



C A M B R I D G E A S S O C I A T E S L L C

## U.S. MARKET COMMENTARY

# THE TROUBLE WITH TREASURIES

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## The Trouble With Treasuries

Over fourth quarter 2008 fears of a global recession and deflation turned a classic flight toward the safety and liquidity of the U.S. Treasury market into a stampede, pushing yields to their lowest levels in over a generation. At one point in mid-December, T-bills effectively offered zero (and even negative) yield, while yields on ten-year Treasuries dipped below 2.1% for the first time since the early 1950s and 30-year Treasury yields reached all-time lows of nearly 2.5% (Tables A and B). The dramatic rally in U.S. Treasuries has many investors nervously scratching their heads. Are U.S. government bonds grossly overvalued or correctly pricing in the economic environment to come? To some, yields of less than 3.0% make ten-year Treasury bonds a reckless investment; to others a very prudent purchase going forward. Compounding matters is the recent decision by the U.S. Federal Reserve to begin direct purchases of U.S. government debt. Does this make Treasuries more attractive by capping yields or presage a painful unwind to come?

A cornerstone of Cambridge Associates' investment advice has been that intermediate- to long-term noncallable sovereign bonds provide the best protection against a prolonged, deflation-driven contraction or stagnation in economic growth. And it seems such an environment has arrived; the global economy is experiencing its worst recession in the post-World War II period amid what will likely be a multiyear deleveraging of U.S. households and the broader Western financial system.<sup>1</sup> However, with U.S. government bond yields at their lowest levels in over 50 years, the effectiveness of Treasuries as a "deflation hedge" has been greatly diminished going forward. While amid a prolonged deflationary environment yields have the potential to move lower and Treasury prices to remain well-bid, we view the risk-reward trade-off for Treasuries as unattractive, especially in an environment where policymakers across the globe are aggressively trying to fight deflation with monetary and fiscal reflation.

In other words, Treasuries do not currently compensate investors for the risk that deflation fears may give way to future inflation concerns. Although the current environment still demands that investors maintain deflation protection, investors should take advantage of the recent rally in Treasuries to rebalance allocations back to target and actively seek to shorten their duration exposure. Diversifying the traditional deflation-hedging part of the portfolio to include a barbell-type strategy of holding T-bills and/or short-duration bonds alongside longer-term Treasuries and perhaps inflation-linked bonds (TIPS) makes sense today. While shortening duration will sacrifice potential "upside" from any rallies in long-term Treasuries, amid a deflationary environment such an allocation can provide for liquidity and spending without exposing investors to undue price risk.

## What Is the Fed Doing?

On March 18, the Federal Reserve announced a series of aggressive actions designed to support credit markets and lower longer-term interest rates by directly purchasing assets. Most notably:

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<sup>1</sup> Please see our February 2009 paper *Hard Choices for Hard Times*, part of our Asset Allocation in the Current Environment series.

- The Fed will begin purchasing up to \$300 billion in U.S. Treasury bonds over the next six months, with a focus on the two- to ten-year sector. This sector of the curve is expected to see approximately \$680 billion in new issuance over the next six months, implying the Fed will be purchasing an amount equivalent to 44% of new issuance (although it may choose to buy higher coupon, older off-the-run issues). The Fed also implied it may purchase nominal Treasuries of other maturities and TIPS, although no target amounts or timing was announced.
- The Fed will purchase an additional \$750 billion of U.S. Agency mortgage-backed securities (MBS), bringing total planned purchases for the year to \$1.25 trillion. This would amount to 26% of outstanding Agency MBS debt.
- The Fed will also purchase an additional \$100 billion of Agency bonds (non-MBS), for a total for \$200 billion.
- Finally, the Fed expressed its commitment to keeping the overnight Fed funds rate floored between 0 and 25 basis points for “an extended period.”

As the figures above highlight, the Fed is expending much more firepower on credit-related initiatives than on Treasuries, as it views this as the most effective way to resume credit creation in the economy. These actions are in addition to the \$200 billion in planned purchases related to the Term Asset-Backed Securities Loan Facility (TALF) to support the asset-backed securities market and the \$500 billion for the Private-Public Investment Fund (PPIF) to take on bad debts from bank balance sheets. According to Goldman Sachs, the Fed’s balance sheet currently stands at around \$2.0 trillion (or 14% of GDP) and will expand rapidly under the TALF and PPIF. The TALF program began the week of March 23.

Such measures are often referred to as “quantitative easing,” or QE. In essence, QE is an unconventional monetary policy designed to ease financial conditions when traditional monetary tools, such as overnight policy rates, have hit their lower bounds and are ineffective. The Fed is effectively “printing money” by creating a liability on its balance sheet (and thereby expanding the monetary base) to purchase Treasury bonds and other government-backed securities as the matching “asset.” The Fed, which succeeded in rapidly expanding its balance sheet last year, was likely concerned over the recent contraction that has occurred given the slow adoption of its market support programs.

The decision to begin direct purchases of U.S. Treasury bonds follows a similar announcement by the Bank of England (BOE) in early March, although the Fed had expressed in November its willingness to influence longer-term interest rates by purchasing Treasury bonds if necessary. Indeed, some argue this announcement prompted the strong rally in Treasuries toward 2.0% in December. Nor is this the first time the Fed has “monetized” U.S. government debt; during World War II, the Fed helped finance Treasury debt by purchasing bonds. In the 1960s, the Fed purchased Treasuries in an unsuccessful attempt to influence the shape of the yield curve by lowering the long end of the curve while raising short-term interest rates (the so-called Operation Twist).

## Implications

We have long argued that the Federal Reserve would do anything in its power to fight deflation, so the current moves come as little surprise, especially given the massive amount of Treasury issuance coming to market (although the move to QE occurred sooner than the markets expected). Rising longer-term interest rates runs counter to the Fed's goal of easing financial conditions.

Following the announcement, Treasury bonds rallied sharply, as did equities. More importantly, however, the U.S. dollar weakened and gold and other commodities rallied, highlighting market concerns of possible higher future inflation.

Some argue that by stepping in to buy Treasuries, the Fed will help stabilize the market by alleviating concerns over upcoming issuance and will reduce upward pressure on yields by maintaining what may now be viewed as an unofficial ceiling of 3.0% for ten-year Treasury yields. Further, if growth conditions do not improve or deflation intensifies, the Fed may push yields down even lower to help ease monetary conditions. Following this line of reasoning, Treasuries are attractive, even at current levels.

However, we are not so sanguine. Such a move implies a distortion of the market, augmenting current overvaluation. This is inherently unsustainable. At some point, the Fed will stop its bond purchases (most likely when it sees signs of concrete inflationary pressure), at which time the Treasury market might become destabilized. Furthermore, the Fed stepping in as the buyer of last resort in the face of massive issuance only encourages current holders of Treasuries to attempt to offload their holdings at current high prices. Market volatility could even increase as the markets (and perhaps the Chinese) test how much the Fed can digest, and how willing it is to extend the program to keep yields down. Already both the BOE and the Fed have witnessed sloppy auctions of government bonds recently.

None of this is to say the Fed will not be successful in the short term or that Treasury yields will not decline or stay low for an extended period. History has shown this is possible, especially in the face of a weak economy and lingering deflation. However, aggressively monetizing government spending only raises the specter of future inflation should the economy turn and should central banks be reluctant to drain excess liquidity from the system. Investors are currently not being compensated for such a scenario.

## A Question of Valuation

While ten-year Treasury yields below 3.0% seem very low by recent historical standards, are they in fact overvalued? The answer to this question depends on two main considerations: (1) the outlook for inflation versus deflation relative to expectations priced into the bond market and (2) the market's ability to absorb the massive increase in Treasury issuance.

## **Inflation or Deflation?**

Assessing the “value” of Treasury bonds in today’s environment is especially challenging, as it is unclear whether the future will be deflationary or inflationary in nature. Indeed, Mr. Market himself has been quite schizophrenic in this regard, shifting from inflation fears last spring (when TIPS yields were driven to record lows) to a deflation panic this fall, and now hesitantly back toward inflation jitters as central banks up the ante with monetary easing.

On the one hand, the deflationary forces emanating from the global recession are powerful. As a recent J.P. Morgan economic research piece noted, “inflation is likely to reach zero next year in the developed world, where the economy is forecast to veer far below its potential growth path, generating an enormous amount of slack.” And until growth resumes sufficiently to remove such slack, downward pressures on prices remain, especially if unemployment continues to rise. U.S. household wealth has declined by \$12.9 trillion since June 2007—an unprecedented drop in the post–World War II period—and will have a large impact on demand and consumption for some time to come (Table C).

On the other hand, with central banks across the globe engaging in aggressive monetary policy with the expressed desire to avoid a deflationary scenario, and governments priming the fiscal pumps as well, it seems bond yields below 3.0% are destined to offer a negative *real return*, given that inflation has averaged 3.2% per annum since 1900.

At its most basic level, government bond valuation comes down to expectations of future real yields (which are tied to future economic growth expectations) and future inflation. These two components can be observed in the inflation-linked bond market, with the yield on TIPS serving as the real growth expectation, and the yield spread between nominal Treasuries and TIPS of the same maturity as the future inflation compensation (the so-called breakeven inflation spread). With nominal ten-year Treasury yields of 2.7% and ten-year TIPS yields of 1.4%, the market is pricing in inflation expectations of 1.3% over the next ten years (Table D).

At face value the Treasury market seems to be pricing in a very low growth, low inflation environment for the next decade. Such yields would seem attractive if the U.S. and global economies were to slide in a Japan-like funk. Indeed, Japan is the counter argument to all the inflation angst currently circulating. After years of zero interest rates and liquidity pumping, inflation has remained nonexistent. Japanese government bond yields fell decisively below 2.5% in 1997 and have remained there ever since, as the structural growth rate of the economy shifted downward following a prolonged debt deleveraging that slowly purged excess capacity from the system (Table E).

As would be expected in the current environment, various analysts reach different conclusions. Goldman Sachs’ proprietary bond model puts the fair value for ten-year Treasuries at 2.62% measured by

consensus-based forward estimates of growth, inflation, and short-term interest rates,<sup>2</sup> implying that given current conditions, Treasuries are appropriately priced.

In contrast, the regression model developed by Ned Davis Research (NDR) based on a series of historical relationships implies fair value for ten-year Treasuries of 3.9%, with ten-year Treasuries still more than 1 standard deviation overvalued at the end of March.<sup>3</sup> Like NDR's model, our own, simpler valuation tool (based on the level of yields that should compensate investors for growth and inflation over a full economic cycle) points to fair value for ten-year Treasuries at around 4.0%. While the bond market may be right to price in lower growth expectations going forward, it may be too soon to rule out inflation over the next ten years. (Please see the appendix for more details.)

The current economic environment clearly justifies lower government bond yields given the poor outlook for economic growth this year, and possibly going forward, yet the inflation compensation component remains the wild card. Because we view growth prospects for the U.S. economy as structurally lower (around 2.0%), but the inflation risks more normal over the next ten years, we feel comfortable classifying ten-year Treasury yields below 4.0% as overvalued, and below 2.5% as very overvalued.

### **Issuance: Who Will Buy These Bonds?**

A clear source of concern for Treasuries going forward is the impact of rapidly increasing supply relative to unknown demand. Based on estimates by the Congressional Budget Office (CBO), the U.S. government deficit will rise to \$1.85 trillion over fiscal year 2009, or 13% of GDP, up from 3.6% in 2008. Already, \$569 billion in marketable Treasury debt was issued over fourth quarter 2008, with planned issuance of \$493 billion over first quarter 2009 and \$165 billion over the second quarter. Various observers estimate that the Treasury will eventually have to bring over \$2.0 trillion of new issuance to market to support new fiscal initiatives and debt servicing. And such estimates could rise further. Regardless of the outlook for inflation or deflation, a mountain of supply should result in higher bond yields.

