

## **Prefatory Note**

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JUNE 23, 2005

# MONETARY POLICY ALTERNATIVES

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PREPARED FOR THE FEDERAL OPEN MARKET COMMITTEE  
BY THE STAFF OF THE BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

## MONETARY POLICY ALTERNATIVES

### Recent Developments

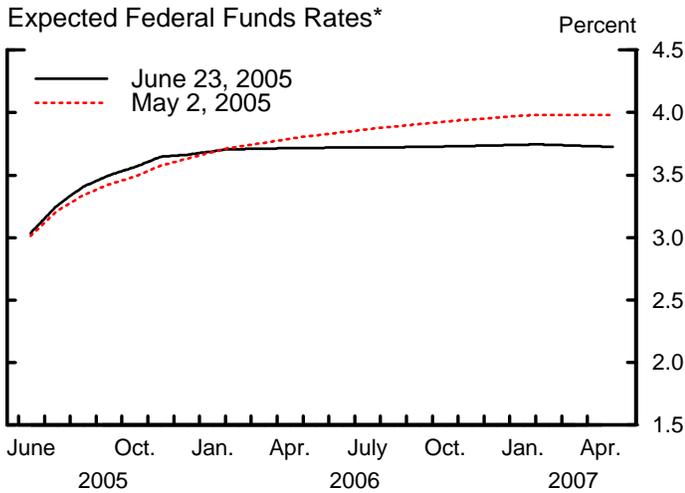
(1) The decision at the May FOMC meeting to raise the federal funds rate target 25 basis points to 3 percent, to maintain an assessment of balanced risks to the goals of price stability and sustainable growth, and to retain the “measured pace” language was widely expected in financial markets and elicited little reaction by the end of the day.<sup>1,2</sup> The minutes that were published three weeks later also held few surprises for investors. In the weeks that followed, releases of data on economic activity appear to have reassured market participants that solid economic expansion will continue and inflation will likely remain benign. Policy expectations, which were buffeted at times by remarks by Federal Reserve officials, ended the period a bit higher in the near term but markedly lower at longer horizons (Chart 1). According to options on federal funds futures, market participants are confident that the FOMC will hike the funds rate 25 basis points at the June FOMC meeting and view another such increase at the August meeting as very likely. However, high odds are placed on a pause in the tightening cycle later in the year, and the expected funds rate at the end of 2006 is currently 3.73 percent, down 21 basis points from the level that prevailed before the May FOMC meeting. All twenty-two primary dealers responding to the most recent survey by the Trading Desk predict a 25-basis-point rate increase at the

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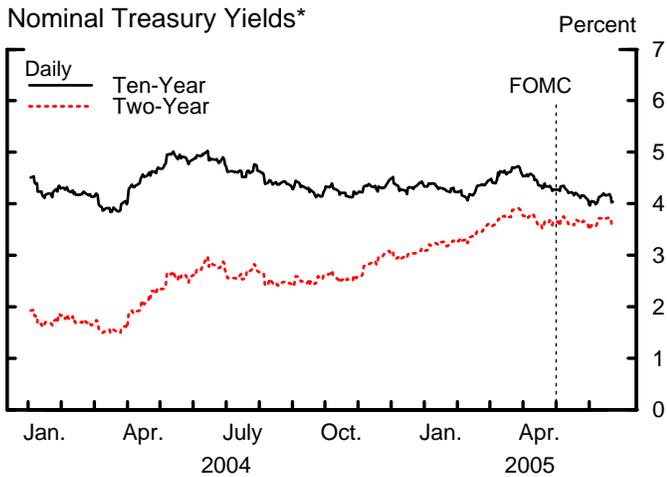
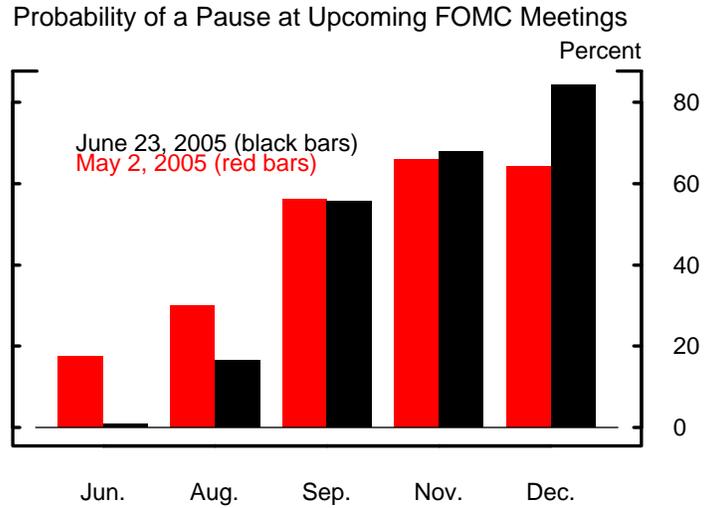
<sup>1</sup> The statement released at 2:15 p.m. mistakenly omitted the Committee’s observation that inflation was well contained, and it was subsequently corrected. Money market futures rates moved in a 5-basis-point range that afternoon but ended the day little changed.

<sup>2</sup> The effective federal funds rate averaged 3.00 percent over the intermeeting period. The Desk purchased \$4.3 billion of Treasury coupon securities and \$1.25 billion of Treasury bills in the market. The volume of outstanding long-term RPs remained unchanged at \$17 billion.

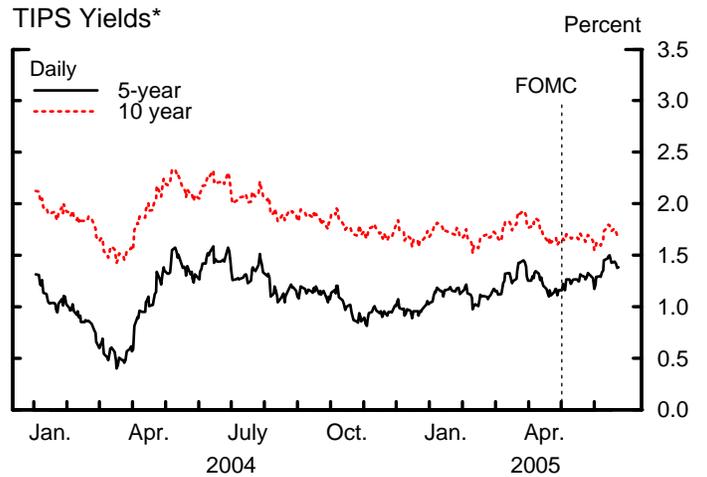
### Chart 1 Interest Rate Developments



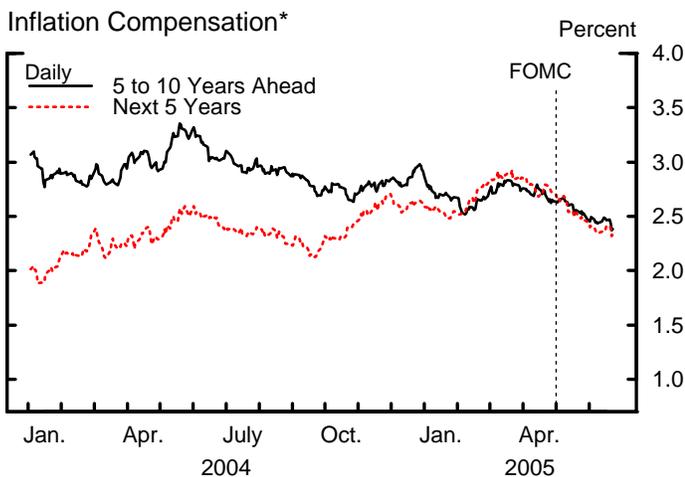
\*Estimates from federal funds and eurodollar futures, with an allowance for term premia and other adjustments.



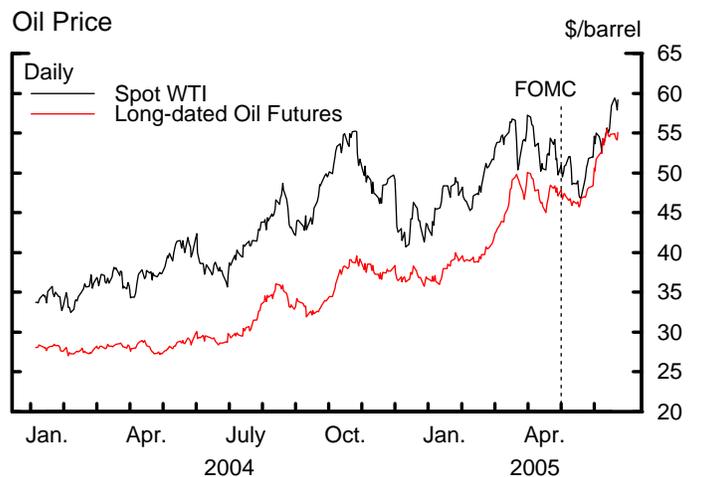
\*Par yields from an estimated off-the-run Treasury yield curve.



\* Estimates are from a smoothed inflation-indexed yield curve. Yields shown are those on notional par Treasury inflation-indexed securities with semi-annual coupons.



\*Based on a comparison of an estimated TIPS yield curve to an estimated nominal off-the-run Treasury yield curve.



Note: Vertical lines indicate May 2, 2005. Last daily observations are for June 23, 2005.

June meeting and nearly all expect statement language similar to that of the last meeting.

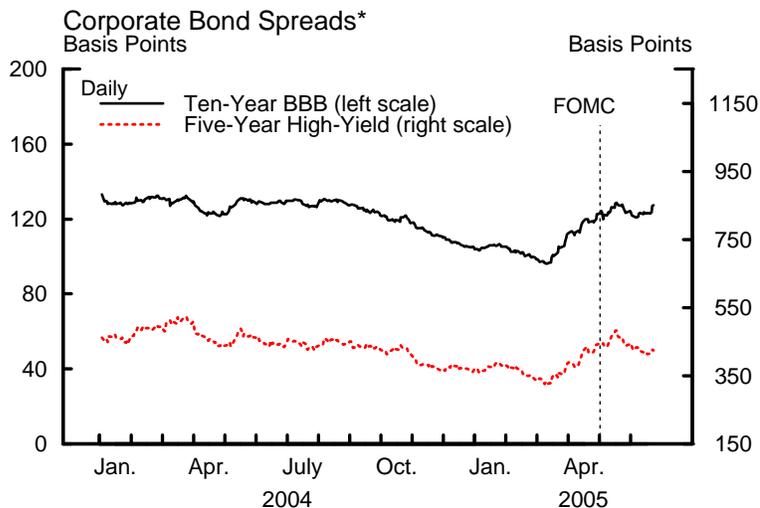
(2) Nominal Treasury yields showed mixed changes, on net, over the intermeeting period: Two-year yields were unchanged and ten-year yields ended the period near 4 percent, about 25 basis points below the level at the May meeting.<sup>3</sup> The decline in longer-term nominal Treasury yields masked an increase in real rates as inflation compensation fell appreciably, even though both spot and far-dated futures oil prices rose considerably over the same period. With investors apparently more confident about the outlook, five- and ten-year TIPS yields rose 22 and 7 basis points, respectively, although after adjusting for lags in inflation indexing the five-year rate was up only about 10 basis points and the ten-year rate was about unchanged. On a similarly adjusted basis, inflation compensation fell about 25 basis points across the maturity structure, as investors' concerns about inflation pressures ebbed. Some survey measures of inflation expectations also moved down a little over the intermeeting period.

(3) Corporate securities markets weathered rating downgrades in the auto sector over the intermeeting period. Investors were apparently reassured in part by economic news pointing to continued firm expansion. Spreads on investment-grade corporate bonds were little changed over the intermeeting period, while spreads on speculative-grade bonds fell 19 basis points—though they remain noticeably above the very low levels seen earlier in the year (see Chart 2 and the box “Credit Market and Hedge Fund Developments”). Over the intermeeting period, broad measures of corporate credit quality generally remained favorable, implied volatility on equities

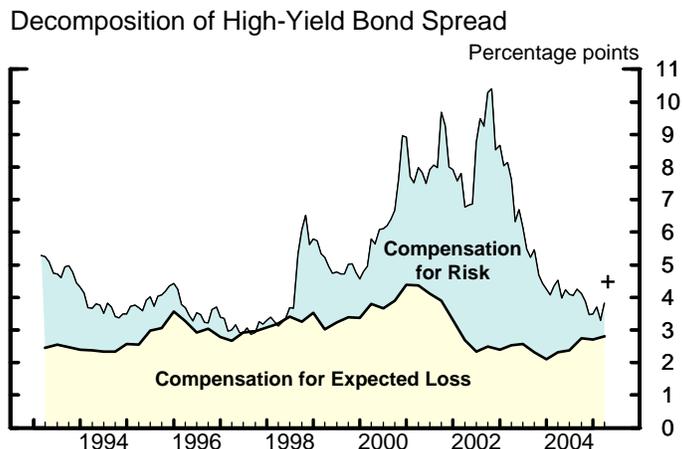
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<sup>3</sup> The upward slope of the term structure of forward rates at the time of the May FOMC meeting suggests that investors expected the two-year yield to rise 7 basis points over this intermeeting period. However, downward revisions to the expected path for policy beyond the end of the year offset this effect. The level and recent movement of the ten-year yield is addressed in more detail in the material sent to the Committee on June 23 by Vincent Reinhart, “Some Perspective on Longer-Term Yields.”

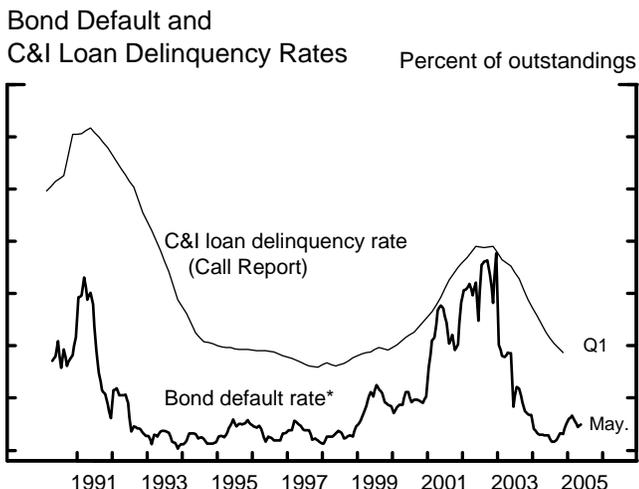
### Chart 2 Capital Market Developments



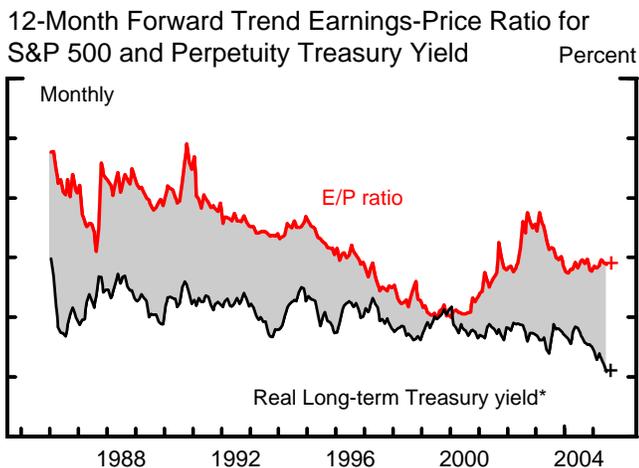
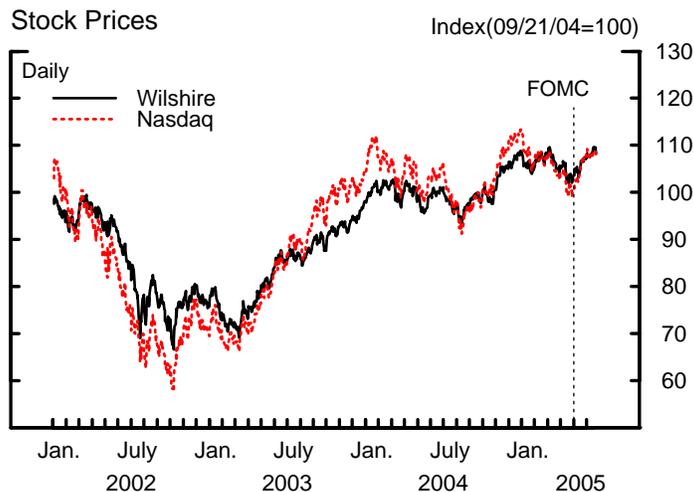
\*Measured relative to an estimated off-the-run Treasury yield curve.



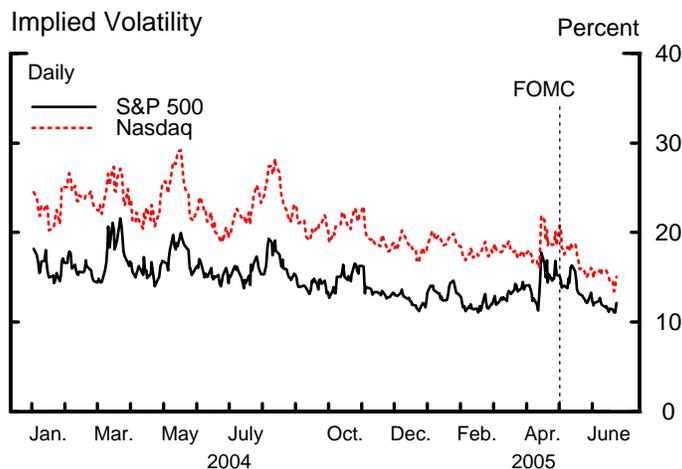
Note. Merrill Lynch Master II minus 7-year Treasury. Staff estimates are shown for 2005Q1.  
 Note. + Denotes the latest observation of the high-yield bond spread.



\*6-month moving average, from Moody's Investors Service.



\* Perpetuity Treasury yield minus Philadelphia Fed 10-year expected inflation.  
 Note. + Denotes the latest observation using daily interest rates and stock prices and latest earnings data from I/B/E/S.



