The Index Investor

Invest Wisely…Get an Impartial Second Opinion.

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This Month's Issue: Key Points

Summer is inevitably a time for reflection and renewal, and ours was no exception. As the crisis in the financial markets snowballed, we found ourselves drawn into a deep (and, as the pace of events quickened, increasingly time consuming) look at its root causes and dynamics, and their implications for the future. The good news was that, in retrospect (and as many of you have since noted in your emails to us), we got a lot of things right in our May 2007 article about why we weren't sleeping well at night, and what that meant for investors' asset allocations. The bad news is that nothing we found in our analysis improved our outlook for the future.

Coincidentally, or perhaps serendipitously, we also found ourselves reading histories covering the end of the 19th and beginning of the 20th centuries. These were years much like our own, in terms of the number of exciting events that competed for people's day-to-day attention. However, this was also a period where trends began that would drive the emergence of dramatic changes over the succeeding fifty years. Yet then, as perhaps now, most people missed the full meaning of these trends (if they even spotted them), especially mainstream expert commentators whose efforts were primarily focused on current events. With this in

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mind, we asked ourselves what we might be missing here in 2008. We took the approach of trying to identify trends which could not continue, and whose reversal was likely to be quite sudden, after either recognition or pain reached a certain threshold. This led to five scenarios which we describe in this double issue's second feature article. Again, this exercise did not add to our optimism about the challenges that lie ahead. Last but not least, this month's product and strategy notes review yet another group of excellent papers that highlight the folly of investing in long-only actively managed mutual funds. Particularly important (but least likely to be seen on the front page of major financial publications) is a study by Barras, Scaillet and Wermers which finds that, after adjusting for the role of luck, just six tenths of one percent of mutual funds display true skill, defined as the ability to earn returns in excess of their trading costs and expenses. Complementing this is a new study by Mark Kritzman which (echoing Ross Miller's previous work) finds that on an apples-to-apples basis, long only mutual funds actually charge somewhat more for their active management services that "2 and 20" hedge funds. Kritzman shows how investors who choose to employ some active management approaches in their portfolio can lower their costs by combine index funds with uncorrelated (i.e., pure) alpha strategies – just what we have been suggesting for years in these pages.

This Month's Letters to the Editor

In light of recent events, I wanted to thank you again for a great call back in May 2007. The arguments you described then that were causing you lack of sleep have since proven to be right on target. Having said that, I'm curious as to how you're sleeping these days?

Thank you for your kind words. That said, it is something of a mixed bag of emotions when you are right about there being a major crisis on the horizon. Also, having spent the summer looking back on our forecasts, we have to admit that while we got it right at the strategic level (i.e., what would occur – a crisis, and why – unsustainable U.S. current account and consumer borrowing), we failed to fully "connect the dots" with respect to how the crisis would play out. Over time, we had written about a number of points that later proved to be critical – for example, we regularly bemoaned the lack of credit skills in today's market, thought credit risk was underpriced, and wondered about whether players in the credit default swap market had

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sufficient capital to back up the bets they were making. And more than once we wrote about the close relationship between information and liquidity, and how because of the very high amounts of leverage being employed to generate returns in increasingly competitive markets, a small crisis in one part of the system could very quickly spread across multiple asset classes and grow in size to system-threatening proportions. Clearly, we weren't the only ones voicing our worries – so too did people like Warren Buffet (who memorably called credit derivatives "financial weapons of mass destruction"), Nouriel Roubine (of RGE Monitor), Jim Grant (of Grant's Interest Rate Observer) and no doubt others. Finally, we missed an important February 2007 paper ("How Resilient Are Mortgage Backed Securities to Collateralized Debt Obligation Market Disruptions" by Mason and Rosner) that would have helped us better understand the full importance of the failure of the Bear Stearns leveraged hedge funds (that invested in CDOs based on lower rated tranches of subprime-backed mortgage securities) that played out during the second quarter of 2007, and provided a clear picture of what was later to happen on a much larger and less controllable scale.

Hindsight, however, is inevitably 20/20. In point of fact, as you move from the strategic level (what and why) to the operational level (how) to the tactical level (when, where and who), the number of possible outcomes explodes, and the forecasting challenge becomes exponentially more difficult. While our "after action review" of our performance found areas where we'd like to improve, as a practical matter, accurate forecasting, particularly at the operational and tactical levels, will remain a very, very challenging task. However, regardless of the accuracy of the result, the very process of developing a forecast is a very worthwhile one, since done correctly it can expand your mental models and focus your attention in the right directions.

With that in mind, the second feature article in this month's double issue attempts to answer the question you asked, albeit in very preliminary terms. We still don't sleep well at night; there seem to be trends underway that must inevitably reverse, and will likely have a dramatic impact when they do. Yet how those trends will interact, and what will emerge as the result, remains to be seen. To use a timely historical analogy, we have a vague worry that this is what the world may have felt like in 1908. In some ways, just like our world in 2008, it was a year with no shortage of exciting events to grab one's attention, even as H.G. Wells wrote in relative obscurity about the possibility of global war. That year saw a presidential election in

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the United States between William Howard Taft and William Jennings Bryan, an Olympics in London, an exciting long-distance road race between New York and Paris (via Russia), a large meteorite explosion in Siberia, a growing number of women's suffrage marches in the U.S. and U.K., the launch of the model-T Ford and early experiments with radio broadcasting, the Dow Jones Index up by almost 50%, the first oil production in the Middle East (in Iran), political upheavals in the Ottoman empire and Egypt, growing tension between Germany and France over Morocco, and between Russian, Serbia and the Austro-Hungarian Empire over the latter's annexation of Bosnia-Herzegovina, and in China, the suspicious death of the dowager empress and ascension of two year old Pu-Yi to the throne. Few, we are sure, imagined then what the next forty years would be like, even as forces were taking shape that would dramatically transform the world. We wonder whether that is happening yet again, while our attentions are focused on the current events that transfix us today.

This loyal U.K. based subscriber is curious about what you think about the presidential election underway in the U.S.

We are of the school that believes that history is made by the intersection of dynamic forces with individuals. The forces that will determine the next American president's agenda and constrain his options are both strong and uncertain. In this climate, the American people seem to be looking for strong leadership rather than competent management. To its credit, the presidential primary system has put forth two candidates who meet that test. In that sense, this is a "no lose" election for the country, even though it has inevitably resulted in a campaign that is focused on character (and character attacks) rather than a discussion of the fundamentally different policies that will be needed in the years ahead to deal with the problems that are sapping America's strength just as we head into a period of heightened global uncertainty.

More specifically, we believe that six domestic policy changes could dramatically improve the path the country is on: (1) replace the progressive income tax with a progressive consumption tax to encourage savings and limit consumers' incentive to overspend and over-leverage themselves; (2) institute a national service requirement – covering both military and non-military service – to reverse the fragmentation of the country into increasingly extremist blocs that has accelerated over the past thirty years; (3) copy Australia and make it mandatory

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to contribute to pension plans like 401k accounts. Ensure that these contributions are invested in a broadly diversified portfolio of low cost index funds, as is currently the case in the defined contribution pension plan for federal government employees, and make mandatory the annuitization of the balances in these funds upon a contributor's retirement; (4) again, copy Australia's "two tier" health care system, which combines a privately run health care delivery system (to ensure cost and quality competition), a national single payer system financed by contributions tied to income (to pays for a basic level of health care for everyone), and private insurance (to pay for "luxury" health care services). This will help control costs, equalize quality, and improve America's productivity by reversing its declining rates of geographic mobility; (5) add further benefits to productivity growth by copying the educational reforms already undertaken in Canada (especially in the province of Alberta), where taxpayer funds follow the child and schools (be they public, private or religious) compete for students, teachers are rewarded with merit bonuses, and all children are regularly tested to ensure they meet rigorous standards; and (6) dramatically change foreign policy dynamics by establishing an energy policy worthy of the name that focuses on developing cost effective alternatives to hydrocarbon fuels and technologies that reduce emissions from the use of coal. In our mind, a failure by the next U.S. president to use his leadership skills to enact these (or similar) policies will only ensure that the country continues its decline at a time when the world's other capitalist democracies may ill be able to afford that outcome.

Is there any research based on the equally weighted portfolio as a viable asset allocation?

As we have noted in the past, our logic for using a portfolio equally weighted across a number of broadly defined asset classes is that it makes no assumptions at all about their future returns, risks and correlations, and hence avoids the compounding of estimation errors over time. Of course, it still leaves potential error that can come from defining asset classes too narrowly (e.g., small cap and large cap equities, property and bonds, instead of equity, property and bonds), and ending up with an unbalanced exposure to different underlying return generating processes. On the subject of research, many studies have found that simple averaging of different forecasts tend to outperform more complicated approaches (e.g., "Optimal Forecast Combination Under Regime Switching" by Elliott and Timmermann, or "Forecast Combination

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with Entry and Exit of Experts" by Capistran and Timmerman). With respect to portfolio applications, we recommend two papers that have looked at the 1/N approach, and found it advantageous where the risk of compounding estimation errors is high: "1/N" by De Miguel, Galappi and Uppal and "The 1/N Pension Investment Puzzle" by Windcliff and Boyle.

At our investment firm, we use your publications as "an anchor to windward" to help us stay focused and not go off in all directions, particularly with the current volatile and uncertain investing world. In past issues, you have looked at a few products that allow retail investors to get some exposure to pure alpha, or as pure as it gets. Are there now enough products out there for you to do one of your great in-depth analyses of this sector?

We appreciate your sailing analogy, and are delighted to hear about the way you see our publications. We try to take a clear position and describe in detail the logic chain, evidence, assumptions and uncertainties behind our conclusions. If this enables our readers to weigh the merits of our arguments against those made by other publications, and then make investing decisions with more confidence and less fear of regret, we have achieved our goal. We agree with the point you made about the rising number of products that claim to offer "alternative" strategies (though many of these are clearly not uncorrelated alpha strategies). As we highlight in this month's product and strategy notes, there is growing evidence that a portfolio based on a mix of index and uncorrelated alpha funds is superior to one made up of actively managed long-only funds. That said, as we also highlight this month, it is extremely difficult to identified skilled uncorrelated alpha managers in advance (which leads to our preference for giving an equal weighting to a group of unrelated approaches). However, recent analyses also serve to point us in the direction of where the best products should lie – they are likely to have low correlations not only with the returns on major asset classes (and not just the equity asset class), but also with the index return for other funds employing a similar strategy. We agree that the time has come to undertake this analysis, and will soon perform it and report the results.

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Global Asset Class Returns

YTD 29Aug08	In USD	In AUD	In CAD	In EURO	In JPY	In GBP	In CHF	In INR
Asset Held								
US Bonds	1.74%	3.65%	8.62%	1.04%	-1.20%	10.11%	-1.34%	12.03%
US Prop	1.91%	3.82%	8.79%	1.21%	-1.03%	10.28%	-1.17%	12.20%
US Equity	-10.20%	-8.29%	-3.32%	-10.90%	-13.14%	-1.83%	-13.28%	0.09%
AUS Bonds	3.71%	5.62%	10.59%	3.01%	0.77%	12.08%	0.63%	14.00%
AUS Prop	-29.07%	-27.16%	-22.19%	-29.77%	-32.01%	-20.70%	-32.15%	-18.78%
AUS Equity	-17.35%	-15.44%	-10.47%	-18.05%	-20.29%	-8.98%	-20.43%	-7.06%
CAN Bonds	-2.55%	-0.63%	4.33%	-3.24%	-5.49%	5.82%	-5.63%	7.74%
CAN Prop	-10.28%	-8.37%	-3.40%	-10.98%	-13.22%	-1.91%	-13.36%	0.01%
CAN Equity	-8.27%	-6.36%	-1.39%	-8.97%	-11.21%	0.10%	-11.35%	2.01%
Euro Bonds	2.15%	4.06%	9.03%	1.45%	-0.79%	10.52%	-0.93%	12.43%
Euro Prop.	-12.50%	-10.59%	-5.62%	-13.20%	-15.44%	-4.13%	-15.58%	-2.21%
Euro Equity	-23.03%	-21.12%	-16.15%	-23.73%	-25.97%	-14.66%	-26.11%	-12.74%
Japan Bnds	3.83%	5.74%	10.71%	3.13%	0.89%	12.20%	0.75%	14.12%
Japan Prop	-19.61%	-17.70%	-12.73%	-20.31%	-22.55%	-11.24%	-22.69%	-9.32%
Japan Eqty	-14.15%	-12.23%	-7.27%	-14.84%	-17.08%	-5.78%	-17.23%	-3.86%
UK Bonds	-7.50%	-5.59%	-0.63%	-8.20%	-10.44%	0.86%	-10.58%	2.78%
UK Prop.	-24.22%	-22.31%	-17.34%	-24.92%	-27.16%	-15.85%	-27.30%	-13.93%
UK Equity	-20.27%	-18.35%	-13.39%	-20.96%	-23.20%	-11.90%	-23.35%	-9.98%
World Bnds	1.26%	3.17%	8.14%	0.56%	-1.68%	9.63%	-1.82%	11.55%
World Prop.	-15.83%	-13.92%	-8.95%	-16.53%	-18.77%	-7.46%	-18.91%	-5.54%
World Eqty	-14.38%	-12.46%	-7.50%	-15.07%	-17.31%	-6.01%	-17.45%	-4.09%
Commod	3.45%	5.36%	10.33%	2.75%	0.51%	11.82%	0.37%	13.74%
Timber	6.25%	8.16%	13.13%	5.55%	3.31%	14.62%	3.17%	16.53%
EqMktNtrl	-3.93%	-2.01%	2.95%	-4.62%	-6.86%	4.44%	-7.01%	6.36%
Volatility	-8.22%	-6.31%	-1.34%	-8.92%	-11.16%	0.15%	-11.30%	2.07%
Currency								
AUD	-1.91%	0.00%	4.97%	-2.61%	-4.85%	6.46%	-4.99%	8.37%
CAD	-6.88%	-4.97%	0.00%	-7.58%	-9.82%	1.49%	-9.96%	3.41%
EUR	0.70%	2.61%	7.58%	0.00%	-2.24%	9.07%	-2.38%	10.98%
JPY	2.94%	4.85%	9.82%	2.24%	0.00%	11.31%	-0.14%	13.23%
GBP	-8.37%	-6.46%	-1.49%	-9.07%	-11.31%	0.00%	-11.45%	1.92%
USD	0.00%	1.91%	6.88%	-0.70%	-2.94%	8.37%	-3.08%	10.29%
CHF	3.08%	4.99%	9.96%	2.38%	0.14%	11.45%	0.00%	13.37%
INR	-10.29%	-8.37%	-3.41%	-10.98%	-13.23%	-1.92%	-13.37%	0.00%

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Asset Class Valuation Update

Our market valuation analyses are based on the assumption that markets are not perfectly efficient and always in equilibrium. This means that it is possible for the supply of future returns a market is expected to provide to be higher or lower than the returns investors logically demand. This means that we believe asset classes can be over or undervalued. We also believe that the use of a consistent quantitative approach to assessing valuation helps to overcome normal human tendencies towards over-optimism, overconfidence, wishful thinking, and other biases that can cause investors to make decisions they later regret. Finally, we stress that our monthly market valuation update is only a snapshot in time of the results of complex and often non-linear market processes. For that reason, our concluding that a given asset class is over or undervalued says nothing about whether that situation will increase or reverse in the future.

In the case of an equity market, we define the future supply of returns to be equal to the current dividend yield plus the rate at which dividends are expected to grow in the future. We define the return investors demand as the current yield on real return government bonds plus an equity market risk premium. As described in our May, 2005 issue, people can and do disagree about the "right" values for these variables. Recognizing this, we present four valuation scenarios for an equity market, based on different values for three key variables. First, we use both the current dividend yield and the dividend yield adjusted upward by .50% to reflect share repurchases. Second, we define future dividend growth to be equal to the long-term rate of total (multifactor) productivity growth. For this variable, we use two different values, 1% or 2%. Third, we also use two different values for the equity risk premium required by investors: 2.5% and 4.0%. Different combinations of all these variables yield high and low scenarios for both the future returns the market is expected to supply (dividend yield plus growth rate), and the future returns investors will demand (real bond yield plus equity risk premium). We then use the dividend discount model to combine these scenarios, to produce four different views of whether an equity market is over, under, or fairly valued today. The specific formula is (Current Dividend Yield x 100) x (1+ Forecast Productivity Growth) divided by (Current Yield on Real Return Bonds + Equity Risk Premium - Forecast Productivity Growth). Our valuation estimates are shown in the following tables, where a value greater than 100% implies

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overvaluation, and less than 100% implies undervaluation. In our view, the greater the number of scenarios that point to overvaluation or undervaluation, the greater the probability that is likely to be the case.

