

# U.S. Economic Outlook What Happened to Goldilocks ?

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# Forecast at a Glance

	2005	2006	2007	2008E	2009E
GDP Growth <sup>(1)</sup>	2.9	2.6	2.5	0.2	2.4
Core CPI Inflation <sup>(1)</sup>	2.1	2.6	2.3	2.3	2.3
Budget Surplus (% of GDP)	-2.6	-1.9	-1.2	-2.9	-2.5
Fed Funds Rate <sup>(2)</sup>	4.25	5.25	4.25	2.00	4.00
10-Year Note Yield <sup>(2)</sup>	4.39	4.71	4.15	4.25	5.25

E = Morgan Stanley Estimate.

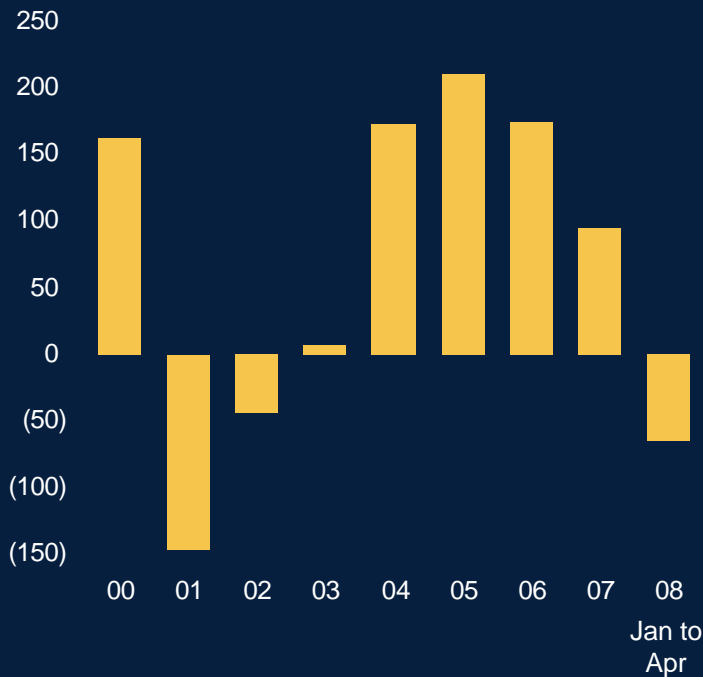
(1) 4Q / 4Q Percent Change.

(2) End of period.

# From Goldilocks to Recession...

## Job Growth

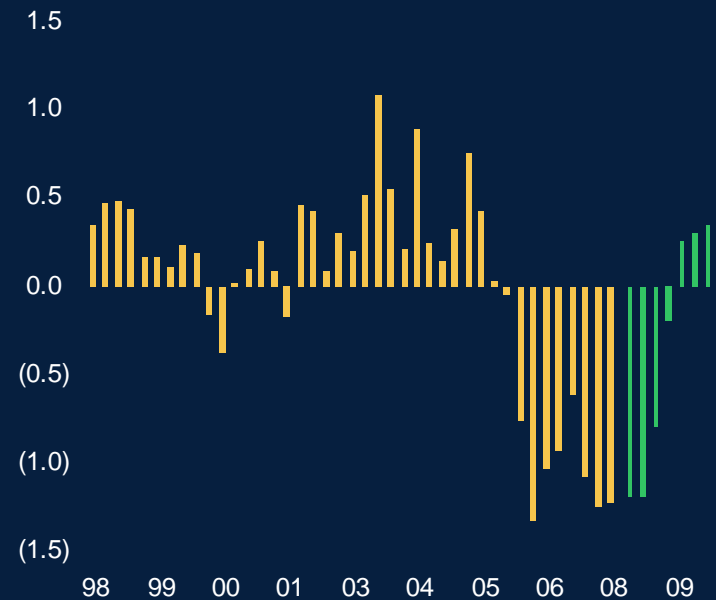
(Average Monthly Payroll Change, 000s)



Source: BLS

## Residential Investment

(Percentage Point Contribution to Quarterly GDP Growth)

