

UBS Investment Research

US Rates Strategy

A U.S. Rates Thesis

■ **Housing is the horse, Treasury rates the cart**

The fortunes of the US housing market will almost certainly shape the path of US interest rates in the months and years ahead. We look at the US housing market of today and we have great concern that home prices in the US will continue to decline for the foreseeable future. This means that financial stresses among lenders and consumers are likely to stay elevated for some time to come. This also means that loan costs will rise (for a given base rate) and that loan provision is likely to shrink further. This all means lower Treasury rates up ahead.

■ **The lessons from the Great Depression are revealing**

Ben Bernanke wrote a wonderful piece in 1983 on the “Non-Monetary Effects of the Financial Crisis in the Propagation of the Great Depression.” We take Bernanke’s key conclusions from this study and compare them with today’s financial crisis. Some of the parallels are stunning.

■ **Follow the money**

If you look at the most recent Fed Senior Loan Officer’s Survey statistics you can almost see the well of loans drying up before your eyes. At the same time that loan provision dries up, we’d guess that the velocity of money is declining. Monetarists would say that a declining turnover of money would have two outcomes: lower output (for a given money supply) and lower inflation. We discuss this in light of what we know about Housing and Credit conditions.

“It is better to debate a question without settling it than to settle it without debate” Joseph Joubert

For months now we’ve been projecting a bullish view on US rates in our daily writings and during the many client meetings that we’ve had all around the globe. As our readers doubtlessly know, the keystone of our bullish rate view is a belief that the worst housing bust since the Great Depression will have a debilitating effect on the overall US economy. We’ve held this view since 2006 which was when it became clearer that the housing market had passed peak and that the historic housing bubble had begun the process of deflating. With this write-up, we have decided to step away from our daily commentary to put forth a more in-depth outlook for US rates. We’re no great fans of “weekly” research tomes for US rates because there is typically too much to say every day in our most liquid of markets. Indeed, many rates market opportunities are often too fleeting for a weekly publication to pick them up. Even so, a weekly-style publication has its place when mapping out the few key puzzle pieces that underpin our overall interest rate picture. Join us for look at the key themes that drive our bullish outlook for Treasury rates.

Important disclaimer: We believe that economic fundamentals are a main driver of US rates. Our views expressed here may differ with the *official* UBS views held by our economics team.

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It's All About Housing

The fingerprints of the US housing bust are everywhere one looks these days. US nonfarm payrolls have fallen for 7 straight months, the housing crisis has led directly to a banking and lending crisis, consumer sentiment has plunged to multi-decade lows and even overseas economies have weakened as the world's banks get caught up in the housing maelstrom. If we are convinced of anything these days, it's that the bottom of this economic downturn is unlikely to be seen until home prices finally stabilize, at least.

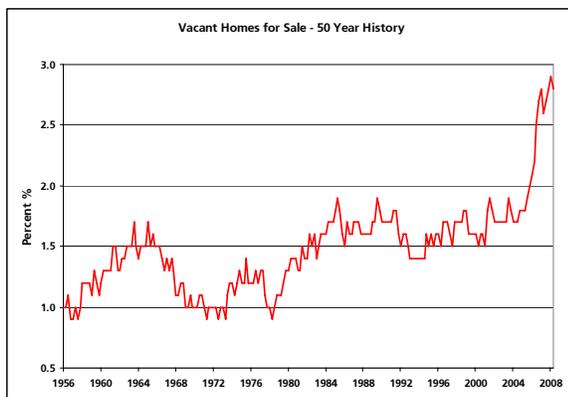
You Can't Clear One Without The Other:

The housing market is caught in a vicious trap. Housing prices are still too high relative to incomes (more on this later), banks are still loss-hobbled, loss-laden banks have become more reluctant to lend, the drying well of available loans further deters buyers which then forces home prices lower, and lower home prices further stress banks which begins the process all over again. It's a trap that catches up both banks and borrowers and that's why we've seen the government and the Fed step in to ease the stress by attempting to break this stand-off between lenders and consumers, and buyers and sellers.

The two charts below illustrate the problem pretty well. Chart 1 shows the historic volume of unsold and vacant US housing. The supply of vacant homes for sale is clearly unprecedented. The next chart shows the NAR's somewhat simplistic Housing Affordability Index (HAI). We say simplistic because the NAR's HAI does not directly take into account bank lending standards. We were making good progress with home affordability before the recent rise in market and home mortgage rates. Higher mortgage rates have caused housing affordability to fall back—even while home price declines have continued apace. This is a headwind (or less of a tailwind) for the housing market even before accounting for the continued ratchet higher in bank loan standards. As such, home price declines are near certain to continue unless or until loan rates fall significantly enough to pull the HAI back up to "stimulative" levels that can overwhelm restrictive loan standards and still-high home prices. As of now, home affordability is not where it needs to be.

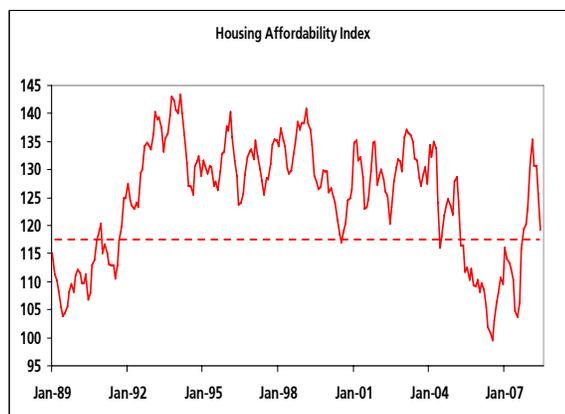
Higher mortgage rates in recent months have dramatically crimped housing affordability- even while home prices have steadily declined.

Chart 1: Vacant, Unsold Homes Like Never Seen Before



Source: Census Bureau, Haver, UBS

Chart 2: Housing Affordability Gets Stage Fright?