Equity Market Valuation Analysis at 29 Aug 2008

Australia	Low Demanded Return	High Demanded Return
High Supplied Return	53%	82%
Low Supplied Return	81%	113%

Canada	Low Demanded Return	High Demanded Return
High Supplied Return	81%	140%
Low Supplied Return	152%	226%

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Eurozone	Low Demanded Return	High Demanded Return
High Supplied Return	59%	91%
Low Supplied Return	91%	128%

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Japan	Low Demanded Return	High Demanded Return
High Supplied Return	73%	137%
Low Supplied Return	149%	232%

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United Kingdom	Low Demanded Return	High Demanded Return
High Supplied Return	25%	57%
Low Supplied Return	53%	89%

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United States	Low Demanded Return	High Demanded Return
High Supplied Return	91%	150%
Low Supplied Return	164%	239%

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Switzerland	Low Demanded Return	High Demanded Return
High Supplied Return	45%	83%
Low Supplied Return	82%	213%

India	Low Demanded Return	High Demanded Return
High Supplied Return	94%	185%
Low Supplied Return	227%	361%

Our government bond market valuation update is based on the same supply and demand methodology we use for our equity market valuation update. In this case, the supply of future fixed income returns is equal to the current nominal yield on ten-year government bonds. The demand for future returns is equal to the current real bond yield plus the historical average inflation premium (the difference between nominal and real bond yields) between 1989 and 2003. To estimate of the degree of over or undervaluation for a bond market, we use the rate of return supplied and the rate of return demanded to calculate the present values of a ten year zero coupon government bond, and then compare them. If the rate supplied is higher than the rate demanded, the market will appear to be undervalued. This information is contained in the following table:

Bond Market Analysis as of 29Aug08

	Current Real Rate	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
Australia	2.25%	2.96%	5.21%	5.75%	0.55%	-5.04%
Canada	1.56%	2.40%	3.96%	3.53%	-0.43%	4.25%
Eurozone	2.28%	2.37%	4.65%	4.17%	-0.48%	4.71%
Japan	1.21%	0.77%	1.98%	1.42%	-0.56%	5.69%
UK	0.68%	3.17%	3.85%	4.48%	0.63%	-5.84%

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	Current Real Rate	Average Inflation Premium (89-03)	Required Nominal Return	Nominal Return Supplied (10 year Govt)	Return Gap	Asset Class Over or (Under) Valuation, based on 10 year zero
USA	1.82%	2.93%	4.75%	3.83%	-0.92%	9.22%
Switz.	1.30%	2.03%	3.33%	2.90%	-0.43%	4.26%
India	2.05%	7.57%	9.62%	9.15%	-0.47%	4.39%

*Derived from ten year yield and forecast inflation

It is important to note some important limitations of this analysis. First, it uses the current yield on real return government bonds (or, in the cases of Switzerland and India, the implied real yield if those bonds existed). Over the past forty years or so, this has averaged around 3.00% in the United States. Were we to use this rate, the required rate of return would generally increase. Theoretically, the "natural" or equilibrium real rate of interest is a function of three variables: (1) the expected rate of multifactor productivity growth (as it increases, so to should the demand for investment, which will tend to raise the real rate); (2) risk aversion (as investors become more risk averse they save more, which should reduce the real rate of interest, all else being equal); and (3) the time discount rate, or the rate at which investors are willing to trade off consumption today against consumption in the future. A higher discount rate reflects a greater desire to consume today rather than waiting (as consumption today becomes relatively more important, savings decline, which should cause the real rate to increase). These variables are not unrelated; a negative correlation (of about .3) has been found between risk aversion and the time discount rate. This means that as people become more risk averse, they also tend to be more concerned about the future (i.e., as risk aversion rises, the time discount rate falls).

All three of these variables can only be estimated with uncertainty. For example, a time discount rate of 2.0% and risk aversion factor of 4 are considered to be average, but studies show that there is wide variation within the population and across the studies themselves. The analysis in the following table starts with current real return bond yields and the OECD's estimates of multifactor productivity growth between 1995 and 2002 (with France and Germany proxying for the Eurozone). We then try to back out estimates for risk aversion and

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the time discount rate that would bring theoretical rates into line with those that have been observed in the market. Higher risk aversion factors and lower time discount rates indicate more conservative attitudes on the part of the average investor in a given currency zone. Increasing conservatism raises the risk of sharp downward price moves and increases in volatility when they occur at a time when many asset classes appear to be overvalued. If this conservatism becomes excessive (which is admittedly very hard to gauge), undervaluation may result. In contrast, falling risk aversion and rising time discount factors may indicate a rising danger of overvaluations occurring in asset markets. The real rate formula is [Time Discount Rate + ((1/Risk Aversion Factor) x MFP Growth)].

Real Interest Rate Analysis at 29Aug08

Real Rate Analysis	AUD	CAD	EUR	JPY	GBP	USD
Risk Aversion Factor	4.0	5.0	4.0	5.5	6.5	4.5
Time Discount Rate	1.75%	1.25%	1.75%	1.00%	0.50%	1.50%
MFP Growth	1.60%	1.20%	1.40%	0.60%	1.40%	1.40%
Theoretical Real Rate	2.15%	1.49%	2.10%	1.11%	0.72%	1.81%
Actual Real Rate	2.25%	1.56%	2.28%	1.21%	0.68%	1.82%

Our bond market analysis also uses historical inflation as an estimate of expected future inflation. This may not produce an accurate valuation estimate, if the historical average level of inflation is not a good predictor of average future inflation levels. For example, if expected future inflation is lower than historical inflation, required returns will be lower. All else being equal, this would reduce any estimated overvaluation or increase any estimated undervaluation. For example, if one were to assume a very different scenario, involving a prolonged recession, accompanied by deflation, then one could argue that government bond markets are actually undervalued today.

Let us now turn to the subject of the valuation of non-government bonds. Some have suggested that it is useful to decompose the bond yield spread into two parts. The first is the difference between the yield on AAA rated bonds and the yield on the ten year Treasury bond. Because default risk on AAA rated companies is very low, this spread may primarily reflect prevailing liquidity and jump (regime shift) risk conditions (e.g., between a low volatility, relatively high return regime, and a high volatility, lower return regime). The second is the difference between BBB and AAA rated bonds, which may tell us more about the level of compensation required by investors for bearing credit risk. For example, between August and

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October, 1998 (around the time of the Russian debt default and Long Term Capital Management crises), the AAA-Treasury spread jumped from 1.18% to 1.84%, while the BBB-AAA spread increased by much less, from .62% to .81%. This could be read as an indication of investor's higher concern with respect to the systematic risk implications of these crises (i.e., their potential to shift the financial markets into the low return, high volatility regime), and lesser concern with respect to their impact on the overall pricing of credit risk.

The following table shows the average level of these spreads between January, 1970 and December, 2005 (based on monthly Federal Reserve data), along with their standard deviations and 67% (average plus or minus one standard deviation) and 95% (average plus or minus two standard deviations) confidence range (i.e., based on historical data, 95% of the time you would expect the current spreads to be within two standard deviations of the long term average).

	AAA – 10 Year Treasury	**BBB-AAA**
Average	.97%	1.08%
Standard Deviation	.47%	.42%
Avg. +/- 1 SD	1.44% - .50%	1.51% - .66%
Avg. +/- 2 SD	1.91% - .03%	1.93% - .23%

At 29 August 2008, the AAA minus 10 year Treasury spread was 1.77%. This is significantly above the long-term average compensation for bearing liquidity and jump risk (assuming our model is correct), and reflects continuing investor concerns about the problems that have roiled the fixed income markets since August 2007 and have yet to fully abate.

At the end of the month, the BBB minus AAA spread was 1.52%. This one standard deviation above the long-term average compensation for bearing credit risk. However, it seems low given that conditions in the real economy continue to deteriorate. We still believe that it is more likely that credit risk (on this measure) is underpriced rather than overpriced today, and that, as a result, corporate bonds remain overvalued rather than undervalued.

For an investor contemplating the purchase of foreign bonds or equities, the expected future annual percentage change in the exchange rate is also important. Study after study has

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shown that there is no reliable way to forecast this, particularly in the short term. At best, you can make an estimate that is justified in theory, knowing that in practice it will not turn out to be accurate. That is what we have chosen to do here. Specifically, we have taken the difference between the yields on ten-year government bonds as our estimate of the likely future annual change in exchange rates between two regions. According to theory, the currency with the relatively higher interest rates should depreciate versus the currency with the lower interest rates. Of course, in the short term this often doesn't happen, which is the premise of the popular hedge fund "carry trade" strategy of borrowing in low interest rate currencies, investing in high interest rate currencies, and, essentially, betting that the change in exchange rates over the holding period for the trade won't eliminate the potential profit. Because (as noted in our June 2007 issue) there are some important players in the foreign exchange markets who are not profit maximizers, carry trades are often profitable, at least over short time horizons. Our expected medium to long-term changes in exchange rates are summarized in the following table:

Annual Exchange Rate Changes Implied by Bond Market Yields on 29Aug08

	To AUD	**To CAD**	**To EUR**	**To JPY**	**To GBP**	**To USD**	**To CHF**	**To INR**
From								
AUD	0.00%	-2.22%	-1.58%	-4.33%	-1.27%	-1.92%	-2.85%	3.40%
CAD	2.22%	0.00%	0.64%	-2.11%	0.95%	0.30%	-0.63%	5.62%
EUR	1.58%	-0.64%	0.00%	-2.75%	0.31%	-0.34%	-1.27%	4.98%
JPY	4.33%	2.11%	2.75%	0.00%	3.06%	2.41%	1.48%	7.73%
GBP	1.27%	-0.95%	-0.31%	-3.06%	0.00%	-0.65%	-1.58%	4.67%
USD	1.92%	-0.30%	0.34%	-2.41%	0.65%	0.00%	-0.93%	5.32%
CHF	2.85%	0.63%	1.27%	-1.48%	1.58%	0.93%	0.00%	6.25%
INR	-3.40%	-5.62%	-4.98%	-7.73%	-4.67%	-5.32%	-6.25%	0.00%

Our approach to valuing commercial property securities as an asset class is hindered by a lack of historical data about rates of dividend growth. To overcome this limitation, we have assumed that markets are fairly valued today (i.e., the expect supply of returns equals the expected returns demanded by investors), and "backed out" the implied future real growth rates

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for dividends (which over time should correlated with the real change in rental income) to see if they are reasonable in light of other evidence about the state of the economy (see below). This analysis assumes that investors require a 2.5% risk premium above the yield on real return bonds to compensate an investor for the risk of securitized commercial property as an asset class. The following table shows the results of this analysis:

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Commercial Property Securities Analysis as of 29Aug08

Country	Real Bond Yield	Plus Commercial Property Risk Premium	Less Dividend Yield on Commercial Property Securities	Equals Implied Rate of Future Real Dividend Growth
Australia	2.2%	2.5%	8.8%	-4.1%
Canada	1.6%	2.5%	5.4%	-1.3%
Eurozone	2.3%	2.5%	5.2%	-0.4%
Japan	1.2%	2.5%	2.4%	1.3%
Switzerland	1.3%	2.5%	1.0%	2.8%
United Kingdom	0.7%	2.5%	4.6%	-1.4%
United States	1.8%	2.5%	5.0%	-0.7%

If you think the implied real growth estimates in the last column are too high relative to your expectation for the future real growth in average rents, this implies commercial property securities are overvalued today. On the other hand, if you think the implied growth rate is too low, that implies undervaluation.

To estimate the likely direction of short term commodity futures price changes, we compare the current price to the historical distribution of futures index prices. Between 1991 and 2005 period, the Dow Jones AIG Commodities Index (DJAIG) had an average value of 107.6, with a standard deviation of 21.9. The 29 August 2008 closing value of 189.99 was slightly less than four standard deviations above the long term average (assuming the value of the index is normally distributed around its historical average, a value greater than three standard deviations away from that average should occur less than 1% of the time). If history is any guide, mean reversion will eventually cause these prices to fall back toward their long-term average levels. That said, we are clearly in unchartered territory today, whether due to speculation, a collective fear of high future inflation and/or a substantial decline in the value of the U.S. dollar versus many other currencies, and/or fundamental structural changes in supply and demand conditions in many commodity markets (e.g., the peak oil thesis, changing diets, and the increasing use of agricultural commodities for fuel as well as food, and/or a slow response of supply to increases in demand). For a much more extensive review of the different explanations for why commodity prices are so high, see the April 2008 World Economic

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Outlook published by the International Monetary Fund. Until the underlying factors driving the DJAIG higher become clearer, we continue to believe that the probability of a near term decline in the spot price of the DJAIG still seems much higher than the probability of a substantial further increase. At any given point in time, the current price of a commodity futures contract should equal the expected future spot price less some premium (i.e., expected return) the buyer of the future expects to receive for bearing the risk that this forecasted future spot price will be inaccurate. However, the *actual* return realized by the buyer of the futures contract can turn out to be quite different from the expected return. When it occurs, this difference will be due to unexpected changes in the spot price of the contract that occur after the date on which the futures contract was purchased but before it is closed out. If the unexpected change in the spot price is positive, the buyer of the futures contract (i.e., the investor) will receive a higher than expected return; if the unexpected price change is negative, the buyer's return will be lower than expected. In a perfectly efficient market, these unexpected price changes should be unpredictable, and over time net out to zero. On the other hand, if the futures market is less than perfectly efficient – if, for example, investors' emotions cause prices to sometimes diverge from their rational equilibrium values – then it is possible for futures contracts to be over or undervalued.

Our approach to assessing the current valuation of timber is based on two publicly traded timber REITS: Plum Creek (PCL) and Rayonier (RYN). As in the case of equities, we compare the return these are expected to supply (defined as their current dividend yield plus the expected growth rate of those dividends) to the equilibrium return investors should rationally demand for holding timber assets (defined as the current yield on real return bonds plus an appropriate risk premium for this asset class). Two of these variables are published: the dividend yields on the timber REITS and the yield on real return bonds. The other two variables have to be estimated, which presents a particularly difficult challenge with respect to the rate at which dividends will grow in the future. A number of factors contribute to the expected future growth rate of timber REIT dividends. These are listed in the following table, along with the assumptions we make about their future values:

Growth Driver	**Assumption**
Biological growth of trees	This varies widely according to the type and maturity a given timber property (and, indeed, biological growth doesn't directly translate into returns as different trees and growing arrangements also involve different costs. We assume 6% as the long term average.

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Harvesting rate	In order to produce a timber REIT's dividend, a certain physical volume of trees must be harvested each year. This will vary over time; for example, when prices are high, a smaller volume will have to be cut to pay for a given level of dividends. As a long term average, we assume that 5% of tree volume is harvested each year.
In-growth of trees	This refers to the fact that as trees grow taller and wider, they are capable of producing products with substantially higher values. This so called "grade change" will cause an increase in value (and hence return) of timber even when prices within each product category are falling. We assume this adds 3% per year to the return on timber assets.
Change in prices of timber and land on which the trees are growing	We assume that over the long term prices will just keep pace with inflation. In the U.S. some data shows real price increases of 2% per year over the past 20 years; however, IMF data shows real price declines on a world timber price index. Hence, we assume the contribution of real timber price changes to long term timber returns is zero. That said, given housing market problems around the world, in the short term we may see substantial declines in timber prices.
Diversification across countries	As in the case of commodities, that an investor in an internationally diversified portfolio of timber assets should earn a diversification return, similar to the one earned by investors in a well diversified portfolio of commodity futures contracts. In the interest of conservatism, we assume that in the case of timber this equals zero.
Carbon credits	In the future, investors in timberland may earn additional returns from the receipt and resale of carbon credits. However, since the future value of those credits is so uncertain, we have assumed no additional return from this source.

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This leaves the question of the appropriate return premium to assume for the overall risk of investing in timber as an asset class. Historically, the difference between returns on the NCRIEF timberland index and those on real return bonds has averaged around six percent. However, since the timber REITS are much more liquid than the properties included in the NCRIEF index, we have used four percent as the required return premium for investing in liquid timberland assets. Arguably, this may still be too high, as timber is an asset class whose return generating process (being partially biologically driven) has a low correlation with returns on other asset class. Hence, it should provide strong diversification benefits to a portfolio, and investors should require a relatively low risk premium to own it.

