

Presentation to the Treasury Borrowing Advisory Committee



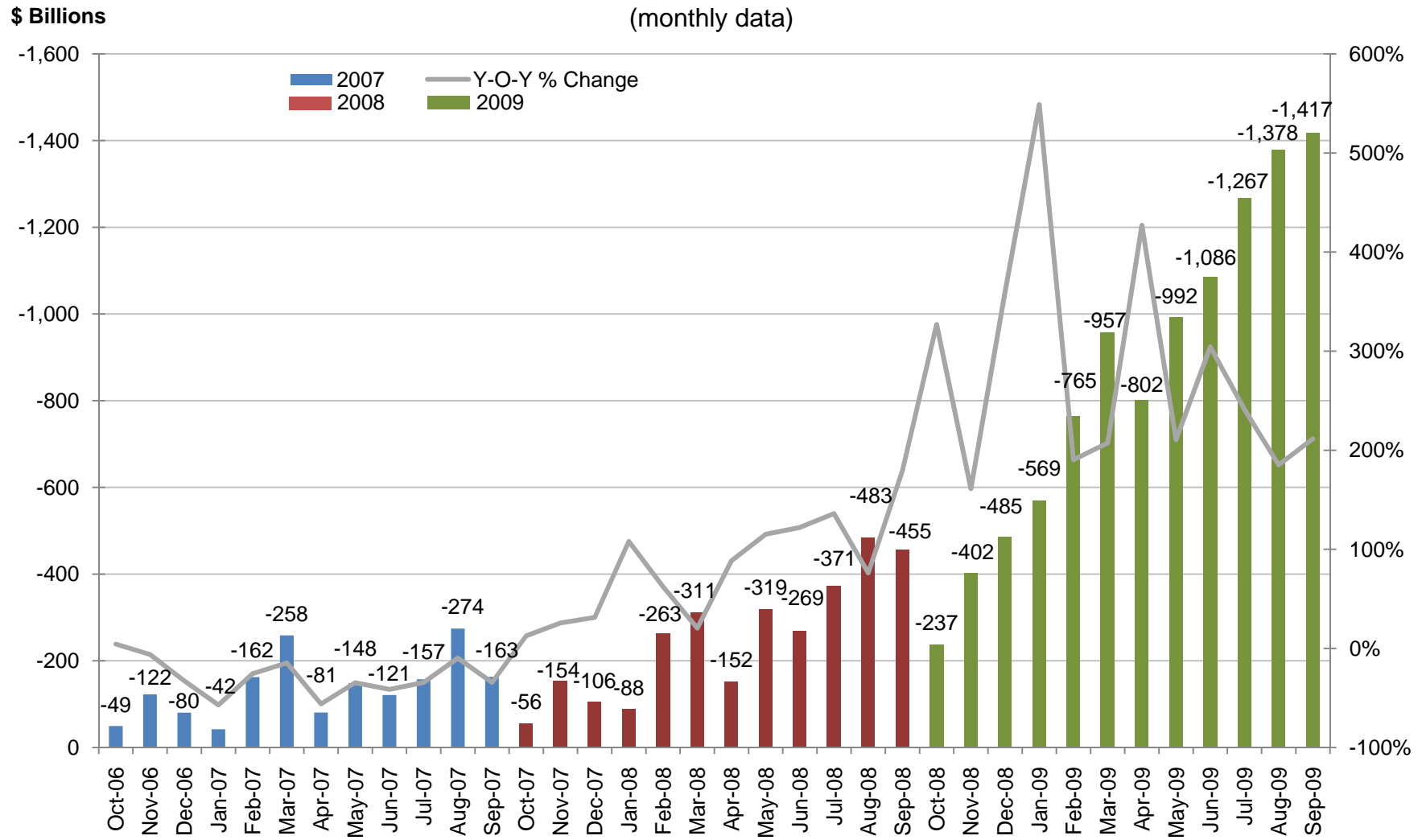
UNITED STATES
DEPARTMENT OF
THE TREASURY



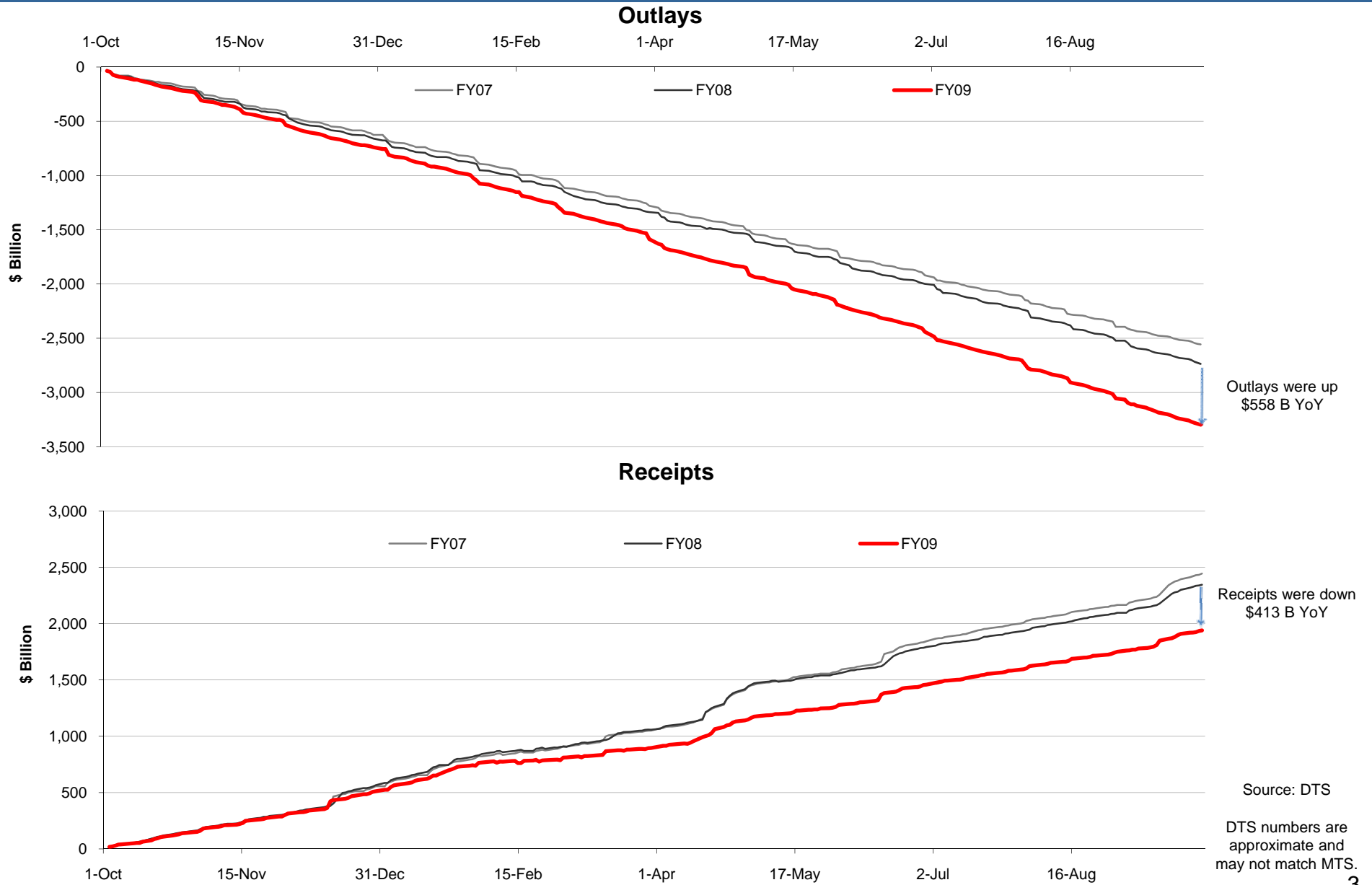
U.S. Department of the Treasury
Office of Debt Management
November 3, 2009

Federal Budget Deficits FY2007 to FY2009

Fiscal Year to Date Deficits

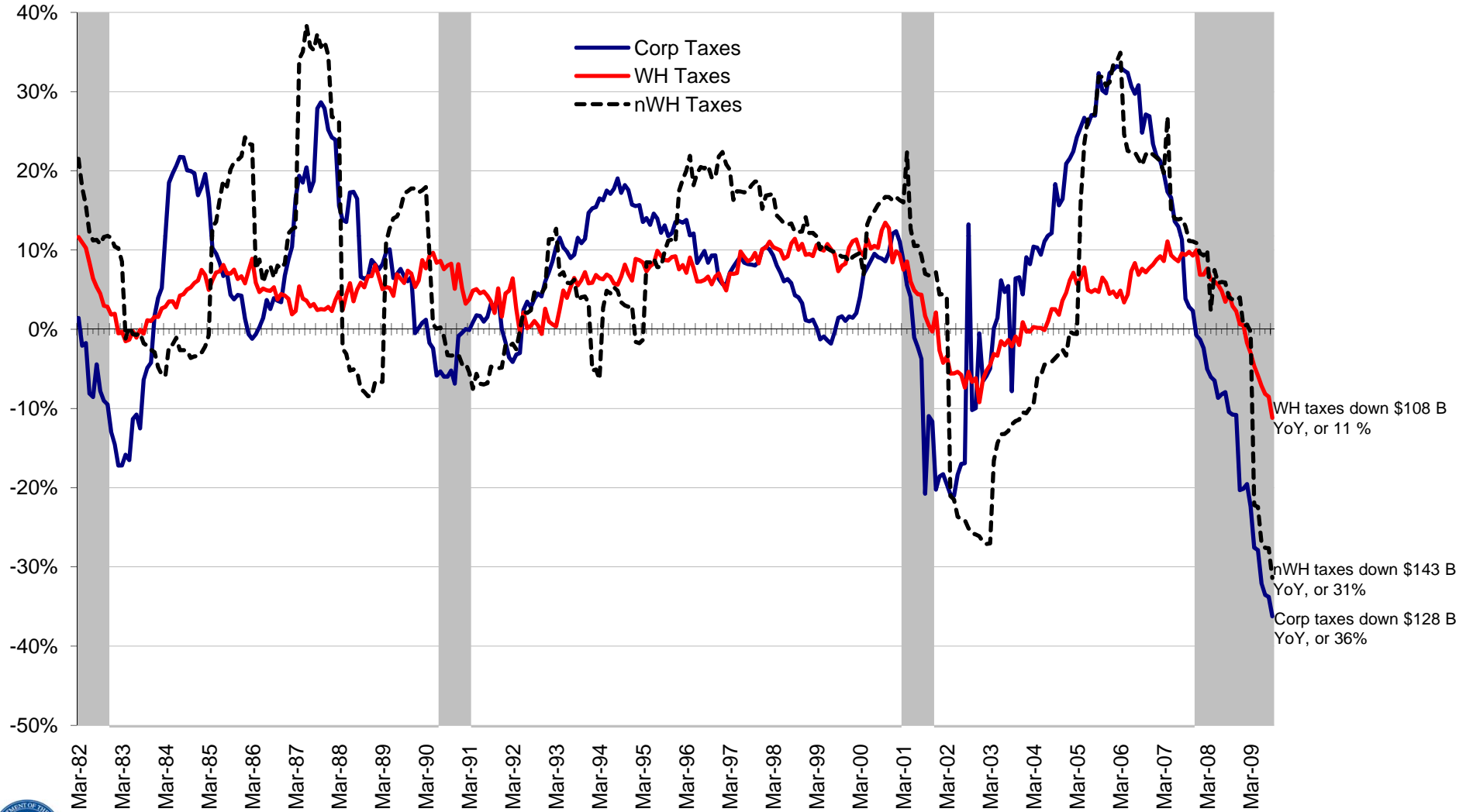


Federal Outlays and Receipts



Tax Receipts Continue to Decline

Rolling 12-Month Growth Rates



Treasury Marketable Financing in FY2008 and FY2009

Treasury Marketable Financing

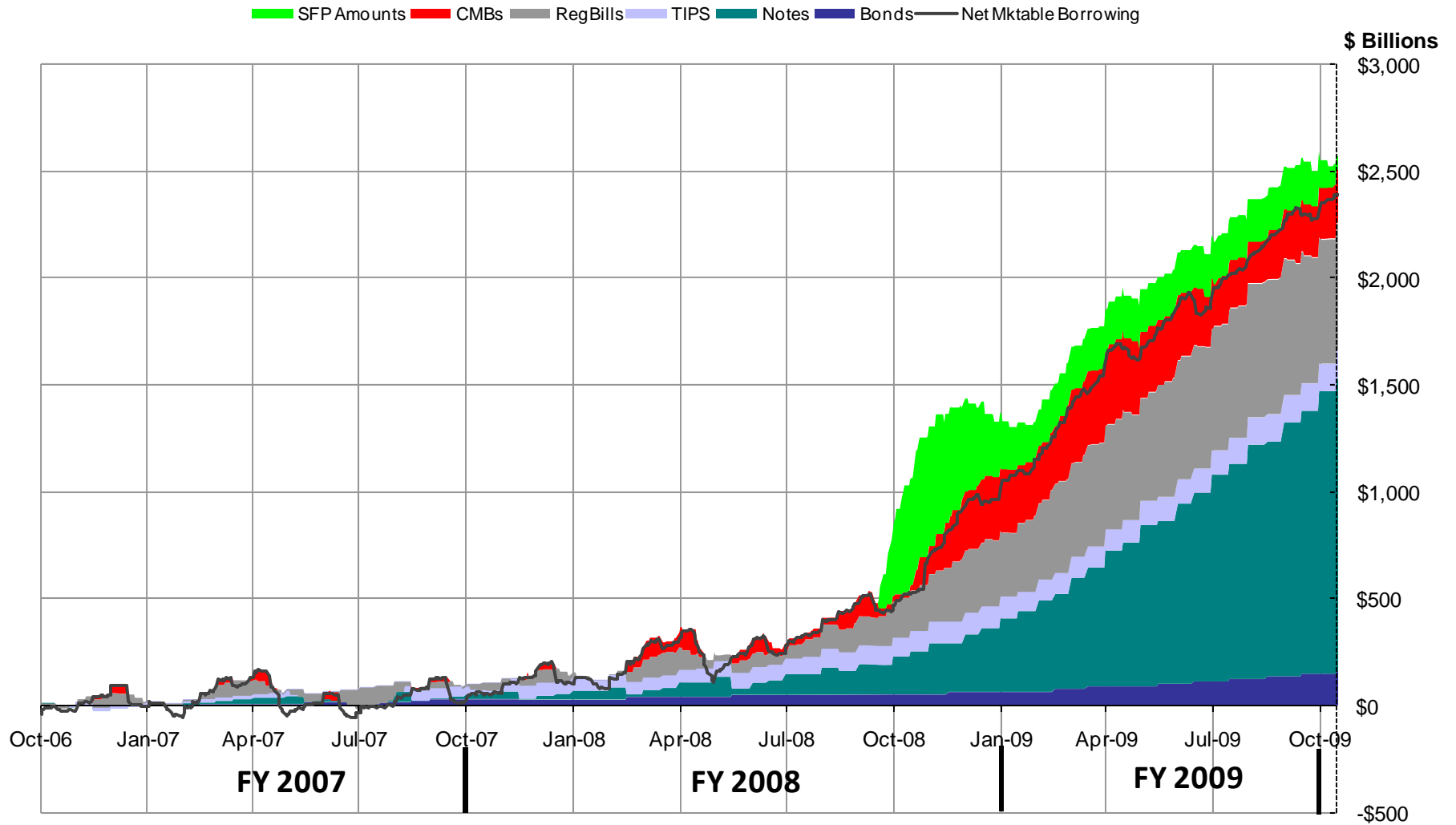
(\$ Billions)	FY 2009				FY 2008			
	October 1, 2008 - September 30, 2009				October 1, 2007 - September 30, 2008			
	<u>Issued</u>	<u>Matured</u>	<u>Net SOMA Activity *</u>	<u>Net Cash Raised</u>	<u>Issued</u>	<u>Matured</u>	<u>Net SOMA Activity *</u>	<u>Net Cash Raised</u>
Bills (includes SFPs)	\$6,920.5	\$6,417.8	\$0.0	\$502.7	\$4,632.9	\$4,101.2	(\$152.0)	\$531.7
Nominal coupons	\$1,886.6	\$640.7	\$0.0	\$1,245.9	\$814.6	\$626.2	(\$5.5)	\$188.5
TIPS	\$58.5	\$20.8	\$0.0	\$37.7	\$61.9	\$21.8	\$3.5	\$40.1
Total	\$8,865.6	\$7,079.3	\$0.0	\$1,786.3	\$5,509.5	\$4,749.2	(\$153.9)	\$760.4

* **Note:** Negative SOMA activity represents redemptions.

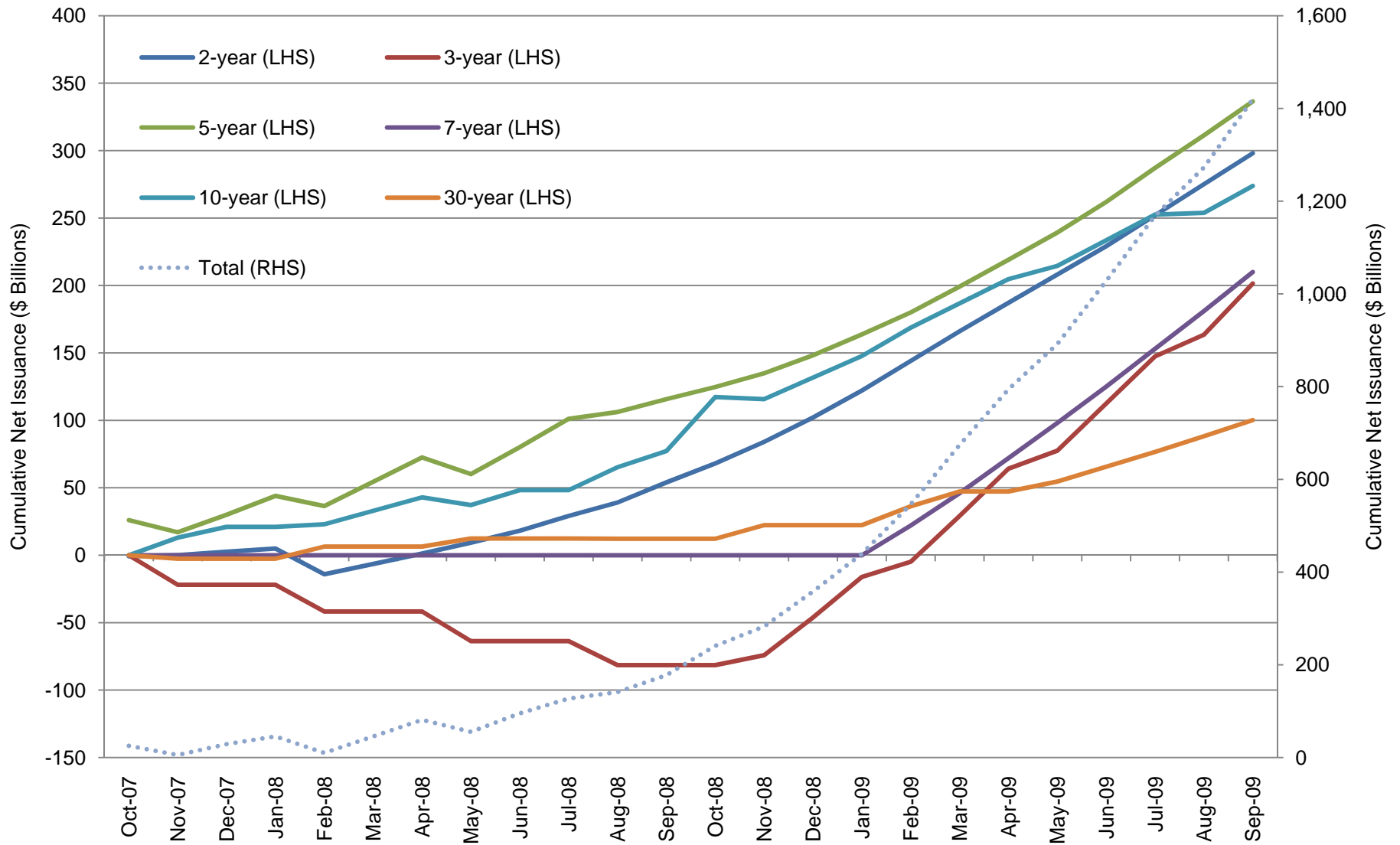
Positive SOMA activity represents additional issuance of securities, made possible by redemptions in maturing securities with the same settlement date; these are offsetting transactions and are net cash neutral.