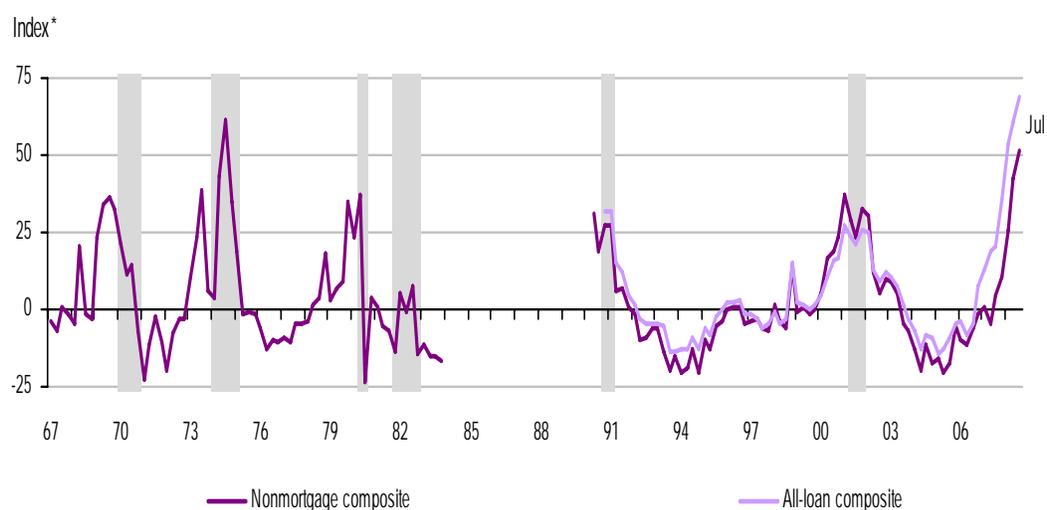


Source: NAR, Haver, UBS

As mentioned above, the Housing Affordability Index does not account for the state of lending standards directly (mortgage rates of course do partially reflect lending standards). UBS keeps an index of aggregated lending standards derived from the components that make up the Fed’s Senior Loan Officer’s Survey. We show this chart below from our economics team. Here you can see a great illustration of just how tight the bank’s loan standards are at present. This Monday’s quarterly update of the series showed acceleration in the rate of loan standard tightening all across the board. Additionally, the Fed asked a separate question in their July survey on expectations for more tightening. Some 60% of banks indicated continued tightening on credit cards in the second half of 2008. Other loan types saw a similar response.

The pro-cyclical tightening of bank lending standards is one of the greatest threats to housing and the broader US economy.

Chart 3: Lending Standards... The Vice Tightens Further



Source: Federal Reserve Board, UBS

Tighter lending bank standards are effectively sterilizing some of the Fed’s efforts to get money rates down. Last Friday, Bloomberg wrote about how sticky Libor rates have been as Libor/OIS spreads have stayed wide since the credit contagion began in earnest a year ago. You can also see the fingerprints of credit stress in the table below where we show year-year changes in mortgage rates and other key loan rates. What stands out is that some home borrowers and some municipal borrowers have seen little or no relief since the Fed began their rate cutting last fall.

If we’re correct about the links between Housing and banking health (and the overall economy certainly), then we need to try to answer two questions: 1) How much further will home prices fall? and, 2), *When* will home prices “find support” and begin to stabilize? If we can make a reasoned guess about these two questions, we will be able to get closer to answering the grandest question of all that relates to the present economic downturn: “How long and how deep?”

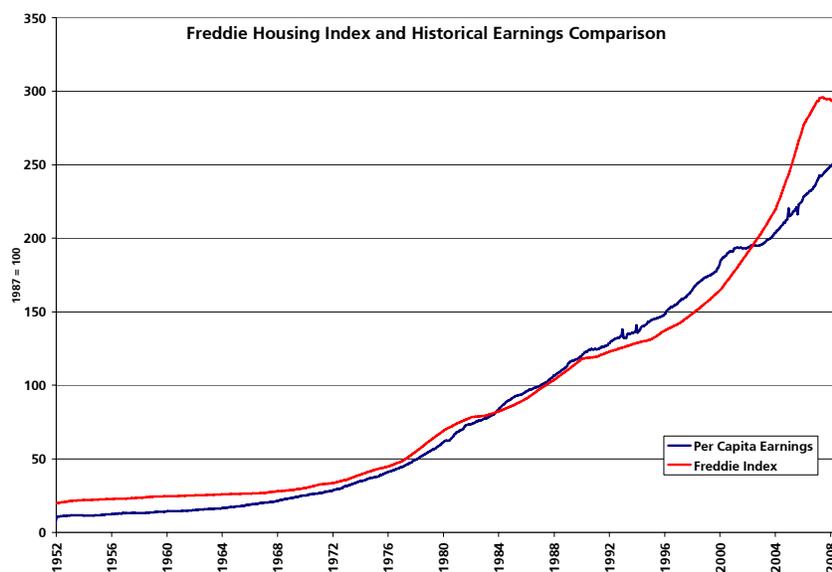
History has shown that it may be reasonable to assume that home prices will generally follow trends in personal disposable income. Some dispute this (Rampell, 2008), but we think it as good a guide as any for projecting both the magnitude and length of the great home price back-up in the US.

We compare Case-Shiller home prices with incomes to attempt to gauge how much further home prices could fall.

Home Prices and Per Capita Earnings – The Strained Relationship

We decided to examine the historical relationship between per capita income in the United States and housing prices to see if there has been a long term relationship. The Freddie Mac housing index is a measure of resale values of the same homes to represent a “constant quality” assessment of housing prices.

Chart 4: Housing and Per-Capita Income

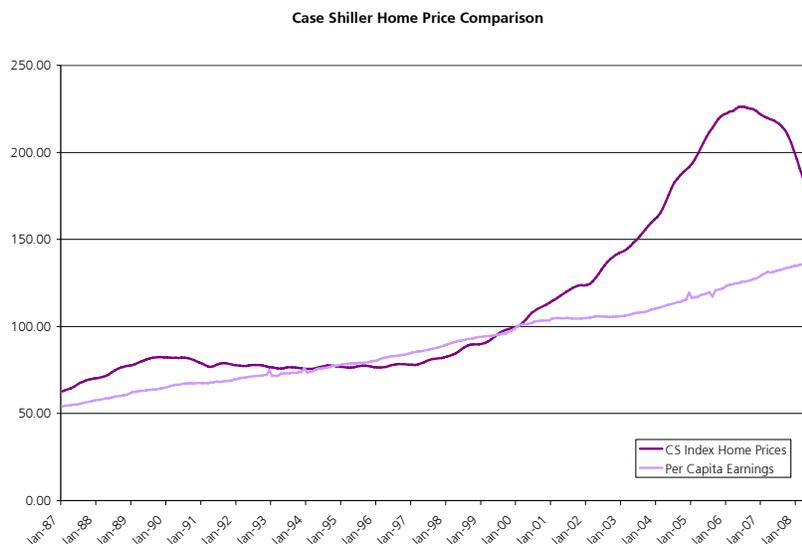


Source: Freddie Mac, BEA, Census Bureau, UBS

- The Freddie numbers are an index based on 1987 levels, so all numbers are representative of price movements from 1987
- Personal income numbers were taken from the Bureau of Economic Analysis, and adjusted to be per capita with Census population data
- These numbers were then indexed to the same year as the Freddie index so that it would reflect percentage movements from 1987 levels as well
- As can be seen from the above graph, there is a long term relationship between home prices and earnings with both increasing in step. *We do not make adjustments for interest rates in our attempt to keep the analysis “simple.”*
- Since this correlation has been shown, more recent numbers can be looked at more in depth, particularly the Case-Shiller home price data that is so closely followed by today’s markets

- These more recent data tell the same story-- house price increases generally track earnings increases but since 2000 there has been a notable deviation