Given these assumptions, our assessment of the valuation of the timber asset class at 29 August 2008 is as follows:

Average Dividend Yield	3.85%
Plus Long Term Annual Biological Growth	6.00%
Less Percent of Physical Timber Stock Harvested Each Year	(5.00%)
Plus Average Annual Increase in Stock Value due to Ingrowth	3.00%
Plus Long Term Real Annual Price Change	0.00%
Plus Other Sources of Annual Value Increase (e.g., Carbon Credits)	0.00%
Equals Average Annual Real Return Supplied	**7.85%**
Real Bond Yield	1.82%
Plus Risk Premium for Timber	4.00%
Equals Average Annual Real Return Demanded	**5.82%**
Ratio of Returns Demanded/Returns Supplied Equals Valuation Ratio (less than 100% implies undervaluation)	**74%**

Our approach to assessing the current value of equity market volatility (as measured by the VIX index, which tracks the level of S&P 500 Index volatility implied by the current pricing of put and call options on this index) is similar to our approach to commodities. Between January 2, 1990 and December 30, 2005, the average value of the VIX Index was 19.45, with a standard deviation of 6.40. The one standard deviation (67% confidence interval)

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range was 13.05 to 28.85, and the two standard deviations (95% confidence) range was from 6.65 to 32.25. On 29 August 2008, the VIX closed at 20.65, very close to its long term average value. However, we believe this level is too low in light of rising uncertainty in the world economy and continuing turmoil in financial markets. Hence, we conclude that equity volatility is likely still undervalued today.

Sector and Style Rotation Watch

The following table shows a number of classic style and sector rotation strategies that attempt to generate above index returns by correctly forecasting turning points in the economy. This table assumes that active investors are trying to earn high returns by investing today in the styles and sectors that will perform best in the next stage of the economic cycle. The logic behind this is as follows: Theoretically, the fair price of an asset (also known as its fundamental value) is equal to the present value of the future cash flows it is expected to produce, discounted at a rate that reflects their relative riskiness.

Current economic conditions affect the current cash flow an asset produces. Future economic conditions affect future cash flows and discount rates. Because they are more numerous, expected future cash flows have a much bigger impact on the fundamental value of an asset than do current cash flows. Hence, if an investor is attempting to earn a positive return by purchasing today an asset whose value (and price) will increase in the future, he or she needs to accurately forecast the future value of that asset. To do this, he or she needs to forecast future economic conditions, and their impact on future cash flows and the future discount rate. Moreover, an investor also needs to do this before the majority of other investors reach the same conclusion about the asset's fair value, and through their buying and selling cause its price to adjust to that level (and eliminate the potential excess return).

We publish this table to make an important point: there is nothing unique about the various rotation strategies we describe, which are widely known by many investors. Rather, whatever active management returns (also known as "alpha") they are able to generate is directly related to how accurately (and consistently) one can forecast the turning points in the economic cycle. Regularly getting this right is beyond the skills of most investors. In other words, most of us are better off just getting our asset allocations right, and implementing them

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via index funds rather than trying to earn extra returns by accurately forecasting the ups and downs of different sub-segments of the U.S. equity and debt markets (for more on this, see "Sector Rotation Over Business Cycles" by Stangl, Jacobsen, and Visaltanachoti and "Can Exchange Traded Funds Be Used to Exploit Industry Momentum?" by Swinkels and Tjong-A-Tjoe).

That being said, the highest rolling three month returns in the table do provide us with a rough indication of how investors expect the economy and interest rates to perform in the near future. *The highest returns in a given row indicate that a plurality of investors (as measured by the value of the assets they manage) are anticipating the economic and interest rate conditions noted at the top of the next column* (e.g., if long maturity bonds have the highest year to date returns, a plurality of bond investor opinion expects rates to fall in the near future). Comparing returns across strategies provides a rough indication of the extent of agreement (or disagreement) investors about the most likely upcoming changes in the state of the economy. When the rolling returns on different strategies indicate different conclusions about the most likely direction in which the economy is headed, we place the greatest weight on bond market indicators. Why? We start from a basic difference in the psychology of equity and bond investors. The different risk/return profiles for these two investments produce a different balance of optimism and pessimism. For equities, the downside is limited (in the case of bankruptcy) to the original value of the investment, while the upside is unlimited. This tends to produce an optimistic view of the world. For bonds, the upside is limited to the contracted rate of interest and getting your original investment back (assuming the bonds are held to maturity). In contrast, the downside is significantly greater – complete loss of principal. This tends to produce a more pessimistic (some might say realistic) view of the world. As we have written many times, investors seeking to achieve a funding goal over a multi-year time horizon, avoiding big downside losses is arguably more important than reaching for the last few basis points of return. Bond market investors' perspective tends to be more consistent with this view than equity investors' natural optimism. Hence, when our rolling rotation returns table provides conflicting information, we tend to put the most weight on bond investors' implied expectations for what lies ahead.

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Three Month Rolling Nominal Returns on Classic Rotation Strategies in the U.S. Markets

Rolling 3 Month Returns Through	***29Aug08***			
Economy	Bottoming	Strengthening	Peaking	Weakening
Interest Rates	Falling	Bottom	Rising	Peak
Style and Size Rotation	Small Growth (DSG) **-3.76%**	Small Value (DSV) **-4.81%**	Large Value (ELV) **-7.99%**	Large Growth (ELG) **-7.24%**
Sector Rotation	Cyclicals (IYC) **-4.64%** Technology (IYW) **-8.61%**	Basic Materials (IYM) **-13.06%** Industrials (IYJ) **-8.42%**	Energy (IYE) **-12.59%** Staples (IYK) **-2.50%**	Utilities (IDU) **-9.23%** Financials (IYF) **-12.40%**
Bond Market Rotation	Higher Risk (HYG) **-3.94%**	Short Maturity (SHY) **1.14%**	Low Risk (TIP) **1.94%**	Long Maturity (TLT) **5.04%**

The following table sums up our conclusions (based on the analysis summarized in this article) as to potential asset class under and overvaluations at the end of August 2008. The distinction between possible, likely and probable reflects a rising degree of confidence in our conclusion.

Probably Overvalued	Commodities, Corporate Bonds/Credit Risk, Most Equity Markets
Likely Overvalued	Commercial Property except Australia
Possibly Overvalued	Japan, US, Swiss and India Govt Bonds
Possibly Undervalued	Australian Dollar and UK Pound Govt Bonds; Australia Commercial Property; Non-U.S. Dollar Bonds
Likely Undervalued	Australian Dollar Real Return Bonds; U.K. Equity; Equity Volatility; Timber (in long run, if not short run given downward pricing pressure)
Probably Undervalued	

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Looking Back on the 2007 Credit Crisis

"Those who cannot remember the past are condemned to repeat it" is probably George Santayana's most prescient and oft-repeated quotation. It is with this timeless insight clearly in mind that this article will review the conclusions reached by a number of important recent analyses of the financial markets crisis that began in August 2007. Our focus will be on developing a better (though necessarily still incomplete) understanding of three of the key causal drivers of the crisis: the explosion of consumer spending and debt; the behavior of financial market institutions and the individuals who work for them; and the actions (or inaction) of the regulators. In each of these areas, we will first identify the key behavioral changes that contributed to the crisis, and then examine the underlying changes in positive and negative feedback loops that could have caused this result. We will finish with some tentative conclusions about how easy or difficult it will be to change the behaviors which lie at the heart of the current financial market crisis.

In their paper "Household Debt in the Consumer Age: Sources of Growth – Risk of Collapse", Cynamon and Fazzari explore the sources of the dramatic changes in consumer spending and borrowing behavior over the past twenty five years. They start with a critical question: what determines your consumption preferences? In contrast to many economists who tend to dodge this question, Cynamon and Fazzari accept the conclusions reached by anthropologists, sociologists and psychologists – that our consumption preferences are determined not only on rational analysis of costs and benefits, but also by our past consumption decisions (i.e., by habit) and by social considerations. Regarding habits, the authors note that they "create an asymmetry in that…consuming less than the habit level resonates more than a same size increase in consumption relative to the habit level." This is strongly reminiscent of Prospect Theory's finding that underperforming a given reference point (e.g., the cost of an investment, the return on an index, or the portfolio returns one's brother-in-law brags about) hurts roughly twice as much as outperforming said reference point feels good.

While habit formation has undoubtedly contributed to the rise in consumer spending in recent years, we believe that other factors have had a stronger effect. The most important are

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those related to the social aspects of consumption decisions. At the most basic level, evolutionary biologists have suggested a logical motive for conspicuous consumption by males – an attempt to signal one's relative possession of valued resources, in order to attract the most desirable mate. This accounts for the male peacock's plumage, and presumably some part of some humans' desire to conspicuously consume. However, that seems to explain only a very small part of what has been driving this latter process. While a number of writers have delved deeper into this issue over the years (e.g., Affluenza by John De Graaf, or Luxury Fever by Robert Frank), we have found Juliet Schorr's analyses particularly insightful. In her paper, "Understanding the New Consumerism: Inequality, Emulation and the Erosion of Well-Being", Schorr argues that the last twenty years have been characterized by a critical shift in consumer attitudes and behavior. To begin with, she asserts that today in the United States (and to varying degrees other developed countries) "much of the function and motivation for consumption derives from social communication and symbolic action, rather than the desire to meet basic needs like food, shelter and clothing." Put differently, people buy many products not only because of what they do (i.e., their functionality and performance) but also because of how consuming those products makes them *feel*. More importantly, "the 'new consumerism' is first and foremost defined by an unusually large increase in the dominant norm of consumer aspiration. The previously dominant norm of 'comfort' has been replaced by a norm of 'affluence' or 'luxury'. In structural terms, this can be described as a shift to a situation in which the upper twenty percent of the income and wealth distribution (whose consumption patterns are roughly synonymous with affluence and luxury) becomes a widespread emulative target throughout society. This is what I call 'vertical' or 'hierarchical' emulation…To make this clearer, consider the old consumerism. This is the world of Thorsten Veblen…in which consumer aspirations and expenditures were prompted by comparative processes that were mainly horizontal and proximate…The phenomenon of 'keeping up with the Joneses' was mainly neighborhood based, and operated through face to face contact. Mrs. Smith went next door to see Mrs. Jones' new refrigerator…These neighborhoods were relatively economically homogenous (i.e., the Smiths and Joneses were of roughly similar economic status), and consumption comparisons were mainly intra-class."

Schorr then describes the three factors that led to the demise of the old consumerism, and the rise of the current system. "The first was the dramatic growth in income and wealth

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inequality that has occurred over the past twenty years." In previous articles, we have described the many factors which have contributed to this, including the impact of information technology (which increased the productivity and incomes of highly skilled knowledge workers, while automating and eliminating many traditional middle management/middle income jobs), globalization (which simultaneously increased the potential market and potential income for highly skilled workers, even as it increased competition and depressed wages for unskilled workers), and social trends (e.g., the tendency of more educated people to marry each other, work a high number of hours and not divorce, while people at the lower end of the educational scale do just the opposite). The impact of these trends over the past forty years is shown in the following table (all income ranges were converted U.S. 2007 dollars in the underlying calculations, to eliminate the impact of inflation):

Share of U.S. Households in Different Income Categories (source: U.S. Census)

Year	< $25k	$25k - $35k	$35k - $75k	$75k-$100k	> $100k
2007	25%	11%	32%	12%	20%
1997	26%	11%	34%	12%	17%
1987	27%	12%	36%	12%	13%
1977	29%	12%	39%	11%	9%
1967	31%	14%	42%	8%	5%

As you can see, this table tells a number of different stories. On the positive side, and consistent with the continuing increase in the United States' productivity over the past forty years, the percentage of households in the lowest two income categories (which one might label lower and lower middle class) has declined. On the negative side, the shift across the rest of the spectrum (e.g., the change in the size of the middle, upper middle, and upper classes) has been lopsided, with the traditional middle (defined as between 75% and 150% of median household income) shrinking, and the upper class quadrupling in relative size. In terms of Schorr's analysis, it is not hard to see why the consumption patterns of the upper middle and

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upper income groups have substantially increased their gravitational pull on the population as a whole, as these groups went from 13% of households in 1967 to 32% of households today.

Equally telling is a comparison between the way people view themselves in terms of the class distribution, and what the Census income statistics show. The following table makes this comparison, using 2007 class self-identification data from the Pew Foundation report "Inside the Middle Class: Bad Times Hit the Good Life" (1% of the latter did not answer this question).

	Lower	**Lower Middle**	**Middle**	**Upper Middle**	**Upper**
Self-Reported	6%	19%	53%	19%	2%
Census Income	25%	11%	32%	12%	20%
Difference	(19%)	8%	21%	7%	(18%)

If self-identified social class drives desired consumption patterns, while income potentially puts a limit on actual purchases (in the absence of reduced saving and/or increased debt), then this table makes quite clear the underlying tension propelling spending and the temptation to borrow to pay for it.

The second trend identified by Schorr was the entry of large numbers of women into the workforce. Schorr notes that "the 1950s and 1960s were a period of high levels of civic engagement and neighborhood socializing. Women met together in morning 'coffee klatches'; they talked together at playgrounds and schools; they entertained at 'cocktail hours.' This fostered horizontal, proximate comparisons. [However, with the entrance of more women into the workforce], the workplace has replaced the neighborhood as an important site for social interaction. But because the corporation is a more hierarchical organization than the neighborhood, women were increasingly exposed to the consumer choices of those above them on the status ladder, which fueled vertical aspiration."

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Both of the first two trends were amplified and reinforced by the third -- changes over time in the media and the way people use it. Schorr notes that since the 1970s, "Americans have been interacting less with their neighbors, families and friends, and spending more time watching television" – and, more recently, on the internet. Schorr notes that "the media has two important functions in fostering the new consumerism. First, it has served as a major conduit of information on the consumption patterns of the top twenty percent. Second, it has imparted an upward bias to people's sense of the prevailing consumption norms, because media, particularly television and the movies, tend to lifestyles and possession of consumer goods at levels that are far above the actual norm…They tend to depict the 'average' household at a lifestyle which is, in fact, at the upper middle or above…[As a result], studies have shown that people who are heavy television viewers greatly overestimate how the average American lives and the possessions they have." Moreover, other researchers have found that as incomes rise, the amount of time spent watching television tends to decline (see, for example, "Neighborhood Environment as a Predictor of Television Watching Among Girls" by MacLeod, Gee, Crawford and Wang).

Thus far, we have looked at some of the drivers of the sharp increase in desired consumer spending over the past twenty years, and in particular for spending on goods such as housing that make one's status visible to one's peers. However, before we turn to how that spending was paid for, it is worth asking one more question: What caused a sufficient percentage of the households at the top of America's income distribution to consume so conspicuously (e.g., via the sharp increase in so-called "McMansions" and the number of expensive cars on the road), that they triggered the destructive "consumption arms race" described by Schorr and other authors? To be sure, not all of these households consumed conspicuously. In fact, there is evidence that conspicuous consumption declines with the increasing wealth of one's peer group (see, for example, "Conspicuous Consumption and Race" by Charles, Hurst, and Roussanov and "First Impressions: Status Signaling Using Brand Prominence" by Han, Nunes and Dreze). But enough of this consumption occurred to inspire a lot of envy and imitation in people who ultimately could not afford the spending they undertook. So we have to ask, what positive feedback loops drove this conspicuous spending by households at or close to the top of the income distribution, and what negative feedback

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loops failed to inhibit it? And will these change in the future, or new ones emerge to take their place?

Undoubtedly, many factors and trends contributed to conspicuous spending by affluent and other households, and the relationships between them are probably complex and non-linear. For that reason, a full understanding of them is beyond our grasp. We can however, still gain a "coarse grained" view of some of the key dynamics that were at work. To varying degrees, these probably included the following:

- Over time, Western societies have gradually been giving greater weight to the freedoms of the individual relative to his or her duty to any collective group (with this trend probably having gone further in the United States than anywhere else). Underlying this development has been the growing popularity of a psychotherapeutic view of the world and the individual's role in it, the mainstreaming of the 1960s liberation philosophy and post-modernist attacks on traditional institutions. The rise of individualism also reflected a sharp reduction in voluntary social group membership due to growing pressure to spend more time at work (to keep pace in an increasingly competitive and insecure economy), and a richer range of competing leisure time media offerings, both of which have been well chronicled by Robert Putnam in his book Bowling Alone.

- Another contributing factor was the weakening appeal of traditional institutions that were more concerned with long term than short term goals, that believed in sacrifice rather than instant gratification, and that sought to balance collective harmony individual self-fulfillment. For example, numerous pages have been written about the drop in respect for traditional elites as the Vietnam War and the "War on Poverty" failed to achieve their respective goals. Many have also written about falling participation in organized religion (and especially so-called "Mainline" Protestant churches) for reasons too numerous to list here.