Yet despite the intuitive logic of greater supply, lower prices, and higher yields, Table F shows that sharply rising issuance has historically generally *not* resulted in sharply rising yields. This is because surging issuance often takes place amid times of economic distress, coinciding with high demand for safety from investors, while such periods are also associated with falling growth and inflation expectations, which, *ceteris paribus*, also helps keep yields in check.

Some observers argue that after years of spending down their savings and selling their holdings for riskier assets, U.S. households and commercial banks will rebuild their balance sheets by buying Treasuries. This is precisely what took place over the early 1990s as the U.S. banking system and households recovered from the real estate and credit crack-up of the savings and loan crisis. In Japan, households and especially

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<sup>2</sup> Goldman Sachs' model is a regression analysis based on one-year forward consensus forecasts of real GDP, inflation, three-month interest rates, and a trade-weighted average of competing foreign ten-year government yields.

<sup>3</sup> NDR's model is a regression based on the historical relationship of current core inflation, six-month T-bills, real German bond yields, and trend-line real GDP growth.

banks and other domestic institutions have readily bought bonds to support the massive fiscal spending Japan has undertaken. Buying Treasuries today would be a means for struggling banks to earning a decent net interest margin by, say, paying depositors 1.0% and buying Treasuries yielding 3.0% (and may even be quid pro quo for further government recapitalizations). Furthermore, by holding short-term rates near zero, the Fed hopes to push income-seeking households out along the curve.

Still, the question remains, is there enough potential demand today to absorb oncoming supply? Table G shows holdings of Treasuries as a percentage of financial assets for various sectors of the economy. As of fourth quarter 2008 the household sector<sup>4</sup> holds 0.7% of its financial assets in Treasuries, a near-record low. Likewise, commercial banks also hold a measly 0.7% of assets in Treasuries. If both of these sectors were to increase their holdings back to their post-1974 averages of 2.5% and 5.9%, respectively, this could amount to \$1.4 trillion in extra demand. Include insurance companies and pension funds returning to historical holdings, and potential demand for Treasuries could amount to \$1.8 trillion, if not higher should allocations move beyond historical averages. However, while sufficient domestic demand for Treasuries may eventually materialize, it is far from certain.

Importantly, domestic buyers are only half of the story. It is well known that foreign investors, most notably central banks in Asia, hold over 50% of outstanding U.S. Treasuries. This is in stark contrast to Japan, where domestic investors and institutions hold almost all of the outstanding government debt. Thus, foreign demand for Treasuries is a key part of the supply-demand equation. As Table H shows, the massive shift toward foreign purchases is a relatively recent occurrence. Both foreign and U.S. households held 23% of outstanding Treasuries at the end of 1995, with the surge in foreign, and especially Chinese, purchases taking place over the past decade as a direct result of booming global trade (Table I). It is unclear whether foreigners wish to absorb more U.S. debt. Many governments have openly voiced concern over their large exposure to US\$ assets, yet many countries are loathe to see their currencies potentially appreciate against the U.S. dollar, which would occur if they began to sell their holdings. And for now, the U.S. Treasury market remains the world's safe haven of choice, for better or worse.

Yet even without formal changes in foreign reserve policies, a natural slowdown in US\$ reserve accumulation should take place in the near term because foreign central banks have lower amounts of foreign exchange reserves to recycle due to the sharp slowdown in global trade. It is therefore unlikely that foreign buyers will be able to fill any substantial shortfall in Treasury demand. So while there is clearly potential for domestic investors to increase Treasury holdings going forward, there will likely remain a funding gap, implying upward pressure on yields.

As a rough estimate, J.P. Morgan employs a ten-year Treasury valuation model that, in addition to the outlook for inflation and real interest rates, takes into account the impact on yields of changes in borrowing from the government, corporate, and foreign sectors. Namely, larger government and corporate deficits require higher bond yields, while lower current account surpluses overseas imply less demand for

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<sup>4</sup> The household sector as measured in the Federal Reserve Flow of Funds is a residual term between the government, nonfinancial business, and financial sectors. Therefore, it also contains the "nonprofit" sector, which would include endowments and foundations.

US\$ assets and higher yields. Using CBO deficit estimates, the J.P. Morgan model implies that “fair value” for ten-year Treasury yields should be approximately 6.4% given the increase in the government deficit.

Such a rise in yields would clearly pressure U.S. financial markets, acting as a de facto tightening of monetary policy. Faced with such a reality, the Federal Reserve is left as the only “natural buyer” of excess issuance. J.P. Morgan argues that Fed purchases of government bonds will effectively offset the net supply coming to the market and therefore fair value for ten-year Treasuries is in the 2.5% to 3.1% range. However, in our view this does not negate the fact that issuance alone argues for much higher yields, and that without Fed intervention, the Treasury market looks fundamentally overvalued.

### **Diversifying the Deflation Hedge**

Recent developments only confirm our advice first advocated in December<sup>5</sup> that clients should seek to diversify their deflation hedges. This entails moving away from the intermediate to long end of the Treasury curve and toward a shorter-duration portfolio composed of mostly cash, short-duration bonds, and possibly TIPS.

At this juncture, it is worth reviewing the role of deflation hedges in the portfolio today. The primary role of a deflation hedge is to provide a source of funds for meeting cash flow needs, including spending, without having to sell equities and other risk assets that have fallen in value as the result of a severe economic contraction brought about by a malign deflationary environment that increases debt burdens and crushes nominal growth and profits. Treasury bonds have provided the best protection amid such an environment, as they lack corporate credit risk and their fixed nominal coupons and principal appreciate in *real terms* amid outright deflation, while most other assets lose value.

And this insurance has paid off; the Citigroup Ten-Year Treasury Index returned 33% from June 2007 to December 2008. However, with yields at current levels, it may be that investors have already received the bulk of any potential capital gains from holding such a hedge.

Today, we feel it is prudent for investors to seek to lock in a large part of the gains they have received from their deflation insurance by moving to cash and short-duration bonds. If the environment to come is truly deflationary, these assets will maintain their value and appreciate in real terms. Indeed, in a deflationary environment, cash does not yield 0%; it yields the rate of deflation.

Under normal circumstances, we would be less concerned about the impact of rising interest rates on the deflation-hedging part of the portfolio. Should rising rates reflect improving economic growth prospects, long-term government bonds would suffer, but gains in equity and equity-like assets would more than offset this bond weakness. However, today our concern is that we may see interest rates rise due to inflation

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<sup>5</sup> Please see our December 31, 2008, *Market Update: Expanded Quarterly Edition* Q&A section and our monthly *Notes on Current Valuations* publication.



concerns at the same time that economic growth remains weak. In other words, rising rates may hurt both Treasuries and risk assets at the same time. While *hoping* for the best, we would advise investors to *prepare* for the worst.

Implicit in our advice to diversify the deflation-hedging part of the portfolio is that we are comfortable giving up any potential return from lower long-term yields or even a period of stable yields, as we would rather reduce price risk going forward. This advice is an acknowledgement of our view that if deflation fears are overblown, the intermediate to long end of the curve is at risk, while if deflation is the scourge, clients are not giving up much return with yields at such low levels.

Table J illustrates this trade-off for the benchmark ten-year Treasury, yielding 2.7%. Should yields fall back to their recent low of 2.0%, the potential upside in price appreciation is a modest 6.2%. Should yields decline to a Japan-esque 1.0%, the potential price return climbs to 16%. However, a back-up in yields to our simple “fair value” of 4.0% would result in a 10.5% loss, while a climb to the 6.0% fair value implied by the J.P. Morgan model based on expected government deficits (sans Fed intervention) results in a 24% loss. The latter example may be extreme in the current environment, but it highlights the structural price risk facing Treasuries; namely, that the risk/return trade-off has grown somewhat asymmetric. And as yields move lower, this trade-off becomes more acute. At starting yields of 2.0%, ten-year Treasuries have a potential upside of roughly 20% *should yields fall all the way to zero*, while losses of over 15% are possible should yield rise above 4.0%.

Table K highlights the characteristics and approximate price sensitivity for buckets of the Barclays Capital (formerly Lehman Brothers) Treasury Index.

- Short-term Treasuries (one- to three-year maturity range) currently yield a minute 0.8% and effectively offer no upside price potential. However, such bonds are much less sensitive to changes in interest rates. Should rates rise to 4.0% (which would be a very large move for the front of the curve), such a portfolio would suffer only a 5.8% loss.
- Intermediate Treasuries (five- to ten-year maturity range)<sup>6</sup> are the least attractive part of the curve in our opinion. While offering a yield of 2.27%, with duration of 6.5, they offer an un compelling risk-reward trade-off. Yields falling to 1.0% would result in gains of only 8.5%; while a back-up in yields to 4.0% (assuming the Fed was unsuccessful in its attempts) would see these bonds lose 10.4%.
- Long-term Treasuries (maturity of ten years or more), currently yield 3.5% with a duration of 12.3, making such bonds the most sensitive to changes in interest rates and inflation expectations. However, their higher yields do offer more compensation than does the intermediate part of the curve, albeit with much higher volatility. A fall in yields to 2.0% would generate a potential return of 20%, while a 26% loss would result should yields move to 6.0%.

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<sup>6</sup> This definition differs from that of the Barclays Capital Intermediate Treasury Index, which covers all bonds in the one- to ten-year range.

For those seeking to capture additional return from a potential fall in bond yields (or a prolonged period of low yields), Table L displays a series of “barbell” portfolios composed of T-bills and the Barclays Capital Long-Term Treasury Index, with a starting yield of 3.5% for the long-bond portfolio.<sup>7</sup> While an approximation, it shows how the barbell approach can effectively shorten the duration of the portfolio. For example, a portfolio of 50% cash and 50% long-term Treasuries would still generate a potential 10% price gain should long-term yields fall to 2.0% (compared to a 20% gain for a 100% long-bond portfolio). Should yields back-up to 6.0% (something the Fed would not allow without a fight), the portfolio would lose only 13%, compared to 26% for a long-bond portfolio. A portfolio of 30% long-term Treasuries and 70% cash provides even more downside protection from rising yields. Such a mix offers an effective yield of 1.18%, while offering a 6% potential gain should yields fall to 2.0%, and only a 7.7% loss should yields rise to 6.0%.

Another option is to add TIPS into the deflation hedge. As we recently highlighted, the return profile of TIPS is relatively attractive given the low level of breakeven inflation expectations.<sup>8</sup> While TIPS will underperform nominal Treasuries in a deflationary environment, their outperformance amid inflation may offset the drag during deflation. TIPS would be expected to perform best under a stagflationary scenario where real economic growth is weak, and inflation and interest rates are rising, something that cannot be ruled out today.

However, the TIPS market is less liquid than the nominal Treasury market, a fact painfully on display last fall when real yields blew out. TIPS funds also tend to have a longer duration,<sup>9</sup> making them more volatile than short-duration bonds. With the Fed expressing the possibility of purchasing TIPS as well, these bonds may also become expensive in the near term, although given their inflation-hedging properties, we would still view them as attractive relative to nominal Treasuries.

The bottom line is that the Treasury market today is under a series of competing pressures—deflation versus inflation, heavy issuance versus central bank intervention—that make us more concerned than normal about the ability of longer-term Treasuries to provide as safe a harbor going forward.

