



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

GLOBAL MARKET COMMENTARY

INFLATION-LINKED BONDS IN A DEFLATIONARY ENVIRONMENT

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Inflation-Linked Bonds in a Deflationary Environment: Worth Buying or Has the Moment Passed?

Over October and November inflation-linked government bond markets across the globe became unhinged, with yields rising sharply (and prices falling) despite these bonds carrying the same “full faith and credit” backing as their nominal counterparts. Indeed, October was the worst month on record for inflation-linked bonds, with the Barclays Global Inflation-Linked Bond Index returning -7.1% in local currency terms and the U.S. TIPS (Treasury Inflation-Protected Securities) subindex returning -8.3%. Over the year ending in November, both indices have posted their worst rolling 12-month performance since inception in 1997, returning -4.4% and -6.3%, respectively.

On the surface, the poor performance of inflation-linked bonds reflects a dramatic shift from commodity-fueled stagflation concerns earlier in the year (during which these bonds perform strongly) to outright deflation fears amid expectations of a global recession following a tumultuous autumn. However, the sharp back-up in yields also reflected the reintroduction of a large liquidity premium, as investors dashed to the safety and liquidity of the deeper nominal government bond markets (especially U.S. Treasuries), combined with forced selling by leveraged holders of inflation-linked bonds and constrained market makers caught in the wave of deleveraging sweeping across the financial system.

As Tables A–C show, over October and as recently as mid-November, most inflation-linked bond markets were offering real yields in the 3% to 4% range, while bond markets were pricing in extremely low levels of future inflation, and in some cases, deflation. This was especially true for the U.S. TIPS market, which at one point was pricing in -2.2% annual inflation over the next five years—the lowest five-year average inflation since 1931–36—and effectively zero inflation over the next decade. As we noted at the time,¹ this increasingly seemed like a disconnect; depression-like inflation assumptions are not compatible with real yields near 3.0% (basically discounting a period of trend economic growth). Either future inflation is being massively underdiscounted, or growth expectations will be aggressively reined in.

Over the early days of December the market seems to have begun correcting itself, with real yields falling sharply and breakeven inflation expectations narrowing for on-the-run issues (those inflation-linked bonds most recently issued and liquid). Yet total normalcy has not returned to the inflation-linked bond space, as off-the-run issues still seem to suffer from a large liquidity discount (and offer a yield premium), while breakeven inflation expectations remain very low.

In this commentary we try to shed some light on the current state of the inflation-linked bond market and what role such bonds could play in today’s environment given the asymmetric return profile of most “linkers” relative to nominal government bonds. Such a return profile is especially important given today’s very low levels of nominal bond yields. For while deflation will remain a pressing near-term concern, a virulent return of inflation is a risk investors need to increasingly hedge against over the next few years.

¹ We first addressed the dislocation and relative attractiveness of the U.S. TIPS market in our September 2008 *Market Update* Q&A section and in our monthly *Notes on Current Valuations* publication.

Real Yields Seem Fairly Valued

As mentioned above, the real yields on offer over October and November seemed more a reflection of market dislocation than economic fundamentals. Indeed, real yields above 3.0% had not been seen since the late 1990s and early 2000s, when inflation-linked bonds were first broadly issued and required a similar liquidity premium to attract investors to the new asset class² (Tables A–C).

However, some of this attractive pricing has since disappeared as the strong rally in global bond markets over late November and early December has pushed yields down and narrowed breakeven inflation expectations. Most markets are now offering yields in the 2% to 3% range, as defined by the Barclays indices.³ While less compelling, these yields are still much higher than those on offer in March 2008, when inflation-linked yields fell well below 2% globally, while at the very front-end of the U.S. curve, short-dated TIPS effectively yielded nothing, and in some cases offered *negative* real yields, as nervous investors *paid* for the privilege of holding inflation-protected principal.

Overall, we currently view most inflation-linked bond markets, and especially U.S. TIPS, as fairly valued and attractive relative to nominal government paper. A notable exception is the U.K. inflation-linked market, which is discussed in more detail below; that market is geared toward very long-maturity issues that still sport very low yields and high inflation expectations relative to nominal bonds and thus are more exposed to widening deflation fears.

We base our valuations of inflation-linked bonds on the level of real yields and inflation expectations priced into the bond market. We compare inflation-linked bond yields to their own real yield histories (both actual and estimated) and to what could be considered the structural growth rate of the underlying economy, as in its simplest form a real yield is nothing more than a claim on economic growth. Relative to nominal government bonds, inflation-linked bonds are more attractive to investors whose inflation expectations are greater than that implied by the yield spread between inflation-linked bonds and nominal government bonds of the same maturity, the so-called “breakeven inflation rate.” In other words, breakeven inflation is the level of inflation that can occur at which an investor is indifferent between holding a nominal or inflation-linked bond.

Even following the early December rally, yields in most inflation-linked bond markets are generally above their average level over the past decade, while compared to estimated real yields based on nominal ten-year government bond yields minus trailing inflation, inflation-linked bond markets also offer yields close to historical (post-1960) norms (Table D). For example, the Barclays U.S. Inflation-Linked Bond Index offered an average yield of 3.38% at the end of November—which subsequently fell to 2.95% by December

² While the U.K. Treasury introduced inflation-linked bonds as early as 1982, the current market did not get underway until the introduction of U.S. TIPS in 1996 and the launch of French inflation-linked bonds in 1997.

³ This yield is the market-cap and duration-weighted average yield of the underlying securities in the index and therefore includes both on- and off-the-run issues. This differs from the more widely quoted yield of the most recent on-the-run bonds, and better reflects the real yield of the opportunity set.

10—compared to an average index real yield of 2.82% since 1997 and a 2.63% yield based on historical nominal ten-year Treasury yields less annual inflation since 1960.

From a broader point of view, we consider inflation-linked bonds to be fairly valued when they offer a yield similar to expectations of economic growth over a full cycle. As Table E shows, most developed economies exhibit trend GDP growth of between 2.0% and 3.0%, with some countries, notably Japan and Germany, showing much lower growth over the past few years, closer to 1% to 2%. Therefore, in most markets the current level of real yields is on par with “average” real GDP growth over the economic cycle, if not higher. Indeed, the current unwinding of credit excesses in many economies—along with the headwind this shift from debt-fueled consumption to savings and investment-driven growth poses over the intermediate term—argues that structural growth expectations may need to be tempered downward, especially for the U.S. economy.⁴

We feel real yields today at 3.0% for the U.S. market and 2.5% for Europe are fair compensation for GDP growth that may be well below that. Japanese average real yields of 4.6% are clearly attractive, although this market is still somewhat dysfunctional, as a buyers’ strike among foreign investors remains in effect, forcing the Japanese government to cancel its most recent inflation-linked bond auction.

Average U.K. inflation-linked gilt yields of 1.7% result from very low yields at the very long end of the curve. Most of the recent issuance has been focused here due to regulatory demand for liability-duration matching on behalf of U.K. pension funds. Ultra-long dated gilts (30+) offer real yields of less than 1.0%. The intermediate part of the inflation-linked gilt curve, however, offers higher average yields of 2.5% and seems more attractive.

So while real yields seem reasonable in aggregate for most markets, this is due in part to the higher yields on older-dated issues at the front of the yield curve—while recently issued, on-the-run bonds sport much lower yields. Tables F–I highlight this dispersion across the curve, which is especially prevalent in the U.S. market. U.S. TIPS maturing in the next few years offer real yields ranging from 3% to 8%, while on-the-run five- and ten-year TIPS yield closer to 2.0%. This partly reflects the front-end of the curve languishing in a sort of financial limbo as most investors seeking short-dated paper are more interested in the liquidity of the nominal Treasury market, while the arbitrageurs that normally step in to seize such opportunities remain on the sidelines.