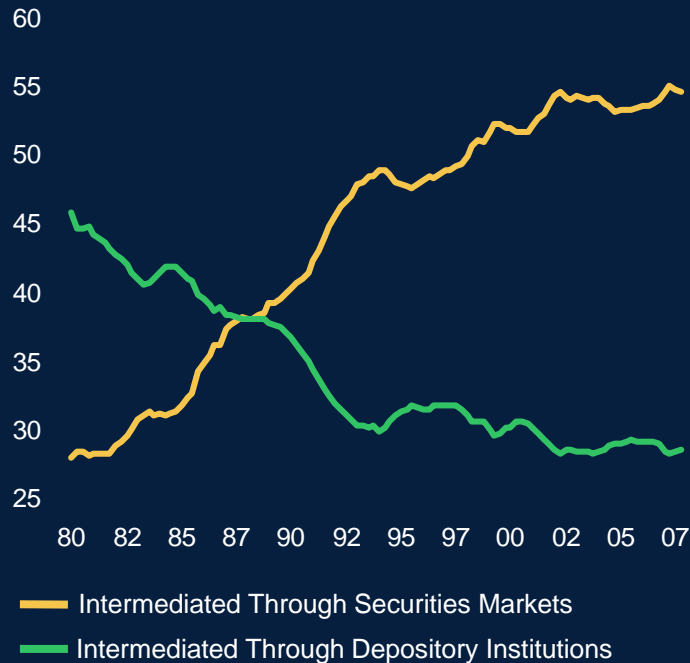


Source: BEA with Morgan Stanley forecast represented by green bars

# The First Credit Crunch in the Era of Securitization

## Trends in Credit Intermediation

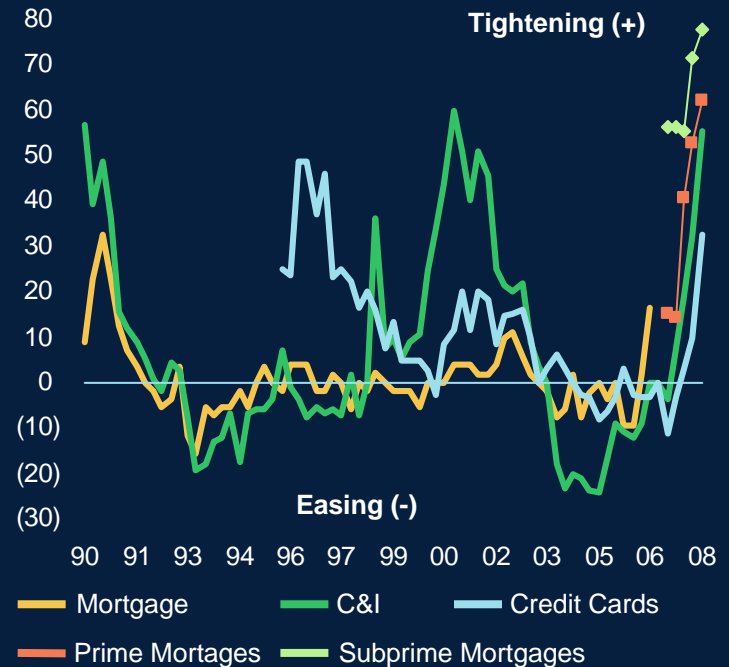
(Share of Private Nonfinancial Debt Outstanding, Percent)



Source: Morgan Stanley calculations based on Federal Reserve Flow of Funds Accounts

## Lending Standards

(Net Percentage of Institutions Reporting a Tightening)



Source: Federal Reserve, Senior Loan Officer Survey. Latest data point is from the April 2008 survey

# The Fed to the Rescue ...

Expected Fed Funds (OIS) vs. 3-Mo LIBOR

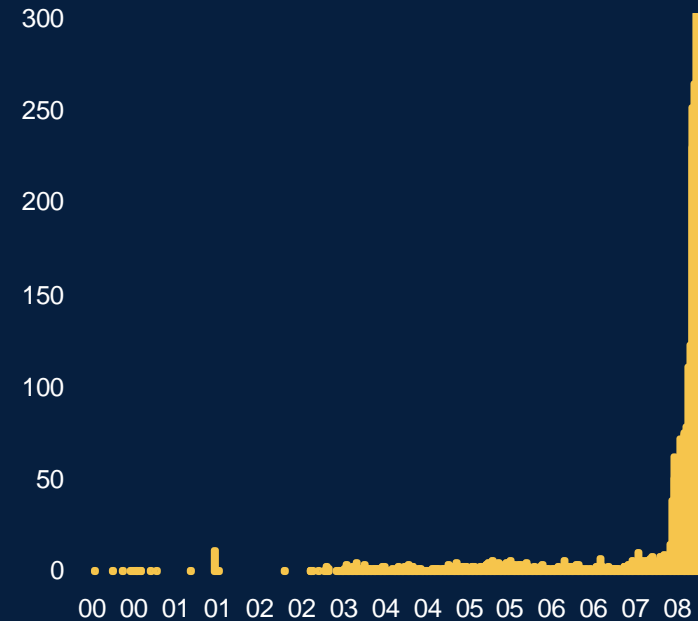
(bps)



Source: Bloomberg

Fed Discount Window+TAF+PDCF+TSLF

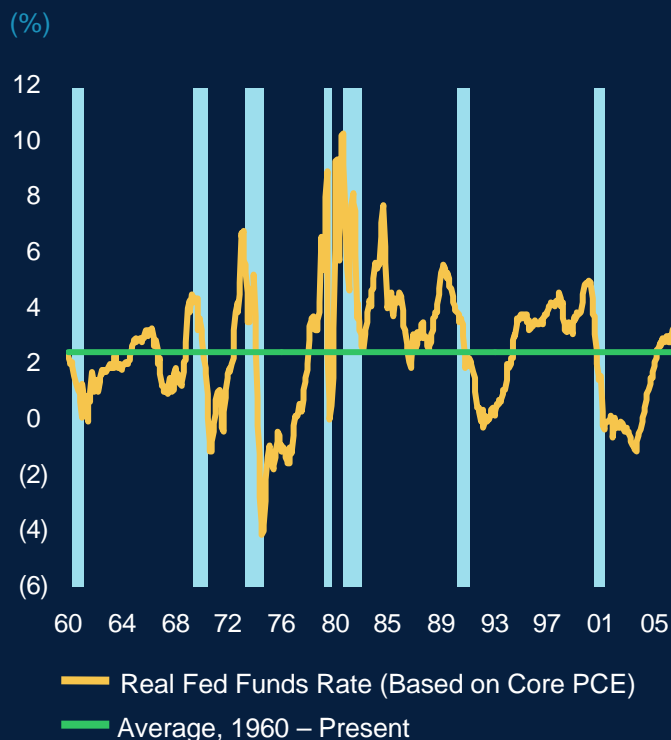
(\$Bn)



Source: Federal Reserve weekly H.4.1 report (data through April 16, 2008)