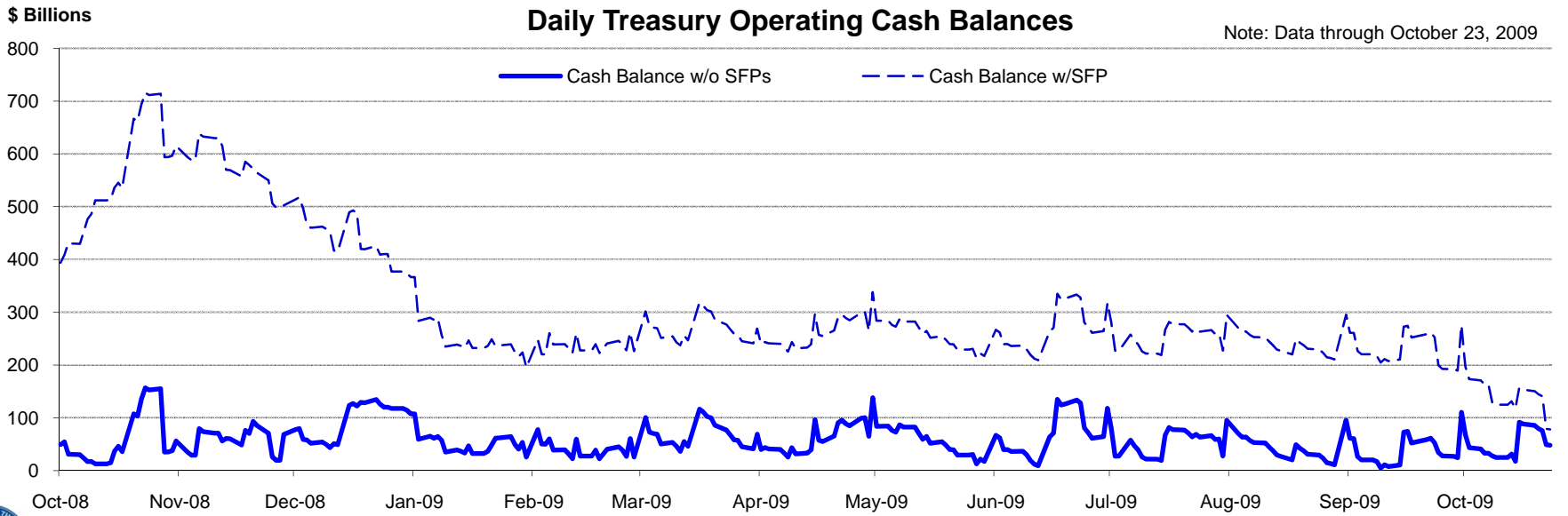
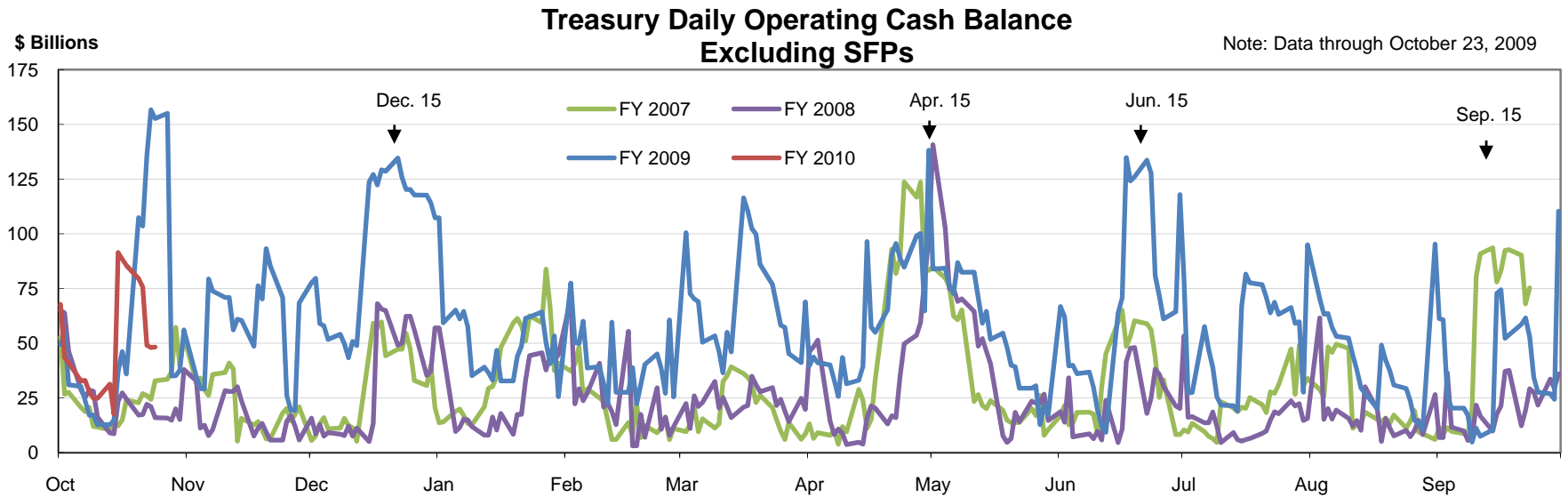
Cumulative Net Financing Flows since FY2007



Cumulative Net Coupon Issuance since FY 2007

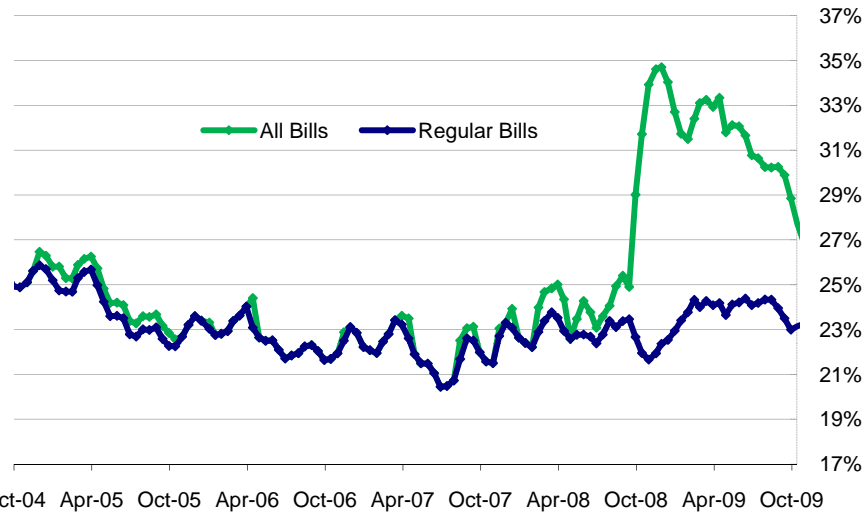


Treasury Cash Balances

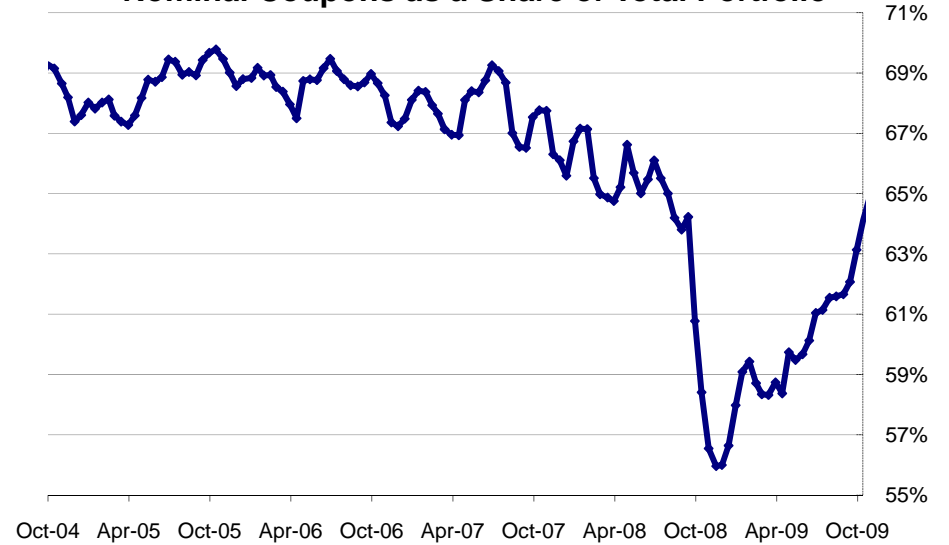


Portfolio Distribution

Bills as a Share of Total Portfolio



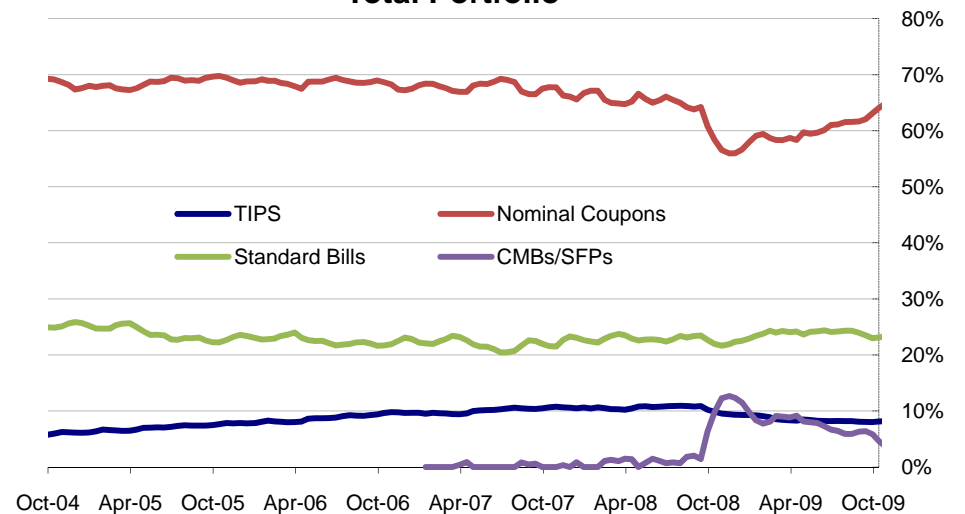
Nominal Coupons as a Share of Total Portfolio



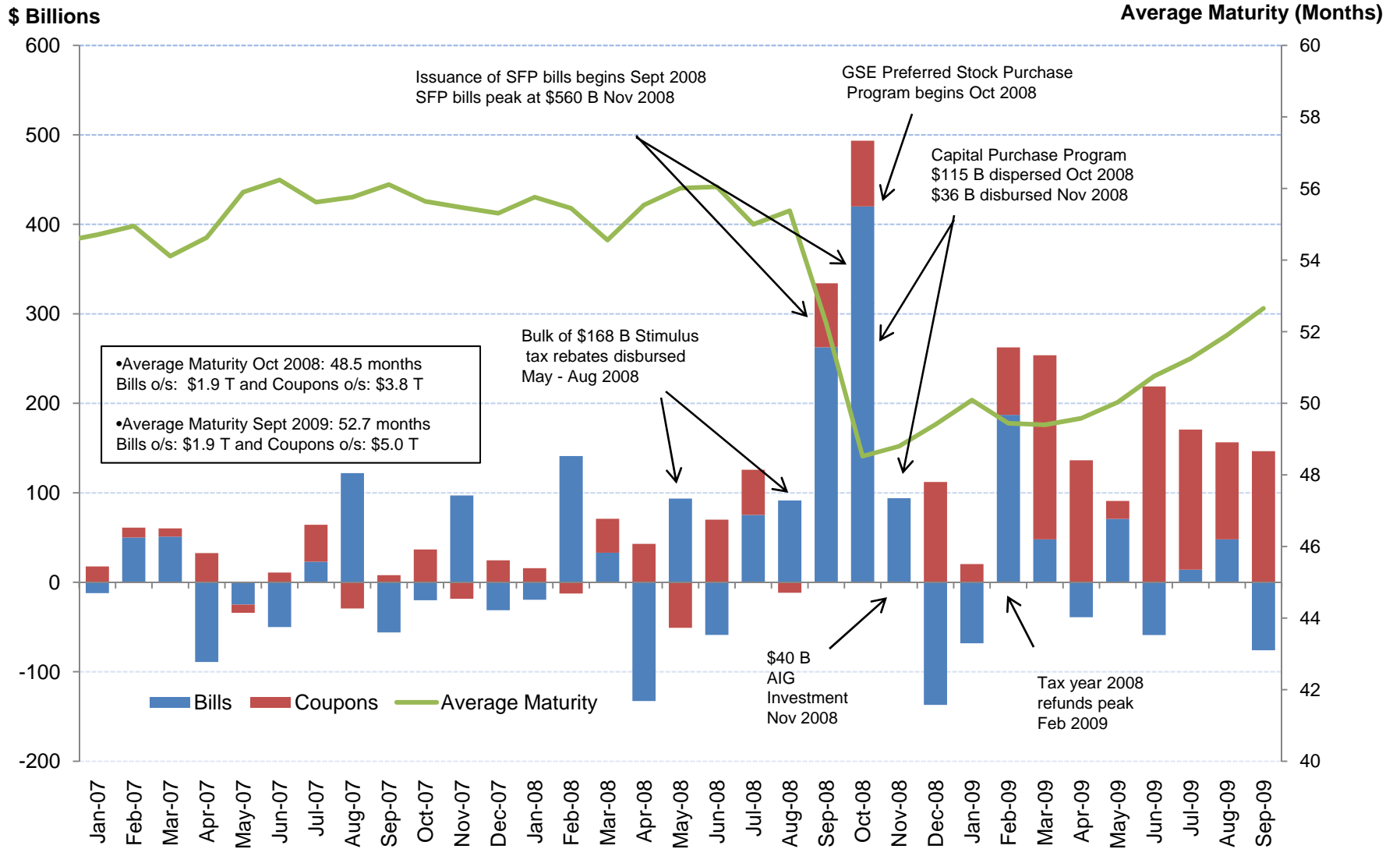
TIPS as a Share of Total Portfolio



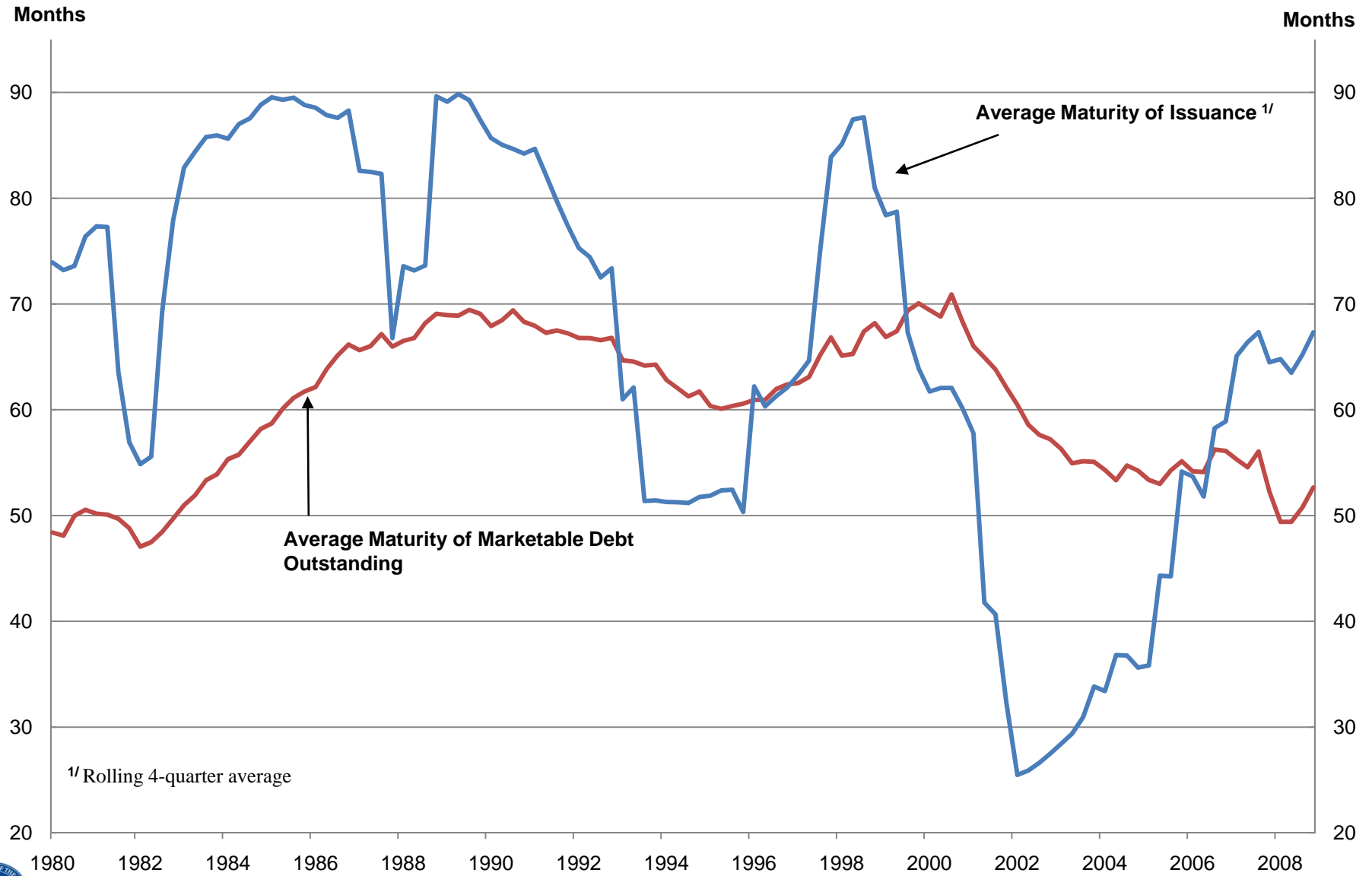
Total Portfolio



Monthly Change in Debt Outstanding versus Average Maturity



Debt Maturity Measures

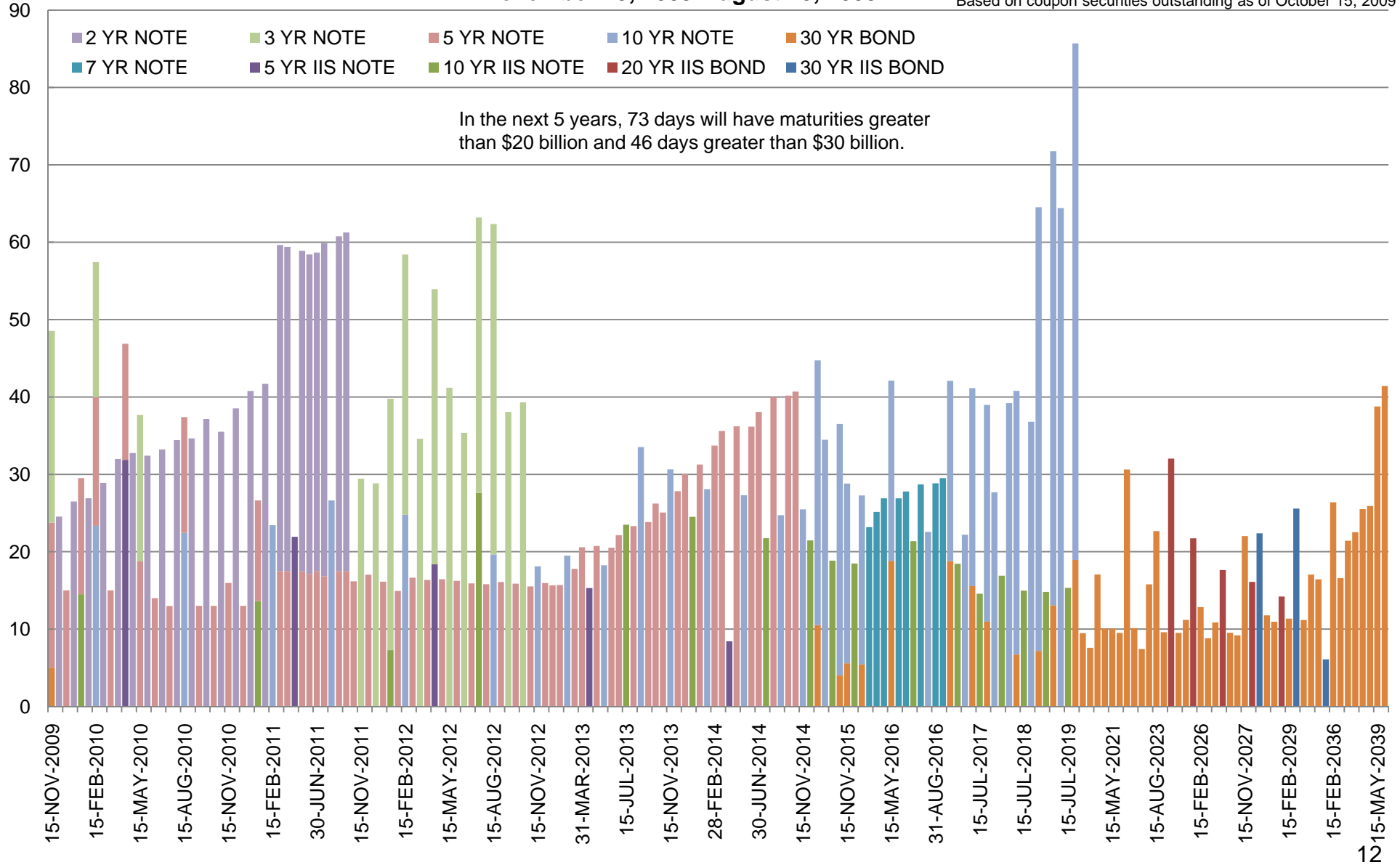


Maturing Coupons

\$ Billions

November 15, 2009-August 15, 2039

*Based on coupon securities outstanding as of October 15, 2009



Primary Dealer and Government Deficit Estimates

FY 2010 Deficit Estimates		\$ Billions	
	Primary Dealers*	CBO	OMB
Current:	1,393	1,381	1,502
Range based on average absolute forecast error**	1,203-1,583	1,081-1,681	1,219-1,785
Estimates as of:	Oct 09	Aug 09	Aug 09
FY 2010 Marketable Borrowing Range***	1,200-1,750		
FY 2011 Marketable Borrowing Range***	725-1,400		

