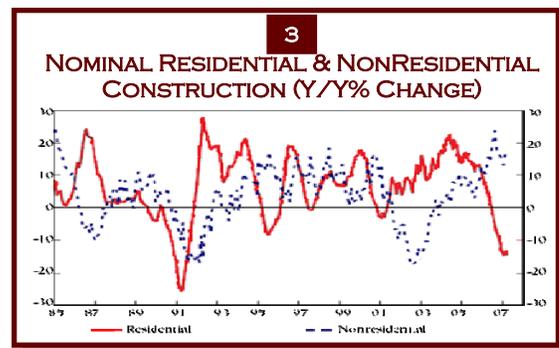
Of course, the contrary view of these record profits is that conditions can only get worse from here. Real (inflation-adjusted) earnings have surged 192% from March 2002 through December 2006, but over the very long-term (since 1881), real earnings have grown by only 1.5% p.a. (see Graph 6, pg. 3). Burton Malkiel of Princeton has pointed out that real earnings were zero from 1900-1947 and again from 1967-1987. Mean reversion will pull profit growth lower, and we're already seeing that. After 16 consecutive quarters of double-digit earnings growth, an all-time record, that streak will likely end this quarter or next.

When the US sneezes, the world catches a cold goes the old expression meant to convey the world's dependency on its largest economy. We've painted a

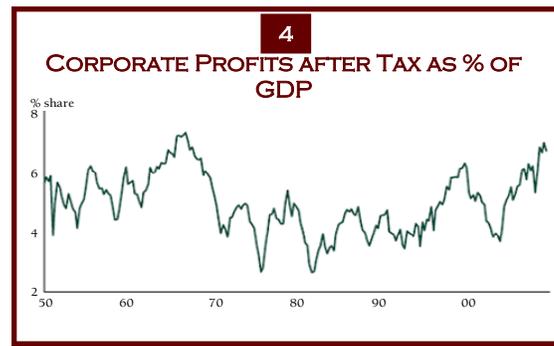


Source: FRB and FDIC

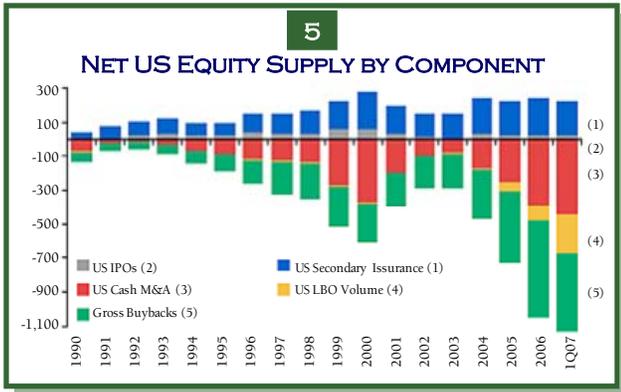
Courtesy: Citigroup



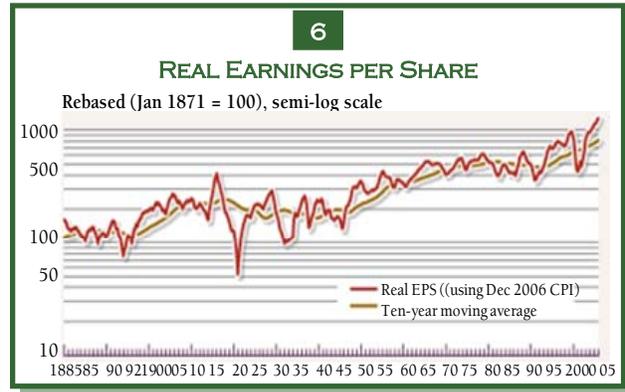
Source: Census Bureau; Courtesy: Citibank



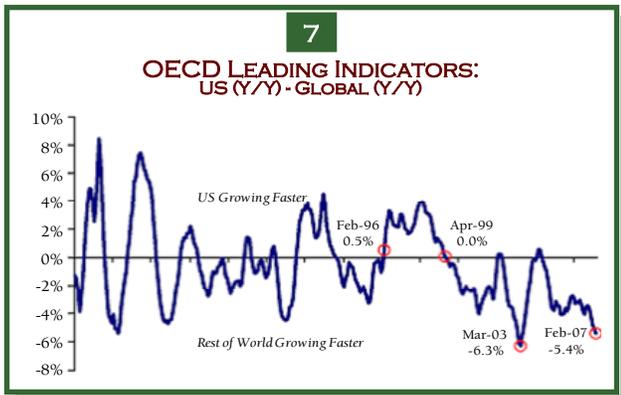
Corporate profits after tax with IVA and CCAdj as % of US GDP
Source: US Department of Commerce Graph Courtesy: Lehman Brothers