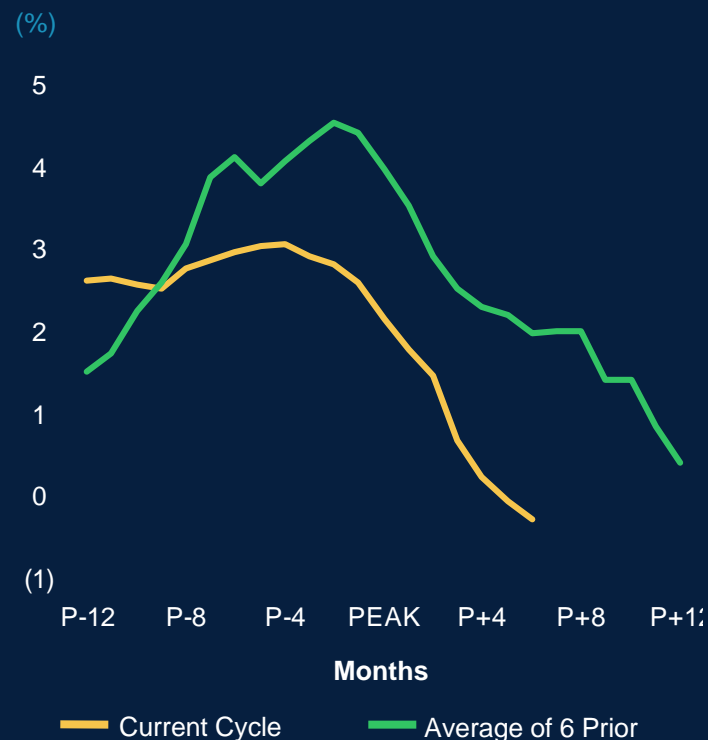
# Monetary Policy Is Already Highly Stimulative

Getting to (and Through) Neutral <sup>(1)</sup>



Source: Federal Reserve and BLS with Morgan Stanley estimates for March and April

Cyclical Comparison: Real Fed Funds Rate <sup>(2)</sup>



Source: Federal Reserve, BLS and Morgan Stanley calculations

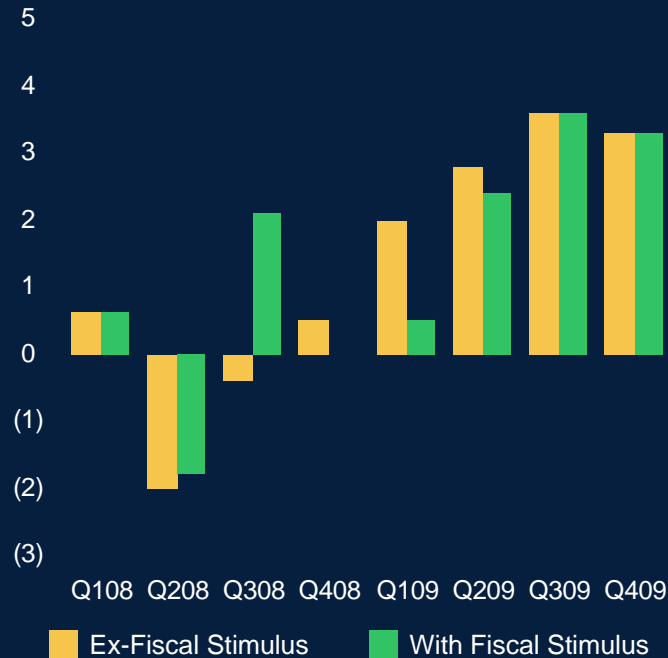
(1) Shaded areas indicate recession.

(2) Real rate calculated using yr/yr core CPI. Data plotted through April (with Morgan Stanley est for April). Assumes current business cycle peak is November 2007.

# Fiscal Stimulus Is Right Around the Corner

## Real GDP Growth Forecast

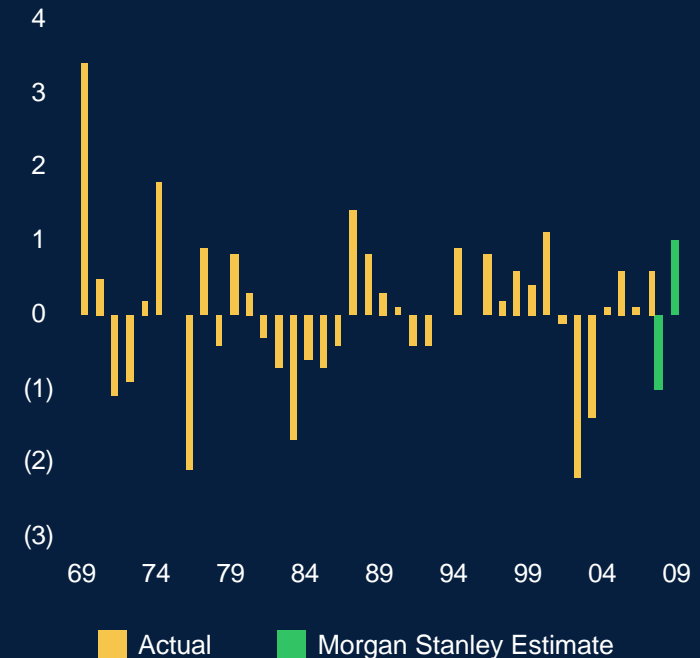
(Annualized Percent Change)



Source: Morgan Stanley Estimates

## Change in Standardized Budget Deficit

(Percent of Potential GDP)