- Finally, tax policy was also supportive, with falling marginal rates for affluent taxpayers.

- Hence, when many people discovered that their pursuit of liberation yielded alienation and anomie rather than the expected increase in happiness and fulfillment, they sought

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> new sources of social connection and individual meaning. Many of these began on the fringe and have gradually become mainstream social trends – for example, a concern with environmental quality has morphed into a broader "environmentalism" that for some verges on nature worship. Similarly, the last forty years have seen a growing focus on the human body in a variety of forms, including exercise, nutrition, sports, surgery and sexuality. Recent decades have also seen the growing popularity of practices and organizations focused on individual "spirituality" and therapy (e.g., yoga and self-help books and websites) designed to help disconnected individuals find meaning and establish behavioral norms. Finally, over the past twenty to thirty years, a substantial portion of the U.S. population has also turned to increased consumption – "shopping therapy" – to connect with other people and construct a story about the meaning of their lives.

With respect to the housing bubble in particular, we believe that two further motivating factors were at work. The first was the recognition by many people, particularly after the technology bubble burst, that they had not saved enough for retirement. In the face of strong social pressures to avoid cutting down on consumption to boost savings, the attractions of boosting one's net worth by "playing the real estate market" were clear. The second factor was the observation that, whatever one's personal doubts might have been about housing valuations, other people seemed to be making a lot of money from real estate. This undoubtedly caused many people to set aside their personal doubts, leverage up and "get into the game." Economists are divided as to whether that behavior represents irrational herding or a rational weighting of private versus public information (on the former, see "Thought and Behavior Contagion in Capital Markets" by Hirshleifer and Teoh; on the latter, see "Bubbles, Rational Expectations and Financial Markets" by Blanchard and Watson). Regardless of the underlying causal factors, it is clear that over the past decade, more and more people began to see residential real estate as an attractive investment, beyond its traditional role of providing shelter.

What are the chances that any of these trends will reverse in the future, and dampen consumer's desire to spend, and in particular spend on housing? Clearly, with so many people having been burned, the bloom will be off the housing rose for many years. And perhaps a

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growing concern with environmental sustainability will reduce the urge to consume for some. Rising marginal income tax rates on the affluent would also constrain spending, as would (more powerfully) a switch from a progressive income tax to a progressive consumption tax (which would discourage conspicuous spending while not penalizing saving). But since the chances of the latter being enacted seem slim, in the absence of a fundamental shift in social attitudes towards conspicuous consumption, we must conclude that the desire for high consumption spending is unlikely to fall very much in the years ahead. Perhaps even more important, the frustration of this desire should generate rising anger, with unpredictable political and policy consequences. At minimum, we expect higher income taxes on affluent taxpayers, and perhaps a greater social acceptability of bankruptcy – a collective willingness to "hit the reset button" so to speak.

Let us now turn to the second major driver of the global financial crisis that began in 2007. In the absence of financial market changes over the past two decades, people's increased desire to consume and invest in housing would have been constrained by their incomes, which for many were stagnating in the face of increased globalization and use of information technology. However, this wasn't the case – rather than acting as a firebreak, financial markets facilitated, and indeed encouraged, a dramatic increase in consumer borrowing, that resulted in U.S. personal consumption and residential real estate investment rising faster than personal income. Why did this happen?

In our view, the deep roots of the answer to this question lie in what has and hasn't changed since the LDC debt and Savings and Loan crises of the early 1980s – the last time when the global financial system faced a serious threat to its stability. The way these crises were resolved set precedents whose full impact would only be clear twenty five years later.

Following the sharp increases in oil prices that occurred in 1973 and 1979, the intermediation of large amounts of surplus funds earned by oil exporting countries largely took place through commercial banks, which issued short term deposits and make longer term loans. When Mexican finance minister Jesus Silva Herzog triggered the crisis in August, 1982 by telling the banks his country could not make its payments falling due, the world's governments also had a problem. So great was the amount of LDC loans on the books of the world's major banks that any attempt to mark them to market would wipe out the banks' equity and render

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them insolvent, causing a loss of depositor confidence, and likely triggering a liquidity crisis and global credit contraction. Over time, the response to the LDC debt crisis would include (a) a sharp increase in the money supply and a fall in yields on short term government bonds, as Central Banks provided funds to the banking system to avert a liquidity crisis; (b) actions by creditor country governments, working through the Paris Club and the IMF, to encourage policy reforms by debtor governments to improve their ability to repay their (usually restructured) debts; (c) use of capital market vehicles (e.g., Brady Bonds) to enable banks to shift LDC debt risks onto the balance sheets of investors who were believed to be better able to bear them; and (d) new regulations increasing minimum capital requirements for banks.

Originally established to take deposits and make long term fixed rate mortgage loans, by the early 1980s, United States Savings and Loan companies were losing money as depositors moved their money to innovative new deposit like accounts (e.g., NOW accounts) that paid higher rates of interest. To retain their deposits, S+Ls raised their rates to levels that ensured negative lending spreads and a gradual erosion of their capital. To reverse this process, in 1982 the U.S. Congress expanded the range of businesses S+Ls were allowed to undertake, while still funded with federally insured deposits. For many S+Ls, the attempt to grow themselves out of their original problem only created an even bigger one, as new investments based on either overly optimistic credit risk assumptions (or outright fraudulent ones) went sour. The crisis came to a head in 1989, when the Resolution Trust Corporation was formed to restructure the S+L industry and workout the large volume of bad loans it had made. Eventually, institutions with asset of $838 billion (in 2007 dollars) were intervened, with eventual losses of $247 billion (again in 2007 dollar terms) split 19%/89% between the industry and the U.S. taxpayer (for more detail, see "The Cost of the Savings and Loan Crisis" by Curry and Shibut of the U.S. FDIC). A key lesson learned from this crisis was the "moral hazard" created by removing market discipline. Specifically, it was believed that federal deposit guarantees caused investors to avoid close examination of the very risky loans and investments being made by the S+Ls. The remedy for this was clear: stronger support for "mark to market accounting" and the "originate to distribute" model of financial intermediation, which would not only distribute risk to those thought best able to bear it, but also ensure that those investors enforced "market discipline" on the creditors and intermediaries.

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Unfortunately, as so often happens in life, reality turned out to be quite different from what theory had predicted. More specifically, it looks as though a number of important assumptions were quite incorrect, including (a) that some or all of the parties involved in securities-focused "originate and distribute" approach to financial intermediation would have the information, skills and incentives needed to make good credit risk judgments; (b) that "mark-to-market" accounting rules would reinforce this market discipline; (c) that sufficient liquidity would be available to enable this system to function, even under stress; and (d) that strengthening bank capital requirements would further strengthen the credit system, and reduce the occurrence of risks to its fundamental stability and functioning. Let's look at each of these.

At this summer's annual Federal Reserve Bank of Kansas City Jackson Hole Symposium for the world's central bankers, Gary Gorton of Yale University delivered an outstanding paper that provides great insight into the microeconomic roots of what he called "The Panic of 2007" (for which the best analogy is probably a pre-Federal Reserve, pre-deposit insurance 19th century banking panic). Gorton's starting point is the expansion of subprime lending that occurred at an accelerating pace throughout the 1990s. Gorton notes the contribution of technology to this change (e.g., cheaper communications and computing made it easier and cheaper to collect, evaluate and share data about borrowers and loans, and to combine these into mortgage backed and even more complicated securities and derivatives. As an example, Gorton starts with the basic mortgage security structure, which involved issuing securities of different credit risk (also known as "tranches") against a pool of subprime mortgages, with the highest rated tranches having the most senior right to any cash received from payments on the underlying mortgages. Gorton then shows how this process would then be repeated, with less senior tranches of securities backed by different mortgage pools would be purchased and combined into a pool, which would issue its own mix of securities (so-called "collateralized debt obligations") with different ratings based on the seniority of their right to receive cash flows from the underlying mortgage backed securities. In turn, some of these CDO tranches would be bought by "special investment vehicles" which would fund them through the issuance of securities (i.e., asset backed commercial paper) with shorter maturities than the higher yielding CDO securities. Finally, Gorton notes that some CDO structures became the basis for the buying and selling of credit derivative contracts that once again shifted the party who ultimately bore the underlying default risk on the original sub-prime mortgage

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loans. As Gorton notes, "this nesting or interlinking of securities, structures and derivatives [which has also become known as the "shadow banking system"] resulted in a loss of information [about the underlying default risk] and ultimately in a loss of confidence since, as a practical matter, looking through to the underlying mortgages and modeling the [risk at] different levels of structure was not possible. And while this interlinking enabled the risk to be spread among many capital markets participants, it resulted in a loss of transparency as to where these risks ultimately ended up…The location and extent of the subprime [default] risk is unknown to anyone." In sum, creating a very complex structure of securities caused the loss of information needed to ascertain their fundamental value. To be sure, models of aggregate default risk (and recoveries conditional on default) provided some comfort (though on the basis of assumptions whose validity was at best uncertain). This left the entire subprime sector of the credit market perched on the precipice of a liquidity crisis, with values essentially held up by the continuing confidence of the players in the health of the overall system.

Gorton makes three other points that are critical for our purposes here. First, he shows how, in the face of the acknowledged riskiness of subprime borrowers, the financial services industry structured products that would generate a sufficient return for lenders only by forcing repeated refinancings over time (e.g., mortgages with low initial rates that reset to much higher rates after two years). He also shows how this system appeared stable as long as house prices were increasing and lenders were willing to refinance. The second crucial point Gorton makes is how the structure of subprime residential mortgage backed securities (RMBS) different in an important respect from those backed by higher quality loans (technically, the use of an excess spread instead of an overcollateralization approach), and how, uniquely, this "caused leakage in the protection for high quality tranches of the RMBS", which introduced further uncertainty as to their value after the subprime crisis was triggered.

Finally, Gorton shows how a major step towards the crisis tipping point was taken when a new credit derivative contract that tracked a subprime securities index (the ABX.HE) was launched in 2006. This index for the first time efficiently aggregated the views of market participants as to the value of various securities backed by subprime mortgages. In a mark-to-market world, the accountants now had an indicator they could use as a starting point for their discussions with the managements of different financial institutions about their valuation of

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these securities. So too did the regulators (for capital adequacy discussions) and lenders (for assessing the value of collateral backing loans). Last but not least, speculators with a negative view of the future of subprime now had a means for shorting the market. The stage was set for what followed. And with $1.5 trillion (i.e., $1,500 billion) of subprime and Alt-A (a step above subprime, but still below prime) mortgages outstanding, the resulting crisis was destined to be a big one and pose risks to the stability of the world's financial system.

However, even if adequate valuation information had been available, there was still the question of whether people with sufficient skill would have been available to draw accurate conclusions about the credit risks involved in the subprime market. Having started out as credit analysts (back in the old days when that meant green spread sheets, number two pencils and a four function calculator), we have long noted the decline of this skill across the financial world. As a friend who still holds a high position in this world once colorfully put it, "you can draw a line in many financial services organizations based on age. Below that line, people think 'credit' is something you assess using a model, then package and trade. Above it, they still think of credit risk as something that ultimately requires human judgment to assess and that can really bite you in the ass if you get it wrong."

In the past, we have noted the questions that some authors have raised about the assumptions used in quantitative credit risk models (e.g., Jon Danielsson's 2001 paper "The Emperor Has No Clothes: Limits to Risk Modeling"). Now two more papers have been published that reach the same conclusion on this issue. In "Credit Risk Models: Why They Failed in the Credit Crisis", Wilson Sy notes that fundamental assumptions used in many of these models turned out to be wrong -- e.g., normal distributions for key variables, an assumption that equilibrium conditions would always prevail, a focus on asset to liability ratios rather than cash flow to service debt, and a view that the limited amount of historical data available was an accurate guide to the future.

In addition to a lack of information and a dearth of skill, the credit market panic of 2007 has its roots in the system of incentives that drove the behavior of the players in the origination, structuring, distribution and investment parts of the financial system. To make a long story short, nobody had an effective incentive to stop the growth of what would eventually become the subprime bubble. Let's start at the origination end of the process, with real estate agents.

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We have no doubt that many of them recognized a simple truth: that real estate booms depend on a steady stream of first time buyers at the bottom end of the market, who enable those above them to "trade up." Moreover, in most cases, real estate agents are legally agents of the seller of the house, not the buyer. Their interest is in getting the highest price for the property, not in counseling buyers on whether or not they can afford it. Rather, their main concern is whether the buyer is approved for a mortgage. Now let's move on to system that provided subprime mortgages. About five years ago, we remember someone cynically asking, "When did mortgage brokers start calling themselves mortgage bankers?" We wish we had fully understood the insight contained in that pithy question. Mortgage brokers/bankers acted as agents of the companies who actually loaned the money. The brokers made money when they arranged mortgage loans for borrowers, not when they told borrowers they were turned down. To make these loans, the brokers had to find lenders who would accept a potential borrower's credit, and an appraiser who would vouch for the value of the house that would serve as security for the mortgage. The former challenge was made easier by the growing competition between different lenders, which in turn was facilitated by the development of the "originate to distribute" business model, in which lenders made money not by holding loans to maturity, but rather by earning fees from packaging them into mortgage backed securities that could be sold to other intermediaries (who in turn would sell their senior tranches to final investors, and use the lower rated tranches to create CDOs). These two changes led to a progressive weakening of the requirements for getting a mortgage loan (once again, the old adage that when something seems too good to be true it usually is – e.g., "how did they afford that house?" – once again proved accurate). Gorton presents data showing how subprime and Alt-A (the next category above subprime) mortgages rose from 7.2% of gross mortgage backed security issuance in 2001 to 39.4% by 2006. In theory, appraisers should have restrained the growth of the residential real estate bubble and the subprime crisis. However, logic suggests that appraisers who provided low values would soon see their business declining. Press reports have indicated that surveys have shown a substantial percentage of appraisers reported feeling pressured (e.g., by mortgage brokers) to inflate the house values they reported (see, for example, a 2005 paper by David Callan, "Home Insecurity: How Widespread Appraisal Fraud Puts Homeowners at Risk"). Moreover, appraisers also faced an intellectual challenge – how to determine the value of a home. In the home buying experiences we have had, the appraiser's approach has

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generally consisted of identifying comparable properties, and their most recent sales prices. This is not very different from the approach taken by the many online "what is my house worth" services that have sprung up in the past decade. What we have never seen is an appraiser who used as an input into his or her valuation the prevailing average sales price to rents or sales price to income ratios for a market – which are generally used as bubble indicators. It therefore seems to us that appraisers' methodology makes them as likely to reinforce a bubble as to prick one before it grows in size and destructive force.

Let us move on to the mortgage lenders. Back in the dark ages, financial intermediaries made mortgage loans that remained on their books until they were repaid. And as we can say from experience, since your name was attached to loans you made that went bad, bankers had career incentives that lined up quite closely with the way shareholders' expected them to behave. Over time, that "old fashioned" model gave way to one in which lenders paid mortgage brokers (er, mortgage bankers) to originate loans, whose creditworthiness the assessed with credit scoring models, and which they funded and held on their books for a short time until they were pooled in a special purpose vehicle and used to back a new issue of mortgage backed securities underwritten by an investment bank. Clearly, these wholesale lenders made more money when they made and securitized more loans.

Investment banks not only underwrote the original mortgage securities, but often earned additional fees from putting together CDOs and selling the securities that they issued. And in the process, they leveraged up their balance sheets to astronomical heights to finance the "work in process" inventory this business generated (usually lower rated tranches that were harder to sell, but in the meantime generated – at least in accounting terms – a nice positive carry). The reason commercial and investment banks plunged wholeheartedly into this business isn't hard to understand. To put it simply, thanks to competition their traditional businesses (e.g., in underwriting, brokerage, and the provision of financial advice) investment banks were under tremendous profit pressure, and, because of their complexity, mortgage securities appeared to be a very profitable exception to this trend (as did proprietary trading for their own account and servicing hedge funds, both of which may have contributed to their current problems). That said, you would still like to think that a concern for its reputation would cause an investment bank to think twice before selling dodgy securities to its buy side clients. Balanced against this,

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however, was the pressure to hit quarterly earnings targets and, at the personal level, investment bankers' and traders' perennial myopia ("this year's bonus makes next year's mortgage payments") and asymmetric incentives ("if this deal makes a load of money I get a big bonus; if it loses a load of money and adds to systemic risk, I only lose my job and find another one somewhere else"). This is nothing new. And to be fair, the increasingly mercenary attitude of many buy side institutions (which were also under pressure to outperform their index benchmarks) also contributed to a decline in concern for, and the value placed on, long-term relationships. This too is a change that has been going on for years. So, while many firms tried to instill a long term perspective (or hold on to the last shreds of a bygone partnership culture) and "cultural control" on excessive risk taking by granting substantial portions of employee bonuses in the form of restricted stock, in truth, there were only two potentially powerful internal sources of restraint on financial intermediaries' tendency to take large amounts of risk in the hopes of earning equally large bonuses: risk management systems and leadership quality.