Chart 5: Case-Shiller 10 Index and Per Capita Earnings



Source: S&P Case-Shiller, Bureau of Economic Analysis, Haver

- The same per capita earnings numbers were used as was compared to the Freddie Index, it is important to note however that the Case-Shiller is indexed to 2000 levels and so income had to be re-indexed to 2000 levels. In addition, the numbers for income were yearly and so 12 month moving averages had to be used.
- It appears that the deviation began in 2000 and continued to widen until middle of 2006 before beginning to rapidly fall back down
- Therefore, an argument can be made that housing prices will continue to “correct” (read: fall) until they are again at historical levels relative to income. Note: *other factors such as mortgage rates, taxes, population growth and zoning restrictions are not included in this simple “model” and they could significantly impact the pace and magnitude of the future decline in home prices.*
- As of the May numbers, earnings are approximately 40% above the levels that were seen in 2000. Housing prices at their peak in mid 2006 were 126% above their 2000 levels. This implies that housing prices need to come down to levels comparable to about 40% above their 2000 levels. They are currently still 80% above 2000 levels.
- If the Case-Shiller data is broken down by metropolitan areas, the areas with highest run-up are the ones that have seen the hardest fall and they are: California, Phoenix, Las Vegas, and Florida

In looking at this data, one of the important take-aways is how far (theoretically) house prices have to adjust before they have reached income-appropriate levels. The following chart shows how much more housing prices in selected areas (and nationally) have to fall (or rise in a few cases) to be at parity with local earnings. One thing does stick out as an interesting sidenote: Dallas shows a notable *appreciation* in home prices to income using on our admittedly simplistic analysis. Isn't it Dallas Fed President Fisher who is the serial dissenter on the FOMC these days?? "Hmmm..." we say to ourselves.

Chart 6: A Stab At What May Be Left In Home Price Declines after May 2008

Percentage Change in Housing Prices to Return To Current Earnings Levels	
LA	-29.53%
Tampa	-21.23%
Seattle	-24.71%
San Francisco	-10.88%
San Diego	-15.83%
Portland	-25.80%
Phoenix	-13.45%
New York	-26.74%
National (CS10)	-23.56%
Minneapolis	-3.24%
Miami	-24.26%
Las Vegas	-11.93%
Detroit	34.57%
Denver	6.87%
DC	-27.10%
Dallas	10.88%
Cleveland	20.05%
Chicago	-10.59%
Charlotte	-0.60%
Boston	-7.96%
Atlanta	-1.81%

Source: S&P Case-Shiller, Bureau of Economic Analysis, Haver

Finally, this data can be aggregated to find how far from their peak value housing prices would have to fall to be at their appropriate levels today compared to income.

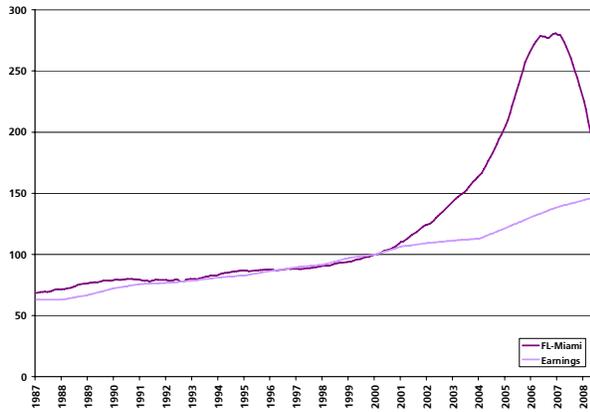
Chart 7: Potential Peak->Trough Housing Declines From May 2008

Percentage Move From Peak To Theoretic Current Price Based On Earnings	
Los Angeles	-48.92%
Miami	-47.90%
Washington DC	-42.16%
Tampa	-41.39%
San Diego	-40.14%
Phoenix	-40.13%
Las Vegas	-39.59%
National (CS10)	-38.70%
New York	-34.19%
San Francisco	-33.60%
Portland	-30.17%
Seattle	-30.04%
Minneapolis	-20.77%
Chicago	-20.44%
Boston	-19.11%
Atlanta	-10.48%
Charlotte	-2.59%
Detroit	-1.91%
Denver	-1.17%
Cleveland	5.85%
Dallas	6.61%

Source: S&P Case-Shiller, Bureau of Economic Analysis, Haver

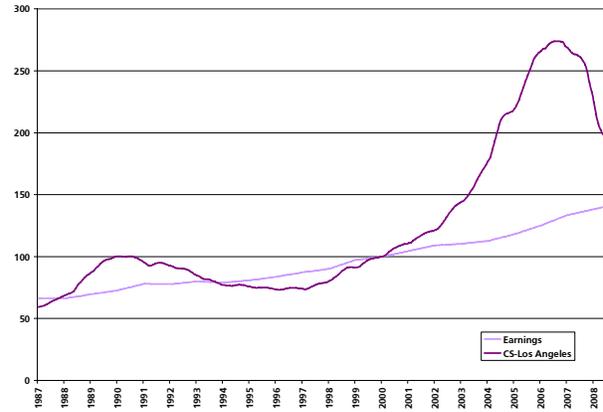
Here are the Home Price versus Income time series for selected cities:

Chart 8: Miami HPA and Earnings



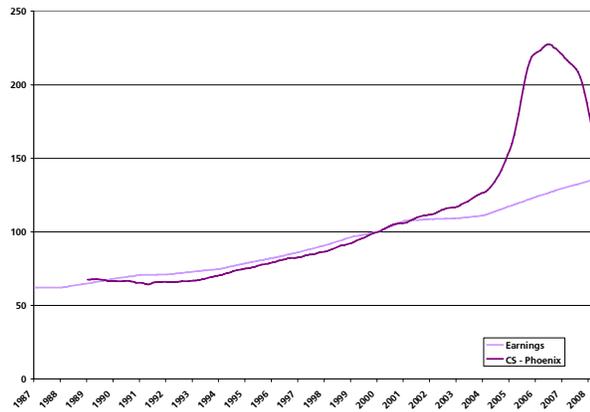
Source: S&P Case-Shiller, Bureau of Economic Analysis, Census Bureau

Chart 9: Los Angeles HPA and Earnings



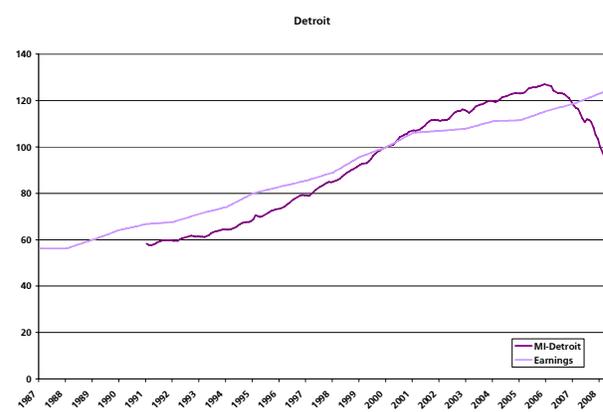
Source: S&P Case-Shiller, Bureau of Economic Analysis, Census Bureau