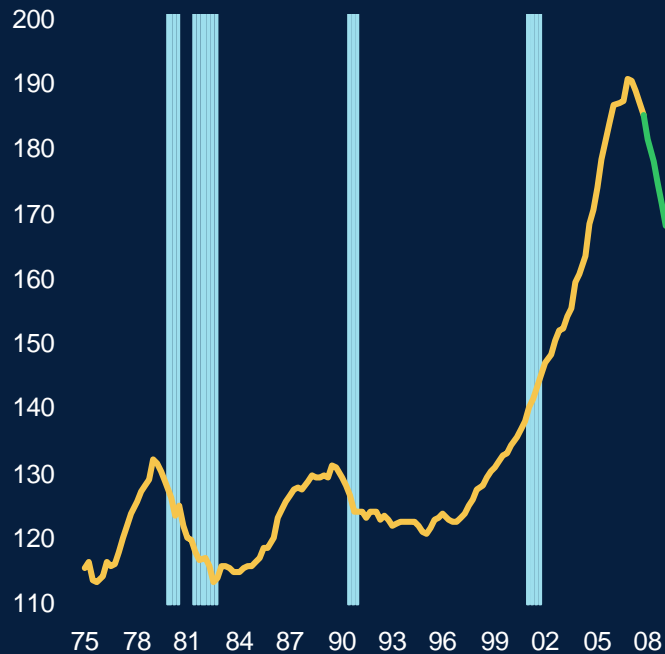


Source: CBO and Morgan Stanley Estimates

# The Housing Market Adjustment Is Well Underway

## Home Prices and the Business Cycle

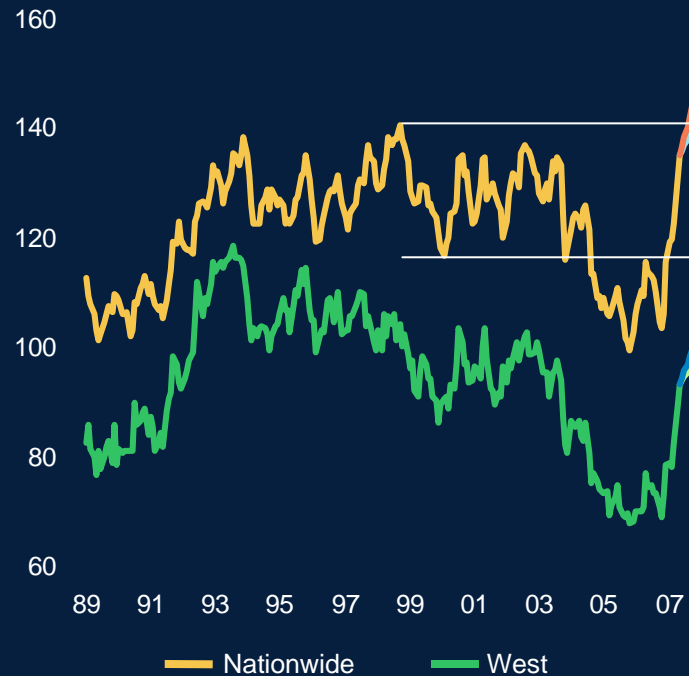
(OFHEO Index Adjusted for CPI Inflation)



**Source:** OFHEO and BLS. Shaded Areas indicate recession. Green line represents a 10% decline in real home prices through early-2009

## Housing Affordability Index <sup>(1)</sup>

(Index, Base=100)



**Source:** National Association of Realtors with Morgan Stanley calculations

# The Wealth Effect vs. an Energy Shock

## Wealth Effect

- Household Real Estate Assets = \$20 trillion
- Assume Home Prices Drop 10%
- “Standard” Wealth Effect implies a \$80 billion (or 0.9%) hit to consumer spending <sup>(1)</sup>

## Energy Shock

- Gasoline and fuel oil account for about 4% of total consumer spending <sup>(2)</sup>
- Assume Gasoline Prices Rise from \$2.75/gal to \$3.50/gal
- This subtracts \$90 billion (or 1.0%) from discretionary spending power

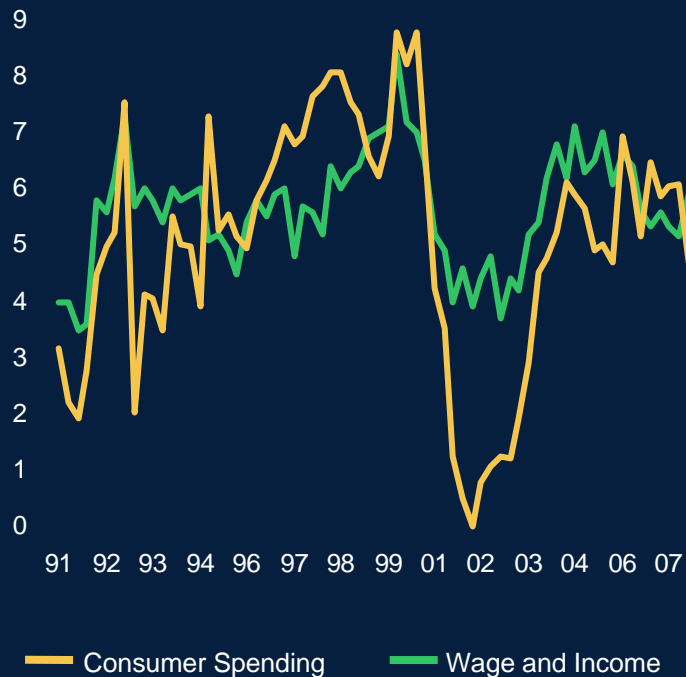
(1) The wealth effect of 4 cents per dollar of change in wealth is based on the econometric model of the U.S. economy that is used by the Federal Reserve Board. Recent research suggests that the housing-specific wealth effect may be even smaller. See “The Decline in Household Saving and the Wealth Effect” by Juster, Lupton, Smith and Stafford.

(2) Does not include household fuels such as natural gas.