With respect to internal risk management systems and staff, there were at least two weaknesses. The first was a failure to see how the imposition of common regulatory capital requirements based on the use of Value at Risk (VaR) models created the potential for endogenous risk, or second order effects – models could not properly account for the impact of everybody using the same models to measure and manage risk exposures. As Elizabeth Sheedy from Macquarie University notes in her paper "Why VaR Models Failed", risk models' failure to anticipate volatility clustering, was caused in part by an accelerating vicious circle (i.e., positive feedback loop) whereby a decline in the value of a subprime related security led to a higher value at risk, which triggered higher capital and collateral requirements, which forced security sales, which drove the price further down, further increasing volatility and VaR while at the same time causing liquidity providers to withdraw from what they saw as an increasingly dangerous market, which in turn further depressed security prices, and further reinforced the downward cycle.

It is not that these dangers were unforeseen. Drexel Burnham ultimately failed because of a sudden liquidity crisis. So too did Askin Capital Management (a firm that used high leverage to invest in illiquid mortgage securities) in 1994. And Enron ultimately succumbed as a result of the combination of high leverage and disappearing liquidity. More recently, in a February 2006

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speech, Timothy Geithner, President of the Federal Reserve Bank of New York gave the following warning: "A characteristic feature of periods of financial innovation is that growth in new instruments and changes in the structure of those markets can outpace the development of the risk management and processing and settlement infrastructure. This gap, the gap between the speed at which markets move to capture the benefits of new opportunities and the pace of development in the supporting control and execution infrastructure, is inevitable. The size and duration of the gap and the risks it presents to the financial system are a function both of will and of ability. They are determined, in part, by the scale of investments that firms make in the infrastructure—investments in people, in technology and in control processes—and they are determined in part by knowledge and experience, which are functions of the environment surrounding innovation."

"Market discipline exercised by counterparties should create incentives to close these gaps relatively quickly, but competition among financial intermediaries can, at least for some period of time, create offsetting incentives and may make individual institutions less willing to move ahead of the pace of improvement of average practice among market participants. This can take the form of what economists call a collective action problem, leaving individual institutions and the systems as a whole with more risk than would be desirable. And when innovation, such as we are now seeing in credit derivatives, takes place in a period of generally favorable economic and financial conditions, we are necessarily left with more uncertainty about how exposures will evolve and markets will function in less favorable circumstances…Internal risk management systems have improved substantially since the mid-1990s, but most firms still face considerable challenges in aggregating exposures across the firm, capturing concentrations in exposures to credit and other risks, and producing stress testing and scenario analysis on a fully integrated picture of exposures generated across their increasingly diverse array of activities. The greater diversity of institutions that now provide demand for credit risk, or are willing to hold credit risk, should make credit markets more liquid and resilient than would be the case if credit risk was still held predominantly by banks or by a smaller number of more uniform institutions, with less capacity to hedge those exposures. However, we still face considerable uncertainty about how market liquidity will behave in the context of a major deterioration in credit conditions or a sharp increase in volatility in equity and credit spreads, and this

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uncertainty is hard to quantify and therefore hard to integrate into the risk management process…"

"The frontier of challenges in the risk management process lies principally in the discipline of stress testing and scenario analysis to capture potential losses in adverse conditions in the "tail" of the distribution. This has been and will continue to be a principal focus of our supervisory efforts. Best practice in these areas is defined by several factors, including:

- the capacity of the firm to capture quickly and aggregate exposures across the firm to specific types of risks, and to integrate these into the stress testing process,

- the use of a range of different approaches to measuring exposures in conditions of stress, what the Counterparty Risk Management Group II calls "a portfolio of analytics,"

- the quality of the effort applied to understanding how risks interact in conditions of stress, particularly market and credit risk,

- the degree of attention to how a substantial and prolonged reduction in market liquidity might amplify losses,

- the balance between the identification of scenarios plausible or realistic enough to more easily capture management attention and those scenarios that may be less plausible but substantially more damaging to the firm,

- the care given to the particular challenges in measuring exposure in illiquid and complex products,

- the adequacy of the cushions—in terms of capital and liquidity—maintained against adverse scenarios where uncertainty is highest, and the strength of the connection between the identification of potential losses and changes to exposure limits and the risk profile of the firm, and

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- the attention given to the range of risks presented by greater concentration in some markets, from the implications of the failure of a major institution to the constraints a large firm might itself face in its capacity to limit its own losses in adverse conditions without exacerbating those conditions."

In light of the points made by Geithner, which amounted to a warning to the major commercial and investment banks, how did we still manage to end up where we are today? This brings us to the second flawed bulwark against excessive risk taking: just as was the case at Enron, banks' internal risk management departments appear to have had no teeth (with J.P. Morgan Chase, Goldman Sachs and Morgan Stanley thus far appearing to be notable exceptions to this generalization). Again, given the amounts of bonus money at stake, this should come as no surprise. The pressure on risk managers to be "team players" and get deals done that would add to the bonus pool – especially when they aspired to eventually move into more lucrative sales and trading or investment banking roles – was undoubtedly overwhelming. But this has always been the case, and begs an important question: what was different at Goldman Sachs and the other firms?

This brings us to the second and ultimately most important source of organizational restraint when it came to risk taking: the quality of a firm's leaders and the culture they created and reinforced. Take Goldman. Even after they went public, the firm's leaders went to great lengths to try to retain the ethos of a partnership, with its "one team" and "capital preservation" culture. While Goldman's failure to take on as much subprime risk as other firms clearly reduced some employees' bonuses, there were no mass defections. Rather, they seem to have been able to place the reputation, survival and profitability of the firm above their individual self-interest. Not that everybody who works there is a saint. Rather, the key point is that Goldman's leaders (and their peers at a few other firms) seemed better able to resist the temptations of the subprime market. While books will undoubtedly be written about this, we strongly believe that this is due not to the efforts of one or two individuals, but rather to the cultures that were built and reinforced at these firms over decades (of course, at J.P. Morgan Chase Manny Hanny Chemical that raises the question of which predecessor firm's culture was responsible for this – but that is a subject outside the scope of this article).

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Finally, let us move on to the ultimate buyers of securities based on subprime mortgages. Why were they willing to hold this paper at such low spreads? How did so many experienced buy-side players miscalculate the real risk involved? We can think of at least five reasons. The first is that the buy side was using the same risk assessment models as their sell-side peers. As previously noted, when subprime loans were combined into a daisy chain of securities and derivative contracts, critical information about the fundamental return/risk generating process was lost. This led to the overreliance on statistical models of risk that made so many old credit types so nervous. In addition, just like the sell side, the buy-side's models vastly underestimated the potential for a severe liquidity crisis to undermine their models' core assumption of continuous markets for the assets they held (a lesson learned the hard way one October day in 1987, that has apparently been forgotten over the years).

The second reason the buy side may have been willing to hold subprime paper at relatively low spreads over government securities was that they believed the rating agencies (Standard and Poor's, Moody's and Fitch) had accurately assessed the risk when they had assigned AAA ratings to senior tranches of CDOs based on subprime mortgages. Apparently far too few investors thought that rating agencies, like housing appraisers, were also in a competitive business that created agency conflicts, or that their models could be wrong. The third reason is that some of these investors thought they had hedged their exposure by buying credit default swaps (i.e., a put option or an insurance policy) on the risky subprime debt that they held. So long as the sum of the cost of this protection plus these institutions' cost of capital was less than the return on the subprime paper, it must have looked like a profitable investment. And they all seem to have made the assumption that the parties selling this protection – such as AIG Financial Products, or the monoline financial insurance firms like AMBAC or MBIA – would have sufficient resources to make good on these policies (technically, derivative contracts) if subprime credit quality ever significantly declined.

The fourth reason the buy-side may have felt complacent was the belief that, given their long-term importance to intermediaries like Lehman Brothers, Merrill Lynch and Bear Stearns, these sell side firms had a strong incentive to play it straight with them about the underlying risks and returns involved in the purchase of securities based on subprime mortgages. As it turned out, either the investment banks' sales people didn't understand the risk inherent in

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subprime based securities, or they misrepresented that risk to investors. Either way, it is not a pretty picture. But could it really be the case that the buy side had completely forgotten that it had been badly burned by the sell side at least twice in recent memory, by junk bonds in the 80s and technology stocks in the 90s? We don't think that was the case.

Thus we come to the fifth and perhaps most important reason why institutional investors kept buying subprime based securities – compensation incentives. In many cases, buy side staff's compensation is tied to their annual performance relative to some benchmark index. One way to outperform the index and earn a big bonus was to purchase AAA rated CDO securities that yielded more than comparably rated Treasury Bonds, even if you had doubts about those securities' value over the long term. To be sure, this is a cynical view, given that these investment managers are supposed to be good stewards of people's retirement savings. And some of them still are, and always have been. But some weren't. Indeed, in our writings over the past few years, we have cited a number of papers that described why and how an investment manager might rationally (given his or her incentives) choose to ride a bubble rather than avoid investing in it (see, for example, "Delegated Portfolio Management and Rational Prolonged Mispricing" by Goldman and Siezak; "Relative Wealth Concerns and Financial Bubbles" by Demarzo and Kaniel; "Riding the South Sean Bubble" by Temin and Voth; "Running With the Devil: The Advent of a Cynical Bubble" by James Montier; and "Hedge Funds and the Technology Bubble" by Brunnermeier and Nagel). However, not all financial professionals played this game equally well. For example, some hedge funds made huge profits by shorting subprime, while Goldman Sachs, and perhaps J.P. Morgan Chase started to hedge their exposure before their peers (though the failure of AIG or other counterparties on these derivatives positions could still cause this strategy to fail). In addition, it appears that intermediaries most heavily involved with the creation and distribution of subprime based securities were stuck – either on their own balance sheets or in special investment vehicles they sponsored – with large amounts of the lower rated (riskiest) tranches of these deals. Thus far, there appear to have been relatively few hedge fund failures caused by subprime, or related credit and derivative market problems. However, it remains to be seen how long that statement will remain true. In the past, we have noted our suspicions that a significant percentage of reported hedge fund "alpha" was really premium income earned from writing insurance – e.g., out of the money equity puts or credit default swaps. In addition, a significant percentage may

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have been due to earning a premium for taking liquidity risk – funding short term to take illiquid assets onto their balance sheets. With many of these insurance and liquidity chickens now coming home to roots, we will soon see whether these funds have sufficient capital to support adverse outcomes for the bets they have made. We suspect that many will not, and we will soon see a growing number of hedge fund failures.

Overall, an attitude of "I'm smart enough to take this position, get a good bonus and get out before it tanks" seems to have been more prevalent on the buy side than trustees, shareholders, depositors, pension plan participants and mutual fund holders would have liked or imagined – more than twenty years after the term "masters of the universe" first entered common usage. Unfortunately, history repeatedly reminds us – as it is doing once again – that few players end up winning this game.

Of course, the pension plan and other trustees who hired these investment managers might have enquired a bit more deeply into the source of a manager's outperformance and the risks that were being taken on to achieve it. But in many cases, trustees had an incentive to avoid this, not only because underfunded pension plans badly needed the extra returns, but also because the investment manager's superior performance also cast the trustees who hired them in a favorable light.

In sum, across the whole financial system, the structure of incentives appeared to reinforce the development of bubbles, rather than restraining them. These incentive structures, and the behavioral norms they reinforce, have proven over time to be extremely resistant to meaningful change – just in our careers, we have seen them not only survive a series of financial market crises (including LDC debt, S+Ls, energy, commercial real estate, junk bond, insider trading, technology stock, mutual fund trading, and now subprime). Indeed, over the 26 years since the LDC debt crisis broke, cynical "me first" attitudes seem to have become stronger, harsher, and more widespread across the financial services industry. As The Times noted in his 2006 obituary, Goldman's John Weinberg was "the last true gentlemen to run a major Wall Street institution before it fell prey to charmless profiteers." The odds do not favor meaningful change from the inside in the prevailing culture of the financial services industry. Indeed, it is folly to expect more collective probity and forbearance at a time when the surrounding culture has become coarser, and more aggressively individualistic in outlook.

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This leads to the inescapable conclusion that the behavior of the regulators was critical to the development of this most recent crisis, and is the key to avoiding similar calamities in the future. An August 2008 report by the Counterparty Risk Management Policy Group (chaired by Gerald Corrigan, formerly president of the Federal Reserve Bank of New York, and currently at Goldman Sachs) began with the following observation: "The Policy Group considers the financial crisis of 2007 and 2008 to be the most severe we have experienced in the postwar period. While this turn of events had multiple causes and contributing factors, the root cause of financial market excesses on both the upside and the downside of the cycle is collective human behavior – unbridled optimism on the upside and fear – bordering on panic – on the downside. As history tells us in unmistakable terms, it is virtually impossible to anticipate when optimism gives rise to fear or fear gives rise to optimism. The last twelve months have been no exception to this sobering reality that, for centuries, has given rise to the universal recognition that finance and financial institutions must be subject to a higher degree of official oversight than is necessary for virtually all other forms of commercial enterprise." Unfortunately, this vigilant oversight seems to have been lacking in recent years.

Let us look at four key issues in this area. In theory, the goal of accounting is to provide information that is useful to a company's employees, investors, customers, suppliers, regulators and other stakeholders. With respect to the reported value of assets, the general rule is "the lower of book or market value." However, there have always been exceptions to this rule. Debt securities that an institution intended to hold to maturity could be held at book value, provided no fundamental impairment to that value had occurred. The logic was that this would minimize the impact of market fluctuations on reported earnings and capital adequacy calculations. The second important exception was when it was not possible to accurately determine the fair market value of an asset. So far, so good. Then along came Enron, Arthur Anderson went under, and Sarbanes Oxley legislation was enacted. These events dramatically changed the relationship between companies and their auditors, making the latter much more aggressive in their approach to the mark-to-market issue, while simultaneously making it much harder for management to successfully disagree with an auditor's judgment. When the subprime crisis broke, auditors were quick to demand recognition of substantial losses due to the decline in many securities' market value, regardless of whether said values were actually being set in well-functioning markets. Once recognized, these losses reduced institutions'

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regulatory capital and/or triggered margin calls (given the large amounts of leverage employed by many intermediaries), which in turn forced more sales into increasingly illiquid markets. In other words, fervent commitment to the mark-to-market ideology seems to have reinforced the downward spiral.

That this triggered twin crises of market and funding liquidity (the first referring to the growing price impact of security sales, and the latter to the sharp reductions in leverage as the collateral supporting it declined in value) should have come as no surprise to anyone. Plenty of papers had been written about this issue, some of which we have cited over the years. Since the credit crisis first appeared, they have been joined by many more – see, for example, a series of papers by Adrian and Shin published by the Federal Reserve Bank of New York, "The Role of Liquidity in Financial Crises" by Allen and Caletti; "Transmission of Liquidity Shocks: Evidence from the 2007 Subprime Crisis" by Frank, Gonzalez-Hermosillo and Hesse of the IMF, and, most presciently, a February 2007 paper by Mason and Rosner that asked "How Resilient Are Mortgage Backed Securities to Collateralized Debt Obligation Market Disruption?". Despite this advanced warning, the world's central banks seemed to be caught unaware by the speed and size of the liquidity shocks that have roiled the credit market, and have been forced to respond with a series of "invented on the fly" solutions. Ironically, this was, in part an unintended result of the regulators strong focus on financial institutions' capital adequacy. With all institutions using the same type of Value at Risk models to measure the adequacy of their capital, the increase in the price volatility of subprime related assets triggered a widespread effort to reduce these positions. The resulting wave of sales put further pressure on market prices and liquidity (not that the accountants noticed) and only served to worsen the crisis.

