STRATEGIC ECONOMIC DECISIONS

Leaders in the Economics of Uncertainty

PROFILE

SEPTEMBER 2007

NUMBER 82

The Problem: *Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?* – T.S. Eliot

The Solution: *SED's Research Programme — dedicated to imparting an inferential edge so that clients are less wrong than the consensus, and less wrong for the right reasons.*

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CRED-INTEL® SERVICE

— Dedicated to Imparting an *Inferential Edge* —

Where is the wisdom we have lost in knowledge?
Where is the knowledge we have lost in information?
- T. S. Eliot

Our goal is to help our clients be less wrong than the consensus, and less wrong for the right reasons.

To this end, we identify and explain counter-intuitive structural changes in the economy and the markets. Upon apprehending these developments, investors should be less surprised by tomorrow's news than they otherwise would be.

We also attempt to identify and explain significant new theoretical developments in economics and finance, developments that render the world less counter-intuitive. After all, Einstein was right: Good theories are good because they work better.

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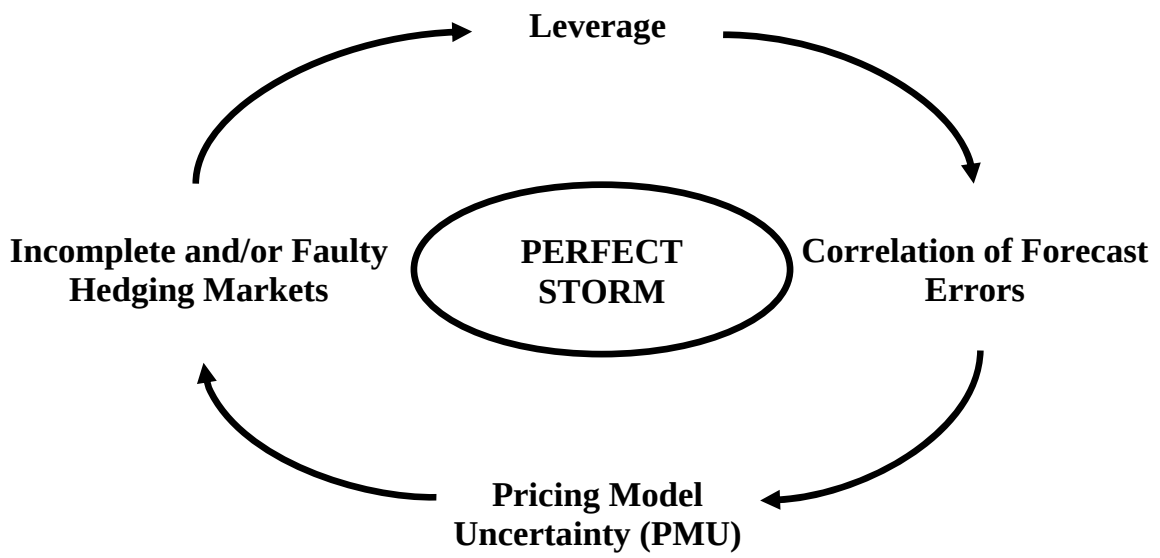
September 2007

THE PERFECT FINANCIAL STORM
– The Four Conditions of Maximal Endogenous Risk –



Legend: The *greater* the magnitude of any one of these sources of endogenous risk, the more "perfect" the financial market storm that could result.

Source: SED

EXECUTIVE SUMMARY

> *Because this crisis taps so deeply into the newly devised structures of finance, anyone who says the worst is definitely over is either a fool or someone with a position to protect. As risk has become bewilderingly dispersed, so too has information. Nobody yet knows who will bear what losses from mortgages—because nobody can be sure what those loans are really worth. Nobody knows if tighter lending standards will oblige borrowers to raise more capital, triggering more sales in stock markets and more pain. Nobody knows how messy the inevitable bankruptcies will turn out to be. What markets need now is time to piece that information back together.*
>
> Editorial, *The Economist*
> August 16, 2007

The five chapters of this report are divided into two distinct parts. The three chapters of Part I, happily, do not focus on the recent turmoil in global markets. Rather, they center on an even more important topic: The true nature of today's evolving world economy, and the nature of the "Black Swan" that is lurking therein. Chapter I appraises the concept of globalization from a statistical standpoint and concludes that, to date, it has helped bring about a "goldilocks" economy on a global scale. Chapter II focuses on the future, and introduces a different and disturbing perspective. It identifies as today's true Black Swan the false belief that we are witnessing the triumph of global capitalism pursuant to the collapse of communism. Regrettably, in all too many cases, this is not the case. Indeed, in many important ways, capitalist forces are receding—a point that becomes clear when we recall what a true capitalist economy *really* entails. Moreover, the specific ways in which capitalism is failing, portend crises far more serious than that of today's financial market turmoil.

Chapter III concludes Part I by building upon the Black Swan arguments of Chapter II, to argue that a wholly new paradigm of political economy and public policy is now needed. Specifically, the triumphant paradigm of "market economics" that has proven so successful during the 20th century, now needs to be replaced with a new paradigm of "politics"—a generalized paradigm subsuming classical market economics as a limiting special case.

> *This new paradigm must itself be based upon a deep understanding of politics as multi-lateral bargaining--between interest group—no more, but no less. Curiously, this is a perspective that is missing from most political science textbooks today, even if it represents what life is all about. The reason such a paradigm is needed is that the principal problems the world confronts, both politically and economically, are genuine bargaining problems. They are not problems of efficient resource allocation via the Invisible Hand. This is as true of energy and water as it is of Middle Eastern politics.*

Our argument here may strike the reader as novel, and indeed it is. Yet just as we urged clients to take seriously our anti-consensus analysis of future energy prices starting four years ago, and just as we urged you to beware of the toxic stew of excess leverage and endogenous risk that is now bringing down global markets, so do we now urge you to pay particular attention to Chapters II and III. It is our belief that our new research insights will once again be proven right for the right reasons, *ex post*. Research thank you, not "market commentary."

Part II: Today's Global Market Crisis in Perspective

In Part II (Chapters IV and V), we turn to the recent turmoil in world financial markets and set forth our forecast and risk assessment of the US economy. To motivate the content of our two chapters addressing today's credit market turmoil, consider first the excerpt from the *Economist* appearing above, along with the following excerpt from a front page *New York Times* article of August 17 entitled, "As Markets Gyrate, Insight Suffers." The paradox posed in both is central to an understanding of what has really been going on.

> "Twenty-first century financial markets react with lightening speed to events halfway around the world. Investors in China immediately see what happened in New York and make trades in London based upon the news. So why is the credit panic of 2007 being played out in slow motion?
>
> One reason is that those involved have never seen anything like this before (e.g., the strange behavior of the new-fangled securities that are mispricing). Information may arrive instantly, but insight takes longer.
>
> It seemed unlikely, if not absurd, that the American economy and credit system could be shaken because a few people with poor credit fell behind on their mortgages. Why should that slow consumer spending? Why should it affect companies that made mortgage loans only to people with good credit? Why should it bring to a halt the leverages buyout boom?"

Whereas most readers of such commentaries will agree with the new perspective they set forth, they will not have a clue as to how to answer the four questions posed above, much less how to *utilize* the implied new paradigm in making investment decisions. For while a new set of perceptions about market behavior is indeed emerging, a set of perceptions does not constitute a *bona fide theory* with which to explain why strange things are happening, much less how to better predict the future. The distinction we are making here is all-important in practice.

Yet readers of past SED essays *will* recognize that what is now being discussed, if only implicitly, is the crucial role of "endogenous risk" in explaining the true dynamics of financial markets—a concept we have helped to develop over the past decade. In the *Times* excerpt, the central point is that it is not the news *per se* that matters, but rather the *interpretation* of the news ("insights" about it), just as we have often stressed. In particular, due to the persistence of embedded market Belief Structures, new interpretations of reality take time to evolve. For this reason, security prices do not move instantaneously, much less "correctly," in sync with the news. Rather, they are driven both by the news *and* by lagged shifts in an evolving Belief Structure. This is one reason why forecasting can prove so difficult, and why many quant models fail.

Additionally, both the *Times* and the *Economist* articles implicitly place great emphasis upon the critical role of Pricing Model Uncertainty (PMU) in driving markets, another staple of SED's analyses for a decade. PMU has, in fact, been *the* great driver of what has happened in *this* market rout: Investor after investor has admitted to not being able to know the value of those new-fangled assets they have been investing in, even after they have learned all the latest news. For game theoretical reasons we have discussed in the past, such PMU generates massive confusion, overshoot, and "illiquidity".[1] Excess leverage merely makes matters worse, as it *amplifies* endogenous risk. Please refer to the "Perfect Storm" diagram above, portraying all this.

Finally, readers of SED's more technical past essays will appreciate something deeper than all of this. They will know that concepts such as PMU, correlated mistakes, and leverage appearing in the schematization above are not merely disjointed concepts offering a novel perspective. Rather, readers know that these concepts have now been woven into a fully general, mathematically consistent theory of *asset market pricing* developed at Stanford University during the past decade: the Theory of Rational Beliefs. This theory has recently been tested econometrically in two different ways, and has been shown fully to explain and reproduce *all* the risk and risk premia parameters that both classical finance and behavioral finance could not explain.[2]

> *The central message of this theory is that asset market behavior (including market madness) does not, in fact, result from "investor irrationality," but rather from investor mistakes. Investors, that is, are rational-yet-wrong because, in an evolving and non-stationary world, they cannot know* ***(i)*** *the true conditional probabilities of future events, or* ***(ii)*** *the asset prices associated with such events, even if they could somehow divine the news in advance. Any reader doubting the importance of lack of knowledge and thus of investor mistakes—as distinct from "irrationality"—should immediately reread the excellent Economist excerpt appearing at the beginning of this summary.*

In our view, this new theory constitutes the greatest advance in economic theory since the advent of the Economics of Uncertainty by Kenneth Arrow in 1953, subsequently extended by G. Debreu, S. Ross, M. Scholes, R. Merton, P. Samuelson, and so many others. Importantly, the theory does not "replace" either the Efficient Market Theory (EMT) or behavioral finance. Rather, in the best tradition of scientific progress, the EMT emerges mathematically as a limiting special case of the new theory, just as Newton's equations emerged as a special case of Einstein's ten metrical field equations of general relativity. Moreover, important aspects of the irrationalities introduced in behavioral finance are incorporated within the concept of investors "being wrong." We thus view Rational Beliefs Theory as a milestone in the *synthesis* of complementary perspectives.

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[1] PMU is *not* always the culprit in generating endogenous risk. It played little role, for example, in the Russian default of the late 1990s.

[2] See "Determinants of Stock Market Volatility and Risk Premia", Kurz, M., Motolese, M., *Annals of Finance* **1**, pp. 109-147, 2005; and see "Diverse Beliefs and Time Variability of Risk Premia", Kurz, M., and Motolese, M., Working Paper, Stanford Institute of Theoretical Economics, August, 2007.

Only with such a theory in hand can both a superior explanation of the past *and* a superior forecast of the future become possible. Piecemeal concepts alone do little in this regard, no matter how "insightful" or interesting they may be. What is needed is philosophical *holism*, and it is precisely such holism that has been lacking in market commentaries over the past few weeks. No one has integrated all the new "perspectives" being discussed.

Understandably, the authors of the *Times* and *Economist* articles above had no idea of this new theoretical advance, nor do most people teaching finance or editing publications like the *Financial Analysts Journal.* But its advent is a fact, and one well known to the readers of our essays and to an increasing number of theoretical economists worldwide. Keeping our clients informed of such developments is one reason why we are in business. Please refer to the Table of Contents for a more structured description of each of the five chapters.

Two Apologies

To the Reader: Chapter IV concerning this summer's market turmoil is a minor revision of the lengthy Client Memo I emailed to you on August 13. So many people contacted me to ask my thoughts that I accelerated the writing of this chapter, and sent it out. However, the forecast that appears in Chapter V below builds upon and extends this earlier analysis.

To the CFA: In my August Client Memo, I was unduly critical of the CFA when I criticized its "retreaded management." I apologize for this comment. Nonetheless, it is a fact increasingly acknowledged worldwide that the economics and financial theory portion of the CFA's curriculum is not only very dated, but deleterious to practitioners, given what we have learned both theoretically and empirically during the past two decades. Whenever I lecture—whether in Sydney or Dublin—a constant refrain from young people is: "Gosh—that makes so much sense. Why don't we learn of any of this in our CFA programme?"

In today's environment, where even editorial writers at the *Economist* and the *New York Times* understand intuitively that Pricing Model Uncertainty and structural changes are all-important, it is preposterous for the CFA to teach forty year old theories in which no mistakes of any kind are allowed to enter into economic and financial theory. Yet, as we have explained at length, this is the defining property of all Efficient Market and related theories of asset pricing. Remember the Modigliani-Miller theorem of 1957? "It makes no difference whether the balance sheet of a company is 100% debt or 100% equity." The theorem is absolutely true—provided that all agents are assumed by the underlying theory to know so much that the concept of "being wrong" cannot be defined! But what a waste of time and money for young people to learn such results, *unless as stepping stones to deeper truths we have now ascertained*. As an educator who has worked with and encouraged staff at the CFA as to how to modernize what it teaches over past years, but to no avail, I have every right constructively to criticize it in an effort to push it along. I shall continue to work towards this end in the future.

H. "Woody" Brock
Gloucester, Massachusetts September 2007

CHAPTER I: "GOLDILOCKS" ON A GLOBAL SCALE
– World Growth, Inflation, and Strange Correlation Structures –

"Goldilocks" receives new meaning when *world* growth has accelerated to its highest level in many decades, and *world* inflation has continued to abate despite both soaring demand for product and extraordinary commodity price increases. The purpose of this brief essay is to put these developments into proper perspective. In writing this, the author was partly inspired by the interesting July 31, 2007 *Wall Street Journal* Op-Ed piece by David Hale, "The Best Economy Ever".

1. Is "Accelerating Globalization" a Meaningful Concept? Or is it Journalistic Hype?

To begin with, we must ask whether today's economy is in fact "globalizing" at an unprecedented rate. While it is widely assumed that this is the case, there are those who claim that globalization is nothing new, and that the rate of globalization in the late 19th century matched that of today. While there is some truth in this view, the reality is that we have never before witnessed the extent and rate of globalization as it is today. Three developments make current economic integration special:

First, there is the geographic scope of this development—the fact that there are now large economies all over the globe that are all intertwined. The principal players are Europe, China, the US, Japan, India, and Russia. While some of these players are more advanced than others, and some are larger than others, all are major actors on today's economic and geopolitical stage. Yet above and beyond these Super-6 players, there are dozens of other smaller economies throughout Northern Africa, sub-Saharan Africa, Latin America, and Asia who are participating in today's global boom.

Second, there is the rate at which the linkages between the capital and goods markets of these nations are growing. For example, the gross value of total global capital flows is now 16% of world GDP, compared to only 4.5% during the mid-1990s. As for trade in goods, global imports more than tripled, rising from $3.5 trillion in 1990 to $11.6 trillion today. [We have drawn these statistics from the Hale piece cited above.]

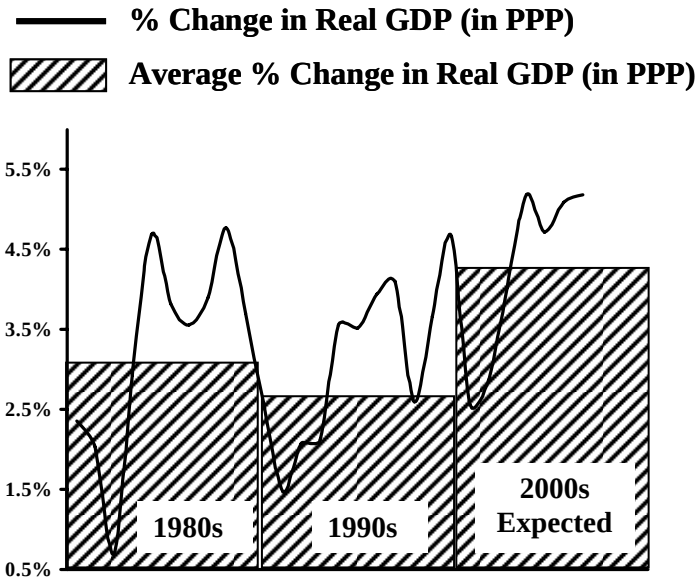
Third, we are witnessing the integration of both goods and capital markets. This was not true in earlier periods when globalization was primarily discussed in terms of trade in goods, not securities. While there was indeed significant foreign direct investment in America by Europe a century ago, such FDI should not be confused with the globalization of capital markets being witnessed today. Recall that in earlier times, liquid markets in tradable securities did not exist.

2. Global Growth in Perspective

Some historical data will be useful in documenting the degree of progress in today's global economy. Figure 1 shows total world GDP growth in Purchasing Parity Terms over the past 28 years.[1] To begin with, we see from the solid line in the graph that expected global growth for the world will be about 5.3% this year, in contrast to average growth of about 2.8% in the 1990s. Interestingly, we also see that growth in the 1990s was *lower* than in the 1980s—indeed lower than in any decade in fifty years.

This surprised everyone since, the end of communism, and indeed of the Cold War, was supposed to be a significant assist to global growth. It was also the decade when Europe began to integrate in a significant way, and when commodity prices fell to all-time lows in certain cases, with oil dropping to $10 per barrel in the late 1990s. What then went wrong in the 1990s?

FIGURE 1: WORLD REAL GDP GROWTH OVER TIME



Source: World Bank World Development Indicators; adjusted to 2000 base

The four principal reasons for low global growth were **(i)** the collapse of growth in Japan for the entire decade, **(ii)** the US credit crunch of the early 1990s led to slow US growth in the first half of the 1990s, compared to rapid growth during the second half of the decade due to the high tech boom, **(iii)** the discovery by European nations that the alleged need for "integration" was less important than the imperative of deregulating its product, capital, and labor markets, and **(iv)** the

[1] We believe it is necessary to utilize PPP measures when describing growth over long periods of time. Doing so eliminates the distorting effects of changes in currency levels, or of the *lack* of such changes in cases like the Dollar/Yuan.

difficulties confronted by formerly communist nations in adopting market-based economic arrangements. The collapse of Russia was the most spectacular example of such adjustment problems. All in all, the result was *unexpectedly* slow global growth, and this was one reason why commodity prices fell as low as they did. Demand growth was much lower than expected.

The Future: To sum up, global growth in the mid-2000s is strong. Moreover, such growth is not restricted to India and China as many believe. Indeed, the growth rates of nearly 120 countries will exceed 4% this year, a completely unprecedented situation. Many nay-sayers claim that today's global growth rate is an anomaly and that it will revert to the much lower growth rates of earlier decades. "Today's rate of global growth is abnormal and unsustainable."

We do not agree. It is the earlier decades that were anomalous in that the great majority of nations were restrained by pathological economic systems that generated very low growth and poor productivity. When global growth should, in principle, have been 4%-5%, it averaged merely 2%-3%. As a consequence of the advent of more rational market-based systems around the world during the past fifteen years, and of the increased level of competitiveness that resulted, global growth increased greatly—just as economic theory predicts. This is true not only in the case of developing nations, but in a number of developed nations as well. For example, the long-term average rate of growth in Ireland nearly *tripled* after the reforms of the mid-1980s—and remained very strong over the two subsequent decades.