⁴ Since 1950, U.S. real GDP has grown at an average annual 3.4%. It has long been assumed that U.S. potential GDP growth has been in the range of 3.0% to 3.5%. However, some economists argue that potential GDP growth is now 2.5% or below. Indeed, U.S. real GDP growth has averaged under 2.8% over the past ten years, despite the consumption boom and the productivity “miracle” of the tech bubble, as increases in credit have had a diminishing impact on economic growth, especially since much of the consumption has taken place in the form of imports.

Inflation-Linked Bonds in a Deflationary Environment

We would argue that the dispersion of yields across the curve also has to do with a high liquidity premium placed on recently issued inflation-linked bonds, coupled with expectations of sharp near-term deflation, driving up the value of embedded deflation protection. For while most investors are familiar with the inflation-hedging properties of inflation-linked bonds, less understood is the behavior of such bonds in a deflationary environment.

Most inflation-linked bonds are structured to pay a fixed *percentage* coupon based on inflation-adjusted principal, defined by the change in a “reference index” such as a consumer price index (CPI).⁵ This differs from a conventional nominal bond whereby the coupon paid is a fixed *dollar* amount. For inflation-linked bonds, as the CPI rises so does the principal, thereby allowing the nominal coupon distributions to keep pace with “inflation.” In a deflationary environment in which the CPI is falling, the inflation-linked bond’s principal is also marked down (a so-called negative inflation accrual) and results in lower nominal coupon distributions. As a result, inflation-linked bonds underperform nominal bonds in a deflationary environment, as both the nominal principal and income fall—although the “real” value is held constant.

Conceptually, in a severe deflationary environment, nominal government bond yields could decline to zero while the effective “real yield” on nominal bonds would be positive (the nominal yield plus deflation). This is why persistent deflation is so damaging to a highly leveraged economy: the “real” burden of debt and debt servicing rises. So despite falling growth expectations, one could argue that inflation-linked bond yields should also rise to better reflect (or compete with) this effective “real yield” on nominal assets; thus inflation-linked bonds should be avoided amid deflation.

However, most inflation-linked bond structures (most notably U.S. TIPS and French/European Monetary Union linkers) incorporate a “deflation floor” into the structure that stipulates that at maturity the bondholder will be paid the *greater of* the inflation-adjusted principal or par value.⁶ In other words, even should such an inflation-linked bond experience deflation throughout its life (and thus suffer principal markdowns), at maturity the bondholder is guaranteed at least par, thus effectively capping the losses suffered in a deflationary environment. This creates an asymmetric return profile for inflation-linked bonds relative to nominal fixed coupon bonds, in that *the potential outperformance during an inflationary environment is much greater than the potential underperformance during deflation.*⁷

In essence, inflation-linked bonds with a deflation floor have an imbedded deflation put option. It is important to remember that inflation-linked bonds “accrue” inflation over the life of the bond as the result of upward adjustments to principal. Therefore, the higher the accrued inflation, the further “out of the money”

⁵ We use the abbreviation CPI in a generic sense, as each inflation-linked market uses a specific reference index to calculate the inflation adjustment.

⁶ U.K. and Japanese inflation-linked bonds, however, do not offer such a deflation floor. Australian inflation-linked bonds, meanwhile, offer a deflation floor on both the principal and the coupon.

⁷ We have written about this asymmetry of returns in the past. For a more in-depth discussion, please see our 2001 report *U.S. TIPS: Fixed Income Substitute?* and our 2002 report *U.S. TIPS: Evolution, Valuation and Implementation*.

the put option, and therefore the more exposed/sensitive that particular bond is to deflation. Conversely, the lower the inflation accrual, the higher the value of the embedded option, and the more valuable the bond.

To illustrate, Table F shows each underlying TIPS issue in the Barclays U.S. Inflation-Linked Bond Index and its corresponding accrued inflation or “index ratio” based on the level of CPI at the bond’s issuance and the current reference level.⁸ For example, the 3% July 2012 TIPS has an index ratio of 1.21, meaning its principal has been adjusted upward 21% since issuance in 2002. Therefore this bond would have to suffer 21% cumulative (or 5.5% annualized) deflation before the deflation floor kicked in. On December 10, this bond yielded 4.10% with an implied breakeven inflation rate of -3.0%.

Compare this to the current on-the-run five-year TIPS issued last April (the 5/8 April 2013) that has an index ratio of 1.03, or only a 3% inflation accrual. This bond has an implied breakeven inflation of only -0.7% and yields 1.76%. That’s right: the older-dated, off-the-run TIPS yields more than twice as much as the current five-year on-the-run issue and has priced in over four times as much deflation occurring, despite maturity dates less than a year apart. The higher yield is effectively compensating for the higher exposure to potential deflation losses.

This pricing of the embedded deflation floor has certain implications for investors.

- The implied breakeven inflation at the shorter end of the curve, which is dominated by older, high-accrual issues may not be a true reflection of market inflation expectations.
- Investors that chose to buy inflation-linked bonds via an index product will receive higher real yields, but will also have more exposure to older issues with higher inflation accruals, and therefore greater potential for losses should realized deflation be lower than currently priced.
- Conversely, those investors nervous about a pronounced deflationary outcome but that want some inflation protection should buy recently issued inflation-linked bonds with minimal accruals, which will retain their value better in a deflationary environment, but offer lower yields.
- Investors in global inflation-linked bond products will be exposed to linkers with both deflation floors (e.g., United States, Eurozone) and those without (United Kingdom, Japan) (Table J).

Inflation or Deflation?

The key issue facing potential buyers of inflation-linked bonds is whether current breakeven inflation expectations are reasonable, regardless of possible distortions from technical factors. For even if deflation occurs, inflation-linked bonds will outperform nominal bonds on a relative basis so long as deflation is less severe than what the market has priced in.

⁸ In practice, the inflation adjustment is based on lagged inflation levels, which differ across inflation-linked bond markets. U.S. TIPS inflation accruals are based on a three-month lag, so that the accrued inflation at the end of December 2008 is based on the level of CPI as of October 31. Other markets use different lags.

Again, Tables F–I show breakeven expectations across global inflation-linked yield curves. Bond markets seem to be pricing in powerful deflation expectations over the intermediate term (one to five years), especially in the United States, United Kingdom, and Japan, while there is basically no inflation compensation priced into the Eurozone market. Longer-term (ten years or more) however, U.K. and Eurozone markets are pricing in relatively normal expectations of inflation in the 2% to 3% range, while breakevens are still very low in the United States and Japan. For example, the U.S. market is pricing in more than -7.0% deflation over the next year or so, and -3.0% annual deflation over the next three years, while on-the-run five- and ten-year break evens are for -0.7% and 0.2% inflation, respectively. Japan is priced for over -3.0% inflation across the curve.⁹

Are these expectations reasonable? Clearly not from a long-term standpoint. Inflation has averaged 2.1% across the G7 developed countries over the past decade. Since 1914, inflation has averaged an annualized 3.3% in the United States, with a similar long-term average in other economies (Table K). Indeed, deflation has been rare in the post–World War II period. Outside of Japan, the last time the developed economies underwent year-over-year deflation was during the mid-1950s, and it was of the mild, benign type.¹⁰ We have to look back to the dark days of the 1930s and 1940s to see the level of deflation now being priced into the market; current U.S. ten-year breakeven expectations of under 0.2% annualized inflation for a decade have not been seen since the 1932–41 period.