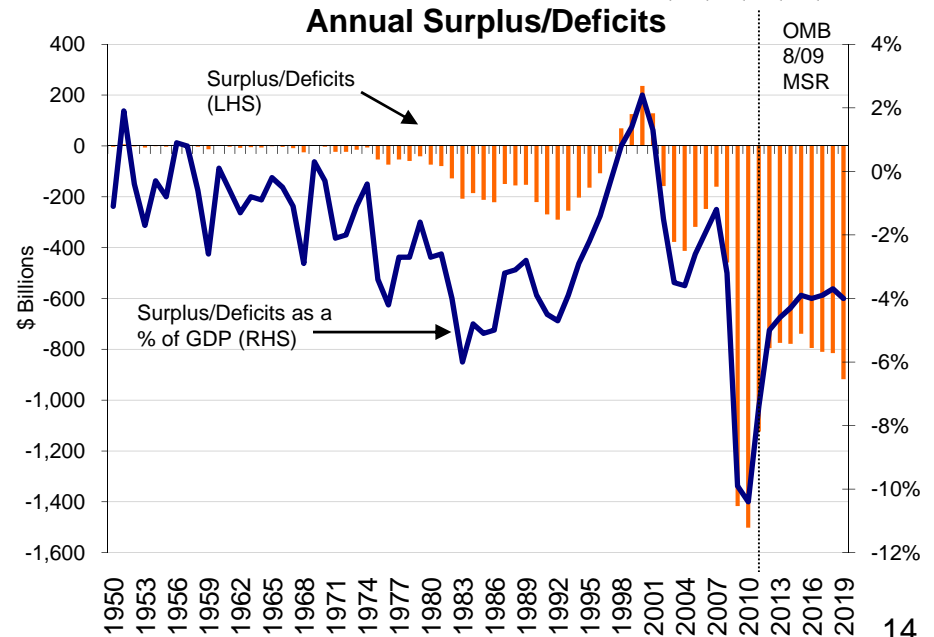
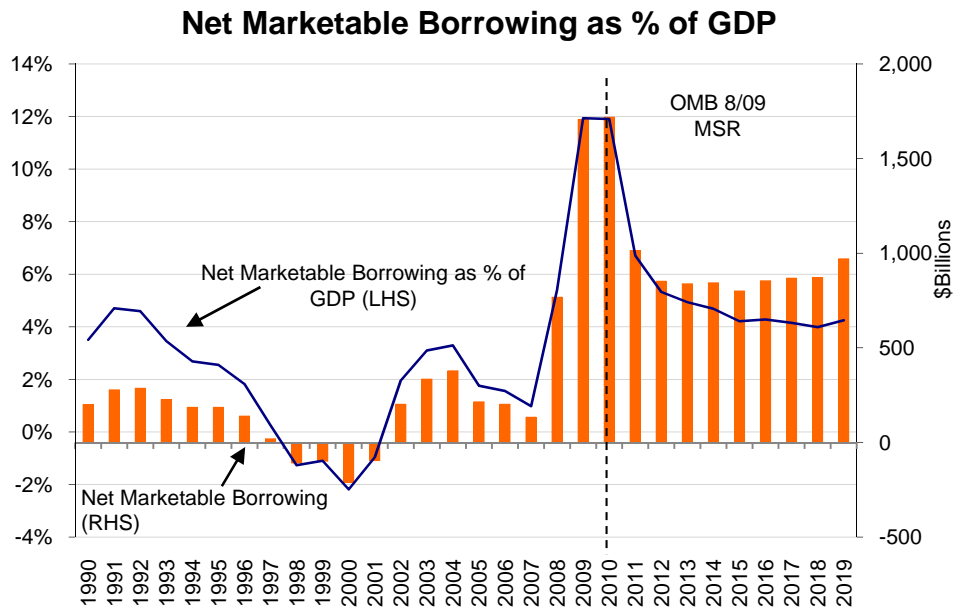
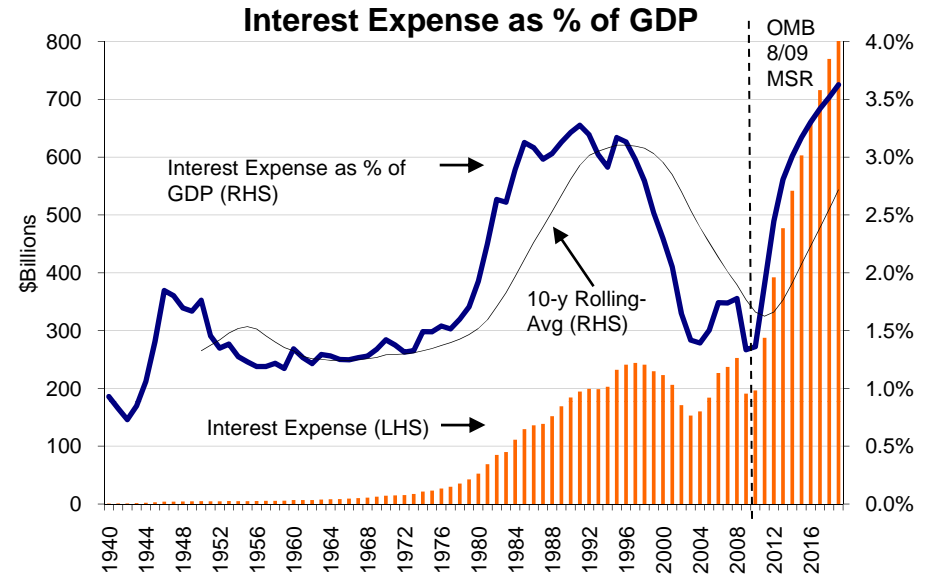
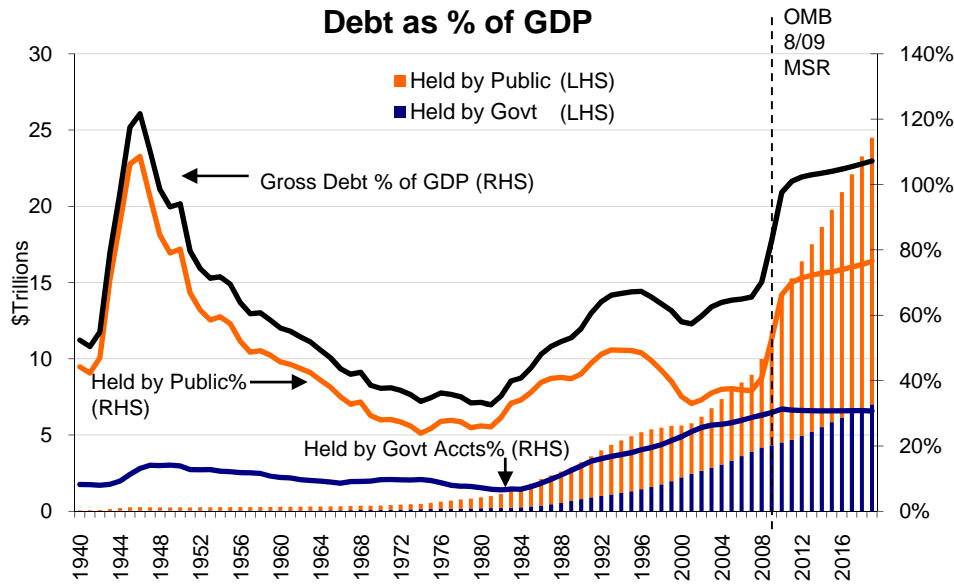
* Primary Dealers reflect average estimate. Based on Primary Dealer feedback on October 29, 2009.

** Ranges based on errors from 2005-2009.

*** Based on Primary Dealer feedback on October 29, 2009.

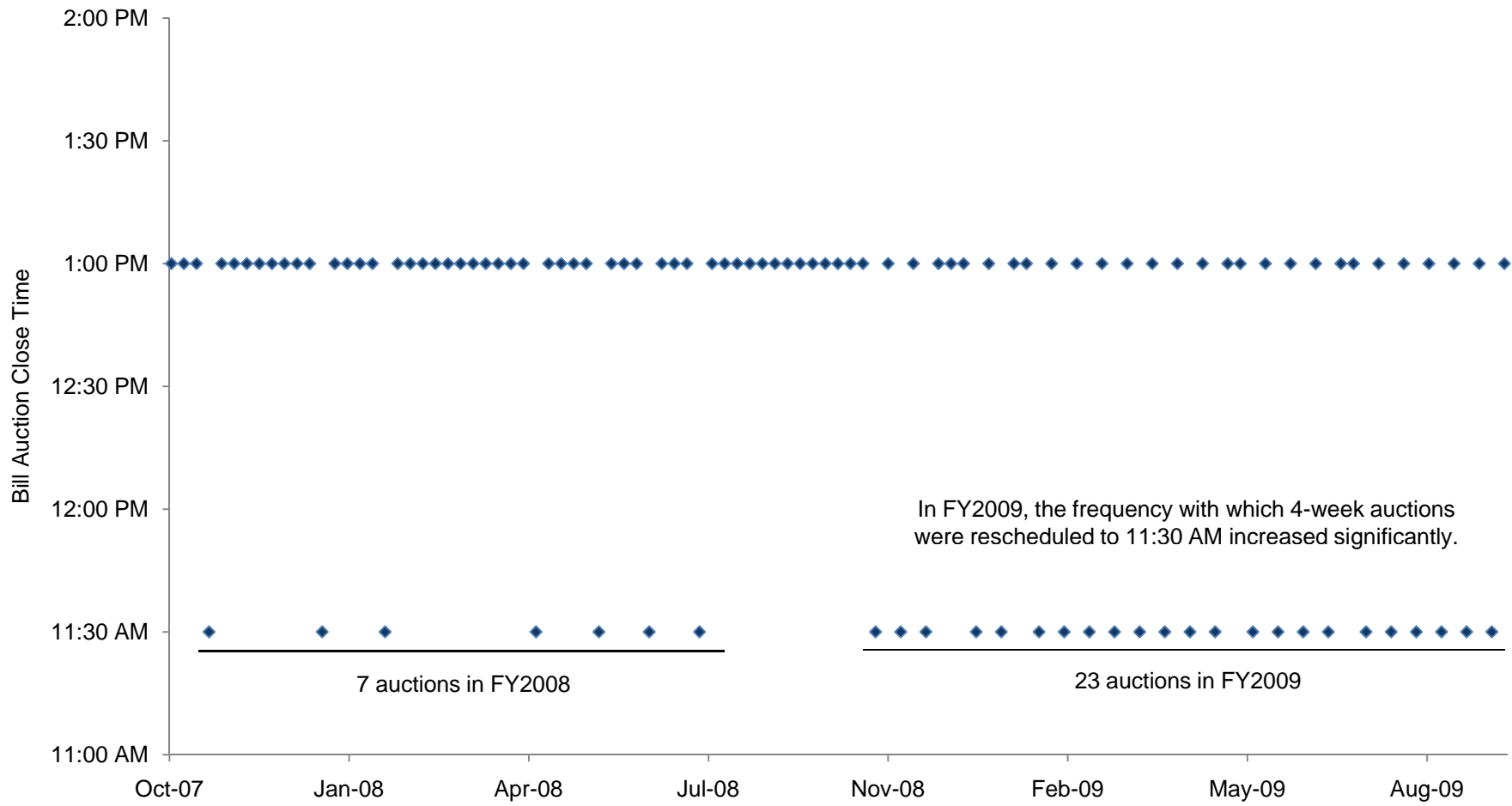


OMB Long-term Deficit and Borrowing Projections

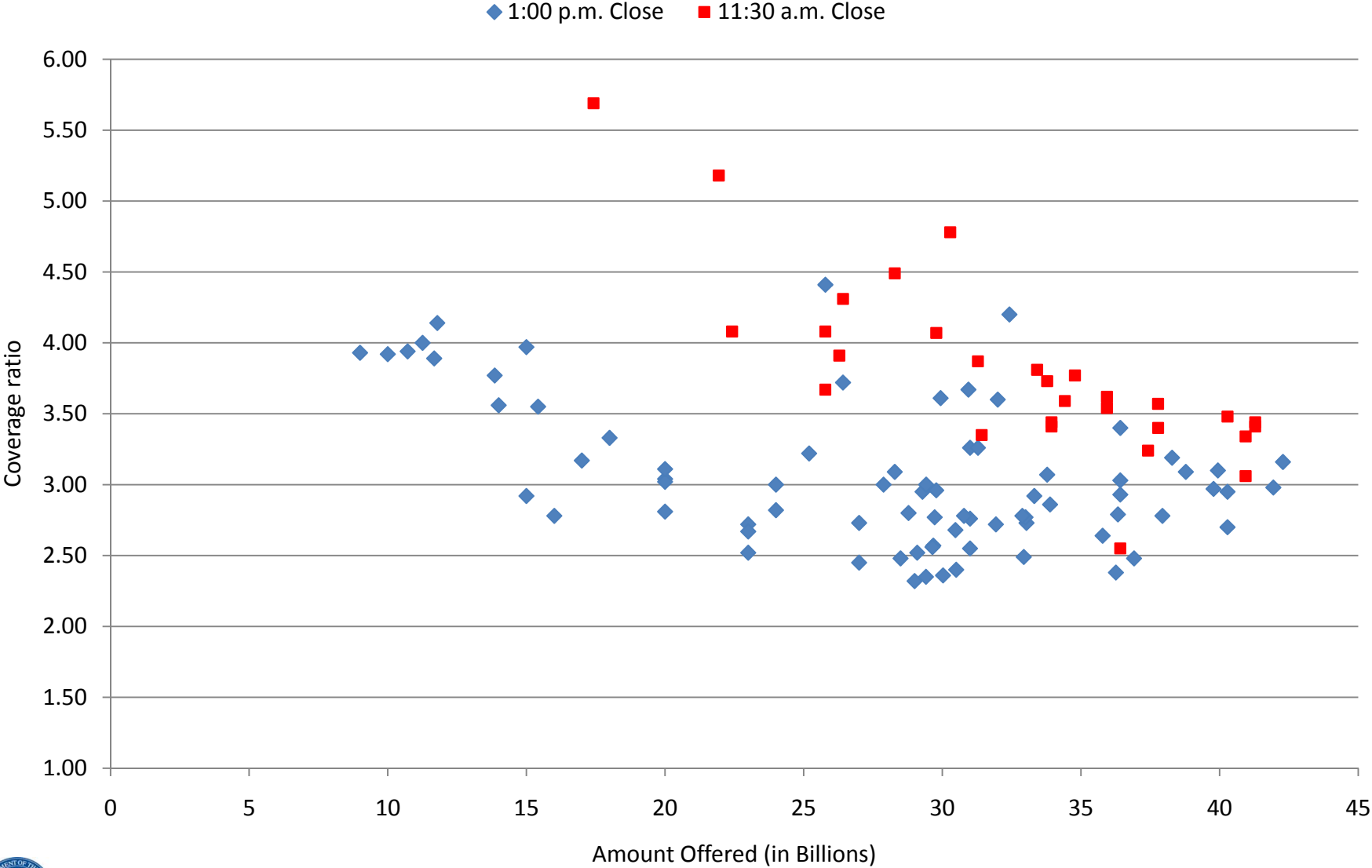


Rescheduled 4-Week Bill Auctions Due to Calendar Constraints

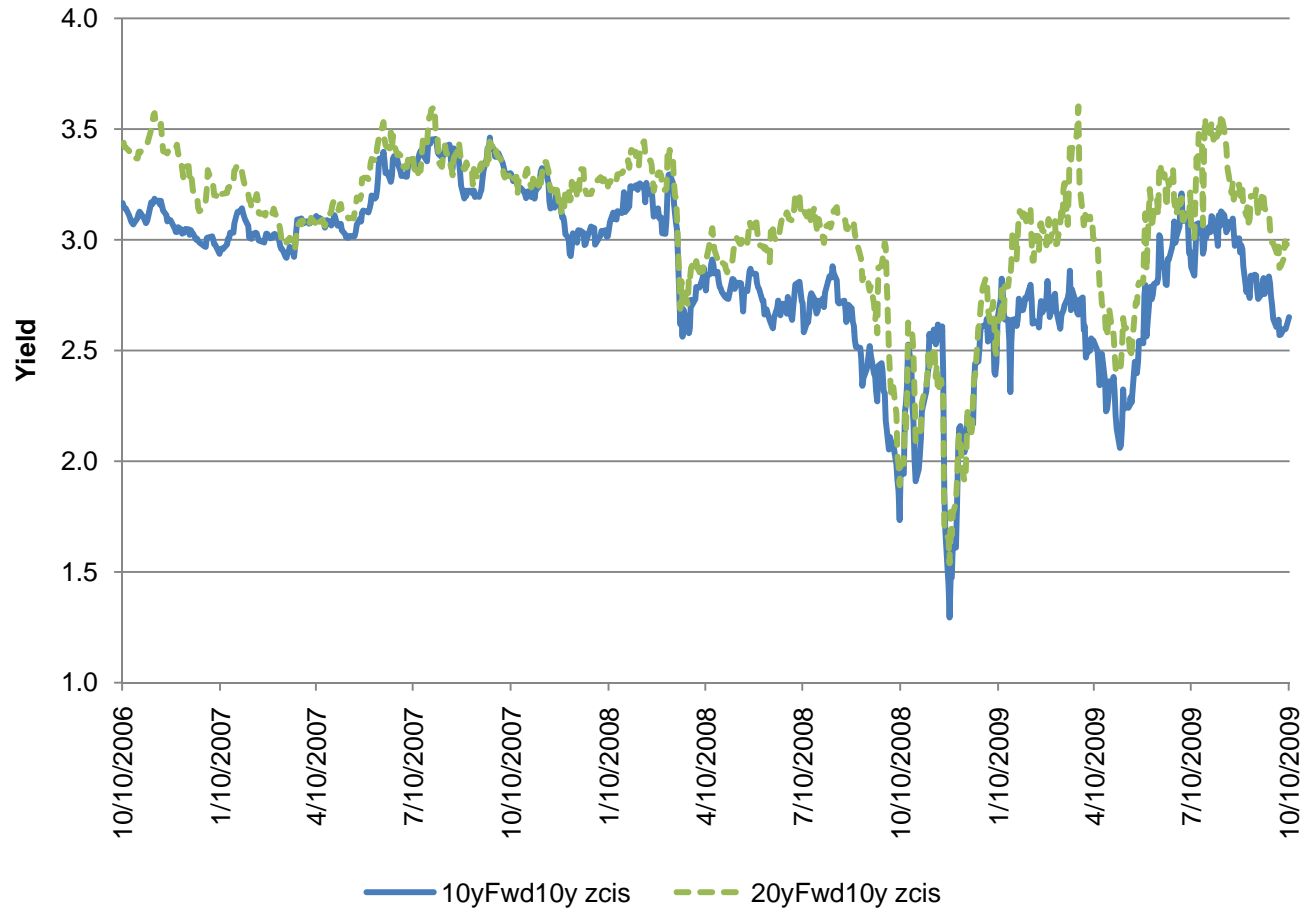
Rescheduling of 4-Week Bill Auctions Due to Conflicts
FY2008 - FY2009



4-Week Bill Coverage Ratios and Offering Amounts



Potential Cost Saving of Moving to 30-Year TIPS



Source: Barclays Live

Graph shows 10-year and 20-year forward zero-coupon inflation levels for 10 years derived from Zero Coupon Inflation Swap data.

Long-term inflation expectations are assumed to be stable; therefore, an upward sloping curve demonstrates an increasing inflation risk premium.



What adjustments to debt issuance, if any, should Treasury make in consideration of its financing needs in the short, medium, and long term?