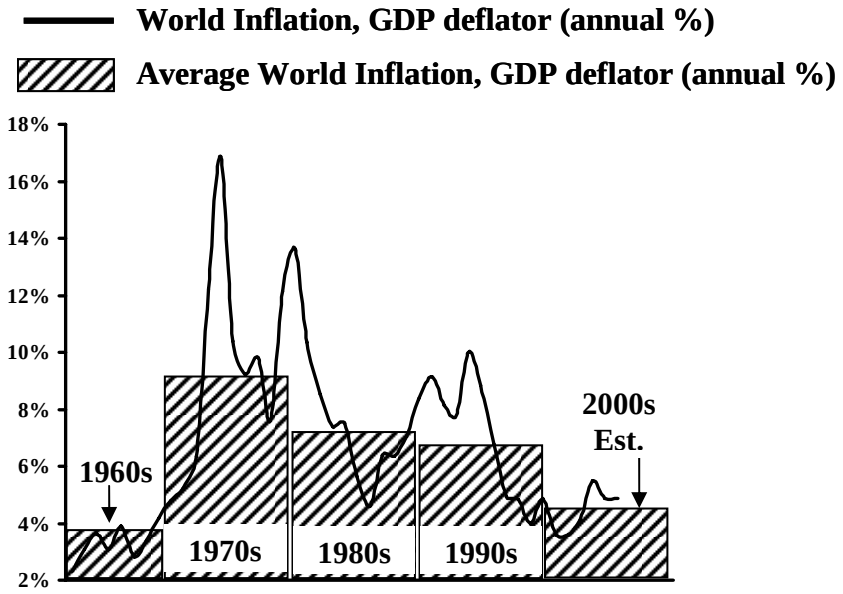
The good news, therefore, is that global growth *could* well lie in a 4%-6% range in the decade to come as nations further rationalize their economic institutions and also enjoy the fruits of "catch up economics." This is the process whereby developing nations can sidestep the long process of development that the developed nations went through and simply cherry-pick the Bayer aspirin, Microsoft products, computers, and medical technology that they need, thus leap-frogging their way forward. An additional driver of growth will be the ongoing re-weighting of the nations comprising global economy as the relative size of the fast-growing nations increases. GDP growth of 10% in China didn't impact global growth much when China was one tenth the size of the US. Yet as the two nations' economies become more equal in size, the impact of differentially higher Chinese growth matters greatly to *overall* global growth.

> *There is, however, an important caveat to this rosy global outlook. Just as deleterious communist philosophies dragged down world growth for much of the past half-century, so may bastardized versions of capitalism do the same in the longer run. A very serious threat is lurking in this regard, and this is discussed in Section 5 just below, and in Chapter II.*

3. Global Inflation in Perspective

For a global economy to merit the "goldilocks" label, not only must growth be strong, but inflation must be low. Figure 2 shows that global inflation in recent years has indeed been low, at least lower than in the previous two decades of the 1980s and 1990s. Why has this been the case?

FIGURE 2: WORLD INFLATION OVER TIME



Source: World Bank World Development Indicators; SED

At a naïve level, some would have expected today's regime of sustained high global growth to have caused *higher* inflation—not lower. After all, accelerating growth shifts outward the demand curve for goods and services. "Surely such growth will cause higher inflation. Do not surging commodity prices over the past six years confirm this logic?" The obvious retort to this observation is that, while soaring demand for product has indeed been partly responsible for driving real commodity prices higher, the price increases of most every good except commodities has in fact, decelerated. Indeed, during the past few decades, the real prices of washing machines, cars, computers, and software have declined sharply.

But why? And can this continue? The principal reason why lies in the duality between demand and supply. Those "new" consumers emerging around the globe are not only consumers, but producers as well. If supply thus rises in tandem with demand, prices need not rise. [The case of depleteable resources like oil represents an exception here.]

Yet three additional developments above and beyond rising supply have helped to restrain inflation:

First, the substitution of quasi-capitalist for socialist and communist modes of resource allocation has significantly increased competition and productivity. In the process, the traditional power of organized labor has fallen sharply. As a result, *unit labor costs have fallen in many instances.* As we have shown in past essays, there is no better proxy for the behavior of inflation in the short-to-intermediate term than the behavior of unit labor cost growth.

Second, most of the new quasi-capitalist entrants onto the world stage do not possess deregulated capital markets. In many instances, this manifests itself in a form of "crony capitalism" in which the goal of many firms or state-owned enterprises is revenue maximization rather than profit maximization. Mathematically, this results in a *higher level of output* than would be the case in a true textbook equilibrium. The result (known as "Asian dumping" in some quarters) will be prices that are lower than they "should be" according to the theory of a competitive equilibrium. This over-production is a second source of deflation.

Third, the mercantilist policies of China—its low currency strategy in particular—have played a role in flooding the world with products whose prices are much lower than they "should be" in economic theory. The disinflation attributed in the US to Wal-Mart pricing is perhaps the best example of this phenomenon. Had the Chinese Yuan been allowed to *rise* by several hundred percent since the mid-1980s—rather than to have been pushed down by 50%—then the prices of Wal-Mart goods *in dollar terms* would have risen faster than they did.

> *All in all, however, the good news is that hundreds of millions of formerly dispossessed and unproductive workers are now joining the global workforce as participants in economic systems that permit them to become increasingly productive at a rapid rate. This is arguably the best news for global inflation, and it is sustainable.*

The Special Case of Commodities: On the surface, goods like commodities that are inherently "scarce" would seem to be much more prone to inflation as demand soars, than other goods and services. While there may be some truth to this, the history of the 20th century suggests otherwise. The real prices of most commodities have *dropped* due to notable productivity increases in exploration and development, and to ever more efficient modes of extraction and recycling.

Does the sharp increase in commodity prices during the past decade suggest that this traditional source of commodity price deflation is breaking down? Yes it does—with very adverse potential consequences for the world economy. This matter is discussed further in Chapter II.

4. Correlation Between Global Economies and Markets

As was stressed in our February 2007 essay, "Correlation — A Complete Rethink," the subject of correlation is far more difficult than is generally recognized. It is also more important than generally appreciated since the structure of correlation is central not only to creating an optimal portfolio, but also to constructing an optimal hedge in most cases.

In the case of today's globalizing economy, the issue of correlation arises in two quite different contexts. *First,* there is the correlation of GDP growth across nations. *Second,* there is the correlation of asset market returns. We now revisit the data on this topic, and in doing so build upon past work.

A. GDP Correlation: This topic is of importance to investors for two reasons. *First*, it is thought to drive asset market correlation since, "as goes the economy, so goes the market." *Second*, to the extent that the correlation between nations' rates of GDP growth is low on average, global diversification of both real and financial assets should be increasingly appealing. What then is the average correlation amongst the world's six principal economic blocs of China, India, US, Russia, Japan, and Europe?[2]

FIGURE 3: CORRELATION COEFFICIENTS FOR PAIRWISE GROWTH – Real GDP Growth 1995 to 2006 –

***Average* Pairwise Correlation Coefficients for the Six Economies Listed = 0.10**

	U.S.	Japan	Europe	China	India	Russia
U.S.						
Japan	0.45					
Europe	0.44	0.07				
China	-0.03	0.63	-0.48			
India	0.11	0.31	-0.44	0.54		
Russia	-0.08	0.23	-0.08	-0.12	-0.08	

Legend: "Europe" in this chart represents the combined economies of Spain, UK, Ireland, Germany, France, Denmark, and Italy

Source: The World Bank and the US Federal Reserve

Figure 3 shows this average to have been **.10** during the period of 1995-2006. This strikes most everyone as extremely low. Indeed, in a survey we carried out of 150 investors, the mean estimate of this average correlation coefficient was **.65**. Interestingly, the standard deviation of responses was surprisingly tight around this mean. Not one response was above **.8**, and not one was below **.25**! We have discussed this counter-intuitive result and its importance in the past—and readers will recall that we predicted this very low correlation a decade ago. Briefly, most people think in terms of "global shocks," like the OPEC oil hikes of the 1970s, as causing a high degree of growth correlation. They also believe in the impact of "domino effects" on correlation, e.g., "when the US economy sneezes, then the rest of the world catches the flu."

But this is the wrong way to think, especially in today's environment. As for "global shocks," these are very few in number. Instead, what dominates the fate of individual economies are *local* shocks—*and these local shocks are surprisingly uncorrelated.* Just think of the two principal developments that drove growth in Japan and the US respectively during the 1990s, antipodal

[2] This coefficient is computed as the unweighted arithmetic average of the 15 pairwise coefficients of correlation between the 15 pairs of the 6 economies in question.

developments that drove Japanese growth lower, and US growth higher: **(i)** The financial collapse in Japan due to 35 years of a misallocation of capital—the real estate bubble of the 1990s being merely one manifestation of this deeper story; versus **(ii)** the high tech boom in the US that drove capital spending to its highest share of GDP in seven decades. Analogously, think of the dates between 1978 and 2000 when all-important microeconomic reforms took hold in China, Russia, India, UK, Ireland, Japan, and many other countries. The dates are completely out-of-sync with one another. *So, therefore, were the resulting GDP responses*.

As for the role of domino effects in heightening correlations, there never was persuasive econometric evidence of significant effects of this kind. However, in today's era when the middle class of Asia as a whole will soon eclipse that of the US in buying power, the concept becomes even more problematic than in the past. In the past year, for example, the growth rate of the US has declined, whereas that of China and Japan has increased. Commentators at investment banks are therefore beginning to talk about "global decoupling," a problematic concept since global economies are indeed becoming more *linked*, yet less *correlated*. An even better example of the fallacy of domino effects lies in what happened within Asia when Japanese growth collapsed during the entire 1990s. It was thought that this event would precipitate a large drop in growth in China and within the rest of non-Japanese Asia, but no such decline resulted. The intra-Asia correlation structure was surprisingly neutral.

Yet so ingrained is the mistaken belief that the greater linkages resulting from increased globalization imply greater correlation, that there was scarcely any discussion in the press about the stability of non-Japanese Asia in the wake of the vertiginous collapse of Japan during the 1990s, and indeed beyond. This was a remarkable oversight of one of the most telling stories of our times. We shall revisit this same story in discussing the impact of today's US mortgage finance crisis on Main Street USA in Chapter IV.

B. Global Stock Market Correlation: In the case of global equity markets, the average correlation coefficient of returns is (as expected) significantly *higher* than that of GDP growth. Moreover, it has risen during the past fifteen years—the first period when we had meaningful data on truly global stock market indices, since Russia and China were somewhat late to the game. Figure 3 sets forth the principal results on relevant average correlation coefficients between ten equity markets of interest.

While the average correlation coefficient is much higher than in the case of GDP growth, it is nonetheless much lower than the estimate we obtained in our survey of 150 investment managers. The mean guesstimate of this coefficient was **.74**, well above the numbers appearing in Figure 3. Thus, as in the case of GDP correlation (but to a lesser extent), the consensus overestimates the extent of global correlation.

FIGURE 4: GLOBAL STOCK MARKET CORRELATION

– *Average* Pairwise Correlation Coefficient of 10 Broad Market Indices –

	1990-1995	1996-2001	2002-2007
Average Correlation Coefficient	**0.26**	**0.47**	**0.49**

Legend: The broad equity market indices used to calculate the average correlation coefficient include: US (S&P 500), Japan (Nikkei 225), Hong Kong (Hang Seng), India (Sensex 30), Russia (RTS Index), Australia (ASX 200), Singapore (STI), Canada (TSX), Shenzen Comp., Europe (average between the CAC 40, DAX, and the FTSE 250)

Source: Standard & Poor's (Capital IQ)

Why is the correlation of global equity market returns much higher than that of the underlying global economies? On the surface, this finding does not seem to make much sense. For in classical asset price theory, it is the news from Main Street that drives Wall Street—*and only such news (the source of "exogenous risk").* Yet ever since the pioneering work of Robert Shiller of Yale University in 1981, it has been known that the volatility of stock market returns far exceeds that of the underlying news in the real world. In the 1990s, with the advent of the theory of endogenous as opposed to exogenous risk, it became clear *why* asset markets are much riskier than they "should" be in classical theory.

Importantly, the reason has little to do with "investor irrationality." Rather, the excess volatility stems from the correlated mistakes investors make due to lack of knowledge about the true probability of the news, and about the reaction of prices *to* the news. We have discussed the concept of endogenous risk in these pages since its origin in 1994 at Stanford University.[3]

By extension, endogenous risk helps explain why the *correlations* between asset market returns will be higher than those of the underlying economies. One principal reason why lies in the role of "Pricing Model Uncertainty" (PMU) in asset markets—*but not on Main Street.* When benchmarked global investors do not, in fact, know the "right" price of assets such as the Chinese or Russian stock market *even when they learn the news*, and as a result are confused, they rationally tend to herd together in the *same* direction. Given PMU, they have no meaningful "magnetic north" in their valuation models telling them what the right valuation of the emerging markets is. Moreover, being benchmarked, they have an *incentive* to stay on board the train on which "the trend is my friend" no matter how high or low prices move. For the first guy to disembark knows he will be fired.

Thus, if a debt market crisis in the huge US debt markets causes a significant downturn in US equity prices, then investors worldwide become frightened. As a result they herd together, and there is a resulting sell-off in *non*-US markets, which has little to do with the underlying news in *those* markets. Moreover, to the extent that global investors are leveraged, such herding and

[3] Kurz, M., "On the Structure and Diversity of Rational Beliefs," *Economic Theory*, Vol. 4, pp. 877-900, 1994.

correlation will be amplified. That is why the correlation of global markets can approach **.95** in periods of big crises. Yet such episodes are as memorable as they are rare, and that is why investors' gut feeling about equity market correlation is biased upward. They forget that the *proportion* of time when there are crises that correlate all markets is small! Conversely, they overlook the reality that, *when there are no crises*, correlation coefficients are often surprisingly low.

Stochastic Volatility of Equity Markets: This term refers to the degree to which correlation structures are unstable over time. In the case of global equity markets, there are two ways to assess the degree of such instability. First, at an aggregate level, we simply track the overall or average correlation coefficient over time. The data in Figure 3 above present precisely such data, and suggest that the average degree of correlation of equity returns has almost doubled. Nonetheless, the sample period for which data are available is quite short, and it is not clear how much we can read into this analysis.

At a more disaggregated level of analysis, one can measure the extent of stochastic volatility by looking at the degree to which each and every individual binary correlation coefficient (e.g., that of the US and Japan) changes from period to period. To show the results, we construct a matrix whose cells consist of the *changes* in the value of each correlation between two different time periods, e.g., the early 1990s versus the late 1990s.

Figure 5 shows the degree of stochastic instability in this sense of select global equity markets across the three time periods shown in the data of Figure 4. Be sure to understand what these numbers portray: In the case of India and the US, the cell entry of **.91** in the first matrix indicates that between the first and second periods covered, the correlation coefficient of Indian and US equity returns increased by **.91** (from a correlation coefficient of *negative* **.46** in the first period, to a *positive* **.45** correlation coefficient in the second period). In the figure below, we highlight those cells where there is the largest change in correlation coefficients across each period, respectively.

C. A Fundamental Paradox in the Concept of Correlation: To underscore the point we have often made about the difficulties in *interpreting* correlation coefficients in a meaningful way, consider the following paradox that arises in the case of equity markets in Japan and the US during the 1990s. As is well known, the US S&P 500 index soared during this period, rising from 350 in January of 1990 to 1,470 in January of 2000. At the same time, the Nikkei index in Japan collapsed from 38,900 to 18,900 over the same period. This is evidenced by the fact that the correlation coefficient of US and Japanese *index values* (equivalently "prices" or "cumulative returns") was a *negative* **.48**. Yet the correlation coefficient of equity market *returns* (quarterly changes in prices) in these two markets during this period was a *positive* **.48**. What in the world is going on here? Since quarterly returns are largely a function of changes in the levels of the market index (that is, of "price"), how can the correlation of changes in prices be *positive* **.48** while that of returns be *negative* **.48**, as shown in Figure 6?

FIGURE 5: CHANGES IN CORRELATION COEFFICIENTS – Evidence of Unstable Data –

5A. *Change* in the Pairwise Correlation Coefficients for Global Equity Market Indices Across the First Two Periods 1990–1995 vs. 1996–2001

	US	**Japan**	**Europe**	**Russia**	**China**	**India**
US						
Japan	0.14					
Europe	0.25	0.29				
Russia	0.45	0.50	**0.45**			
China	0.09	**0.61**	0.08	0.44		
India	**0.91**	**1.09**	**0.54**	**0.45**	**0.54**	

5B. *Change* in the Pairwise Correlation Coefficients for Global Equity Market Indices Across the Second Two Periods 1996–2001 vs. 2002–2007

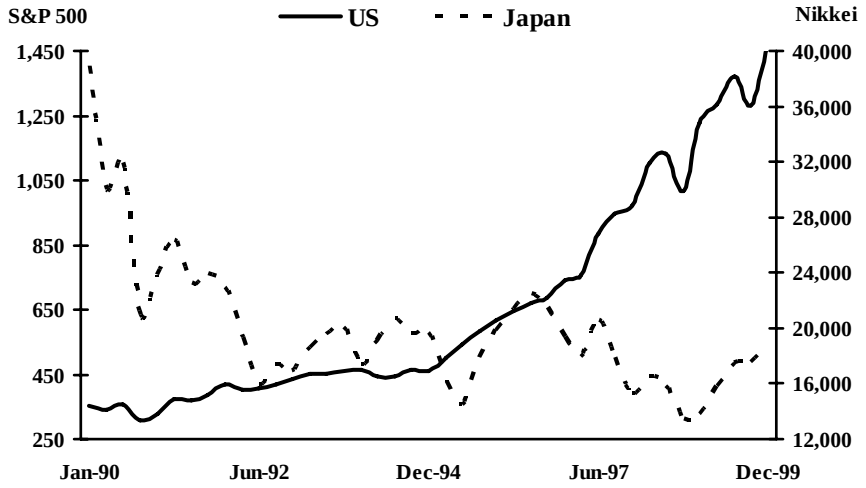
	US	**Japan**	**Europe**	**Russia**	**China**	**India**
US						
Japan	0.12					
Europe	0.05	0.00				
Russia	0.14	0.06	0.07			
China	0.08	**0.22**	0.06	**0.27**		
India	**0.22**	**0.30**	**0.27**	0.08	**0.31**	

Legend: The broad equity market indices used to calculate the average correlation coefficient are the following: US (S&P 500), Japan (Nikkei 225), Hong Kong (Hang Seng), India (Sensex 30), Russia (RTS Index), Australia (ASX 200), Singapore (STI), Canada (TSX), Shenzen Comp., and Europe (average between the CAC 40, DAX, and the FTSE 250)

Source: Standard & Poor's **(**Capital IQ)

The resolution of this paradox lies in the fact that the mathematical construct of the coefficient of correlation is blind to the *pattern* of price changes or returns within the sample. Thus, a close examination of all quarterly data points reveals that in nearly 70% of the sample observations, Japanese and US returns moved in the *same* direction. This partly explains the *positive* correlation of *returns* in the data. But now consider two subsets of this 70% of the sample data: **(i)** the subset of quarters when returns in both markets were negative, and **(ii)** the subset when returns in both markets were positive. When returns in both markets were negative in a given quarter, the Japanese market typically declined much more than the US. And vice versa (to a lesser extent) in the second subset of data when returns in both markets were positive.

FIGURE 6: THE PARADOX OF CALCULATING CORRELATION COEFFICIENTS



	US/Japan Cumulative Returns	US/Japan Quarterly Returns
Correlation Coefficient	**–.48**	**+.48**

Source: S&P; Nikkei market data sources

Finally, consider those 30% of total observations when the returns of the two markets moved in *opposite* directions. In the subset of this sample where Japanese returns were negative, the average absolute value of Japanese returns was much larger than in the complementary case where Japanese returns were positive—and vice versa for the US. This underlying reality helped generate the *negative* correlation of the indices of the two markets over the two periods, or equivalently, of cumulative returns over the entire period.

D. The Investor's Dilemma: Investors thus face a dilemma: How much attention should they pay to the correlation of returns, as opposed to the correlation of cumulative returns (index levels) when making their decisions? Returns correlation might be much more informative for short-term traders, whereas price correlation might be more informative for longer-term investors. The underlying reality here is that the mathematical structure of "correlation" is *inadequate* to highlight the appropriate distinctions we have introduced. Note that this deficiency of the concept of "correlation" is independent of that occasioned by any non-stationarity of the underlying stochastic process, a separate problem analyzed in our February 2007 report.