While we think all investors would benefit from shortening duration in the current environment to eliminate undue price risk, the exposure should relate to investors’ ability to take price risks. The more an investor is concerned with stability of principal and meeting short-term liquidity needs, the more the deflation-hedging part of the portfolio should be oriented toward very short-term bonds and cash, as the risk of loss in an inflationary (or rising interest rate) environment is greatly reduced.

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<sup>7</sup> Given current 90-day T-bill yields of 0.1%, we assume that the T-bill allocation has an effective return of 0% for changes in yields, assuming the bill is held to maturity.

<sup>8</sup> Please see our November 2008 Market Commentary *Inflation-Linked Bonds in a Deflationary Environment*.

<sup>9</sup> Depending on the index provider used, the duration for TIPS ranges from 5.5 to 8.0.

## Conclusion

To paraphrase a recent remark by investment strategist James Montier,<sup>10</sup> “There is a clear speculative case for buying Treasuries today, but not an investment one.”

Before the global credit bust is over, long-term Treasury yields, aided by central bank buying, may very well fall below their current levels. A retesting of the December lows in U.S. Treasuries is quite feasible, while the long-term low in ten-year U.S. Treasuries of 1.55% in 1945 was also aided in part by Fed purchases. Japanese ten-year government bond yields reached 0.7% on March 31, 2003, amid a banking bust. And despite bond yields dipping below 3.0% in the late 1990s, the Japanese bond market has still generated a *real* average annual compound return of 2.5%, or cumulative return of 33.6% since 1997, while the Japanese stock market has gone nowhere but down.

However, today the outlook for the future direction of interest rates and inflation is exceptionally clouded and investors should *not* make explicit bets on the path of either. Rather, investors need to make sure they are properly positioned to withstand both a long, drawn out deflation and a potentially unexpected rise in inflation and interest rates. At current yields, Treasuries are already priced for the former, while offering little compensation for the latter.

Deflation is likely to persist over the near term. Should policymakers across the globe achieve their goal of reflating their economies, the odds tilt toward a return to inflation at some point in the future and higher interest rates across the yield curve. The timing of this shift from deflation to inflation is unclear. It is likely that those who try to perfectly “time” the bond market will be unsuccessful, given that investors are likely to be caught in the middle of a global game of “chicken” between central banks.

Instead, investors should take advantage of the recent rally in Treasuries to rebalance allocations back to target and actively seek to shorten their duration exposure. Diversifying the traditional deflation-hedging part of the portfolio to include a barbell-type strategy of holding mostly T-bills and/or short-duration bonds alongside longer-term Treasuries and perhaps inflation-linked bonds makes sense today. While shortening duration will sacrifice potential “upside” from any rallies in long-term Treasuries, amid a deflationary environment such an allocation can provide for liquidity and spending without exposing investors to undue price risk should interest rates rise.

At a minimum, investors need to be cognizant of the issues facing Treasuries and take advantage of the current rally to rebalance back to target allocations.

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<sup>10</sup> James Montier, formerly of Dresdner Kleinwort, is now co-head of Global Strategy at Société Générale’s Cross Asset Research Group.

## Appendix

### A SIMPLE APPROACH TO BOND VALUATION

We view government bond yields as comprising two basic components: a real yield, which is tied to economic growth expectations, and inflation compensation. For instance, since the early 1960s (when the modern Treasury market came into its own), ten-year Treasury yields have averaged roughly 7.0%, reflecting average annual real GDP growth of 3.4% and average annual inflation of 4.3%. Even excluding the inflationary 1970s and 1980s, ten-year Treasury yields have averaged roughly 6.0% over the past 20 years ending in 2007, composed of 3.0% real GDP growth and 3.1% inflation.

Based on the observed behavioral trait that investors “anchor” their future expectations on the recent past, we have developed a simple ten-year Treasury valuation model using trailing ten-year average annual real GDP growth as a proxy for trend economic growth (and therefore the real yield) and trailing ten-year average annual inflation as the inflation compensation proxy. The combination of these two variables represents our estimate of the full cycle “fair value” of ten-year Treasury yields. Over- and undervaluation can be derived by the gap between current yields and implied fair value, with yields above fair value being viewed as “cheap” and below fair value as expensive. Tables M and N show this fair value estimate relative to actual ten-year Treasury yields over time, and show the degree of over/undervaluation based on the ratio (percentage) of current yields to fair value, expressed in standard deviation units, or a normalized “z-score.”<sup>1</sup>

Like all of our valuation work, such a metric is not intended to be a trading tool, but rather an approximation of what investors should expect to be compensated for over a full investment/economic cycle. It is not “the correct level,” but rather a baseline from which to compare current economic conditions and yields. While very simplistic, this model does a decent job of explaining the historical record. Treasury yields were too low during the 1960s for a fast growing economy, reflective of a loose monetary policy that helped fuel the inflation of the 1970s. Indeed, bond yields were also too low for much of the 1970s. It was not until the early 1980s, when inflation was skyrocketing, that Treasury yields overshot, becoming 2 standard deviations cheap on our measure. From the mid-1980s to 2000 Treasury yields fluctuated around “fair value” until again becoming structurally too low during the first part of this decade (Greenspan’s famous “conundrum”), largely due to foreign central bank recycling of reserves pushing yields down. Over 2002 and 2003 our model implied Treasuries were 2.5 standard deviations overvalued, only briefly returning to fair value between June 2006 and June 2007 when yields breached 5.0%. And from these levels they have steadily moved lower throughout the credit crisis.

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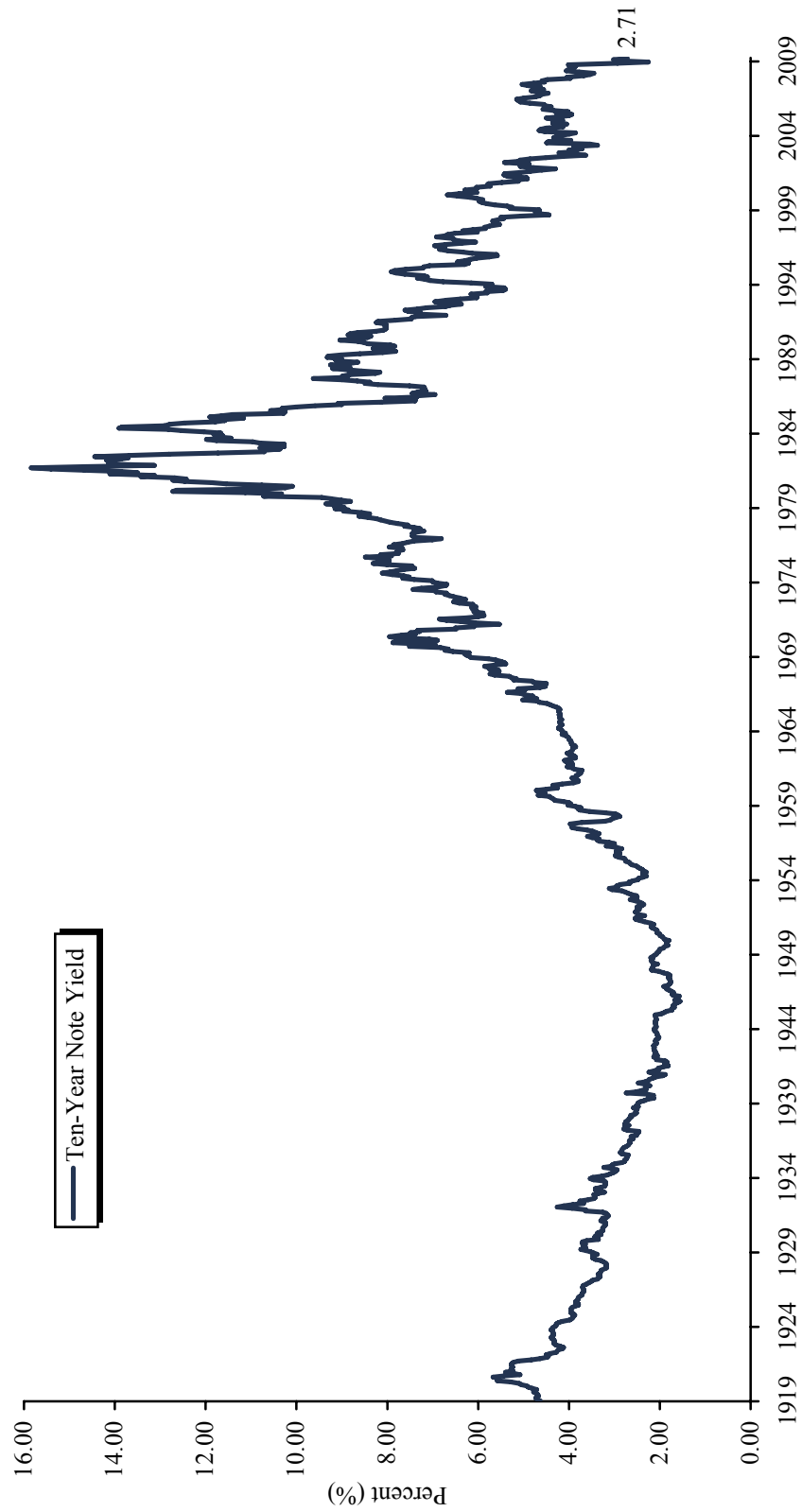
<sup>1</sup> This is simply to say that for each point in time, we have subtracted the current yield ratio from the “average” ratio since 1960 and divided the difference by the standard deviation of all ratios. In some sense this can be viewed as the “error term” of the model, or the yield compensation that is not captured by trailing GDP and inflation. On average yields have been above fair value by 13%, or by 54 basis points (bps), with a range of 18%, or 110 bps, considered “normal.”

At the end of 2008, the model implied a fair value yield of 4.82%, compared to the actual 2.25% level; a record 5.6 standard deviations overvalued. However, this clearly overstates the case given the backward looking nature of our inputs; like most “models” it does reasonably well “fitting” the past, but performs poorly at major turning points in the economy. And clearly there has been a changing of the economic tides.

Plugging consensus forecasts for real GDP growth and inflation for 2009 of -2.8% and -0.9%, respectively, into our trailing ten-year figures produces a “fair value” yield of 4.0%, composed of roughly 2.0% “trend” GDP growth and 2.0% inflation. Comparing this figure to current yields of 2.70%, ten-year Treasuries are a more realistic 1.9 standard deviations overvalued.

At this juncture, we consider such expectations as at least reasonable assumptions (although imperfect) going forward. Real GDP growth of around 2.0% is a feasible assumption for the U.S. economy, while 2.0% inflation, though low historically, implies that investors at least receive some compensation going forward. And as economic conditions change, so will the rolling inputs of the model and the consensus expectations, thus “fair value” will slowly adjust. As always, valuation work is largely a qualitative assessment of the current and future environment based on quantitative tools, such as these, to give a framework in which to make decisions.