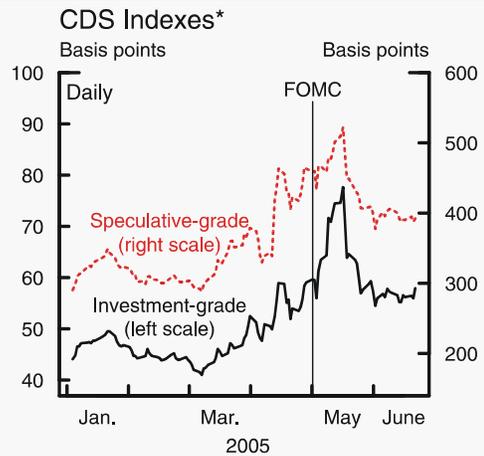
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### Credit Market and Hedge Fund Developments

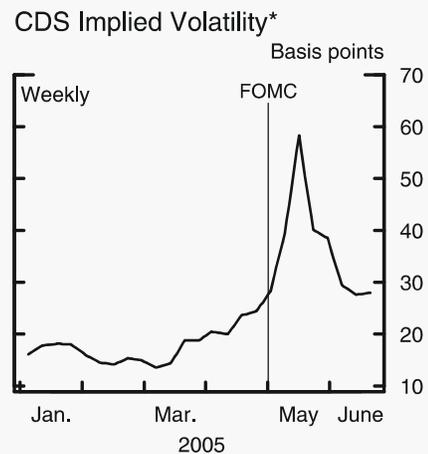
The difficulties experienced by U.S. automobile manufacturers placed strains on the credit markets early in the spring. After rising a good bit in March and April, credit default swap (CDS) indexes jumped in the wake of earlier-than-expected Standard and Poor's downgrade of Ford and General Motors to junk status on May 5. As investors became concerned about the overall market impact of the downgrades, implied volatility on the investment-grade CDS index also surged and market liquidity reportedly deteriorated for a time. Many hedge funds were said to have entered the month of May as sellers of credit protection and of volatility and may have contributed to the strains as they moved to reduce their positions.

Market conditions improved substantially beginning in mid-May, and both spreads and implied volatilities ended the intermeeting period somewhat lower, on net. However, spreads and implied volatilities remain well above the levels that prevailed before Ford and General Motors revised down their outlooks at the beginning of March, most likely evidence of both investors' demand for greater compensation for bearing risk and increased perception of risk.

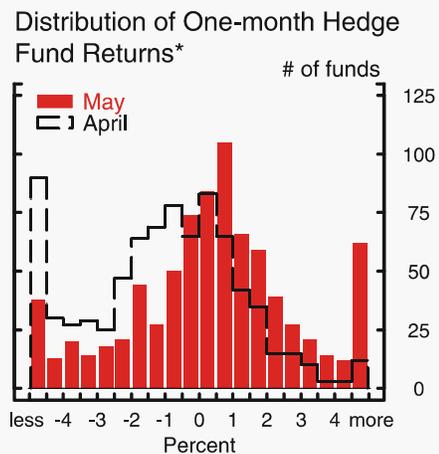
The fallout in credit markets appears to have been limited. A number of small- and medium-sized hedge funds suffered substantial losses in April and a few of them were subsequently closed. And some large credit derivatives dealers reported notable declines in earnings from trading in their fiscal second quarter. However, hedge-fund performance appears to have improved since April.



\*Traded CDS indexes. Source: Markit.



\*Based on options on the investment-grade CDS index. Source: Bear Stearns.



\*Includes all large hedge funds that report results to Bloomberg.

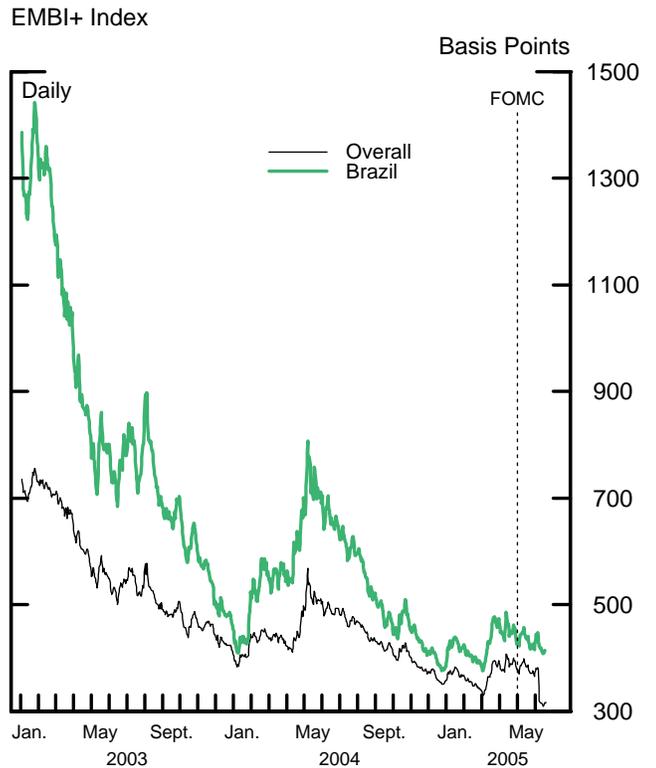
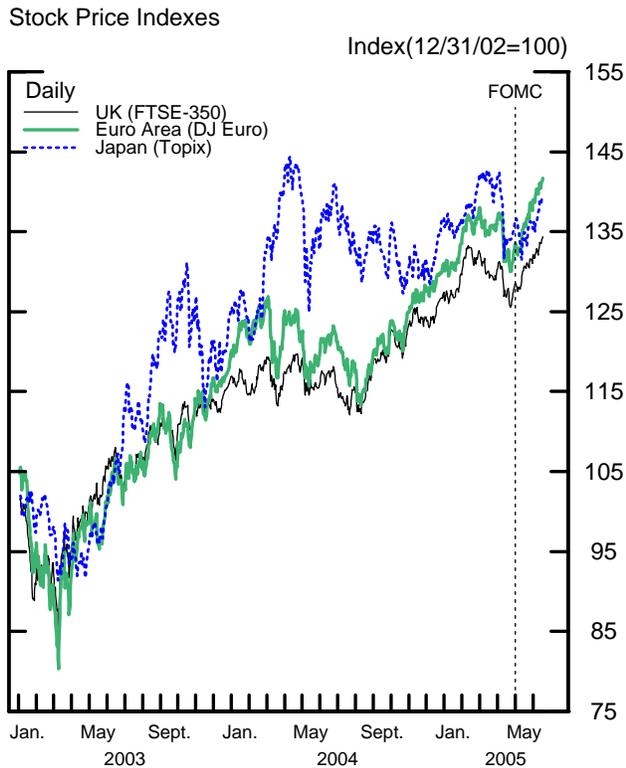
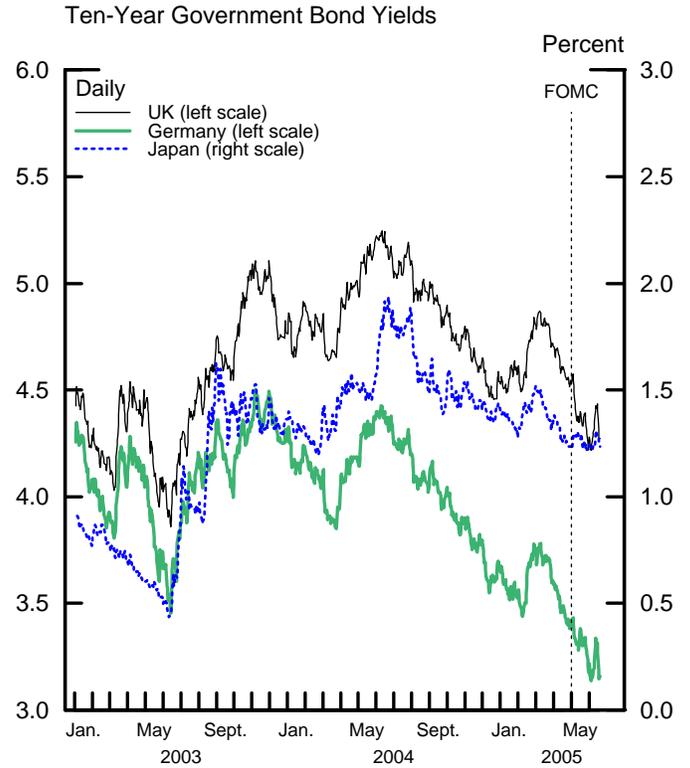
moved down, and major equity indexes rose appreciably. Nonetheless, a rough measure of the equity premium—the gap between the twelve-month forward trend earnings-price ratio and the real perpetuity Treasury yield—widened some.

(4) The trade-weighted foreign exchange value of the dollar against major currencies rose  $3\frac{1}{4}$  percent on balance over the intermeeting period (Chart 3).<sup>4</sup> The dollar apparently drew strength from data releases indicating continued solid U.S. growth, but its moves against individual currencies varied widely. The dollar gained almost 7 percent against the euro, in reaction to the emphatic rejection of the proposed European constitution by French and Dutch voters and several weaker-than-expected data releases in the euro area. Comments from ECB officials appeared to suggest that the ECB's next policy move could be a rate cut, and one-year-ahead euro futures rates fell 35 basis points over the period. Recent data on economic performance in Japan were more encouraging, but the dollar moved up about  $3\frac{1}{2}$  percent against the yen. In contrast, the dollar fell almost 2 percent against the Canadian dollar, as stronger employment and trade data prompted upward revisions to the outlook for Canadian growth. Except in Japan, yields on long-term government securities in other major industrial countries declined during the intermeeting period; yields on some European sovereign issues touched record lows earlier in the period. Share prices in foreign industrial countries registered increases that ranged from 4 to 8 percent, often led by high-tech stocks. Against the currencies of our other important trading partners the dollar was about unchanged on balance over the intermeeting period, as decreases in its value versus the Brazilian *real* and the Mexican peso were offset by increases against several Asian currencies, including the Korean won, the Singapore dollar, and the Thai baht.

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### Chart 3 International Financial Indicators

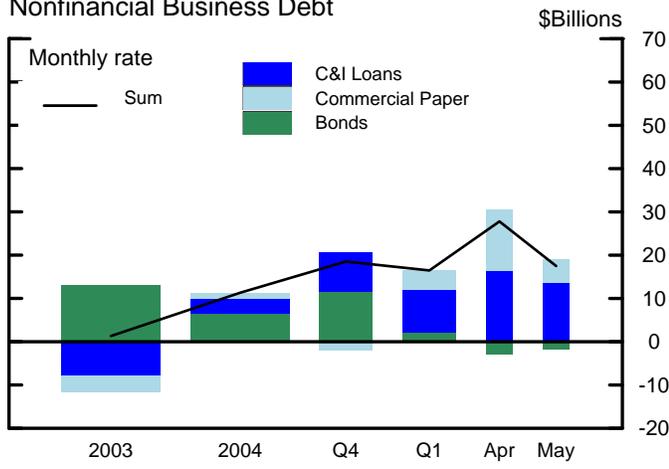


(5) With domestic nonfederal debt expected to expand at a somewhat slower pace in the second quarter, and higher final payments during the April tax season damping federal borrowing, domestic nonfinancial debt is expected to decelerate to a 6¼ percent rate in the second quarter (Chart 4). Bond issuance by nonfinancial corporations was weak in April and May, as elevated spreads held down offerings by speculative-grade firms. However, issuance has picked up considerably in recent weeks, reflecting the decline in long-term interest rates as well as issuance by firms that had postponed coming to market in May. Commercial paper issuance has been solid and business loans have continued to expand, likely spurred in part by merger and acquisition activity. Household debt is likely to grow at a brisk rate in the second quarter, owing to persistent strength in its mortgage component. Mortgage demand in recent quarters has been driven in part by rapid increases in house prices. The OFHEO purchase-only index rose 10¼ percent over the year ending in the first quarter.

(6) M2 has been weak in recent months—contracting in April and advancing sluggishly on net over May and early June—owing to the increased opportunity cost of holding M2 assets. Liquid deposits were especially weak over this period, as rates on these deposits adjust slowly to rising short-term market rates. Despite the recent weakness in M2, its velocity in the current quarter is projected to remain below the level one would anticipate given historical relationships with opportunity costs.

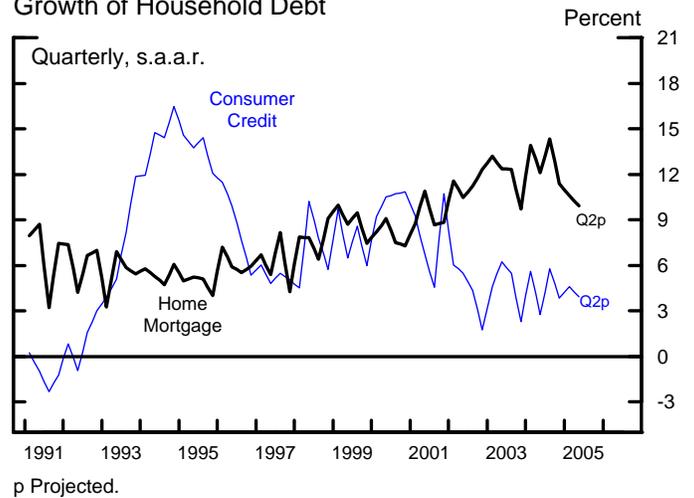
### Chart 4 Debt and Money

Changes in Selected Components of Nonfinancial Business Debt



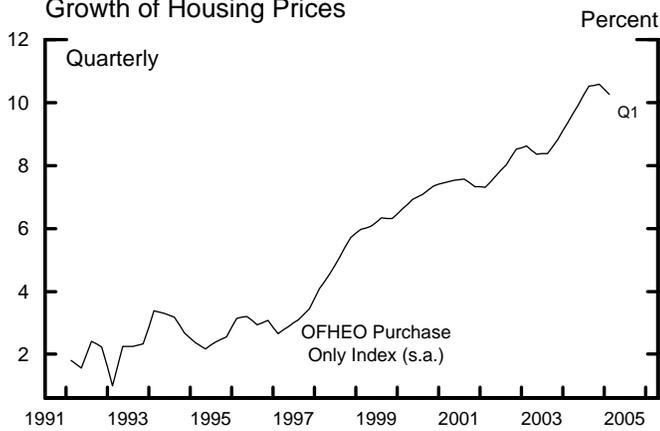
Note. Commercial paper and C&I loans are seasonally adjusted, bonds are not.

Growth of Household Debt



p Projected.

Growth of Housing Prices



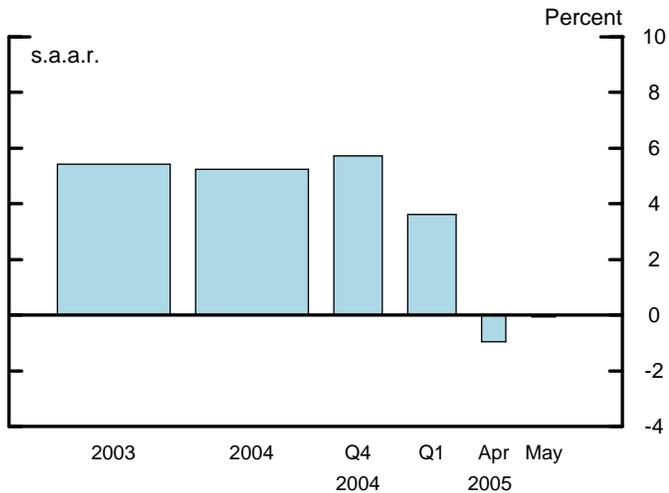
Note: Four-quarter growth rate.

Growth of Nonfinancial Debt

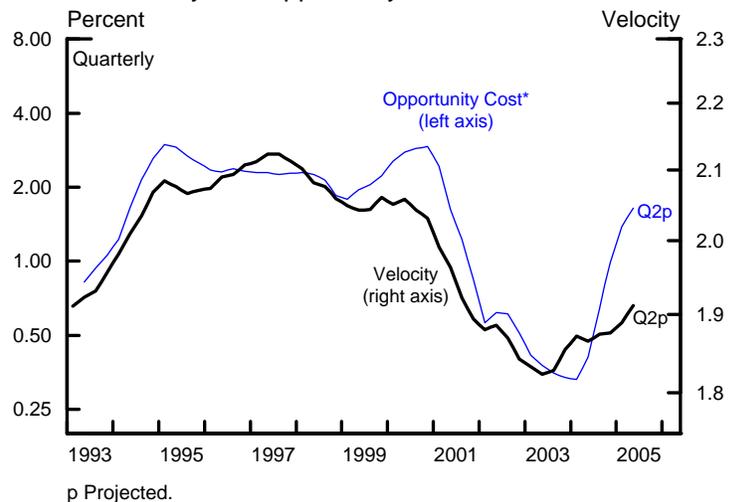
Percent, s.a.a.r.		Total	Nonfederal
2003		8.1	7.5
2004	Q1	9.3	8.7
	Q2	7.7	7.0
	Q3	8.2	8.9
	Q4	8.2	8.4
2005	Q1	10.0	9.1
	Q2 P	6.3	7.2

p Projected.

Growth of M2



M2 Velocity and Opportunity Cost



p Projected.

\*Two-quarter moving average.

## Economic Outlook

(7) The staff's outlook for spending and output has changed little since the May FOMC meeting, but its forecast for inflation has been nudged up. The cumulative policy tightening in this projection is the same as in the April Greenbook, although the staff now assumes that the firming will be more front-loaded, with a 50-basis-point increase over the balance of 2005 and 25 basis points in 2006. Bond yields are expected to edge higher, equity prices increase from their current higher levels at a pace sufficient to provide risk-adjusted returns in line with those in fixed-income markets, and the foreign exchange value of the dollar depreciates gradually, albeit from a level that is about 2¼ percent above that anticipated in the last Greenbook. The price of West Texas intermediate crude oil, which starts from a spot price that is more than \$6 per barrel above that foreseen in the April Greenbook, is forecast to move sideways over the next two years in line with futures market quotes. In view of recent employment reports and other incoming data, the staff now sees the economy as operating with a little less resource slack, and output growth is again projected to narrowly exceed that of potential over the next few quarters. Slack nevertheless persists over the forecast period, with the unemployment rate lingering a touch above the staff's estimate of the NAIRU and the output gap edging down to the ¾ percent area. The upward revision to the forecast for inflation partly reflects the direct and indirect effects of higher energy prices. Still, with resources underused, import prices rising more slowly, and energy prices flattening out, core PCE inflation is projected to edge down from just above 2 percent this year to a touch under 2 percent next year; overall PCE inflation is expected to fall from 2½ percent to 1¾ percent over the same period.