5. Caveat — Is Today's Global Growth Rate Artificially High?

The foregoing analysis is consistent with the widely held view that the advent of global capitalism has been responsible for virtually all of the good news about today's goldilocks global economy. How true is this assumption, however? Suppose that some of the growth, as well as the disinflation we have witnessed, has been *artificially* induced? What might this mean? Is it a potential problem?

Take, for example, the case of the astonishing growth of China. Had China adopted the level-playing-field guidelines of the World Trade Organization (e.g., a market determined currency value, an open capital account, etc.) economists have estimated that its growth during the past two decades would have been up to 3% lower than it has been. That is, its extreme mercantilist policies have generated growth-on-steroids. On the surface, this would seem to have raised overall world growth. But upon closer inspection, this is not the case. In many cases such as that of China, a zero-sum game is played out whereby nations that artificially stimulate their own growth cause correspondingly *lower* growth elsewhere, e.g., in the US. Recall from National Income Accounting identities that an ever rising US trade deficit with China decreases US GDP growth, while boosting China's growth. This is because an increase in any nation's trade deficit reduces GDP by a corresponding amount, other things being equal, and vice versa in the case of an increased trade surplus.

Has declining inflation also been artificially induced by Asian policies of dumping or currency-pegging? The counterpart of the flood of "cheap" Chinese imports into the US that has lowered inflation is the corresponding growth of US indebtedness to China—indebtedness that may reach $3 trillion by 2015. One tempting way to "repay" such debt in the long run would be for the US to dramatically devalue the dollar and thus its *real* obligations to China. But doing so would lead to much higher US inflation—not to mention a possible breakdown of the global economy. Thus, today's short-term gains from disinflation could well be *offset* by much higher inflation in the future. As always, we are reminded that there is no free lunch in economics. But most discussions of the China problem are completely blind to this reality, and typically conclude: "The status quo seems to be good for everyone. Don't rock the boat by trying to change it."

Yet another example of artificially stimulated growth can be seen in Russia and in other oil producing countries. As is argued in Chapter II, today's sky-high oil prices are largely the result of a failure of capitalism to perform its usual job of providing new supplies of oil. When this reality is coupled with soaring demand and inelastic supply and demand functions, the result is an artificially high price that has *artificially* enriched the oil producing nations, and likewise driven up their rates of economic growth. To restate this, had textbook economics prevailed during the past decade, these nations would have experienced lower growth of wealth and output than they have.

CHAPTER II: TODAY'S *TRUE* BLACK SWAN
– The Conceit of Bogus Capitalism –

Author's Note: *If the essay in Chapter I reported on the good news about today's global economy, the present essay explores the principal threat to it in the longer term. It synthesizes a number of themes we have been developing for the past decade into a coherent whole. The fundamental message is that <u>true</u> capitalism is not being allowed to work in many quarters of our globalizing economy, and that because of this there will be hell to pay in the future.*

But what exactly is "true capitalism?" We start off by defining what this concept actually means. This gives us a normative yardstick for assessing to what extent capitalism is <u>not</u> working as it should be, and thus how far the world economy has deviated from this ideal. Without understanding the magnitude of this deviation, it is well nigh impossible to determine suitable policies for dealing with such problems as energy and water shortages, financial market turmoil, and even today's growing inequality of wealth and income. We show that this is the case.

1. Introduction

The concept of a "Black Swan" is now used to describe an event whose probability of occurrence is extremely low, but whose impact is enormous. In this essay, we argue that today's planetary Black Swan is the conceit that the longer-run future of the world economy will continue to be "goldilocks" because, as Francis Fukayama famously put it in his 1989 "The End of History?" article, we are all capitalists now. Fukayama's provocative point was that, with the fall of the Berlin Wall and the end of communism, the great 150 year old debate about the virtues of market capitalism *versus* socialism *versus* communitarianism *versus* dirigisme *versus* communism was dead. For the evidence of the 20th century made a convincing case that market capitalism alone could provide the rising living standards and economic progress that today's global, internet-savvy populace increasingly expect to enjoy. Moreover, when such expectations are disappointed, governments tend to fall, and politicians now know this.

Claims for the superiority of market capitalism were further strengthened by the discovery of the phenomenon now known as "the resource curse." Specifically, everyone noted that the greatest growth in wealth and living standards had occurred in resource-poor states like Hong Kong, Singapore, Taiwan, and even Japan. Conversely, many resource-rich OPEC oil states had fared quite badly for the simple reason that they squandered their newfound wealth.

Yet if this consensus view were true, why do we claim the conversion to market capitalism by almost everyone, almost everywhere, in recent years is a "conceit"? We do so firstly because of the reality that we are not all capitalists at all in any meaningful sense of that term. Indeed, the capitalism we embrace is bogus capitalism, deviating disturbingly from the set of preconditions

which define capitalism in the first place. This will be shown just below. Moreover, the *ways* in which economic regimes are deviating from the canons of true capitalism foretell a future of grave and largely unrecognized problems—indeed catastrophes. Ironically, these problems would not, in fact, blight our future had we all become true capitalists.

A second reason why we deem today's philosophical status quo a conceit is the degree to which economists, columnists, and politicians who should know better have accepted bogus capitalism as true capitalism. Because of this widespread confusion, the quality of their analyses of such issues as "energy policy," "currency strategy," "protectionism," "financial reforms," "inequality of wealth and income," and "global imbalances" is most unsatisfactory—at least in our opinion.

> *To conclude, we advance in this essay the case that our unwitting acceptance of bogus capitalism as true capitalism is the genuine Black Swan on today's horizon. Given the failure of most commentators to discern the existence of this confusion, the probability of its occurrence is deemed very low by most people. Moreover, its impact will be very significant, given the catastrophes it portends. Thus, the concept of bogus capitalism passes the two tests required for a swan to be black.*

In Section 2, we define "true capitalism" and contrast it with what is being practiced today. In Sections 3-6, we then apply this critical paradigm to the four central issues of global imbalances, of energy policy, of financial market deregulation, and of inequality of income. These case studies will link our theoretically-motivated concerns to serious problems in the real world.

2. True versus Bogus Capitalism

When Bill Clinton went to pursue his degree at Oxford as a Rhodes Scholar, he studied the traditional moral tripos known at PPE (moral philosophy, politics, and economics). There, he and his fellow Rhodes Scholars learned that market capitalism, as originally introduced by Adam Smith, was in fact an investigation into moral theory. Indeed, the ideas underlying Smith's *Wealth of Nations* of 1776 were rooted in his predecessor treatise *A Theory of Moral Sentiment*s of 1759. Accordingly, as economic theory developed during the next two centuries, emphasis was always put upon such morally pregnant concepts as non-wastefulness (now known as "efficiency"), distributional equity, stability, privacy (decisional and informational decentralization), and even the more abstract concept of the Public Good in Aristotle's sense.

In short, the links between capitalism, viewed as the study of optimal resource allocation systems and moral philosophy, were deep and abiding. It is easy to overlook this tradition when, in today's ideological environment, a belief in capitalism has morphed into a belief that "markets know best," that "the virtue of free markets is that they result in maximal efficiency," and that "the role of government should be as limited as possible." The idea that government should actively redistribute income (e.g., Ricardian side payments to those who inevitably lose from free trade) and should intervene to remedy a plethora of "market failures" (externalities such as pollution and excessive leverage) is acknowledged by most people who have studied and understood ECON 101. Nonetheless, it is acknowledged in an increasingly grudging manner—as

an agenda best left aside while we attend to the "true" agenda of capitalism—letting free markets augment the efficiency of the resource allocation process. This represents a complete misconception about the nature and justification of true capitalism, a philosophy in which government *and* businesses *and* consumers work hand in hand in the right way and under the constraints necessary to optimize the Public Good.

In short, an understanding of true capitalist theory entails an appreciation of the limited conditions under which the unfettered play of free markets is justified by its contribution to efficiency, equity, stability, and other aspects of the Public Good. As the late conservative economist Milton Friedman always pointed out, the theorems that make clear the conditions under which decentralized market behavior *does* promote the Public Good, are the same theorems that spell out the conditions under which such behavior does *not* do so.

In this vein, when we speak of true capitalism, we refer to the *set of condition*s under which the capitalist resource allocation system will allocate resources efficiently, equitably, etc., and in doing so will promote the Public Good. To summarize these conditions:

A. The Underlying Social and Political Preconditions: For free markets to function correctly, it is well known that the rule of law must prevail. In particular, citizens must enjoy sanctity of contracts, non-bribable judges, transparency in commercial relations, and the protection of intellectual property rights. Without such protections, crony capitalism prevails, and talk of "free markets" usually proves vacuous.

B. Economic and Market Preconditions for Decentralized Free Market Transactions to Maximize the Public Good in a World of Uncertainty about the Future: As students learn in their textbooks, the following five requirements must be met:

(i) Perfect competition—in particular the absence of any bargaining power by any group whatsoever whether cartels, labor unions, or oligopolies. This first assumption implies that product, capital, and labor markets must be fully deregulated. It implies in tandem that every individual producer and consumer "takes prices as given by the invisible hand" and has no ability to impact, much less manipulate prices of anything;

(ii) Risk aversion on the part of all consumers, or equivalently, diminishing marginal utility for goods;

(iii) Complete hedging markets—risk averse agents must be able to hedge every and any risk by creating appropriate portfolios of derivative securities;

(iv) Absence of non-market phenomena or "externalities" such as pollution, where the price system either fails to exist or else misallocates resources; and

(v) Diminishing returns to scale in most (but not all) industries.

C. Economic Preconditions Mandating Legitimate Government Intervention:

(i) Need to regulate business cycles and financial market crises via appropriate fiscal and monetary policies;
(ii) Need to redress market externalities (e.g., pollution) and to provide basic public goods (e.g., a legal system, a military, etc.); and
(iii) Need to address the issue of distributional justice, e.g., determining the optimal rate of progressivity of the tax code. [This axiom surprises many people who believe that pure capitalism focuses on economic efficiency, but not equity. This is false, as even Adam Smith understood. True capitalist theory requires that government confront the issue of fairness, and for highly important reasons reviewed in Section 3.D below.]

D. Extension of these Preconditions to the Case of Multiple Nations with Trade:

(i) The economies of every nation that trades with other nations must possess an economy meeting the above "domestic desiderata," *and additionally* all currencies must be market determined (except in times of crisis), and all capital accounts must be open and transparent. *This is the fundamental symmetry axiom across nations that defines "true global capitalism."* It gives meaning to the concept of "a level playing field" for trade. Without an understanding of these particular preconditions, it is impossible to make sense of today's global imbalances, of who is to blame for them, and of what should be done about them. It is very important to understand this last axiom up front, since a failure to understand it is why most discussions of global imbalances have turned into unconstructive blame games, and little more. To be fair, the axiom is not well known and is thus often overlooked.

Summary Definition of the Public Good: To recap, a world in which "we are now all true capitalists" is one in which all four of the above sets of conditions, **(A)** through **(D)**, are satisfied. Specifically, assuming that the rule of law is in place **(A)**, unfettered free market behavior should prevail within each nation if and only if preconditions **(B)** are met. Where they are not met, government must redress the failings of the free market with the appropriate remedies **(C)**. This includes dealing with, rather than dodging, the issue of the distribution of income. Finally, in the context of international economics and trade, the symmetry axiom of a level playing field for all must hold true **(D)**—and in particular, *all* currency values must be market determined (except in periods of crisis), and *all* capital accounts must be open and transparent.

Adherence to these sets of desiderata *by all trading nations* is what we mean in speaking of an idealized global economic order, or more abstractly the Global Public Good. This concept provides the yardstick by which we can assess how far we have deviated from the optimal, and by which we can know how to improve matters in a constructive manner. Be sure to note how far this ideal lies from presumptions that "capitalism" is about the unfettered play of free markets. It is not, and never was, even though the healthy functioning of markets is central to it.

3. The Four Case Studies

We have discussed each of the following four case studies (energy, leverage, global imbalances, and income inequality) from several different standpoints over the years. We shall probably continue to do so since each keeps bobbing up to the surface like a dead corpse. Below, however, we treat all four from a new and unified standpoint that asks: "To what extent are today's problems in each of these areas reflections of the fact that true capitalism fails to work?"

A. Energy

The Consensus Forecast During Past Years: It was eminently understandable that the consensus was caught off guard by the rapid rise in oil prices between 2003-2005. It was also understandable that many commentators attributed the price rise to tightening of production by OPEC, and/or to leveraged speculators (hedge funds) pushing the price way up, and/or to rapidly rising Chindian demand, and/or to the growing awareness that "oil is getting more difficult to find" as Shell CEO Jeroen van der Veer recently pointed out.

Finally, it was understandable that observers buying into these arguments expected that the oil price would by now have fallen back to somewhere between $25-$45 per barrel by now, well below its "bubble peak" of $70. After all, cartels always collapse, and price bubbles driven by leveraged speculation always burst. Moreover, Chindian demand growth was surely unsustainable (it has since increased). Finally, the "feedback effects" from the classical commodity cycle always kick in: Very high prices discourage demand, and encourage substitution and new exploration. The result is lower prices, after an appropriate lag. Indeed, the dynamics of precisely such cycles in the past gave rise to the widespread view that the five most dangerous words in resource economics are, "It's different this time around."

Yet if such consensus views might have been understandable in the past, how can they remain so today? Are people blind? What additional evidence will it take to convince people that we are in a completely new regime? After all, prices not only did not fall back, but surged higher and stayed far higher than expected—and for longer. Moreover, the copper price followed suit. This was surely a signal-on-stilts that things were different this time around since copper never before mimicked oil as it has this time. After all, there never was a copper cartel, and copper has never been decreed "difficult to find." So what in the world is afoot?

The reality is that everything really *is* different this time around, and what is truly dangerous is our failure to understand this. We at SED predicted that what has happened would happen in a series of essays commencing four years ago. We summarize in a footnote below the logic we set forth as to *how and why* everything was changing. Our analysis was centered around five structural changes that have since occurred. Of these, only two have yet to enter consensus views

notwithstanding all that has happened.[1] Herein, we simply wish to discuss the one structural change that is consistent with the thesis of this essay: namely, that the amount of new oil supply that should have been forthcoming in the past two years and would be forthcoming in the future were true capitalism in play is a *small fraction* of that amount. The reason is that true capitalism is no longer being allowed to work—either in oil, or in copper (and even in other cases).

The True Supply-Side Crisis: High prices no longer provide the necessary incentive for the major oil companies (working with the independents) to make those very long-term investments necessary to ensure future supplies. The IEA estimates that some $20 trillion must be invested in oil and gas during the next 15-20 years for supply to equal demand at reasonable prices. Yet the rate of investment has recently been just one tenth of that amount at an annualized rate, and private forecasts that we respect indicate little improvement to come in this rate. A very similar story is unfolding in the copper market, where not one single greenfield project is under way. Industry veterans say that at least four should be given past, present, and prospective market conditions.

What has happened, of course, is that capitalism is not being allowed to work for the first time—high prices notwithstanding. More specifically, the nations in which the most promising oil reserves are to be found are increasingly thugocratic. Few rational capitalist firms are thus willing to make those very long-run commitments for exploration and developments in such thugocracies as Russia, many central Asian states, Venezuela, Nigeria, Chad, the Sudan, and Ecuador to name a few. Yet very long-run investments are *exactly* what are called for in developing new sources of production (as opposed to marginally expanding declining old fields), and they were made for eight decades in the past. To restate this point, the incentive structure required for capitalism to deliver the goods that it has during the past eight decades has changed and is now pathological. Worse, levels of investment are hindered by yet another structural change: The need of large firms to invest huge sums to buy back shares to please short-term investors and/or to ward off takeovers.

[1] ***First***, on the demand side, there has been the ongoing explosion of demand from China and other newly emerging nations. This development *is* in the market. More generally, with aggregate global growth having nearly doubled, demand growth has been notable. ***Second***, on the supply side, we supported the "peak oil" view that output at most of the existing large oil fields would be lower than expected in the future, and would in fact, begin to decline. Such peaking is increasingly acknowledged to be taking place, as even the recent General Accounting Office study conceded. People who deny the peak oil hypothesis usually point to the large amount of "reserves" that exist. But this is, in fact, a red herring having nothing to do with peak oil. Old oil fields do and indeed must decline geologically and rapidly at the end. Happily, large new reserves do exist, but this is irrelevant to peaking *per se.* ***Third***, while large new oil reserves do exist (as in the case of gas and copper, as well), capitalism is not being let loose to identify and develop them. This is the main point to be discussed in the main text above. *Fourth*, there is the reality that alternative energy sources will emerge far too slowly to plug the energy gap. *Fifth*, both the supply and demand curves for energy are increasingly price inelastic (vertical). As we have shown both mathematically and diagrammatically, this development causes slight changes in supply/demand conditions to translate into *very* large changes in price. A failure to understand this phenomenon leads many investors to believe that conspiracies of some kind (e.g., hedge fund strategies) must underlie the unfathomable price changes of the past ten years, when oil increased from just under $10 to $75 per barrel.

Implicitly, therefore, global consumers must hope that today's ever more powerful state-owned "oil authorities" in developing nations will take over the former role of the Seven Sisters and the independents in identifying and developing large new oil fields. Regrettably, the evidence is that they are incapable of doing so. The reason, once again, is a pathological incentive structure. Indeed, consider how an exodus of talented engineers, along with black market theft of refinery equipment within Iran, has precipitated rioting in the streets during the past two months. Welcome to the future: Street riots within the nation with the second highest reserves in the world, due to the inability of citizens to obtain enough gas to fill up their cars! Even worse, this is occurring in a nation that is relatively stable and enlightened compared with, say, the Sudan or Nigeria. Why has this happened? Once again, the answer lies in the problematic incentive structure within the Iranian oil authority.

The Implications: Wars? The flip side of the failure of capitalism to function properly is the outright *politicization* of the energy market. Simply note the tactics China has been using to scour the world and cut reciprocal deals with thugs throughout Africa and Latin America to secure its own future supplies. Or recall the energy market tactics utilized by Russia to control neighboring central Asian states, and to influence Europe as well. Adam Smith would turn in his grave to think that pundits hail such developments as proof of "the advent of global capitalism."

What should the oil-consuming states do in the face of the polilticization of this all-important market? They must do the only thing they can do, namely play hardball in return: *They must adopt a rational bargaining strategy with appropriate threats if they are to obtain the energy supplies they will need for the future.* At present, most consuming nations have adopted no bargaining strategy at all, other than to oblige the Chinese, Russians, and Venezuelans at every turn.[2] In the next chapter, we will explain exactly what we mean by a rational bargaining strategy, and will demonstrate that the consuming nations hold trump cards that they could be utilizing, but are not. Additionally, consuming nations need immediate energy market reforms to curb consumption of fossil fuels, for purposes of national security more than to combat global warming. Hoping that fuel cells and ethanol will one day save the day is clearly not enough.[3]

Along with water, oil is perhaps the one commodity that could lead to a significant war between nations in the future. We have already witnessed how oil shortages wrecked the US and world economy *twice* in the decade of the 1970s. Our current blindness to the realities set forth above is

[2] To be sure, the oil market has often been politicized in the past. The formation and subsequent behavior of OPEC in the 1970s is a case in point. However, there never was a fundamental shortage of energy back then. The cartel simply reduced output for its own purposes. Moreover, game theory teaches us that cartels almost always collapse, and this happened to OPEC in the winter of 1986, when oil fell from $34 to $9 per barrel after Saudi Arabia discovered that fellow cartel member Iran was cheating on its quotas, and flooded the market with oil in retaliation. The story today is altogether different. The necessary oil is simply not being pumped, and in the future will not be barring those massive investments in exploration and development that we should have been making for the past five years. Even if a huge exploration and development programme were belatedly to be undertaken, the *cumulative* lack of investment in recent years will continue to haunt and hurt us.