**Table A**  
**U.S. TREASURY TEN-YEAR NOTE**  
**January 31, 1919 – March 31, 2009**

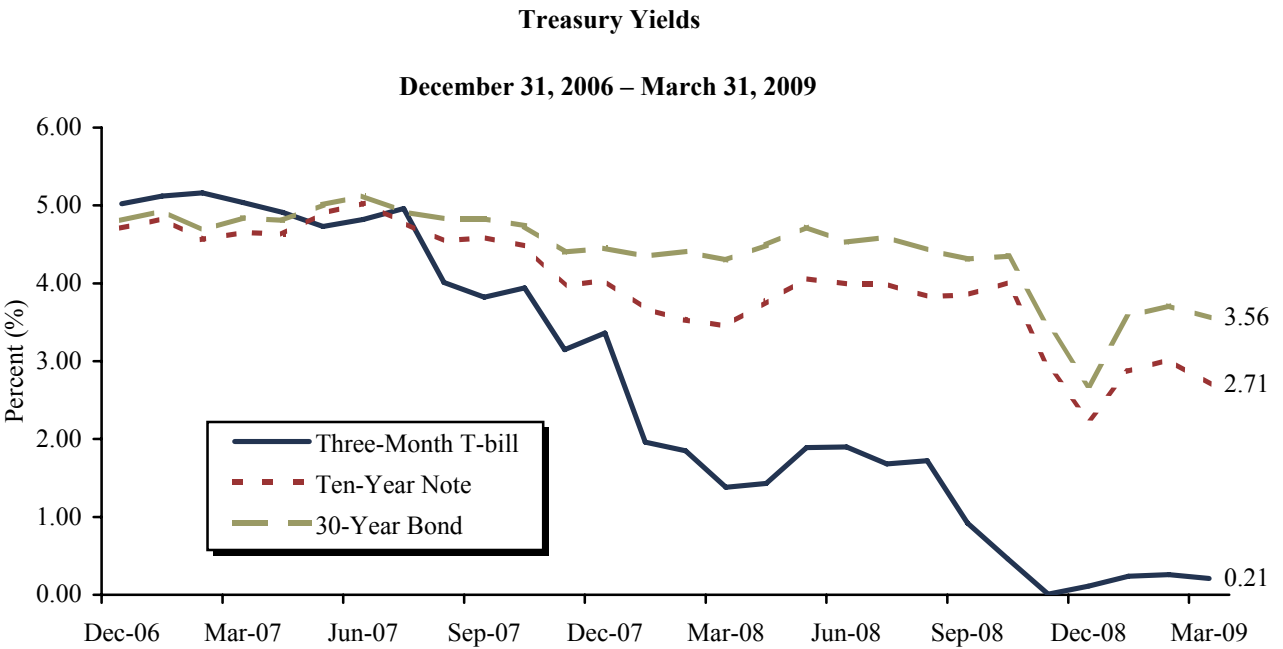
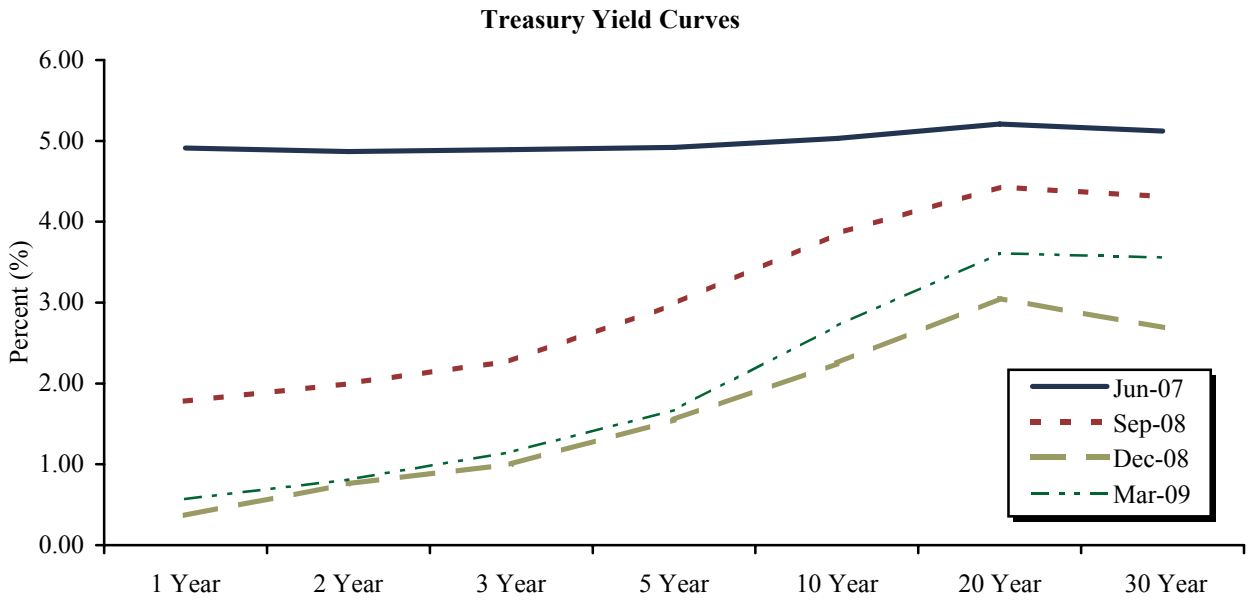


Sources: Global Financial Data, Inc. and Thomson Datastream.

Note: Graph represents monthly data.

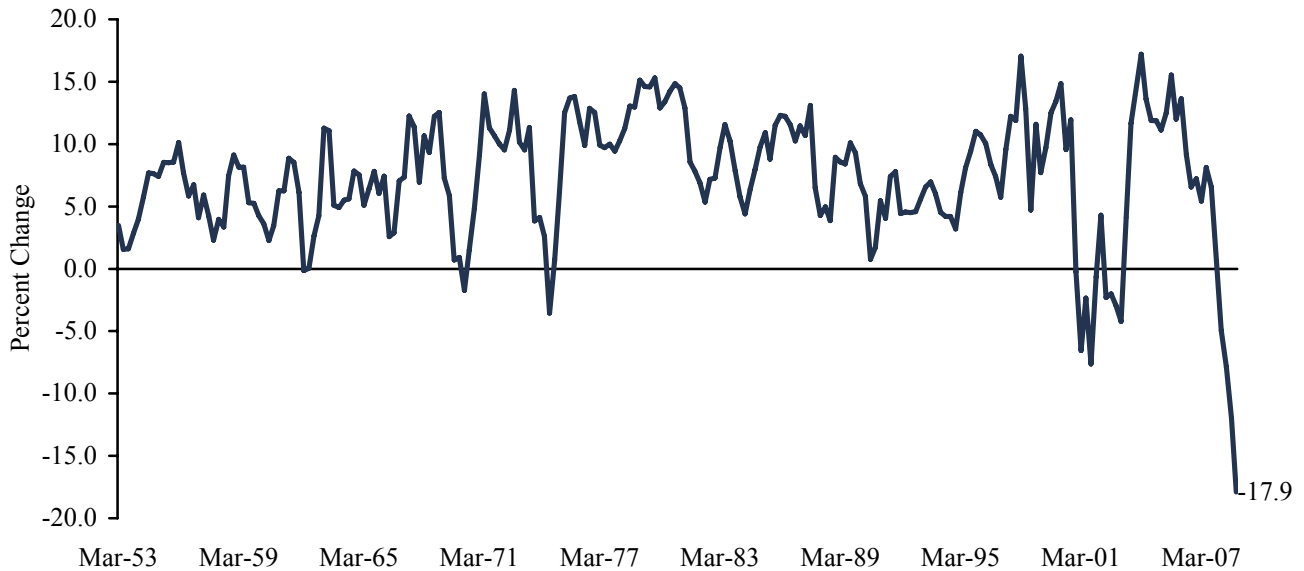
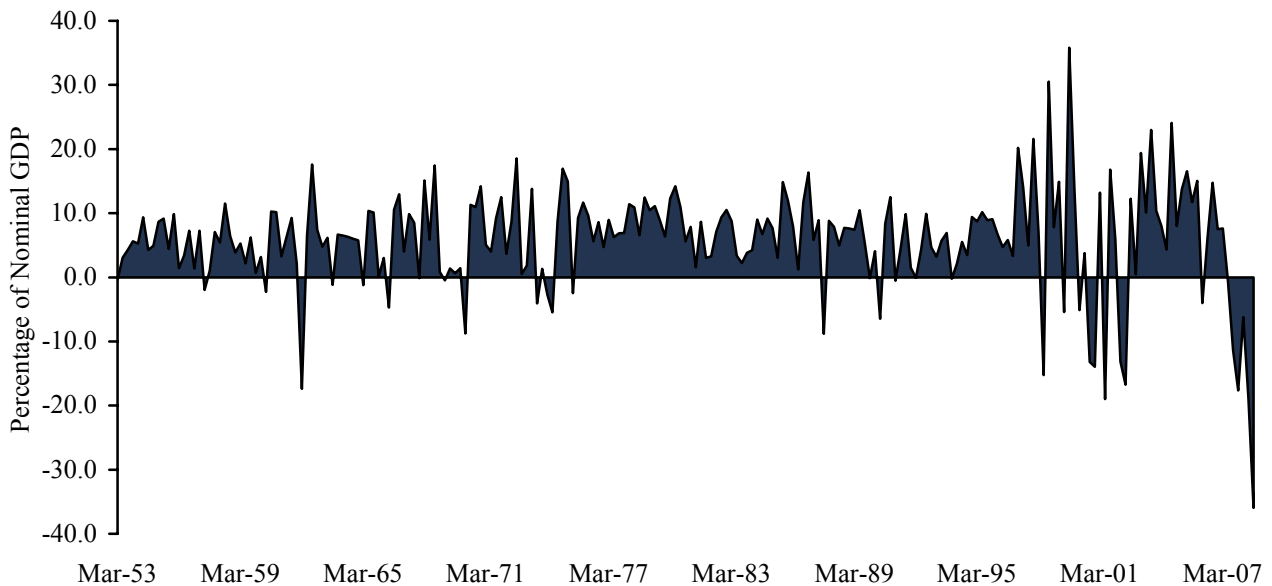
**Table B**

**TREASURY YIELD CURVE**



Sources: Federal Reserve and Thomson Datastream.

Note: Data are monthly and based on the Federal Reserve constant maturity series.

**Table C****U.S. HOUSEHOLD WEALTH****First Quarter 1953 – Fourth Quarter 2008****Household Net Worth (Year-Over-Year Change)****Quarterly Change in Household Net Worth as a Percentage of Nominal GDP**

Sources: Federal Reserve and Thomson Datastream.

Note: Data are quarterly and from Federal Flow of Funds.