However, it should be noted that deflation was quite common under a gold standard. With monetary policy constrained by the need to defend/maintain a fixed exchange with gold, domestic prices (and wages) bore the brunt of the necessary economic adjustments. Since 1914 the worst year-over-year decline in U.S. prices was not during the 1930s, but in 1921, when the CPI fell 15% in a year. Some European economies witnessed worse deflation in the 1920s than during the 1930s.¹¹

Expectations of a deflationary outlook similar to that of the Great Depression may be overdone, as the economic dynamics are very different in the fiat currency system we have today, whereby the monetary authorities can print money with abandon if need be. Indeed, not until President Franklin D. Roosevelt devalued the US\$ relative to gold in 1933 did the deflationary spiral in the U.S. economy show signs of abating. During the Great Depression, the worst year-over-year decline in U.S. prices was 10.7% in 1932. By 1933 at the height (or depths) of the Depression, prices had fallen an annualized 9.5% over the preceding three years, while the trailing ten-year average annual inflation rate had plummeted to -2.9% (Table L). Therefore, the Japanese bond market today seems prepared for the worst!

⁹ This partly reflects the dislocated nature of the market and the lack of an embedded deflation put.

¹⁰ Falling prices brought about by increases in productivity and other positive supply shocks (such as economic reform or China's entry into the global economy) are positive for economic growth, especially if "deflation" is accompanied by rising wages (or wages that fall slower than prices) representing an increase in real living standards. Indeed, such a "deflationary-boom" occurred during the "Roaring Twenties" between 1926 and 1929.

¹¹ The deflation experience of Europe was arguably less severe due to earlier competitive currency devaluations. For example, the United Kingdom went off the gold standard in 1931.

Japan provides the only example of a prolonged deflationary environment in recent times.¹² During Japan's "lost decade" the worst year-over-year decline in inflation was -1.6% in February 2002, while the worst three-, five-, and ten-year annualized deflations were -1.0%, -0.8%, and -0.3%, respectively, which seems less severe than what most bond markets have priced in today, although not by much.

So is a Japan-style experience—not another global depression—in store? Quite possibly. But it seems global policymakers are doing everything within their power (and then some) to avoid such a deflationary funk, perhaps at the cost of future price stability. Using the supposed "lessons" of the Great Depression and Japan, the U.S. Federal Reserve is engaging in highly unorthodox and experimental monetary policies. Flooding the global financial system with liquidity—while needed in the short run—will most certainly have unintended consequences. The more policymakers fixate on wining the battle against deflation—which they must—the more we feel the odds are tilted toward a burst of inflation at some point in the future.

However, this does not preclude the possibility that deflation will occur next year. While we cannot—nor can anyone else for that matter—accurately predict the path of inflation over the near term, given the sharp decline in commodity prices since the summer and weak prospects for economic growth, it is highly likely that consumer price measures will turn negative at some point in 2009, and perhaps force another "deflation panic" in the bond market. The most recent data show the U.S. CPI falling from a 3.7% annual rate of change in October to only 1.1% in November, implying that the United States is already on the verge of crossing into deflation territory. Yet such a development will force policymakers to take even more extreme measures to avoid a broad-based decline in the price level and up the ante further in inflation's favor. The deflationary forces emanating from the credit crunch may keep inflation contained until the global economy stabilizes and begins to reaccelerate—something that may or may not occur in 2009—but whenever the engine does turn, it might set spark to the high-octane liquidity that has been doused all across the financial system.

Conclusion

Real yields on inflation-linked bonds in the 2% to 3% range today look compelling compared to nominal government bond yields approaching generational lows, especially in the United States where Treasury yields well below 3.0% have not been seen since the mid-1950s. Inflation-linked bonds are attractive today for those investors that believe inflation will be higher than what is currently priced into the markets. However, inflation-linked bonds may continue to underperform nominal government bonds (and suffer additional absolute losses) should deflation fears intensify or become realized. This is especially the case for those inflation-linked bonds that do not have a deflation floor built into their structure.

The best time to buy inflation-hedging assets is amid a deflation panic, when such assets are shunned. Whether October and November were that moment, we will only know in hindsight. The odds are

¹² Although several Asian economies experienced brief deflation following the 1997–98 Asia crisis.

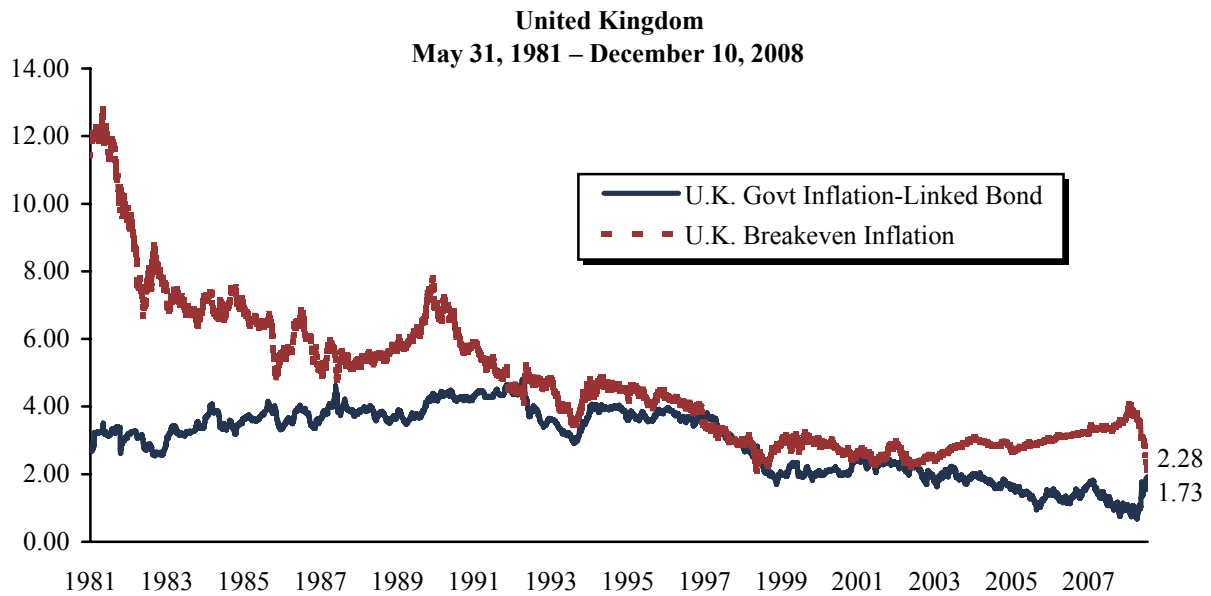
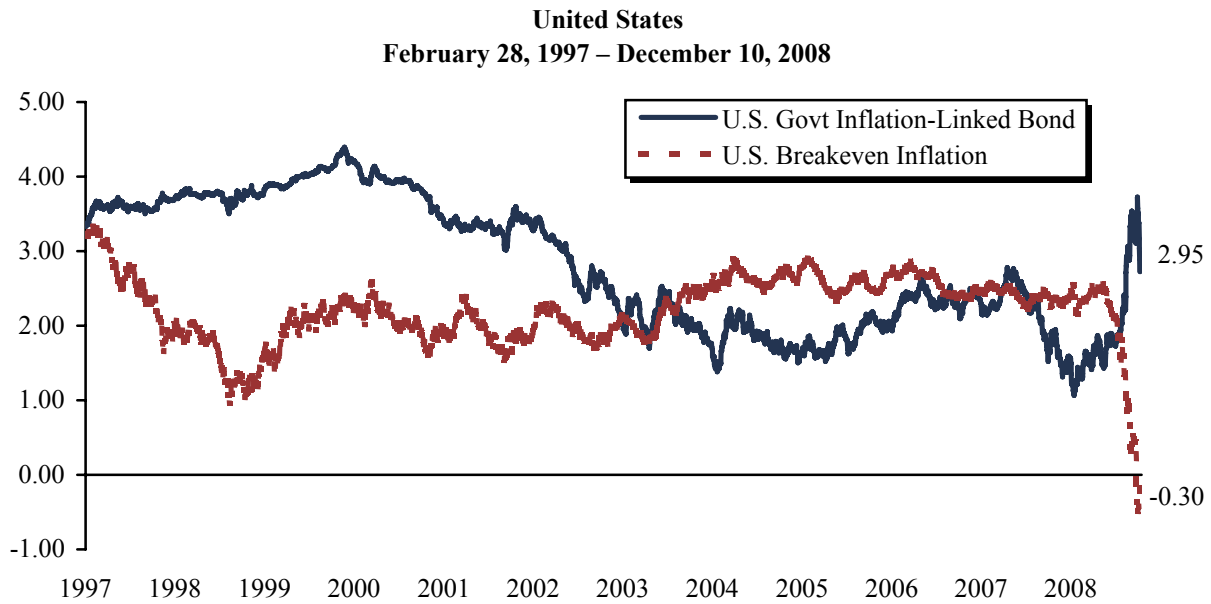
that we may see another such panic at some point in 2009. The risk remains that real yields will rise further as investors continue to flock toward the liquidity and perceived safety of the nominal government bond markets. Investors in inflation-linked bonds need to be willing to tolerate some volatility in the near term as the markets continue to grapple with the inflation/deflation outlook from the credit crisis.