[3] In this regard, a measure of the true magnitude of the US energy crisis is that the nation now imports 64% of its oil, and up to one third of that now comes from nations that are very anti-US. The supine US response to this reality has been to do nothing. Scarcely a complaint from anyone, much less a substantive policy other than the wimpy proposal that utilities substitute alternative energy sources for 15% of their fossil fuel consumption over time.

thus extremely worrisome. Most disturbing, perhaps, is the failure of almost every observer to identify the failure of capitalism as the most serious structural development of all. After all, it is capitalism that has brought the world the energy supplies it has needed for over a century. Even nay-sayers have always existed, claiming that "we are going to run out of oil." And just as in the past, only capitalism can secure our future.

Additionally, there is a widespread failure to realize the *cumulative effects* of ever-delayed investment in new oil fields. The impact of this cumulative shortfall gets magnified by the inelasticity of supply and demand, as was stressed in the lengthy footnote above. The result of all this could be a sequence of global crises in the future, and possibly wars.

Note: For those who may have forgotten, we have already identified the opportunities that these developments pose for investors in our essay, "Prospects for the Prices of Oil and Metals" appearing as Chapter IV in our September 2006 report.

B. Global Imbalances

The Chinese trade surplus with the world, reported for July 2007, rose 64% from its level a year earlier. Note that this is seven years after China "promised to curtail its surpluses significantly," five years after more strenuous such promises, and two years after it "generously" offered to begin to let the Yuan/Dollar rise. While it has indeed risen by about 8% against the dollar, the depreciation of the dollar implied that its trade-weighted value barely changed at all.

Let us be very clear about what is happening here. To begin with, were we in a regime of true global capitalism (recall axiom sets **(A)** and **(D)** in particular, to understand analytically how anti-capitalist China has proven), the Chinese currency in the past two decades would have risen by several hundred percent according to the modern theory of asset market equilibrium, as we have demonstrated in past reports. Yet it is currently *half* of what it was two decades ago—a point that seems to have been overlooked by virtually every commentator. Ironically, the same observers are now most concerned, lest the US (and other nations) become "protectionist" and inaugurate a trade war with a nation that itself launched a massive trade war against the West when it dramatically *devalued* its currency in the early 1990s, and then pegged it! One result of all this is that China now has $1.3 trillion dollars of foreign exchange reserves that are apparently growing at one million dollars per hour.

The blunt reality is that an ever growing number of nations are outraged by China's behavior, and are finally gearing up to do something about it. However, China is not the sole culprit here. Asian nations, as a whole, have been mercantilist for nearly four decades and have accumulated foreign exchange reserves of over $3 trillion. Japan, for its part, was particularly egregious as it has belatedly admitted. But as a close US ally in the Cold War, it could get away with its currency manipulation, its mercantilism, and its large trade surpluses.

Of course, today's global imbalances far transcend the issue of Asian trade surpluses. To begin with, there is the alleged "over-consumption" by the US that is always cited as the source of all imbalances. But what does this claim really add up to? *First*, the US can hardly be blamed for Asia's mercantilist policies. And these Asian trade surpluses partly explained the high consumption/low savings of the US as follows from National Income Accounting identities. *Second*, the US consumer did indeed consume more and save less than its counterparts in Europe and Japan—but why? Surely this imbalance was not due to Asian policies? No, it was not. Rather, this differential reflected the fact that the US grew much faster than the other two economies during the past fifteen years, and outperformed both in ways that boosted its growth rate of consumption and its trade deficit, and lowered its savings rate.

But why did the US outperform other nations during this era? The main reason is that with only 5% of the world's population, and 25% of global GDP, the nation walked off with 89% of the fruits of the Third Industrial Revolution. Conversely, Europe stagnated during a never-ending debate about the need to "deregulate its highly regulated factor markets" that McKinsey & Company's Global Institute revealed to be the principal source of Eurosclerosis. At the same time, Japan fell off the map, not because of its real estate bubble, but rather because the chickens came home to roost as a result of four decades of a misallocation of capital (e.g., the postal savings system and its corollary of crony capitalism).

What this all adds up to is that the US was not the principal miscreant on the global stage, and the sole source of global imbalances, as many wish to believe. True global capitalism (recall Axiom sets **(A)** and **(D)**) implies that every nation must possess fully deregulated and transparent factor markets. Thus, the reason that the US walked away with the fruits of the industrial revolution and thus grew faster lay largely in the failure of *other* countries to meet the criteria set forth in the introduction. This *asymmetry*, in turn, led not only to greater growth but also to an unexpected explosion of family net worth in the US, unmatched elsewhere. This wealth growth, in turn, led to a corresponding reduction in the need to save, according to the logic of Franco Modigliani's Life Cycle Savings Hypothesis.

To sum up, the people of the US became highly optimistic, let the growth of the value of their assets do their savings for them—and thus ended up saving less, and consuming more than others. To claim that all of this is the "fault" of the US is preposterous. The true fault lies in the growth-retarding policies of nations that failed to act in accord with the canons of true capitalism.

> *Enough! We have hopefully made the point that once again a major problem (global imbalances) stemmed largely from a failure of true capitalism to work symmetrically across the nations of the world. This is a radically different diagnosis of today's imbalances from others we know of. Yet our account is completely consistent both with economic theory and with the logic of the charter amendments to the World Trade Organization. Other accounts decidedly are not.*

C. Leverage and Today's Financial Crises

At this writing, this topic has suddenly become so important that it will be discussed on its own in Chapter IV. Briefly, there are two kinds of risk that bedevil financial markets. First, there is classical textbook "exogenous risk." This refers to the movement in asset prices that is caused by *and is in proportion to* the amount of exogenous "news" in the market at any given time. Then there is the tendency for markets to overshoot this fundamentally-based benchmark of volatility. This extra risk is now known as "endogenous risk" and it results from **(i)** correlated mistakes about the likelihood of news (as in most investors' failure to anticipate the magnitude of the subprime default crisis), **(ii)** the inability of agents to properly hedge such risk, **(iii)** the extent of leverage, and **(iv)** the degree of "Pricing Model Uncertainty." The latter refers to the degree to which investors do not and indeed, cannot predict the new price of an asset, even if they were to learn the "news" ahead of time. Total market volatility or risk is the sum of both exogenous and endogenous risk.

Now the way in which true capitalism has failed to work in this third case study becomes clear from the following chain of reasoning. To begin with, the magnitude of endogenous risk simply cannot be assessed. This being true, it *cannot* be correctly priced by the market and as a result, it cannot be optimally hedged. What this means is, quite simply, that endogenous risk is an "externality" or "market failure" calling for government supervision of some kind (recall Axiom set **(C)**). Our own view of this matter is that government should have as little involvement as possible with individual transactions within financial markets. However, given the role of leverage in exponentially amplifying endogenous risk, it must limit leverage when markets get too frothy.

This can be achieved by a fixed and transparent set of rules that let investors know in advance when and why leverage will become more limited. Government used to regulate leverage, as when the US Fed would increase the reserve requirement for the overall banking system, or when the authorities would raise the stock market margin requirement as during the "Nifty-Fifty" stock market bubble of the 1960s. But government no longer does so in today's extreme free market environment wherein whatever is good for Goldman Sachs, is deemed good for all.

The important point here is that, via Axiom set **(C)** above, true capitalism would have witnessed a curtailment of leverage both in the housing market by 2004 *and* in the issuance and trading of several new financial market securities. The market distress at this writing constitutes endogenous risk of a magnitude that would not exist were true capitalism in play. The same goes for the leverage structures in many developing world nations, where the problem is compounded by crony capitalist loans that are all too readily forgiven when they crater.

D. Distributional Equity

If one were to cite the single most significant driver of global politics during the past century—and the source of the rise of communism and socialism in particular—it would be the exploitable conviction of most Have-Nots that they were being taken advantage of by the Haves. Their

misconceived notions of how to rectify the situation culminated in the rise of communism and its ultimate collapse. This age-old redistributive impulse is far from dead. Indeed, the outcome of the next US presidential election will revolve as much around the recent stagnation of living standards of the bottom 60% of the American people, as around the fiasco in Iraq.

It is often forgotten, however, that the issue of distributional equity falls under the purview of economic theory, as much as under political and moral theory. Specifically, as was made clear in Axiom set **(C)**, true capitalist theory simply cannot sidestep this politically charged issue, despite the belief by most self-styled free-marketeers that it can. The issue usually takes the form of how progressive the income tax and inheritance tax rates ought to be. We now spell out the subtle relationship of this issue to true capitalism, and emphasize that the points we are making are Democrat-versus-Republican neutral when properly understood:

- *First*, some rate of tax code progressivity (including negative income taxes for the ill or the very poor) must be selected by government, and is, so in principle it ought to be the "correct" one. The issue simply cannot be dodged.
- *Second*, the Second Fundamental Theorem of Welfare Economics demonstrates that either a redistribution of endowments or equivalently, a progressive tax code, is completely compatible with the concepts of market price systems of economic efficiency, contrary to what is generally believed. [Recall that the two Arrow-Debreu theorems of Welfare Economics are the theorems that finally confirmed Adam Smith's faith in true capitalism.]
- *Third*, one role of a progressive tax codes is to compensate for the absence of those markets that make possible the level of optimal risk-sharing *required* by true capitalism for true economic efficiency to exist (recall Axiom **B. iii** above). Scholars such as Robert Shiller have estimated that over 90% of risk-hedging markets that *should* in principle, exist, do not exist.[4] As a result of the widespread lack of insurance transfers from the lucky to the unlucky, the *ex post* distribution of wealth and income in the real world is far more unequal and skewed towards the rich than it would be under true capitalism. A progressive tax code can be viewed as a *remedy* for this deficiency of real world capitalism, just as fines for polluting and the provision of the military are in a different vein.[5,6,7]
- *Fourth*, elementary ethical as well as economic considerations imply the need for progressivity of the tax code—issues of "missing insurance markets" and efficiency aside. Adam Smith himself was well aware of this moral dimension of economics, and abhorred highly unequal distributions of income and wealth. He was also opposed to the "uselessness" of people living off of unearned wealth. Virtually no one who cites Smith seems to be aware of these facts.

[4] Shiller, R.J., *Macro Markets*: *Creating Institutions for Managing Society's Largest Economic Risks*, Oxford University Press, 1993.
[5] Arrow, K.J., "The Role of Securities in the Optimal Allocation of Risk-Bearing", *Econometrie*, 1953.
[6] Brock, H.W., "Social Choice, Distributive Justice, and the Theory of Games with non-Linearly Transferable Utility", Ph.D. Dissertation, Princeton University, 1975.
[7] Zeckhauser, R.J., *Benefit Cost and Policy Analysis*, Chicago: Aldine Publishing Company, 1974.

Suffice it to say that, when Warren Buffet has to point out that the tax rate on his receptionist's income is nearly double that on his own, we in the US are falling embarrassingly short of the ideal postulated by capitalist theory. Regrettably, the US is not alone in this regard.

> *This concludes the discussion of four case studies in which the true explanation for the problems we are experiencing in today's global economy stem from a failure of all nations to symmetrically embrace true capitalism. Once this point is properly apprehended, completely new and different remedies are called for.*

E. Conclusion

This chapter has proposed the possibility that today's true Black Swan is the fact that many nations now talking the game of capitalism, have not in fact converted to true capitalism at all—*and that this point is not well understood.* Moreover, the ways in which national policies now deviate from the canons of true capitalism presage very serious problems in the near and far future: The energy market will become an unholy mess, when it need not be; global imbalances will continue to be misdiagnosed and little will be done about them, when much could be done; excessive leverage will continue to create financial crises, when such crises could be successfully mitigated in the interests of all; and issues of fairness now being sidestepped will probably become politically explosive, whereas they could be suitably redressed.

But the situation is in fact worse than these comments alone suggest. That is because by their very nature, once imbalances and distortions of capitalism of this kind become embedded in the system, they tend to endure and indeed, to become worse over time. For absent the "spankings" that truly capitalists markets award all of us every Tuesday and Thursday afternoon, the more the underlying plaque builds up. Things get ever worse until the day of reckoning finally arrives.

Japan's misallocation of capital for nearly forty years ultimately brought the nation down for fifteen years. No one had dreamed that this might happen. The constipation of Europe's factor markets became an entrenched way of life, and it has taken two decades of wrenching changes to partially resolve problems that, under true capitalism, would never have needed to be resolved. In precisely the same manner, China's current misallocation of capital and labor will eventually cost it dearly.

What is frightening is how long the frog can be parboiled before it dies. We are reminded of Mancur Olson's brilliant explanation in his 1982 *Rise and Decline of Nations* why great nations inevitably collapse: Pathological status quos become embedded in the culture, as do those entrenched groups of players who end up benefiting from their continuance. This prolongs and exacerbates the underlying problems so that, when the day of reckoning arrives, it is too late. Under true capitalism, the nature of the system prevents the underlying imbalances from arising in the first place. For by the axioms of the rule of law, zero bargaining power, transparency, and symmetry, the troublesome special interests groups preying upon the imbalances cannot arise in the first place.

CHAPTER III: RES POLITICA *versus* RES ECONOMICA
– Why Economics Must Yield to Politics as the Paradigm of Tomorrow –

> ***Author's Note:*** *This is a very personal essay in which ideas that I have long entertained have finally bubbled to the surface, been clarified, and are now ready for discussion for the first time. I hope readers find this to be one of the most unusual and significant contributions to these pages in many years. The subject is both deep and timely.*

A. Economics Imperialism and its Origins

The phrase "economics imperialism" has circulated for nearly three decades. It refers to the reality that, of all the social sciences, economics has emerged as the most relevant, most useful, and most rigorous discipline. Its perspective on social behavior and its analytic methods have invaded every facet of sociology, political science, and social psychology. The success of such books as "Freakonomics" is proof of precisely this point, as has been trumpeted by its author Steven Levitt. Finally, if any further proof of economics hegemony is needed, just consider the surging enrollments in economics and finance courses at major universities worldwide, a surge that is well known to have caught university administrators off guard.

The same phenomenon is true in public policy analysis. There was a time when the cabinet of the US president was dominated by lawyers, or political scientists and theorists, but that is no longer the case. We are living in an age when economists such as Martin Feldstein or Lawrence Summers or Alan Greenspan dominate policy discussions. With their well-honed analytical skills (lacking in other fields), they sound off with credibility on any number of topics, and often have the last word.

There are four reasons why all this has happened. *First,* the discipline of economics is indeed highly analytical and rigorous, and this imparts credibility to it. It can explain phenomena, and also (to some extent) abet forecasting the future.

Second, the analytics of economics are not mere abstractions, but are transformed into testable models via the linkage between economics and econometrics. In an age when the "objectivity" of analysis is prized (and indeed required by the press), it sure helps a policy maker to trot out extensive statistical back-up for his case. The fact that most people confronting econometric evidence have no way of knowing whether the underlying statistical methodology is valid does not change this reality.

Third, economics was the first discipline to put central emphasis on the concept of "incentives." When they make decisions, consumers, producers, and investors respond to given incentives. This point is extremely important for two reasons: **(i)** the concept of "incentive structure compatibility" is arguably the most important concept ever set forth in the history of analytical

social science; and **(ii)** incentives can be changed by government policy. This second point has permitted economics to be linked to public policy in a very compelling manner: By knowing the consequences of changing incentives, a politician can much better predict the outcome of a change in policy, and thus identify a better policy.

Fourth, beginning students of economics are presented with a timeless and powerful analytical model that is as compelling to economics as is the Law of Gravity to physics: The Law of Supply and Demand. Imagine economics without this model! Moreover, no matter how far students progress in their studies, they never deviate far from the model of market equilibration via the price system.

The Contrasting Failure of Political Science: Now contrast this plethora of selling points to the dismal state of political science today. To begin with, there is no organizing paradigm or "model" of any kind. The field is often described as "mush". At its best, the discipline serves up rules of thumb about alternative voting procedures and their relative desirability. Issues of incentives and incentive structure incompatibility are suppressed, even though they are as important in politics as in economics. Worse yet, the fundamental paradigm of politics is largely side-stepped, namely "Politics: Who gets What, When, How," as set forth in 1935 by Harold Laswell. That is, the all-important paradigm of *politics as multilateral bargaining between interest groups* is absent from the pages of most political science textbooks.

For reasons we are about to see, these deficiencies of contemporary political science must be remedied. In particular, we need a hard-core analytical model as compelling to *Res Politica* as the Law of Supply and Demand is to *Res Economica.*

B. Why the Paradigm of Economics No Longer Suffices

It is time to take a leaf from Aristotle, who correctly recognized that political science is the master discipline—*not economics.* Here are several reasons why:

First, by reviewing the meaning of "true capitalism" as set forth in axiom sets **(A)** through **(D)** in Chapter II above, it is clear that our cherished paradigm of free market economics is completely dependent upon the assumptions of the rule of law, of unbribable judges, of sanctity of contract, and of transparency (recall axiom set **(A)**). Put bluntly: Proper political institutions are a *necessary* condition for the virtues of a free market system to deliver the outcome society wants. They come first. They are not an after-thought.

Second, as axioms sets **(C)** and **(D)** made clear, the ability of a free market capitalist system to deliver the goods requires much more than the basic institutional set-up just described. Specifically, whenever issues of "public goods," "externalities," or "imperfect competition" arise, impacted interest groups must determine via *multilateral bargaining* exactly what gets provided, and who is to pay how much of the bill in the process. Moreover, in a global context, issues of how to cope with misaligned currencies, vast trade deficits, and theft of intellectual

property rights will only be resolved politically via *multilateral bargaining* between myriad interest groups. This is part and parcel of a well-functioning capitalist system.

Third, as was also argued in Chapter II, we are living in a world where the price, quantity, and allocation of important commodities like oil were once determined by a free market. But they no longer are. Recall our discussion of the ongoing and dangerous "politicization" of the oil, gas, copper, and other markets. We did not even mention the increasingly relevant case of *multilateral bargaining* over "intellectual property rights."

Fourth and more broadly, most of the important issues that could stymie future world growth and precipitate war remain quintessentially political in nature. For starters: Who gets how much water at what price? Who will pay how much for dealing with global warming? How much will tomorrow's youth be taxed to pay for the elderly? Which nations will be "allowed" to go nuclear? And how will the rival claims of the Middle East eventually get sorted out?

In short, our future depends upon success in politics—that is, in the quality of future "governance" to utilize a preferable term. But what do we mean by "success in governance?" Is there a yardstick equivalent in politics to "resource allocation efficiency" in economics? More broadly, is there an organizing paradigm or model that could prove as useful to *res politica* in the future as the Law of Supply and Demand has proven useful to *res economica* in the past? Happily, there is. Yet this model is completely unknown to most political scientists and philosophers. This must change.

C. The Possibility of the Hegemony of Political Science – The Nash-Harsanyi-Selten Pluralistic Bargaining Model –

The model in question is known as the Nash-Harsanyi-Selten (NHS) model of multilateral bargaining. It is one of the accomplishments that earned all three game theorists the only triple Nobel Prize awarded in economics (1994). Moreover, this model is one of the analytical marvels in the history of analytical science, and indeed of all science.[1] Before its development during the period of 1950–1965, concepts like "democratic pluralism," "bargaining equilibrium," "balance of power," and "power" itself were problematically elastic concepts that lacked precise meaning. Additionally, without this model, the notion of relative bargaining ability could not be defined. For absent a model predicting an optimal bargaining equilibrium between symmetrically rational players, the degree to which one player bargained *better* than another could not be determined. By extension, it is impossible to assess the relative competence of different governments in striking bargains on behalf of their citizens without such a model.

The Building Blocks of the Model: The building blocks of the logic are starkly simple: **(i)** a set of **n** individual players; **(ii)** the set of $\mathbf{2^n}$–2 possible (non-empty) coalitions that could form and

[1] The fundamental paper in this regard is "A Simplified Bargaining Model for the **n**-Person Cooperative Game," by John C. Harsanyi, *International Economic Review*, 4, pp. 194-220, 1963. This paper synthesizes and unifies the different theories of Nash, Selten, and Shapley into a coherent whole.

oppose one another (e.g., the environmentalist lobby versus the lumber industry); **(iii)** the set of all **n(n-1)** possible pairs of players that could come face to face with each other in any number of coalitions that might include them both; and **(iv)** the different resources of each individual player and each coalition—including resources each could use to threaten the others.