These regulatory shortcomings are all covered in depth in a long, scathing paper delivered at the Jackson Hole conference by Willem Buiter (former chief economist of the European Bank for Reconstruction and Development, and member of the U.K. Monetary Policy Committee). While complementing the European Central Bank, Bank of England and U.S. Federal Reserve for the success (so far) of their improvised response to the crisis (e.g., opening the U.S. discount window to investment banks), in "Central Banks and Financial Crises" Buiter excoriated them for the mistakes that Buiter believes helped cause the crisis. He

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terms one critical mistake "regulatory capture", or an overly high concern by central banks with the health of different financial institutions, rather than the real economy, or with asset bubbles. This caused them to increase the money supply too quickly when problems occurred (e.g., the Long Term Capital Management bailout in 1998, and the response to the technology bubble bursting in 2001), which made financial intermediaries and investors less risk averse (the so-called "moral hazard" issue) and set the stage for the property bubble and subprime crisis. As Buiter notes, "fundamentally, what drives this asymmetry is the fact that the authorities are unable or unwilling to let large, highly leveraged financial institutions collapse. There is no matching inclination to expropriate, to subject to windfall taxes, to penalize financially or to restrain in other ways extraordinarily profitable financial institutions. This asymmetry therefore creates incentives for excessive risk taking."

Another mistake he cites is a failure to restrain the growing use of leverage by financial institutions and to understand how its use, along with repeated securitization of the same underlying loans, create the preconditions for a massive market and funding liquidity crisis. As Buiter notes, "every asset and credit boom in history has been characterized by rising, and ultimately excessive leverage…The crisis we are now suffering is no exception." This is also a point strongly made by Rogoff and Reinhart in their paper "Is the 2007 U.S. Subprime Financial Crisis So Different?", and before them in the writings of the formerly obscure but now increasingly famous Hyman Minsky (e.g., see "Macroeconomics Meets Hyman P. Minsky" by Wray and Tymoigne). While Buiter credits the central banks with rapidly evolving a new role for themselves as the "market maker of last resort", he rightfully criticizes them for the previous analytical and policy failures that made this necessary. As he notes, in the absence of effective regulation, "during periods of financial boom and bubble, useless financial products and pointless financial enterprises proliferate, often achieving enormous scale. Finance is, after all, trade in promises, and can be scaled almost costlessly, given optimism, confidence, trust and gullibility."

Should we expect more effective regulation in the future? We are guardedly optimistic on this point, noting that landmark legislation like the Federal Reserve and Glass-Steagall Acts followed previous crises. Time will tell whether this latest crisis is severe enough to produce similarly far-reaching regulatory reforms. We also believe that this crisis will produce

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significant progress in the analytical tools that are available to guide regulators' actions. From a complex adaptive systems perspective, the current crisis emerged as a result of unforeseen non-linear reactions between the factors we have noted in this article, including capital adequacy and accounting rules, the use of large amounts of leverage, security design and distribution decisions, and the widespread use of similarly incomplete risk models. We expect that this will lead to more widespread use of advanced approaches to understanding such emergent processes.

So where does this leave us today? Still unanswered is the central question of who will absorb the substantial losses created by the decline in the value of residential real estate and related financial assets. These undoubtedly extend beyond those that have been recognized and announced thus far – for example, there are surely many local and regional banks sitting on ailing portfolios of development and construction loans that are poised to fail, as may some insurance companies that were heavily involved in credit default swaps (proving yet again, as in the case of asbestos and long term care insurance, that even insurance companies and their actuaries can get risk assessments disastrously wrong). Some of the economic losses that exist throughout the system today will be absorbed (via lower standards of living) by more affluent borrowers, who will have to keep making payments on mortgages that are worth more than the underlying properties. Lenders will not be willing to renegotiate mortgage payments as long as these borrowers have steady income.

On the other hand, to the extent that the credit market crisis leads to a contraction in the economy and job losses, more borrowers may rationally seek bankruptcy protection as a means of escaping the burden of their mortgage and credit card debt (especially when late payments on the latter now trigger interest rates of more than 30%). Increased bankruptcy filings seem particularly likely if middle class anger (born of a frustrated desire to consume and a sense that those above and below them on the income scale are being bailed out by the government) erodes the social stigma traditionally associated with going this route. In this regard, our instincts tell us there is more to the "Sarah Palin" phenomenon than first meets the eye. She appears to have become an attractor for the frustration many Americans feel in the face of falling property values, job losses, credit card bills they can never hope to pay off, dashed hopes, and the sense that they have somehow been taken for a ride by elites who rigged the

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game in their favor, lived like kings, and then were bailed out by the government when the house of cards came tumbling down. On the other hand, the Palin phenomenon may also hint at how a substantial portion of over-stretched and over-stressed Americans would like to work their way through the tough times they know lie ahead: in the manner of the Alaskan frontier (perhaps after declaring bankruptcy and starting over) rather than powerless victims ever more dependent on government. We may be reading too much into the past few weeks. But big changes are clearly afoot, even if they still remain below the surface and their eventual direction is not yet clear.

In an ideal world, most of the losses from the deflation of the housing, subprime, and consumer credit bubbles would be borne by financial intermediaries, causing suffering to their employees, creditors and shareholders. However, the size of the losses that must eventually be recognized will likely dwarf the capital these institutions have available to absorb them. Moreover, as we have already seen, left unchecked, debt deflation leads to credit contraction and a slowdown in real economic activity that only reinforces the downward liquidity spiral. It therefore seems inescapable that governments – which means taxpayers -- will, yet again, be the ones who ultimately absorb most of the cost of this latest financial debacle. The interesting question is the form this loss absorption will ultimately take. We have already seen governments nationalizing troubled institutions like Northern Rock, Fannie Mae and Freddy Mac. We may yet see the rebirth of the Resolution Trust Corporation, which was set up during the S+L crisis to take on and workout distressed assets to facilitate the sale or liquidation of failing institutions. However, going that route will probably be much more difficult this time around. In the simpler days of the S+L crisis, the RTC took ownership of bad real estate loans that were usually secured by physical properties. Granted, they may have been overvalued and stopped midway through construction. But, from a workout perspective, the way forward in those situations in clear. The current situation is much different – for example, where would a new RTC start? Buy buying CDO tranches at a deep discount? On the one hand, that would force the selling bank to recognize losses and deplete its capital, which at best would force either a contraction of its loan book (in the case of a commercial bank) or forced sales of its securities at fire sale prices to reduce its leverage in order to stay within capital adequacy guidelines. At worst sale of these CDO tranches at a deep discount to a new RTC would trigger a wave of insolvencies. And what would the RTC get in return? CDO tranches are debt

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securities issued by a special purpose vehicle (that also has other tranches of debt outstanding) that financed a portfolio made up of tranches of primary mortgage backed securities, that themselves represent pools of mortgage loans secured by properties all over the United States - many of which are held by people who can't or won't pay (it is just a matter of time until the class action suits start on behalf of these "victims") and secured by liens on properties that were overvalued in the first place and have since dropped precipitously in value. . When you consider all these complications, direct takeovers of troubled institutions – i.e., nationalizations via convertible debt injections -- may actually make more sense given the complex web of the credit instruments at the root of the current crisis. On the other hand, we're not quite sure of where CDO traders will fit on the civil service pay scale.

Finally, given what are sure to be the very large costs involved in untying this Gordian Knot, governments will surely be tempted to broadly distribute them by increasing the money supply and allowing inflation to rise (which, as happened in the 1970s in the United States, would have the political benefit of reducing the real value of fixed rate mortgages, while perhaps raising nominal property values). On the other hand, a deliberate increase in inflation is not likely to go down well with the foreign central banks and sovereign wealth funds (say, the Chinese) which have been primarily responsible for financing the United States' current account deficit over the past two years. Time will tell which path the U.S. chooses to take. At this point, all we can say with certainty is that we have a long, uncertain, and undoubtedly painful way to go before we are out of the woods, and many changes to make in the way financial institutions are managed and regulated.

What then, are the implications of the current outlook for future asset class returns? For better or worse, our views are the same ones we have been stating for quite some time:

- We seem to be in for a rougher ride than most people (still) imagine, with a sharp slowdown in economic activity, and threats of debt deflation giving way to a renewed period of high inflation our most likely scenario.

- Under these conditions, real return bonds should benefit as fears of higher inflation intensify (note too that because of their minimum capital value structure, U.S. TIPS should also do well during a deflationary period).

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- Domestic government debt should initially benefit from a flight to quality, but then suffer as the expectation of higher inflation pushes up yields. Shorter maturities will work best.

- The outlook for foreign currency government debt is more complicated. We continue to believe that habit will initially cause a flight into U.S. Treasuries in the face of uncertainty. At some point, however, we expect this view to change, and private demand for Australian and Canadian dollar bonds to increase as more and more investors recognize not only their rich endowments of natural resources, but also their relatively small populations and the fact that they have made more progress toward limiting health care and pension liabilities than most other developed countries. To be sure, this may not trigger a sharp fall in the U.S. dollar, provided that foreign central banks – i.e., China and Middle East petroleum exporters – continue to fund the U.S. current account deficit. But that is clearly not guaranteed to happen.

- While there was undoubtedly some overbuilding in the developed country commercial property markets, it appears to have been orders of magnitude smaller than what happened in the housing sector. Moreover, with rising inflation, property should become more attractive. However, weak rental growth in a stagnant economy will constrain returns.

- Commodities and timber should do relatively well because they help investors to preserve real value in an inflationary environment. Beyond that, higher returns will critically depend on whether China and other developing countries are able to shift from a heavy dependence on export led growth to higher levels of personal consumption expenditure and domestic demand.

- We expect all equity markets to deliver weak returns relative to the past, due to a prolonged period of stagnation. China (and those countries that sell to it) may be an exception to this if it can manage the change from export to domestic demand based growth, and weather the substantial risk of social and political turmoil this transition will cause.

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- In sum, we continue to believe that adequate liquidity reserves (which should include a mix of currencies and physical gold – e.g., coins), a portfolio that is diversified across many broadly defined asset classes, and careful monitoring of valuations is the best strategy for riding out the tough times that lie ahead.

Possible Implications of Some Trends that Cannot Continue

In early August, the Counterparty Risk Management Policy Group (made up of chief risk officers from major financial institutions) released a report titled "Containing Systemic Risk: The Road to Reform." It was, in effect, a group mea culpa for having gotten things so wrong in the run up to the current financial markets crisis, and a roadmap for improving future performance. Among much other interesting information, it contains this telling paragraph:

"Over the past nine to twelve months, unprecedented market disruptions have combined with a deterioration of the financial condition of firms to place significant pressure on the funding of individual firms, as well as on the system as a whole. These events, and the resulting funding pressures, have exposed weaknesses in firms' approaches to stress testing and the connection between these stress tests and "business as usual" liquidity management. Many firms had sound approaches to idiosyncratic and systemic funding liquidity disruptions but did not forecast the likely overlap of these events and their related maximum liquidity outflows in any given period of time. In addition, many firms' stress testing and contingency planning were designed with relatively short survival horizons under the assumption that a crisis would be of moderate duration and that within this timeframe confidence in the institution and the system would be restored. "

Over the years, we have read many similar paragraphs in the 9/11 Commission report and other inquiries into intelligence failures, as well as investigations into the destruction of the space shuttle Columbia and major industrial accidents. In all these cases, there are patterns that tend to repeat, many of which we have written about before in these pages. These include the following:

- A mental model might be described as an individual's cognitive representation of the key elements in a situation and our sense of how they are related to each other.

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- Mental models affect the way we allocate our scarce attention, and what we perceive in our environment. We see what we expect to see, and often miss anomalies – at least at the cognitive level. In many cases, however, our subconscious picks them up, causing people to have the proverbial "funny feeling" about something they can't quite put their finger on. Unfortunately, our willingness to expend further conscious effort seeking out the cause of these feelings often seems inversely proportional to our self-perceived level of expertise in an area. It is for this reason that relative novices are often the ones who ask the "dumb" or "obvious" questions that lead to breakthrough insights (an aspect of the benefits of diversity that is rarely discussed).
- Mental models also enable us to explain to others why things have happened in the past, and to make predictions about what is likely to happen in the future.
- The causal patterns and relationships we use in our mental models become more coarse-grained and approximate as the underlying system grows more complex – e.g., when cause and effect are non-linear and widely separated in time.
- Consequently, you can think of three different levels of prediction, defined by their specificity. Strategy predictions are focused on "what" and "why." Given their inherent uncertainty with respect to timing, at best they can only enable you to take broad hedging actions (e.g., reduce exposure to a significantly overvalued asset class), rather than very specific actions that will increase upside returns. Operational predictions focus on "how" the predicted strategic outcome might come to pass – the operation of potential causal processes. These provide general ideas for earning higher upside returns and limiting exposure to more specific risks. In hindsight, examples of actionable operational predictions would have been that the rapid increase in subprime mortgage origination in 2005 and 2006 would eventually lead to a wave of defaults, or that liquidity problems could be caused by the combination of high leverage and uncertainty about who held what risks that was created by increasing use of credit derivatives by hedge funds with weak reporting requirements. Finally, tactical predictions focus on "who", "when" and "where", and provide very specific guides to action (e.g., "We cut Bear Stearns' funding line

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this morning, and I just saw their management team walking into the New York Fed").

- Research has shown that the most effective mental models, from a predictive point of view, are neither too simple nor too complex. This reflects the finding by cognitive psychologists that most human beings can work with a maximum of five to seven "chunks" of information at one time.
- Experts' mental models differ from novices' in terms of the amount of information that is aggregated in the chunks they use. For example, a novice driver might try to keep track of the position of other cars, speed, weather conditions, gas gauge, engine temperature, and the next two turns on the way to her destination, while a more experience driver may consider more aggregated categories like "external conditions", "how the car is running" and "route to the store."
- Because of human's natural tendency to look for patterns (which undoubtedly raised the chances for survival early in our evolutionary history), mental models are initially on the basis of relatively little data. However, they subsequently cause us to pay the most attention to data that are consistent with them. As a result, once formed, they are difficult to change. Experts' use of aggregated categories, while increasing cognitive efficiency, may also make their mental models even more resistant to change. Finally, hindsight bias – our inability to correctly remember our previous forecasts when confronted with new information, and to believe that we knew it all along – also hinders our ability to modify our mental models in a timely manner.
- When we are finally forced by events to admit that modification is necessary, our human desire to maintain positive affect (feelings) and avoid negative affect will usually cause us to minimize the amount of change we make in our mental models (e.g., in "Hindsight Bias, Risk Perception and Investment Performance", Biais and Weber show how hindsight bias often causes us to underestimate risk). Also, because of the positive self-regard conferred by recognized expertise, experts may find it harder than non-experts to change their mental models (for more on this, see Philip Tetlock's outstanding book, Expert Political Judgment: How Good Is It? How Can We Know?).

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- The importance of regularly updating one's mental models comes up again and again in the literature on so-called "high reliability organizations" (e.g., nuclear plant operating teams, or aircraft carrier flight crews), which are characterized by a constant preoccupation with identifying new anomalies and potential system failure modes, taking steps to prevent their occurrence, and preparing an organization to respond to them. In contrast, less reliable organizations often disregard anomalies, and instead see lack of failure as confirmation of the accuracy of their existing mental models, which are typically not modified until a serious failure has occurred.

Over the years, a number of techniques have been developed and used, particularly in the military and intelligence agencies, and increasingly in the corporate sector, to manage the risks posed by the cognitive limitations described above, and their sometimes disastrous consequences. These range from requiring the generation and comparison of an even number of alternative hypotheses or scenarios (since odd numbers naturally cause us to focus on the one in the middle), the use of devil's advocacy processes and competing analytical and planning teams (known as "Red Teaming"), and so-called "pre-mortems", where a given forecast is assumed to be wrong (or a plan to have failed) and a group is asked to work backwards from that point and explain why the assumed failure occurred (for a fuller discussion of these, see "Rethinking Alternative Analysis to Address Transnational Threats" by Fishbein and Treverton). In our own personal experience, we have found all these techniques to be useful, and over the years have employed a number of them in our own analysis process. We have found that while the use of these alternative analytical methodologies certainly don't guarantee accurate forecasts, they lead to more confidence in our forecasts, particularly at the strategic level (i.e., what will happen, and why) which is most appropriate for broad asset class valuation and allocation decisions. In the case of the current crisis, we think they worked quite well, as can be seen by the warnings we provided in May, 2007 and preceding months.

With that in mind, this summer we explored a range of situations that seem to be characterized by trends that can't continue forever, but have yet to reverse, and which could have a substantial impact on asset class returns when this happens. Our goal was not, at this point, to make detailed forecasts; rather, it was to develop initial scenarios of what such trend reversals might look like, in order to expand our current range of mental models and better

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target the allocation of our attention in the months ahead. We hope that by reporting the initial results of our efforts, we will stimulate similar thinking by our readers.