Chart 10: Phoenix HPA and Earnings



Source: S&P Case-Shiller, Bureau of Economic Analysis, Census Bureau

Chart 11: Detroit: Well Through the Earnings Line

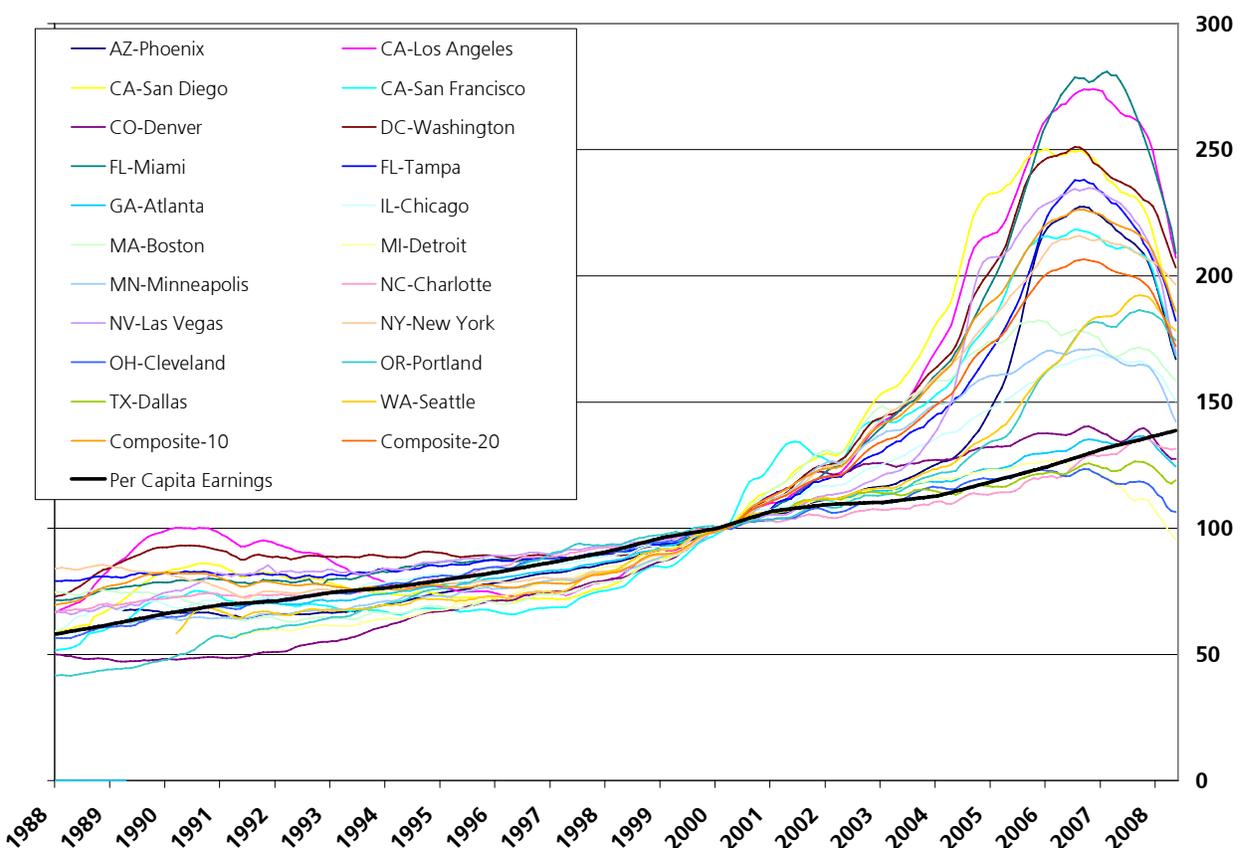


Source: S&P Case-Shiller, Bureau of Economic Analysis, Census Bureau

It is possible to take a forward look at the path of home prices if you are willing to make assumptions about how the correction continues to play out.

- The growth in per capita earnings will continue to be steady out for the rest of this decade, so the average of the month over month changes in earnings was taken and then this rate was used to extrapolate the data from January 2007 forward into 2010.
- Housing levels will correct all the way down to parity with the comparative level of earnings, this was modelled by taking the moving average of previous month over month declines in housing prices.

Chart 12: Aggregate Case-Shiller Data and Incomes, Indexed to 2000



Source: S&P Case-Shiller, Bureau of Economic Analysis, Census Bureau

The assumptions shown above may be reasonable; however, there are other possible situations that could occur to change the bottom level of housing prices and the timing of the move in prices lower.

- Housing prices could bottom out and the growth rate could slow, this would allow for a longer correction as earnings growth outpaces housing growth and the levels eventually again reach parity
- Housing prices could over correct and continue to go downward after breaking through the income line
- Income levels in the face of current downside economic risk could flatten or fall (as was seen in 2000) implying a lower bottom for the housing market and possibly a later date
- A spread between earnings and housing prices could persist into the future

If we simplistically assume that income growth levels remain relatively constant, and if we assume that the recent pace of home price declines remains intact, then we find that the decline in home prices will meet up with the income curve around September 2009.

When we extrapolate recent trends in home prices and incomes, the two curves should meet around September 2009.

If the Case-Shiller data were to revert to the “mean,” or to re-synch with earnings, then our data shows that Case-Shiller prices could fall by as much as

40% from their 2006 peak—assuming that home price declines don't fall through the income curve. As the charts above show, home prices did fall below the income curve after the last housing bust in the early 1990's. We know of very few economists who project such a peak-trough decline in home prices during this downcycle—though some do. Our own economics team officially expect that we'll see a -25% peak-trough decline in home prices in National Case-Shiller terms. While sitting slack-jawed over this prospect, we think it important to consider just how big the bubble in home prices was before it began to deflate. Some, like the Economist magazine many months ago, have proclaimed the US housing bubble as the biggest bubble of all time. If you look at the charts shown above, the home price appreciation after the turn of the century was clearly without precedent. Indeed, we note that if tech stocks can trade happily at \$75.00 one year (say 2000) and unhappily at \$0.75 the next (and with constant earnings), then why can't home prices fall by 40%?

Lessons from the Great Depression

Many market experts have called the present credit/banking crisis the worst since the Great Depression. Having heard that, we decided to take a stroll back in financial history to look at the parallels between the Great Depression and today. We've always believed that the past offers lessons and guidance for the future. We will not use these pages to regurgitate a history of the Great Depression nor will we go beyond making some simple comparisons between today's events and those highlighted by Fed Chair Ben Bernanke in his 1983 work on the Great Depression.