## Longer-Run Strategy

(8) To analyze strategies and risks for monetary policy, several sets of simulations were conducted using the version of the FRB/US model with the following properties: Policymakers base their decisions on complete knowledge of the model and the forces hypothesized to be consistent with the extended Greenbook outlook; financial markets—including those for foreign exchange, stocks, and bonds—understand how monetary policy is set so that the path of policy is not associated with systematic forecast errors by investors; and households and firms form their expectations using more limited information, as in the standard version of the model. For each model simulation, the optimal path of the funds rate was determined based on policymakers' relative preferences for minimizing deviations in unemployment from its natural rate and deviations in inflation from a long-run goal (defined in terms of the core PCE index) as well as for minimizing changes in the federal funds rate.<sup>5</sup> One set of simulations was oriented towards evaluating the macroeconomic effects of alternative values of the long-run inflation goal, while a second set was conducted to analyze factors instrumental in achieving the inflation goal.

(9) The baseline for these simulations was prepared using the FRB/US model (with judgmental adjustments) to extend the staff forecast through 2015. On the supply side, structural labor productivity growth is assumed to moderate toward historical norms, slowing from 3 percent this year to 2¼ percent by 2015. Potential output growth is projected to decrease from 3¼ percent to a little below 2½ percent by 2015, while the NAIRU is assumed to remain at 5 percent. As for aggregate

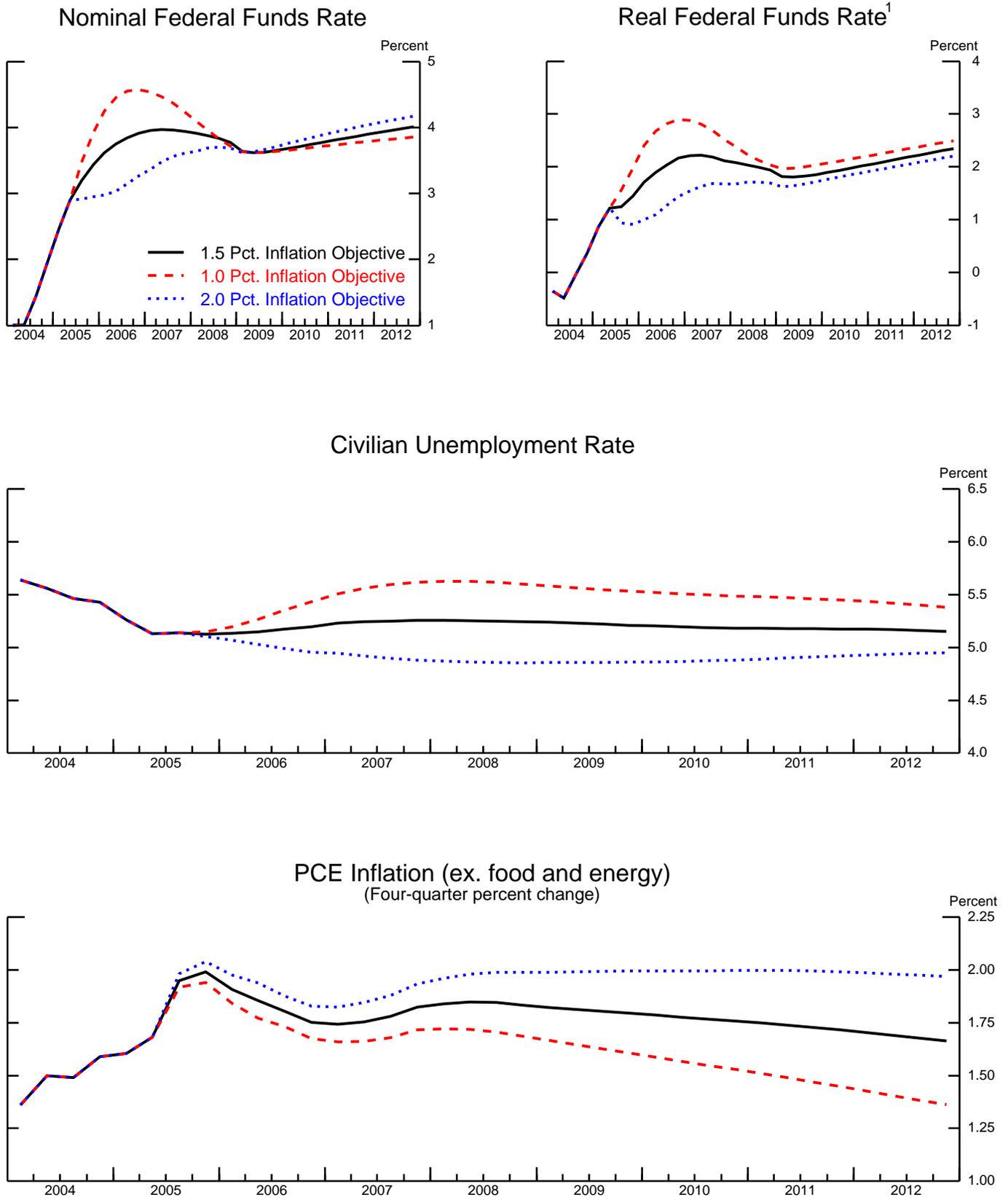
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<sup>5</sup> More precisely, the federal funds rate path is chosen to minimize the equally weighted sum of three components: the squared deviations of unemployment from its natural rate; the squared deviations of core PCE inflation from target; and squared changes in the funds rate. The last term helps ensure that the optimal funds rate path in the simulation does not exhibit much more volatility than that observed in the historical record.

demand, the personal saving rate is expected to rise gradually, while the unified federal budget deficit remains around 2½ percent of nominal GDP over the next decade. Although the real foreign exchange value of the dollar depreciates at an annual rate of about 4 percent from 2007 onwards, the current account deficit is projected to widen to a peak of nearly 8 percent of nominal GDP by 2011 and to decrease gradually thereafter.

(10) The first set of simulations analyzes the implications of alternative specifications of the long-run goal for core PCE inflation. The solid line in each panel of Chart 5 depicts a scenario in which policymakers aim for the core PCE inflation rate eventually to settle down at 1½ percent. In this case, the funds rate rises steadily over the next eighteen months and then remains at a plateau of about 4 percent through the end of 2012. With that backdrop of moderately tight financial conditions, the unemployment rate stays a bit higher than its natural rate over the next eight years. Core PCE inflation remains close to 1¾ percent through 2008 and then begins to fall very gradually towards the long-run goal. A key factor explaining the shallowness of the decline in inflation is that the expectations of households and firms regarding the long-term average rate of inflation recede slowly from nearly 2 percent in 2005 to about 1.6 percent in 2012. The dashed line in each panel corresponds to a lower long-run inflation goal of 1 percent. In this case, the funds rate reaches a peak of about 4½ percent by early next year before easing somewhat in subsequent quarters. Given the tighter path for policy, the unemployment rate moves up to around 5½ percent and remains there while inflation moves gradually towards the long-run goal, falling below 1½ percent by the end of the decade. In contrast, a somewhat higher inflation goal of 2 percent (dotted line) allows policymakers to tighten policy far more gradually this year and next. This policy does not involve substantial gaps between unemployment and its natural rate, because the actual path of inflation is fairly close to the central bank's goal and to the long-run expectations of

Chart 5  
Optimal Policy with Alternative Inflation Objectives



1. The real federal funds rate is calculated as the quarterly average nominal funds rate minus the four-quarter lagged core PCE inflation rate as a proxy for inflation expectations.

households and firms.

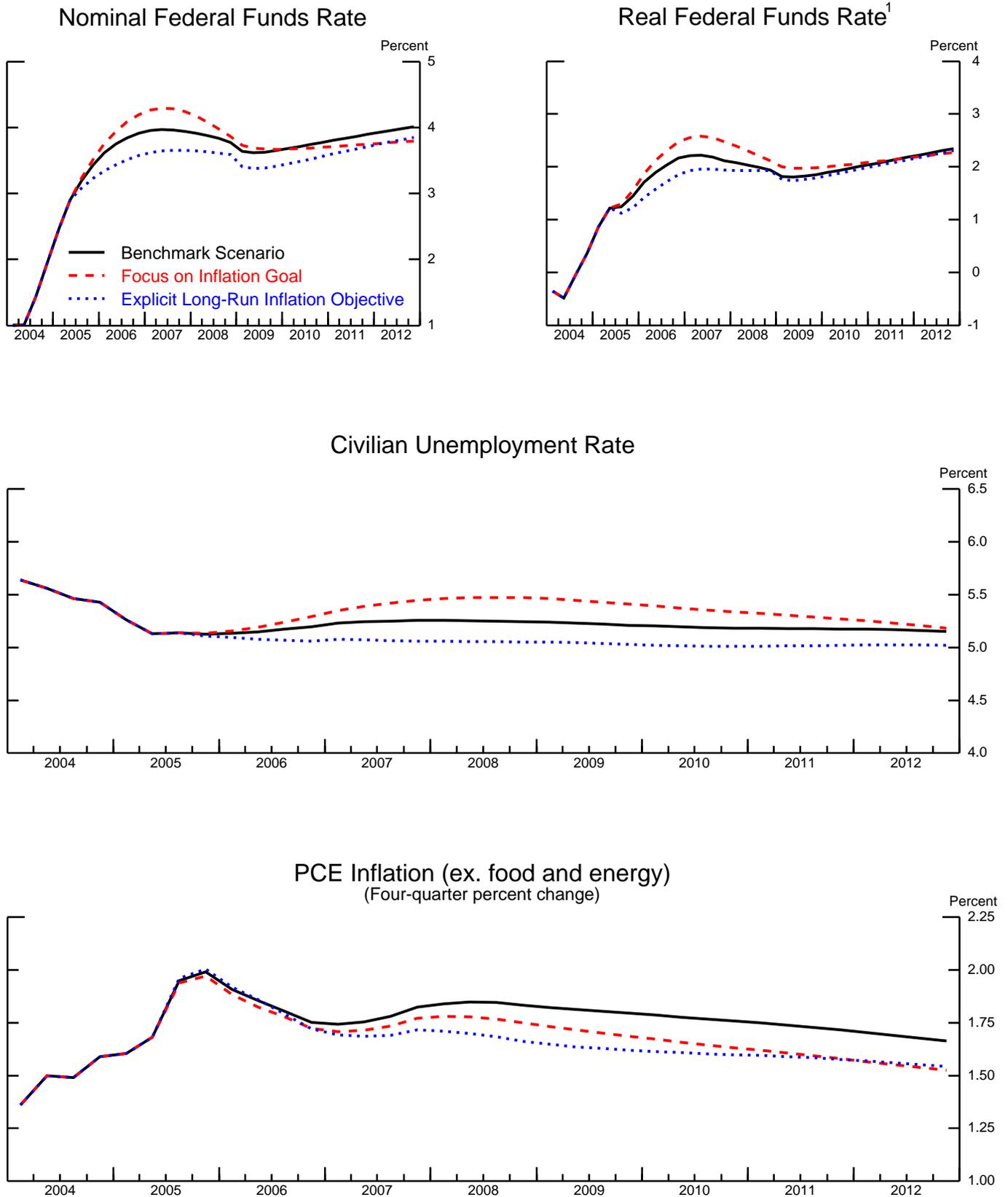
(11) At first glance, an apparently unattractive implication of the preceding simulations is that policymakers' pursuit of their inflation objective appears to be rather tepid, with actual inflation still differing noticeably from the goal at the end of 2012. However, such an outcome is optimal in the FRB/US model when policymakers place equal weights on stabilizing unemployment and inflation. Because the model implies that inflation is quite insensitive to the level of economic activity and long-term inflation expectations of households and firms evolve slowly in response to realized inflation, policymakers do not find it worthwhile to create sufficient resource slack to make more rapid progress in achieving the inflation goal. The simulations shown in Chart 6 consider two potential mechanisms within this modeling framework that could hasten the attainment of a long-run goal of 1½ percent core PCE inflation. First, a stronger focus on inflation can be represented by ratcheting down the relative weight on unemployment deviations; in this case, the optimal path of policy (as indicated by the dashed lines) is significantly tighter than in the benchmark case with equal weights on unemployment and inflation (the solid lines).<sup>6</sup> Second, the long-term inflation expectations of households and firms might move lower, perhaps encouraged by the adoption of an explicit long-run inflation objective;<sup>7</sup> under this assumption, the optimal path of the funds rate only rises modestly over the next few quarters to a plateau of about 3½ percent. While both approaches succeed in bringing inflation close to the Committee's assumed goal within the next few years, the model indicates that the unemployment costs are substantially smaller when this outcome is achieved through less inertial inflation

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<sup>6</sup> Specifically, the weight on the unemployment-gap term is diminished by a factor of one-twentieth.

<sup>7</sup> To illustrate this possibility, we assume that long-term inflation expectations converge to the 1½ percent objective by the end of 2007.

Chart 6  
Alternative Approaches to Stabilizing Inflation



1. The real federal funds rate is calculated as the quarterly average nominal funds rate minus the four-quarter lagged core PCE inflation rate as a proxy for inflation expectations.

expectations. Whether an explicit long-run inflation objective, however, would achieve that end remains an open question.

## Short-Run Policy Alternatives

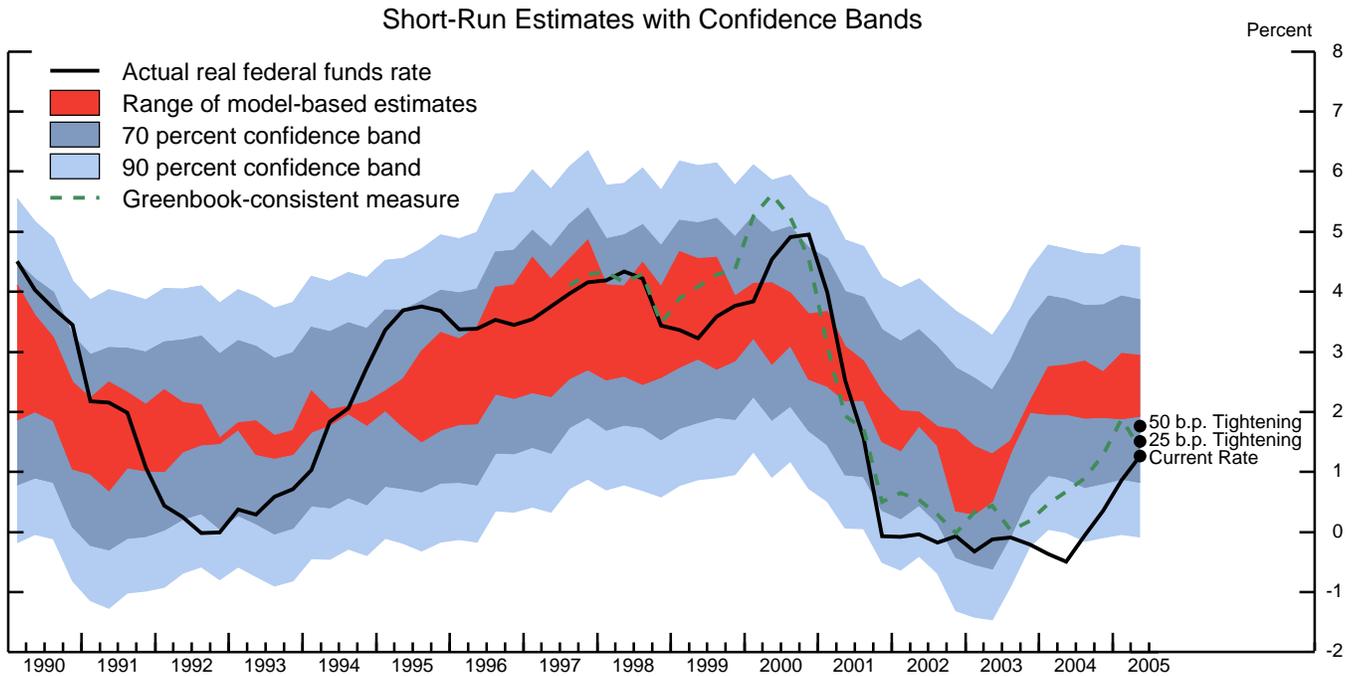
(12) Table 1 presents three short-run policy alternatives for consideration by the Committee. Under Alternatives A and B, the federal funds rate would be boosted another 25 basis points at this meeting. Apart from updating the description of the current economic situation, the announcement associated with Alternative B is little changed from that issued after the May meeting. The announcement accompanying Alternative A would indicate that policy accommodation had been substantially reduced and would hint at less tightening going forward. Under Alternative C, the Committee would raise the federal funds rate 50 basis points at this meeting, eliminate all forward-looking language, and make other significant changes to the announcement. As usual, the Committee could consider combining policy action and draft language from more than one alternative or view some of the language choices as foreshadowing the future direction of its statement.