TBAC Presentation to Treasury

November 3, 2009

TBAC Presentation to Treasury: Exit Strategies

November 3, 2009

Outline

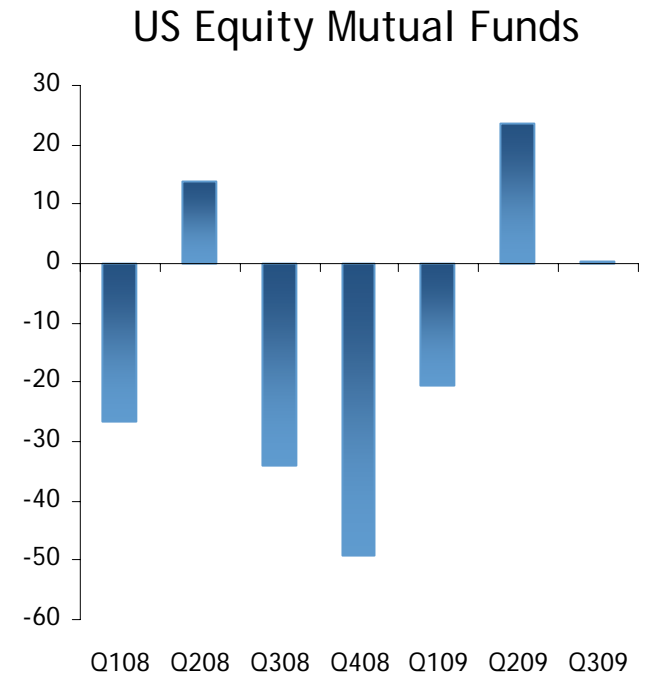
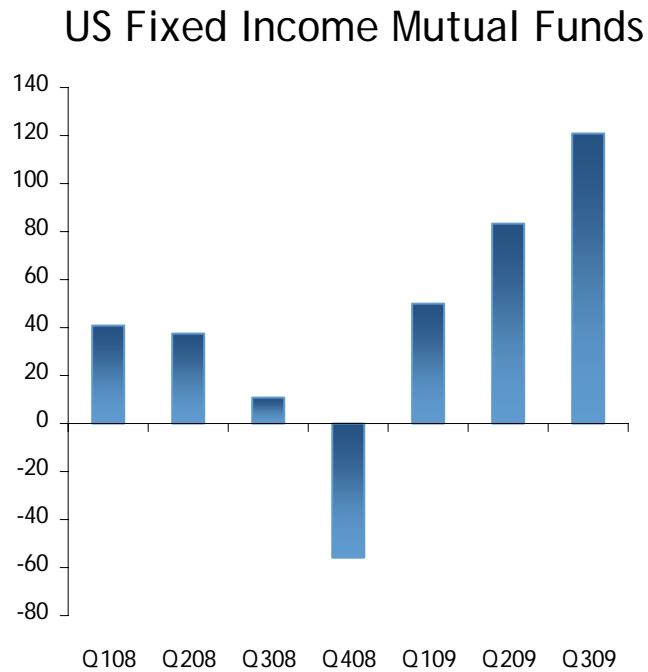
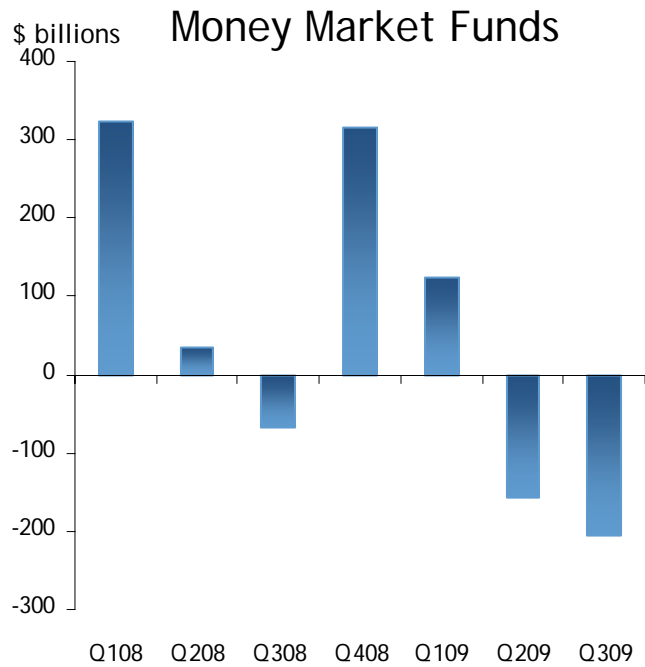
- Importance of the Exit Strategy
- Form and likely Sequence
 - Removal of Excess Reserves
 - Ending the MBS purchase program
 - Raising the Funds rate target
- Implications for the Treasury and related markets
- Potential policy errors
- Conclusions/Recommendations

Importance of the Exit Strategy

- Near zero interest rates have had a significant impact on investor demand for many asset classes
- Many investors can not stay in cash or earn zero for long
 - Pension funds
 - Insurance companies
 - Endowments
 - Retired individuals living on income
- Zero yields on money market funds have pushed investors into longer-dated riskier asset classes
- The return of low cost financing as repo markets have reopened (aided by TALF and other Fed programs) has pushed leveraged investors into longer-dated riskier assets classes
- The increased demand has benefited Treasuries somewhat, but has benefited risk assets such as corporate bonds and securitized assets even more
- When the markets anticipate the move away from zero, the impact on longer dated risk assets may be significant due to reduced investor demand

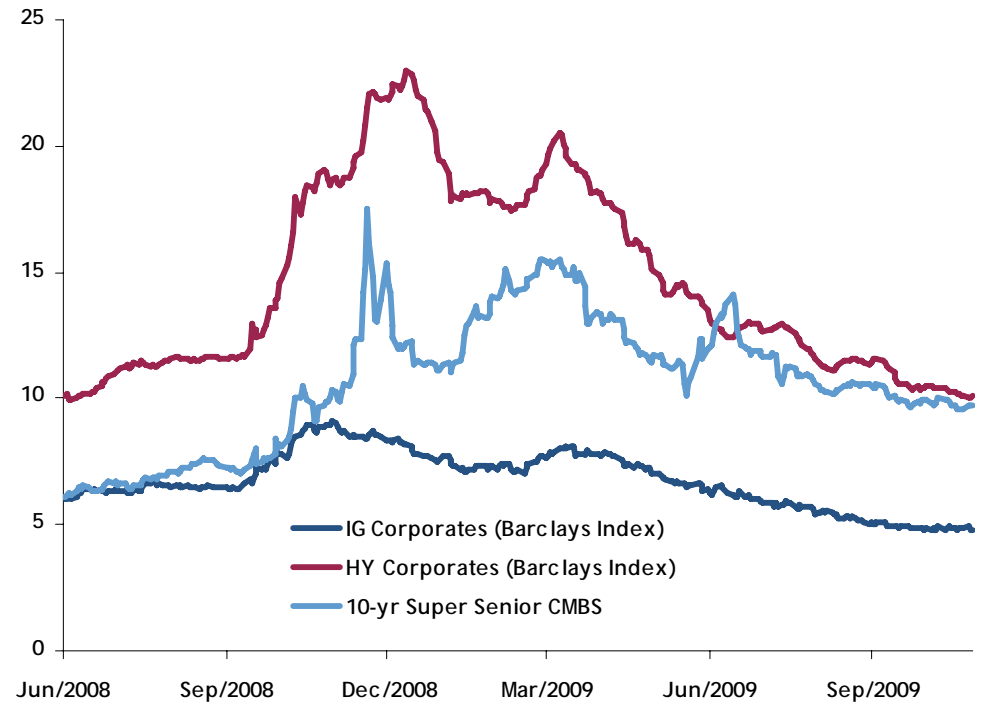
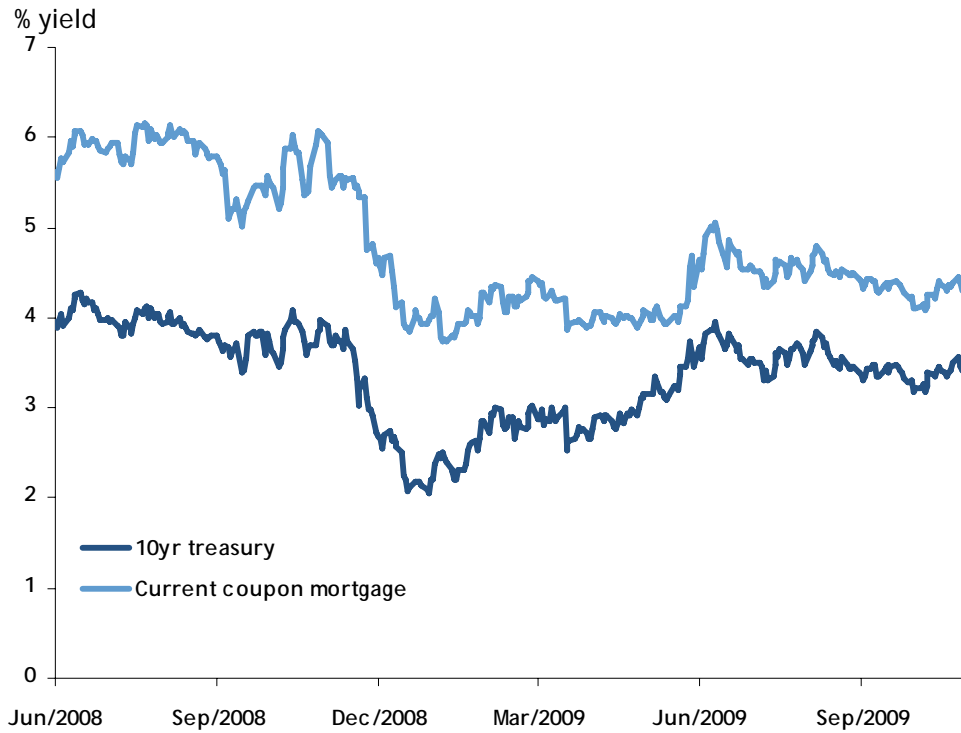
Importance of the Exit Strategy

- Investors have been moving out of cash and into longer-dated risk assets as the markets have stabilized and cash earns zero
- This can be seen in mutual funds flows



Importance of the Exit Strategy

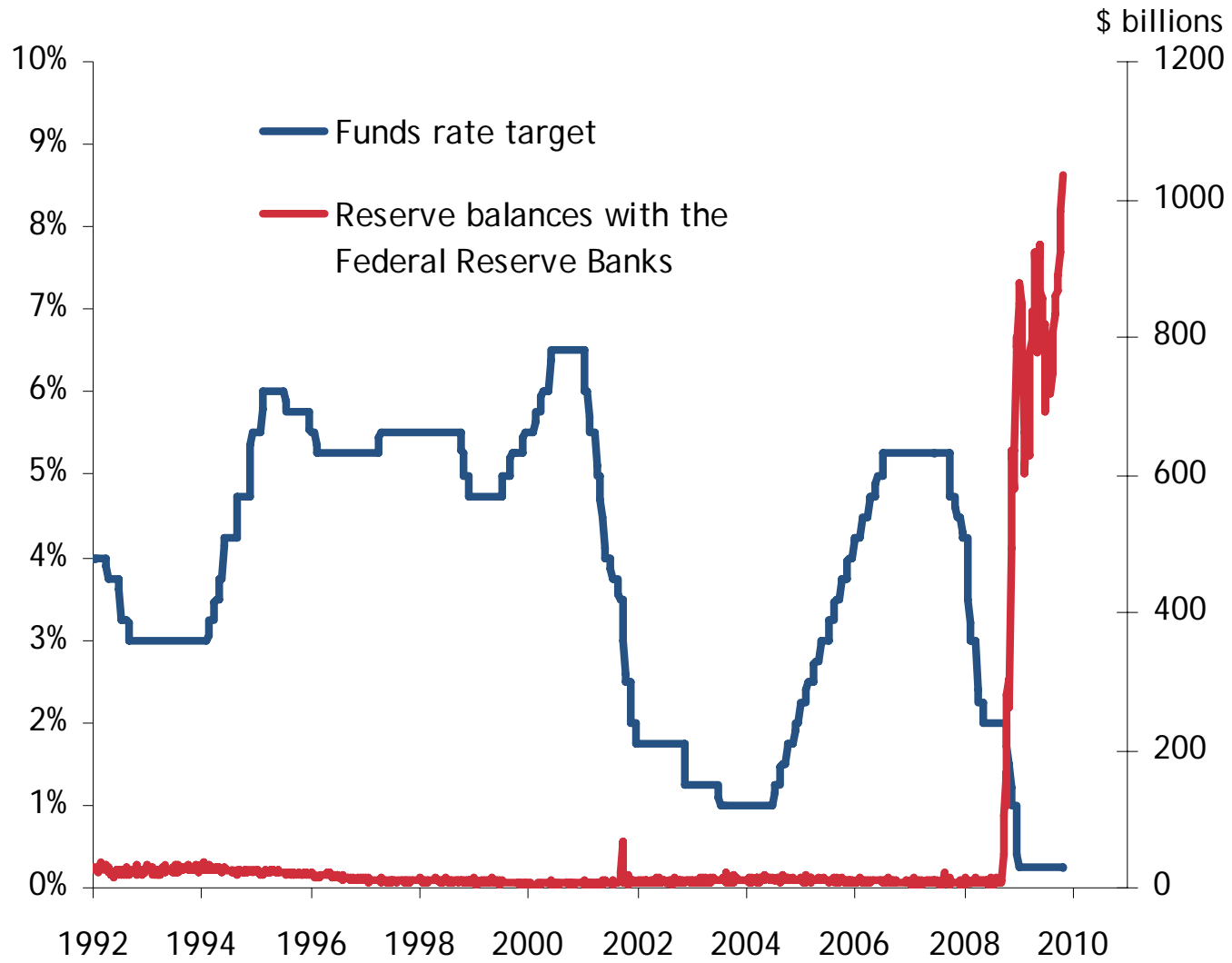
The sponsorship for longer dated risk assets has led to lower yields



Form and Likely Sequence of the Fed's Exit Strategy

- The Fed has a very difficult task to get the form and timing correct
 - Importance of the first move
 - Uncertainty and fragility of the economic recovery
 - Dependence of housing and other sectors on low rates
- As a result, predicting the form and timing of the exit strategy is also difficult
- The most likely sequence appears to be
 1. Draining excess reserves
 2. Ending MBS purchases
 3. Raising the Funds rate target

Form and Likely Sequence: This Tightening Cycle is Different



Form and Likely Sequence: Excess reserves to neutralize

	Source	Excess Reserves
End of 2009		~ \$1500 billion
	Liquidity facilities roll off	(\$300)
	Securities roll off	(\$100) - (\$200)
End of 2010		\$1000 - \$1100 billion
	Securities roll off	(\$100) - (\$200)
End of 2011		\$800 - \$1000 billion

Form and Likely Sequence: Alternatives for Neutralizing Reserves

- Raise the funds rate and thereby the rate paid on excess reserves
 - Increases opportunity cost of using reserves
 - *Potential complication(s): requires Fed to raise the funds rate*
- Reverse repurchase agreements
 - Banks and perhaps money markets potential counterparties
 - Changes composition of Fed's liabilities
 - *Potential complication(s): reverse repos for TSYs cleaner than for MBS, scope for draining reserves unclear*
- Term deposits
 - Banks move overnight reserves into term facility
 - *Potential complication(s): Mechanism for setting rate and bank utilization unclear, implications for LIBOR market*
- Sell assets
 - Shrinks asset and liability sides of the balance sheet
 - *Potential complication(s): Private appetite for additional MBS and Treasury securities unclear*

Form and Likely Sequence: Reverse Repos

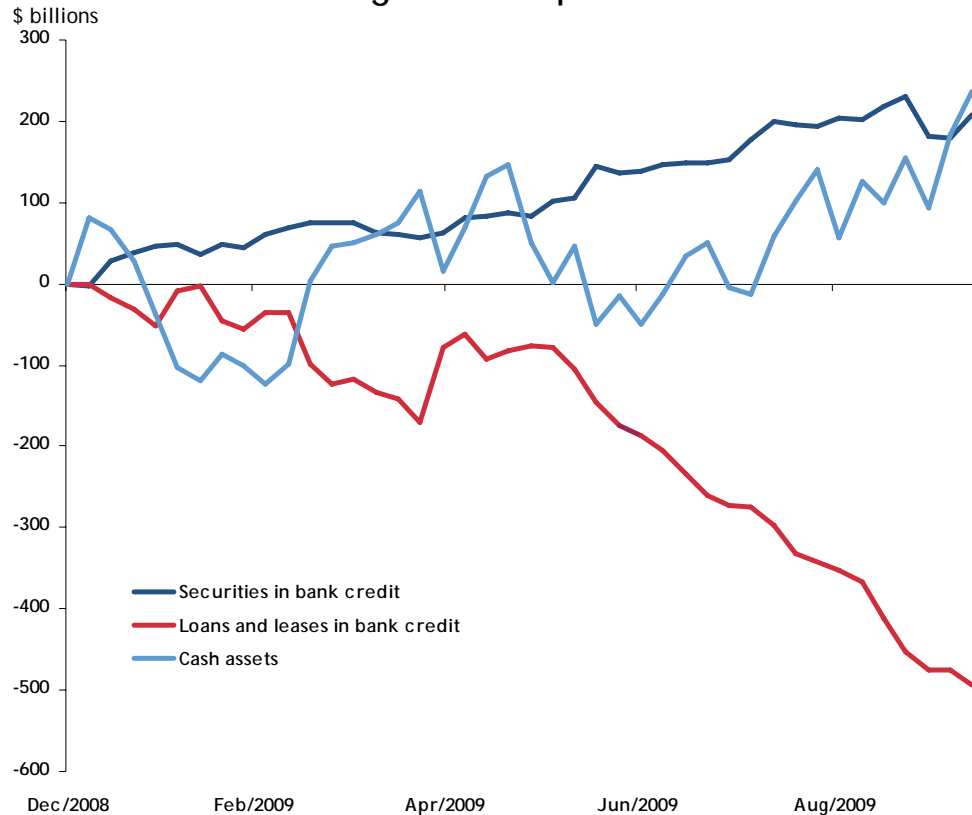
- Direct with Dealers
 - Initial capacity \$150 - \$200 billion
 - Tier one capital relief could boost capacity in some instances
 - Unlimited term
- Direct with Money Market funds
 - Initial capacity near \$1000 billion
 - Term less than 7 days
 - Requires cumbersome setup
- TALF Model
 - Banks are agents; allow access to MM with cumbersome setup
 - No incentive for Banks

Market implications

- Compete with other short-term investments
- Upward pressure on bill rates

Form and Likely Sequence: balance sheets, reserves and treasury demand

Cumulative change in composition of bank assets



- Loans and leases declined from \$7.3 trillion to \$6.7 trillion over the past year

- Declines are being partially offset by securities purchases, particularly Treasuries

- Reserves being moved to securities?

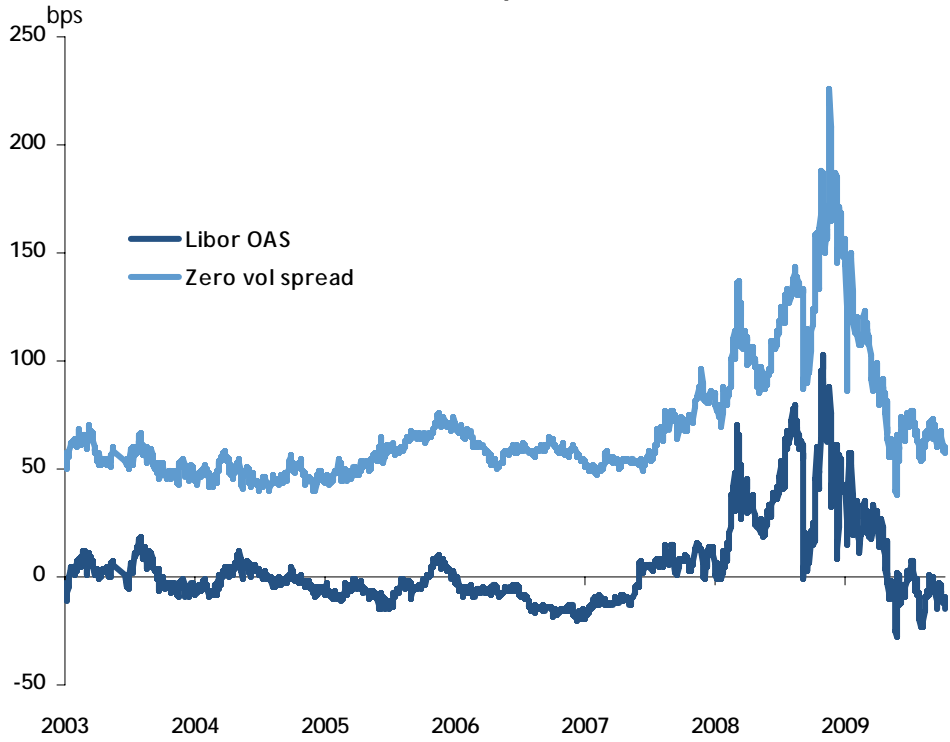
Change in securities from Dec 17th

Treasuries and agencies	163.2
Other	65.7
Total	228.9

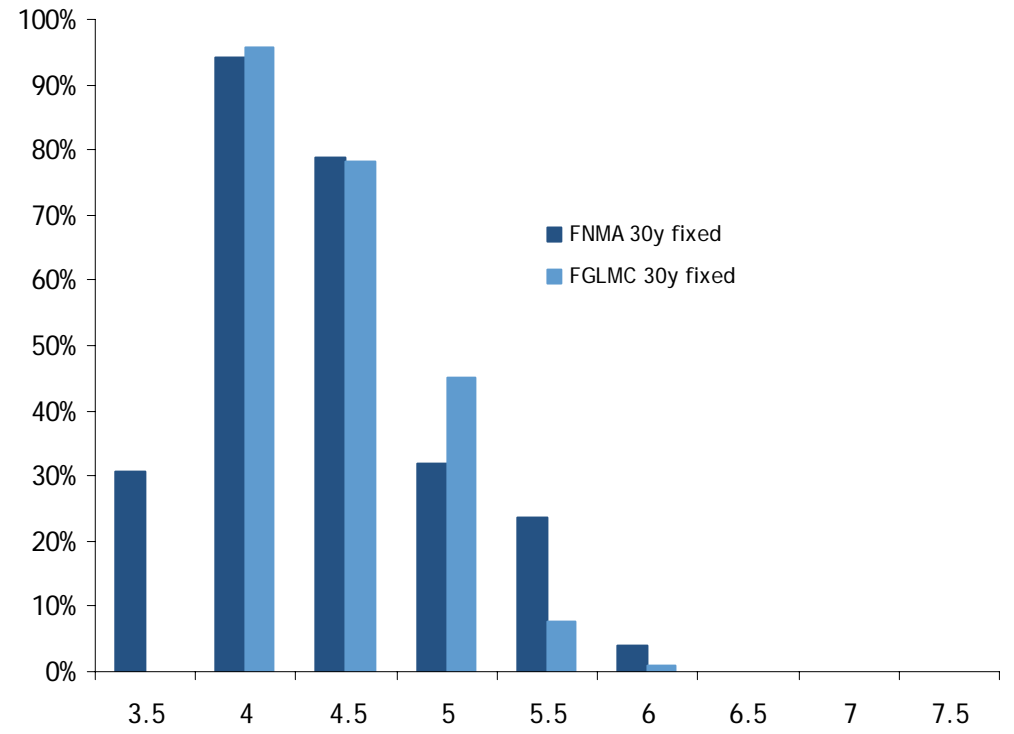
Form and Likely Sequence: Ending MBS Purchases