The Bargaining Logic Utilized to Arrive at a Rational Compromise: In Stage 1 of the two-stage bargaining game, the various coalitions form and determine their best threat strategies to be utilized against their complementary coalitions in the event that no compromise ends up being reached, and the players fall back on playing their threat strategies (e.g., labor goes out on strike and/or management eliminates their jobs). In Stage 2, the all-player coalition of all **n** members forms, and its members determine how to allocate the gains to each player (above *his threat payoff*)that mutual cooperation makes possible.

The basic point is that, since everyone (with suitable side-payments) can end up better off by compromising rather than receiving their non-cooperative threat payoff, they have an *incentive* to reach a compromise. This is, of course, the hallmark of all social life as we know it. In the NHS model, the compromise that rational players arrive at will be that agreement that equalizes the "risk limits" of every player. The interested reader is referred to a footnote that explains this remarkable result in more depth.[2]

Market-based economic exchange is a very simple form of a bargaining game in which a consumer's only threat strategy is simply not to buy a given product at the price offered. In true political contexts, threats must be determined on the basis of how much damage a given coalition **S** (or single player) can do to its opposing coalition **R** *net of the cost to itself* **S** from carrying out its threat—relative to the damage the opposing coalition **R** can do to it **S** *net of the cost to itself* **R** from carrying out *its* threat. The logic is subtle: *What matters is relative threat power*.

The Remarkable Power of this Framework: There are four ways in which the NHS model is extremely powerful:

1. It Offers a Simple *Graphical* Representation of Politics: As stressed above, political science will never be a "science," much less a successor to economics as a dominant paradigm without an intuitively appealing graphical model, such as that of intersecting supply and demand curves in economics. Happily, there does exist an analogous diagrammatic representation of bargaining. It is shown in the Appendix to this essay below, and it is also discussed both verbally and graphically in a new "On Demand" lecture by the author himself. This can be found by logging in to our website www.SEDinc.com, and then clicking on "Politics as Bargaining: The NHS Model" under our "Lectures On-Demand" option.

[2] During the process of bargaining, each player starts off demanding more than he knows he will end up getting. As the game goes on, each player thus makes compromises so as to reduce the risk that others players say, "Screw you—we shall play our threat strategy against you!" Where does this process stop? What is the "sticking point" beyond which rational players will *not* make further concessions? It occurs at the point when the utility losses from making a further concession exactly equal the utility value of the reduction in risk, resulting from making a further concession. [Mathematically, this point happens to be the outcome with the property that it *maximizes the arithmetic product of the utility gains* of the players above their threat payoffs. The product—not the sum!]

2. It Incorporates the Right Mix of "Cooperative" and "Non-Cooperative" Game Theory: In searching for the right paradigm with which to make sense of strategic interaction, game theorists during past decades believed that they needed to choose between two very different kinds of games: non-cooperative versus cooperative games. In the former case, emphasis is placed on the requirement that every player *individually* adopts a strategy that is optimal against every other individual's strategy. This requirement must hold symmetrically for every player. Moreover, there are no coalitions in non-cooperative games.

In this paradigm, cooperation between people of the kind that arises in multi-lateral bargaining is oddly absent. The best, and indeed most celebrated, example of such a game is the Prisoner's Dilemma in which, since neither prisoner can get together with the other and make a binding agreement not to tattle on the other, no gains from cooperation are possible. In this pathological case, the solution of the game (the non-cooperative Nash equilibrium) is for each prisoner in isolation to tattle on the other. The result: Each serves a much longer term in prison than would have been the case could they have communicated and agreed not to tattle.

Regrettably, this *non*-cooperative paradigm has dominated game theory for the past two decades. Previously, the cooperative paradigm had been dominant. In this latter case, the perspective is one in which players enter into groups for the purposes of adopting coordinated strategies that end up leaving everyone better off. In other words, they utilize outright bargaining to arrive at an optimal division of the spoils resulting from cooperation. Cooperation is central. The problem with most of these models was that they gave no play to the phenomenon whereby players adopt credible threats against one another as a *prelude* to the "final settlement." In short, if classical non-cooperative game theory suffered from ignoring the gains from cooperation, classical cooperative theory failed to incorporate the non-cooperative aspects of human relations (threat-making in particular) in a proper manner.

It is one of the great virtues of the NHS model that it fully integrates *both* aspects of politics into a coherent model: The non-cooperative posturing ("If I don't get my way, I'll see that you pay dearly") is integrated with the cooperative process of arriving at a final distribution of the proceeds from cooperation. It was John Harsanyi, who in 1963 provided a complete unification along these lines in games with **n>2** players, and demonstrated mathematically how the two principal dimensions of bargaining (the threat game *versus* the cooperative game) are logically interdependent: One cannot be solved without solving the other.[3]

3. It Provides of a Yardstick for Measuring Bargaining Ability and thus Political Competence: As we suggested above, in the absence of a compelling definition of a rational bargaining outcome, it is difficult to say whether a given party bargained "competently" or "incompetently." By extension, with no yardstick in hand, there can be little accountability by government to its citizenry regarding the quality of bargains it strikes, whether implicitly or explicitly. Happily, the NHS model provides precisely the missing yardstick. We will

[3] Specifically, the equations characterizing the bargaining equilibrium are a set of simultaneous non-linear equations, as is true of the general model of supply and demand in economics (general equilibrium theory), and in many models within physics and biology.

demonstrate this qualitatively in Section D just below where we apply bargaining logic to the difficult problem of negotiating with China.

4. It Offers a Unifying Framework for the *Moral Tripos* of Politics, Economics, and Ethics: We have already cited several of the reasons for the primacy of politics over economics (e.g., the importance of the rule of law as a precursor of market economies, as well as the bargaining that arises in dealing with market externalities, with public goods, with imperfect competition, and with trade and currency values). But when the NHS perspective is introduced, the potential hegemony of politics far transcends these issues of economics.

The physicist Mendel Sachs has recently shown that there is a single truly unified field theory in physics from which *all* manifestations of matter (quantum phenomena, gravity, and electro-magnetism) can be derived—just as Einstein always predicted would be the case.[4] Analogously, and remarkably, it turns out that the NHS bargaining model can provide a unified framework for several disciplines within social science. In particular, the model can be "extended" in many different directions to re-derive the most serious theories now existing of interest group politics *and* of unbiased political representation *and* of perfectly competitive market economies *and* of the moral philosophical theory of Distributive Justice ("To Each according to His Contribution" *and* "To Each According to his Needs" can both be derived from the NHS model).

D. An Application of the NHS Bargaining Model – Case Study of How to Redress China's Role in Global Imbalances –

As a case study of the usefulness of an NHS bargaining perspective to applied public policy, let us revisit the "global imbalances" crisis discussed in our essay "Today's True Black Swan," appearing as Chapter II above. [Please refer to Part 3.D of that essay, in particular.]

The Consensus: In recent years and especially during recent months, the economics establishment has come down hard against those who believe it is time to retaliate against China—a view increasingly proposed by Democratic legislators and candidates for the US presidency. Whether it be Paul Krugman, Martin Wolf, David Hale, the editors of the *New York Times* or the *Wall Street Journal* or the *Financial Times*, the consensus of the intelligentsia is: "Neither the US nor the West, more broadly, should fall for the populist trap of protectionism. China needs time to develop, and must be encouraged to undertake a gradual approach to currency revaluation and reform in general."

Other commentators go further and suggest that *both* parties are gaining from today's status quo: "The US obtains cheap financing of its current account deficit, as well as products whose low Wal-Mart prices have kept inflation in check, whereas China obtains the huge market that it needs for its export machine." This seductive argument runs afoul of the "no Free Lunch" theorem in economics. In the present case, this translates into the reality that the US will end up

[4] Sachs, M. *Quantum Mechanics and Gravity*, Springer Verlag, 2004.

$3 trillion in debt to China for all these goodies—a debt we will pass on to our children, in addition to trillions of domestic debt.

The Fallacious Reasoning Underlying the Consensus: Given China's clearly undervalued currency and skyrocketing global trade surplus, what is the origin of the view that we must not fall prey to protectionism? Its origin is very interesting, and is central to the change of paradigm that we are proposing in this essay. The principal justification of the consensus is that, should we retaliate against Chinese policies via the imposition of tariffs, a trade war would result. For example, as a lead *New York Times* editorial of August 13 stated: "We have consistently argued against such punitive legislation, which could harm America's economy by unleashing a trade war."

An Alternative and More Constructive Perspective: But is this, in fact, the case? *Need* US legislation unleash a trade war? The answer to both questions is "No," once a proper bargaining perspective is adopted. More specifically, today's consensus is based upon the widespread assumption that resolving trade frictions constitutes a *non-cooperative* game. The logic that, if we do anything to upset China, they should and will retaliate, is taken from the logic of non-cooperative games like the Prisoner's Dilemma. But this is not the correct logic, especially since the very concept of economic exchange is *cooperative* in nature. When I sell to you and you buy from me, we must both be gaining or else the trade would not have occurred. Thus, we need to adopt a cooperative game perspective—but one in which the role of mutual threats and recriminations assume their proper toll. This is exactly where the NHS perspective rises to the fore.

Here is what this perspective says regarding bargaining with China at present:

First, recognize that the concept of retaliation as being "protectionist" is nonsensical when China (and Asia, more broadly) admits to having been mercantilist for decades. We reiterate a point made in previous reports: Under true capitalism, there could not exist a $1.3 trillion cumulative US trade deficit with China, much less a cumulative $3.2 trillion deficit with Asia as a whole. For under *true* capitalism (no mercantilism, open capital accounts, transparency, and market determined currencies), these figures would be in the realm of $0 as an average. Thus, for the victims of mercantilism to eventually rise up and protect themselves is not "protectionist" in any meaningful sense. Rather, it is a rational response to their victimization over decades.

Second, understand that the wrong response would be a piecemeal implementation of specific industry-by-industry tariffs on a nation-by-nation basis. Regrettably, this is the uncoordinated strategy that is now being adopted.

Third, implement the right strategy as dictated by the logic of true multilateral bargaining theory. This would be a coalitional strategy implemented by *all* nations victimized by Asian mercantilism—a strategy taking proper advantage of all their coalitional muscle and threat power. More specifically, China (and certain other nations) should be told:

"We want you in the World Trade Organization (WTO). We welcome your economic ascendancy and the opportunity to trade with you. We are not going to offend you by imposing willy nilly tariffs on a case-by-case basis. However, you promised seven years ago that you would curtail trade in stolen goods and patents, yet your export of these has more than doubled since 2002. You also promised to open your capital account and deregulate your financial system, but progress has been extremely slow. Finally, you agreed that your trade deficit would be curtailed (primarily through a significant appreciation of the Yuan), but on a trade-weighted basis, the Yuan has not risen, and your trade surplus has mushroomed. This state of affairs cannot and will not go on."

"While we are not going to retaliate tomorrow morning on a case-by-case basis, we are, as a group of nations that uphold the covenants of the WTO, now going to insist that as regards intellectual property rights and counterfeit goods, you have two years to achieve a ___% reduction; as regards your closed financial system, you have three years to implement policies A, B, and C respectively; and as regards your trade surplus and your undervalued currency, you have five years in which to achieve a ___% reduction in your surplus with us, and five years to bring about a ___% increase in the trade-weighted value of the Yuan."

"Should you continue to stonewall such reforms, then in two years, *all of us* will impose a 35% quota on all goods we buy from you. In four years, this will rise to 70%. And in five years it will rise to 100%. This is not an idle threat. We are joined in common purpose here to help you *and* to redress our own problems. If you do not cooperate and refuse to change, the impact of our joint strategy will be to reduce your growth rate from 9% to an estimated 5%—a growth rate that will put tens of millions of your workers out of work, create social instability, and threaten your entire banking system. Please join us in working out this problem so that we might all come out ahead. We have no desire to damage your economy. However, history makes all too clear that, the longer these excesses and imbalances go on, the worse the ultimate denouement for all. Today's status quo must thus end."

Providing Political Cover to the Chinese Government: Note how this strategy is deliberately sympathetic to the position of the government of China. After all, just as is true in the States, the government of China *itself* is beholden to special interest groups and is thus quite weak. That is why a coordinated strategy by *all* of China's trade victims, giving China several years to comply, is essential. It offers the government of China political cover to persuade their internal interest groups that, "This time, the West means business, and their threat is both powerful and credible. We have to give them part of what they want." Note how different the strategy we have outlined is from that which is now likely to be implemented—a piecemeal tariff by one industry in September, another in November, etc. Each will invite a minor retaliation by China—a "tit for tat" strategy of the kind analyzed in *non*-cooperative game theory, precisely the wrong model to use in this essentially cooperative context.

China's Counter-Threat: Game theory, like relativity theory in physics, is based upon symmetry: *The views of both sides must symmetrically enter the picture.* How should China respond to the above strategy by its trade partners? To begin with, the government of China will not welcome this message, and will issue counter-threats, just as it did during the week of August 6, 2007. Xia Bin, head of financial research at a key government think tank, said that China should use its gargantuan holdings of foreign exchange reserves in US treasuries as a "bargaining

chip" (his words) in bilateral negotiations with the US. Then, He Fan of the Chinese Academy of Social Sciences, writing in *The China Daily* on August 9, warned that China may (for political reasons) be forced to sell large holdings of dollars leading to a mass depreciation of the US dollar.

But is this threat credible? This is the question that John Nash, Jr. taught us to address back in 1953 by analyzing the *relative* threat power of both sides, and then identifying the unique "mutually optimal and credible threat strategies between the players" that he proved will always exist. In the present case study, for China to dump US securities would indeed precipitate a large drop in the dollar. Yet Chinese ministers have told this author privately, "We have been, and will hopefully continue to be, semi-pegged to the dollar…If we were to cause the dollar to tank, then our currency relative to those of many of our *other* trading partners (e.g., all of Europe) would *fall*, further infuriating them against us. This is hardly an outcome we would welcome." But above and beyond this point, the threat of the West to drive down China's growth rate would indeed imperil the nation's banking system—and this is a very powerful and credible threat indeed against China. *And they know this.*

Now, consider the price paid by the coalition of nations that might end up imposing significant tariffs on China to force it to adhere to WTO conventions. Yes, their domestic inflation rate would rise a bit as Chinese imports would be more expensive and/or less available. Yet on the other hand, domestic production of certain goods would increase, thus stimulating the growth rate of the economies involved. To restate this more analytically, the resulting reduction in their trade deficit with China would be offset by a corresponding increase in their GDP growth, via the elementary relationships of National Income Accounting.

Judging the Quality and Competence of Bargaining: Given these numerous observations, made possible by applying the NHS perspective to this textbook case of dealing with China, we are forced to ask how the Establishment has adopted the supine position that it has, namely "Don't rock the boat…Give China time…Don't start a tit-for-tat trade war by taking action…And don't irritate China—it can sell its dollar assets and cause the dollar to collapse!" *The answer is that most observers think incorrectly about the nature of bargaining.* They think at best in terms of the non-cooperative model, and at worse they do not think at all. The NHS model is the correct model and prescribes a set of strategies *diametrically opposite* to those we have implicitly adopted.

Regrettably, it is the Chinese who do understand the logic of bargaining, and they exploit it brilliantly. So does Putin, who has exploited it brilliantly in his craven dealings with nations dependent upon Russian gas. All of this is to say that the West is the classic frog being unwittingly parboiled to death by incompetent governance. Bluntly, our politicians should receive a very low score on their "bargaining competence test."

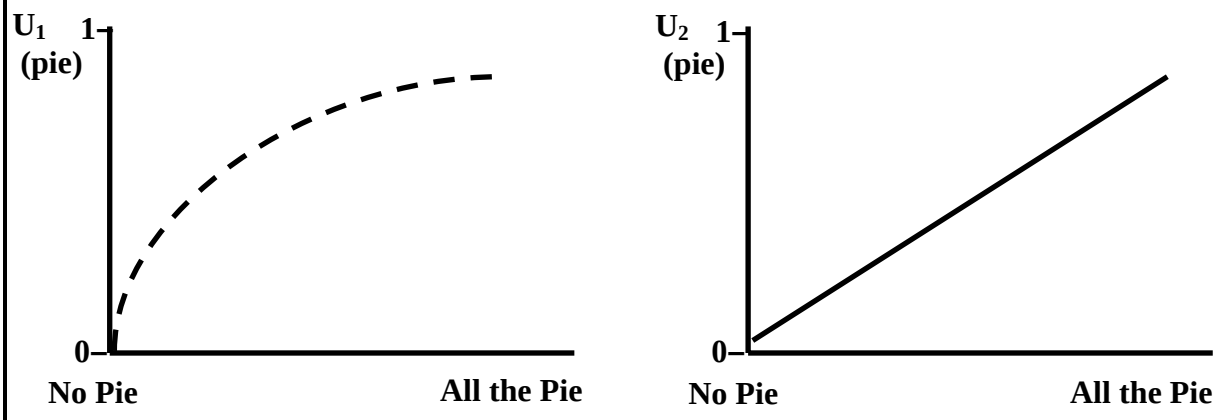
> *Yet absent the fundamental shift in paradigm proposed in this essay, there can be no yardstick with which to hold governments responsible for such a squandering of our future.*

APPENDIX
– A Diagrammatic Representation of the NHS Model –

In this Appendix, we set forth the basic logic of the bargaining problem as conceived by Nash, Harsanyi, and Selten. We refer the reader interested in a verbal lecture with further analytical slides to log-on to our website www.SEDinc.com, and click on the title "Politics as Bargaining: The NHS Model" under our "Lectures On-Demand."

The purpose of this brief Appendix is to show that, just as any beginning student of economic learns about supply and demand curves, and how their "intersection" yields market-clearing prices and quantities of commodities, any beginning student in political science can and should learn the elementary graphical model that is set forth below. Indeed, this should provide the basis for a serious new course in what used to be called "civics."

FIGURE 1: TWO UTILITY FUNCTIONS



Source: SED

The Example

– Simple Two-Person "Pie Division" Case with No Optimal Threat Selection –

This is the simplest of all cases. Two players must determine how to divide a pie by noon tomorrow. If they do *not* reach an agreement, then both leave the table empty handed. Determining the disagreement payoff in this simple case does not entail any selection of optimal threats as it does in the general case. Rather, it is simply the "no agreement = no pie" payoff.

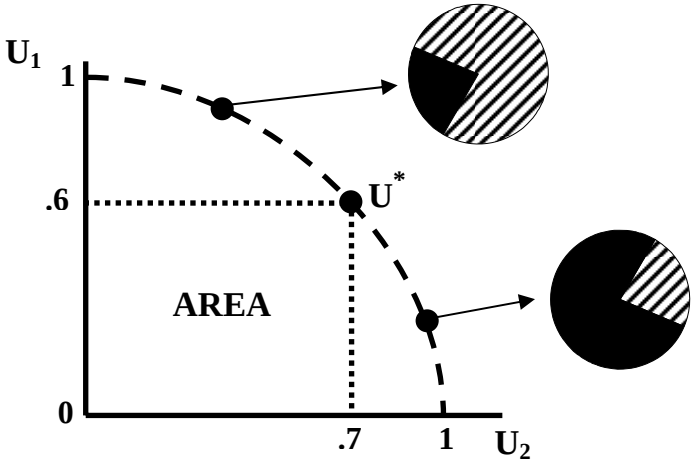
The Two Utility Curves: We start off with the concept of each player's preferences for all possible allocations of pie, that is, their "utility functions" for pie. These preferences are shown in Figure 1. By convention, a utility score of 0 is assigned to each player for the worst outcome

(no pie), and a score of 1 is assigned to the best outcome (all the pie). The numbers in between 0 and 1 are determined by an assessment procedure well-known in economics (this is described in the on-demand lecture). Basically, the more curved ("concave") a player's utility function is, the more utility he attaches to the first piece of pie compared to the second, and the more he attaches to the second than the third, etc. This is the property of "declining marginal utility for pie." In Figure 1, we show a traditional curve of this kind for player 1, and contrast it with the straight line constant marginal utility curve for player 2.[5]

The "Prospect Space" of the Bargaining Game: Figure 2 then plots the two utility payoffs corresponding to *all* possible divisions of the pie. This set of all possible payoffs constitutes the curved "utility frontier" or boundary in the figure. The diagram is self explanatory: For any possible pie division, such as ¼ of the pie for player 1 and ¾ for player 2, just read off the corresponding utility payoffs to each from their respective utility curves shown in Figure 1. This doublet of utility payoffs then gets plotted as *one* point on the boundary, as in the two pictorial examples shown. The entire frontier is constructed in this manner, with any possible division of the pie corresponding to exactly one point on the frontier.