(13) The Committee may see little reason to diverge at this point from its established precedent of measured policy firming and thus be attracted to **Alternative B**. Although aggregate spending and output growth evidently slowed in early spring, the economy appears to remain reasonably robust. Moreover, the recent evidence may be read as indicating that the pace of expansion is likely to rebound during the second half of the year to a rate somewhat above that of the growth of potential output, even with further modest policy tightening. That outlook is consistent with staff estimates of the equilibrium real federal funds rate (Chart 7), which mostly lie well above the current level of the real federal funds rate. Meanwhile, although recent inflation readings have proven reassuring, further increases in energy prices and diminishing slack in the economy may be read by

**Table 1: Alternative Language for the June FOMC Announcement**

	May FOMC	Alternative A	Alternative B	Alternative C
<b>Policy Decision</b>	1. The Federal Open Market Committee decided today to raise its target for the federal funds rate by 25 basis points to 3 percent.	The Federal Open Market Committee decided today to raise its target for the federal funds rate by 25 basis points to <b>3-1/4</b> percent.	The Federal Open Market Committee decided today to raise its target for the federal funds rate by 25 basis points to <b>3-1/4</b> percent.	The Federal Open Market Committee decided today to raise its target for the federal funds rate by <b>50</b> basis points to <b>3-1/2</b> percent.
<b>Rationale</b>	2. The Committee believes that, even after this action, the stance of monetary policy remains accommodative and, coupled with robust underlying growth in productivity, is providing ongoing support to economic activity.	The Committee believes that, <del>even after this action, the stance of</del> <b>the degree of</b> monetary policy <del>remains accommodative</del> <b>accommodation has been substantially reduced.</b> and, coupled with <del>robust</del> <b>Robust</b> underlying growth in productivity, is providing ongoing <del>support to economic activity.</del> <b>continues to provide</b> support to economic activity.	[no change]	The Committee believes that, even after this action, the stance of monetary policy remains accommodative and, <del>coupled with robust underlying growth in productivity,</del> is providing ongoing support to economic activity.
	3. Recent data suggest that the solid pace of spending growth has slowed somewhat, partly in response to the earlier increases in energy prices. Labor market conditions, however, apparently continue to improve gradually.	Recent data suggest that the solid pace of spending growth has <del>slowed somewhat, partly in response to the earlier increases in</del> <b>Nonetheless, growth in spending slowed somewhat in the spring,</b> partly in response to the earlier increases in <b>elevated</b> energy prices. Labor market conditions, however, apparently continue to improve gradually.	<b>Growth in spending slowed somewhat in the spring, and energy prices have risen further. Nonetheless, R</b> recent data suggest that the solid pace of spending growth has <del>slowed somewhat, partly in response to the earlier increases in</del> energy prices <del>labor market conditions, however,</del> <b>expansion remains solid and that L</b> labor market conditions, <del>however,</del> apparently continue to improve gradually.	Recent data suggest that the solid <del>pace of spending growth has slowed somewhat, partly in response to</del> <b>underlying</b> <del>pace of spending growth has slowed somewhat, partly in response to</del> <b>remains solid despite elevated</b> the earlier increases in energy prices. Labor market conditions, however, apparently continue to improve gradually.
	4. Pressures on inflation have picked up in recent months and pricing power is more evident. Longer-term inflation expectations remain well contained.	Pressures <del>on inflation have picked up</del> <b>Readings</b> on inflation have <del>picked up</del> <b>been subdued</b> in recent months, and pricing power is more <del>evident. L</del> longer-term inflation expectations <del>remain well contained</del> <b>have declined.</b>	Pressures on inflation have <del>picked up in</del> recent months and pricing power is <del>more evident. L</del> <b>stayed elevated, but</b> longer-term inflation expectations remain well contained.	Pressures on inflation have picked up <del>further</del> in recent months and pricing power is <del>more evident. L</del> <b>although measures of</b> longer-term inflation expectations remain well contained.
<b>Assessment of Risk</b>	5. The Committee perceives that, with appropriate monetary policy action, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal.	The Committee perceives that, with appropriate monetary policy <del>action,</del> the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal.	[no change]	<del>The Committee perceives that, with appropriate monetary policy action, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal.</del>
	6. With underlying inflation expected to be contained, the Committee believes that policy accommodation can be removed at a pace that is likely to be measured. Nonetheless, the Committee will respond to changes in economic prospects as needed to fulfill its obligation to maintain price stability.	With underlying inflation expected to be contained, the Committee believes that <b>remaining</b> policy accommodation can be removed at a pace that is likely to be measured. Nonetheless, the Committee will respond to changes in economic prospects as needed to fulfill its obligation to maintain price stability.	[no change]	<del>With underlying inflation expected to be contained, the Committee believes that policy accommodation can be removed at a pace that is likely to be measured. Nonetheless, The Committee will respond to changes in economic prospects as needed to fulfill its obligation to foster the attainment of both sustainable economic growth and maintain price stability.</del>

### Chart 7 Equilibrium Real Federal Funds Rate



Notes: The real federal funds rate is constructed as the difference between the quarterly average of the actual nominal funds rate and the log difference of the core PCE price index over the previous four quarters. For the current quarter, the nominal funds rate used is the target federal funds rate as of the Bluebook publication date.

#### Short-Run and Medium-Run Measures

	Current Estimate	<i>Previous Bluebook</i>
<b>Short-Run Measures</b>		
Greenbook-consistent measure	1.4	1.5
Single-equation model	1.9	1.7
Small structural model	2.9	2.9
Large model (FRB/US)	2.2	2.0
Confidence intervals for three model-based estimates		
70 percent confidence interval	0.8 - 3.9	
90 percent confidence interval	-0.1 - 4.7	
<b>Medium-Run Measures</b>		
TIPS-consistent measure	1.7	1.8
Single-equation model	2.2	2.2
Small structural model	2.8	2.8
Confidence intervals for two model-based estimates		
70 percent confidence interval	1.5 - 3.4	
90 percent confidence interval	0.7 - 3.9	
<b>Memo</b>		
Actual real federal funds rate	1.26	1.09

Notes: Confidence intervals and bands reflect uncertainties about model specification, coefficients, and the level of potential output. The final column indicates the values for the current quarter based on the estimation for the previous Bluebook, except that the TIPS-consistent measure and the actual real funds rate are the values published in the previous Bluebook.

## Equilibrium Real Rate Chart: Explanatory Notes

The equilibrium real rate is the real federal funds rate that, if maintained, would be projected to return output to its potential level over time. The short-run equilibrium rate is defined as the rate that would close the output gap in twelve quarters given a model's projection of the economy, and the medium-run concept is the value of the real funds rate projected to keep output at potential in seven years under the assumption that monetary policy acts to bring actual and potential output into line in the short run and then keep them equal thereafter. The real federal funds rate employs the log difference of the core PCE price index over the previous four quarters as a proxy for expected inflation, with the staff projection used for the current quarter. Since TIPS indexation is based on the total CPI, the TIPS-consistent measure incorporates an adjustment for the expected difference between CPI inflation and core PCE inflation.

Measure	Description
<b>Single-Equation Model</b>	The measure of the equilibrium real rate in the single-equation model is based on an estimated aggregate-demand relationship between the current value of the output gap and its lagged values as well as the lagged values of the real federal funds rate. In light of this model's simple structure, the short-run measure of the equilibrium real rate depends only on the recent position of output relative to potential, and the medium-run measure is virtually constant.
<b>Small Structural Model</b>	The small-scale model of the economy consists of equations for five variables: the output gap, the equity premium, the federal budget surplus, the trend growth rate of output, and the real bond yield. Unlike the estimates from the single-equation model, values of the equilibrium real rate also depend directly on conditions associated with output growth, fiscal policy, and capital markets.
<b>Large Model (FRB/US)</b>	Estimates of the equilibrium real rate using FRB/US—the staff's large-scale econometric model of the U.S. economy—depend on a very broad array of economic factors, some of which take the form of projected values of the model's exogenous variables. These projections make use of several simple forecasting rules which are appropriate for the three-year horizon relevant for the short-run concept but are less sensible over longer horizons. Thus, we report only the short-run measure for the FRB/US model.
<b>Greenbook-consistent</b>	Measures of the equilibrium real rate cannot be directly obtained from the Greenbook forecast, because the Greenbook is not based on a formal model. Rather, we use the FRB/US model in conjunction with an extended version of the Greenbook forecast to derive a Greenbook-consistent measure. FRB/US is first add-factored so that its simulation matches the extended Greenbook forecast, and then a second simulation is run off this baseline to determine the value of the real federal funds rate that closes the output gap. The medium-run concept of the equilibrium real rate is not computed because it requires a relatively long extension of the Greenbook forecast.
<b>TIPS-consistent</b>	Yields on TIPS (Treasury Inflation-Protected Securities) incorporate investors' expectations of the future path of real interest rates. The seven-year instantaneous real forward rate derived from TIPS yields as of the Bluebook publication date reflects the short-term real interest rate expected to prevail in seven years. This forward rate is adjusted down for a term premium, assumed to be 70 basis points, and adjusted up for the difference between total CPI inflation and core PCE inflation, projected to be 40 basis points in the medium run.

members as posing risks to inflation performance. With the inflation outlook perhaps slightly worse than previously anticipated and solid economic expansion seemingly on track, the Committee may well be inclined to continue its measured pace of firming at this meeting. In favoring this over a larger move, members might interpret some market indicators, including inflation compensation read from TIPS and the considerable flattening of the nominal yield curve, as suggesting that an aggressive tightening of policy at this time is not warranted.

(14) The announcement associated with Alternative B would update the wording of the May statement in view of incoming data on spending, output, and employment but would leave the rest of the statement unchanged. As shown in Table 1, the statement would indicate that “Growth in spending slowed somewhat in the spring, and energy prices have risen further. Nonetheless, recent data suggest that the expansion remains solid and that labor market conditions continue to improve gradually.” Regarding inflation, it would modify slightly the wording used in May to say that “Pressures on inflation have stayed elevated”—an indirect reference to even higher energy prices and slightly reduced economic slack—and delete the mention of pricing power, a phenomenon that appears to have received less attention of late. The recent evidence on long-term inflation expectations has been good, with readings from TIPS down appreciably over the intermeeting period and survey-based measures ticking down after rising a bit earlier in the spring. These circumstances might be seen as consistent with a reiteration of the view that “longer-term inflation expectations remain well contained.” With events thus far unfolding broadly in line with the Committee’s expectations, it might again indicate that “. . . with appropriate monetary policy action, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal.” On the same logic, the Committee might again be comfortable expressing an expectation that the removal of policy accommodation could likely proceed at a measured pace.

(15) Financial market participants unanimously expect the FOMC to increase the target federal funds rate 25 basis points at Thursday's meeting. Also, most if not all expect relatively minor changes to the language, with nearly unanimous anticipation that the Committee will both retain an assessment that the risks to sustainable growth and price stability are balanced and reiterate the "measured pace" language. Investors, however, would likely view the lack of any signal that the Committee intends to pause sometime soon, as well as the absence of an acknowledgment of a decline in inflation expectations, as a reason to build in a bit more firming.

(16) The Committee may believe that the 2¼-percentage-point cumulative tightening over the past year implied by a 25-basis-point move at this meeting would amount to a substantial reduction in the degree of monetary policy accommodation and that, after Thursday, the real federal funds rate may be within a notch or two of its sustainable level. As can be seen in Chart 7, a 25-basis-point step next week plus one more such action would bring the real funds rate close to the lower edge of the range of model-based estimates of the equilibrium real funds rate. Particularly if the Committee is averse to quick reversals in the direction of policy adjustment, it may be inclined to move relatively slowly after this meeting in order to allow more time to gauge the effects of recent policy actions and to avoid overshooting with its policy instrument. In this case, the FOMC may be attracted to **Alternative A's** combination of a 25-basis-point hike in the funds rate at this meeting and statement wording that hints that the Committee could soon pause, at least for a time, in its process of policy firming. Members might view such an indication as allowing for a smoother transition toward a reasonably sustainable policy stance. And with economic growth having slowed somewhat in the second quarter and investors' concerns about inflation apparently having diminished significantly in recent weeks, the Committee may see little risk that such a signal would compromise its credibility regarding the pursuit of its price stability objective. If the Committee saw a 2 percent inflation

target as appropriate, then, as shown in Chart 5 of the previous section of the Bluebook, monetary tightening going forward can be considerably more gradual than it has been over the past year. Winding down the process of tightening, at least for now, would also presumably be favored to the extent that members read the net reduction in, and low level of, long-term yields as a signal that market participants harbored doubts about the continued robustness of economic expansion.

(17) The draft statement associated with Alternative A could be explicit that “The Committee believes that the degree of monetary policy accommodation has been substantially reduced.” Presuming that the FOMC would again wish to indicate that robust underlying productivity growth was supporting the economic expansion, the announcement could follow that indication with “Nonetheless, growth in spending slowed somewhat in the spring” while again acknowledging that labor market conditions apparently continue to improve gradually. With regard to prices, the statement could accentuate the positive by indicating that “Readings on inflation have been subdued in recent months, and longer-term inflation expectations have declined.” Finally, the FOMC could indicate that remaining policy accommodation can likely be removed at a measured pace.

(18) Market participants continue to expect that the path of the intended federal funds rate will flatten out somewhat in the second half of the year, but market commentary and survey evidence suggest that investors do not anticipate that the FOMC will overtly signal any such development next week. Accordingly, a statement employing the draft wording shown in Alternative A would likely produce a noticeable downward shift in money market futures quotes, a rally in bond and equity markets, and some depreciation in the foreign exchange value of the dollar. The extent of the rally, however, would likely be limited by the clear implication that some further tightening was still likely in prospect. Policy uncertainty arguably could

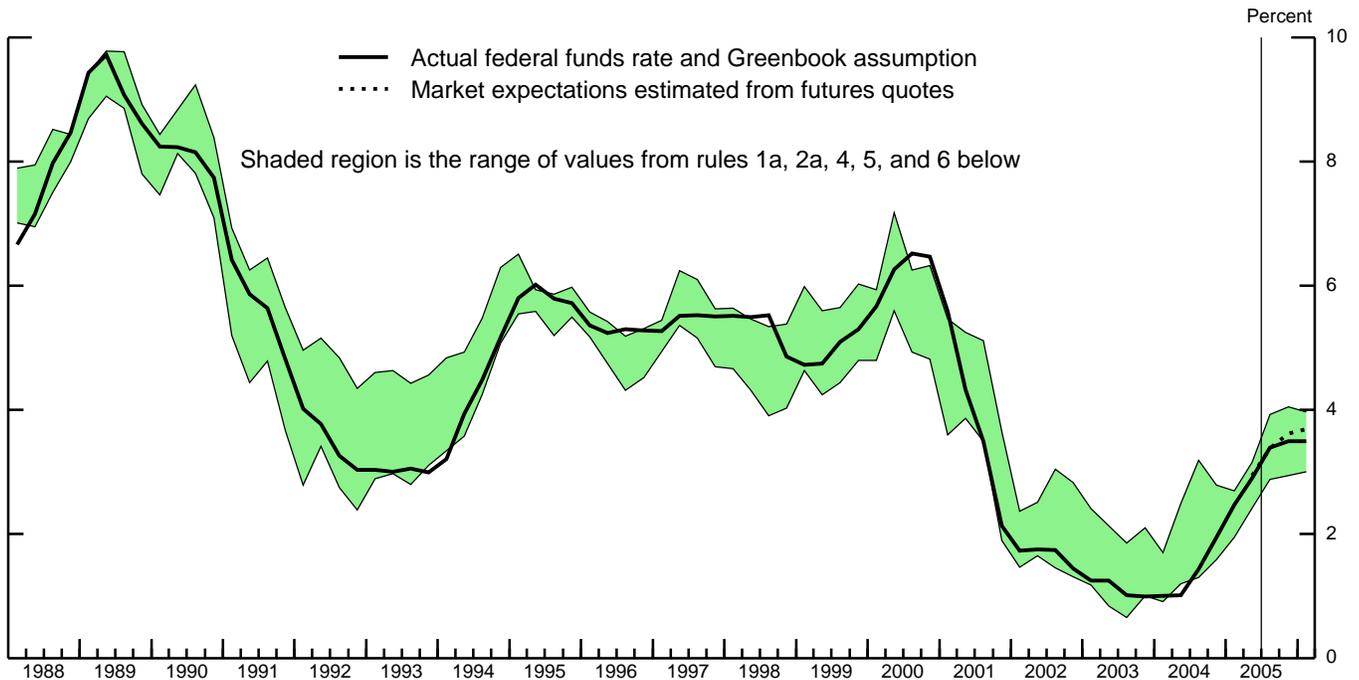
increase a little, as market participants might become a little less sure as to the timing and magnitude of remaining policy actions.

(19) If the Committee, by contrast, has become more concerned about the potential for an upcreep in inflation in response to developments over the intermeeting period, then it may favor the 50-basis-point increase in the federal funds rate of **Alternative C**. The staff forecast for inflation has been revised up since the April Greenbook in response to data pointing to a narrower output gap, higher labor costs, a narrower price markup, and—most importantly—substantial further increases in crude oil prices. Indeed, far-futures oil prices, having risen even more steeply than spot prices in recent months, currently suggest that significant relief from elevated energy prices is unlikely. The Committee may now see greater inflation risks than does the staff or find the inflation outcome in the Greenbook to be unsatisfactory. If so, somewhat tighter money market conditions than assumed by the staff would seem to be in order. Indeed, the policy rules presented in Chart 8, especially those based on an inflation target of 1½ percent, recommend substantial further tightening in coming months.<sup>8</sup> And, as indicated in Charts 5 and 6, the projection-based optimal control exercises presented in the previous section suggest that, should the FOMC wish to pursue an inflation rate of 1 percent, or to make more rapid progress in achieving a 1½ percent goal in the face of sluggishly adjusting expectations, the federal funds rate would need to be boosted considerably by the middle of next year. Given the resilience that spending and output have shown to date in the face of higher energy prices, the Committee might wish to pick up the pace of tightening, especially if it believes that the low level of long-term interest rates represents financial accommodation that has to be offset. The Committee may also see an advantage in

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<sup>8</sup> The results of the policy rules for the third quarter of 2005 and beyond have generally been revised up since the April Bluebook by ¼ to ½ percentage point, reflecting a narrower output gap and higher inflation rate—either estimated, actual, or projected, depending on the specification of the particular rule.

**Chart 8**  
**Actual and Assumed Federal Funds Rate and**  
**Range of Values from Policy Rules and Futures Markets**



**Values of the Federal Funds Rate from Policy Rules and Futures Markets**

	2005				2006
	Q1	Q2	Q3	Q4	Q1
<b>Rules with Imposed Coefficients</b>					
1. Baseline Taylor Rule: a) $\pi^*=1.5$	2.70	3.16	3.92	4.05	3.97
b) $\pi^*=2$	2.45	2.91	3.67	3.80	3.72
2. Aggressive Taylor Rule: a) $\pi^*=1.5$	2.12	2.55	3.51	3.69	3.63
b) $\pi^*=2$	1.87	2.30	3.26	3.44	3.38
3. First-difference Rule: a) $\pi^*=1.5$	2.31	2.80	3.27	3.55	3.75
b) $\pi^*=2$	2.06	2.55	3.02	3.05	3.00
<b>Rules with Estimated Coefficients</b>					
4. Outcome-based Rule	2.10	2.65	3.29	3.51	3.57
5. Greenbook Forecast-based Rule	2.24	2.63	3.10	3.12	3.08
6. FOMC Forecast-based Rule	1.95	2.42	2.88	2.94	3.00
7. TIPS-based Rule	2.48	2.91			
<b>Memo</b>					
Expected federal funds rate derived from futures		2.94	3.38	3.63	3.70
Actual federal funds rate and Greenbook assumption	2.47	2.90	3.40	3.50	3.50

Note: Rule prescriptions for 2005Q2 through 2006Q1 are calculated using current Greenbook projections for inflation and the output gap (or unemployment gap). For rules that contain the lagged funds rate, the rule's previous prescription for the funds rate is used to compute prescriptions for 2005Q4 and 2006Q1. It is assumed that there is no feedback from the rule prescriptions to the Greenbook projections through 2006Q1. The TIPS-based rule is computed using average TIPS and nominal Treasury yields to date.