The Fed's purchases of MBS have had a significant impact on valuations

MBS Spreads



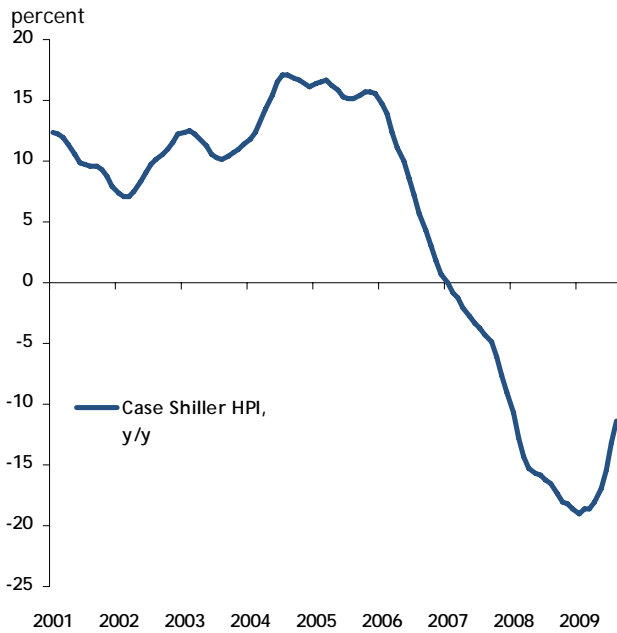
Fed Holdings as % of Total Outstanding by Coupon



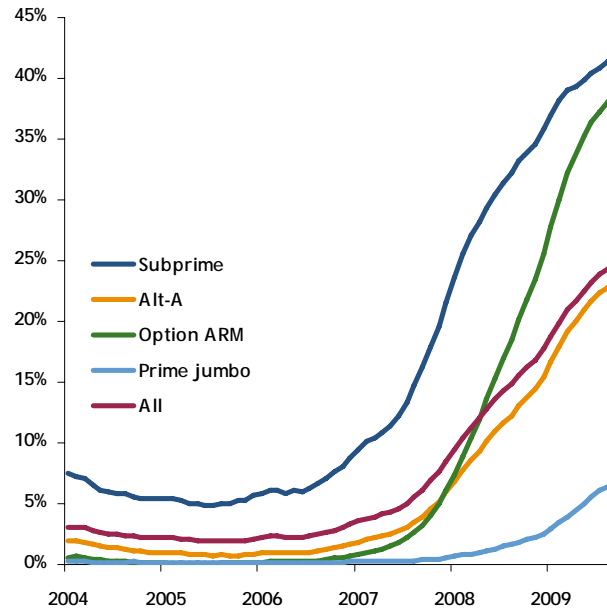
Form and Likely Sequence: Ending MBS Purchases

Housing market still fragile and needs low mortgages rates

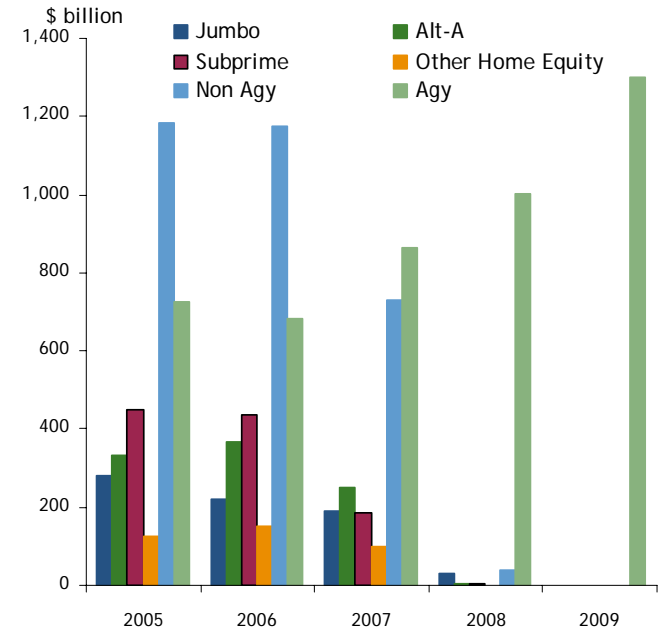
House Prices



60 days+ Mortgage Delinquencies

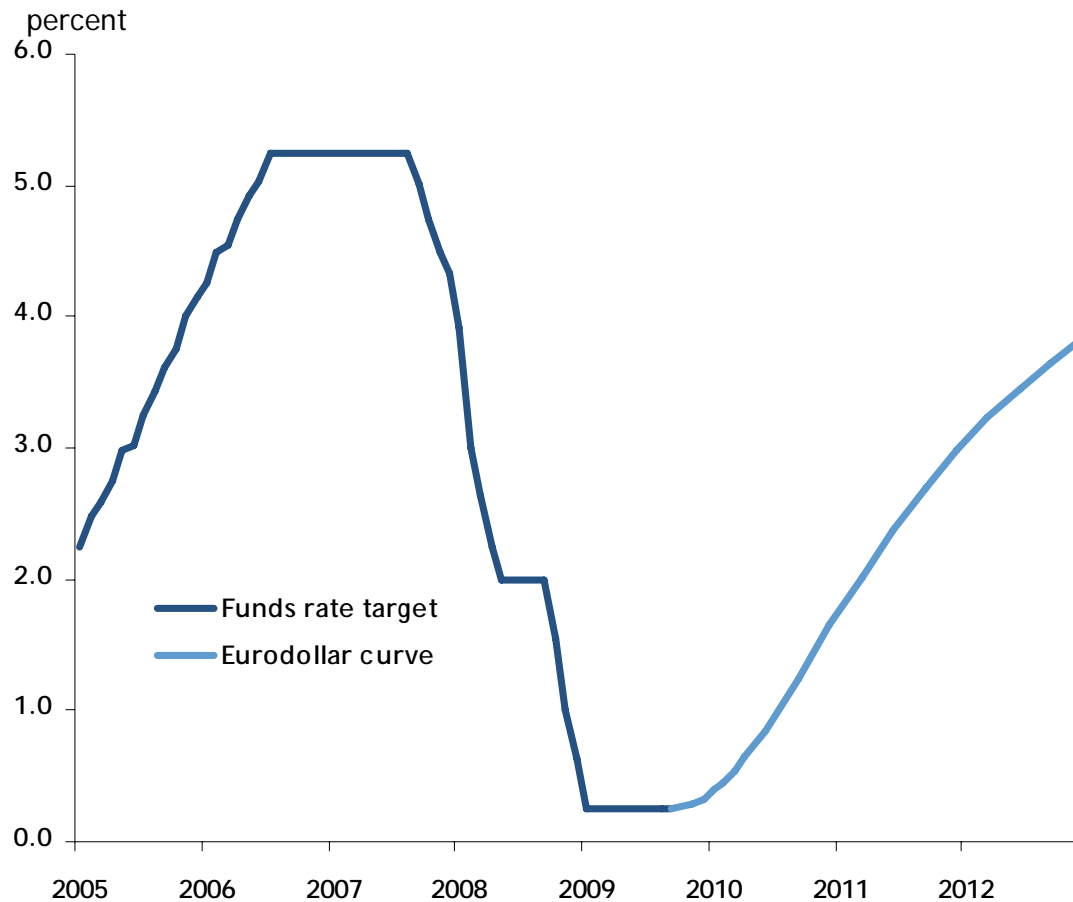


Gross MBS Issuance

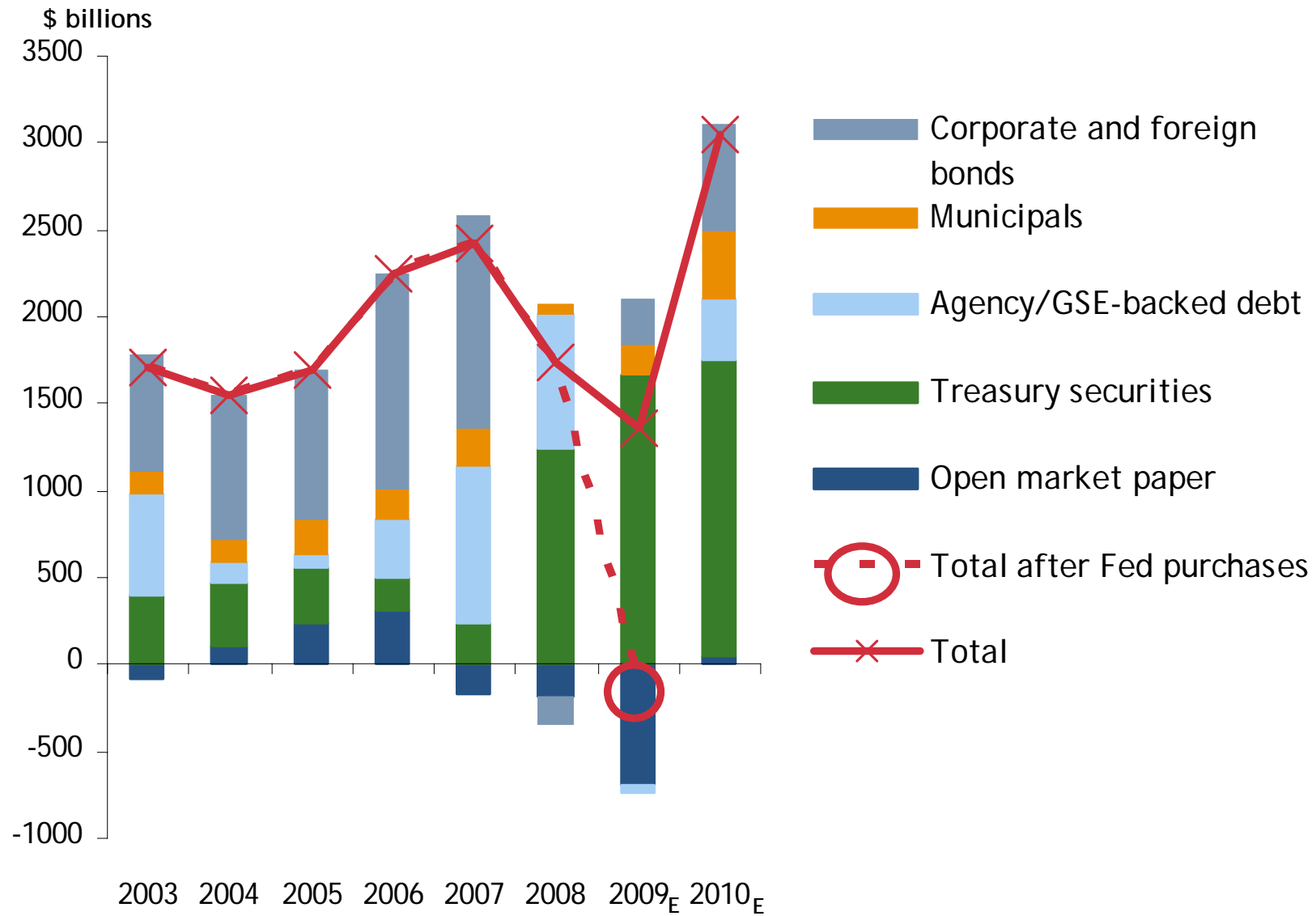


Form and Likely Sequence: Raising the Fed Funds Rate

- Markets pricing in the first move in the first half of 2010 and expecting gradual tightening similar to the past
- Another possibility is a discreet initial move (to 1% for example) to remove emergency level followed by a pause and then gradual tightening



Market Implications: Net Fixed Income Supply



Market Implications: Net Fixed Income Purchases

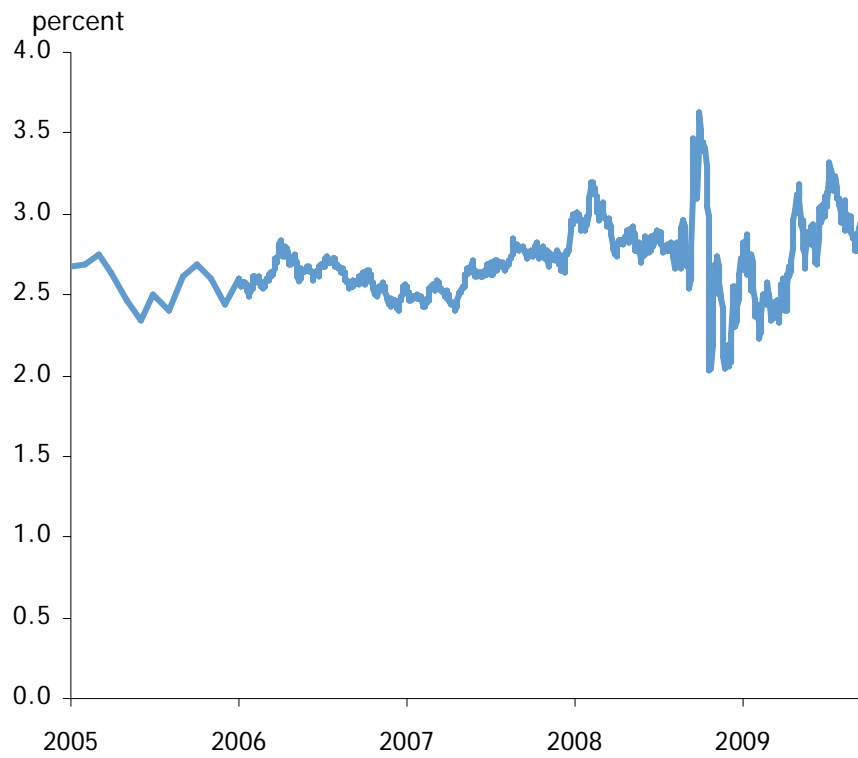
2008						
	Open market paper	Treasuries	Agency/Agency MBS	Municipals	Corporates	Total
Households	-139	148	85	42	-143	-8
Financial	126	698	846	50	-41	1678
Nonfinancial	-59	-7	-4	-24	--	-95
State and Local Gov	-71	-9	-10	0	-4	-94
Federal Gov	--	--	54	--	--	54
Federal Reserve	--	-265	20	--	--	-245
Rest of the World	-45	674	-218	-4	40	447
Total	-189	1239	772	64	-149	1737

2009						
	Open market paper	Treasuries	Agency/Agency MBS	Municipals	Corporates	Total
Households	-3	709	-1158	86	77	-290
Financial	-634	30	24	63	256	-261
Nonfinancial	26	21	2	17	--	67
State and Local Gov	-21	-4	-44	0	5	-64
Federal Gov	--	--	192	--	1	193
Federal Reserve	--	368	1079	--	--	1447
Rest of the World	-67	546	-135	9	-78	274
Total	-699	1670	-41	176	260	1366

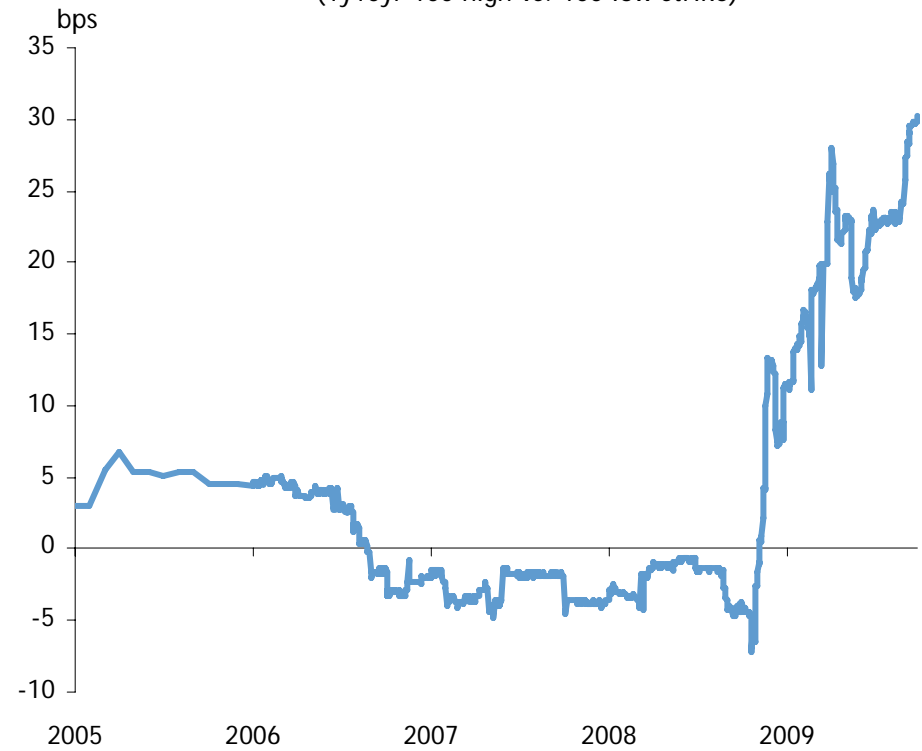
\$ billions

Market Implications: Concern about higher real rates rather than inflation?

5yr5yr Forward TIPS Inflation Expectations

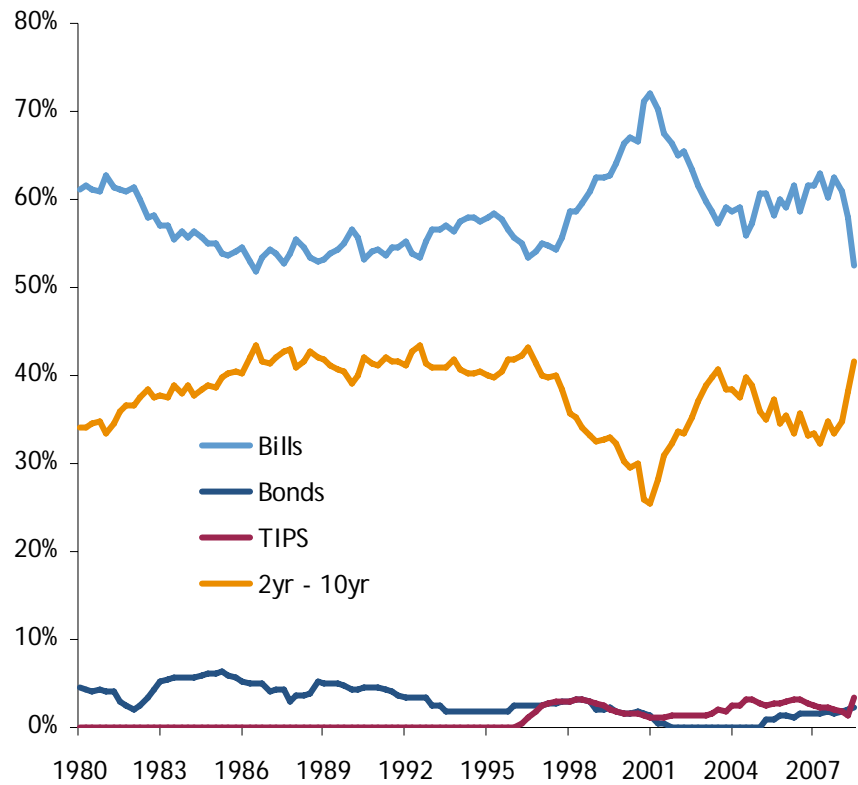


Volatility Skew (1y10yr 100 high vs. 100 low strike)