FIGURE 2: WHO GETS HOW MUCH PIE

The solution is the point **U*** that maximizes the *area* shown below



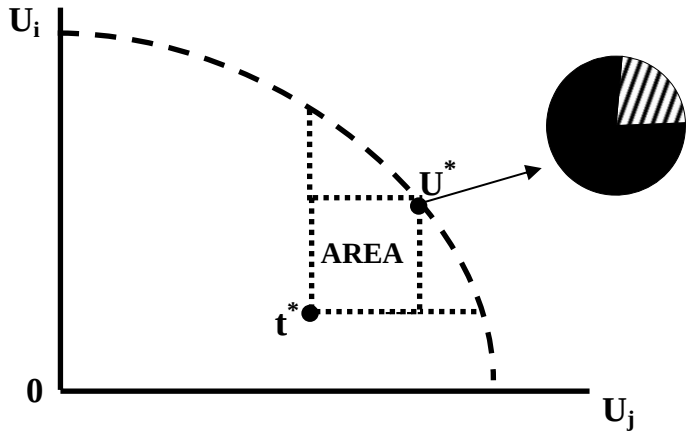
Source: SED

[5] Interestingly, the degree of concavity of these curves can be interpreted in a manner completely different from that of the degree of decreasing marginal utility of a player. The alternative interpretation is that of the degree of the player's relative risk aversion. The more concave the function is, the more risk averse the player is. A straight line utility function represents the limiting case of zero risk aversion, or "risk neutrality."

The Solution—Who Gets How Much Pie: The NHS solution is astonishingly simple, even if the logic underlying it is very subtle. If both players are equally rational, then they will end up dividing the pie such that the arithmetic product of the two associated utility payoffs is maximized. Note: Not the sum, but the product! In the example of Figure 2, the solution is the pie division (not shown) generating the payoff doublet **U* = (.6, .7)**. To see visually that this particular point on the frontier maximizes the product of the utilities, *note that its coordinates define the box with the largest possible area within the prospect space*. More intuitively, this turns out to be the particular division of the pie at which each player's "risk limits" are equalized in the process of mutual concession-making central to bargaining. It is the point where it becomes irrational for any player to make a further concession to the other, for the reasons described in Footnote 1 above. Intuitively, the player with the more concave (curved) utility function gets less, because he is "more needy" (or equivalently "more risk averse") and thus gets bargained down by his opponent.[6]

Extension to n>2 Players, with Optimal Threat Selection: As described in the main essay above, there are generally two stages in a bargaining game, whether with two players or more. In Stage 1, the players determine their optimal threat strategies against one another. Then in Stage 2, they attempt to reach a compromise from which everyone does better than by playing their threats. Figure 3 sketches this fully general solution, and demonstrates how it is a straightforward extension of the simple case shown above.

FIGURE 3: SOLUTION TO THE GENERAL CASE



Source: SED

[6] The mathematical equivalence of "relative risk averseness" and "relative neediness" was proven by the author. See "To Each According to His Needs: An Axiomatic Characterization," appearing in *Studies in Economic Theory*, Volume 18, Edited by C. D. Aliprantis, Kenneth J Arrow, and Peter Hammond, Springer Verlag, 2004.

Once again, we always let 0 denote the utility payoff to every player from the worst possible outcome, and 1 the payoff for the best. Note here that players 1 and 2 have been replaced by players **i** and **j** to make the point that this is an **n>2** person game. The point **t*** is known as the "net threat payoff vector." Its coordinates, projected onto each of the **n** utility axes, represent the utility payoff to each player if and when all coalitions play their threats against one another—threats that must be determined according to the Stage 1 logic of relative threat power summarized in the text.

Then in Stage 2 of the game, all **n** players determine how to reach a compromise relative to this lurking threat payoff. In doing so, they arrive at the solution that maximizes the product of the utility gains for each player *above and beyond his threat payoff,* i.e.,

$$\textbf{(1)} \qquad \textbf{MAX} \prod_{\mathbf{i=1}}^{\mathbf{n}} (U_i - t^*_i)$$

Thus the logic of the simple two-person pie division carries right over to the complex case, the principal modification being the need to determine the "reference point" (the threat payoffs) that "orients" the Stage 2 bargaining game. All this should be clear from Figure 3. It should also be clear that, *the further to the right the threat payoff is,* the more pie the game will award to player **j**. To conclude, a given player will do better than another player if **(i)** he is less risk averse, and **(ii)** he has greater threat power as a result of the coalitions he is in. This is exactly *how* threat power ends up mattering to the final solution. In the case shown, it gives player **j** an advantage.

The purpose of this example has been to point out that via two quite simple diagrams, the essence of the NHS model of politics can be explained in an intuitively appealing visual manner, just as the law of supply and demand is in economics. The larger purpose of the foregoing essay was to convince the reader of the need for, and the timeliness of this bargaining theoretic paradigm. For in the new century we have entered, issues of politics and good governance must trump those of economics alone. Again, please turn to our website's "Lectures On-Demand" if you are interested in hearing the author discuss the contents of this appendix in more detail.

CHAPTER IV: GLOBAL CREDIT MARKET TURMOIL
– Endogenous Risk to the Forefront –

Nothing seems to be working for us. Previously uncorrelated factors have recently fallen in lock-step, leaving us with very few places to hide.

An anonymous analyst
Financial Times, August 11, 2007

Note to Reader: An earlier version of this chapter was sent out in mid-August at the request of numerous clients who were concerned about market turmoil at that time.

There are three important questions that arise concerning the ongoing market meltdown in mortgage-backed and indeed a wide array of other securities.

First, what has caused all the liquidity to evanesce so rapidly in so many markets?

Second, what caused the magnitude of price adjustments to be so large?

Third, what are the downstream implications of what is happening on Wall Street for Main Street? Will the consumer be the next player to unravel?

In this essay, we address these questions at a level of analysis that has not been attempted in any of the myriad commentaries that have appeared during the past few weeks. Many of these commentaries amounted to tautological restatements of the liquidity crisis, or else gossip about which funds are "now" supposedly in trouble. Our mode of analysis below will be altogether different, yet it will be familiar to regular readers of our ***PROFILE*** reports. In particular, we shall draw upon the best analytical concepts available to equip clients with the tools needed to make sense out of what is really happening today.

Most all of these concepts have been developed in past SED reports. They include **(i)** the critical role of the "Belief Structure" of the market in generating market volatility; **(ii)** the need to understand how non-stationarity of the stochastic process generating asset returns undermines the validity of most quant models; **(iii)** the nature and sources of endogenous risk ("overshoot")—in particular the synergistic roles of excess leverage *and* Pricing Model Uncertainty (PMU) *and* correlated market mistakes in generating such risk ("Hedge Funds Exhibit Pack Mentality"—*New York Times* headline, August 13, 2007); and **(iv)** the limited extent of feedback from Wall Street to Main Street when such crises occur. The reason why we have expended time explaining these concepts over the years is precisely to enable clients to make sense of what is happening today—and to do so from first principles. We know of no other research service that has attempted this.

The Root Cause of Today's Crisis: What is happening is a scenario driven by a radical shift in the Belief Structure of the market. This shift has caused **(i)** liquidity to dry up, **(ii)** many "quantitative models" based upon an implicit axiom of stationarity to break down, and **(iii)** time-tested correlation structures to blow up. With this in mind, let us address the three questions above.

1. Where Did All The Liquidity Go?

As readers of past reports know, we already posed and hypothetically answered this question in Figure 2 of our essay, "Where Has All the Money Come From and What Could Cause It All To Go Away?" appearing in our February 2007 report. We now revisit this analysis in light of what has happened.

To begin, note that today's crisis is *not* the result of a big shock, such as war or oil shock. *Nor* is it due to "the Fed this" and "the Fed that." Indeed, the Fed funds rate has remain unchanged for a long time, and behavior on the part of the Fed in recent months has played virtually no role in precipitating what has happened. Rather, what occurred was a shift in the Belief Structure of the market, to utilize the term introduced by the new theory of Rational Beliefs at Stanford University in the 1990s. *Simply think of this as a shift in the beliefs-about-returns on the part of the consensus, whether the shift is from optimism about returns to pessimism, or vice versa*.[1] No, you do not need to be a rocket scientist or to invoke "psychology" or Behavioral Finance to understand this point. It is much more elementary, and is best explained graphically as it originally was in Chapter IV of our February 2007 report, an essay entitled, "Where Has All the Money Come From? What Could Cause it All to Go Away?" Readers hopefully now understand why we wrote that essay when we did.

Please consider Figure 1, adapted from that essay. The supply curve **S** represents the outstanding stock of NIVs (New Investment Vehicles of many kinds—almost all containing embedded leverage of one kind or another). These are the various new-fangled instruments gobbled up by hedge funds and institutional investors in the past decade, in an often very successful effort to boost returns. Note that this curve is *vertical* since it represents the total stock of outstanding assets, a quantity that does not change even if valuation (plotted on the vertical axis) does change.

The demand curve **D** in this context represents the willingness of investors to hold any given amount of these assets at any given valuation level. Its downward slope represents investors' budget constraints: *Given* their beliefs about future returns, the *quantity* of deals that they can invest in increases as the *price* of entry (valuation) drops.

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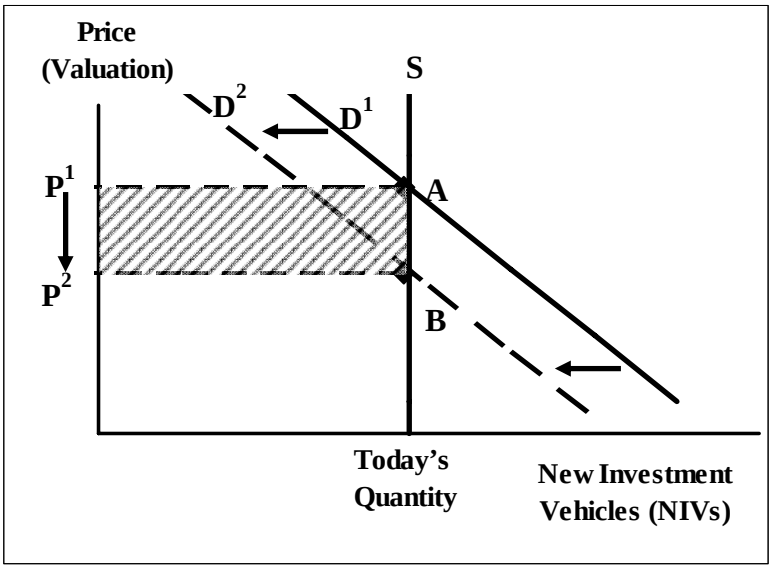
[1] This all-important concept does not, and indeed cannot, play any role whatsoever in classical Efficient Market analyses of market behavior. This is one reason why classical theory predicts a level of volatility *one-fifth* of that observed in reality. The reason why the concept cannot arise is that the "Rational Expectations" axiom underlying Efficient Market Theory and indeed most quantitative models amounts to the preposterous assumption that investors know so much about the future that *they cannot make mistakes*. In this context, belief shifts from "overly pessimistic to overly optimistic" are concepts that cannot enter the picture! It is *very* important to understand this point.

Figure 1: Destruction of Value and Wealth
– The Asset Market Equilibrium in June *versus* August 2007 –



Legend: The upper shaded rectangle represents investors' *loss of wealth* from the adjustment.

Source: SED

Now, what has happened in the past month is simply that the majority of investors who expected their NIVs to yield high and reasonably safe returns, now believe that they will lose money in those investments. As a consequence of this shift in the market's Belief Structure, investors' willingness to hold the assets (curve **D)** shifts *backwards*. **S**, for its part, cannot move since investors are *stuck* with the existing stock of assets (except to the extent that some cease to trade and have zero value, in which case **S** would shift slightly backwards). The result, as is clear in the diagram, is that the equilibrium valuation drops a lot. The simple analytics described here are typically referred to as "a loss of liquidity" *or* "an absence of buyers" *or* "an extinction of wealth." But what has happened is nothing more than that which is depicted in the graph.

The loss of investor wealth that results is given by the *area* of the upper hatched rectangle. This area measures the reduction in valuation times the quantity of assets held. Of course, if leverage is involved, the total loss in wealth will be much greater than is shown here. Note that statistical arbitrage funds typically have outstanding borrowings equal to four times their assets, according to an August 12, 2007 article in the *Financials Times*.

What caused this shift in the Belief Structure? What determined how far **D** shifted backwards? First, recall that Belief Structures can sometimes change significantly either when there is no news at all (Black Monday of 1987 is often cited in this regard), or else when there is very little

news (the May 2006 emerging market meltdown is often cited in this regard). In the present case, the only initial trigger event was a higher-than-expected rate of default on subprime mortgages—an event that even your dog could have predicted. Again, the usual suspects of the central bank and/or of the carry trade were *not* involved.

2. What Caused the Magnitude of Price Adjustment to Be So Large?

Twenty years from now, when the management of the CFA awaken and recognize that the retreaded financial theories of the 1960s are irrelevant to the real world, students will learn the following result that *is* relevant:

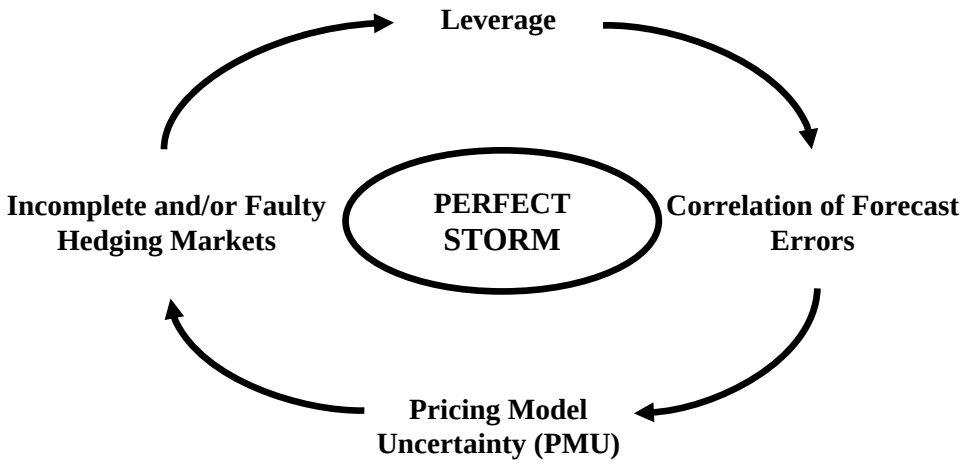
Theorem I: The Fundamental Theorem of Endogenous Risk: The degree of overshoot or more generally "market misbehavior" will be an exponentially increasing function of:

1. The degree to which the laws governing the behavior of asset returns are non-stationary, meaning that the laws themselves change over time in a difficult-to-predict *and* non-periodic manner;
2. The degree to which the majority of investors discover that their forecasts of future news were wrong at a given point in time—and wrong in the same direction (e.g., the degree of "correlated mistakes");
3. The degree to which the majority of investors admit that they do not place much faith in their asset pricing models, or more specifically, the degree to which investors agree that even if the Good Lord told them the news in advance, they would *not* know the resulting price. [In past essays, we have called this Pricing Model Uncertainty or PMU];
4. The degree of "incompleteness" in those hedging markets that permit investors to optimally hedge every and any risk in proportion to their risk tolerance (they are *required* to do so in modern financial theory);
5. The degree to which such hedging strategies hold up during a period of stress (dynamic hedging strategies collapsed during the afternoon of Black Monday in 1987); and finally
6. The degree to which investors are leveraged.

Figure 2 summarizes an earlier version of this result, and was published as Figure 1 in our essay "Derivatives Market Meltdown to Come?" appearing in our May 2006 ***PROFILE*** report.

The relevance of every single point in this important result, to explaining what has happened during the past two months, will be obvious to readers of past SED reports. Indeed, not a day goes by without more admissions by managers at the best of Wall Street and European firms that, "Our quant models proved unreliable—the financial world is indeed non-stationary;" "The correlation structures we had back-tested and expected backfired;" "Leverage is indeed the culprit;" "How could anyone be expected to assess *these* crazy risks?"; "Our hedges crumbled;" and "The real problem driving much of the panic selling is that no one knows how to value our assets and hence, our positions at this point in time….We are truly flying blind."

FIGURE 2: THE PERFECT FINANCIAL STORM
– The Four Conditions –



Legend: The *greater* the magnitude of any one of these sources of endogenous risk, the more "perfect" the financial market storm that could result.

Source: SED

The last point strikes us as perhaps the most important: Not a day goes by without an *implicit* recognition of the role of Pricing Model Uncertainty in explaining what is happening.

To summarize, while bread-and-butter news about the rate of default being higher than expected initially triggered today's crisis, it is leverage coupled with Pricing Model Uncertainty and the other sources of endogenous risk cited in the theorem above that explains the spillover effects that have resulted, as well as their magnitude. As for how bad things will get from here, the blunt answer is not that we do not know, but that this magnitude is *non-knowable.* This last observation leads us directly to:

Theorem II: Endogenous Risk is usually non-assessable, especially during periods of market turmoil. Do not try to compute it, and thus pretend to be able to manage it "optimally." The fact that endogenous risk cannot be properly *assessed* ensures that it cannot be properly *priced*, much less *managed*.

For this reason, it is not surprising that so many quants and risk managers are finding their VAR models so unreliable. Acknowledging the troublesome existence of "fat tails" does not change this. It just restates the problem that it is all but impossible to assess such risks econometrically.

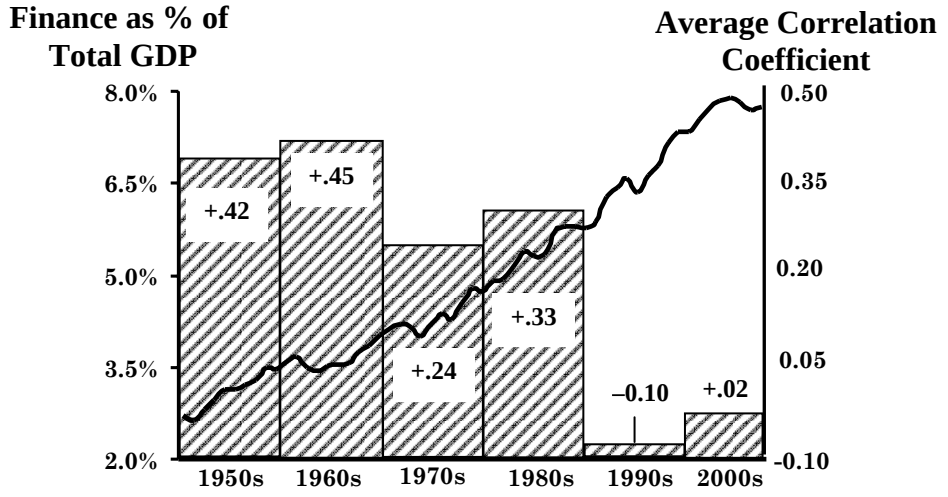
3. What Will Be the Feedback from Wall Street to Main Street?

One hallmark of modern economic life is that the feedback from Wall Street to Main Street will be small, provided the central bank steps in and provides liquidity to troubled brokers and bankers. *The converse, however, does not hold.* If a recession or depression results on Main Street, the financial markets will suffer enormously. We have stressed this asymmetry many times over the years. How will it play out this time?