## Policy Rules Chart: Explanatory Notes

In all of the rules below,  $i_t$  denotes the federal funds rate,  $\pi_t$  the staff estimate at date  $t$  of trailing four-quarter core PCE inflation,  $(y_t - y_t^*)$  the staff estimate (at date  $t$ ) of the output gap,  $\pi^*$  policymakers' long-run objective for inflation,  $i_{t-1}$  the lagged federal funds rate,  $\varepsilon_{t-1}$  the residual from the rule's prescription the previous quarter,  $(y_{t+3|t} - y_{t+3|t}^*)$  the staff's three-quarter-ahead forecast of the output gap,  $(\Delta y_{t+3|t} - \Delta y_{t+3|t}^*)$  the staff's forecast of output growth less potential output growth three quarters ahead,  $\pi_{t+3|t}$  a three-quarter-ahead forecast of inflation, and  $(u_{t+3|t} - u_{t+3|t}^*)$  a three-quarter-ahead forecast of the unemployment gap. Data are quarterly averages taken from the Greenbook and staff memoranda closest to the middle of each quarter, unless otherwise noted.

Rule	Specification	Root-mean-square error	
		1988:1-2005:1	2001:1-2005:1
<b>Rules with Imposed Coefficients</b>			
<b>1. Baseline Taylor Rule</b>	$i_t = 2 + \pi_t + 0.5(y_t - y_t^*) + 0.5(\pi_t - \pi^*)$	.97 <sup>a</sup>	1.08 <sup>a</sup>
<b>2. Aggressive Taylor Rule</b>	$i_t = 2 + \pi_t + (y_t - y_t^*) + 0.5(\pi_t - \pi^*)$	.68 <sup>a</sup>	.64 <sup>a</sup>
<b>3. First-difference Rule</b>	$i_t = i_{t-1} + 0.5(\Delta y_{t+3 t} - \Delta y_{t+3 t}^*) + 0.5(\pi_{t+3 t} - \pi^*)$	.97 <sup>a</sup>	.43 <sup>a</sup>
<b>Rules with Estimated Coefficients</b>			
<b>4. Estimated Outcome-based Rule</b> Rule includes both lagged interest rate and serial correlation in residual.	$i_t = .52i_{t-1} + 0.48 [1.23 + 0.96(y_t - y_t^*) + 1.47\pi_t] + 0.51\varepsilon_{t-1}$	.23	.26
<b>5. Estimated Greenbook Forecast-based Rule</b> Rule includes both lagged interest rate and serial correlation in residual.	$i_t = .71i_{t-1} + 0.29 [0.66 + 1.05(y_{t+3 t} - y_{t+3 t}^*) + 1.61\pi_{t+3 t}] + 0.35\varepsilon_{t-1}$	.25	.27
<b>6. Estimated FOMC Forecast-based Rule</b> Unemployment and inflation forecasts are from semiannual "central tendency" of FOMC forecasts, interpolated if necessary to yield 3-qtr-ahead values; $u_t^*$ forecast is from staff memoranda. Inflation forecasts are adjusted to core PCE deflator basis. Rule is estimated at semiannual frequency, and projected forward using Greenbook forecasts.	$i_t = 0.47i_{t-2} + 0.53 [0.40 - 2.05(u_{t+3 t} - u_{t+3 t}^*) + 1.57\pi_{t+3 t}]$	.45	.60
<b>7. Estimated TIPS-based Rule</b> $\pi_{comp5 t}$ denotes the time- $t$ difference between 5-yr nominal Treasury yields and TIPS. Sample begins in 1999 due to TIPS volatility in 1997-8.	$i_t = 0.97i_{t-1} + [-1.23 + 0.68\pi_{comp5 t}]$	.41 <sup>b</sup>	.43

<sup>a</sup> RMSE for rules with imposed coefficients is calculated setting  $\pi^*=1.5$ .

<sup>b</sup> RMSE for TIPS-based rule is calculated for 1999:1-2005:1.

tightening policy in a relatively large, 1/2-percentage-point increment at this meeting if it is worried that the measured tightening of policy to date, and especially the FOMC's repeated indications that measured tightening can likely continue, may be fostering a degree of complacency among investors about risks—including the risks of investing in housing.

(20) A number of modifications to the Committee's statement would be required to accommodate the selection of Alternative C. For instance, the FOMC might wish to delete the reference to "robust underlying growth in productivity," given that actual productivity growth appears to have dropped sharply in the second quarter. Although the staff believes that trend productivity continues to expand briskly, the Committee might be sufficiently uncertain about that assessment to be uncomfortable continuing to assert strength in underlying productivity. As for aggregate demand, the Committee could summarize recent developments by saying that "Recent data suggest that the underlying pace of spending growth remains solid despite elevated energy prices"—striking the prior reference to the slowing of growth in the spring—and could go on to mention that "Labor market conditions continue to improve," eliminating both "apparently" and "gradually." The FOMC could implicitly acknowledge the further run-up in energy prices and reduction in labor market slack by noting that "Pressures on inflation have picked up further in recent months, although measures of longer-term inflation expectations remain well contained." As discussed in the April Bluebook, the Committee might also take this opportunity to eliminate the forward-looking language from the statement, dropping both the risk assessment and the reference to the measured pace of tightening.

(21) With nary a hint heretofore of an upshift in the pace of policy tightening, market participants would be shocked by the combination of a 50-basis-point increase in the funds rate at this meeting and the announcement suggested for Alternative C. The statement would likely lead investors to conclude that the FOMC expected to

continue to tighten policy for some time—and, with the elimination of the measured pace language, to anticipate that at least some future policy moves could come in additional 50-basis-point increments. Such a revision to policy expectations would likely trigger a sharp sell-off in fixed-income and equity markets and a rise in the foreign-exchange value of the dollar, although the increase in long-term yields could be limited should investors foresee that policy tightening might well lead to weakness in the economy and subdued inflationary pressures. The pairing of the language of Alternative C with a 25-basis-point move would also catch investors unawares, probably leading them to ratchet up their expectations of policy firming considerably and prompting a sell-off in fixed-income markets.

### **Money and Debt Forecasts**

(22) Under the Greenbook forecast, M2 growth is projected to remain quite damped at just a 2 percent annual rate from May through December, as the rising opportunity costs associated with further increases in the federal funds rate restrain money demand. For 2005 as a whole, M2 growth would also be about 2 percent, a good deal slower than the 5¼ percent pace of 2004, and M2 velocity would climb 3¾ percent. M2 is projected to accelerate somewhat in 2006, as the pace of monetary tightening slows and deposit rates begin to catch up to market interest rates, but velocity would still increase appreciably. Domestic nonfinancial sector debt growth is forecast to decelerate somewhat this year and to slow further in 2006. Household sector borrowing is expected to drop off considerably over the next six quarters, reflecting a moderation in increases in house prices and a slight rebound in the saving rate. Federal borrowing is also likely to slow a little as the budget deficit narrows a bit. Despite rising capital expenditures, business borrowing is projected to remain moderate this year and next, owing in part to slower accumulation of liquid assets.

Overall, domestic nonfinancial sector debt is expected to expand  $7\frac{3}{4}$  percent in 2005 and  $6\frac{1}{2}$  percent in 2006, down from about  $8\frac{1}{2}$  percent in 2004.

**Alternative Growth Rates for M2**

(percent, annual rate)

		Raise 25 bp*	Raise 50 bp **	Greenbook ***	
<b>Monthly Growth Rates</b>					
	Jan-05	2.6	2.6	2.6	
	Feb-05	2.6	2.6	2.6	
	Mar-05	3.6	3.6	3.6	
	Apr-05	-0.9	-0.9	-0.9	
	May-05	-0.1	-0.1	-0.1	
	Jun-05	2.7	2.7	2.7	
	Jul-05	1.3	0.9	1.3	
	Aug-05	2.4	1.6	2.2	
	Sep-05	2.6	1.8	2.0	
	Oct-05	2.3	1.6	1.5	
	Nov-05	3.2	2.7	2.5	
	Dec-05	2.6	2.2	2.0	
	Jan-06	4.2	3.8	3.7	
	Feb-06	4.1	3.8	3.7	
	Mar-06	4.1	3.8	3.7	
<b>Quarterly Growth Rates</b>					
	2004 Q4	5.7	5.7	5.7	
	2005 Q1	3.6	3.6	3.6	
	2005 Q2	1.0	1.0	1.0	
	2005 Q3	1.9	1.5	1.7	
	2005 Q4	2.6	2.0	2.0	
	2006 Q1	3.7	3.3	3.2	
<b>Annual Growth Rates</b>					
	2004	5.2	5.2	5.2	
	2005	2.3	2.0	2.1	
	2006	3.9	3.7	3.7	
<b>Growth From To</b>					
	2004 Q4	Jun-05	2.3	2.3	2.3
	2004 Q4	Sep-05	2.2	2.0	2.1
	Dec-04	Apr-05	1.9	1.9	1.9
	May-05	Dec-05	2.5	1.9	2.0

\* Increase of 25 basis points in the target federal funds rate at this meeting and no change thereafter

\*\* Increase of 50 basis points in the target federal funds rate at this meeting and no change thereafter

\*\*\* This forecast is consistent with nominal GDP and interest rates in the Greenbook forecast.

## Directive and Balance of Risks Statement

(23) Draft language for the directive and draft risk assessments identical to those presented in Table 1 are provided below.

### *Directive Wording*

The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee in the immediate future seeks conditions in reserve markets consistent with MAINTAINING/increasing/REDUCING the federal funds rate AT/to an average of around \_\_\_\_\_ 3 percent.

### *Risk Assessments*

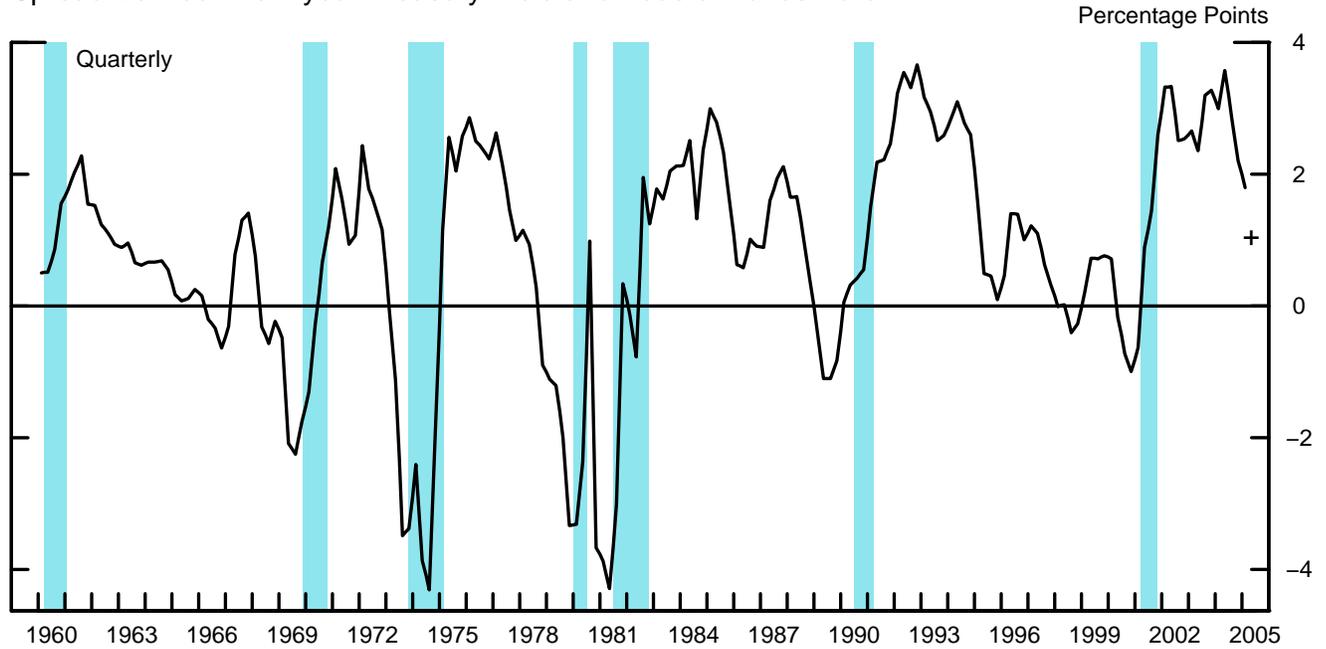
- A. The Committee perceives that, with appropriate monetary policy, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal. With underlying inflation expected to be contained, the Committee believes that remaining policy accommodation can be removed at a pace that is likely to be measured. Nonetheless, the Committee will respond to changes in economic prospects as needed to fulfill its obligation to maintain price stability.
- B. The Committee perceives that, with appropriate monetary policy action, the upside and downside risks to the attainment of both sustainable growth and price stability should be kept roughly equal. With underlying inflation expected to be contained, the Committee believes that policy accommodation can be removed at a pace that is likely to be measured. Nonetheless, the Committee will respond to

changes in economic prospects as needed to fulfill its obligation to maintain price stability.

- C. The Committee will respond to changes in economic prospects as needed to fulfill its obligation to foster the attainment of both sustainable economic growth and price stability.

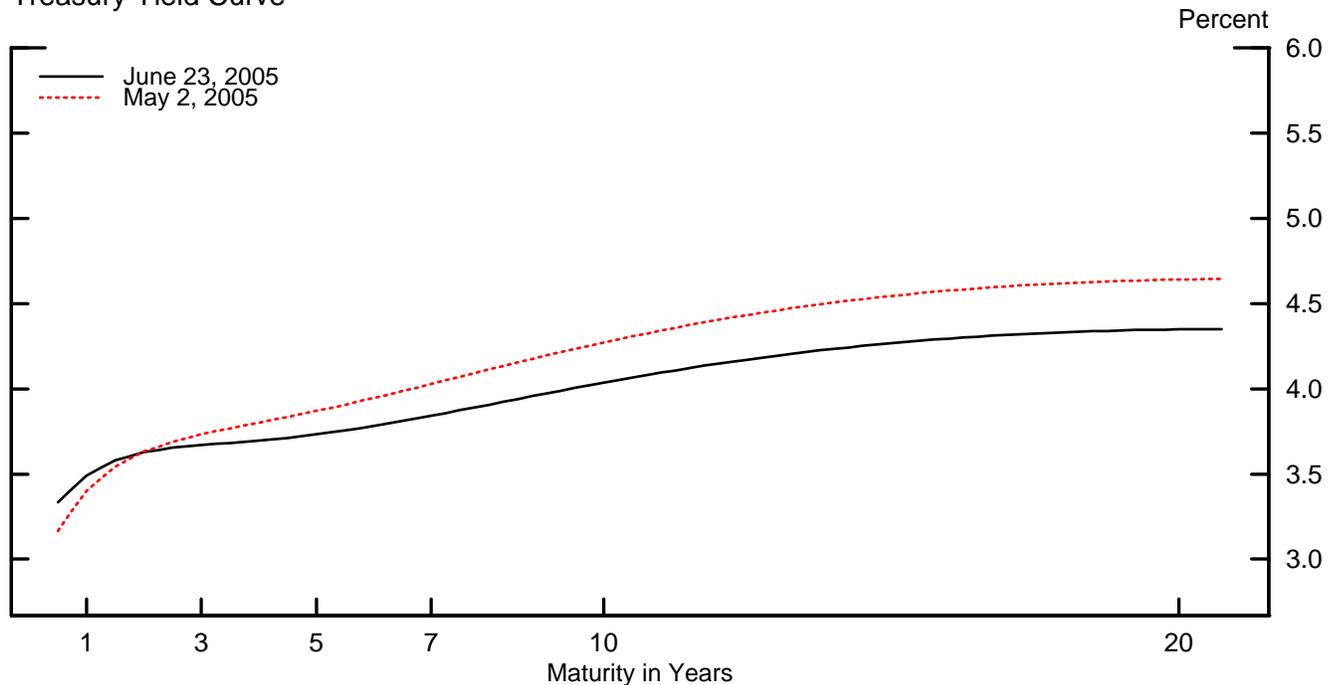
# Treasury Yield Curve

### Spread Between Ten-year Treasury Yield and Federal Funds Rate



+ Denotes most recent weekly value.  
Note. Blue shaded regions denote NBER-dated recessions.

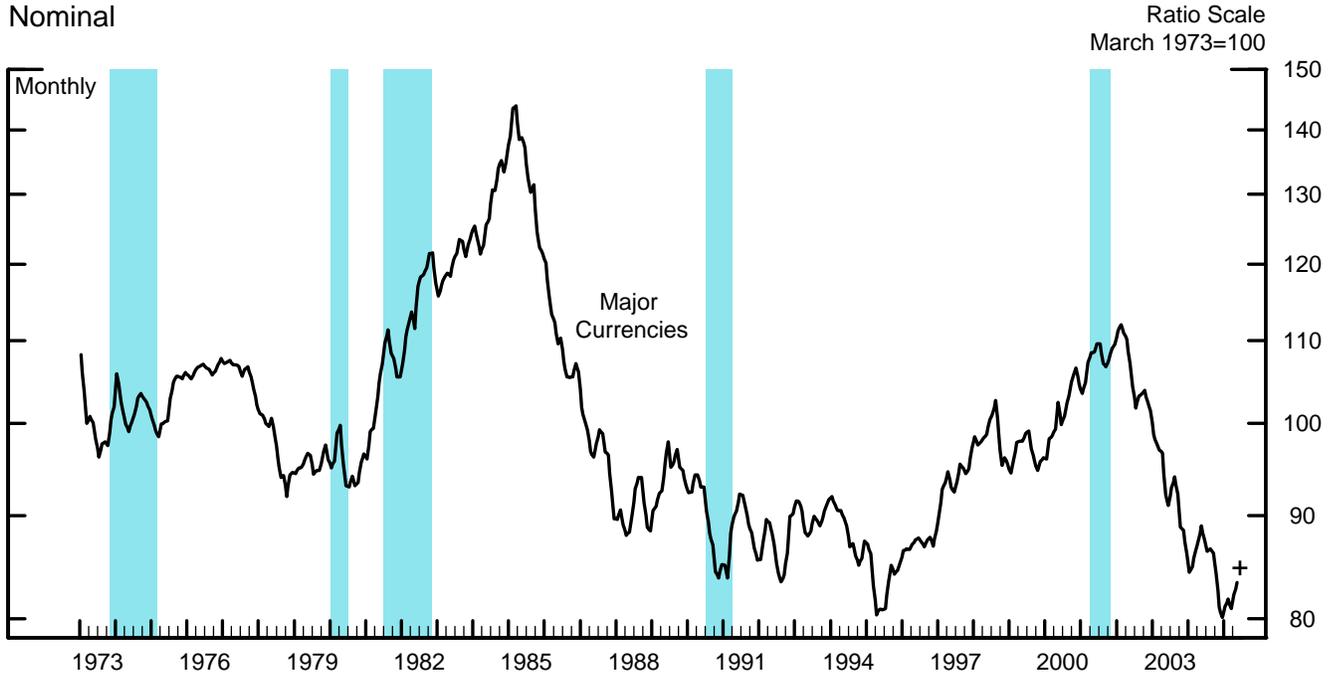
### Treasury Yield Curve\*



\*Smoothed yield curve estimated from off-the-run Treasury coupon securities. Yields shown are those on notional par Treasury securities with semi-annual coupons.