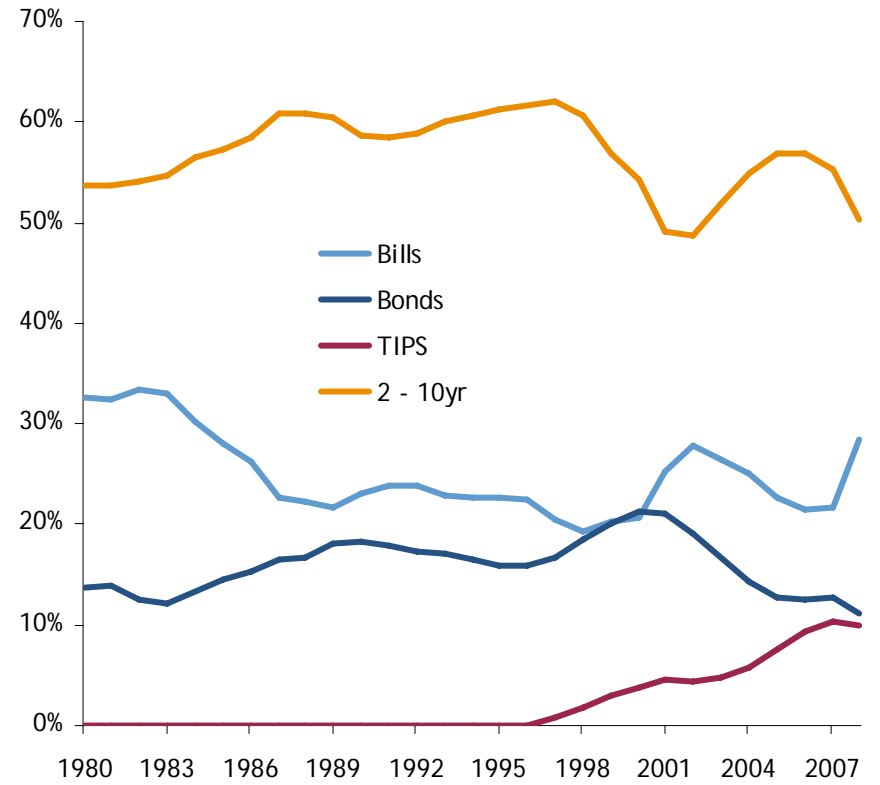


Market Implications: Issuance and debt outstanding

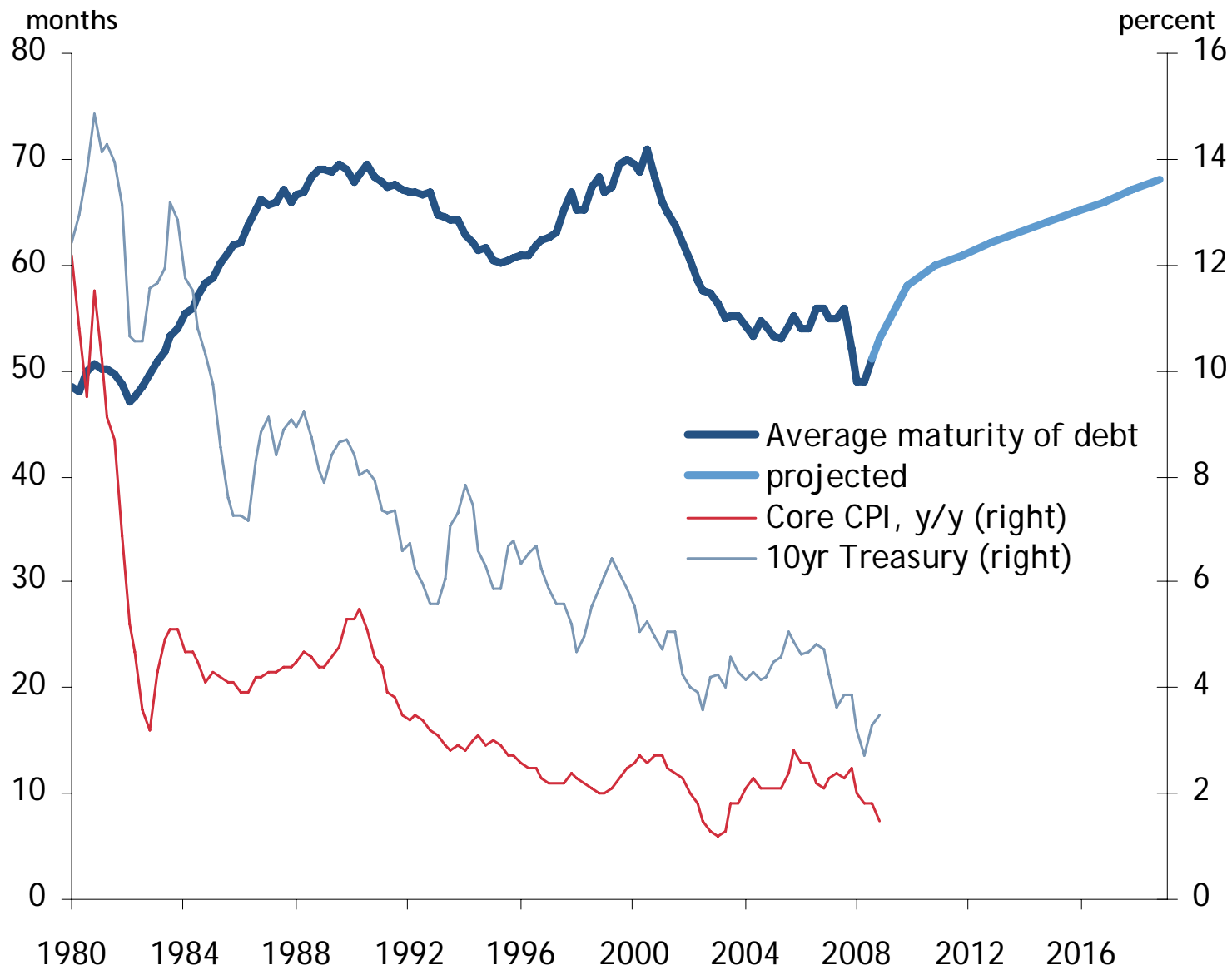
Quarterly Issuance



Marketable Debt Outstanding



Market Implications: Average Maturity of the Debt



Market Implications: More TIPS Issuance

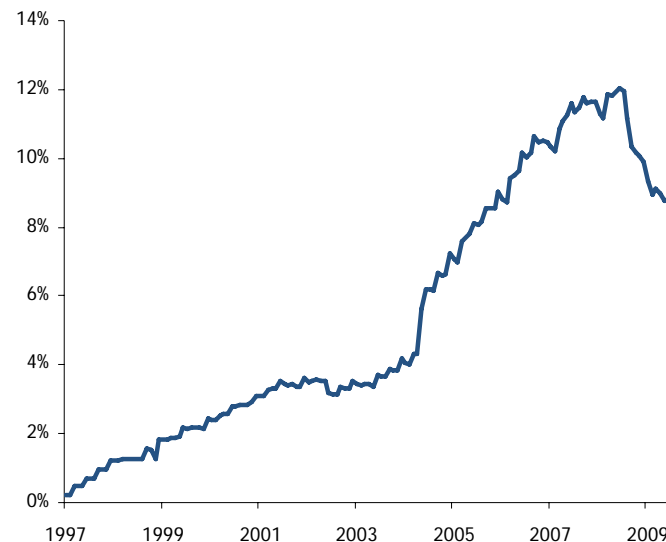
Advantages

- Diversify and broaden the buyer base of Treasury debt in time of extreme borrowing need
- Potentially further lower the funding cost of nominals if TIPS remove some inflation risk premium
- Further extends average maturity of issuance and debt
- Limited risk because tax receipts effectively hedge Treasury inflation exposure

Disadvantages

- Given low breakevens, there is potential for higher explicit cost relative to nominal
- If there is substantial further disinflation or deflation, buyer base for TIPS may dwindle just as issuance increases

TIPS as Percentage of Nominals Outstanding



Potential Policy Errors

Fiscal considerations

- Lack of budgetary restraint
 - Big issue for non-US investors
 - Need spending cuts or tax revenue increases as economy stabilizes
 - Need to refrain from a second fiscal stimulus

Monetary considerations

- Liquidity programs
 - Many of the programs addressing the money markets and financing can be removed now
 - TALF is still needed to restart the shadow banking system, particularly for more difficult assets
- MBS program
 - Housing market still needs low rate
 - Stopping purchases vs. selling MBS
- Traditional policy
 - Raising rates too soon is the bigger risk

Conclusions

- The Fed's exit strategy is a significant challenge and the form and timing will have a significant impact on the broad financial markets
- The likely first step will be the use of reverse repos to remove excess reserves from the banking system
- The eventual increase in the Fed funds rate target will have the biggest impact and will likely come at a time when supply of fixed income securities is increasing and the Fed has stopped purchasing longer-dated securities
- The Treasury should continue to have a very transparent plan to increase issuance given the growing deficit and
 - Extend average maturity
 - Issue more inflation-linked debt

**Treasury Borrowing Advisory Committee:
Optimal Issuance Strategy**

Quarterly Meeting

November 3, 2009

Questions

Given the recent trends in the economy and the government's fiscal position, please discuss Treasury's plan to lengthen the average maturity of the portfolio in the medium term. Is there an optimal average maturity range, given structural financing needs in the medium and long term? Does it make sense to apply asset-liability management to Treasury's marketable debt portfolio? Can you discuss approaches to financing and risk management by other sovereign nations and how they might be applicable to the US Treasury debt management?

Agenda

- ◆ Background
- ◆ Optimization Model/Debt management strategies
- ◆ Conclusions:
 1. Inflation, higher interest rate and roll over risk should be the primary concerns in Treasury's debt management strategies.
 2. In most scenarios, it is prudent to lengthen maturities significantly from current average maturity of 50 months. Our base case is to extend to 74 months, stretch case to extend to 96 months.
 3. The objective of lowest borrowing cost could lead to higher yields that conflict with monetary policy objective.
 4. Clever debt management strategy could potentially reduce debt service cost meaningfully, but still can't completely substitute for prudent fiscal policy.

Comparison of debt management strategies across the G7

Debt management strategies across the G7							
Country	Avg Maturity (years)	% Foreign Ownership	Total Public Debt (USD \$bn)	Ratio of Debt to revenue	Ratio of debt to GDP	Interest Payments as share of revenue	Debt Management Methodology Summary
USA	4.25	49%	7551**	359%	53%	18%	Cashflow matching. No ALM framework currently used
UK	14.2	30%	1,347.1	118%	56%	3.30%	Cashflow matching. No ALM framework currently used
Germany	6.10	30%*	1522	151%	65.90%	6.10%	Optimizes mix of funding instruments to minimize long term cost and risk for the issuer. Derivative instruments such as swaps are also used
France	6.70	30%*	1689.7	137%	67.40%	5.70%	Cashflow management. Management of average maturity and effort made to ensure liquidity in issues
Italy	6.87	30%*	2382.5	230%	105.80%	11.10%	Strategic scenario analysis and risks. Use of various cash and derivatives products to minimize cost of debt and reduce risk
Japan	7.00	6%	9875.1	2331%	190%	26.20%	Cashflow matching. No ALM framework currently used
Australia	5.60	53%	92.87	19%	4.60%	2.60%	Cost and risk optimization. Use of swaps until Nov 2007
New Zealand	5.60	72%	35.8	49%	15.60%	6.00%	Driven by set of principles to minimize risk and costs of debt and help the DMO issue debt cost-effectively. Focus is on fiscal control, government balance sheet risk management, and containment of moral hazard, and limiting contingent liability risk to the Government. Contingent liabilities are disclosed, analyzed and contained on a sub-national level with limited central government intervention.

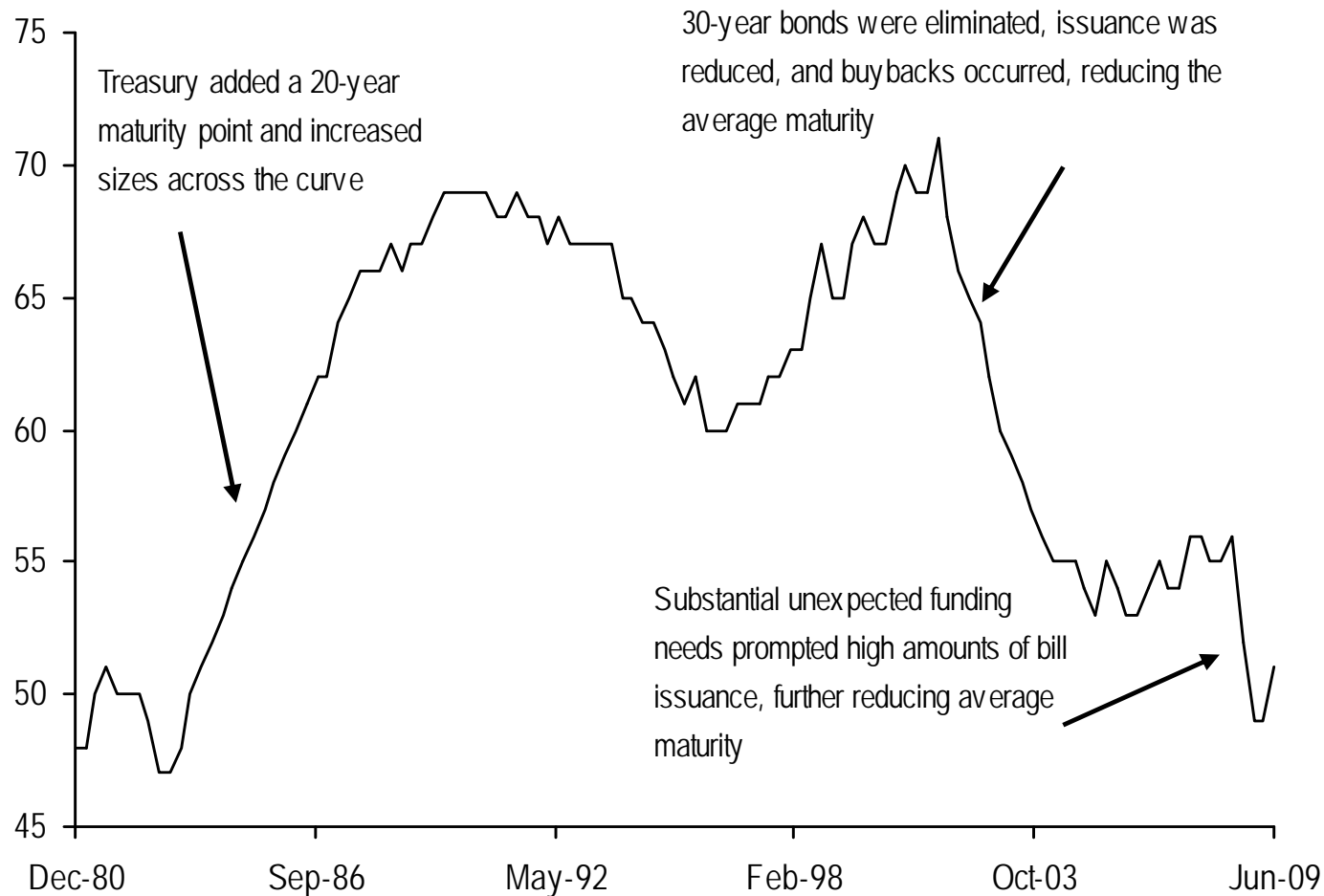
* Estimated ownership for Eurozone debt by non Eurozone members

** Debt held by public

Source: JP Morgan

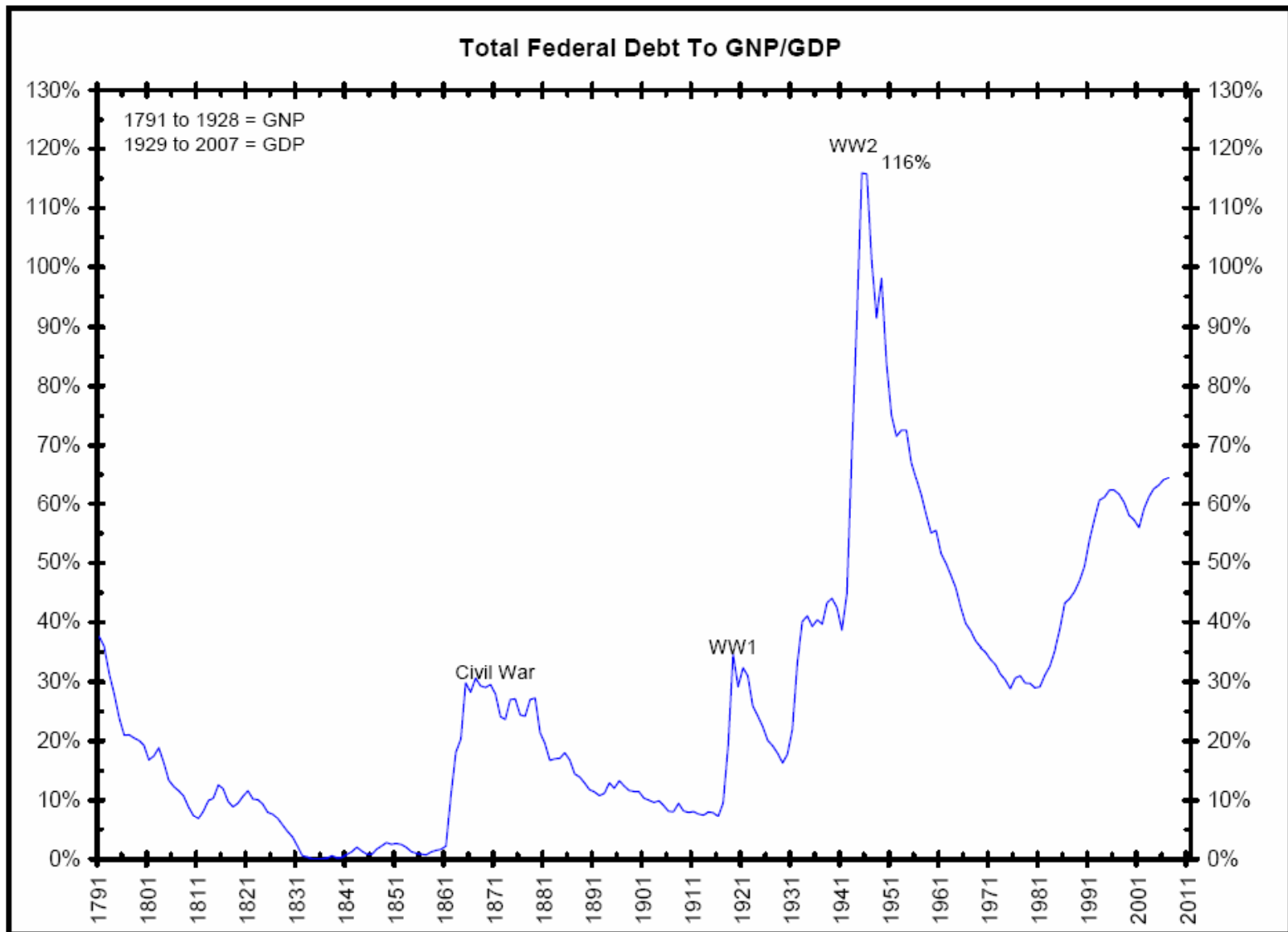
Average maturity of outstanding treasuries is approximately 50 months, which is near 25-year lows!

Average Maturity of Outstanding Treasuries, Months



Source: JP Morgan

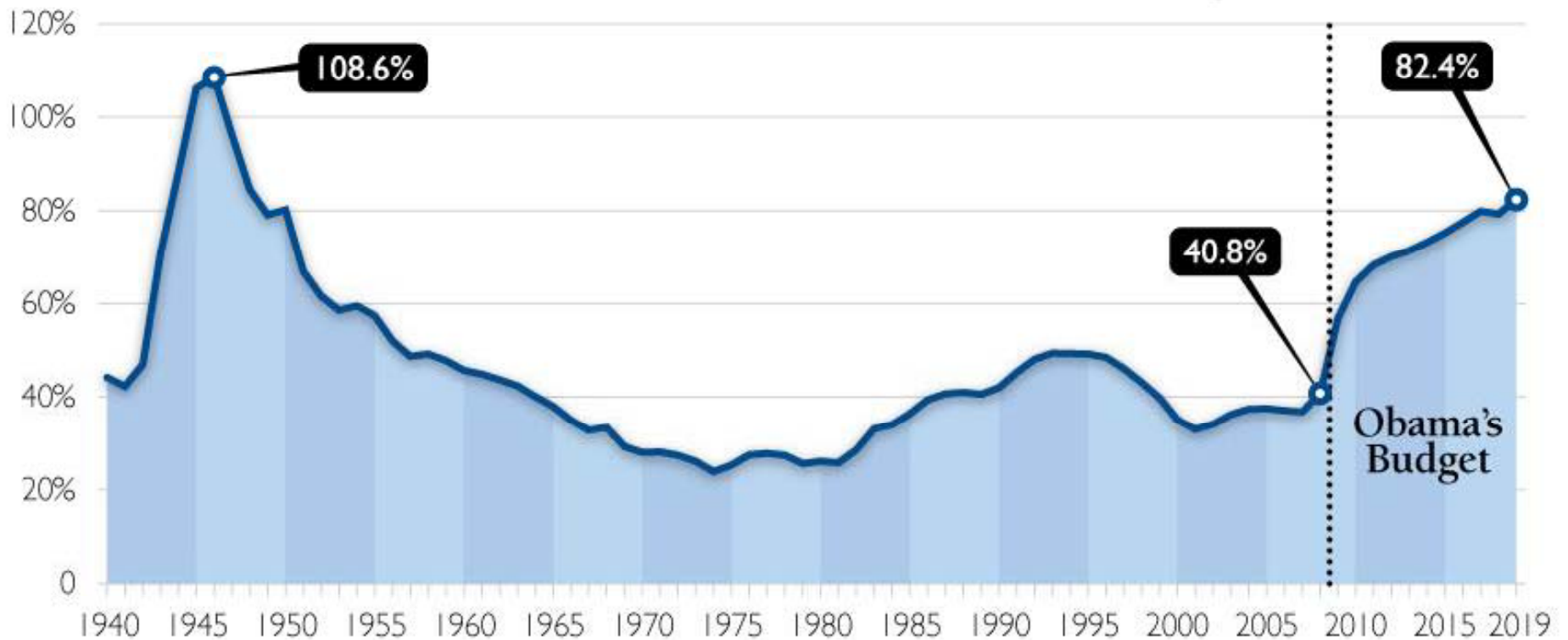
Total federal government debt to GDP ratio was only higher during WW II