Ben Bernanke's seminal work on the Depression circa 1983 is titled, "Non-Monetary Effects of the Financial Crisis in the Propagation of the Great Depression." This is a wonderful read and it offers interesting insights into the experience that may have patterned the thinking of our current Fed Chairman. We're going compare his 1983 observations about why the Depression was so deep and lasted so long with the events of the present day. The correlations are stunning and they hint that we may be in for a longer slog than almost all economists expect. At the core of this hunch is observed banking behavior. Yes, things are in many ways different this time and we know that. Even so, we know from experience that human and institutional behavior tends to be constant over time-- and for given shocks to the system. People say "Ouch!" when they're hurt just like banks react to eroding loan quality and financial losses by tightening up lending standards. That's why a study of banking history is so important when trying to understand the quasi-predictable behavior of the banks today.

A statistical comparison between today's housing/credit crunch and the Great Depression may not be fair; but a behavioural comparison makes for an interesting exercise.

The Cost of Credit Intermediation (CCI):

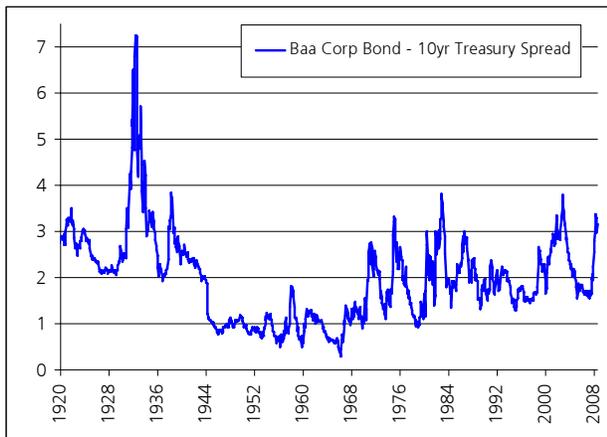
Bernanke defines the CCI as: "The cost of channeling funds from the ultimate savers/lenders into the hands of good borrowers." A key point that Bernanke makes is derived from the work of Friedman-Schwartz and his essential premise is that, "Because markets for financial claims are incomplete, intermediation

between some classes of borrowers and lenders requires nontrivial market-making and information-gathering services. The disruptions of 1930-1933... reduced the effectiveness of the financial sector as a whole in performing these services. As the real costs of intermediation increased, some borrowers (especially households, farmers, and small firms) found credit to be expensive and difficult to obtain. The effects of this credit squeeze on aggregate demand helped convert the severe but not unprecedented downturn of 1929-1930 into a protracted depression.” (Bernanke, 1983)

The CCI is tough to measure. One way that Bernanke attempted to measure it (empirically, at least) was by looking at the spread between Baa corporates and US treasuries. You can see this timeseries just below and though spreads are not anywhere near as wide as they were during the Depression, they are back near the wides of the last 50 or so years. A more “modern way” to illustrate the impact of higher CCI on market rates might simply come from the Libor/OIS spread as we show in Chart 14.

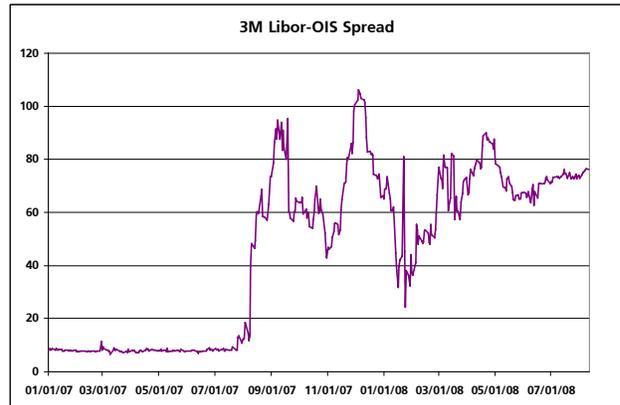
The widening gap between Libor and OIS may be a modern way of illustrating a higher CCI in the banking system.

Chart 13: Baa Corporates versus Treasuries back to 1920



Source: Federal Reserve Bank, NBER, UBS

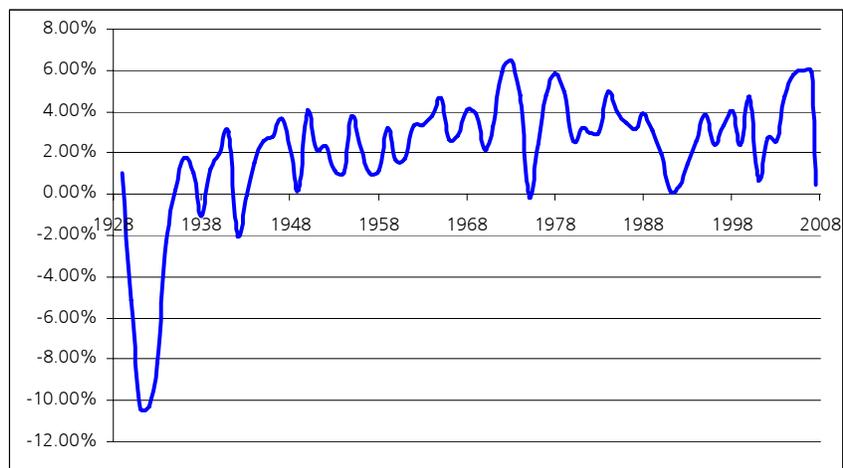
Chart 14: 3M Libor/OIS Spread Since January 2007



Source: Bloomberg, UBS

Bernanke then posits that a higher CCI should have an impact on the *provision* of bank credit. For this measure he looked at the monthly change in bank loans outstanding, normalized by monthly personal income. Bernanke notes that “The shrinkage of credit shared the rhythm of the banking crisis” which underscores the pro-cyclical nature of bank lending in downturns. We have tried to replicate this same series and we’ve done so in the chart below (with the kind help of the Bureau of Economic Analysis (BEA) and their personal income series that dates back to the Depression years). Bernanke used monthly data but we’ve chosen to use annual data since the Fed series on total commercial bank loans (Monetary and Banking Statistics) was itself annual data back in the 1920’s. The results are telling and the recent sharp fall-off in this series offers further proof that a higher CCI can reduce the provisioning of loans. Indeed, the last time we saw such a sharp decline in the series was back in the middle 1970’s when bank lending standards were roughly as tight as they are today (Chart 3 above).