After a lot of exploration, we settled on five different trend reversal scenarios, many of which are related to each other in some way. The first trend is the continuing rise of unfunded liabilities at all levels of government in the United States. At the local level, this trend is primarily due to ballooning liabilities for unionized public school teachers' retirement benefits (both pensions and healthcare), which soak up an ever larger share of education budgets, even as students' educational achievement declines relative to other nations, and teachers' living standards and economic security increasingly outdistance those of the average taxpayer. At the state level, one finds more unionized employees and exploding retirement liabilities, as well as the rapidly increasing costs of various social programs and a growing bill for long-overdue projects to address America's crumbling infrastructure (which constrains its future productivity growth). And at the federal level, we can now add the cost of financial system bailouts to the already huge deficits faced by Social Security, Medicare and Medicaid, and the rising cost of the United States' military and development activities around the world. As we have noted in the past, David Walker, former Comptroller General of the United States and now CEO of the Peter G. Peterson Foundation, has been a leading voice trying to call attention to this issue. To some extent, his message seems to have been heard – for example, most of the funding for the United States' still large (as a percentage of GDP) current account deficits is now provided by foreign central banks, rather than private investors. But the unsustainability of this trend (in the absence of a substantial jump in U.S. productivity), much less the painful alternatives to its continuation (higher taxes? Cuts in Social Security and/or Medicare benefits? Dramatic restructuring of the U.S. healthcare system?) have yet to dawn on a majority of Americans. While we don't know what will eventually trigger widespread recognition of this problem, we expect that when this happens the U.S. dollar will experience a sharp decline, particularly against the currencies of countries – like the Australian and Canadian Dollars – that have made the most progress toward resolving similar issues. However, as these markets are too small to absorb the full volume of desired capital outflows from the dollar, we would also expect the Euro to benefit as well (and the Chinese Renminbi, assuming more open currency markets AND a successful transition from export led to domestic demand led growth AND no major social and political upheavals during this transition). We would also expect to see an additional

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risk premium to be applied to U.S. government securities, which would reduce investor returns (e.g., such a premium would compensate investors for the risk that the U.S. Government might try to inflate its way – at least in the short term – out of an immediate crisis). This would also translate into higher demand for inflation hedging asset classes, such as real return bonds, commodities, and timber, and to a lesser extent commercial property.

Our second scenario is a collapse of public order in Mexico, triggered by the continuation of three current trends: (a) falling oil production; (b) increasing corruption as the one party, PRI dominated state gives way to a more competitive political system (though one characterized by more extreme views); and (c) the rising power of drug gangs (thanks, in part, to Colombia's success in combating them). The immediate consequence of this would be a surge in illegal immigrants into the United States, and possibly into Canada too (while the latter is much better at immigration enforcement than the former – just visit Seattle and Vancouver in the same week if you doubt this – the scale of the problem could overwhelm Canadian resources). Given Mexico's population of 107 million (compared to the United States' 305 million and Canada's 33 million), a significant surge in emigration from Mexico would likely be highly disruptive to the U.S. and Canada. What might be done to prevent this surge from occurring is not clear, though the redeployment of the U.S. Army's First Armored Division to Fort Bliss in El Paso, Texas (right on the Mexican border) suggests that the use of U.S. armed forces to restore order must be considered a likely course of action. Given the demonstrated difficulty of returning illegal immigrants to Mexico once they have successfully entered the United States, we would expect that investors would take fright at the implications of this latest wave (largely poor, and potentially dependent on public services, not to mention socially and politically destabilizing because of the language issue), and raise required risk premiums on U.S. government debt, reduce valuations on U.S. equities, and/or move out of the U.S. dollar. The same might happen in Canada if a large number of illegal Mexican entrants looked like they were overwhelming that country's ability to respond. In addition, the long-term deployment of a significant number of U.S. troops in Mexico to maintain order (as would probably be necessary, absent a carefully targeted effort to quickly destroy the drug gangs) might well increase the opportunities for mischief in the Middle East, and thus energy prices.

The third trend that seems likely to reverse was well described in a 2001 National Intelligence Estimate, titled "Growing Global Migration and Its Implications for the United

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States." The report notes that "Europe and Japan face rapidly aging populations and shrinking labor forces, that threaten the solvency of their pension systems and will constrain their future economic growth in the absence of greater immigration or other compensatory measures such as pension reform and/or increases in productivity." In our view, pension reform is unlikely to win widespread public support in Europe for the same reason it will struggle in the United States – too many voters do not have company-sponsored defined benefit nor have they accumulated sufficient savings to achieve their target retirement incomes. Public pension systems in Europe, like Social Security in the United States, are increasingly important to their future economic security. However, we do not expect that Europe will achieve the sustained increases in productivity growth that are needed to shore up its pension systems without the need for higher levels of immigration. Research has shown that productivity growth results from a combination of technology investment and organizational changes that enable an organization to take full advantage of the new technology's potential. However, there are long-entrenched cultural and political norms, particularly in continental Europe that prevent these organizational changes from taking place to the same extent they have in the United States. Hence it seems likely that Europe will have to accept higher levels of immigration. The NIE concludes, "in the European Union, countries will attempt to reconcile protection of national borders and cultural identity with the need to relieve growing demographic and labor market imbalances. Most EU countries are unlikely to opt for large numbers of new immigrants, while legal constraints against discrimination and laws favoring family reunification also preclude a "fortress" approach. Instead, most are likely to opt for "targeted migration" in an effort to meet labor shortages in selected sectors while not unduly burdening national health and welfare systems or provoking a political backlash." The key question, of course, is whether this cultural tipping point will be reached before the economic growth goals needed to fund pension programs are achieved. Unfortunately, Europe will most likely make cuts in other areas – e.g., military spending – in order to raise its chances of achieving its growth, pension and immigration goals.

In Asia, the NIE forecasts that "populous countries such as China and India will be the source of growing regional and global migration flows. The advanced countries in the region—with the exception of Australia and New Zealand—will strongly resist integrating migrants socially and politically. Japan, which faces the greatest demographic imbalances, nonetheless

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will attempt to retain its current, highly cautious approach to immigration. Japan's premium on ethnic homogeneity, few legal constraints against discrimination, high population density, and geographic insularity will reinforce this approach absent a sustained economic recovery. Should a recovery take hold, however, labor shortfalls may become so acute that Japan may shift eventually to a more open, targeted migration approach."

In contrast to Europe and Japan, being an American (or a Canadian or Australian for that matter) is more based on ideology, while being German or French or Japanese is more dependent on historical ties and culture. Hence, we believe the U.S., Canada, and Australia have an inherently greater cultural capacity to absorb immigrants. However, Australia and Canada seem likely to benefit more than the United States from these flows, as they focus on attracting high skill immigrants, are better at controlling illegal immigration, and have already made more progress toward addressing retirement income security than many other countries.

Clearly, it appears that some level of immigration is good for developed economies, and indeed probably crucial for their future ability to meet future retirement income and healthcare liabilities. The NIE, however, concludes that actual levels of immigration are likely to be greater than the ones sought by developed country governments: "During the next 15 years, globalization, demographic imbalances between OECD and developing countries, and interstate and civil conflicts will fuel increasing international migration, much of it illegal…Illegal migration—facilitated increasingly by alien-smuggling syndicates and corrupt government officials—will grow dramatically, matching or exceeding other forms of migration into many countries in Europe and in the more developed countries of Asia." From our perspective, this raises two critical issues: First, what happens to these countries when the total level of immigration – both legal and illegal – passes the "tipping point?" Could it lead to higher levels of social unrest, causing a sharp increase in risk premiums (and therefore a one-time fall in value) in the government bond and equity markets? At the extreme, could it lead to an outflow of investment and a fall in the exchange rate? On the other hand, could it be good news for future returns on commercial property and housing? Second, how will higher levels of emigration affect developing countries? For years, some commentators have warned of a sharp drop in returns on financial assets as rising numbers of retirees sell them in order to provide income. The counterargument has been that (1) increased investment in emerging markets by developed country savers (on which they should earn attractive returns because of the higher

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return to capital in markets where labor is plentiful) would enable these economies to grow more quickly, which would (2) increase emerging market savings and thereby ensure sufficient demand (i.e., attractive prices) for the assets developed country retirees want to sell. To what extent does increased emigration from emerging market countries undermine this argument? Logically, if the economy is booming at home, why would they want to leave? It would appear that both the "emerging markets will boom" and "emerging markets will stagnate and lead to high emigration levels" rest on an unstated assumption about the quality of government these countries will have in the future. That would seem to be a critical uncertainty that investors need to carefully monitor because of its potential knock-on effects.

Our next scenario is closely related to the one just reviewed, and is driven by what the *Financial Times* has termed "the demographic time bomb in the Middle East." Let us start with the following table (based on statistics from the IMF and CIA World Factbook), which gives a good sense of the population and economic dynamics that have been underway in some key countries in the world:

Country	**Population (millions)**	**Median Age**	**Avg. Annual Pop. Growth Rate (00 – 08)**	**Avg. Annual Real GDP Growth Rate (00 -08)**	**Avg. Annual Real GDP/Cap Growth Rate (00 – 08)**
Egypt	75	24	2.0%	5.0%	3.0%
Algeria	34	26	1.7%	4.2%	2.5%
Morocco	30	25	1.1%	4.8%	3.7%
Iraq	28	28	N/A	N/A	N/A
Saudi Arabia	24	24	2.5%	4.2%	1.7%
Yemen	22	17	3.1%	4.2%	1.1%
Syria	20	21	2.5%	3.5%	1.0%
Australia	21	37	1.2%	3.2%	2.0%
Canada	33	40	1.1%	2.7%	1.6%

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Country	Population (millions)	Median Age	Avg. Annual Pop. Growth Rate (00 – 08)	Avg. Annual Real GDP Growth Rate (00 -08)	Avg. Annual Real GDP/Cap Growth Rate (00 – 08)
France	62	39	0.6%	1.9%	1.3%
Germany	82	43	0.0%	1.4%	1.4%
Italy	59	43	0.1%	1.7%	1.6%
Japan	128	44	0.1%	1.7%	1.6%
Spain	46	41	1.6%	3.4%	1.8%
Switzerland	7	41	0.2%	2.0%	1.8%
United Kingdom	61	40	0.5%	2.6%	2.1%
United States	305	37	1.0%	2.3%	1.3%
China	1,328	34	0.6%	9.8%	9.2%
India	1,140	25	1.6%	7.2%	5.6%
Mexico	107	26	1.1%	2.9%	1.8%
Russia	141	38	-0.5%	7.0%	7.5%
Iran	72	26	1.6%	5.6%	4.0%

The essence of the this scenario is that the current rate of population growth in the most populous countries of the Middle East and North Africa cannot continue at its current pace without causing significant changes from today's status quo. This argument is well summed up in a recent paper by Noland and Pack, titled "Arab Economies at a Tipping Point." The authors note that "the World Bank estimates that the Arab world will have to create something on the order of 55 to 70 million jobs between now and 2020 to keep pace with the growth rate of its population and bring unemployment down to the global norm…The region faces a conflict between two opposing forces – the demographic pressure to create jobs and the capacity of the economy to absorb new entrants…It is an open issue as to which will prevail…On the back of the commodity boom…growth in the region has accelerated…But underneath this good news there is much cause for concern."

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Socially and politically destabilizing unemployment in the region is well above the global average, even among the most educated members of the population. The authors note that "one method of rapidly creating a sustainable increase in employment is through an expansion of labor-intensive manufacturing or service exports [e.g., call centers or outsources software coding], often in conjunction with foreign investors or local entrepreneurs integrating into global supply networks. [However] the region's track record on this score is not promising, and with the rise of China, India and others, the competitive pressures embodied in the global marketplace are increasing…Broadly speaking, over the past few decades the region has experienced a decline in its global market share in almost every indicator of cross-border economic activity…Indonesia has roughly twice as many employed in manufacturing today as the entire Arab world, even though it has 100 million fewer people." Moreover, what gains in market share that have been made have mostly been due to energy producing countries integrating downstream into capital, but not labor, intensive industries such as chemicals and plastics. The authors also note that weak intellectual property and contract law in many Arab countries, as well as the poor quality of many local education systems have further discouraged foreign investment, as has a cultural issue the authors describe as follows: "historically, Arab governments have disfavored opening up to international trade [because] import licenses, monopoly rights, and other state interventions [in the economy] were a convenient way to generate rents [resources] that could be used to build domestic political coalitions." Finally, Noland and Pack note that "a common tactic by incumbent governments of weakening the possibility of moderate, secular dissent has contributed to delivering an opposition with an increasingly religious cast, presumably on the calculation that confronted with such a choice, the public's reaction will be 'better the devil you know.' Paradoxically, this lack of political dynamism in the face of underlying social change together with the increasingly religious orientation of the political opposition raises the possibility of abrupt transitions." Because of all of these factors, "the Arab region as a whole appears to be characterized by relatively high subjective risk assessments on the part of investors", which in turn limits capital spending, job creation, productivity improvement and an increase in living standards based on something other than the redistribution of energy related export profits.

Given the complex web of obstacles that would have to be removed in order to substantially increase economic growth, the relentless pace of population growth, and thus far

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limited legal emigration options, we believe that this situation will trigger increasing repression and ultimately major political upheavals, the most dangerous of which would be in Egypt. Assuming radicals manage to maintain their grip on Iran (which we do not think is inevitable), Israel would potentially be faced with not one, but two large and dangerous enemies. Moreover, a radical upheaval in the Arab world's largest country could easily trigger further upheavals in the oil rich Persian Gulf region, and possible across North Africa as well. The stage would then be set for a disruption of energy supplies, and/or a large surge of illegal immigrants into Europe.

In terms of asset class impacts, serious domestic turmoil in the Arab world would probably trigger a shift of capital away from Europe and towards the U.S., Canada and Australia. This would result in lower returns on financial assets in Europe, and higher returns (as well as exchange rate appreciation) in those countries receiving inflows. In the short term, commodity prices would also rise, probably spectacularly. However, if energy flows are reduced for an extended period, the global economy would clearly suffer, which would hurt equity markets around the world. From an active management point of view, this scenario also suggests another reason (beyond worries about peak oil and global warming) for continued investment in alternative energy technologies that would help cushion the impact of a demographically driven crisis in the Middle East and North Africa.

Our fifth scenario addresses the quality of governance issue that seems likely to drive the shape of the world in the years ahead. Our approach to this is based on a growing body of research that suggests the normal state of affairs may be a world dominated by authoritarian states. In "The Natural State", North, Wallis and Weingast begin by noting that "the fundamental question of both economic history and economic development can be asked in two ways: how did a handful of countries achieve sustained rates of economic growth and development in the late 18th and early 19th centuries? And why have most nations failed to achieve sustained economic growth?...Unfortunately, political scientists and economists have failed to develop a theory of the state adequate to answering these questions…Simply positing the existence of a stable state cannot explain how it gains control of the instruments of coercion, how it survives, and how it enforces its decisions, including the rights and privileges extended to various members of society. To explain these aspects of the state and why states fail to develop requires a deeper approach."

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The authors go on to "argue that the state's foremost task is securing its own survival. In doing so, states provide social order that provides a solution to the problem of endemic violence in primitive societies... A 'natural state' is a specific way of structuring political and economic systems so that the economic rents created by limiting entry [into various types of activity] are available to secure credible commitments among politically powerful groups. Potential rivals in a natural state stop fighting (or fight less) when the economic rents they enjoy depend on the continued existence of the state and the social order it creates…In other words, natural states use the economic system as a tool to solidify the stability of the ruling coalition…The natural state establishes and enforces a property rights system, whereby specific groups with specific ties to the ruler have specific rights and privileges (e.g., the exclusive right to import cloth). The ruler has an incentive to honor these rights, because constituent groups whose rights are infringed can withdraw their support, thereby lowering the probability that the ruler survives."

Viewed from this perspective, it is capitalist democracies, not authoritarian regimes that are the true exceptions to the general rule. "In the last three centuries, a handful of 'open access orders' have emerged that [sustain social order through political and economic competition rather than rent creation] …However, for much of the world, the relevant alternative to the natural state is not an open access order like the United States or France, but rather a descent in to the hell of disorder… Open access in economics requires that the economy contain competitive markets, rather than highly controlled markets to create rents for favored constituents…Natural states necessarily thwart development because thriving, open markets reduce the rents available to create the natural state's political security. Open markets also provide people with income apart from any direct dependency relationship with the state, creating a resource base that allows some to challenge the state… Open access in politics requires that citizens' rights do not depend on a political relationship to those in power, but derive from the fact of citizenship; and further that citizens have the right to organize and compete for political power…The move from the natural state to an open access order is therefore a move from the world of privileges and personal exchange to one of rights and impersonal exchange…In a real sense, the problem of explaining the transition from natural states to open access orders is the most important question in economic history."