# How Far Down for the Labor Market?

## The Link Between Income and Spending

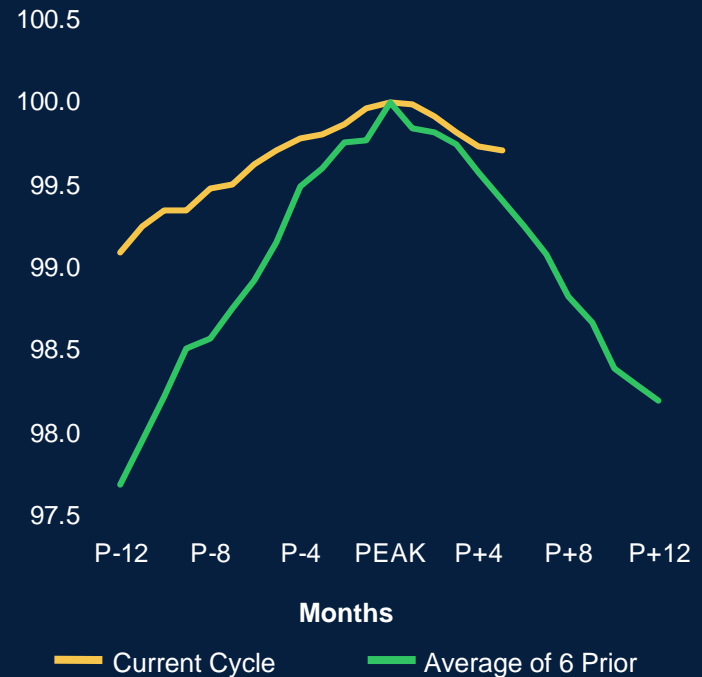
(Year / Year Percent Change)



Source: BEA

## Private Sector Payrolls: Cyclical Comparison

(Indexed to Cycle Peak=100)



Source: BLS with Morgan Stanley calculations

# Inflation Fears Are Heating Up (But OER Should Help)

## Core Inflation

(Percent Change from Year Ago)



Source: BEA and BLS

## CPI for Owners' Equivalent Rent

(Year / Year Percent Change)

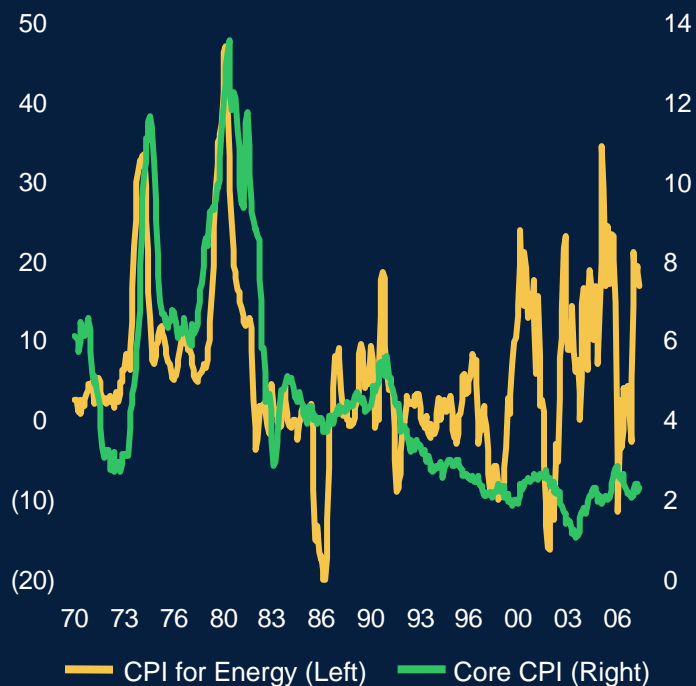


Source: BLS

# Commodity Prices and Labor Cost Pressures Bear Watching

## A Mixed Track Record

(Percent Change from Year Ago)



Source: BLS

## Unit Labor Costs and Inflation

(Year / Year Percent Change)



Source: BLS

# Leveraged Losses: Lessons from the Mortgage Market Meltdown <sup>(1)</sup>

## Our Story

- Mortgage losses are substantial, yet modest relative to routine swings in the capital markets
- The key is to compare losses to the capital base of levered financial intermediaries
- The markets that show the greatest disruptions are the ones in which these institutions play a pivotal role (e.g., mortgages and commercial paper)
- Restoring equilibrium requires a rebuilding of the capital base of these institutions
- In the interim, there will be further deleveraging as the intermediaries cut back on their risk exposure
- Credit contractions can impact the aggregate economy
- Policy options should take this factor into account

(1) "Leveraged Losses: Lessons from the Mortgage Market Meltdown" by David Greenlaw, Jan Hatzius, Anil Kashyap and Hyun Song Shin. Presented at the Second Annual Monetary Policy Forum held in New York City on February 29, 2008.

# How Large Are the Subprime Losses?

- We present three alternative methods to estimate the ultimate losses tied to subprime mortgages
- One approach relies on prices in the ABX derivatives market
- Most importantly, all three methods are consistent with overall mortgage losses of roughly \$400 billion
- A key source of uncertainty is the cumulative decline in house prices

# A Look Inside the Subprime Mortgage Market

## ABX AAA Index

(07 – 01 Series)



Source: Markit

## Characteristics of Subprime and Alt-A Mortgages

	Subprime Pools		Alt-A Pools	
	FRM	ARM	FRM	ARM
<b>Outstanding Loan Balance</b>				
Mean (\$)	\$144,965	\$201,222	\$228,575	\$349,194
<b>Status (%)</b>				
Current	77%	53%	92%	82%
<b>Index (%)</b>				
6-Month LIBOR	N/A	99%	N/A	38%
<b>Interest Rates (%)</b>				
Mean at Origination	7.88%	8.02%	6.59%	4.72%
Fully Indexed Rate	N/A	9.05%	N/A	6.25%
Margin	N/A	6.02%	N/A	2.91%
<b>Loan to Value Ratios</b>				
LTV (First Lien)	0.78	0.82	0.73	0.77
% With Multiple Liens	9%	32%	26%	4%
Combined LTV (All Loans)	0.98	0.99	0.95	0.94
<b>FICO Score</b>				
Mean	629	618	713	708
<b>% Single Family Residence</b>	81%	75%	66%	59%
<b>% Not Owner Occupied</b>	10%	9%	29%	24%
<b>% Full Documentation</b>	75%	60%	39%	26%

Source: Federal Reserve Bank of New York based on Loan-Performance ABS Loan Level Data