Chart 15: Change in Bank Loans Normalized By Personal Income (Annual)



Source: Bureau of Economic Analysis, Federal Reserve Bank

Bernanke also notes that one way for the banks to adjust for a higher CCI is to increase rates charged to borrowers. This is exactly what today's mortgage lenders of last resort, the GSE's, are known to be doing. Bernanke further notes that such pro-cyclical actions can be counterproductive as higher rates increase the risk of default. The alternative, as Bernanke points out, is for banks to eschew loan provision to borrowers including those who would have readily qualified when times were good. As such, Bernanke notes that low market rates (treasuries or top-tier corporate rates) *can be a misleading indicator* of just how easy money is. When we think of the optics of a theoretically stimulative 2.00% Fed Funds rate, we also think it important to consider where loan rates are too. It's clear to us that the effects of a rising CCI has potentially sterilized much of the "good" of a 2.00% Fed Funds rate. Borrowing conditions for all but the most gilt-edged borrowers remains stressed even today and even after the numerous and innovative attempts by the Fed to improve funding liquidity. As long as borrowing conditions stay tight, the US economy is likely to stay weak and Treasury "safe" rates are likely to stay low. (Continued, next page)

Table 1: One Year On, Some Borrowers See Little Benefit....

Instruments	July 31 2008	August 2 2007	Change (bp)	Instruments	July 31 2008	August 2 2007	Change (bp)
Federal funds (effective)	2.09	5.24	-315	TIPS			
Commercial Paper				5-year	1.09	2.47	-138
Nonfinancial				7-year	1.40	2.48	-108
1-month	2.08	5.26	-318	10-year	1.65	2.46	-81
2-month	2.13	5.23	-310	20-year	2.16	2.45	-29
3-month	n.a.	n.a.		Inflation-indexed long-term average	2.14	2.44	-30
Financial				Interest rate swaps			
1-month	2.36	5.26	-290	1-year	3.02	5.24	-222
2-month	2.56	5.26	-270	2-year	3.44	5.13	-169
3-month	2.71	5.24	-253	3-year	3.80	5.16	-136
CDs (secondary market)				4-year	4.02	5.22	-120
1-month	2.48	5.33	-285	5-year	4.17	5.29	-112
3-month	2.77	5.34	-257	7-year	4.43	5.39	-96
6-month	3.11	5.33	-222	10-year	4.67	5.51	-84
Eurodollar deposits (London)				30-year	5.00	5.67	-67
1-month	2.65	5.33	-268	Corporate bonds (Moody's seasoned)			
3-month	3.00	5.35	-235	Aaa	5.73	5.60	13
6-month	3.30	5.32	-202	Baa	7.21	6.60	61
Bank prime loan	5.00	8.25	-325	State & local bonds	4.74	4.51	23
Discount window primary credit	2.25	6.25	-400	Conventional mortgages	6.52	6.68	-16
U.S. government securities				30yr fixed rate	6.41	6.41	0
Treasury bills				15yr fixed rate	6.02	6.16	-14
4-week	1.52	4.93	-341	1 year ARM	7.17	5.7	147
3-month	1.65	4.75	-310	AAA rated Municipal Bonds			
6-month	1.84	4.75	-291	2-year	2.46	3.73	-127
1-year	2.20	n.a.		10-year	3.85	4.03	-18
Treasury constant maturities				30-year	4.9	4.64	26
1-month	1.55	5.02	-347				
3-month	1.68	4.89	-321				
6-month	1.89	4.95	-306				
1-year	2.27	4.83	-256				
2-year	2.52	4.59	-207				
3-year	2.81	4.57	-176				
5-year	3.25	4.62	-137				
7-year	3.56	4.68	-112				
10-year	3.99	4.77	-78				

Source: Federal Reserve Bank, Bloomberg, UBS

Bernanke underscores his point about the threats from a high CCI when he says, "A higher cost of credit intermediation for some borrowers... implies that, for a given safe interest rate, these borrowers must face a higher effective cost of credit. (Indeed, they may not be able to borrow at all.) If this higher rate applies to household and small firm borrowing but not to their saving (they may only earn the safe rate on their saving), then *the effect of higher borrowing costs is unambiguously to reduce their demands for current-period goods and services*" (our emphasis). UBS expects that the Fed Funds rate will have to be cut further below 2.00% and this whole discussion about the effects of an elevated CCI is a good way to visualize just why the Fed may one day need to cut the Funds rate further. As Bernanke concluded in his CCI discussion in 1983: "... For a given safe rate, an increase in the cost of credit intermediation reduces the total quantity of goods and services currently demanded. That is, the aggregate demand curve, drawn as a function of the safe rate, is shifted downward by a financial crisis. In any macroeconomic model one cares to use, this implies lower output and lower safe interest rates." We do not believe that "safe" rates are yet low enough to restore balance sheet health and to get the economy growing again. A higher CCI has kept loan rates high and loans themselves difficult to obtain. Safe rates therefore should fall further in the months ahead to help bring loan rates back to earth.

Bernanke links higher credit intermediation costs with higher loan rates and reduced demands for goods and services. It's one reason why base or safe rates need to fall when loan markets get gummed up.

Debt Burdens: No Relief Here

In describing the role of debtor insolvency in the propagation of the Great Depression, Bernanke said: “Given that debt contracts were written in nominal terms, the protracted fall in prices and money incomes greatly increased debt burdens. According to Clark (1933), the ratio of debt service to national income went from 9% in 1929 to 19.8% in 1932-1933.” Think about what Bernanke says here and reflect on charts 16 and 18 which show present day household debt burdens. Chart 18 further shows that the Fed’s Financial Obligations Ratio has risen substantially as home equity withdrawal (a recent piggy-bank for homeowners) has plunged. Bernanke also noted in his 1983 Depression piece that roughly 50% of all US properties were mortgaged at the beginning of the Depression and that this contributed to the debt crisis of that day. Today we find that some 60+% of all properties in the US are mortgaged in some way (Chart 17).

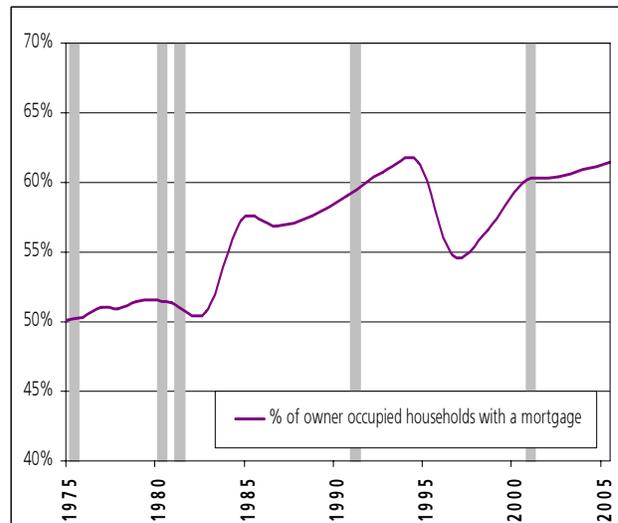
Household debt service grew sharply during the Great Depression. Debt burdens have also grown sharply in the US since the early 1990’s