Indeed, the asymmetric return profile of U.S. TIPS makes them increasingly attractive today. Their relative underperformance during a deflationary bust is offset by their vast outperformance should inflation rear its head. Investors in an index-type product may receive higher real yields, but are more exposed to negative inflation accruals should outright deflation occur. Investors concerned about a deflationary outcome, but also nervous about (or dissatisfied with) the low level of nominal yields should buy recently issued inflation-linked bonds with minimal inflation accruals (preferably at prices below par), which will retain their value better in a deflationary environment. Yet such bonds will have lower yields than older, off-the-run issues.

A deep deflationary bust brought about by severe credit contraction and collapsing demand cannot be ruled out, but we think such an extreme outcome will be avoided. A fiat currency system makes the odds of a severe deflation less likely, especially when both the monetary and fiscal authorities are aggressively pursuing expansionist policies. We feel we may avoid a deep deflation today, at the cost of higher inflation later, or at least the *threat* of higher inflation down the road. When (not if) the global economy begins to stabilize, a key question is whether central bankers will prove as aggressive in tightening policy as they have been in loosening it. The answer remains to be seen as the fear of deflation may be hard to shake; while central bankers claim to know how to fight inflation, will they have the “true grit” and conviction to do so? Inflation-linked bonds seem a low-cost insurance policy in case they do not.

Table A

U.S. AND U.K. INFLATION-LINKED BOND YIELDS AND BREAKEVEN INFLATION

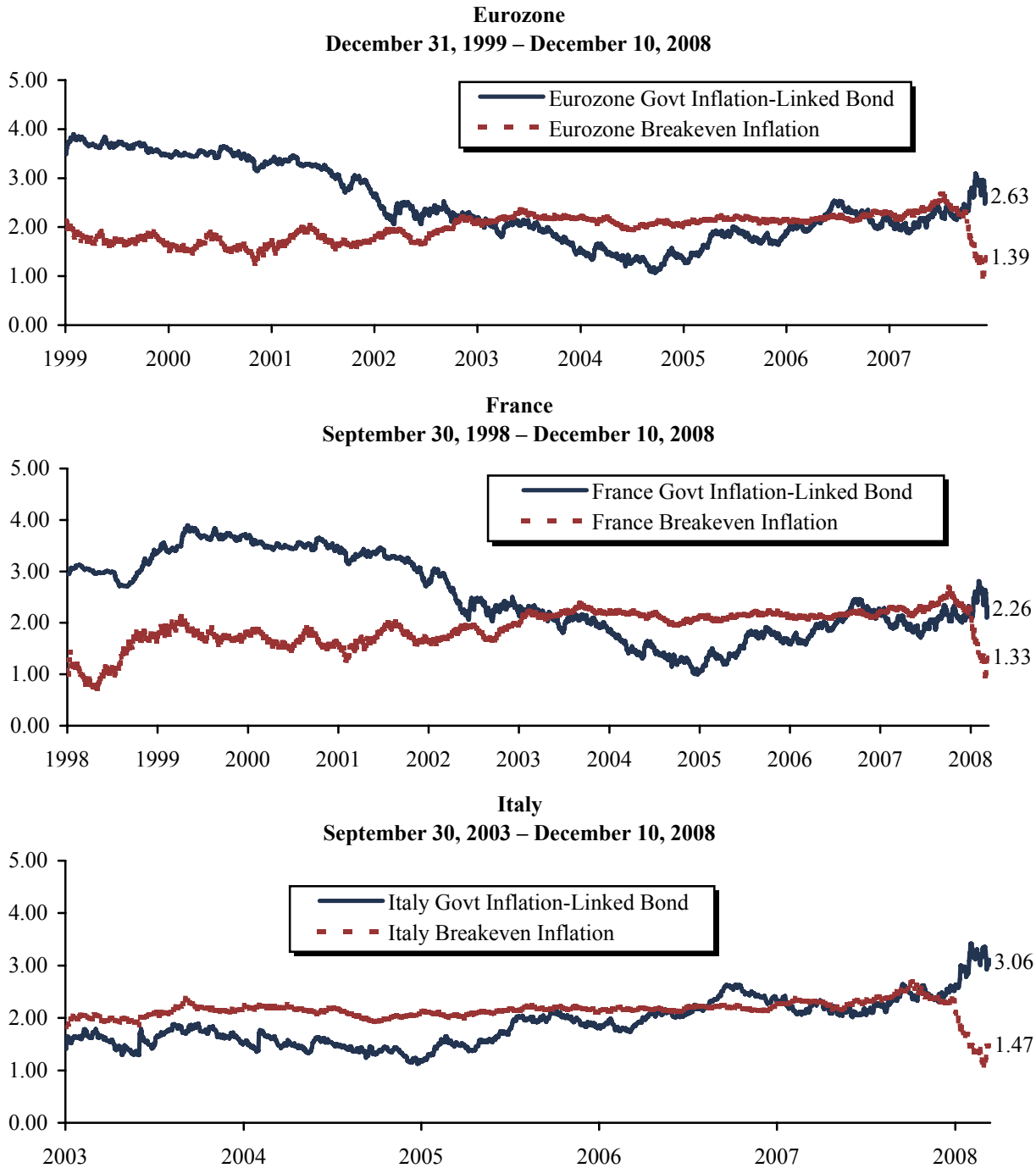


Source: Barclays Capital.

Notes: Real yields and breakeven inflation are based on Barclays Global Inflation-Linked Bond indices. Real yields reflect the market cap and duration-weighted average yield across all maturities.