# Subprime Losses Implied by Current Market Pricing

Estimates of RMBS Issuance by Rated Tranche (\$Bn)							MtM Loss (\$Bn) based on ABX Pricing					
Year (%)	All Subprime	AAA	AA	A	BBB	BB / Other	All Subprime	AAA	AA	A	BBB	BB / Other
	100	80.8%	9.6%	5.0%	3.5%	1.1%	100	80.8%	9.6%	5.0%	3.5%	1.1%
2005	625	505	60	31	22	7	98	40	16	17	18	6
1Q 2006	140	113	13	7	5	2	43	24	8	6	4	1
2Q 2006	165	133	16	8	6	2	51	28	9	7	5	2
3Q 2006	160	129	15	8	6	2	75	49	12	7	5	2
4Q 2006	135	109	13	7	5	1	63	41	10	6	4	1
1Q 2007	93	75	9	5	3	1	47	32	7	4	3	1
2Q 2007	56	45	5	3	2	1	28	19	4	2	2	1
3Q 2007	28	23	3	1	1	0	14	10	2	1	1	0
<b>Total: 2005 – 1Q 2007</b>	<b>1,402</b>	<b>1,133</b>	<b>135</b>	<b>70</b>	<b>49</b>	<b>15</b>	<b>420</b>	<b>243</b>	<b>68</b>	<b>50</b>	<b>43</b>	<b>14</b>

## ABX Prices by Vintage (April 23, 2008)

ABX Index	AAA	AA	A	BBB	BB / Other
<b>100%</b>	<b>80.8%</b>	<b>9.6%</b>	<b>5.0%</b>	<b>3.5%</b>	<b>1.1%</b>
ABX 06 – 1	92.07	73.00	41.50	18.54	15.00
ABX 06 – 2	78.96	43.80	17.96	9.57	8.00
ABX 07 – 1	62.25	21.00	9.04	7.89	7.88
ABX 07 – 2	57.04	21.00	11.11	10.07	9.71

# Allocation of Losses: Top Down Approach

<b>Home Mortgage Debt</b>		<b>(\$Bn)</b>
<b>Total</b>		<b>11,028</b>
<b>U.S. Leveraged Institutions</b>		<b>5,591</b>
<b>Commercial banks</b>		<b>2,881</b>
Direct		1,935
RMBS		946
<b>Savings Institutions</b>		<b>1,148</b>
Direct		895
RMBS		253
<b>Credit Unions</b>		<b>361</b>
Direct		300
RMBS (estimate)		61
<b>Brokers and Dealers</b>		<b>213</b>
Direct		0
RMBS (estimate)		213
<b>Government-Sponsored Enterprises</b>		<b>987</b>
Direct		457
RMBS (estimate)		530

# Allocation of Losses: Bottom Up Approach <sup>(1)</sup>

	Total Reported Subprime Exposure (US\$Bn)	Percent of Reported Exposure (%)
U.S. Investment Banks	75	5
U.S. Commercial Banks	250	18
U.S. GSEs	112	8
U.S. Hedge Funds	233	17
Foreign Banks	167	12
Foreign Hedge Funds	58	4
Insurance Companies	319	23
Finance Companies	95	7
Mutual and Pension Funds	57	4
<b>U.S. Leveraged Sector</b>	<b>671</b>	<b>49</b>
Other	697	51
<b>Total</b>	<b>1,368</b>	<b>100</b>

**Source:**

Goldman Sachs Equity Research, Authors' calculations

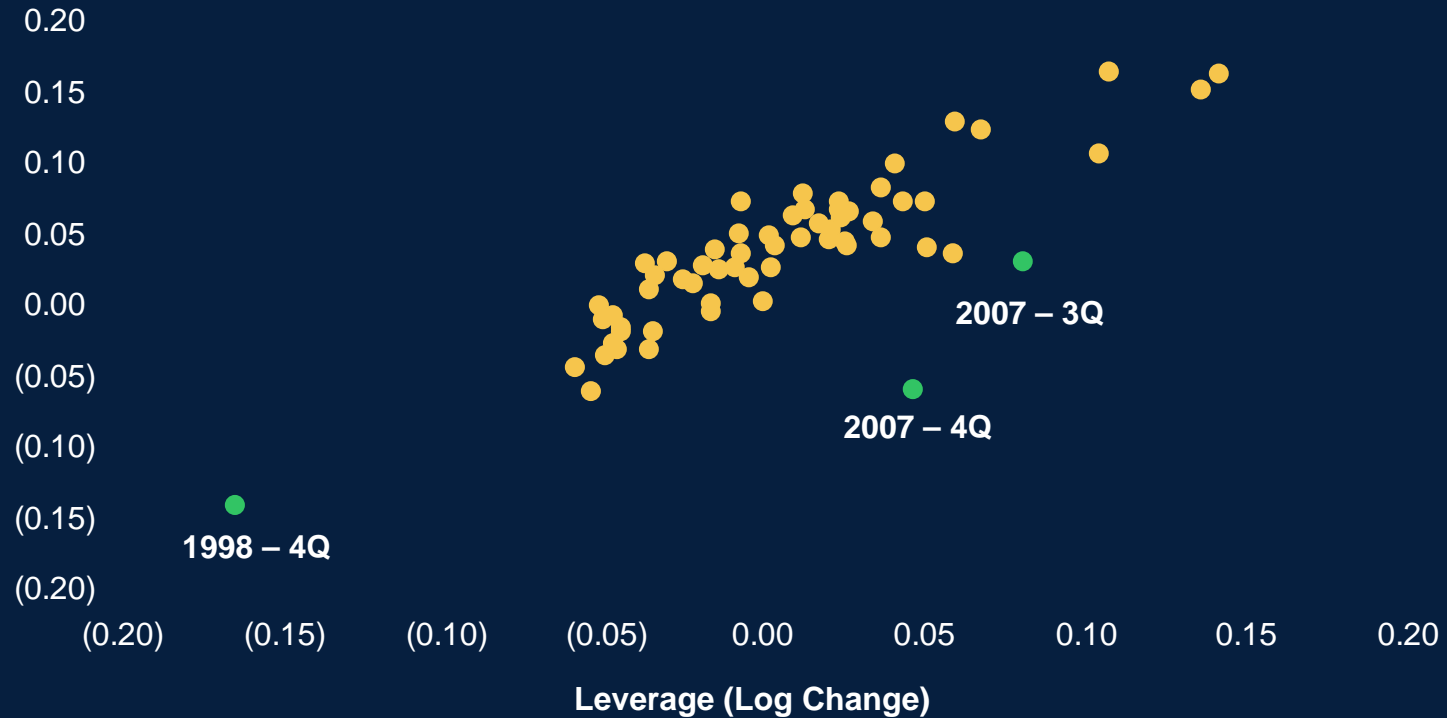
(1) The total for U.S. commercial banks includes \$95 billion of mortgage exposures by Household Finance, the U.S. subprime subsidiary of HSBC. Moreover, the calculation assumes that U.S. hedge funds account for four-fifths of all hedge fund exposures to subprime mortgages.