Chart 16: Household Debt Burdens and Disposable Income



Source: Federal Reserve Board

Chart 17: % of Households With a Mortgage



Source: Census Bureau

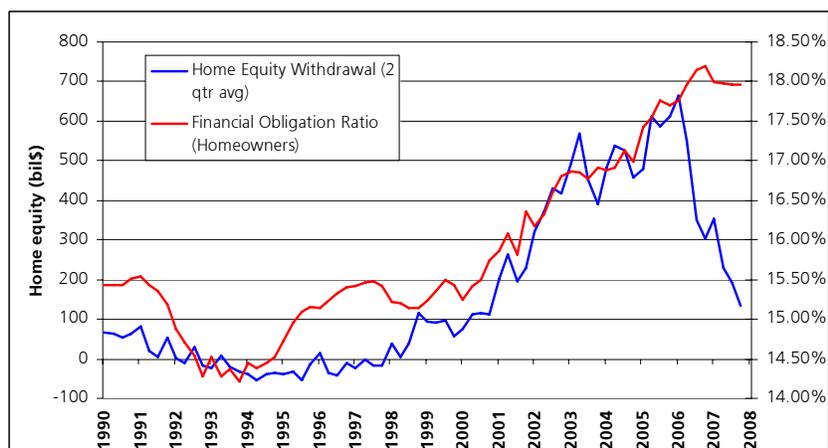
It’s bad; when does it end?

Bernanke suggested in 1983 that theory holds that the duration of a financial crisis depends of two factors: 1) the time it takes to “establish new or revive old channels of credit flow” and 2) the time it takes to “rehabilitate insolvent debtors.” This makes sense. Bernanke’s most interesting point on this comes in his conclusion that lenders “emerged from the 1930-1933 episode chastened and conservative.” We’ve always wondered what conditions would be needed to get banks lending again—at least at a pace that could return the US economy to trend growth. Bernanke’s study found the following and it’s an ominous warning for the coming few years: “...It seems safe to say that the return of the private financial system to normal conditions after March 1933 was not rapid; and that the financial recovery would have been more difficult without extensive government intervention and assistance. A moderate estimate is that the U.S. financial system operated under a handicap for about five years... a period

Bernanke found that during the Great Depression lenders were very slow to swing back from conservative lending practices to more liberal loan provision as the economy passed the trough in March of 1933.

which covers most of the time between the recessions of 1929-30 and 1937-38. This is consistent with the claim that the effects of financial crisis can help explain the persistence of the Depression.” (Bernanke, 1983) It’s our expectation that the US will continue to suffer from the ill effects of diminishing asset quality, rising costs of credit intermediation and persistently tight lending standards. Simply, we don’t expect the banks to suddenly shed their new-found conservatism and to crank open the loan spigot again. Once chastened, twice shy we’d guess. This thinking keeps us married to our weak growth, lower (safe) rate views.

Chart 18: Financial Obligations Rise as the Cash Well Dries Up...



Source: Federal Reserve Bank, Haver

Money Velocity and Inflation

“It is well enough that people of the nation do not understand our banking and monetary system, for if they did, I believe there would be a revolution before tomorrow morning.” Henry Ford

Earlier this year we tripped over an incredibly timely New York Fed research piece written by Tobias Adrian and Hyun Song Shin. The NY Fed’s synopsis of this research piece is worth repeating: “The authors of this study argue that the growth rate of aggregate balance sheets may be the most fitting measure of liquidity in a market-based financial system. Moreover, the authors show a strong correlation between balance sheet growth and the easing and tightening of monetary policy.” (Adrian & Shin, 2008) If you’ve not read this work, you should. What resonates for us was their interesting (and intuitive) links between balance sheet adjustments and economic cycles. Anyone sitting on a Wall Street trading floor this year knows that balance sheets are contracting and lending standards were being cinched up in the wake of the massive trail of losses from housing market assets. Indeed, it was easy to watch in real time just what Adrian and Shin were writing about.

As we pondered the links between balance sheets, the economy and Fed policy, we began thinking about the theory of the Velocity of Money (V). We are *not* experts on money velocity theory but we thought it a good concept to think about as we followed the money trail while hunting down a rates outlook. It also seemed logical to conclude that tightening balance sheets among financial intermediaries would eventually cause the velocity of money to decline as lenders threw up their arms in exasperation over loan losses with borrowers walking away from the loan window empty-handed. As Shuibo Sun once wrote, “In human bodies, both the stock and the velocity of blood are very important. In the economy system, the stock of money and its velocity have the analogous positions.” (Sun, 2002)

It's not just the volume of money in the system, it's also the pace at which it flows through the system that matters too.

With lending standards tight and with money likely to be changing hands more slowly, followers of the Quantity Theory of Money would conclude that the money supply would have to grow (this is the role of the Fed) to maintain the same level of purchases. As such, the debilitating effects on consumption from falling V would, or could, force the Fed to further increase the money supply (by cutting rates) in the months ahead to get the economy and the velocity of money rolling again—like the shock of a defibrillator, if you will.

We know from studying the Equation of Exchange that there are two outcomes from changes in the velocity of money: inflation/deflation and economic output (J.S. Mill (1848), M. Friedman (1987), et al). We also know from experience that the velocity of money is notoriously difficult to measure (i.e., what does one use for M or money supply?). One day in late June we got a “hallelujah” e-mail that described the recent work of Louis Gave and his associates at GaveKal on the subject of money velocity. Louis and crew have done the exhaustive work of measuring the elusive V and they have been incredibly kind in letting us show their work here to help to frame our discussion.

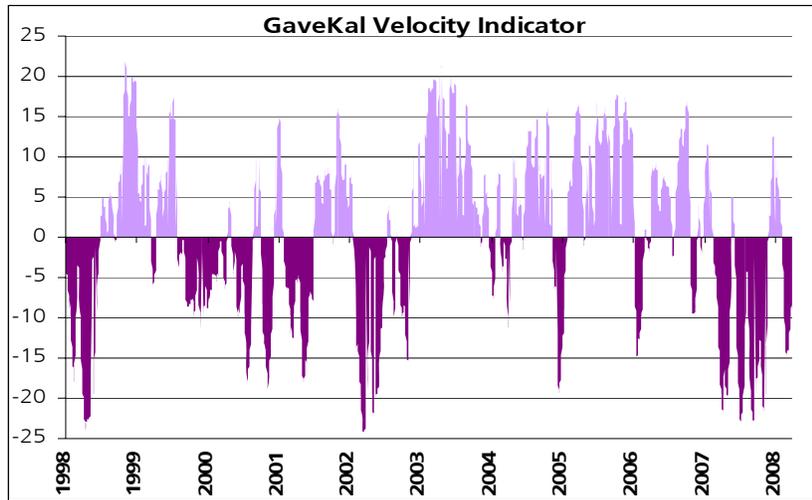
Louis Gave’s money velocity tool is made up of the following components:

- The banking multiplier in every major economic zone
- A large set of quality spreads (junk vs. investment grade, IG and govies, etc.)
- Government bond yield curves (US, Eurozone, UK and Japan)
- Performance of bank shares relative to equity and bond markets in all major regions
- Mortgage refinancing in the US
- Equity performance data (such as small cap relative performance)
- Changes in forward rates in liquidity sensitive currencies (HK\$...)