Table B

EUROPEAN INFLATION-LINKED BOND YIELDS AND BREAKEVEN INFLATION

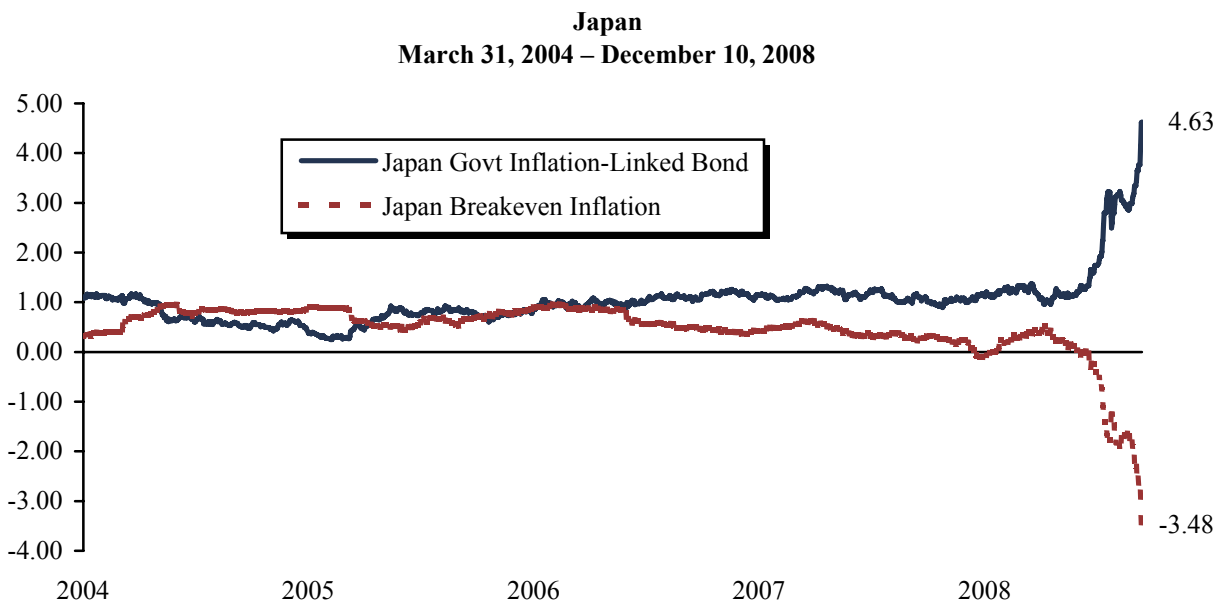
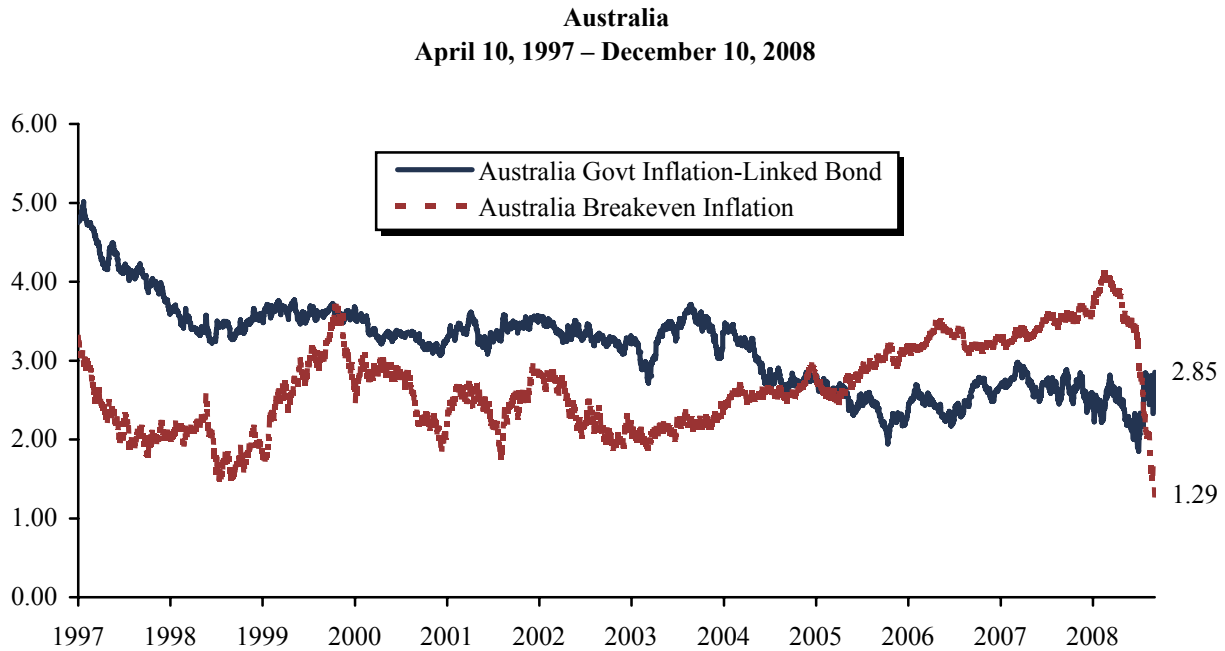


Source: Barclays Capital.

Notes: Real yields and breakeven inflation are based on Barclays Global Inflation-Linked Bond indices. Real yields reflect the market cap and duration-weighted average yield across all maturities.

Table C

**AUSTRALIA AND JAPAN INFLATION-LINKED BOND YIELDS
AND BREAKEVEN INFLATION**



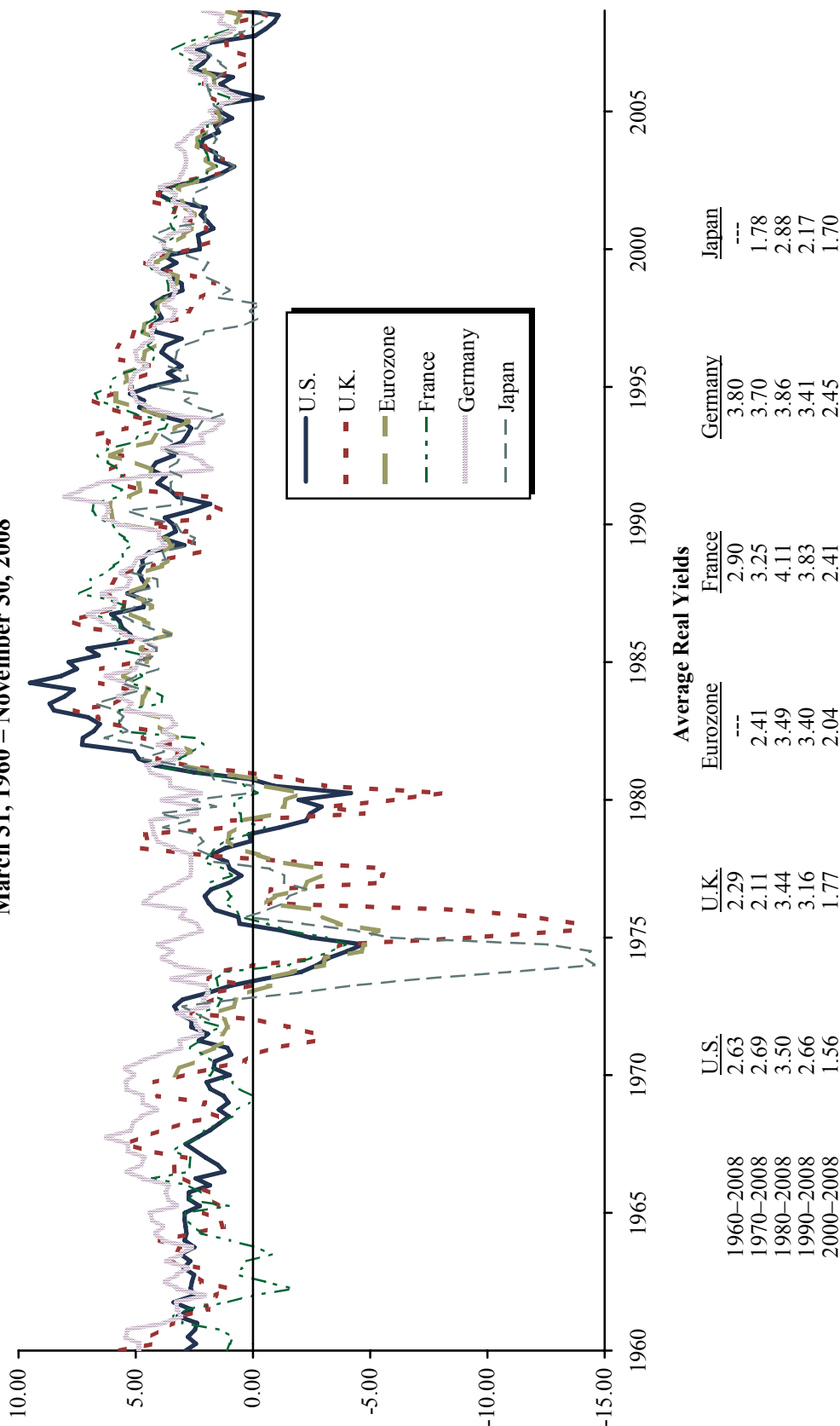
Source: Barclays Capital.