Source: Bianco Research

Debt to GDP about to go up significantly

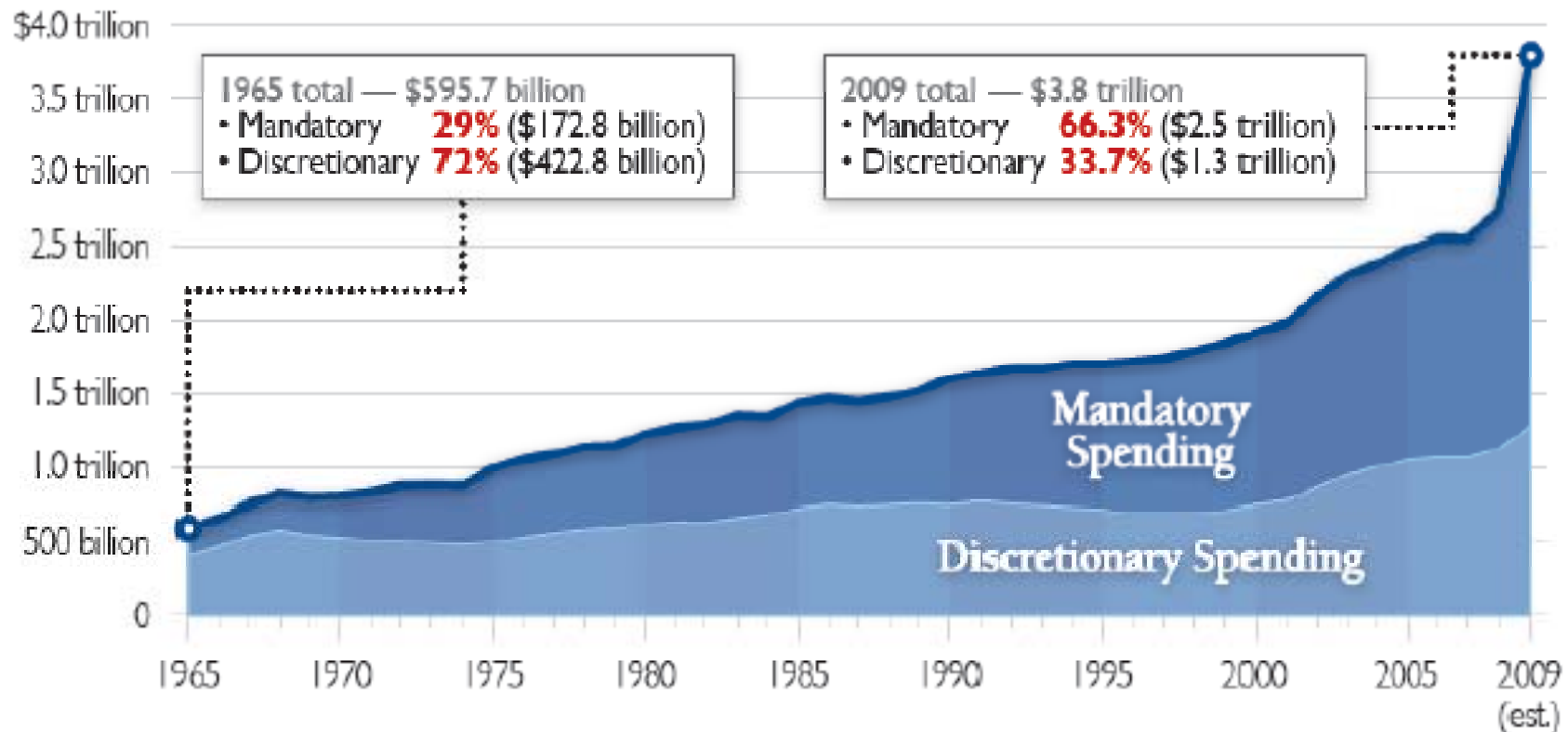
Debt Held by the Public as a Percentage of GDP



Source: White House Office of Management and Budget, Congressional Budget Office

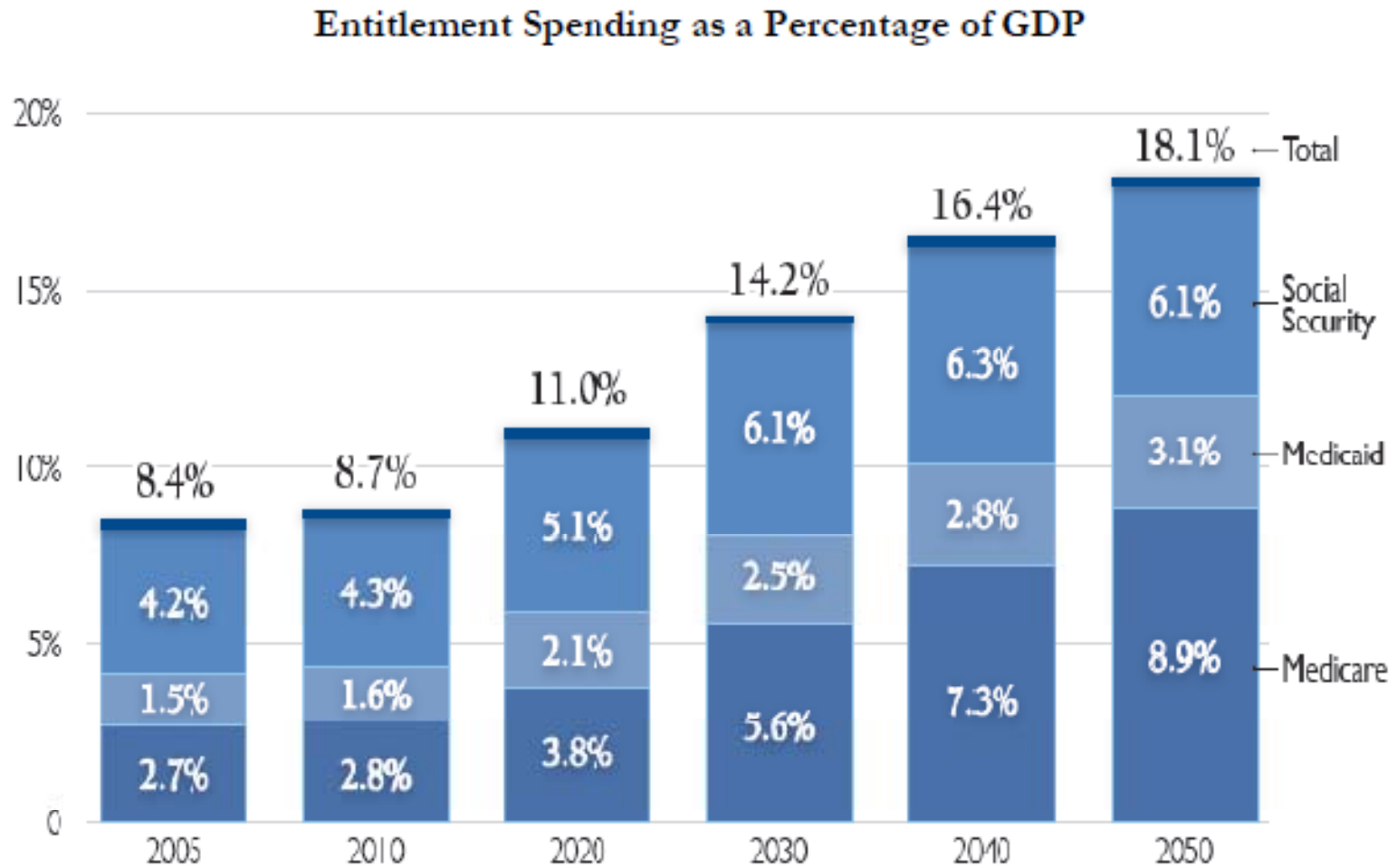
Mandatory spending has increased 5x faster than discretionary spending

**Total Discretionary Spending vs. Mandatory Spending
in Inflation-Adjusted Dollars (2008)**



Source: *The Heritage Foundation 2009 Federal Revenue and Spending Book of Charts*; and White House office of Management and Budget

Entitlement spending is confronting a demographic time bomb



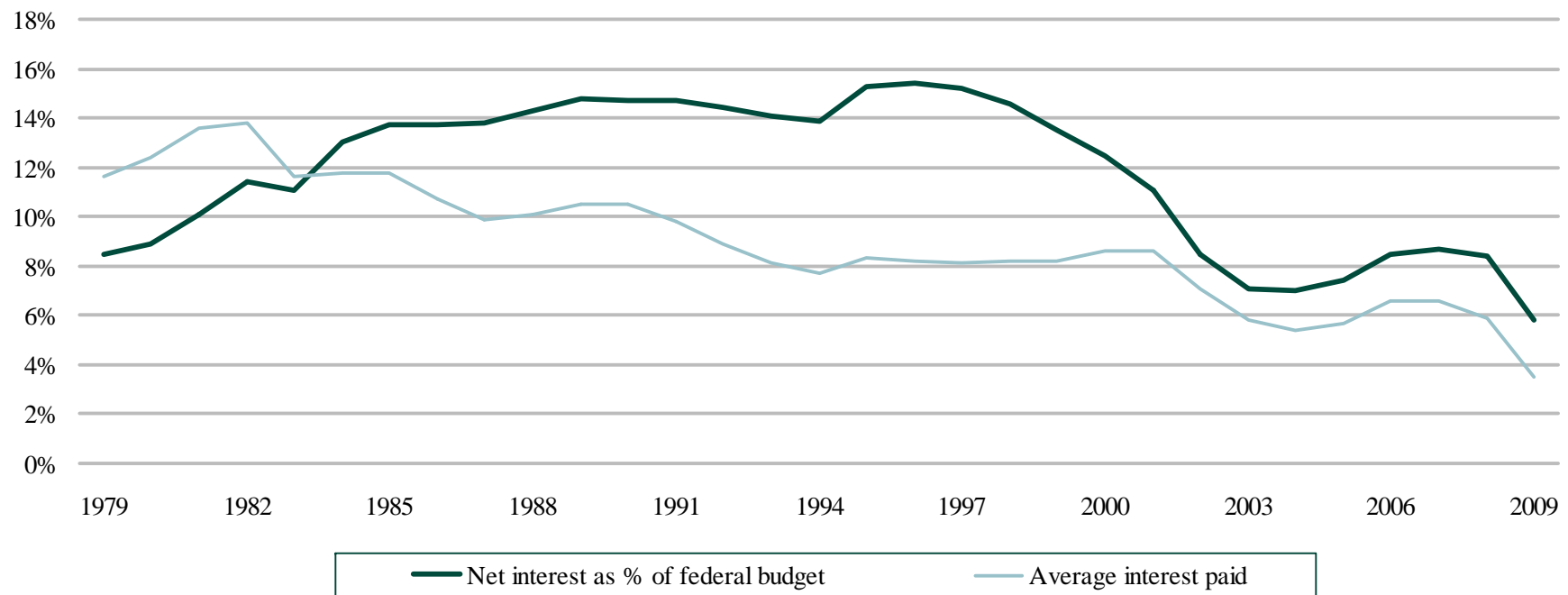
Source: *The Heritage Foundation 2009 Federal Revenue and Spending Book of Charts*; and *Congressional Budget Office*

Plausible budget deficit outlook

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
CBO August Baseline	-1587	-1381	-921	-590	-538	-558	-558	-620	-625	-622	-722
Plausible Revenue Changes											
EGTRRA & JGTRAA	0	-4	-121	-217	-247	-260	-271	-281	-290	-298	-307
AMT	0	-7	-69	-31	-34	-37	-41	-46	-53	-60	-70
Interaction	0	0	-13	-44	-49	-53	-58	-64	-70	-77	-85
Making Work Pay, etc.	0	-48	-141	-199	-203	-201	-199	-198	-199	-202	-205
High Income	0	76	106	131	140	147	155	165	175	186	186
Debt Service	0	0	-4	-17	-42	-75	-109	-146	-189	-236	-286
Subtotal Rev	0	17	-242	-377	-435	-479	-523	-570	-626	-687	-767
Plausible Spending Changes											
Inflate Discretionary by GDP	0	-8	-33	-74	-120	-159	-194	-228	-261	-294	-328
Iraq War Phaseout	0	1	7	29	59	83	97	104	106	111	115
Debt Service	0	0	-1	-1	-3	-8	-13	-19	-28	-39	-52
Subtotal Disc. Spending	0	-7	-27	-46	-64	-84	-110	-143	-183	-222	-265
Total Change	0	10	-269	-423	-499	-563	-633	-713	-809	-909	-1032
Resulting Surplus / Deficit	-1587	-1371	-1190	-1013	-1037	-1121	-1191	-1333	-1434	-1531	-1754
GDP	14140	14439	14993	15754	16598	17319	18019	18760	19524	20308	21114
Deficits as % of GDP	-11.2%	-9.5%	-7.9%	-6.4%	-6.2%	-6.5%	-6.6%	-7.1%	-7.3%	-7.5%	-8.3%
Debt Held by Public	7612	8984	10174	11186	12224	13345	14536	15869	17304	18836	20590
Debt / GDP	54%	62%	68%	71%	74%	77%	81%	85%	89%	93%	98%
Interest	177	199	250	319	420	556	657	746	841	934	1038
Interest Rate	2.3%	2.2%	2.5%	2.9%	3.4%	4.2%	4.5%	4.7%	4.9%	5.0%	5.0%

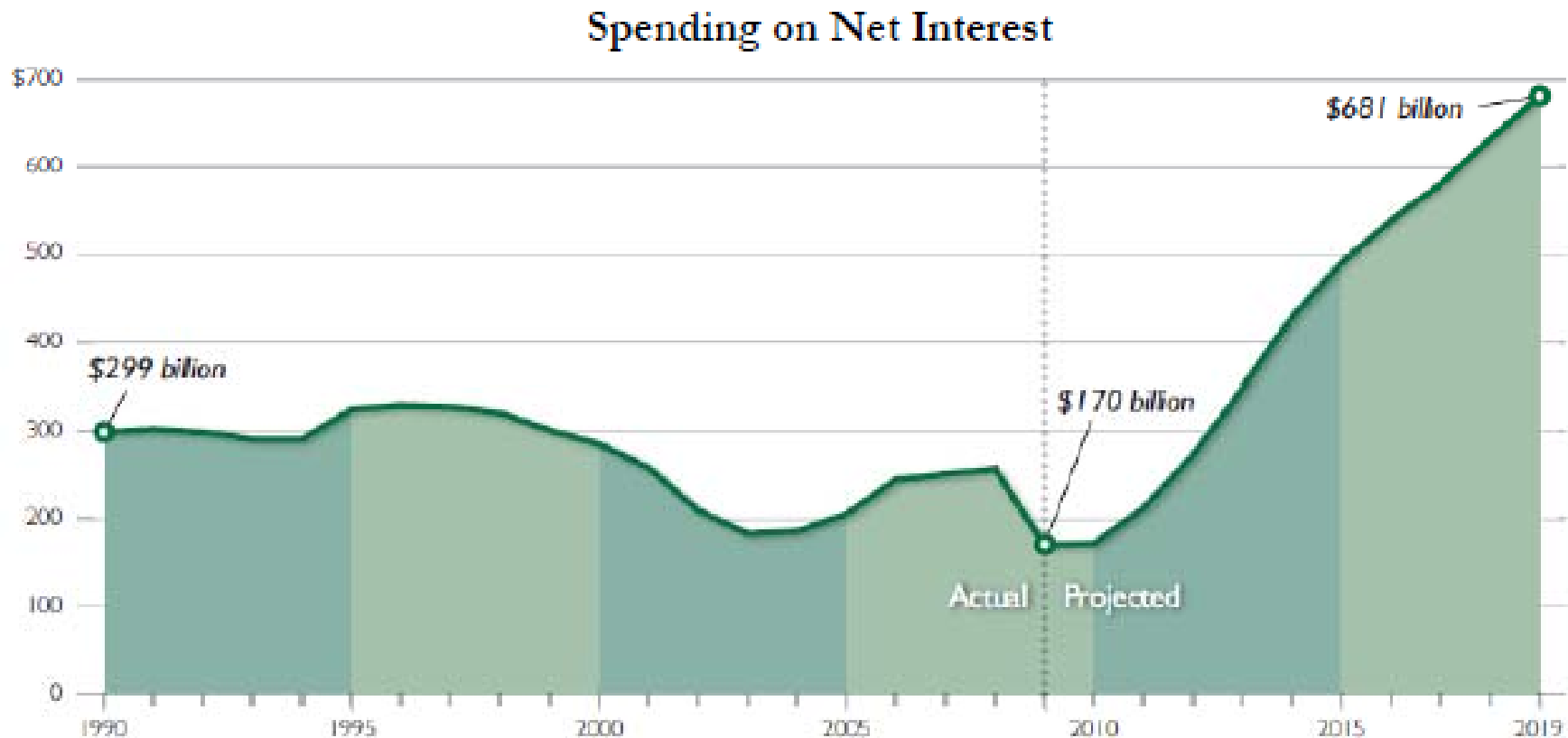
The federal budget has benefited from the decline in rates, BUT approximately 40% of marketable Treasury securities now mature in less than 1 year

Interest payments on federal debt



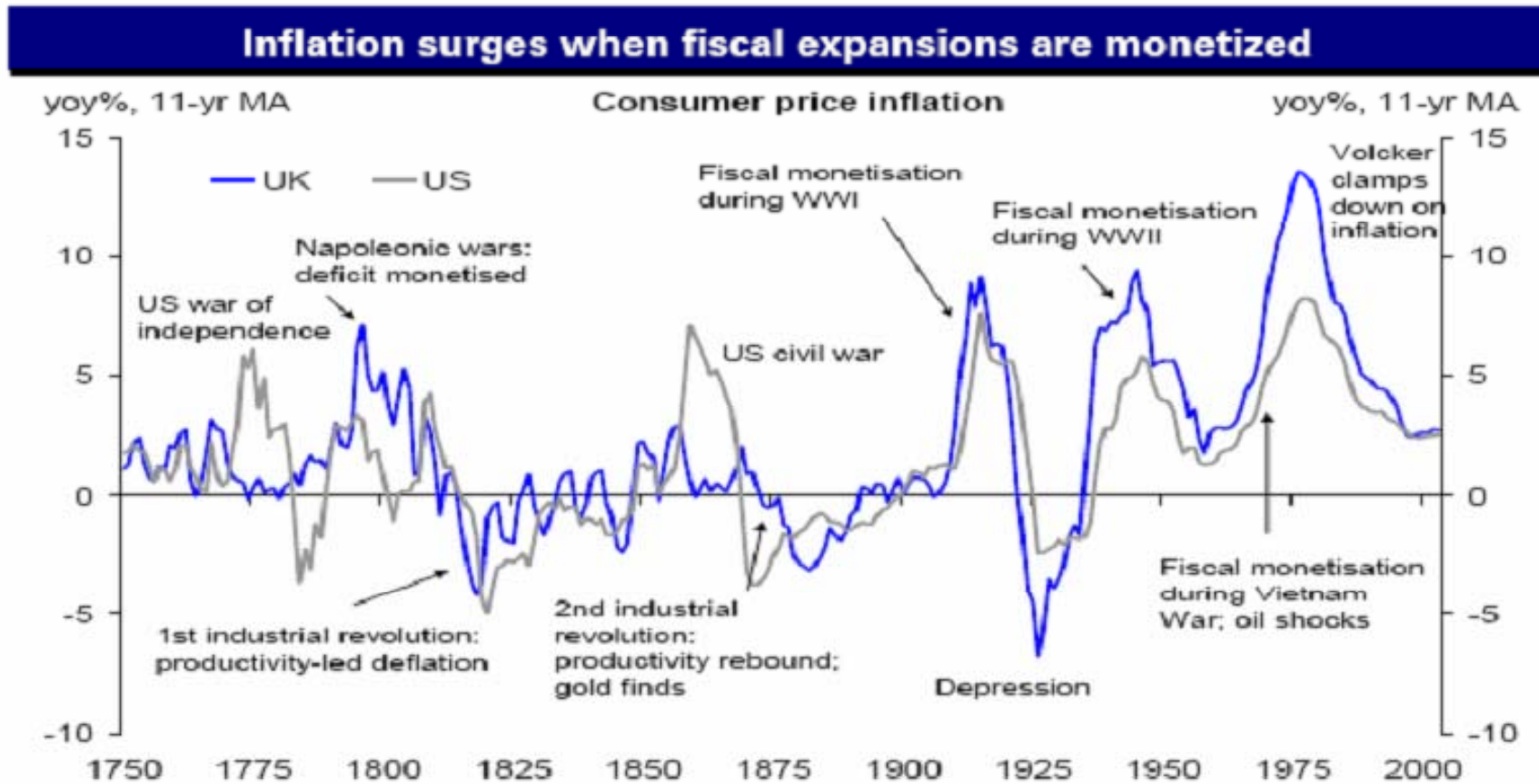
Source: Economic Report of the President 2009

Interest payments to rise substantially



Source: Heritage Special Report July 27, 2009; Office of Management and Budget, Budget of the United States Government, FY 2010, Historical Table, Table 3.2, (July 15, 2009); Congressional Budget Office, A Preliminary Analysis of the President's Budget and an Update of CBO's Budget and Economic Outlook, March 2009, (July 15, 2009). Figures adjusted for inflation into 2009 dollars.