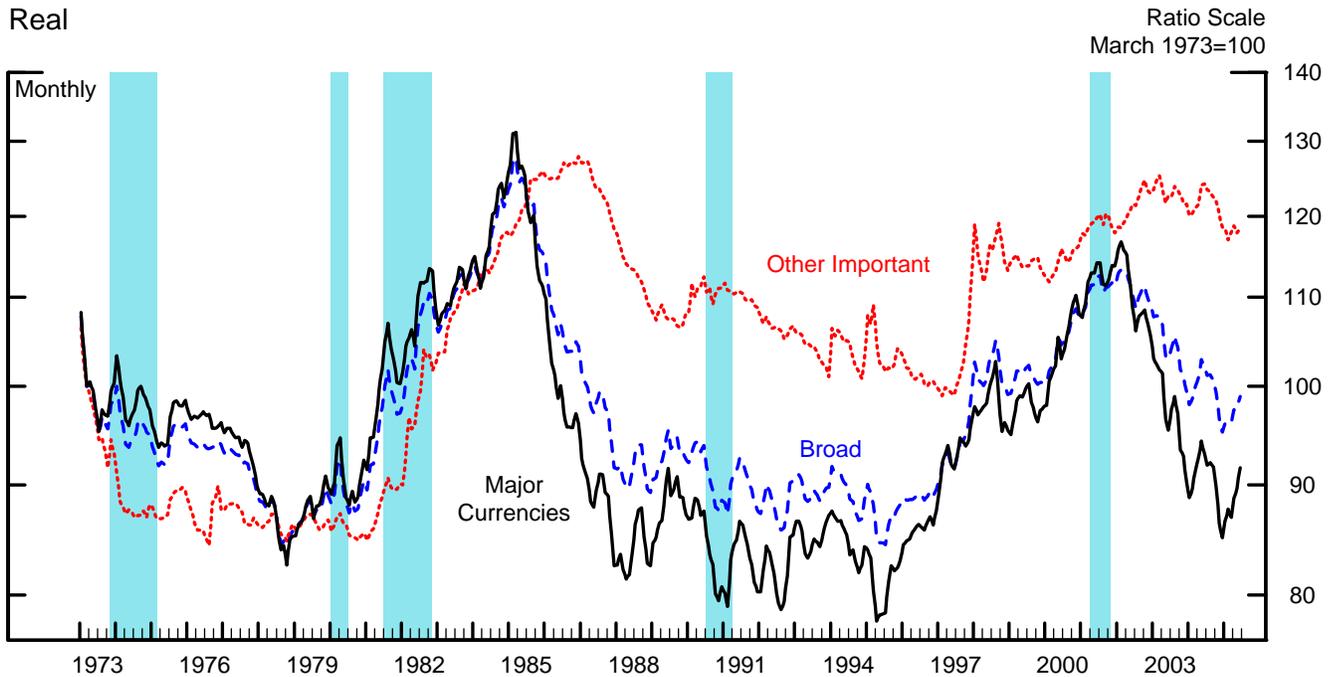
# Dollar Exchange Rate Indexes

Nominal



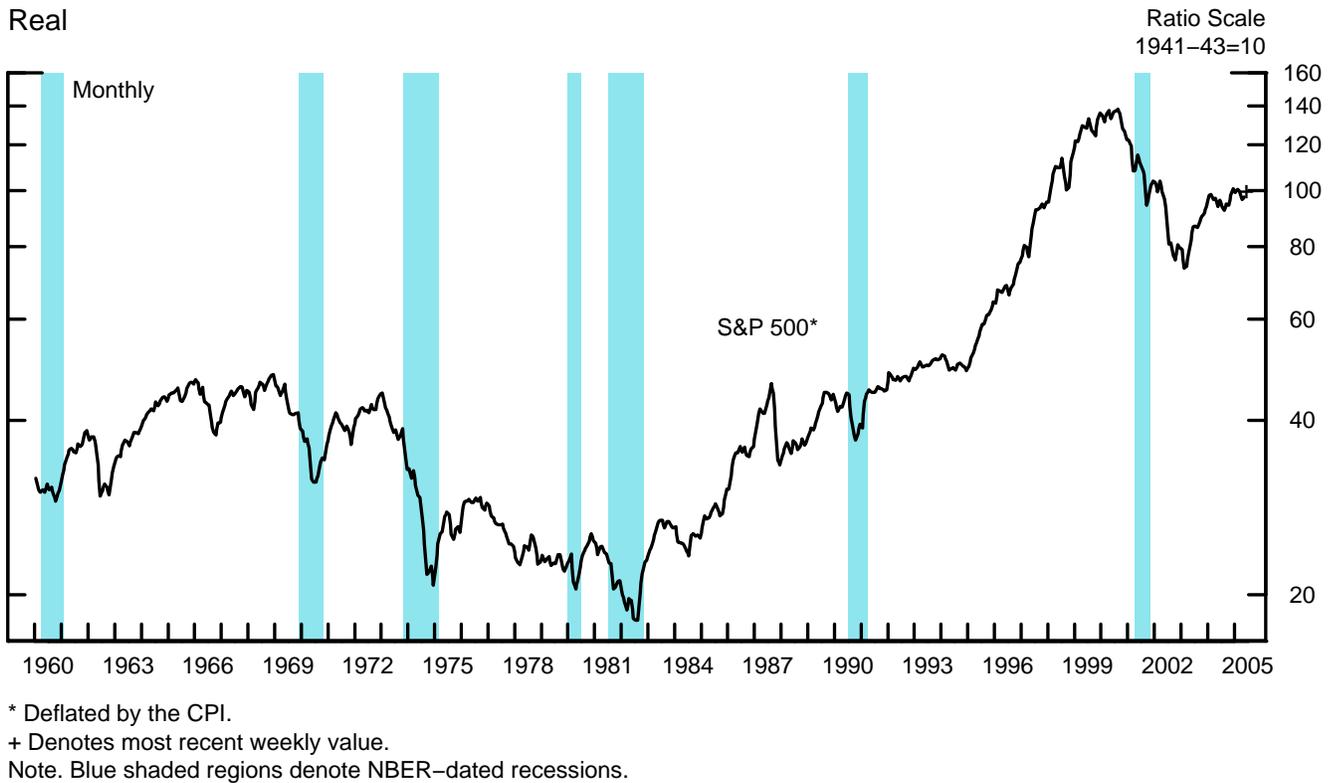
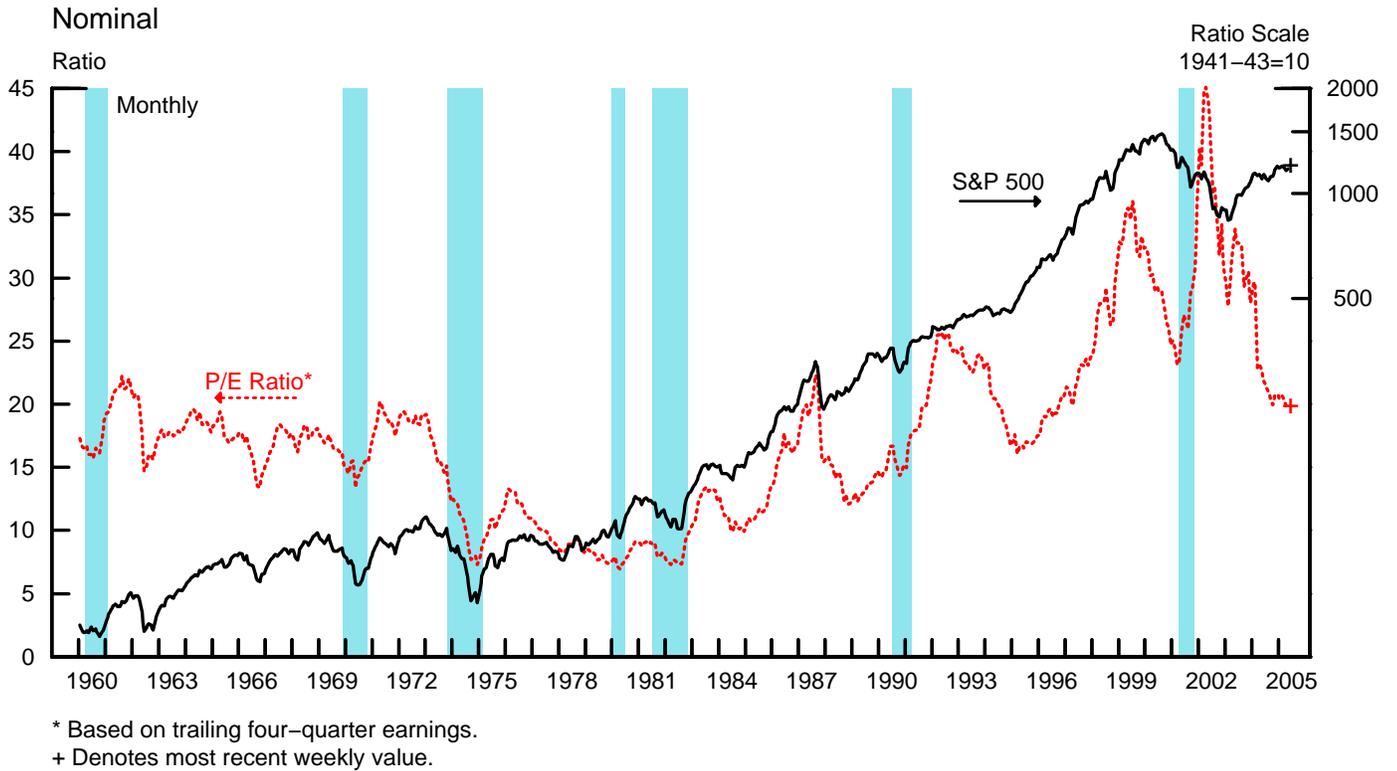
+ Denotes most recent weekly value.

Real



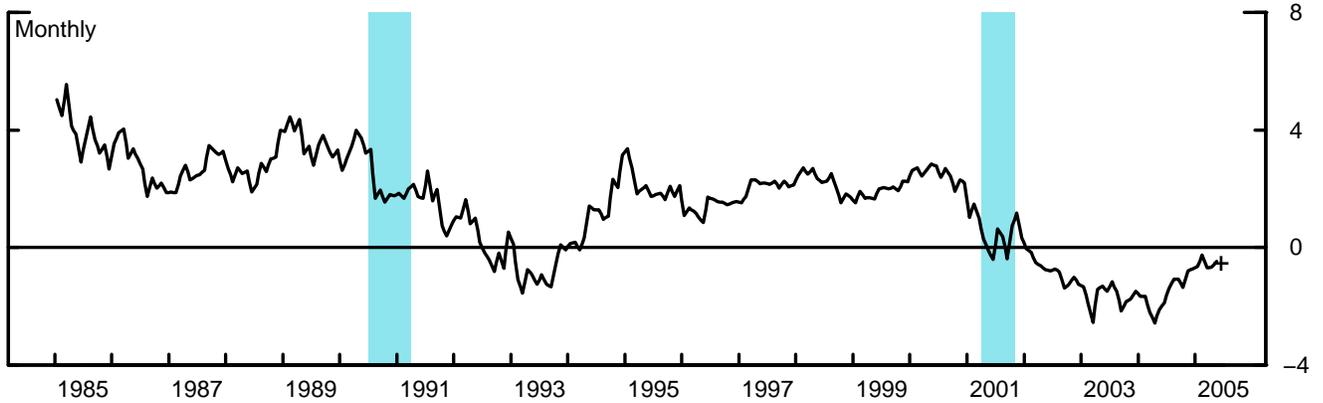
Note. The major currencies index is the trade-weighted average of currencies of the Euro area, Canada, Japan, the U.K., Switzerland, Australia, and Sweden. The other important trading partners index is the trade-weighted average of currencies of 19 other important trading partners. The Broad index is the trade-weighted average of currencies of all important trading partners. Real indexes have been adjusted for relative changes in U.S. and foreign consumer prices. Blue shaded regions denote NBER-dated recessions.

# Stock Indexes



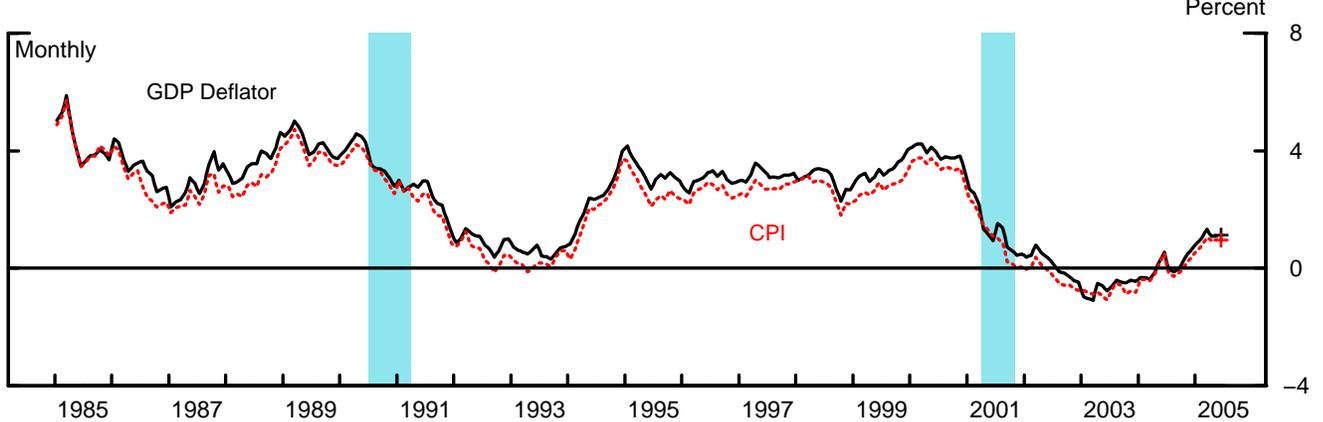
# One-Year Real Interest Rates

One-Year Treasury Constant Maturity Yield Less One-Year Inflation Expectations (Michigan Survey)\*



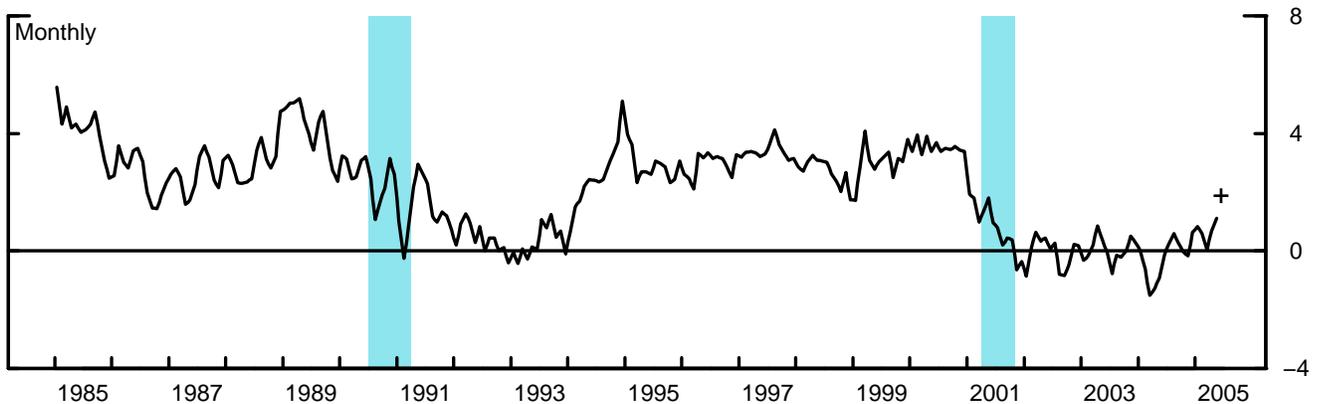
\* Mean value of respondents.

One-Year Treasury Constant Maturity Yield Less One-Year Inflation Expectations (Philadelphia Fed)\*



\* ASA/NBER quarterly survey until 1990:Q1; Philadelphia Federal Reserve Bank Survey of Professional Forecasters thereafter. Median value of respondents.