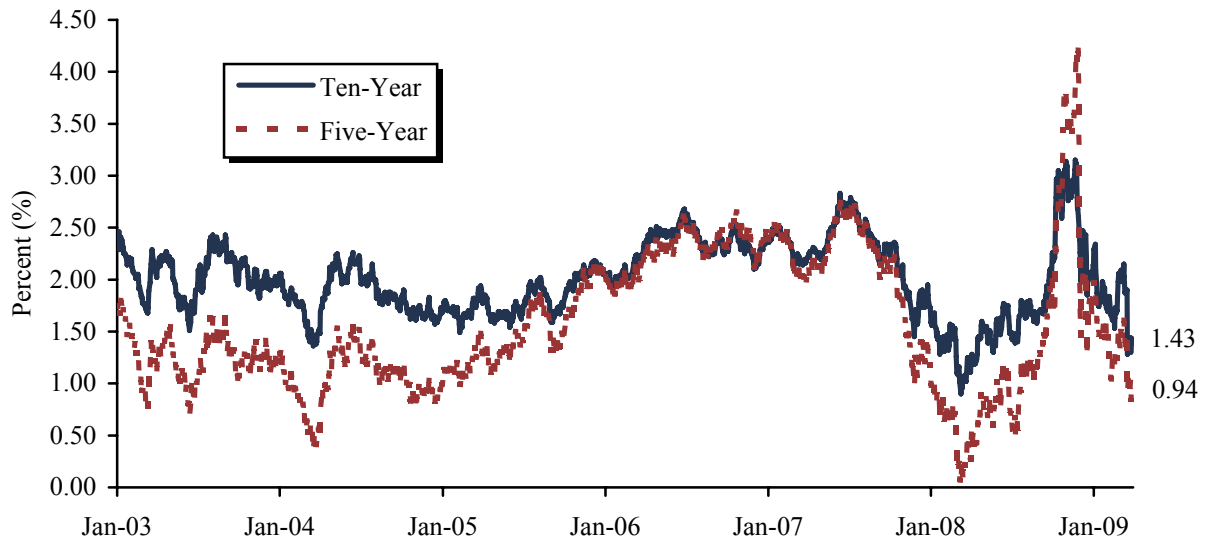


Table D

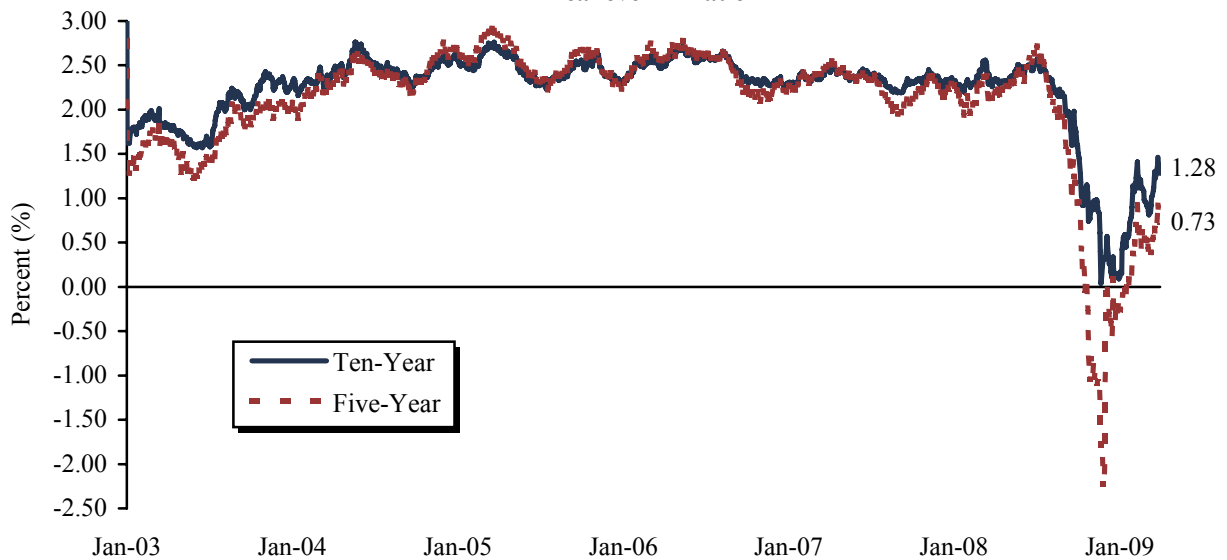
U.S. INFLATION-LINKED GOVERNMENT BOND YIELDS

January 1, 2003 – March 31, 2009

Real Government Bond Yields



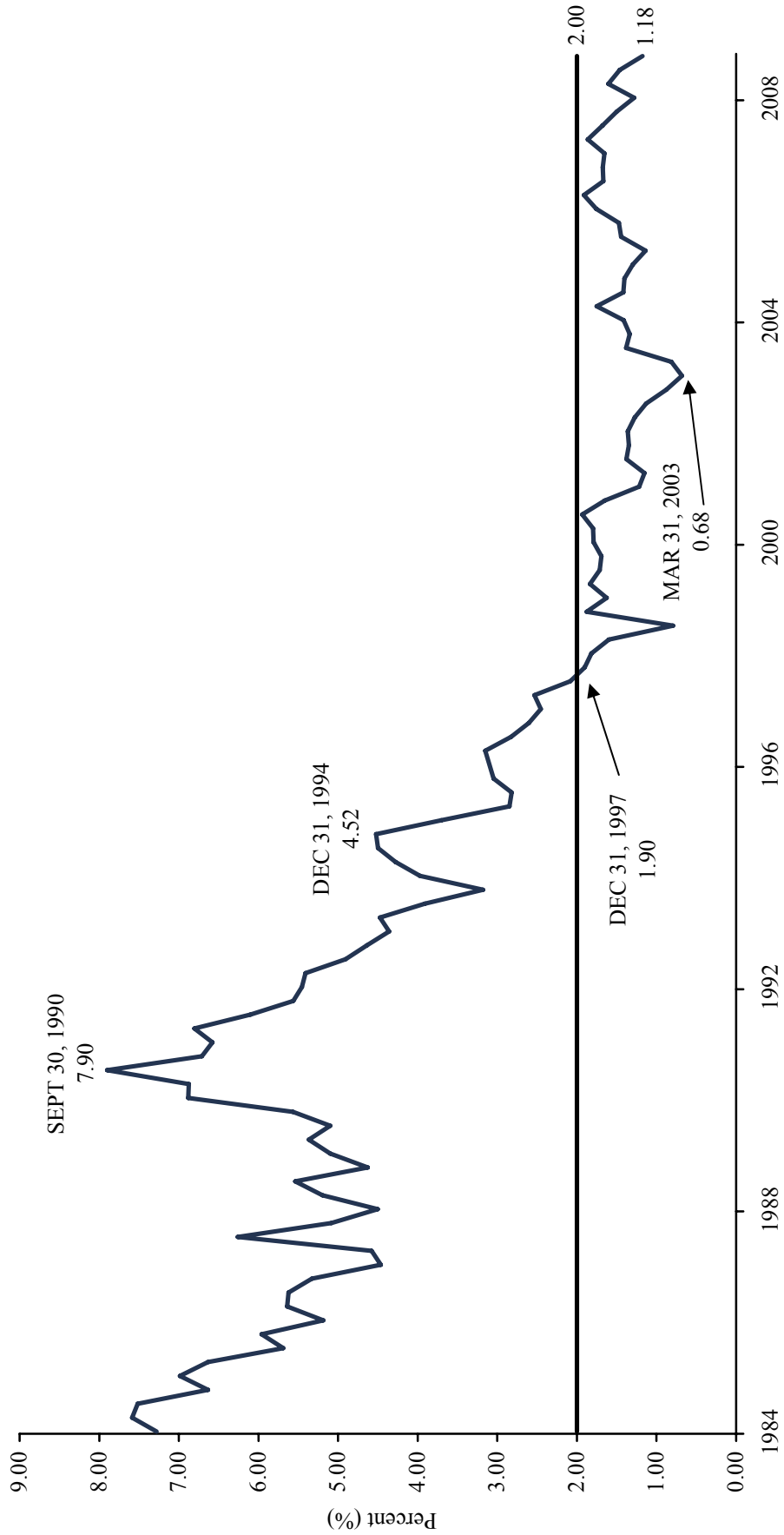
Breakeven Inflation



Sources: Federal Reserve and Thomson Datastream.

Note: Data are based on the Federal Reserve constant maturity series.

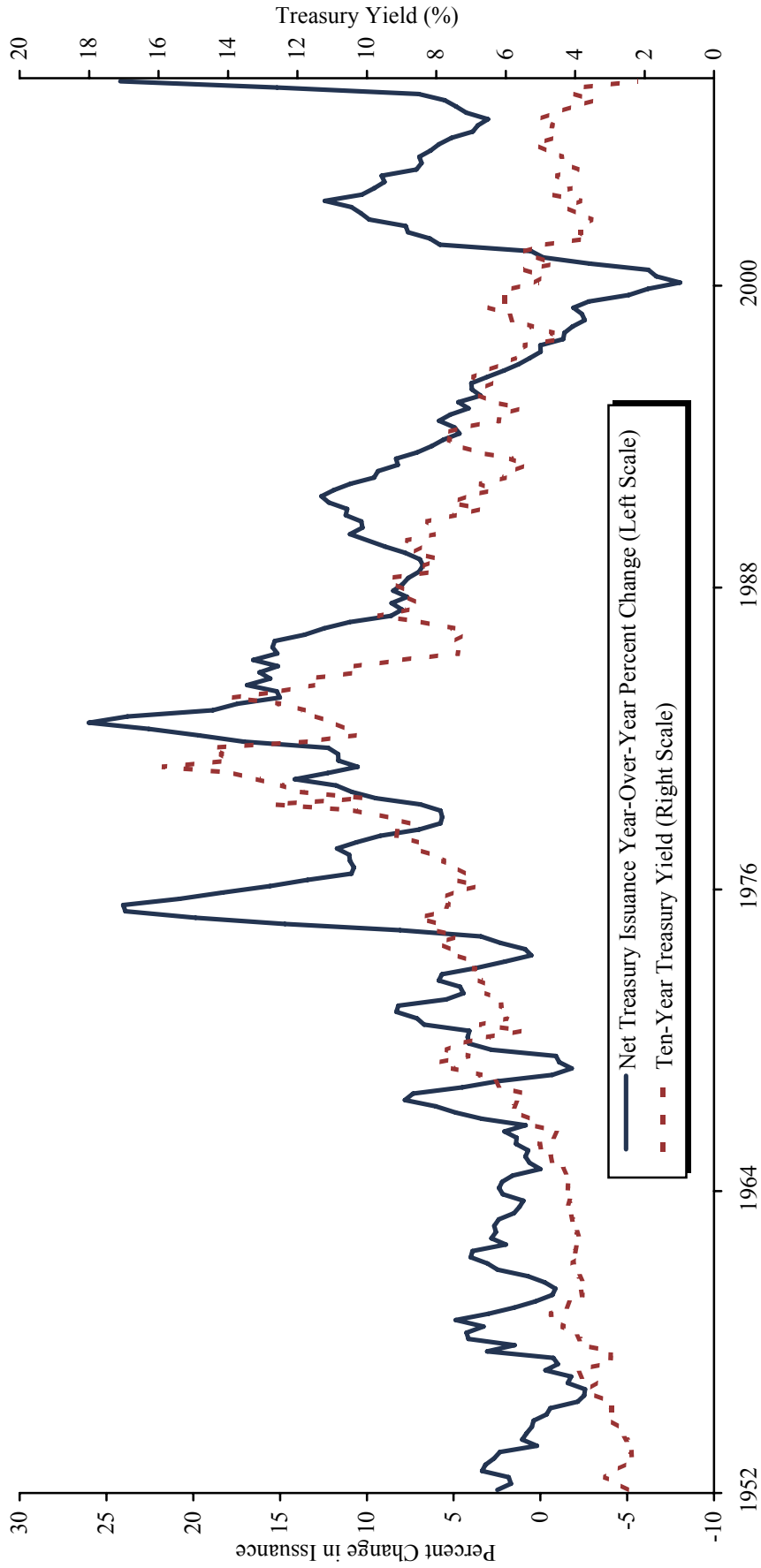
**Table E**  
**JAPANESE TEN-YEAR GOVERNMENT BOND YIELD**  
**First Quarter 1984 – Fourth Quarter 2008**



Sources: Global Financial Data, Inc. and Thomson Datastream.

Note: Data are quarterly.