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In a subsequent paper ("A Conceptual Framework for Interpreting Recorded Human History"), North, Wallis and Weingast take a closer look at this transition process. They begin by noting that it is not an either/or proposition of changing economic or political institutions and practices – both are critical, and they constitute a tightly connected complex system. They go on to observe that "each order is characterized by the type of organization it supports…natural states place significant limits on the number and type of contractual organizations that can be formed…[In contrast] open access orders allow for creation of and access to a much wider variety of organizations." The authors posit that the central feature of the transition from the natural state, with its limited access, to the open access state "is the development of impersonal exchange among elites." This cannot develop until three specific conditions are met: (1) rule of law for elites, (2) perpetual forms of organizations for elites, including the state itself, and (3) political control of the military. These three conditions are interrelated: "Non-military members of the dominant coalition must be credibly convinced [e.g., by the establishment of a rule of law] that military force will not be used to expropriate their wealth. The group that controls the military must therefore be lodged within the natural state in such a way that the state controls the group's use of the military and controls the circumstances under which the group uses the military…This requires that the dominant coalition agrees about what constitutes the legitimate use of violence… and on the existence of powerful, well-organized non-military organizations that can credibly threaten the military with economic sanctions." Finally, the authors note that once established, by making elites better off, impersonal exchange "creates economic incentives to extend access at the margin to other institutions that support impersonal exchange and thus the benefits for the elites." This process then sets off a series of positive feedback loops that over leads to the emergence of an open access order.

On the one hand, this theory is reassuring in that it helps to make sense of the observation that what the authors call "natural states" are much more prevalent in the world than those they term "open access orders." But on the other hand, it is disturbing when it shows there is no inherent reason to expect natural states to evolve into open access ones, since the transition process seems to be so fragile and dependent on a complex web of beliefs, behaviors, and, we imagine, the accidents of history (i.e., luck). Concretely, this means that the most likely scenario for the future is that "natural states" like Russia, China, most countries in

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the Arab world, and not a few other developing countries will remain the authoritarian regimes they are today. In other words, we cannot count on any internal evolutionary process to moderate the increasingly expansionist tendencies of Russia, nor China's push to achieve co-equal status with the United States, nor the seemingly inexorable march toward more turmoil in the Middle East and the world's oil markets, nor the improvement in domestic governance upon which the emerging markets investment story ultimately rests. And while many readers will find this conclusion in line with what their instincts have been telling them for years, this is still not good news.

Consider what this could mean. Let's start with a timely fact: the United States, the keystone of the world's open access orders, is currently deeply in hock to China and the authoritarian regimes of the Middle East. Up to now, these countries have more or less played by the rules set by the open access nations of the West. But why should we expect that to continue (Lehman's bankruptcy filing showed how dependent it was unsecured funding from Asian lenders)? History tells us that nations inevitably seek to use their power – be it military, economic, ideological and/or cultural – to advance their own interests. Why should we not expect China and Russia to also follow that path? And does that not that the rules of many games – most importantly for our purposes, the global economic and financial order – might also change in the years ahead, and not to the West's advantage?

Or consider this: What is a rapidly ageing Europe's capacity for global action if it continues to be dependent on energy that either comes from or whose transport is controlled by Russia (e.g., remember all that pipeline in Georgia), while at the same time cutting its military spending in order to pay for pensions and healthcare for its growing population of retirees? Russia's strategic goal has always been to dominate Eurasia, and it is not hard to envision Europe (led by Germany) in the future deferring more often to an expansionist Russia's wishes. Similarly, assuming China can manage the shift of its economy from growth led by exports to growth led by domestic demand (a transition which we have repeatedly noted is fraught with social and political risks), we can also see many countries in Asia, perhaps including Japan, eventually deferring more to its wishes. Clearly, these two trends would only be helped by the preoccupation of a fiscally overstretched United States with worsening situations in the Middle East (where, if nothing else, its commitment to Israel and dependence on oil will maintain its involvement) and Mexico. Given these trends, it is not hard to envision the emergence of a tri-

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polar world, centered around the Russian and Chinese spheres of influence, and an alliance between the Anglosphere (i.e., U.S., U.K., Australia, Canada, New Zealand and perhaps Ireland), and India, Japan (for which becoming a Chinese vassal state seems culturally inconceivable), and Latin America (not only is the region the United States' de factor hinterland, but also, and despite their ups and downs over the years, most of these countries have slowly but surely been institutionalizing the desire and capacity for open access regimes). Under this scenario, the Middle East and Africa would be destined to be the scene of great power conflicts and intrigue, with all sides seeking to maintain their access to (and ideally increase their control over) energy and strategic mineral resources. Granted, the development of this scenario is not guaranteed; for example, both China and Russia both face daunting and growing internal weaknesses which, if they pass a certain tipping point, could lead to the emergence of very different outcomes than the one described here.

That said, for many of our readers, the realization of this negative scenario would likely have significant financial implications, possibly including restrictions on capital mobility, weakened property and contractual rights (e.g., as has recently been demonstrated in Russia), higher risk premiums on investments that cross "sphere of influence" bounds, increased attractiveness for hard assets like property, timber, and perhaps commodities, and much greater allocation to liquid reserves, including physical gold and diamonds (reflecting decreased confidence in the long-term value of many currencies)

On the positive side, the realization of this scenario is far from guaranteed; depending on how some uncertainties turn out, event could take a much more favorable path. For example, breakthroughs on the energy front – whether technical (e.g., algae based fuels produced using carbon dioxide captured from power plants) or policy (e.g., the U.S. following France and raising its use of nuclear power generation) – could reduce Europe's dependence on Russia and allow the U.S. to reduce the resources it currently commits to the Middle East in order to more directly challenge an expansionist, but demographically shrinking Russia. Alternatively (or perhaps concurrently), China could collapse into internal disorder due to the social and political strains caused by its attempt to switch from export to domestically led growth. Or perhaps the highly educated, westernized, and religiously non-extremist Iranian majority will finally tire of their current leadership, and replace it with a more moderate regime

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that can serve as an anchor of stability in Middle East (essentially realizing Nixon and Kissinger's original hopes for the country). Or perhaps, after President Mubarak's inevitable death, Egypt will smoothly transition to another authoritarian regime that will be able to keep the pressures caused by the country's demographic explosion from causing a major disruption. Or perhaps Mexico will take a page from Colombia's book, and accept outside resources that eventually enable it to reduce its corruption and crime problems before it becomes a failed state. Indeed, any or all of these changes could happen, as well as many others, in combinations to numerous to count and too complex to fully understand. So things could certainly turn out better than the scenario we have painted. That said, we also have to accept that authoritarian governments may well be the natural state of affairs, and that the paths that Russia, China and the United States are currently on could easily lead to a very different world than the one we live in today, much as the world of 1912 radically changed over the next forty years.

As we said at the beginning of this article, our objective is not to make tactical predictions that can substantially boost investors' returns via large, targeted bets. Rather, our goal is to provide investors with superior strategic warning – the what and the why of changes that could have a substantial impact on asset class returns, risks and portfolio allocations. As we have often said, our primary goal is limiting investors' downside risks, and preserving the real value of their capital over the long-term. And it is all the better if we can also provide occasional operational insights (regarding "how" predicted changes might occur) that enable investors to improve their returns – but this is not our primary mission. As we said, we believe our approach did a good job of preparing our readers for the current crisis. However, we also recognize that this represents a heightened danger for us, in the form of a temptation to rest on our laurels and become too locked-in to mental models that worked well in the past. This article represents an attempt to add new possible scenarios to our mental models, to better guide the allocation of our attention and challenge our thinking as developing reality diverges from our expectations. We hope you find this useful, and do not hesitate to share your own views with us and with the other readers of our publications as we collectively seek to achieve our financial goals in the face of difficult and uncertain conditions.

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Product and Strategy Notes

More Damning Studies on the Profitability (for Investors, if not Fund Managers) of Active Management

Over the past ten years, we have written about a growing body of research that makes a critical point: in the academic world, hindsight makes active management look easy; however, in the real world it must be based on foresight, and over time fails with increasing frequency as luck cancels out and painfully reveals how few truly skilled managers there really are in the world. This summer, we read another pile of studies that further reinforce these points.

In "Soft Information in Earnings Announcements: News or Noise?", Demers and Vega use advanced textual analysis software (and you thought linguistics was boring?) to analyze more than 20,000 corporate earnings announcements that were made between 1998 and 2006. They find that they are able to predict post announcement changes in returns and volatility. Similarly, in their paper "Some Insiders Are Indeed Smart Investors", Giamouridis, Liodakis and Moniz study trading by U.K. corporate insiders between 1994 and 2006, and show how they were able to identify the most informed trades in advance. They also show how using their system could enable a portfolio manager to earn statistically significant excess returns. In "How Markets Slowly Digest Changes in Supply and Demand" is a fascinating paper by Bouchaud, Farmer and Lillo that delves deeply into the market microstructure of trade execution, and in particular the long-memory process (i.e., predictable volumes) generated by the practice of breaking up large trades into smaller limit and market orders. They demonstrate the intimate relationship between liquidity and volatility at the microstructure level, and how this propagates over time (unfortunately, their paper was written before the credit market panic rather emphatically reinforced their point on the macro scale). While they don't take the step of linking their insights to a new system for generating excess returns, one presumes that some other academic will soon try to apply their work for this purpose, using a historic data set to prove his or her point.

Two other studies look at hedge fund performance. In "The Geography of Hedge Funds", Melvyn Teo finds that Asian focused hedge funds located in that region significantly outperform similar funds located abroad, implying that geographic location can be used as a

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proxy for access to superior information. And in "Strategy Distinctiveness and Hedge Fund Performance", Wang and Zheng find that funds whose returns have a low correlation with their category's average tend to outperform. As they note, this is presumably because "hedge fund managers pursue unique strategies when they have great new ideas and superior investment skills, while less skilled managers are likely to herd and follow publicly known investment ideas [which lead to category average returns]." This is consistent with other papers that find smaller and newer hedge funds typically outperform larger and longer established competitors, and that their relative outperformance diminishes as they grow larger (presumably because there are far fewer good ideas that can absorb a large amount of investment without diminishing potential returns that there are small ideas in this category). On the other hand, it raises some questions about the motivations of investors, since other data show that the largest hedge funds are controlling an increasingly large percentage of this sector's assets under management.

Finally, in their paper "Forecast Accuracy and Stock Recommendations", Hall and Tacon "examine whether it is profitable to trade according to the recommendations of analysts who made accurate earnings forecasts in the prior year or quarter." Their conclusions are not encouraging. "The top third of forecasters in a prior period are just four percent more accurate in a subsequent period than the bottom third of forecasters. This low level of persistent forecasting ability means that prior forecasting ability has no association with analysts' ability to identify mispriced securities in a subsequent period. Furthermore, regardless of forecasting ability, analysts are predisposed to recommend stocks with low book-to-market ratios and positive price momentum. We suggest that this bias outweighs analysts' objectivity, thereby offsetting any ability to make accurate forecasts and profitable recommendations." These findings are similar to those contained in "Acting on the Most Valuable Information: 'Best Idea' Trades of Mutual Fund Managers" by Lukasz Pomorski of the University of Toronto. The author studies trades made by mutual fund managers who work for companies sponsoring multiple funds. As he notes, managers in these companies have access to similar information, and "if they receive particularly valuable news, many managers will act on it and engage in similar trades", which he deems their "best idea" trades. He finds that these trades "outperform benchmarks and other trades by up to four percent per year" and concludes that this demonstrates that "managers have skill in the sense that their [best idea] trades generate

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abnormal performance." However, he also finds that "managers do not stop at their 'best idea' trades, but also trade on other, less advantageous information. These additional trades, amounting to about seventy percent of the average company's volume, do not beat the benchmarks, even before transaction costs are deducted."

And those transaction and other fund costs are anything but cheap, when you look at the incremental expenses paid by investors for just the actively managed portion of a typical long-only mutual fund's total returns. This point was originally made by Ross Miller in his paper "Measuring the True Cost of Active Management by Mutual Funds" and has now been reinforced by Mark Kritzman's paper "Who Charges More: Hedge Funds or Mutual Funds?" He finds that, when correctly measured, a typical mutual fund's active management fees are actually somewhat higher than a hedge fund's customary "2 and 20" charge. He therefore concludes that a mix of index funds and uncorrelated alpha strategies is superior to combining both in actively managed long-only funds.

Finally, one of our favorite authors, Russ Wermers of the University of Maryland, has recently published (with Laurent Barras and Olivier Scaillet) an updated version of one of the most damning studies of actively managed mutual funds that we have ever read. In "False Discoveries in Mutual Fund Performance: Measuring Luck in Estimated Alphas", Wermers and his co-authors use an innovative approach to separate the roles of luck and skill in generating the returns produced by active fund managers. The results are not pretty (though we have long given up on the financial press, with its revenue dependence on advertising placed by active management companies, ever giving this and similar studies the publicity they deserve). They find that, between 1975 and 2006, 26.6% of active funds exhibited "truly negative" (i.e., luck-adjusted) alphas, net of expenses and trading costs, while 72.8% were "zero alpha funds" whose managers "possessed skills just sufficient to recover their costs, including expenses and trading costs." Just .6% (that is, six tenths of one percent of the sample) of funds exhibited "true skill" – that is, levels of luck-adjusted alpha that were more than sufficient to cover their costs. In what, from the perspective of most investors, would appear to be a vast understatement, the authors conclude that, given their extreme scarcity, "finding truly skilled funds is extremely difficult."

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Meanwhile, on the Private Equity Front

A recent paper by Guo, Hotchkiss and Son looks at the performance of buyouts completed between 1990 and 2006, and compares their value creation drivers to their predecessors in the 1980s. In "Do Buyouts (Still) Create Value?", they find that deals in the most recent period were more conservatively priced and used less leverage, although that started to change in recent years, as monetary liquidity and the credit boom/bubble took off. The authors also find that increases in operating cash flow after a buyout were substantially greater in the earlier period. This is consistent with a point we have often made, that as a result of the 80s buyout boom, most companies are much more efficiently run today. Moreover, in a world where competitive conditions are changing much more quickly than in the 1980s, it is also the case that efficiency has become relatively less important to value creation than effectiveness – i.e., the ability to accurately sense and quickly respond to changes in customer needs, competitor offerings, and technology. And superior effectiveness is inevitably based on having some slack in the system – a point which may well clash with private equity firms' traditional focus on squeezing out what they perceive to be "excess" costs. Hence, we are not surprised that the authors of this study found only minimal gains in operating performance compared to comparable public company peers. That leaves two big sources of value creation during the most recent buyout era – increased use of debt (which, thanks to the debt tax shield, also increases cash flow) and an increase in overall valuation multiples in the sectors where the most buyouts occurred. Needless to say, we look forward to watching how private equity deals (and returns to investors in buyout funds) fare in the months ahead.

Model Portfolios Update

Our model portfolios are constructed using a simulation optimization methodology. They assume that an investor understands the long-term compound real rate of return he or she needs to earn on his or her portfolio to achieve his or her long-term financial goals. We use SO to develop multi-period asset allocation solutions that are "robust". They are intended to maximize the probability of achieving an investor's compound annual return target under a wide range of possible future asset class return scenarios. More information about the SO methodology is available on our website. Using this approach, we produce model portfolios for

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six different compound annual real return targets: 7%, 6%, 5%, 4%, 3%, and 2% We produce two sets of these portfolios: one assumes only investments in broad asset class index funds. These are our "all beta" portfolios. The second set of model portfolios includes equity market neutral (uncorrelated alpha) funds as a possible investment. These assume that an investor is primarily investing in index funds, but is willing to allocate up to ten percent of his or her portfolio to equity market neutral investments.

We use two benchmarks to measure the performance of our model portfolios. The first is cash, which we define as the yield on a one year government security purchased on the last trading day of the previous year. For 2008, our U.S. cash benchmark is 3.97% (in nominal terms). The second benchmark we use is a portfolio equally allocated between the ten asset classes we use (it does not include equity market neutral). This portfolio assumes that an investor believes it is not possible to forecast the risk or return of any asset class. While we disagree with that assumption, it is an intellectually honest benchmark for our model portfolios' results.

The year-to-date nominal returns for all these model portfolios can be found at: http://www.indexinvestor.com/Members/YTDReturns/USA.php

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