Large fiscal expansions coupled with debt monetization lead to inflation



Source: Deutsche Bank Global Markets Research

Optimal Maturity of Issuance

Definition of the problem

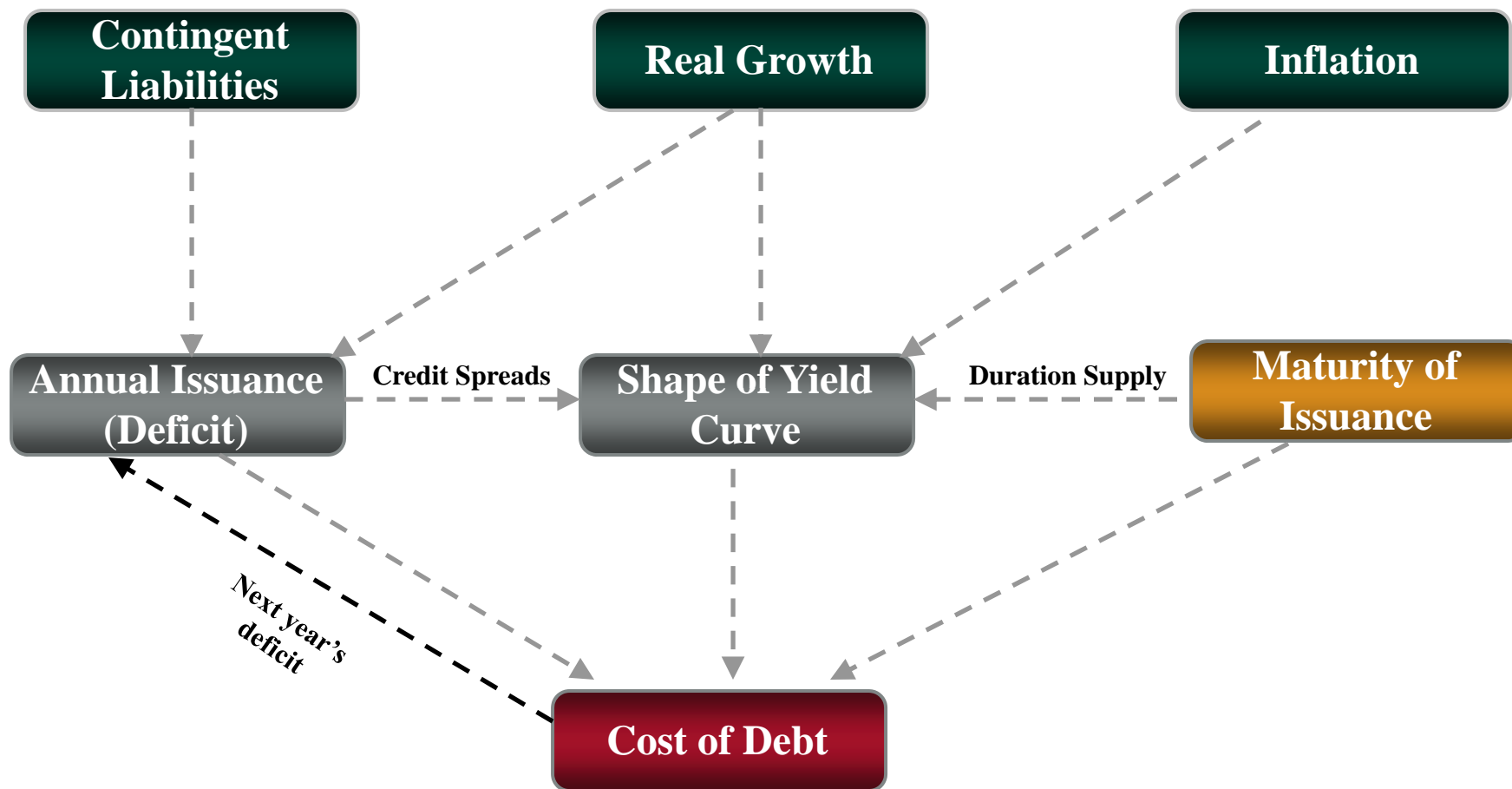
Overview

- Across a range of 15 economic and credit scenarios, we project funding needs over the next 10 years
- Our goal is to find the optimal average maturity of debt issuance given different risk scenarios over the next 3 years

Setup of problem:

- **Decision variable**: % gross issuance of 2009-2011 to be issued in 3-months and 10-years
- **Objective**: Minimize the total cost of debt service from 2010-2020 (try to consider a confidence crisis on sovereign credit by 2020)
- **Constraints**:
 - Maintain enough net issuance in bills and 10-years to meet investor needs
- Additional Consideration**
 - Keep yields within a range to achieve monetary policy goals

Overview of the model



Macro and credit scenarios

- ◆ The model considers 15 scenarios:
 - 5 macro scenarios: combinations of growth and inflation
 - 3 credit scenarios: optimistic, base case and disaster

Four focus scenarios

Scenario	Description	Inflation	Real Growth	Credit Losses			Total
				Fannie / Freddie	FDIC	Extraordinary Assistance	
1	Base Case	2%	2%	\$300	\$200	\$75	\$575
2	Low Growth, low inflation (Japan)	0%	0%	\$300	\$200	\$75	\$575
3	Moderate growth, high inflation	2%	5%	\$300	\$200	\$75	\$575
4	High credit loss	2%	2%	\$600	\$600	\$200	\$1,400

Yield curve dynamics

- ◆ The 10-year rate is the sum of:
 - Real growth rate
 - Inflation
 - Credit spread: based on amount of credit losses
 - Inflation risk premium: 50 bps + 20% of current inflation
 - An adjustment for duration supply: assume \$1trn in net issuance leads to 1% increase in yields. *
- ◆ The 3-month point is largely determined by the Fed:
 - Taylor rule: $d(3\text{-month Yield}) = 1.5 * d(\text{Inflation}) + 0.5 * d(\text{Real Growth})$
 - The 3-month credit spread is smaller than the 10-year spread and varies by credit scenario
 - The impact of duration supply is small: \$1trn in net issuance increases yields by 7 bps

Rates in 2020 across focus scenarios

Scenario	Growth	Inflation	Credit Spread	Inflation Risk Prem	Impact of Durn Supply	10-yr Yield	3m Yield	Debt / GDP
Base	2.0%	2.0%	0.25%	0.9%	2.3%	7.5%	2.9%	123%
Japan	0.0%	0.0%	0.25%	0.5%	2.1%	2.8%	0.0%	149%
High Inflation	2.0%	5.0%	0.25%	1.5%	2.9%	11.7%	7.4%	117%
High Credit	2.0%	2.0%	1.75%	0.9%	2.9%	9.6%	4.3%	140%

* A recent study by JP Morgan concluded that net issuance of 10yrs in the amount of 1% of GDP causes yield to rise by 30bps. This would imply that yields would rise by 2% given \$1 trn in issuance. We found this lead to yield curves that were implausibly steep by 2020 so we halved the effect. We do feel that the effect we used in our model is on the conservative side.

Budget outlook across scenarios

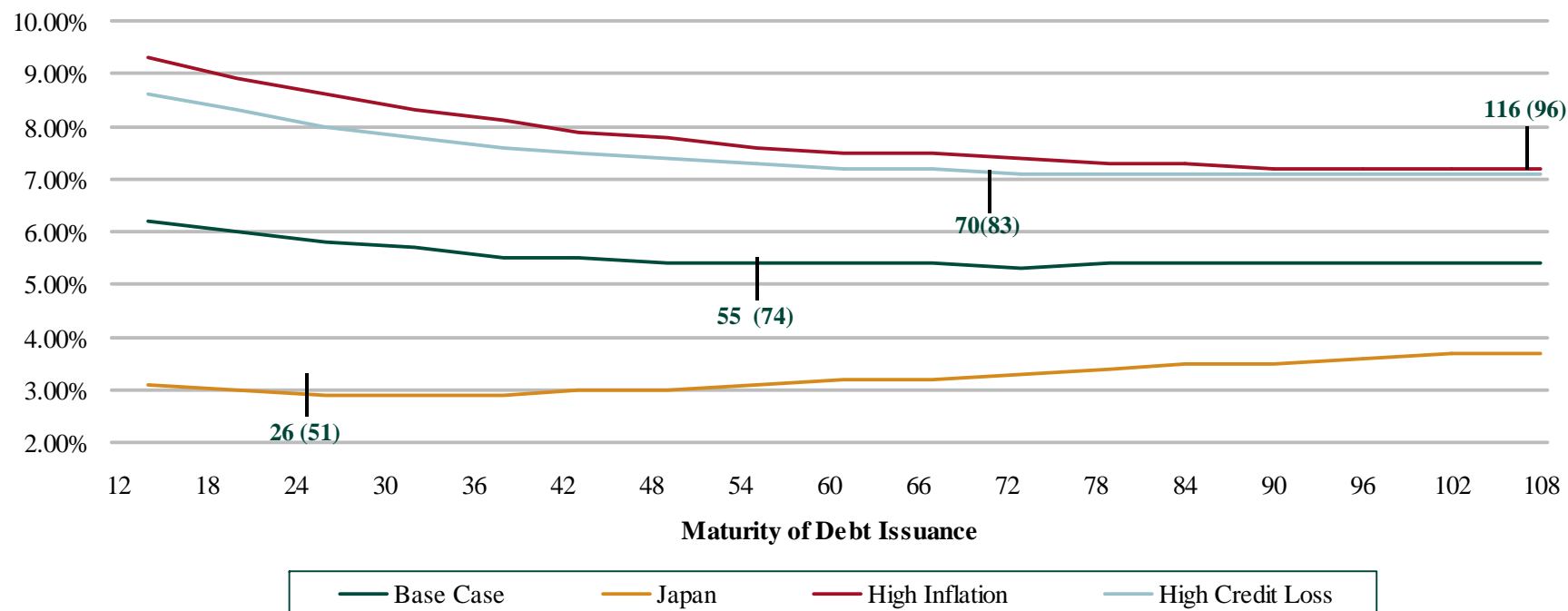
Federal budget in focus scenarios

Scenario	% Bill in Gross Supply	Avg Maturity of Issuance	Avg Maturity of Debt 2011	2011 Yield Curve		2020 Yield Curve		Deficit/ GDP (2015-2020)	Debt/GDP in 2020	Debt Service / GDP in 2020
				3m	10y	3m	10y			
Base	56%	55	74	2.2%	5.8%	2.9%	7.5%	9%	123%	7%
Japan	81%	26	51	0.2%	2.8%	0.0%	2.8%	7%	149%	3%
High Inflation	3%	116	96	4.4%	7.8%	7.4%	11.7%	11%	117%	9%
High Credit	42%	70	83	2.6%	7.0%	4.3%	9.6%	9%	140%	9%

Optimization across scenarios

- ◆ In the low growth / low inflation scenario, we want to keep issuance as short as possible
- ◆ In the high inflation scenario, we should issue long now to lock in low rates

Average Debt Service / GDP: 2015-2020



*Line shows optimal maturity of issuance to minimize total debt service cost for 2009-2020
 Number in parentheses is average maturity of total debt at the end of 2011*

Optimal issuance across macro and credit scenarios

Current macro environment

		Recent Issuance		Yield Curve				
Real Growth	Inflation	% of Bills	Maturity	3m	10y	Deficit / GDP	Debt / GDP	Debt Service / GDP
-1%	1%	70%	26	0.08%	3.59%	14%	50%	1.3%

Optimal issuance for a given macro environment

		Base Case Tax Rate							30% Higher Taxes						
Real Growth	Inflation	Optimal Issuance		Yield Curve in 2020		Deficit / GDP (2015-20)	Debt / GDP in 2020	Debt Service / GDP in 2020	Optimal Issuance		Yield Curve in 2020		Deficit / GDP (2015-20)	Debt / GDP in 2020	Debt Service / GDP in 2020
		% Bills in Gross Supply	Debt Maturity	3m	10y				% Bills in Gross Supply	Debt Maturity	3m	10y			
0%	0%	80.6%	26	0.2%	2.8%	7.4%	149%	3.5%	83.6%	22	0.2%	2.7%	4.9%	112%	2.5%
2%	2%	55.6%	55	2.2%	5.8%	8.9%	123%	6.6%	60.4%	49	2.2%	5.7%	5.5%	87%	4.6%
2%	5%	3.4%	116	4.4%	7.8%	11.1%	117%	9.3%	10.5%	108	4.4%	7.8%	7.4%	81%	6.1%
4%	0%	62.7%	47	1.2%	5.5%	7.0%	107%	5.4%	66.9%	42	1.2%	5.3%	2.8%	71%	3.6%
4%	5%	0.0%	120	4.9%	8.8%	10.6%	96%	8.8%	0.0%	120	4.9%	8.8%	5.4%	60%	5.4%

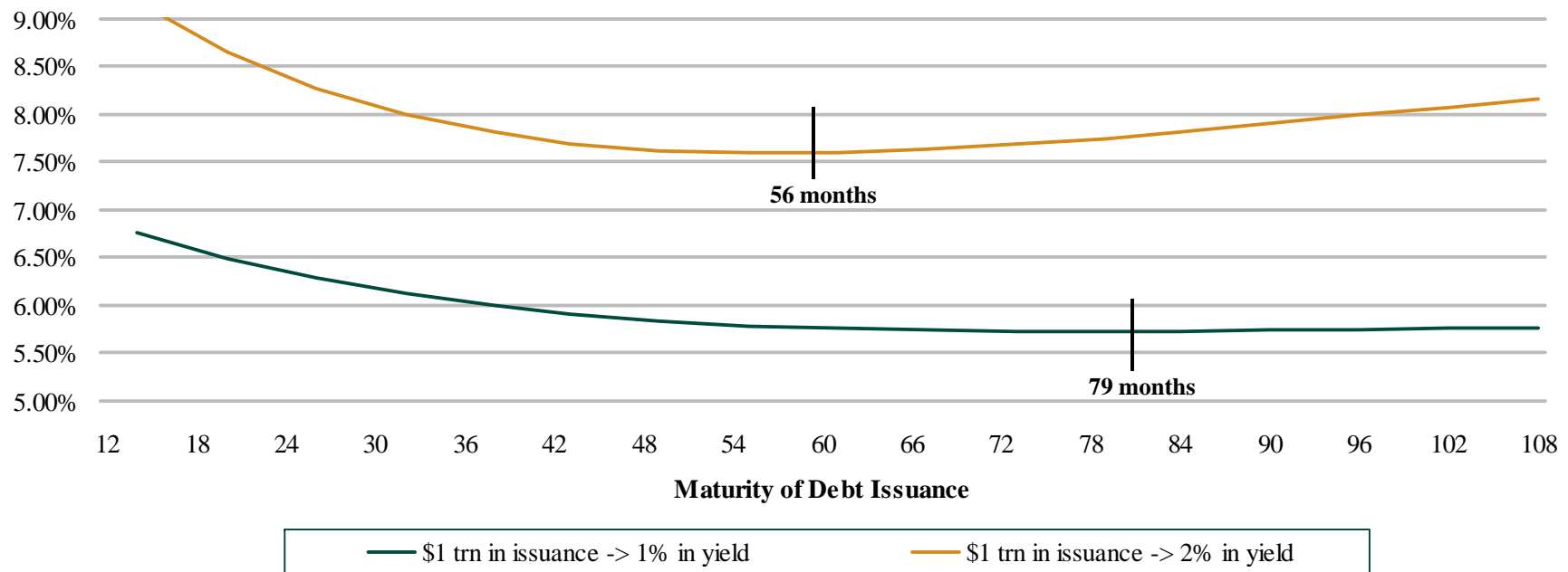
Optimal issuance for a given macro/credit environment

			Base Case Tax Rate							30% Higher Taxes						
Real Growth	Inflation	Credit Losses (bn)	Optimal Issuance		Yield Curve in 2020		Deficit / GDP (2015-20)	Debt / GDP in 2020	Debt Service / GDP in 2020	Optimal Issuance		Yield Curve in 2020		Deficit / GDP (2015-20)	Debt / GDP in 2020	Debt Service / GDP in 2020
			% Bills in Gross Supply	Debt Maturity	3m	10y				% Bills in Gross Supply	Debt Maturity (mos)	3m	10y			
0%	0%	\$6	82.7%	23	0.1%	2.5%	7.4%	142%	2.9%	85.7%	20	0.1%	2.4%	4.8%	105%	2.1%
0%	0%	\$575	80.6%	26	0.2%	2.8%	7.4%	149%	3.5%	83.6%	22	0.2%	2.7%	4.9%	112%	2.5%
0%	0%	\$1,400	73.1%	34	0.6%	4.0%	7.9%	168%	5.9%	76.3%	31	0.6%	3.9%	5.6%	128%	4.3%
2%	5%	\$6	6.5%	112	4.4%	7.5%	11.1%	111%	8.6%	13.2%	105	4.4%	7.5%	7.2%	75%	5.5%
2%	5%	\$575	3.4%	116	4.4%	7.8%	11.1%	117%	9.3%	10.5%	108	4.4%	7.8%	7.4%	81%	6.1%
2%	5%	\$1,400	0.0%	120	4.8%	8.8%	11.7%	132%	12.0%	0.0%	120	4.8%	8.8%	8.2%	93%	8.1%

Impact of duration supply

- ◆ Our choice of maturity is highly dependent on the impact of duration supply on yields
- ◆ All else equal if issuing more long debt has a larger impact on rates, the optimal maturity will be shorter

Average Debt Service Across all Scenarios / GDP: 2015-2020



Implications of monetary policy constraints for debt issuance

- ◆ The lowest-cost issuance strategy may lead to yields that conflict with monetary policy goals
- ◆ If we restrict ourselves to strategies that limit near-term bond yields, the maturity of issuance will be shorter

Issuance strategies across targeted yields

Maximum Allowed 10- Year Yield	Average Maturity of Issuance 2009- 2011	Debt Maturity 2011	Debt Service / GDP 2015-2020 *
None	79	87	5.7%
5.5%	74	84	5.7%
5.0%	56	75	5.8%
4.5%	41	65	5.9%
4.0%	28	53	6.2%
3.5%	16	41	6.7%
3.0%	15	39	6.8%

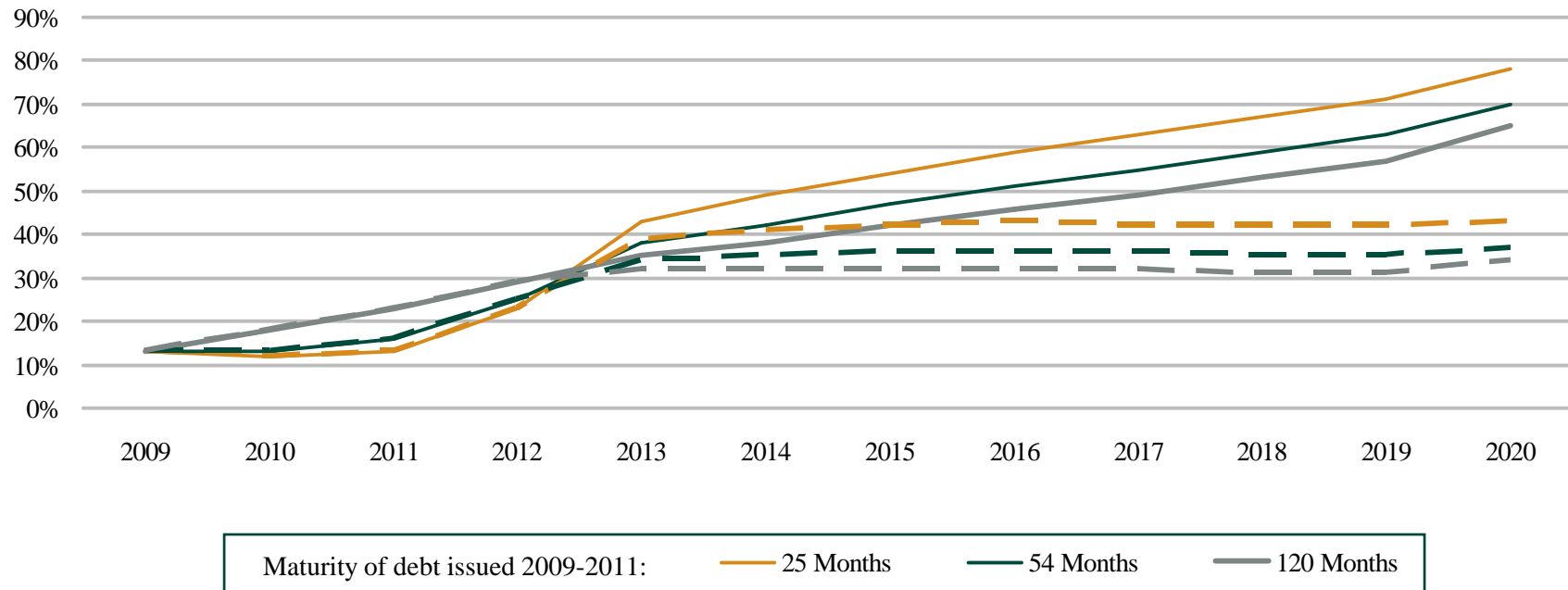
* *Maximum across all scenarios*

** *Average across scenarios*

The choice of maturity matters, but without budgetary restraint the cost of debt could spiral

- ◆ In a high credit loss, high inflation scenario issuing long-dated debt from 2009-2011 can reduce debt service cost in 2020 by 13% of government revenues
- ◆ But even with the optimal maturity debt service costs will be unbearable
- ◆ The dashed lines assume spending is cut by 30% by 2012

Debt Service as % of Federal Revenues: High Inflation, High Credit Scenario



Recap

Four Conclusions:

1. Inflation, higher interest rate and roll over risk should be the primary concerns in Treasury's debt management strategies.
2. In most scenarios, it is prudent to lengthen maturities significantly from current average maturity of 50 months. Our base case is to extend to 74 months, stretch case to extend to 96 months.
3. The objective of lowest borrowing cost could lead to higher yields that conflict with monetary policy objective.
4. Clever debt management strategy could potentially reduce debt service cost meaningfully, but still can't completely substitute for prudent fiscal policy.

Future Research

- ◆ We did not fully consider entitlement and state and local government as potential contingent liabilities. Hence risk to the model is to the upside.
- ◆ We can enhance the model on duration supply going forward. Current literature focused on historical regression. Possible new variables to consider: oil, dollar debasement, change of foreign demand, and US saving rate.
- ◆ We can attempt to model the rollover risk in a different context. We can tie the front end credit spread to the amount of short term debt maturing within a certain time frame.