As Gave concluded in a recent note to us, his model provides an interesting measure of the “animal spirits” prevalent in the financial markets. We show his model’s time series below and one can see how those animal spirits (risk appetites) are “stubbornly low.” What Gave appears to do is to link risk appetite to money velocity to get a measure of V—something that we find reasonable. Our own concern is that the diminished risk appetite (by lenders) will further translate into diminished consumption and lower prices. We’ve clearly seen ample evidence of widespread financial and housing asset price deflation and we

expect to see commodity prices follow asset prices, and perhaps V, lower in the months ahead.

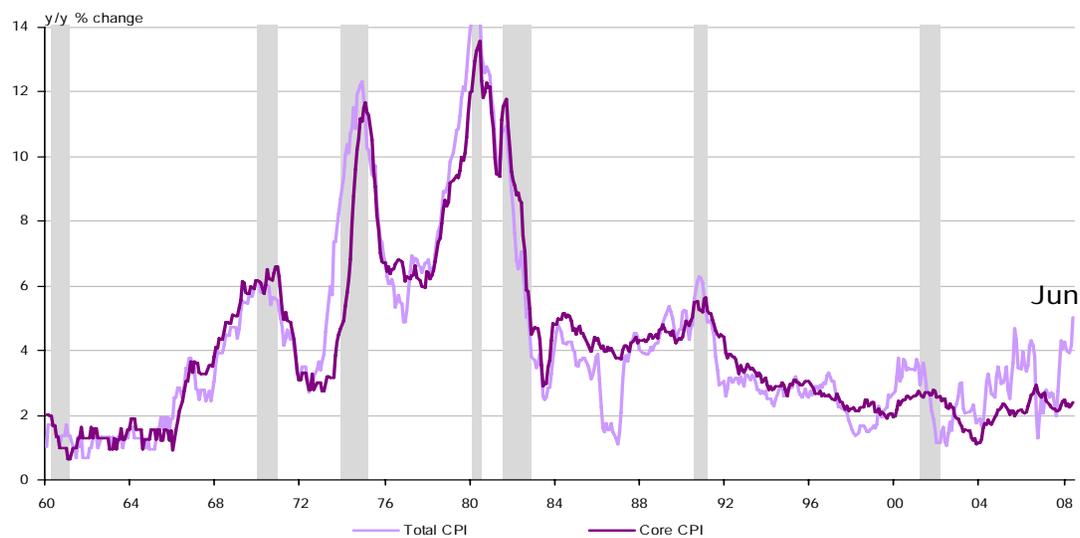
Chart 19: One Measure of Money Velocity



Source: GaveKal

The next chart we show relates to inflation and recessions. This chart is our self-anointed “chart of the year” and it’s one that we snatched from our economics team. It shows how core and headline CPI have hit their cyclical peaks during every recession of the last 50yrs. Besides underscoring the known lagging nature of inflation, history naturally shows that recessions tend to create slack and destroy demand. Indeed, the big declines in headline and core inflation tend to occur *after* recessions end and when pricing power is theoretically at its nadir.

Chart 20: Headline and Core Inflation Peak *During* Recessions...



Source: Bureau of Labor Statistics

Threats to Our View:

Chart 21: Weekly Stocks... Big Hammer Spring in Mid-July



Source: CQG

Chart 22: Light Crude, Daily



Source: CQG

Stocks Look Good For Now; Oil Doesn't

We're not experts in Stocks and we know little about Stock fundamentals. That said, we know a lot about technical analysis and what we see in the Stock charts elicits some concerns about our weak economy, bullish rates outlook. Simply, the stock charts look pretty good and the Oil chart looks pretty bad (the two are probably inexorably entwined.)

We highlight the Weekly S&P chart just above. In the Weekly S&P chart we can see a classic bottoming signal in the candlestick chart of the S&P. Bank in mid-July the S&P 500 futures traced out what we candlestick chartists would call a "Hammer Spring." A Hammer Spring is a classic Hammer Bottom but with an added and important twist: it's where prices rejected a major support that week which, in this case, was the 2006 S&P 500 lows. The Hammer Bottom suggests that a market is "attempting to hammer out a bottom." (Nison, 1991)

The Daily Oil chart basically looks as bad as the S&P Weekly chart looks good. Oil broke below its 2008 uptrend on July 22nd and Oil prices appear aimed at \$110/bl and the 38% retracement point of the whole rally since the beginning of 2007 and \$50/bl.

We're not in the business of calling the shots in Stocks and Oil but we do have concerns that higher Stock prices and lower Oil prices could muddy our bullish Treasury outlook. Higher Stocks and lower Oil prices--at some point--could act like a tax cut for businesses and consumers while giving a lift to consumer sentiment and thereby consumption. We're keeping an eye on these

developments as we remain steadfast in our view that the downturn in Treasury rates, and in the US economy, will last longer and go deeper than most in the investment community expect.

Summary

A few concepts can drive a macro view. We know that home prices can create wealth or destroy it. At the same time, the fortunes and behavior of the financial institutions who lend to the housing market are naturally shaped by the path of home prices. As home prices fall like they have in the past two years, financial losses spur a natural reaction among lenders and borrowers: they curtail lending and they curtail consumption. It's our belief that home prices are likely to continue to decline. Home price valuations look out of line with incomes and tighter lending standards have forced mortgage rates higher at a time when they should be falling in line with base rates. As long as home prices decline, the lubricants of the financial system, the banks, should continue to keep loan provision tight. This all means that economic growth should remain "below trend" for some time to come and, with that, Treasury rates should remain historically low. At the same time, inflation should moderate as US and global demands for goods wanes.

We expect that Treasury 2yr yields will fall toward 1.75% by the end of 2008 and after it becomes clearer that the 2.00% Fed Funds rate has not done enough to push loan rates to levels commensurate with economic formation. We also expect the Treasury 2y-10y yield curve to widen back to +200bp as short rates fall. We see Stocks and Oil as the key risk to this view given that higher Stocks and lower Oil prices can act like a rate/tax cut on the economy. Our eyes remain open.

Bibliography

Adrian & Tobias (2008) Tobias Adrian and Hyun Song Shin, *Liquidity, Monetary Policy, and Financial Cycles*, Federal Reserve Bank of New York, January/February 2008.

Bernanke (1983) Ben S. Bernanke, *Non-Monetary Effects of the Financial Crisis in the Propagation of the Great Depression*, NBER, January 1983.

Nison (1991) Steve Nison, *Japanese Candlestick Charting Techniques*, New York Institute of Finance, 1991.

Rampell (2008), *In Various Ways, Economists Try and Find Right Price For a Home*, NY Times, August 8th 2008.

Sun (2002) Shuibo Sun, *Does Transaction Velocity of Money Work on GDP? An Empirical Study*, Nankai University, November 2002.

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