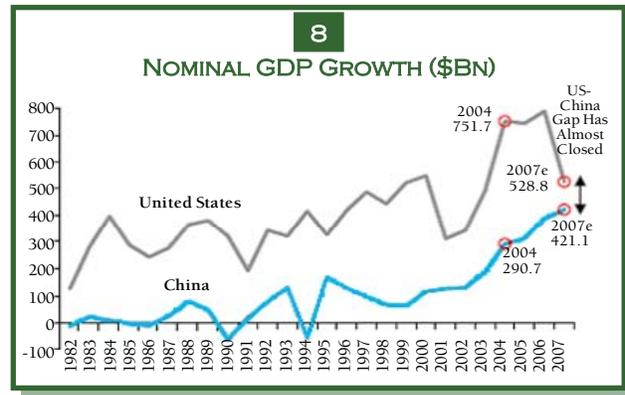
1Q07e annualized. Source: Thomson Financial, Dealogic, Compustat, Morgan Stanley Research, e=Morgan Stanley Research estimate



Graph Courtesy: Financial Times



Global=OECD + Six Major Non OECD Members (i.e., Brazil, Russia, India, China, South Africa & Indonesia). Source: Organization for Economic Cooperation & Development, Morgan Stanley Research.



Source: IMF, Morgan Stanley Research, Graph Courtesy: Morgan Stanley

reasonably robust picture of the US economy, but we are really the laggards around the globe. Over the past year, our GDP growth has trailed Europe, the UK, Japan and Canada, not to mention China, India, Turkey and Ecuador, and the gap is widening (see Graph 7). This year, US GDP, about one-quarter of the global economy, is estimated to grow by about \$525 billion. Amazingly, China, about 4% of the world economy, will add approximately \$420 billion to world growth (see Graph 8), highlighting the extraordinary divergence of growth rates that we can extrapolate as indicative of the spread between developed and developing economies. We used to call these countries “Third World,” but as half the global economy now emanates from here, we suspect that phrase has been relegated to the history books. It is these countries that are the engines of world growth.

None of this has been lost on US corporations, whose profits have become more dependent on foreign activity, fitfully but inexorably, over the past 60 years (see Graph 9, pg 4).

Something does feel inexorable to us about this relative growth trend. Barring some calamitous exogenous event, such as a catastrophic war or an asteroid strike, it does seem “right” that 80% of the world’s population “should” have a bigger role in the world economy, as it did for most of world history (see *Lion’s Gate*, January 2007). To support our inevitability argument, we turn to Diego Comin and William Easterly of NYU and Erick Gong of UC-Berkeley who, remarkably, found correlations between wealth today and technology adoption 500, 2,000 and 2,500 years ago (see Graphs 10 & 11). So, it appears that not only is China’s rise inevitable, it is pre-ordained.

Inevitable or otherwise, this divergence of relative growth between developed and developing economies has led to some “extreme” imbalances in the global economy, including, *i.a.*, record US trade and current account deficits (see Graph 12, pg. 5) and the concomitant record reserves held by our trading partners.

A current account deficit does not mean a cur-

Asian currency crises and Russian default, and have continued unabated with the rise in trade and oil prices.

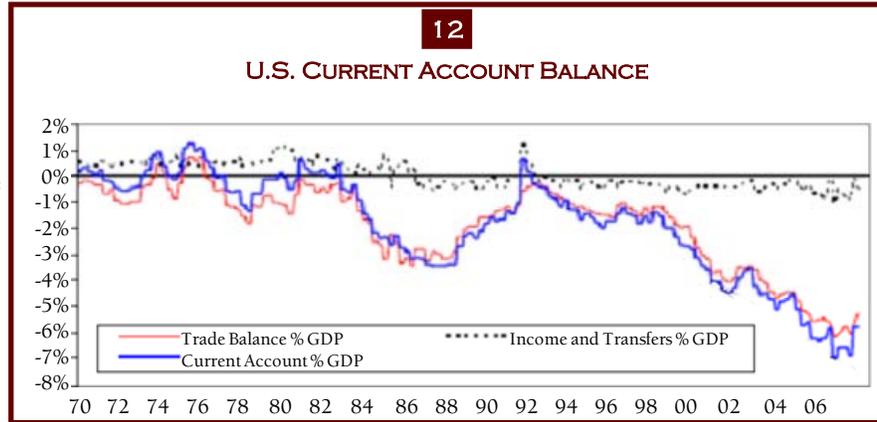
This surge in savings flow directed outward from Asia and the oil exporters has taken place against a backdrop of strong world economic growth. In the past decade, the global economy has averaged 4.1% growth p.a., much higher than the 3% average over the previous two decades. This robust economic environment has enabled corporate and sovereign debt to be reduced, and as noted above, net equity issuance has declined.