Note: Real yields and breakeven inflation are based on Barclays Global Inflation-Linked Bond indices. Real yields reflect the market cap and duration-weighted average yield across all maturities.

Table D

HISTORICAL GLOBAL REAL YIELDS

March 31, 1960 – November 30, 2008



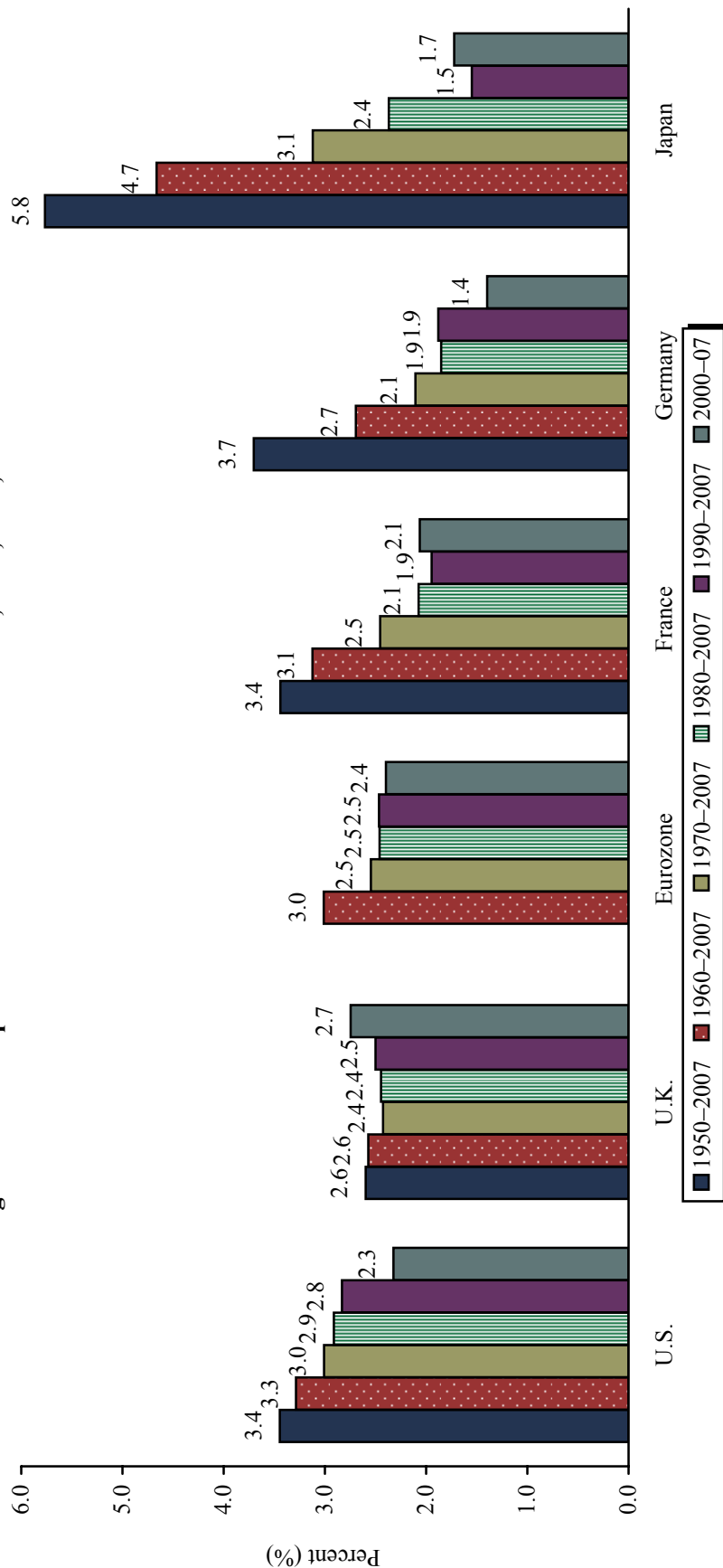
Source: Global Financial Data, Inc.

Notes: Historical real yields based upon quarterly historical nominal ten-year government bond yields minus annual trailing inflation. Data for November 30, 2008, are monthly yields. Eurozone composite provided by Global Financial Data, Inc. and is based upon published data for individual member countries. Data for Eurozone composite begin in 1970. Data for Japan begin in 1972. Current Japanese annual inflation data are as of October 31, 2008.

Table E

GLOBAL REAL GDP GROWTH

Average Annual Compound Real GDP Growth Since 1950, 1970, 1980, 1990 and 2000

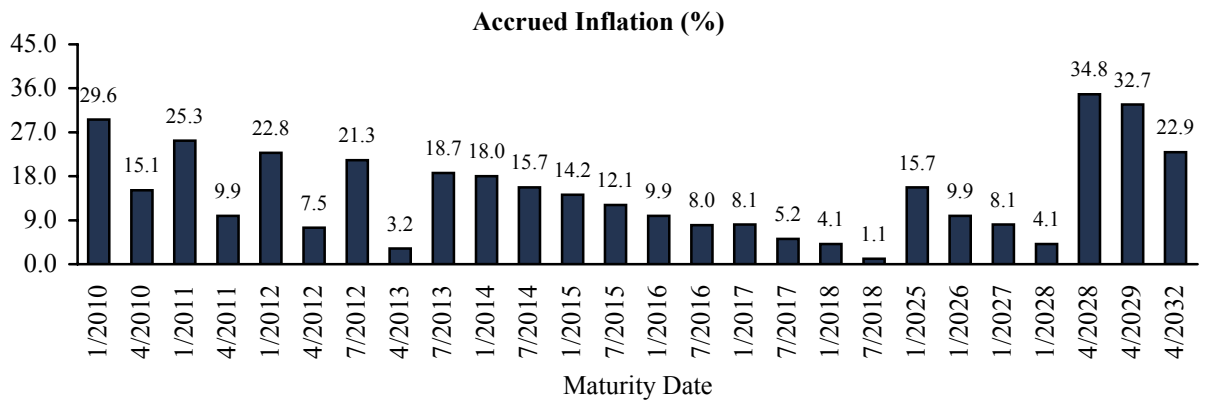
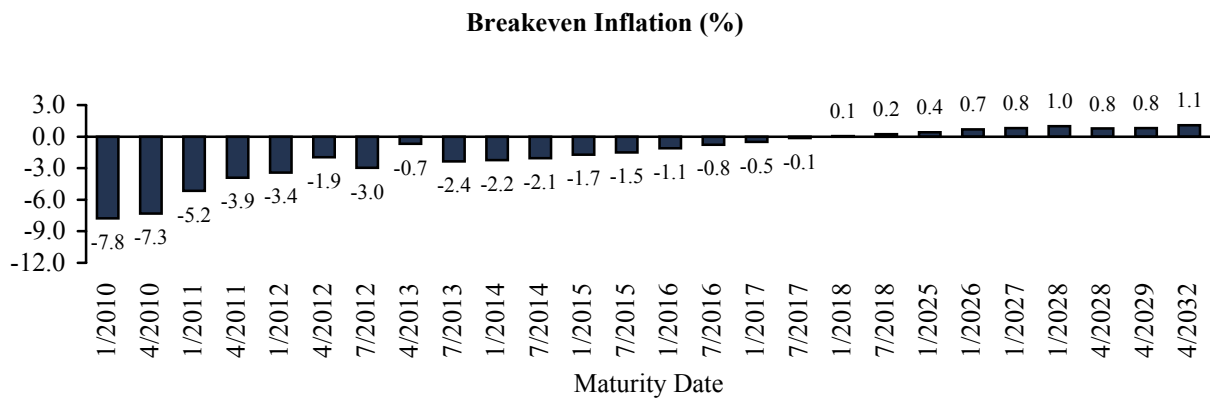
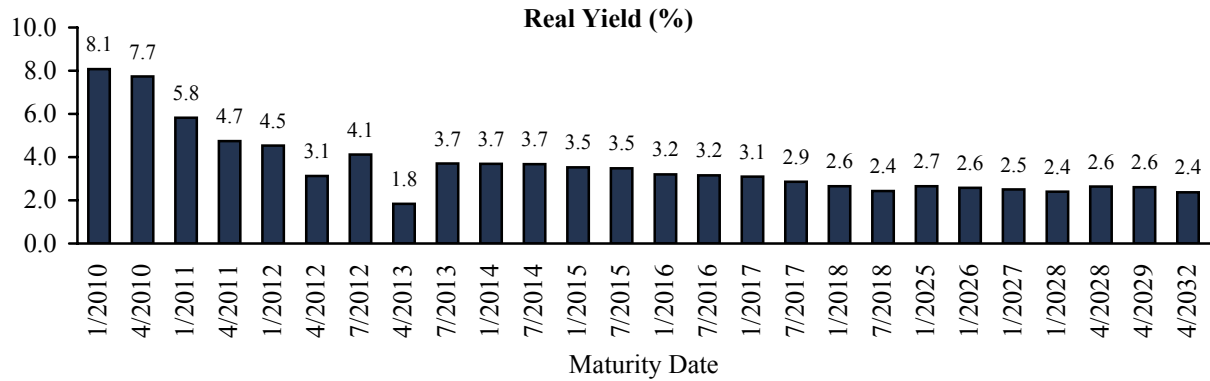