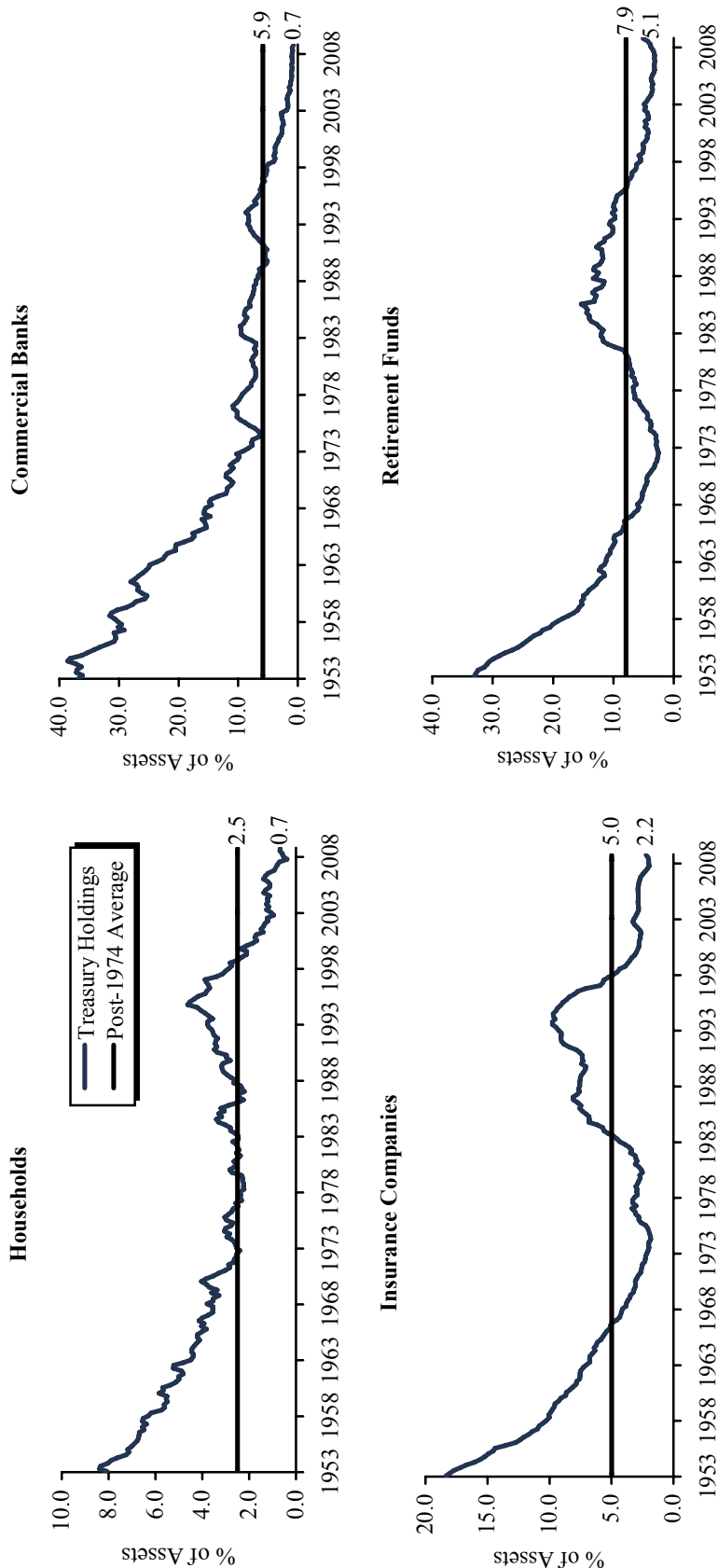
**Table F**  
**TREASURY SUPPLY AND YIELDS**  
**Fourth Quarter 1952 – Fourth Quarter 2008**



Sources: FactSet Research Systems, Federal Reserve, and Global Financial Data, Inc.

Notes: Data are quarterly. Ten-year Treasury yield data prior to 1962 are calculated by Global Financial Data, Inc.

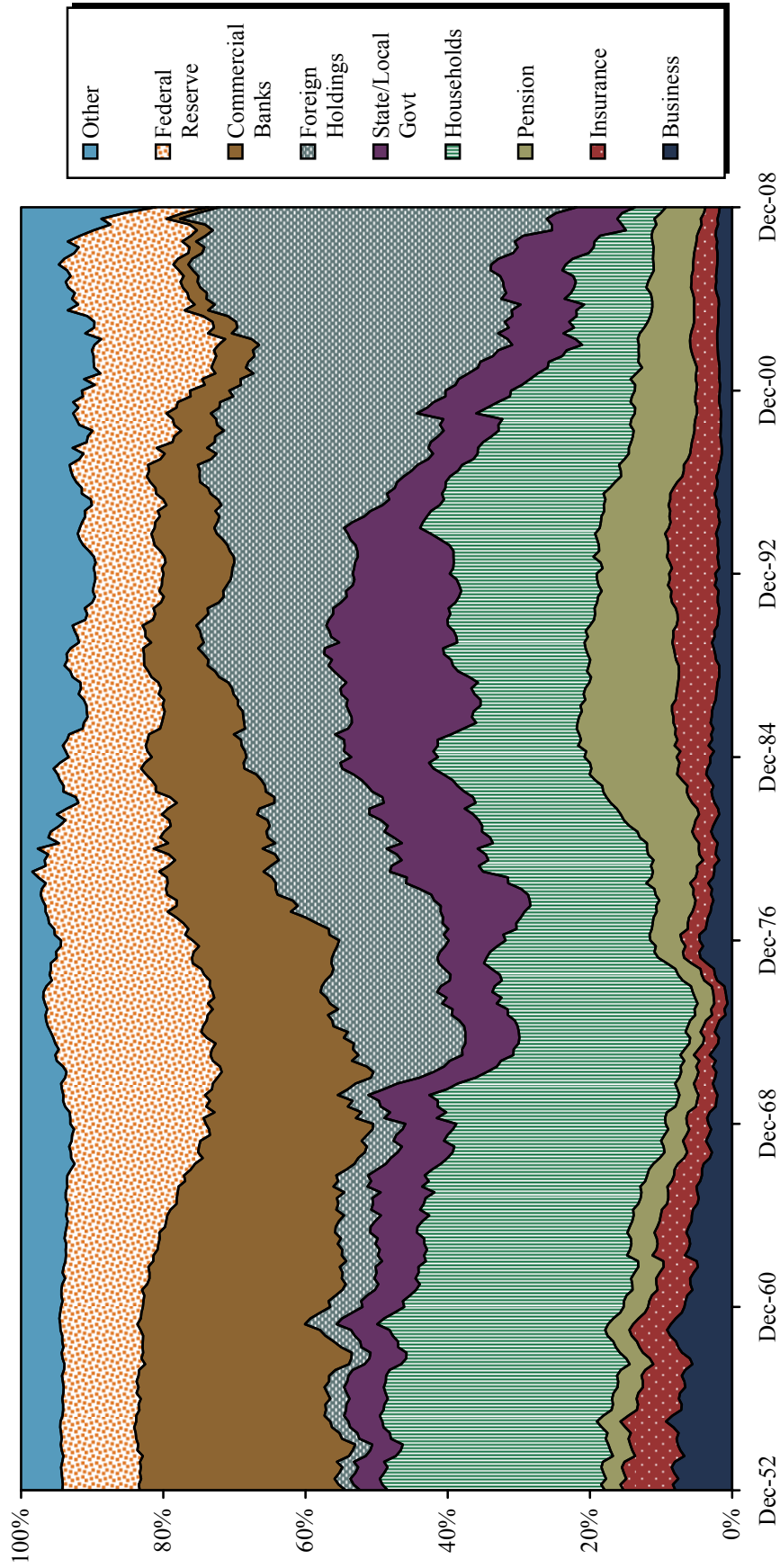
**Table G**  
**TREASURY HOLDINGS AS A PERCENTAGE OF FINANCIAL ASSETS**  
**First Quarter 1953 – Fourth Quarter 2008**



Sources: Federal Reserve and Thomson Datastream.

Notes: Data are quarterly. All data are expressed as a percentage of financial assets. All averages are based on data post 1974. Household data include nonprofits. Retirement funds include private pension funds and state and local funds.

**Table H**  
**HOLDERS OF U.S. TREASURIES**  
**Fourth Quarter 1952 – Fourth Quarter 2008**



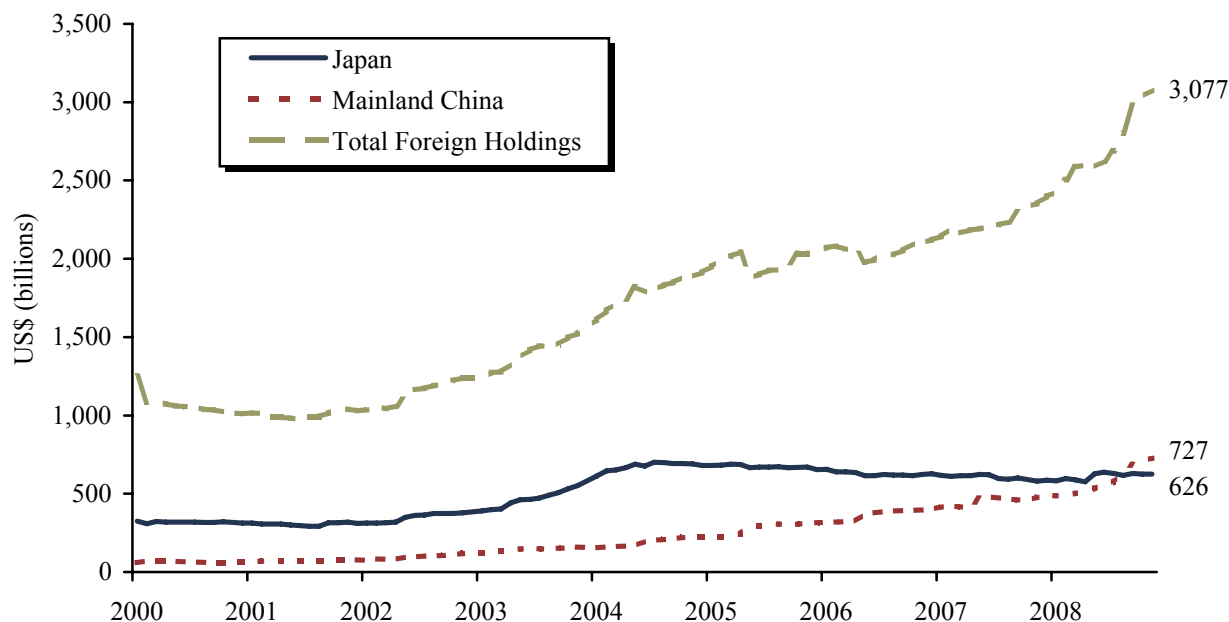
Sources: Federal Reserve and Thomson Datastream.

Notes: Data are quarterly and from Federal Flow of Funds. Households data include nonprofits. Pensions include both private and state government funds.