These powerful, secular forces have converged: an outflow of savings from developing countries due to poor domestic investment opportunities and a scarcity of assets, both financial and real, to absorb these flows. It is no surprise, then, that valuations are rich across virtually every asset class.

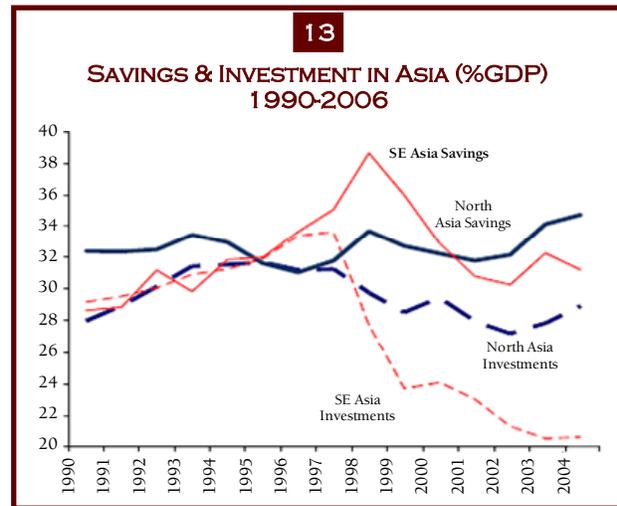
In the classic economic model, huge current account imbalances must be corrected by a currency adjustment, and the bigger the deficit/surplus, the bigger the devaluation/revaluation. That is because, historically, imbalances have been caused by excess liquidity, leading to rising inflation that can only be halted by monetary tightening. But in the framework we've described, it's not excess liquidity that has caused these imbalances, but the reverse: the huge current account imbalances, driven by these secular forces described above, are the source of global liquidity.

The powerful forces driving these dynamics are not likely to shift suddenly. As a consequence, these imbalances are likely to be of greater magnitude and sustained for a longer period than we have experienced before. Some see a fragility in these massive current account deficits/surpluses, but there is also a heightened mutual dependency. It's this reliance on each other that will keep the world spinning.

A year after he validated the wave theory of light, León staged his most dramatic public demonstration. From inside the top of the cupola of the prestigious Paris Observatory, center of world scientific research, he hung a pendulum designed to move freely without resistance. It had long been accepted, *but never proven*, that the Earth rotates, and León postulated that a pendulum, once set in motion, would retain its plane of swing while the Earth rotated beneath it.



Graph Courtesy: Bridgewater Associates



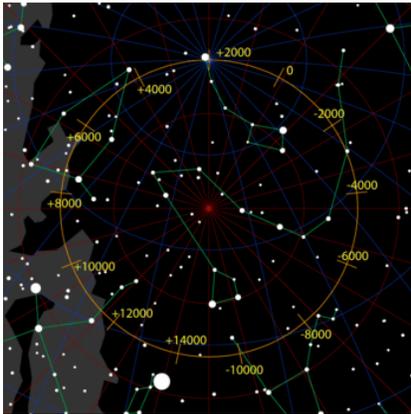
Source: CEIC, Morgan Stanley Research, Graph Courtesy Morgan Stanley

He set his pendulum in motion above a circular ring with marked intervals. Before the leading scientists of Europe, with the pendulum behind him, he presented his paper and his famous sine law: $T=24/\sin q$, where T is the time in hours for the pendulum to return to its original position and q is the latitude at which the experiment is conducted. At the poles, $T = 24$ hours, and at the equator, the pendulum does not rotate at all. Two weeks later, a distinguished panel of experts provided the mathematical proof of the sine law, and in the interim, everyone could see with their own eyes, how the Earth rotated beneath Foucault's pendulum. To emphasize his point, later that year he invented the gyroscope, a device that remains fixed in space while the Earth moves. There is not an airplane in the world today, or a rocket or a spacecraft or a large telescope that doesn't employ Foucault's gyroscopes.

Precession refers to the movement of the Earth's axis of rotation with respect to inertial space. It is caused by the differential gravitational forces on the Earth from the Sun and the Moon. Not only does the Earth rotate, its axis of rotation shifts too. Imagine an infinite line drawn through the poles. Today, the North Pole aligns with the star Polaris (the "North Star"), but 4,000 years ago it was the star Thuban. The brilliant Vega will be the

north star in 12,000 years, as it was 14,000 years ago. So Polaris will return as the north star in about 26,000 years.

All this spinning may seem like our planet is in a precarious balance, and perhaps that's true. But an object in motion remains in motion unless an external force is applied to it. Capital flows and economic dynamics may seem imbalanced, but these are forces that make the world go 'round. 📖



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