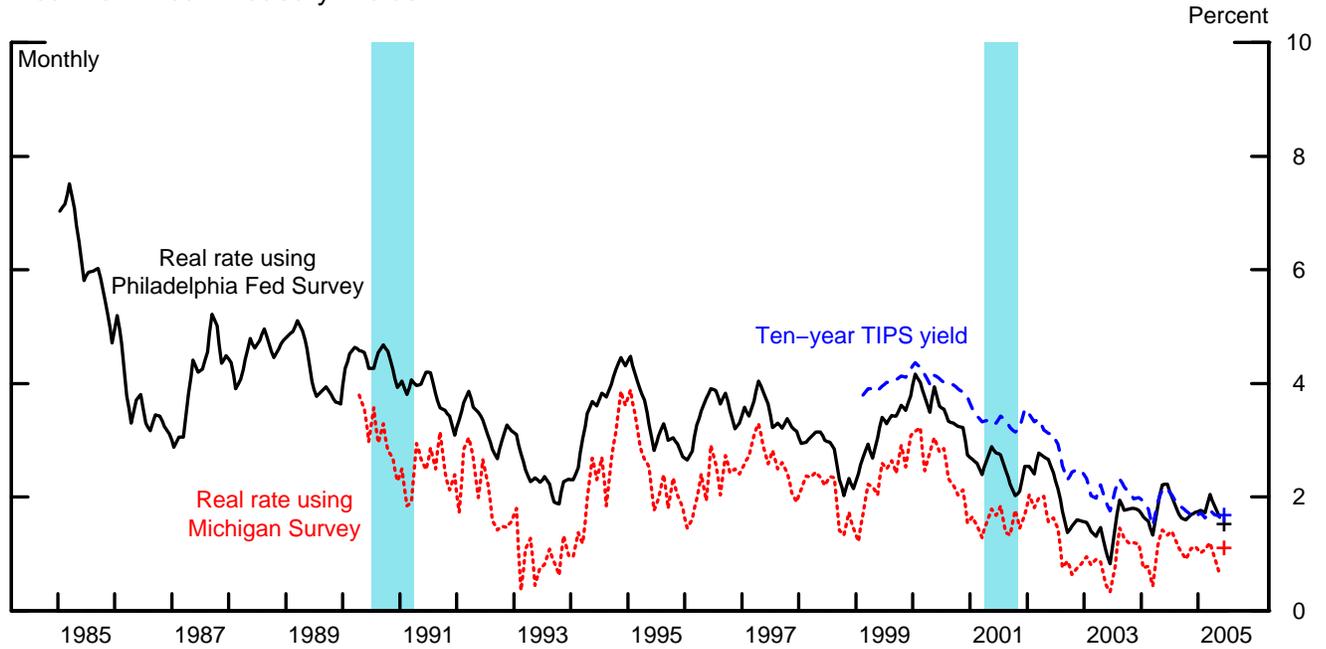
One-Year Treasury Constant Maturity Yield Less Change in the Core CPI from Three Months Prior



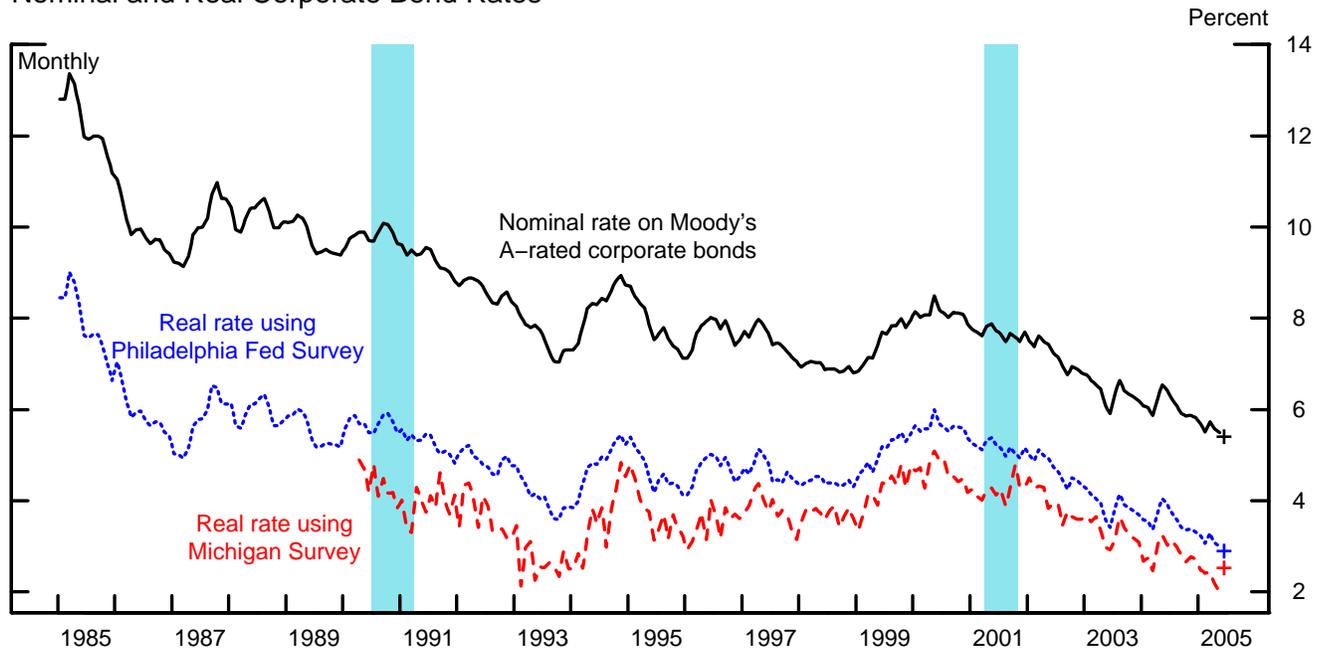
+ Denotes most recent weekly Treasury constant maturity yield less most recent inflation expectation.  
Note. Blue shaded regions denote NBER-dated recessions.

# Long-Term Real Interest Rates\*

## Real Ten-Year Treasury Yields



## Nominal and Real Corporate Bond Rates



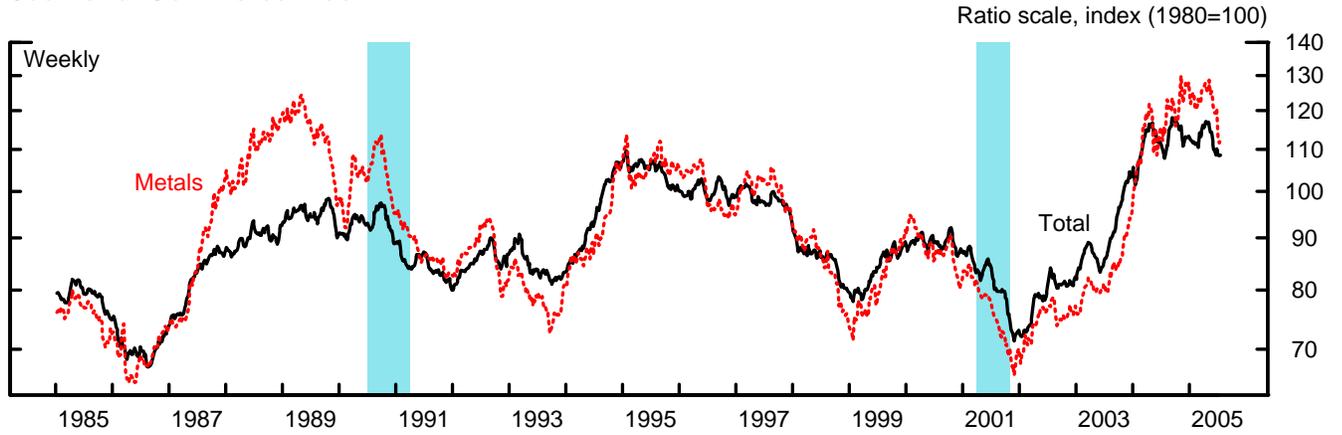
\* For real rates, measures using the Philadelphia Fed Survey employ the ten-year inflation expectations from the Blue Chip Survey until April 1991 and the Philadelphia Federal Reserve Bank Survey of Professional Forecasters thereafter (median value of respondents). Measures using the Michigan Survey employ the five- to ten-year inflation expectations from that survey (mean value of respondents).

+ For TIPS and nominal corporate rate, denotes the most recent weekly value. For other real rate series, denotes the most recent weekly nominal yield less the most recent inflation expectation.

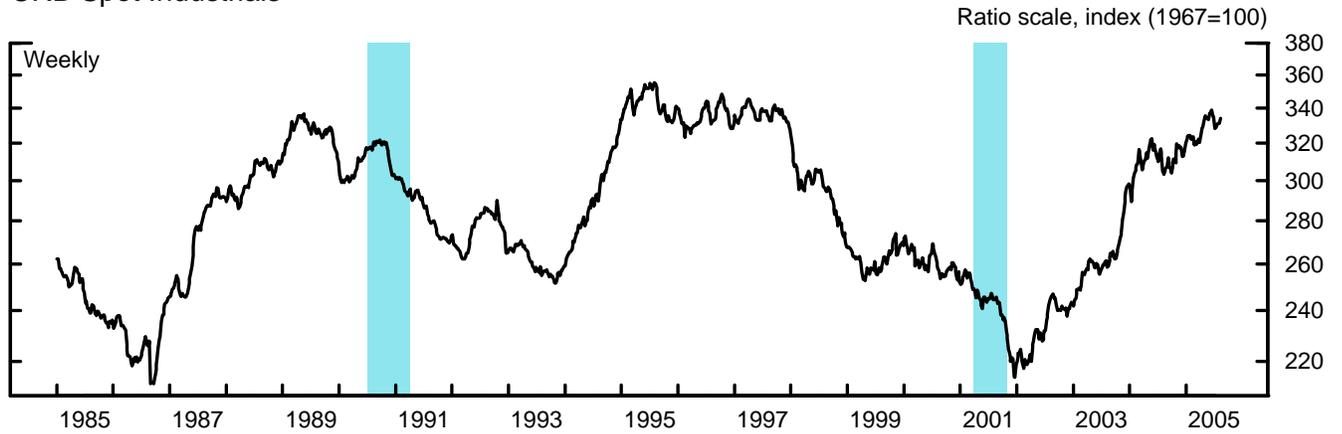
Note. Blue shaded regions denote NBER-dated recessions.

# Commodity Price Measures

## Journal of Commerce Index



## CRB Spot Industrials



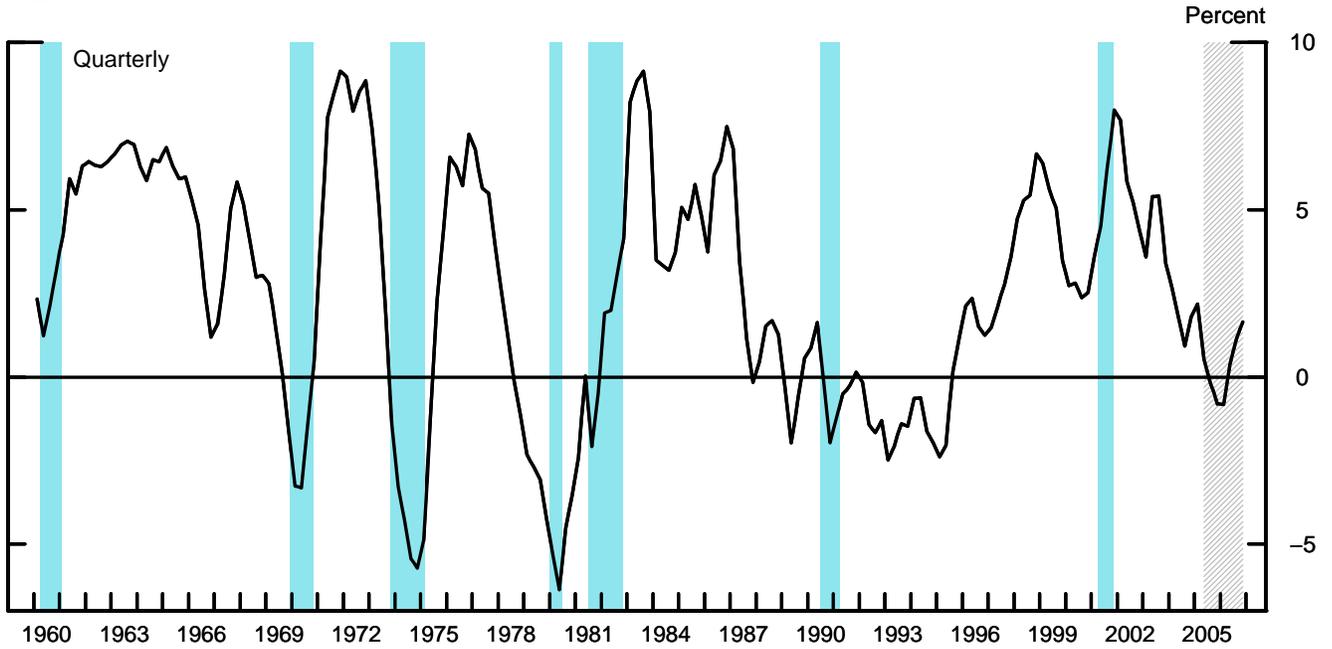
## CRB Futures



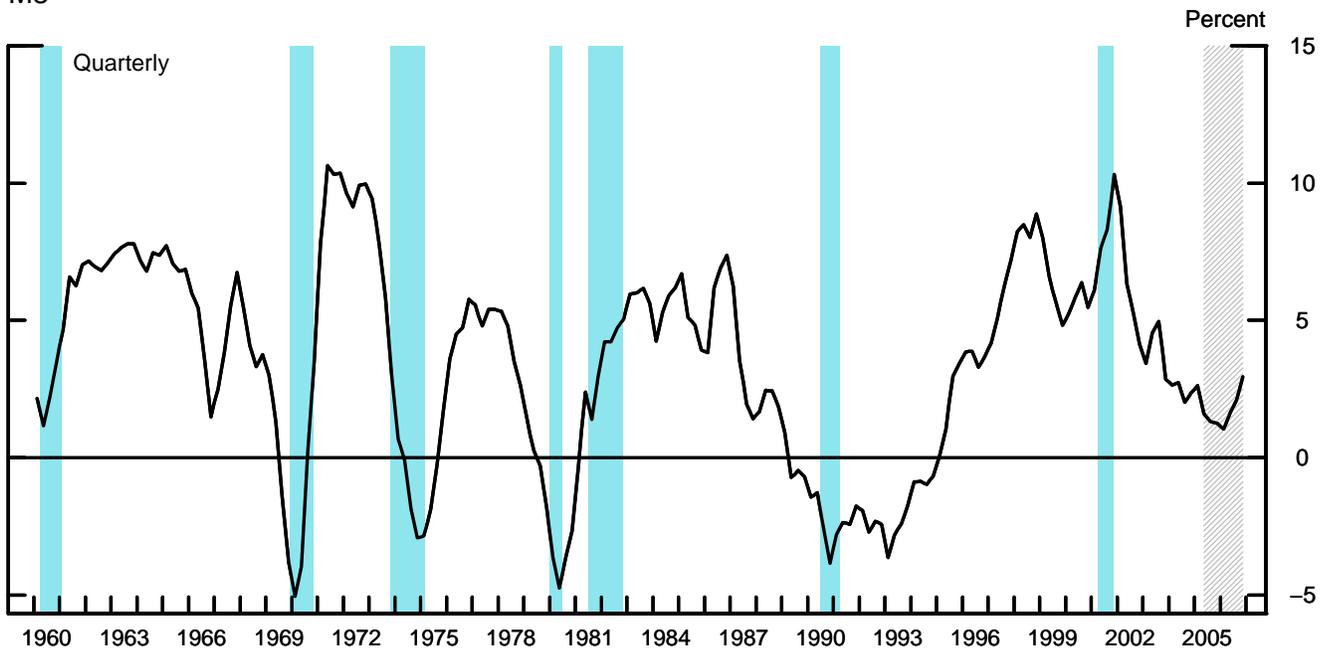
Note. Blue shaded regions denote NBER-dated recessions.

# Growth of Real M2 and M3

M2

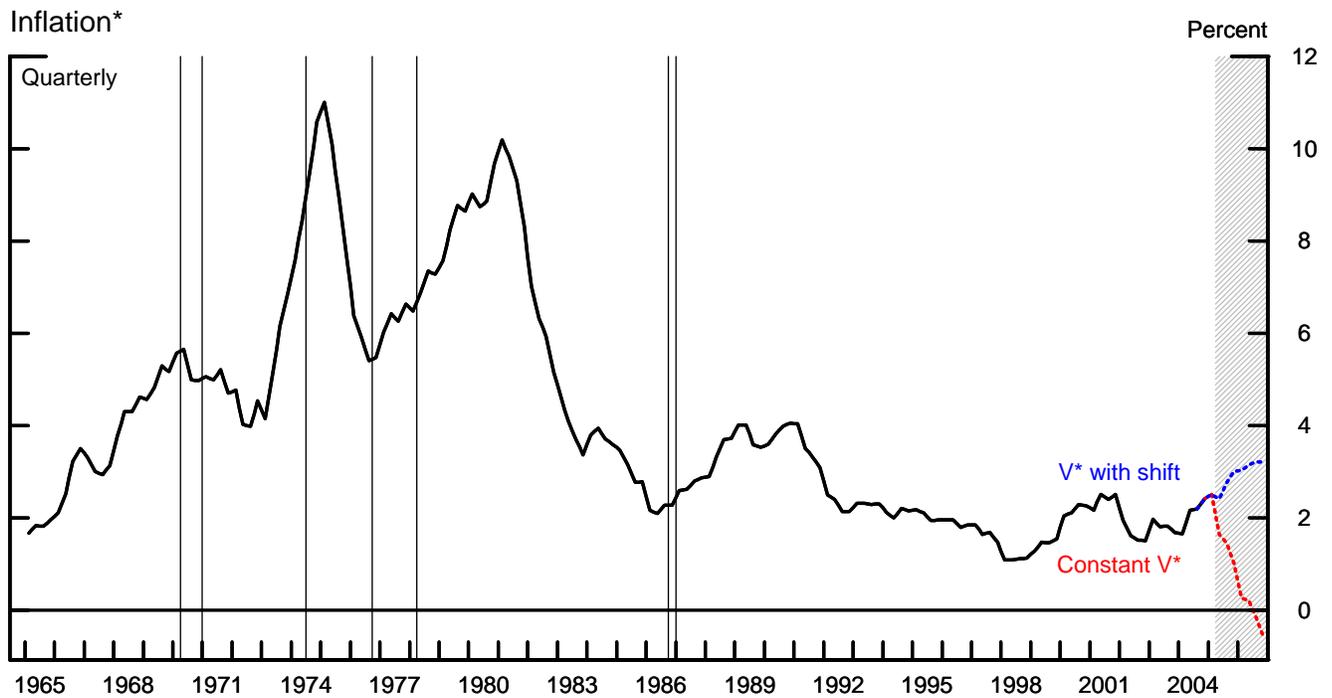
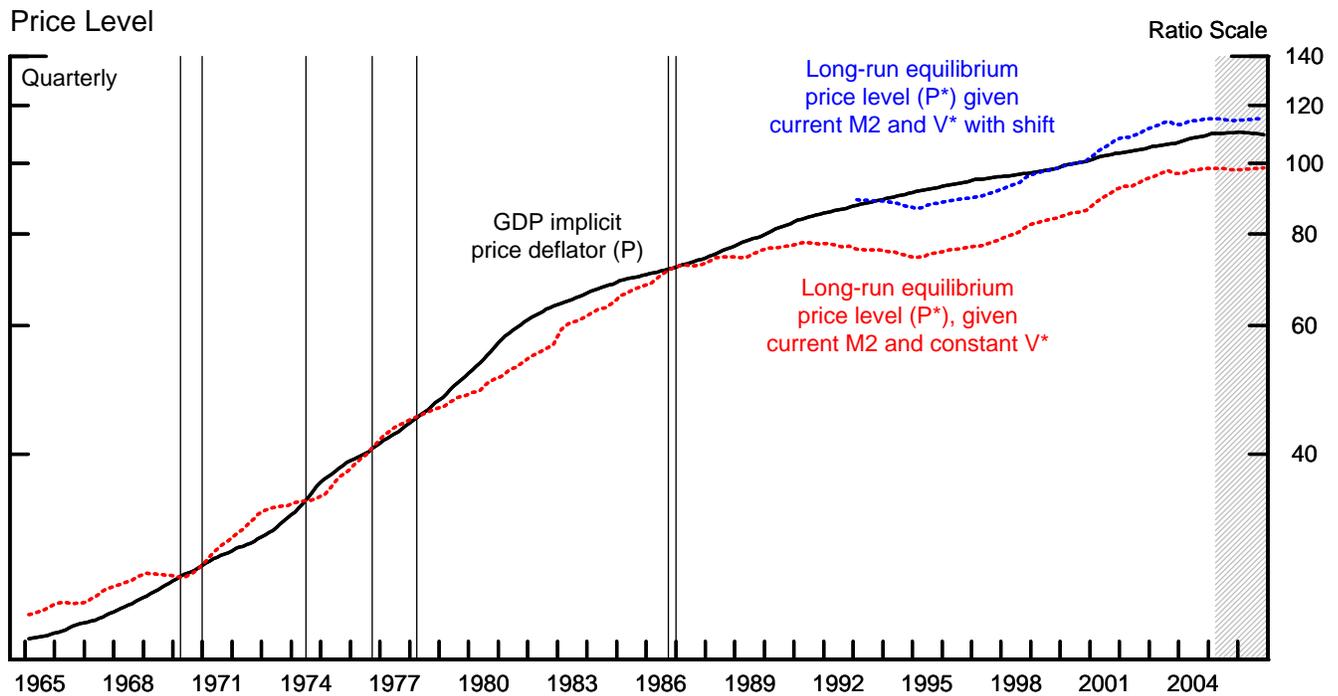