Table I

## FOREIGN HOLDINGS OF U.S. TREASURY SECURITIES

February 29, 2000 – December 31, 2008



## Percentage of Total U.S. Treasury Securities (%)

	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
Japan	10.7	10.7	11.8	15.4	17.5	16.1	14.4	12.8	10.8
Mainland China	2.0	2.6	3.7	4.4	5.7	7.4	9.2	10.6	12.6
Total Foreign Holdings	34.2	35.0	38.6	42.6	47.8	48.8	48.7	52.1	53.3

## Percentage of Total Foreign-Held Treasury Securities (%)

	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
Japan	31.3	30.6	30.5	36.2	36.6	32.9	29.6	24.7	20.3
Mainland China	5.9	7.6	9.6	10.4	11.8	15.2	18.9	20.3	23.6

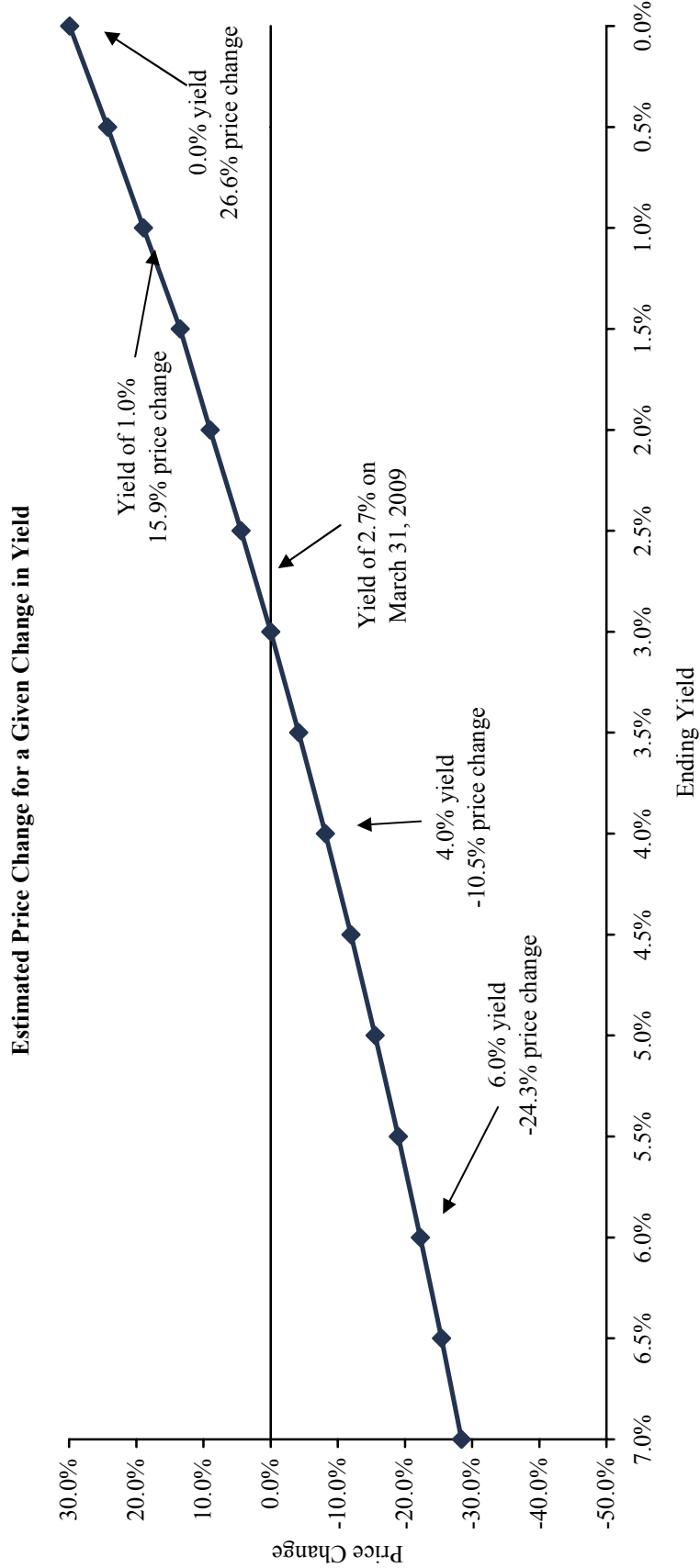
## Annual Growth in Holdings (%)

	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
Japan	-2.5	0.1	18.9	45.7	25.3	-2.9	-7.0	-6.9	7.9
Mainland China	1.5	30.3	50.6	34.3	40.2	39.1	28.0	20.3	52.3
Total Foreign Holdings	-18.9	2.5	19.1	23.0	23.8	7.9	3.4	11.8	30.9
Total U.S. Treasury Securities	-7.8	0.0	8.0	11.5	10.3	5.6	3.8	4.5	27.8

Source: U.S. Department of Treasury.

Notes: Estimated foreign holdings of U.S. Treasury marketable bills, bonds, and notes reported under the Treasury International Capital reporting system are based on annual Surveys of Foreign Holdings of U.S. Securities and on monthly data. Percentage growth figure for 2000 reflects changes in holdings from February 29, 2000, through December 31, 2000. All other annual data are as of December 31.

**Table J**  
**ESTIMATED PRICE CHANGE AT VARIOUS ENDING YIELDS**  
**FOR TEN-YEAR TREASURY NOTE WITH AN INITIAL YIELD OF 2.7%**

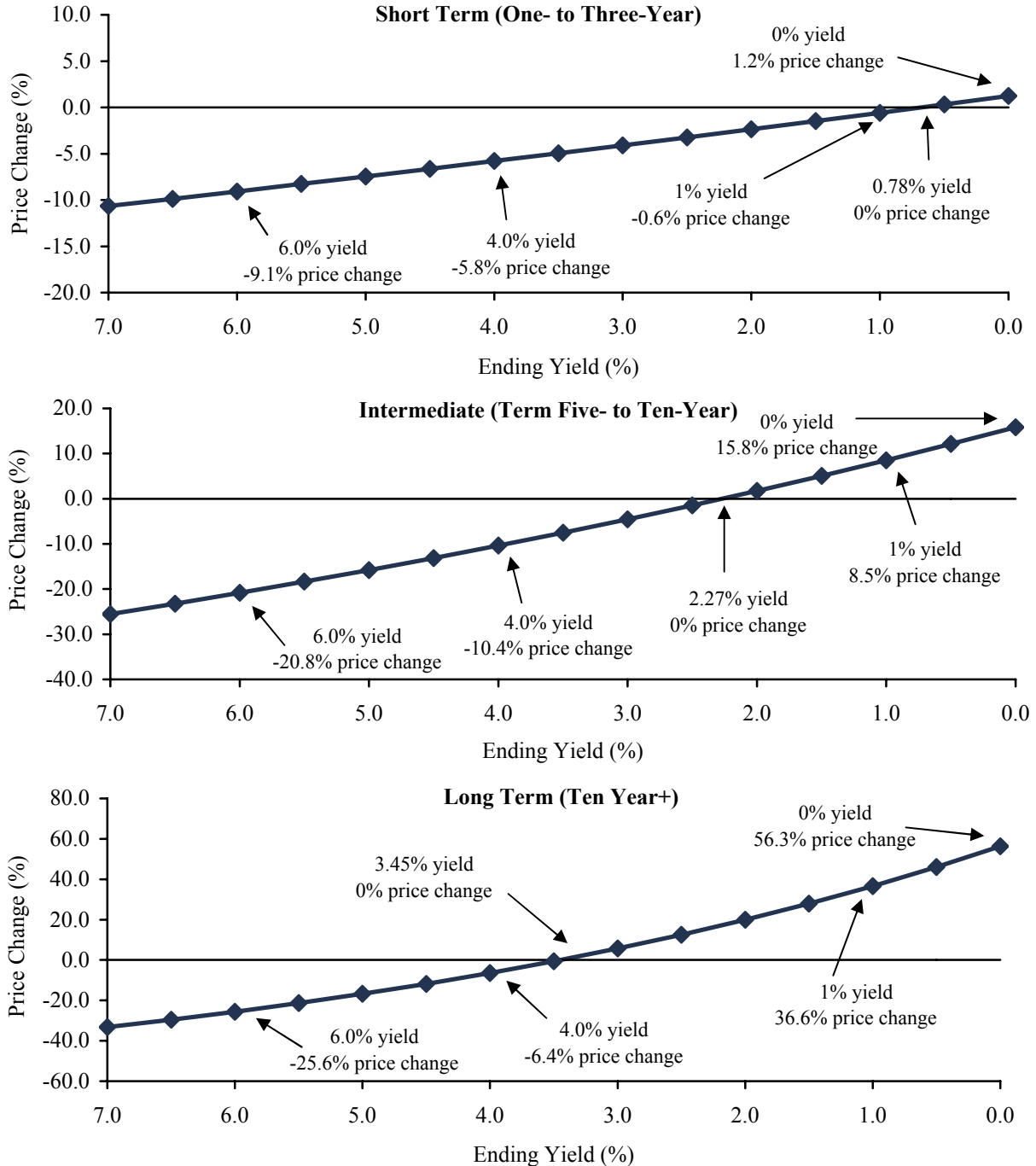


Source: Bloomberg L.P.

Note: Based on benchmark ten-year Treasury issue with a 2.75% coupon and February 15, 2019, maturity date.

**Table K**

**TREASURY PORTFOLIO ESTIMATED PRICE CHANGES AT VARIOUS ENDING YIELDS**

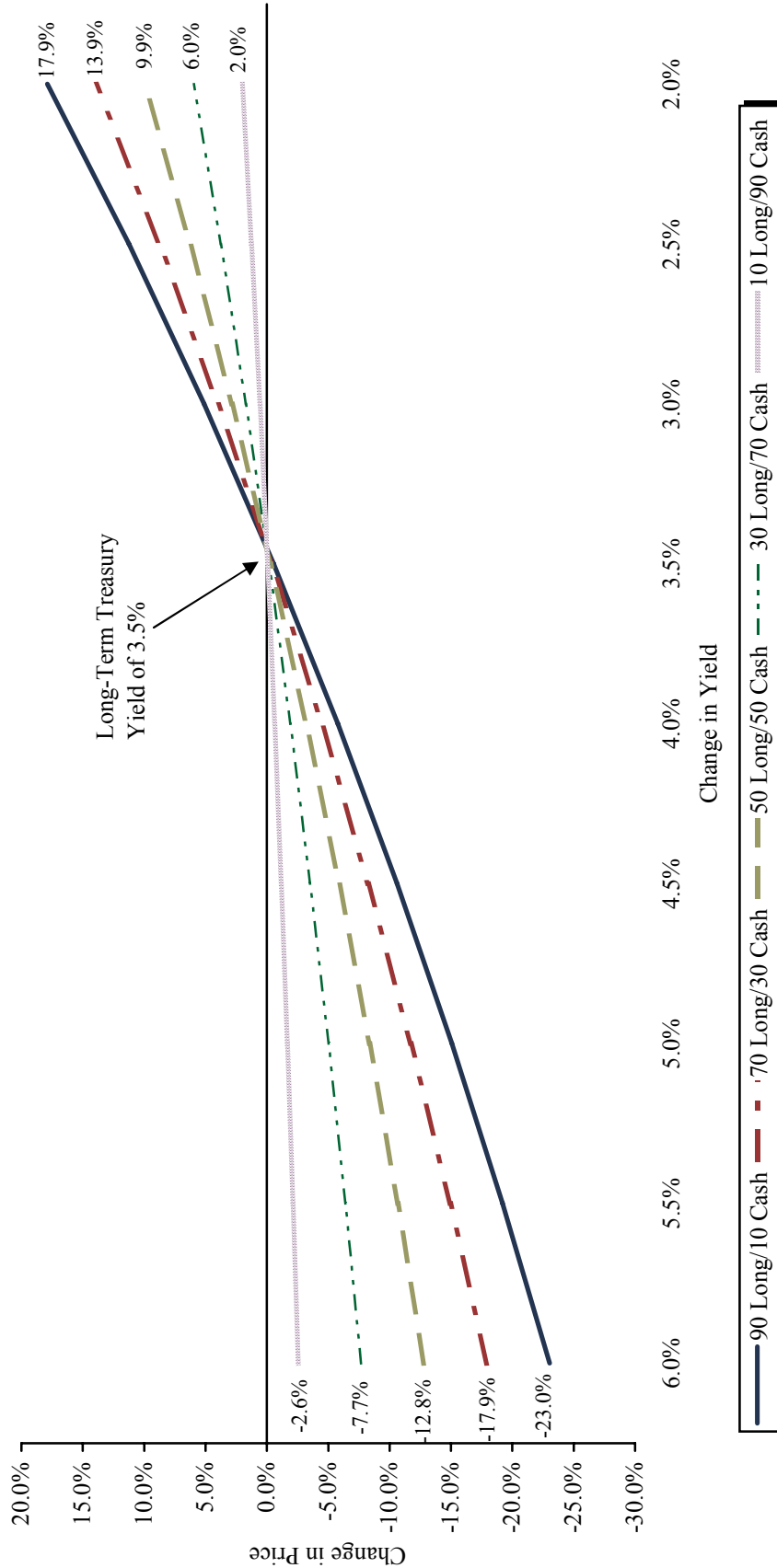


Sources: Barclays Capital and Cambridge Associates LLC.