First of all, since the magnitude of endogenous risk is essentially unknowable, any answer to this question of feedback must be viewed as tentative, and subject to constant revision. Nonetheless, there is a bright side.

The Good News: As suggested above, the evidence of adverse feedback from Wall Street to Main Street is *less* than is often assumed. One way to see this at a very deep level is to consider the data in Figure 3 below. Here, we set forth the results of a correlation analysis between changes in output of the financial sector, with changes in output of the nine other principal sectors of the US economy.

FIGURE 3: FINANCE SECTOR'S CORRELATION WITH GDP



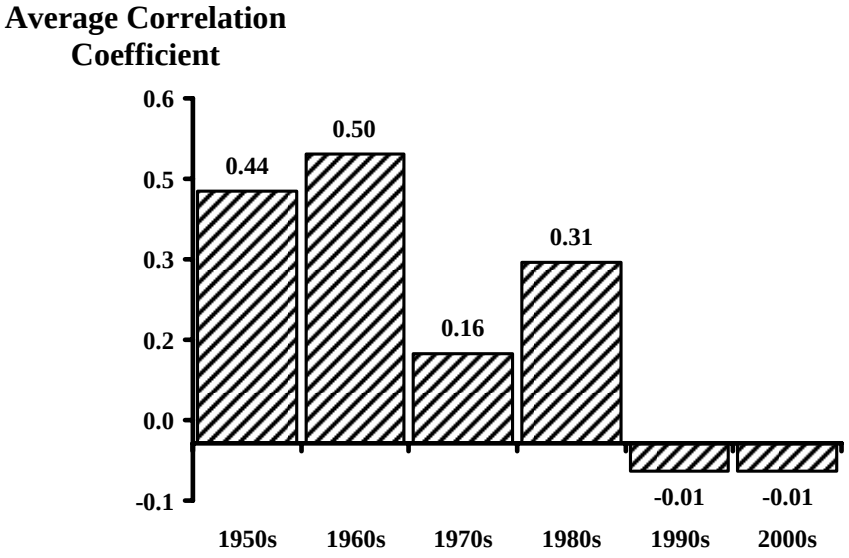
Note: The nine sectors tested here for their correlation with the financial sector are manufacturing (durable); manufacturing (non-durable); retail trade; real estate and rental and leasing; wholesale trade; professional, scientific, and technical services; health care and social assistance; federal government, state and local government.

Source: Bureau of Economic Analysis, SED

The first thing that jumps out here is that the financial sector's correlation coefficient has declined pretty regularly from over **.40** half a century ago, to an astonishing **0** today. That is, in recent years, its ups and downs have had increasingly less impact on the rest of the economy as a whole. This finding is good news for yet another reason: as the heavy upward-sloping line in the graph makes clear, the relative size of the financial sector has increased by over **300%** in the past half century. This makes the zero correlation coefficient discovery even more important for the purposes of analyzing prospective stability on Main Street, given turmoil on Wall Street. Just suppose that the average correlation coefficient had increased to **.8** and not decreased to **0**!

Figure 4 below presents additional information auguring relative stability on Main Street. Here we look at the trend in the *average* correlation coefficient of changes in output between *all ten sectors*—a good measure of the "independence" of each sector from one another, on average. We see that this overall correlation structure has also been completely neutralized, with a *negative* average correlation during the past fifteen years! We first predicted this decrease some 20 years ago in an essay that postulated "increasingly neutral inter-sectoral correlation" as one of six developments that explained the remarkable **75%** reduction of the riskiness of Main Street during the 20th century (where riskiness was proxied by the decade-by-decade standard deviations of consumption, of income, and of GDP).

FIGURE 4: AVERAGE CORRELATION COEFFICIENT BETWEEN TEN SECTORS OF THE US ECONOMY



Note: Sectors analyzed are manufacturing (durable); manufacturing (non-durable); retail trade; finance and insurance; real estate and rental and leasing; wholesale trade; professional, scientific, and technical services; health care and social assistance; federal government; and state and local government.

Source: Bureau of Economic Analysis

While these data are only partially informative, they do suggest that Main Street can weather the storm in today's financial markets better than many might imagine because of the low magnitude of inter-sectoral correlation shown in the data. However, one caveat is in order here. It is essential that the *credit crunch* now impacting specific sectors of the financial markets does not spill over to Main Street itself. In particular, it is crucial that businesses be able to continue to finance their capital spending, and that consumers can continue to borrow on their credit cards.

Will this be the case? Currently, there is a partial and disturbing seize-up in the ability of corporations to fund their activities in, say, the commercial paper market. This should prove temporary. Moreover, the corporate sector as a whole, now possesses the highest level of cash to projected expenditures in many a decade. This is good news. Households, too, have not yet been denied the credit necessary to transact their daily affairs, except for not being able to obtain mortgages at the low rates offered up to two months ago.

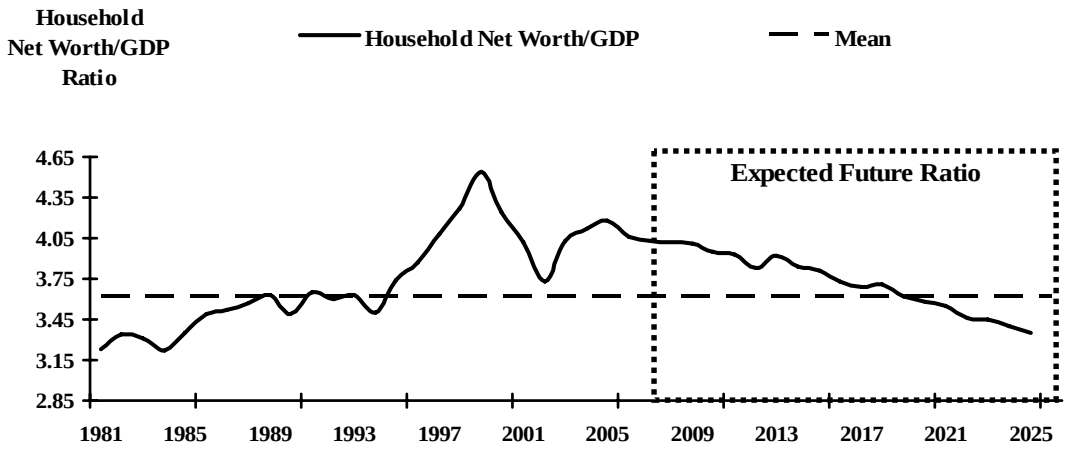
The Less Good News: We have just painted a somewhat rosy picture of the ability of consumers to go on spending. Many other commentators follow suit, and cite such positives as rising employment, rising income, and upbeat indices of consumer confidence.

However, a deeper and less optimistic story is afoot here, and this concerns the long-term wealth effect impact on the future growth rate of consumption. The US share of GDP accounted for by consumption has been rising for 15 years, and has recently been its highest in history. As a corollary, the savings rate (regardless of how it is measured) has plummeted. As we pointed out in a Client Memo a year ago, there is a deep-seated reason for the increase in consumption and corresponding decrease in savings witnessed during the past 15 years—a reason indeed, that far transcends arguments about the recent "greed" and "short-termism" of US citizens.

Specifically, the net worth of American families exploded during this period. Indeed, going back to 1982, net worth in nominal terms rose from $10.8 trillion to about $54 trillion today. Housing, art, real estate, and bonds all performed far better than anyone could have expected, especially given the disaster of wealth reduction during the previous 1965-1982 period.

Now, according to Franco Modigliani's Life Cycle Savings Hypothesis, this explosion of net worth implies that rational consumers *should* have reduced their cash savings rate, just as they have. For the unexpected appreciation of their wealth has, in effect, done their savings for them. Regrettably, as we first pointed out four years ago, this regime of rapid wealth growth has to come to an end. For net worth-to-GDP is a ratio that does and must stay fixed at an average value of about **3.4** over the very long run. [Figure 5 shows a higher mean of 3.6, but this reflects the "rich" sample period chosen of 1981-2007.] To restate this point, national wealth and GDP growth grow at the same rate, with the former equaling **3.4** times the latter, on average. [Think of this as a re-statement of the celebrated invariance of the "capital-output ratio" of an economy that most Econ 101 students learn about. It is one of the most widely documented numbers in all of economics, and it holds true everywhere.]

FIGURE 5: MEAN-REVERTING DYNAMICS OF NET WORTH
– Nominal Net Worth/GDP –



Source: Federal Reserve Board, US household balance sheet data; SED

Once the reality of "wealth reversion" sets in and US consumers *realize* that their growth of net worth will be quite low for a very long time, they will confront two dismal choices: **(i)** cut back on consumption and save more for retirement, or **(ii)** plan to work until age 75. There is no other way to square this circle! Case **(i)** will inevitably have an adverse impact on GDP growth, which could slow by up to **0.5%** annually for up to two decades because of this. Of course, slower GDP growth and in particular, consumption growth should reduce the US trade deficit—a reduction that *increases* GDP and thus partially offsets the negative impact on GDP of reduced consumption growth.

> *From the standpoint of this savings/consumption/growth analysis, the importance of today's reduction in house prices—and the growing realization that a price recovery is <u>not</u> around the corner—is that it will finally foster a growing awareness that wealth growth is no longer on autopilot, and that increased cash savings will be needed by most families. The role of the housing crisis is to <u>trigger</u> this realization. This is the principal feedback from Wall Street to Main Street that will really matter—but happily it will matter with a lag.*

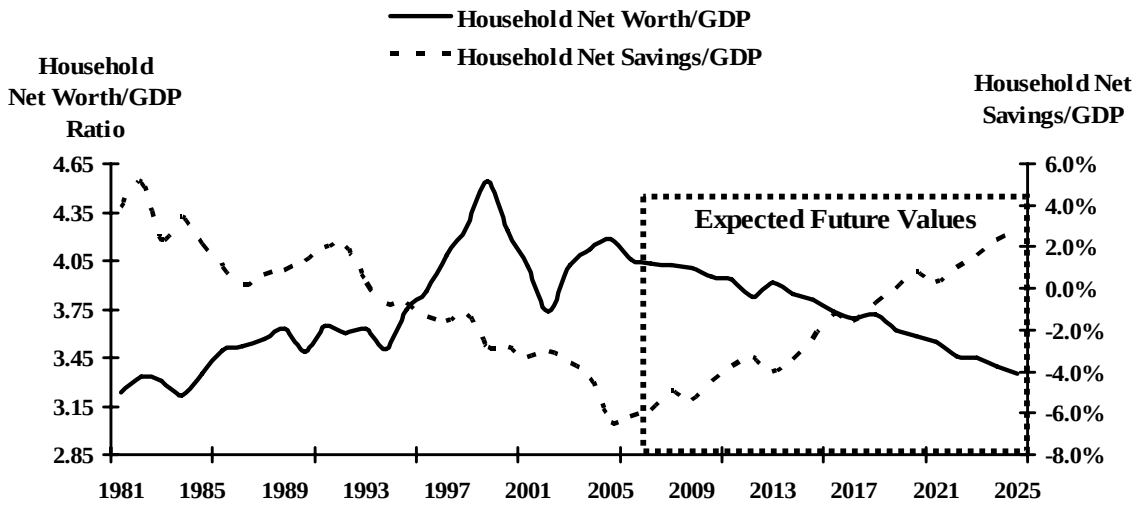
Figure 6 sets forth a final set of speculations along these lines. The underlying story is not as depressing as it looks because, for example, it does not capture positive developments like the shrinkage of the trade deficit. But it certainly indicates that an important regime shift is under way—a shift that some would say is long overdue. The first part of the graph shows how the

explosion in net worth cited above was accompanied by a dramatic fall in the household savings rate. Recall that this is consistent with the Life Cycle Savings Hypothesis Model. In the second (dotted) part of the graph, we show how the next twenty years should represent a *reversal* of everything that happened up until the early 2000s.

Note: The savings rate we have used here on the vertical axis is sometimes known as the "financial balance" of the household. It consists of disposable income minus all consumption expenditures *and* investment in housing. It is thus a *lower* savings rate than the traditional savings rate that is calculated as disposable income minus expenditures, but not minus housing investment.

This completes our discussion of the three questions posed at the beginning of this essay.

FIGURE 6: THE UNTOLD STORY
– Long-run Wealth Effect Impact –



Source: Federal Reserve Board, US household balance sheet data; SED

CHAPTER V: FORECAST AND RISK ASSESSMENT OF THE US ECONOMY

Main Street USA is more stable and more resilient to shocks than is widely appreciated, and more than it used to be. The riskiness of GDP growth and consumption growth has been nearly **80%** less during the past two decades than it was earlier in the 20th century, as we have documented in past reports. One reason why was cited in Chapter I above on prospects for the world economy. We noted there that the *average correlation coefficient* between changes in output of the ten principal sectors is virtually **0**, and more astonishingly, is down from about **.4** in the middle of the 20th century. Figure 1 is adapted from that earlier analysis. Note in particular the non-existent correlation of the finance sector with most of the other sectors.

FIGURE 1: CORRELATION COEFFICIENTS FOR PAIRWISE GROWTH – GDP Growth: 1991 to 2006 –

***Average* Pairwise Correlation Coefficients for the Ten Sectors Listed = 0.00**

	1. Man. (dur)	2. Man (non-dur)	3. RT	4.Fin.	5. Real estate	6. Whole	7. PTS	8. HC	9. Fgov	10. Sgov
1. Manufacturing (durable)		0.54	0.40	0.13	0.13	0.59	0.55	-0.64	-0.29	-0.57
2. Manufacturing (non-dur.)			0.24	-0.11	0.11	0.50	0.15	-0.20	-0.11	-0.24
3. Retail trade				-0.38	0.17	0.63	0.35	-0.50	-0.58	-0.37
4. Finance and insurance					-0.07	-0.28	0.27	-0.10	-0.14	-0.17
5. Real estate						0.34	0.51	-0.09	-0.17	-0.12
6. Wholesale trade							0.41	-0.47	-0.31	-0.54
7. Professional services								-0.55	-0.39	-0.58
8. Health care									0.64	0.80
9. Federal Govt.										0.42
10. State and Local Govt.										

Note: Sectors analyzed above are manufacturing (durable); manufacturing (non-durable); retail trade; finance and insurance; real estate and rental and leasing; wholesale trade; professional, scientific, and technical services; health care and social assistance; federal government; and state and local government.

Source: Bureau of Economic Analysis

It thus takes quite a shock to bring about an outright contraction of GDP growth in today's postmodern economy. Nonetheless, the financial turmoil occurring at this writing makes a recession a distinct probability. For this reason, this particular Forecast and Risk Assessment essay focuses on the numerous *policy tools* available to government to deal with what is happening in the financial markets, as well as whether or not a serious "credit crunch" could kill

economic growth, much as it did during the US Savings and Loan crisis of the early 1990s. We do not expect negative GDP growth during late 2007 or early 2008, and currently give such an outcome only a 10% probability. Yet even without outright recession, the consequences of much lower growth and of higher unemployment could be serious in an economy as leveraged as ours.

The Australian and UK Housing Slumps: Before commencing, it is interesting and perhaps relevant to note that the UK experienced a housing slump with rising mortgage default rates over two years ago, as did Australia over some three years ago. In both cases, the impact on their broader economies, respectively, was surprisingly well-contained, as was the resulting slide in property values. When the US housing crisis began some eighteen months ago, we took solace from these two related Anglo-Saxon experiences. *We may well have been wrong.* If so, one reason why was the greater laxity of credit standards (and hence of sub-prime defaults) here in the US than abroad. Another reason may be that whereas problems in the smaller UK and Australian debt markets would not be expected to "contaminate" markets globally, severe problems in the US debt markets may be doing just that. We regret that we do not have the data to investigate this matter further.

1. Central Banks to the Fore—and Prospective Fed Policy

Recent turmoil in global financial markets has brought about increased scrutiny of the role and indeed, the potential power of central banks. The Fed and its counterparts are now operating in an environment that is new in two main ways.

First, the globalization of the securities markets—and their very high correlation in times of crisis—has meant that central banks from China, Australia, and Europe to the US are being obliged to coordinate their strategies more than before. What happened this past August offers ample proof of this.

Second, the nature of the central banks' role has changed. Consider the case of the US. Before the 1930s, the greatest threat to financial stability came from runs on banks. After the collapse of the (private) Bank of the United States in the early 1930s and the Great Depression, the Deposit Insurance Act was passed. This protected the deposits and savings of most depositors, and removed the type of self-fulfilling panic that caused runs on banks and financial chaos. Today, however, a completely new financial architecture is in place. It is one that relies on *securities* much more than on bank loans. This phenomenon is sometimes called "disintermediation" since the mediating role of banks as middlemen has diminished so greatly.

The problem, of course, is that when the value of these securities falls and a panic ensues, there is no equivalent of deposit insurance to buoy up the confidence of investors, much less the prices of the underlying assets. Moreover, during the past five years, those investors have come to include ever expanding subsets of the investing public, from mom and pop investment shops to the largest pension and hedge funds. *Everyone* today is aware of what is going on. Because of this, a crisis of confidence could arguably boil over from Wall Street to Main Street more readily in than in the past.

Nonetheless, when turmoil erupts, it is widely assumed that central banks *can* come to the rescue, as if these structural changes either had not occurred, or else have not been understood. Witness the constant discussion of "the Greenspan put." However, as we have stressed in these pages for many years, the power of central banks to achieve socially desirable goals is much less than many observers believe it to be. Let us now take a fresh look at the arsenal of tools available to the Fed in times of a crisis.

The Interest Rate Tool: To begin with, even if radically lowering interest rates were a palatable policy option (and with Bernanke as Chairman, it is not—see below), evidence is accumulating that cheaper money does not necessarily restore the value of assets once the Belief Structure of the market has shifted from one of optimism to pessimism about prospective returns. And this, of course, is exactly what has happened as an expanding share of the investing public does not know how to value its assets.

Would a **2%** Fed funds rate in today's environment really drive back up the price of condos in Miami by the **60%** needed to make many investors whole again? No, and that is just the point. Additionally, as the economist Avinash Persaud has pointed out, interest rate cuts completely fail to redress of the loss of wealth due to the "de-rating" of asset quality, an important phenomenon at present.

The blunt reality is not only that the regulatory authorities (including the Fed) have little control over the *valuation* of these new securities that are now stores of wealth—they do not even know who holds them—but also that one of their two one principal policy tools (interest rate policy) may not be able to forestall distress as much as is expected, or as much as used to be possible.

The Liquidity Injection Tool: Of course, the Fed, as a second option can "inject liquidity" into bank reserves, just as it and other central banks have been doing as of this writing. This certainly helps banks fulfill *their* role in the crisis we have witnessed. But once again, the role of banks proper has been greatly diminished by financial deregulation and innovation. And whereas the Fed can inject liquidity into the balance sheets of Citicorp, it is more difficult to do so in the case of Goldman Sachs or Bear Sterns or myriad hedge funds which do not fall under Fed supervision. Can the authorities bail out these players? Should they do so? These are the issues that will now be debated for years.

But there is more to the liquidity-provision story than this. The Fed and other central banks rely on a narrow group of Federal Reserve System member banks and primary dealers to transmit liquidity in the overnight market to the rest of the financial system. But in today's circumstances, when banks are hoarding reserves and seeking to reduce exposure to risk, this transmission mechanism may not function effectively. Liquidity may not flow to longer-duration markets or to hedge funds experiencing the greatest distress. According to an editorial in the *Financial Times* on August 16, considerations like this point to the need for an outright cut in rates—and not just the discount rate. "Rate cuts more directly lower the cost and increase the availability of funds at all maturities throughout the entire financial system." But this view dodges the point raised

above, that rate cuts will not restore the value of sub-prime mortgage paper, much less of Miami condos.