Sources: Global Financial Data, Inc. and Thomson Datastream.

Notes: Real GDP growth based on annual data. Eurozone data begin in 1962. Eurozone composite provided by Global Financial Data, Inc. and is based on published GDP data for individual member countries. Germany data from 1950-60 are from Global Financial Data, Inc. and from 1961 to present are from Thomson Datastream.

Table F
U.S. INFLATION-LINKED BONDS

As of December 10, 2008



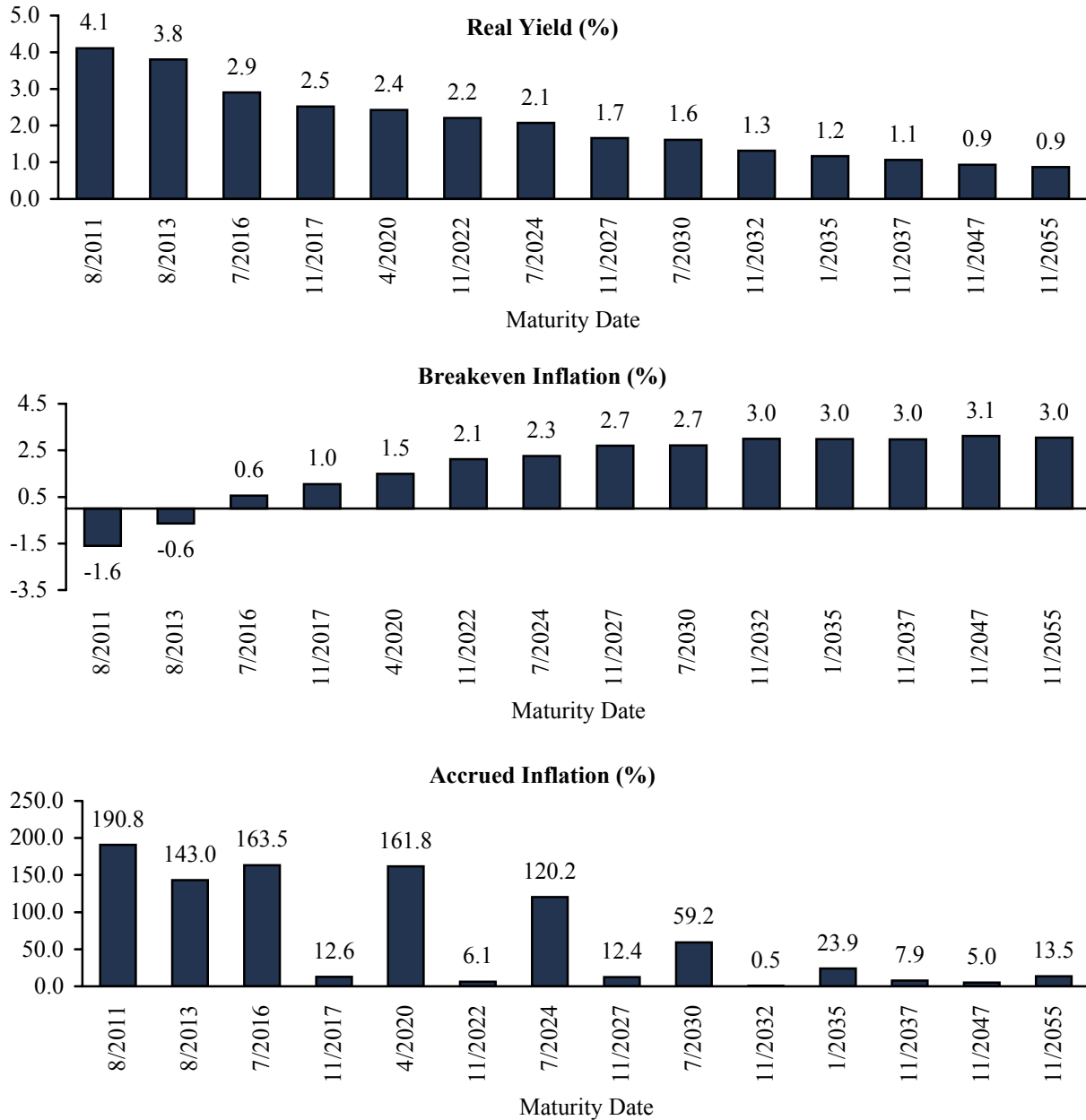
Source: Barclays Capital.

Notes: Based on the constituents of the Barclays Global Inflation-Linked Bond indices. Accrued inflation indicates the adjustment to nominal principal since issuance for each underlying bond.