Note: Based on Barclays Capital Treasury Bond indices as of March 31, 2009.



**Table L**  
**ESTIMATED PRICE CHANGE AT VARIOUS ENDING YIELDS**  
**FOR PORTFOLIOS OF BARCLAYS LONG-TERM TREASURY INDEX AND CASH**



Sources: Barclays Capital and Cambridge Associates LLC.

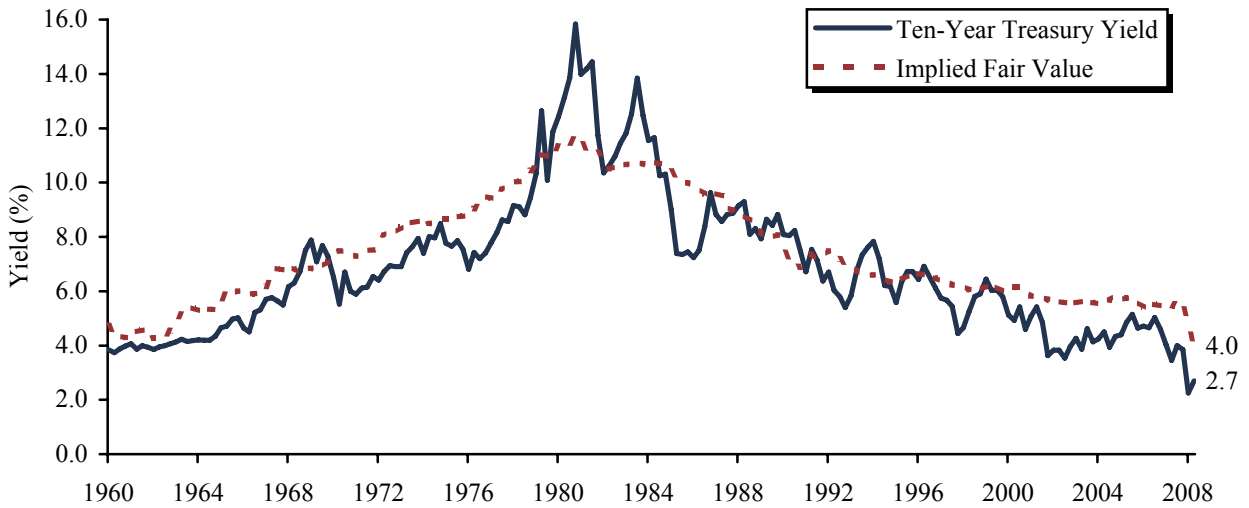
Notes: Based on Barclays Capital Long-Term U.S. Treasury Index and 91-Day T-bill. Using data as of March 31, 2009, we assume a coupon of 6.2% and a maturity of 18.6 for the Long-Term U.S. Treasury Index. Cash returns are assumed to be 0%. This is based on the assumption that T-bills are marked at cost and hold until maturity, and therefore do not suffer any loss from changes in interest rates.

**Table M**

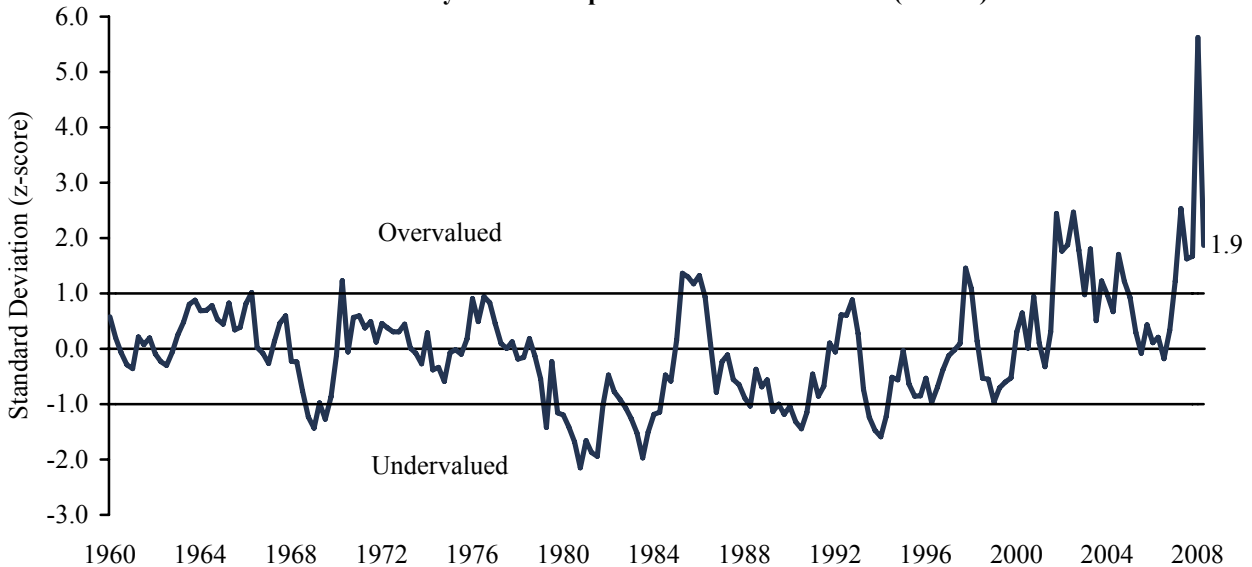
**TREASURY VALUATIONS**

**Fourth Quarter 1960 – First Quarter 2009**

**Ten-Year Treasury Yield vs Implied Fair Value**



**Ratio of Treasury Yield to Implied Over/Undervaluation (z-score)**



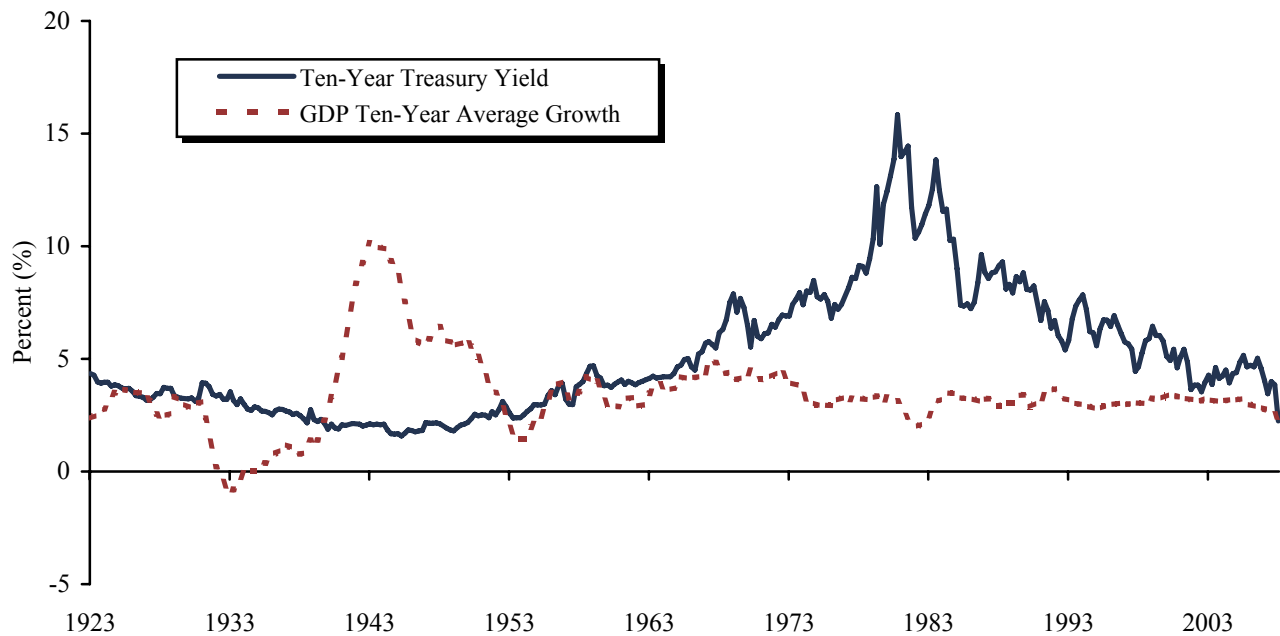
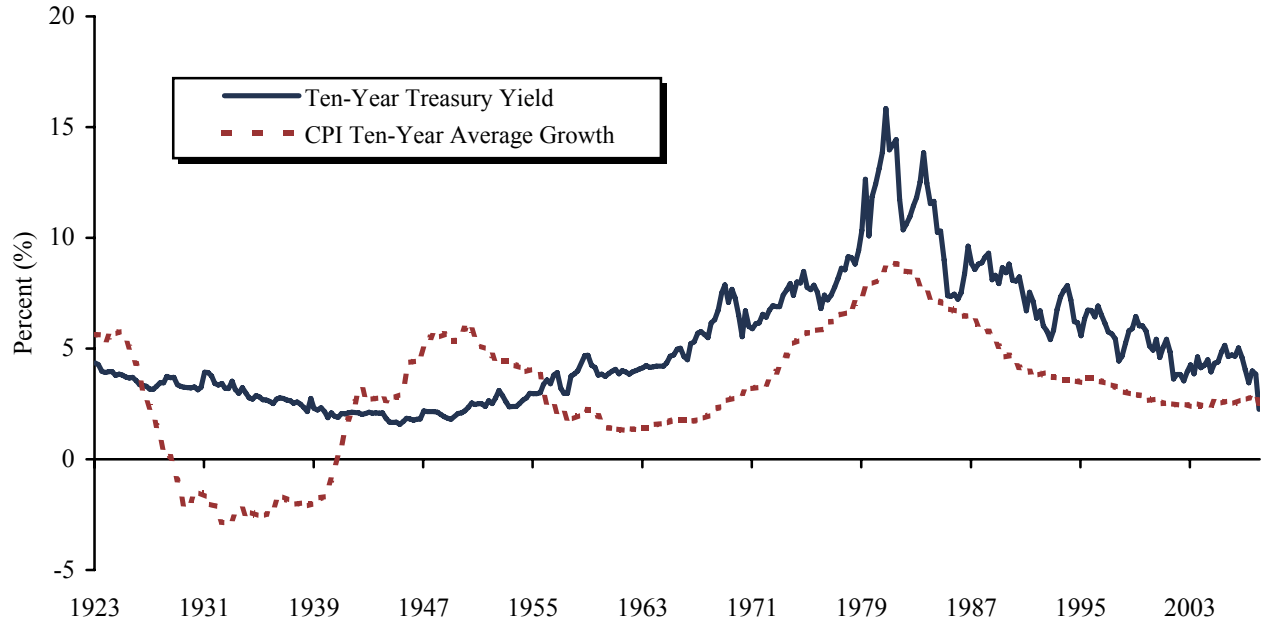
Sources: Global Financial Data, Inc. and Thomson Datastream.

Notes: All data are quarterly. Ratio figure for first quarter 2009 is based on Consensus Economics forecasts. Implied fair value is ten-year average CPI plus ten-year average GDP.

Table N

## U.S. TEN-YEAR TREASURY YIELDS VERSUS CPI AND GDP

Fourth Quarter 1923 – Fourth Quarter 2008



Sources: Global Financial Data, Inc., Thomson Datastream, and U.S. Department of Labor - Bureau of Labor Statistics.

Notes: Data are quarterly. GDP and CPI data are shown as ten-year average annual compound return figures. Prior to 1947, annual GDP data has been interpolated to show quarterly GDP growth.