# How Do We Resolve Two Important Puzzles?

- **Puzzle #1.** During the early stages of the mortgage crisis – from August 2007 to October 2007 – some markets suffered acute distress (e.g., jumbo mortgages and commercial paper) while others were largely unscathed (e.g., equities and corporate bonds)
- **Puzzle #2.** The losses related to subprime are relatively modest in the larger scheme of things. For example, \$400 billion represents only about 2.5% of U.S. stock market cap
- However, it's important to note that the losses have had a significant impact on the capital position of leveraged institutions
- These leveraged entities react very differently to shocks as compared to households. Specifically, household leverage goes down when house prices rise. But, bank leverage goes up when asset prices rise

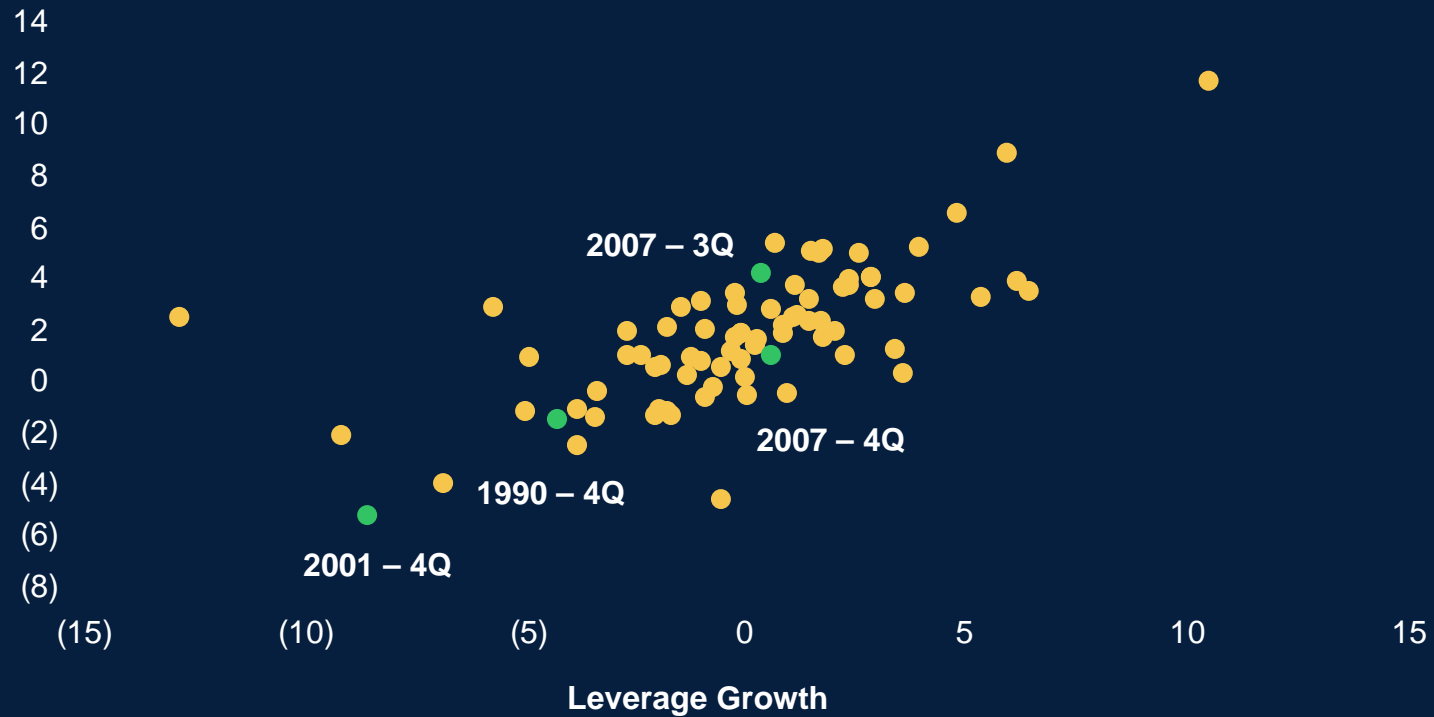
# Leverage and Asset Growth for Large U.S. Investment Banks

Total Assets (Log Change)



# Leverage and Asset Growth for Large U.S. Commercial Banks

## Asset Growth



# Leverage of Various Financial Institutions

	Assets (\$Bn)	Liabilities (\$Bn)	Capital (\$Bn)	Leverage
Commercial Banks	10,793	9,693	1,100	9.8
Savings Inst	1,914	1,687	227	8.4
Credit Unions	748	659	89	8.4
Brokers / Hedge Funds	5,397	5,226	171	31.6
GSEs	1,633	1,567	66	24.7
<b>Leveraged Sector</b>	<b>20,485</b>	<b>18,804</b>	<b>1,681</b>	<b>12.2</b>