M3



Note. Four-quarter moving average deflated by the CPI. Blue shaded regions denote NBER-dated recessions. Dashed areas denote projection period.

### Inflation Indicator Based on M2 and Two Estimates of V\*



\* Change in GDP implicit price deflator over the previous four quarters.

Note. P\* is defined to equal M2 times V\* divided by potential GDP. Long-run velocity (V\*) is estimated from 1959:Q1 to 1989:Q4. V\* after 1992 is estimated from 1993:Q1 to present. For the forecast period, P\* is based on staff M2 forecast and P is simulated using a short-run dynamic model relating P to P\*. Vertical lines mark crossing of P and P\*. Dashed areas denote projection period.

**Selected Interest Rates  
(Percent)**

	Short-term						Long-term									
	Federal funds	Treasury bills secondary market			CDs secondary market	Comm. paper	Off-the-run Treasury yields				Indexed yields		Moody's Baa	Municipal Bond Buyer	Conventional home mortgages primary market	
		4-week	3-month	6-month	3-month	1-month	2-year	5-year	10-year	20-year	5-year	10-year			Fixed-rate	ARM
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
04 -- High	2.34	2.08	2.28	2.63	2.51	2.29	3.13	4.10	5.03	5.64	1.57	2.28	6.90	5.45	6.34	4.27
04 -- Low	0.92	0.73	0.87	0.96	1.04	0.97	1.49	2.65	3.84	4.68	0.40	1.38	6.00	4.73	5.38	3.36
05 -- High	3.09	2.85	3.06	3.28	3.43	3.17	3.92	4.32	4.73	5.04	1.50	1.91	6.22	5.04	6.04	4.33
05 -- Low	2.19	1.86	2.31	2.63	2.50	2.24	3.11	3.58	3.97	4.30	0.98	1.50	5.64	4.72	5.56	4.10
Monthly																
Jun 04	1.03	1.04	1.29	1.64	1.46	1.13	2.78	3.93	4.88	5.49	1.43	2.16	6.78	5.40	6.29	4.10
Jul 04	1.26	1.18	1.35	1.69	1.57	1.29	2.64	3.70	4.64	5.29	1.32	2.04	6.62	5.29	6.06	4.11
Aug 04	1.43	1.37	1.51	1.76	1.68	1.48	2.50	3.49	4.43	5.12	1.15	1.88	6.46	5.18	5.87	4.06
Sep 04	1.61	1.54	1.68	1.91	1.86	1.67	2.51	3.35	4.26	4.96	1.12	1.82	6.27	5.04	5.75	3.99
Oct 04	1.76	1.62	1.79	2.05	2.04	1.79	2.57	3.35	4.24	4.92	1.00	1.76	6.21	4.99	5.72	4.02
Nov 04	1.93	1.91	2.11	2.33	2.26	2.01	2.86	3.52	4.32	4.95	0.93	1.68	6.20	5.06	5.73	4.15
Dec 04	2.16	1.95	2.23	2.50	2.45	2.22	3.02	3.59	4.34	4.94	0.97	1.65	6.15	5.03	5.75	4.18
Jan 05	2.28	2.02	2.38	2.68	2.61	2.33	3.23	3.70	4.32	4.82	1.15	1.72	6.02	4.92	5.71	4.12
Feb 05	2.50	2.36	2.59	2.85	2.77	2.49	3.39	3.76	4.25	4.65	1.10	1.63	5.82	4.87	5.63	4.16
Mar 05	2.63	2.64	2.80	3.09	2.97	2.67	3.74	4.15	4.59	4.92	1.27	1.77	6.06	5.01	5.93	4.23
Apr 05	2.79	2.63	2.84	3.14	3.09	2.84	3.67	3.99	4.42	4.78	1.21	1.69	6.05	4.93	5.86	4.25
May 05	3.00	2.62	2.90	3.17	3.22	2.97	3.65	3.84	4.22	4.59	1.25	1.65	6.01	4.83	5.72	4.23
Weekly																
Apr 22 05	2.77	2.64	2.90	3.13	3.10	2.89	3.59	3.89	4.34	4.72	1.13	1.62	6.01	4.89	5.80	4.26
Apr 29 05	2.80	2.65	2.91	3.17	3.14	2.93	3.64	3.90	4.31	4.67	1.15	1.62	5.97	4.83	5.78	4.21
May 6 05	2.98	2.62	2.88	3.18	3.17	2.97	3.64	3.87	4.28	4.67	1.19	1.64	6.02	4.84	5.75	4.22
May 13 05	2.99	2.56	2.88	3.18	3.20	2.97	3.68	3.89	4.28	4.65	1.24	1.66	6.03	4.87	5.77	4.23
May 20 05	3.01	2.53	2.87	3.15	3.22	2.98	3.63	3.82	4.20	4.56	1.27	1.66	6.02	4.81	5.71	4.26
May 27 05	3.01	2.75	2.95	3.16	3.25	2.98	3.64	3.79	4.15	4.50	1.29	1.65	5.98	4.78	5.65	4.21
Jun 3 05	3.02	2.79	2.98	3.14	3.29	3.00	3.55	3.68	4.02	4.37	1.24	1.58	5.83	4.72	5.62	4.26
Jun 10 05	2.99	2.81	3.01	3.14	3.33	3.03	3.62	3.73	4.04	4.35	1.34	1.64	5.80	4.75	5.56	4.21
Jun 17 05	3.02	2.77	3.00	3.22	3.37	3.11	3.73	3.86	4.18	4.49	1.47	1.76	5.96	4.83	5.63	4.25
Jun 24 05	--	2.81	3.03	3.27	3.41	3.16	3.67	3.78	4.09	4.40	1.41	1.72	--	--	5.57	4.23
Daily																
Jun 7 05	2.96	2.82	3.02	3.14	3.32	3.02	3.56	3.67	3.99	4.30	1.29	1.59	5.74	--	--	--
Jun 8 05	2.96	2.82	3.02	3.15	3.32	3.02	3.61	3.71	4.02	4.32	1.33	1.62	5.77	--	--	--
Jun 9 05	3.01	2.80	2.99	3.14	3.34	3.03	3.64	3.74	4.04	4.34	1.35	1.64	5.81	--	--	--
Jun 10 05	3.01	2.80	3.00	3.14	3.35	3.05	3.71	3.81	4.12	4.42	1.45	1.73	5.89	--	--	--
Jun 13 05	3.04	2.79	3.03	3.22	3.35	3.08	3.72	3.85	4.17	4.47	1.47	1.76	5.93	--	--	--
Jun 14 05	3.01	2.78	3.01	3.22	3.35	3.08	3.73	3.87	4.20	4.52	1.49	1.79	6.00	--	--	--
Jun 15 05	3.05	2.77	3.00	3.22	3.37	3.11	3.74	3.87	4.20	4.52	1.50	1.78	5.99	--	--	--
Jun 16 05	3.00	2.75	2.97	3.21	3.39	3.14	3.72	3.84	4.16	4.48	1.45	1.74	5.95	--	--	--
Jun 17 05	2.99	2.78	2.98	3.22	3.40	3.12	3.72	3.85	4.16	4.47	1.43	1.73	5.94	--	--	--
Jun 20 05	3.01	2.78	3.02	3.27	3.40	3.16	3.73	3.87	4.19	4.49	1.44	1.75	5.96	--	--	--
Jun 21 05	2.96	2.85	3.02	3.28	3.41	3.16	3.71	3.82	4.13	4.43	1.42	1.72	5.91	--	--	--
Jun 22 05	2.93	2.83	3.03	3.25	3.41	3.17	3.60	3.71	4.02	4.34	1.38	1.68	5.84	--	--	--
Jun 23 05	3.05 <sup>p</sup>	2.77	3.06	3.27	3.43	--	3.63	3.73	4.04	4.35	1.38	1.68	--	--	--	--

NOTE: Weekly data for columns 1 through 13 are week-ending averages. Columns 2 through 4 are on a coupon equivalent basis. Data in column 6 are interpolated from data on certain commercial paper trades settled by the Depository Trust Company. Column 14 is the Bond Buyer revenue index, which is a 1-day quote for Thursday. Column 15 is the average contract rate on new commitments for fixed-rate mortgages (FRMs) with 80 percent loan-to-value ratios at major institutional lenders. Column 16 is the average initial contract rate on new commitments for 1-year, adjustable-rate mortgages (ARMs) at major institutional lenders offering both FRMs and ARMs with the same number of discount points.

p - preliminary data

Appendix Table 2  
**Money Aggregates**  
 Seasonally Adjusted

Period	M1	M2	nontransactions components		M3
			in M2	in M3 only	
			1	2	
<b>Annual growth rates (%):</b>					
<b>Annually (Q4 to Q4)</b>					
2002	3.3	6.8	7.7	5.9	6.5
2003	7.1	5.4	5.0	3.6	4.8
2004	5.4	5.2	5.2	7.1	5.8
<b>Quarterly (average)</b>					
2004-Q2	6.0	7.8	8.3	12.8	9.4
Q3	3.6	3.5	3.5	5.8	4.3
Q4	5.5	5.7	5.7	-0.3	3.8
2005-Q1	0.7	3.6	4.4	8.4	5.1
<b>Monthly</b>					
2004-May	3.5	11.3	13.4	12.7	11.7
June	6.4	2.3	1.2	11.3	5.2
July	-6.6	0.4	2.3	0.8	0.5
Aug.	16.2	4.1	0.8	4.5	4.2
Sep.	3.9	6.6	7.4	5.3	6.2
Oct.	0.1	5.1	6.4	-7.1	1.1
Nov.	13.2	6.9	5.2	-2.8	3.8
Dec.	-1.0	4.5	6.0	9.2	6.0
2005-Jan.	-8.3	2.6	5.5	13.4	6.0
Feb.	6.9	2.6	1.4	7.8	4.2
Mar.	6.4	3.6	2.8	3.7	3.6
Apr.	-15.3	-0.9	2.9	20.2	5.9
May p	10.2	-0.1	-2.8	12.1	3.9
<b>Levels (\$billions):</b>					
<b>Monthly</b>					
2005-Jan.	1356.3	6436.9	5080.6	3062.2	9499.1
Feb.	1364.1	6450.7	5086.6	3082.0	9532.7
Mar.	1371.4	6469.9	5098.5	3091.4	9561.3
Apr.	1353.9	6464.8	5110.9	3143.5	9608.2
May p	1365.4	6464.4	5099.1	3175.1	9639.5
<b>Weekly</b>					
2005-May 2	1358.1	6471.8	5113.8	3153.6	9625.4
9	1359.8	6462.5	5102.7	3160.7	9623.2
16	1346.6	6454.4	5107.8	3165.7	9620.1
23	1368.7	6466.5	5097.8	3175.4	9641.9
30	1389.7	6464.5	5074.8	3201.7	9666.2
June 6p	1357.0	6484.9	5127.9	3199.3	9684.2
13p	1340.5	6469.0	5128.4	3231.3	9700.2

p preliminary

**Appendix Table 3**  
**Changes in System Holdings of Securities <sup>1</sup>**  
**(Millions of dollars, not seasonally adjusted)**

June 23, 2005

	Treasury Bills			Treasury Coupons						Federal Agency Redemptions (-)	Net change total outright holdings <sup>4</sup>	Net RPs <sup>5</sup>		
	Net Purchases <sup>2</sup>	Redemptions (-)	Net Change	Net Purchases <sup>3</sup>				Redemptions (-)	Net Change			Short-Term <sup>6</sup>	Long-Term <sup>7</sup>	Net Change
				< 1	1-5	5-10	Over 10							
2002	21,421	---	21,421	12,720	12,748	5,074	2,280	---	32,822	---	54,242	-5,366	517	-4,850
2003	18,150	---	18,150	6,565	7,814	4,107	220	---	18,706	10	36,846	2,223	1,036	3,259
2004	18,138	---	18,138	7,994	17,249	5,763	1,364	---	32,370	---	50,507	-2,522	-331	-2,853
2004 QI	1,707	---	1,707	1,311	2,848	1,251	275	---	5,685	---	7,391	-772	-3,515	-4,286
QII	7,756	---	7,756	1,693	2,543	988	84	---	5,307	---	13,063	1,133	418	1,550
QIII	4,508	---	4,508	1,898	4,406	1,507	434	---	8,244	---	12,753	-1,787	782	-1,005
QIV	4,167	---	4,167	3,092	7,453	2,018	571	---	13,134	---	17,301	-5,956	1,728	-4,227
2005 QI	35	---	35	---	---	---	---	544	-544	---	-509	1,653	-3,454	-1,801
2004 Oct	500	---	500	1,593	2,765	1,225	400	---	5,984	---	6,484	-2,121	-4,443	-6,564
Nov	3,155	---	3,155	---	2,284	453	86	---	2,822	---	5,977	-1,416	1,543	127
Dec	512	---	512	1,499	2,404	340	85	---	4,328	---	4,840	-1,492	812	-680
2005 Jan	---	---	---	---	---	---	---	---	---	---	---	1,100	-3,387	-2,287
Feb	35	---	35	---	---	---	---	333	-333	---	-298	2,163	-2,187	-24
Mar	---	---	---	---	---	---	---	211	-211	---	-211	1,746	896	2,642
Apr	---	---	---	---	1,200	470	230	---	1,900	---	1,900	385	1,499	1,884
May	1,760	---	1,760	---	2,295	898	---	---	3,193	---	4,953	-2,453	340	-2,113
2005 Mar 30	---	---	---	---	---	---	---	---	---	---	---	3,047	-3,000	47
Apr 6	---	---	---	---	---	---	---	211	-211	---	-211	-936	3,000	2,064
Apr 13	---	---	---	---	---	---	---	---	---	---	---	-1,558	-1,000	-2,558
Apr 20	---	---	---	---	---	---	---	---	---	---	---	2,225	2,000	4,225
Apr 27	---	---	---	---	1,200	---	---	---	1,200	---	1,200	-2,868	1,000	-1,868
May 4	---	---	---	---	---	470	230	---	700	---	700	-40	-2,000	-2,040
May 11	1,257	---	1,257	---	125	773	---	---	898	---	2,155	-1,901	-2,000	-3,901
May 18	26	---	26	---	---	---	---	---	---	---	26	1,631	1,000	2,631
May 25	227	---	227	---	1,048	50	---	---	1,098	---	1,325	-2,940	5,000	2,060
Jun 1	500	---	500	---	1,122	75	700	---	1,897	---	2,397	5,012	-1,000	4,012
Jun 8	---	---	---	---	---	---	---	---	---	---	---	-3,432	---	-3,432
Jun 15	---	---	---	---	---	---	---	---	---	---	---	1,866	-3,000	-1,134
Jun 22	---	---	---	---	---	340	85	---	425	---	425	1,845	-3,000	-1,155
2005 Jun 23	---	---	---	---	---	---	---	---	---	---	---	-6,746	3,000	-3,746
Intermeeting Period														
May 3-Jun 23	2,010	---	2,010	---	2,295	1,238	785	---	4,318	---	6,328	-2,558	---	-2,558
Memo: LEVEL (bil. \$)														
Jun 23			265.0	112.1	216.6	54.1	78.1		460.9	---	726.0	-17.9	17.0	-0.9

1. Change from end-of-period to end-of-period. Excludes changes in compensation for the effects of inflation on the principal of inflation-indexed securities.  
2. Outright purchases less outright sales (in market and with foreign accounts).  
3. Outright purchases less outright sales (in market and with foreign accounts). Includes short-term notes acquired in exchange for maturing bills. Excludes maturity shifts and rollovers of maturing issues, except the rollover of inflation compensation.

4. Includes redemptions (-) of Treasury and agency securities.  
5. RPs outstanding less reverse RPs.  
6. Original maturity of 13 days or less.  
7. Original maturity of 14 to 90 days.