An Array of Other Fed Tools: Above and beyond these two principal policy tools, the Fed could also lengthen the maturity of its re-purchasable transactions in the money markets—for example, by making 7 or 14 day loans to banks rather than overnight loans on a daily basis. "The Fed could also send a much clearer signal if it conducted term repo operations at the *end* of the maintenance period," said Gerald Lucas of Deutsche Bank. Additionally, the Fed could utilize the discount window more aggressively than it recently has. This would expand direct access to short-term liquidity on competitive terms to a wider range of institutions, and in doing so might help spread this liquidity along the curve and throughout the financial system.

In an extreme case, the Fed could lower the Fed funds rate and the discount rate both to **4.5%**, allowing all banks to borrow at the same rate as the Fed funds rate, against a much wider range of collateral. It could even engage in currency swaps with other central banks to make funds available offshore to deal with a spike in demand for overnight dollars from foreign banks outside US trading hours.[1]

Non-Fed Tools: Above and beyond monetary policy, government can shore up the system in other ways. In the US, for example, there has been pressure in Congress to bail out the mortgage mess by having Fannie Mae and Freddy Mac acquire large portfolios of mortgages from lenders in distress. The problem here, of course, lies in the moral hazard of bailing out lenders who ought to fail. The Bush administration was probably right in quelling this proposal, even though it will be resurrected if the housing crisis materially worsens.

The other principal non-Fed tool is fiscal policy. It always surprises us that "the Fed" is written about and emphasized, perhaps twenty times as much as fiscal policy is, whenever there is a crisis. This bias partly reflects the reality that the Fed is a tightly knit group who can actually *do something* within a matter of hours during a crisis—and is the opposite of "government" in this regard. It also partly reflects the belief that entitlement expenditures have so tied the hand of Congress, that there is little they *can* do to mitigate a crisis. But both inferences are wrong.

First, if things get bad enough, it is in the interest of legislators on both sides of the aisle to act and to act fast. They have in the past, in both military and financial matters. *Second*, despite entitlement spending strictures, it was fiscal policy and not monetary policy that saved the day when the tech bubble burst in 2000–2001. Recall that between increased expenditures and tax cuts, the fiscal deficit went from a surplus of nearly **2%** of GDP to a deficit of nearly **4%**. This *swing* of **6%** mathematically raised GDP by the same amount, thereby preventing any outright drop in GDP growth at all—notwithstanding an arresting collapse in capital spending similar to that of 1930–1933! Yes, monetary policy played a role, but given the lags associated with most forms of monetary policy, its impact came later. This point largely escaped the attention of the financial press at the time and it still does. As usual, all eyes remain upon the Fed.

[1] Several of these proposals were cited in a very good article in the *Financial Times* on August 16, 2007, by Krishna Guha and Michael Mackenzie.

The Larger and More Depressing Reality: Whatever the powers of the central bank and government might be, once investors no longer believe that they will make money in those New Investment Vehicles (NIVS) that they have purchased during the past decade, they have no options other than to hold them, or to sell them at much lower prices. The Fed can do little to prevent this. Bluntly, swings in the Belief Structure of the market often matter more than the tinkerings of monetary policy, as we have stressed for the past five years.

Such swings can result in a seizing up of today's complex new credit markets that have become the principal conduits of free-flowing credit, and in a vast loss of wealth from the shrunken value of the NIVS that *someone* has to hold. [Recall Figure 1 in Chapter IV above that graphically depicts exactly how wealth is lost in this manner.] This situation is exacerbated by two further structural changes: *First,* the securitization revolution has reduced the degree of scrutiny exercised by loan originators, and has thus increased the proportion of bad paper. *Second,* the recent social acceptability of leverage and the ease of obtaining credit has further exacerbated matters.

The Bernanke Policy Conundrum: Confronting this morass, what can we expect Fed Chairman Bernanke to do? To date, he has failed to lower rates at a juncture when many assumed that he would and *should* have done so. Isn't the combination of a rapidly slowing economy and a financial crisis enough to compel him to do so? We, for our part, predicted that he would hang tough unless circumstances become extreme. This is because of his academic background as a scholar steeped in Rational Expectations economics. Remember that the Chairman came of age during the OPEC era, when the rise in inflationary *expectations* is what led to the very inflation that nearly brought down the world economy, and that caused Fed Chairman Volcker to ultimately raise rates to nearly **20%**, and thus to precipitate a very severe recession.

Given Bernanke's belief in the primacy of fighting inflationary expectations, and given that inflation has been running at a rate above target despite weak growth, it is not surprising to us that he has maintained the Fed funds rate as high as he has. Of course, if the current financial crisis gets much further out of hand, he will be obliged to ease policy further. In this regard, the behavior of the unemployment rate will be particularly salient during the next months, as Election Day 2008 gets closer. Given the US Humphrey-Hawkins Act of 1979, mandating that the Fed target both inflation *and* unemployment, the Fed must *target* unemployment—not just monitor it, especially with a Democratic Congress in power. We expect the unemployment rate to rise to **5.9%** by year's end (see our forecast below), and thus expect a **25** basis point funds rate reduction during the autumn, with an additional cut by the New Year. Nonetheless, should the economy and the unemployment rate stay unchanged, the Fed will maintain its current stance and not cut rates. *This is the Bernanke Fed, not the Greenspan Fed.*

2. A Possible Credit Crunch?
– Another Case Study in the Role of Pricing Model Uncertainty –

One of the most salient ways in which distress on Wall Street can spill over onto Main Street is for financial market distress to morph into a full blown credit crunch. Predicting whether this will happen is always difficult, but more so than ever in today's environment, given the *novelties* of today's crisis.

What exactly is a credit crunch? It can take two different forms. *First*, there is a price-of-credit driven crunch. Either Fed-determined or market-determined interest rates can rise, making it much more difficult for Main Streeters to obtain the cash needed to carry on business as usual. One need only recall the impact on the economy of **20%** T-bill yields during the 1980–1981 oil crisis. Then there was the market-driven collapse of junk bonds at the end of the Michael Milken era in the late 1980s.

Second, there is a quantity-of-credit driven crunch that arises when—regardless of interest rates—funds are simply not available. This is sometimes called a liquidity crisis that can arise due to a collapse of confidence. But there are other forms of quantity-driven crises, notably those that used to occur when the Fed would raise rates above those Reg Q interest "rate ceilings" that Savings and Loan banks were allowed to pay depositors. Prior to 1980, this would have the effect of terminating the availability of mortgage financing as a matter of public policy, and not as the result of a crisis of confidence. [Recall that *only* S&Ls could make mortgages back then.]

> *In the present environment, many claim that we are experiencing a quantity-driven credit crunch born of a "crisis of confidence." This explanation is a bit superficial, since the source of today's crisis of confidence has been quite unique. It was largely born of Pricing Model Uncertainty. When sub-prime mortgage paper became worthless, a contagion began whereby whole new classes of New Investment Vehicles became very difficult for investors to "price." The rest is history.*

Will this intra-market contagion significantly impact credit availability on Main Street? As of this writing (late August), it has not to any notable extent.

The Optimistic Case: Corporations are flush with cash, and should have little trouble funding their capital spending programs. Indeed, in the first quarter of this year, cash on the balance sheets of non-financial corporations was running at a record $1.2 trillion, a figure that has doubled since 2001. Internally generated funds were nearly equal to all outlays for new plants and equipment, something unique this far into a cyclical expansion. Moreover, while capital spending was very slow before today's credit crunch, it ironically has now improved at the very time when the financial crisis dominates the news. Indeed, business construction alone surged 22% in the second quarter, the largest quarterly advance in 13 years.

This positive news is somewhat offset by the collapse in the quantity of credit available for private equity and related deals. Yet what matters to Main Street is the former and not the latter:

Whereas capital spending does impact GDP growth and employment, deal-making largely does not.

At the consumer level, the good news is that *some* of the kinds of financing that consumers rely upon to manage their affairs (e.g., credit cards) are still available. Regrettably, there is plenty of offsetting bad news here.

The Pessimistic Case: In the case of households, there has been a virtual collapse in the ability to obtain funds from home equity withdrawals. This is certainly one quite new form of credit crunch. But caution is needed in being too pessimistic in this case. Two years ago, New York investment bank economists argued quite unanimously that the consumer would be very badly hit by a contraction of home equity borrowing *one-third* the size of what has now occurred. [Over the past two years, this quantity has fallen from an annualized rate of around $750 billion to about $100 billion]. Yet when home equity withdrawals fell off sharply during 2006, and well into 2007, the US consumer surprised everyone yet again by continuing to spend. Even though increases in wages and employment helped, this outcome was still quite remarkable.

A second cause for pessimism stems from the inability of companies considering stock repurchases or private takeovers to obtain the kinds of financing that has made such behavior possible in recent years–junk bonds, private equity, and hedge fund financing in particular. The impact of this development on Main Street is indirect and will be transmitted to it by a fall in stock prices. This will, in principle, levy a wealth effect on Main Street. But the caveat "in principle" is needed here because as we have argued in the past, such wealth effects have proven very small in recent years. The wealth effect that really matters is the *long-term* wealth effect on households that will occur once they realize that the family net worth is growing much slower than it used to—*and that this will continue for many years.*

Another form of credit crunch negatively impacting business is the seizing up of the commercial paper market. For example, steep drops in value of some asset-backed commercial paper securities have flustered commercial paper lenders in recent weeks. To restore "normal trading conditions," central banks have had to inject emergency liquidity into the markets. The Canadian commercial paper market virtually came to a halt when many large institutions found that they were not able to issue such securities at all. A rescue effort in Canada was able to help resolve this problem, but the underlying obstacle has raised more general concerns about global short-term funding.

One last cause for credit crunch pessimism comes from one of the great structural changes that, until now, has been viewed as a "positive" for the economy: the advent of the "securitization" of credit during the past two decades. Securitization has certainly helped us all to better "slice and dice risk" in the manner prescribed by the Economics of Uncertainty. In doing so, it has also made the economy safer by spreading out risk more than ever before. But there are now those pointing out that, in a severe credit contraction, securitization may heighten financial distress, not mitigate it. To begin with, households having trouble meeting payments can no longer turn to traditional lenders (e.g., their local S&L) to "work out" their problems over time, for the mortgage was repackaged and sold off long ago.

The result has been aptly described as a "credit merry-go-round," in which none of the parties involved knows *which* parties can legally restructure the terms of the mortgage in a manner permitting the workout that benefits most everyone involved. One result is that the number of foreclosures will be much greater than in an environment when work-outs were still possible—a development that will depress house prices further. But above and beyond this, Avinash Persaud has argued in the *Financial Times* (August 15, 2007) that "securitization may make the down cycle more severe by transmitting systemic risks along untraditional paths, that may prove less sensitive to interest rate cuts than in the past."

3. Housing, Capital Spending, Bond Markets, and GDP Growth

Housing: We have little to add to what is already widely known about the US housing cycle. The blunt reality is that the drop in housing starts and the decline in prices and the accelerating rate of defaults are *all* proving worse than expected. US Treasury Secretary Paulsen's assessment this past spring that "the crisis has bottomed out" has proven incorrect. We were rightly skeptical of his view since, by the time of his announcement, it was becoming clear that the magnitude of abuses in the housing market on the part of all parties involved had been egregious. Given the lags involved, how could anyone have stated that matters had bottomed out?

Nonetheless, we too, underestimated the spillover effects that we are now seeing. Specifically, the present $200 billion in delinquencies will grow to over $400 billion in 2008, since some $570 billion more low-teaser-rate mortgages will reset to market rates that will consume at least **50%** of borrowing family incomes. Most of these mortgages will be foreclosed or restructured in a way that costs about 1.7 million families the ownership of their homes.[2] The resulting extra supply of houses will depress prices more than they otherwise would, since few lenders will want to put mortgages on the houses liquidated at distress prices. At the other end of the market, jumbo loans will be much more expensive and difficult to obtain.

The only good news is that, bad as all this is, the total financial losses involved will only amount to **2%-3%** of GDP, and will depress only aggregate family net worth by about **1%** of GDP. However, these figures do not include the secondary impact of decreased net worth due to a further general decline in house prices. To conclude, we expect house prices to fall further, and to fail to recover significantly until well into 2009.

The impact of all this on GDP growth via a "wealth effect" will be discussed below. But let us not forget the direct impact of these same developments on the rate of new housing starts and home improvements—impacts *directly* affecting GDP growth. Housing starts and permits have already declined to their lowest levels in more than a decade—starts being down more than 21% from a year earlier. The developments just cited suggest that this number will drop even further later this year and well into 2008. The National Association of Home Builders' survey, which measures home-builder confidence, recently fell to a 16-year low. Matters are made still worse

[2] In citing these statistics, we have drawn in part upon the analysis of Wilbur Ross, Chairman of WL Ross & Co.

by taking into account significantly higher mortgage rates, tighter lending standards, outright credit rationing in some segments of the market, and larger down payments.

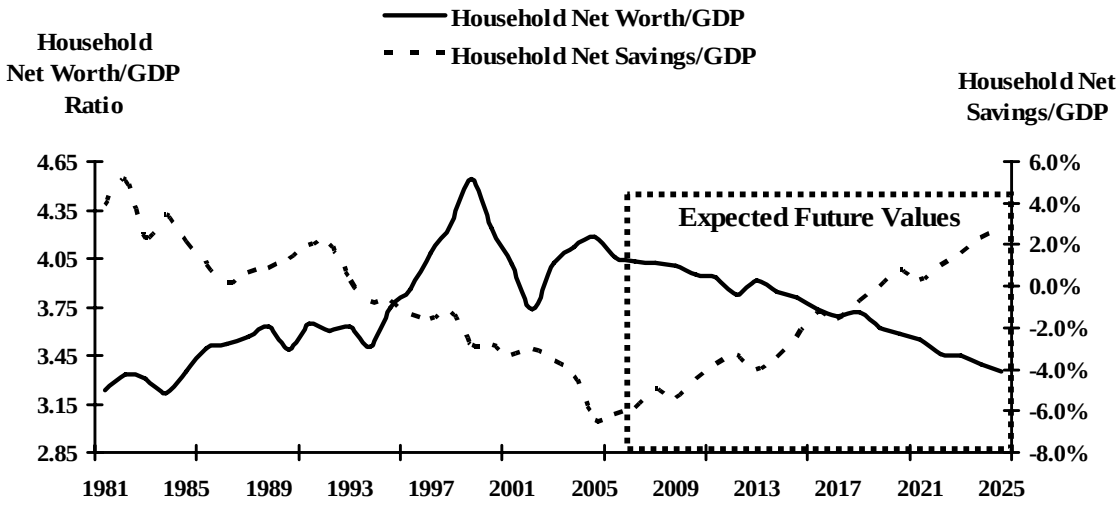
The Consumer: As we already stated, the behavior of US consumers has been somewhat paradoxical for nearly two decades. In particular, despite such shocks as the market crash of 2001, the corresponding collapse in GDP growth, and the corresponding **2.4%** rise in unemployment at that time, consumption growth never turned negative. More recently, consumption has held up despite the housing crisis, better than most people ever expected. There are several reasons why. *First,* negative "wealth effects" on consumption have proven *very* much lower in the past decade than in previous decades. *Second,* both employment and wages have grown, with incomes from wages and salaries this past June up **6.7%** from a year earlier. And in the US, if people earn more, they tend to spend more, even if they "should" be concerned about deteriorating balance sheets. Above and beyond all this, measures of consumer confidence have remained surprisingly high despite higher gas prices and market turmoil.

Nonetheless, consumer spending did take a hit during the second quarter of 2007, growing at only **1.3%**. More notable is the fact that the states in which it suffered the most were precisely those with the worst real estate problems, namely Arizona, California, Florida, Hawaii, and Nevada. The sixty-four thousand dollar question is whether the second quarter dip is yet another random blip in this data series on consumption, or else the beginning of a serious and prolonged slowdown in consumption growth. Its recent dip most probably reflected growing concerns about housing values, along with sharp increases in expenditure on fuel since gas prices peaked in May at $3.22 per gallon.

> *Looking forward, however, we see a much bigger and more prolonged story. Because of certain new developments, the American consumer will gradually retrench to a pattern of reduced consumption and greater savings reminiscent of earlier times. The reason for our view has been set forth in previous SED publications. We shall now briefly review this logic, since the developments we have foreseen are now beginning to come into play, and could well dominate the economic landscape of the future*.

The basic point is that, just as the very rapid growth rate of National Net Worth between 1980 and 2000 had to reverse because of "Wealth-to-GDP mean reversion," so must the savings rate rise back up. This point is summarized in Figure 2, which also appears as Figure 6 in Chapter IV. The relationship between growth of wealth and the savings rate over long periods shown there captures the *true* "wealth effect" at work in the economy. This is all a logical corollary of Franco Modigliani's celebrated "Life Cycle Savings/Investment Hypothesis." What is important, however, is that the savings rate will not materially rise and hence, consumption growth will not materially fall until the broader public *understands* that it has been experiencing, and will continue to experience, much slower wealth growth than in the previous regime. Bluntly, it takes people time to change their habits, and they need good reason to do so. Much slower wealth has already begun, just as we predicted that it would several years ago.

FIGURE 2: THE UNTOLD STORY
– Long-Run Wealth Effect Impact –



Source: Federal Reserve Board, US household balance sheet data; SED

Yet most people are not aware that this has begun, and that it will continue for many years to come. Indeed, we read of a survey in which **75%** of those interviewed expect house prices to start rising back up by mid-2008! A good three more years may be required for such awareness to sink in. This is *good* news, for this delayed adjustment in expectations gives the nation breathing room to adjust. Were the change to occur overnight, a soaring savings rate could well cause a massive recession.[3]

Net Exports: The silver lining in all this is that, just as the longer-term growth rate of US consumption should slow down, it should accelerate in most other countries. The result will be a significant improvement in the US current account deficit, and this of course *raises* US GDP growth by the same magnitude, thus partially offsetting the depressive effects of a higher savings rate. Of course, soaring oil and other commodity prices can offset these positives, leaving the US with its worst trade deficits in history. Yet all in all, we expect a gradual improvement in net exports, one that is already under way with US exports up a healthy **6.4%** last quarter.

[3] In an August 2007 speech in Sydney, the second highest ranking official at the Fed presented a paper sympathetic to our views here. Governor Donald Kohn, in a paper co-authored by economist Karen Dynan, expressed the view that the increase in wealth in recent years—housing wealth in particular—has boosted both economic growth and debt, at the expense of savings. They apparently expect a reversal of these trends in the future. The Fed has never expressed this view before, to the best of our knowledge.

GDP Growth: Putting this all together, we see GDP growth running at a range of **1.50%-2.50%** for the duration of this year and for the first part of 2008. We also foresee a small rise in the unemployment rate towards year-end, also continuing into 2008. Given the uncertainties in the environment right now, however, this estimate could prove wrong in both directions. The variance around our distribution is very large given today's uncertainties.

Inflation: The picture here is a mixed story. On the plus side, the unemployment rate is beginning to rise, gasoline prices are backing down, and even the Fed is now signaling concern about a slowdown in the overall economy. On the negative side, the recent downward revision of the productivity growth numbers is bad news. Indeed, recent Labor Department data show that *the all-important growth rate in unit labor costs has reached its highest level in seven years*. This, of course, puts pressure on firms to raise prices, although this may not be possible if overall growth slows as much as we expect. We have already discussed the implication of this mixed outlook for Bernanke's dilemma. We expect the Fed funds rate to be cut two times by year-end.

Bond Market: Happily, some traditional rules of thumb are still working: As both history and theory would predict, the prices of longer-term Treasury securities have risen a lot as investors seek safety. Bond spreads have risen as well. The Lehman BBB corporate bond spread index has widened **45** basis points since mid-June. We believe this spread could rise another **25** basis points by year-end if the credit crisis deteriorates further, but we give this a fairly low probability.

One thing that will not change is the hunger for yield that has driven much of what has transpired in the debt market. Looking forward, we expect the price of long 10-year Treasuries to rise a bit further, with yields falling to **4.25%** if the economy slows down materially while credit market concerns are contained, and even down to **4%** should the credit market panic worsen with serious spillover effects on Main Street.