**Source:**

Authors' calculations based on Flow of Funds, FDIC Statistics on Banking, Adrian and Shin (2007), and balance sheet data for Fannie Mae, Freddie Mac, and broker-dealers under Goldman Sachs equity analyst coverage

# The Role of Risk Management

- Mark-to-Market Accounting + Risk Management (or VAR) = Pro-cyclical Leverage at Financial Institutions
- Measured risk is low in booms, high in busts
- $E = \text{equity capital} = \text{VAR per dollar} \times \text{assets}$
- $\text{Leverage} = A/E = 1/(\text{VAR per dollar})$
- Suppose New Leverage:  $A^*/E^* = u \times A(t)/E(t)$
- So,  $A^*/A(t) = u \times E^*/E(t) = u \times (1 - (L(1-k))/E(t))$
- Where  $L = \text{losses}$  and  $k = \% \text{ of recapitalization}$

# Another Way to View the Deleveraging Process



# Impact of \$200 Billion Equity Loss

- Aggregate Asset Contraction as a Fraction of Initial Assets (%)

		Decline in Leverage		
		0%	5%	10%
k	100%	1.00	0.95	0.90
	75%	0.98	0.93	0.88
	50%	0.95	0.90	0.86
	25%	0.93	0.88	0.83
	0%	0.90	0.86	0.81

- Total Asset Contraction Associated with Deleveraging (\$Tn)

		Decline in Leverage		
		0%	5%	10%
k	100%	0.00	1.03	2.05
	75%	0.50	1.50	2.50
	50%	1.00	1.98	2.95
	25%	1.50	2.45	3.40
	0%	2.00	2.93	3.85

Where K = % of Recapitalization

# Loan Reduction to the Rest of the Economy

- $Y/A = (H+E)/A = (E/A)(1+(H/E))$
- $Y = ((E/A)(1+(H/E)))A \rightarrow Y = ((1/10)(1+(7.375/20.5)))A = 0.46A$
- Decline in Credit to Non-Levered Entities (\$Tn)

**Decline in Leverage**

	0%	5%	10%
<b>100%</b>	0.00	0.47	0.94
<b>75%</b>	0.23	0.69	1.15
<b>50%</b>	0.46	0.91	1.36
<b>25%</b>	0.69	1.13	1.56
<b>0%</b>	0.92	1.35	1.77

k

*Where K = % of Recapitalization*

# Translation to the Real Economy

- Treat decline in credit as a “supply-induced” decline in domestic nonfinancial debt (DNFD)

## Dependent Variable Quarterly GDP Growth (At An Annual Rate)

Independent Variable	Coefficient	Standard Error	T-Statistic
Constant	1.470	0.475	3.080
GDP Growth <sub>t-1</sub>	0.290	0.112	2.590
GDP Growth <sub>t-2</sub>	0.284	0.102	2.800
GDP Growth <sub>t-3</sub>	(0.224)	0.107	(2.100)
4 Quarter DNFD Growth <sub>t-1</sub>	0.140	0.072	1.950

# Isolating the “Supply-Induced Variation”

- Predict DNFD from the TED spread and loan officer opinion survey on the willingness to make installment loans

## Instrumental Variable Estimates of GDP Growth and DNFD

### Dependent Variable Quarterly GDP Growth (At An Annual Rate)

Independent Variable	Coefficient	Standard Error	T-Statistic
Constant	0.904	0.590	1.530
GDP Growth <sub>t-1</sub>	0.247	0.118	2.100
GDP Growth <sub>t-2</sub>	0.242	0.111	2.190
GDP Growth <sub>t-3</sub>	(0.264)	0.110	(2.410)
4 Quarter DNFD Growth <sub>t-1</sub>	0.338	0.176	1.920

# Leveraged Losses: Where Do We Go From Here?

- The key to restoring a market equilibrium is reducing credit exposure and rebuilding capital. The U.S. economy will suffer until such an equilibrium is achieved
- Capital can be rebuilt in a number of different ways, such as
  - Retain more internally generated cash flow (i.e., cut dividends)
  - Obtain an external infusion (perhaps from SWF's or PE)
  - Write-ups of the underlying assets
- An aggressive policy response from Washington lawmakers could have an important impact on the valuation of mortgage-related assets
- The likelihood of policy action has risen dramatically in the aftermath of the Federal Reserve's response to the Bear Stearns situation

# Writedowns vs. Capital Injections: Where Do We Stand? <sup>(1)</sup>

Company	Subprime Writedowns (\$Bn)
UBS	\$38.0
Citigroup	\$35.3
Merrill Lynch	\$31.7
Morgan Stanley	\$12.6
IKB Deutsche	\$9.1
Bank of America	\$9.2
Deutsche Bank	\$7.5
Credit Agricole	\$6.6
Credit Suisse	\$6.3
Mizuho	\$5.5
JPMorgan Chase	\$5.5
Wachovia	\$4.9
CIBC	\$4.1
Societe Generale	\$3.9
Lehman Brothers	\$3.3
RBS	\$3.1
<b>Overall Total</b>	<b>\$247.6</b>

Company	Capital Infusion (\$Bn)
Citigroup	\$30.4
UBS	\$28.0
IKB Deutsche	\$13.4
Bank of America	\$13.0
Merrill Lynch	\$12.8
Wachovia	\$10.5
WaMu	\$10.0
Societe Generale	\$8.8
WestLB	\$7.9
Barclays	\$7.7
Morgan Stanley	\$5.0
Lehman Brothers	\$4.0
CIBC	\$2.9
HSBC	\$2.0
Nat City	\$1.9
<b>Overall Total</b>	<b>\$162.5</b>

Source: Bloomberg

(1) Announced writedowns and recapitalizations are as of April 21. Overall totals include institutions that are not listed separately.

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