Table G

U.K. INFLATION-LINKED BONDS

As of December 10, 2008



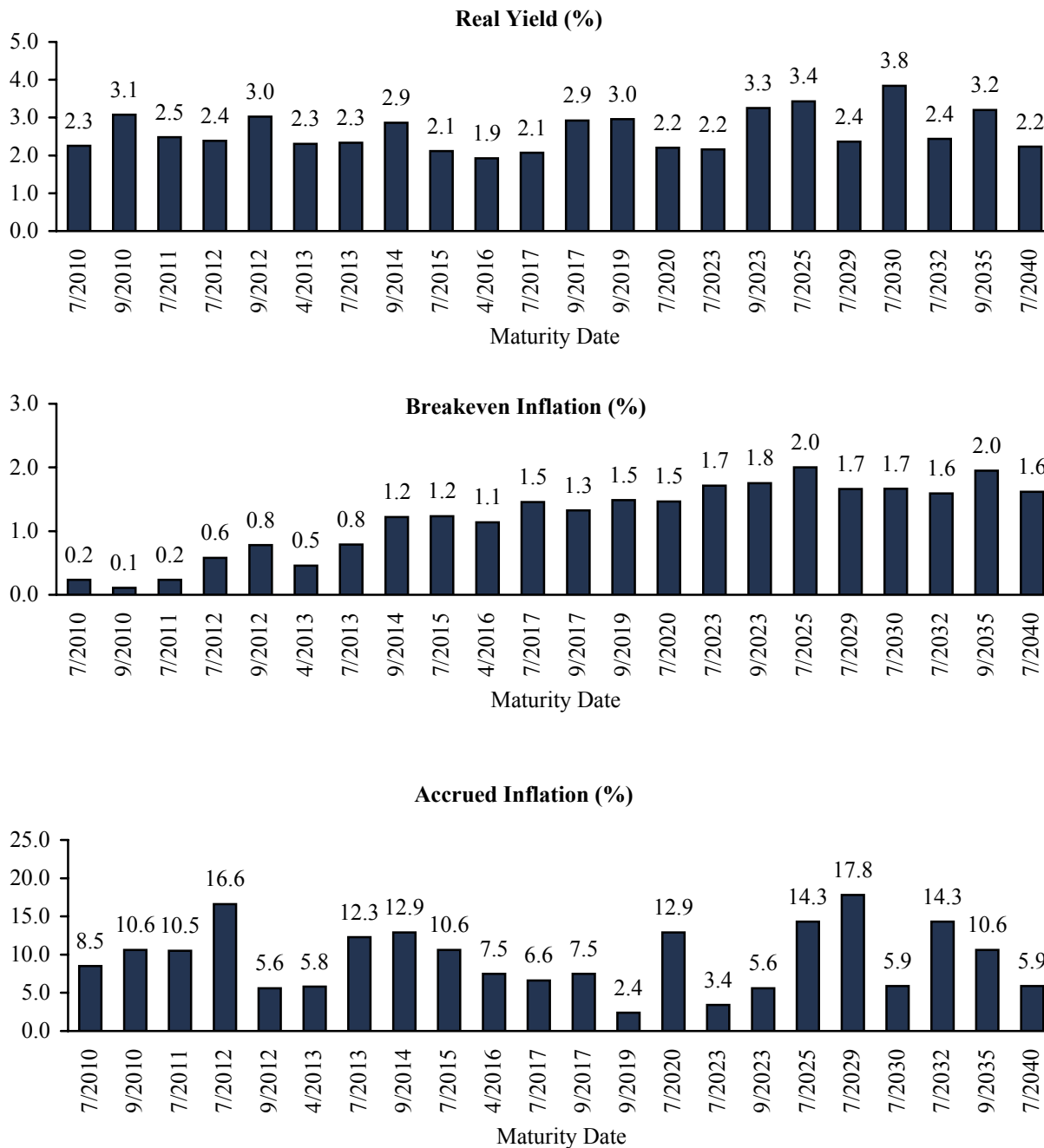
Source: Barclays Capital.

Notes: Based on the constituents of the Barclays Global Inflation-Linked Bond indices. Accrued inflation indicates the adjustment to nominal principal since issuance for each underlying bond.

Table H

EUROZONE INFLATION-LINKED BONDS

As of December 10, 2008



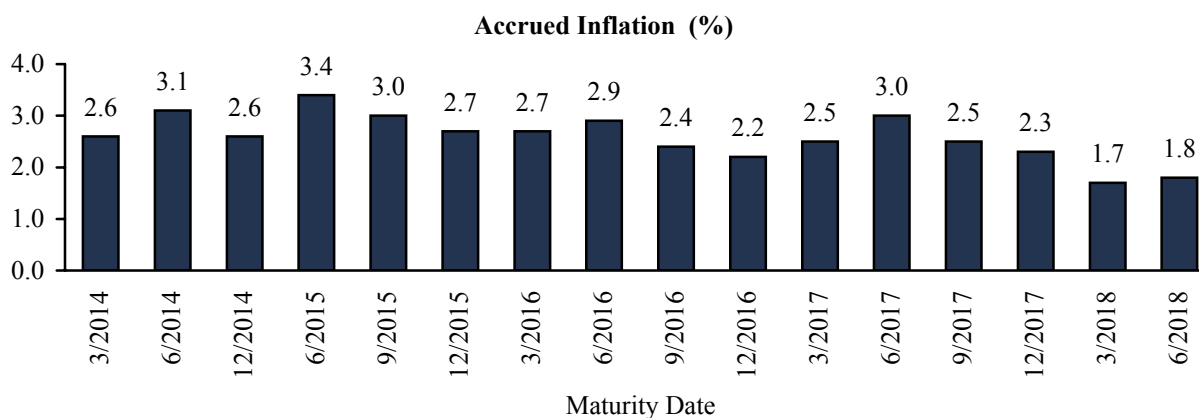
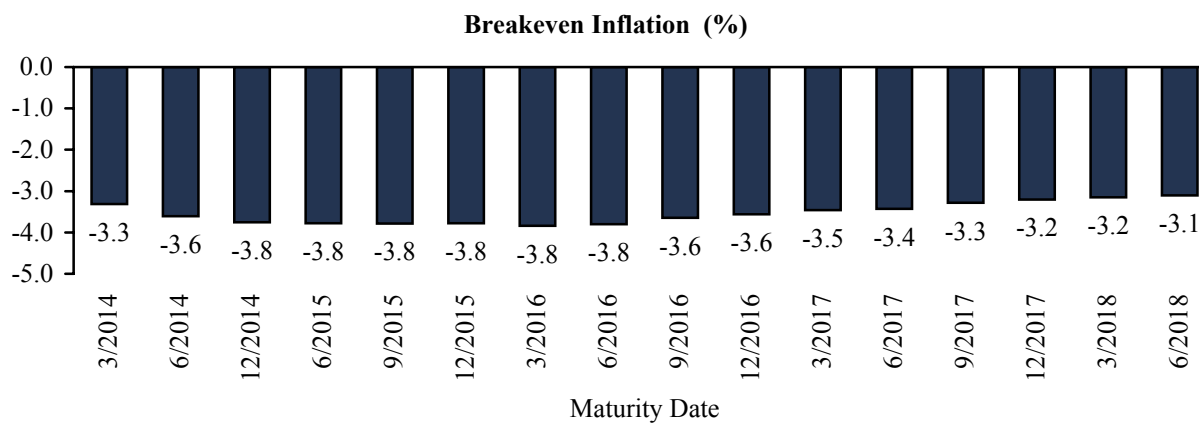
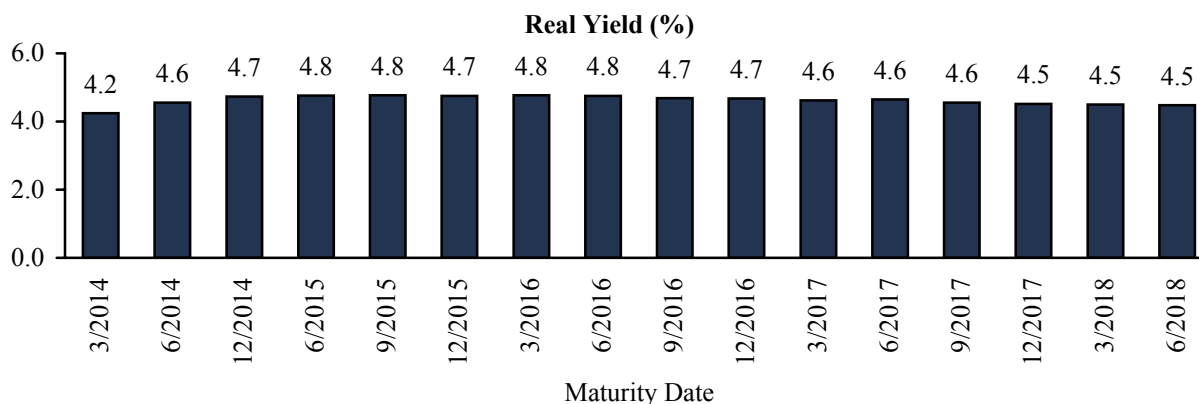
Source: Barclays Capital.

Notes: Based on the constituents of the Barclays Global Inflation-Linked Bond indices. Accrued inflation indicates the adjustment to nominal principal since issuance for each underlying bond.

Table I

JAPAN INFLATION-LINKED BONDS

As of December 10, 2008



Source: Barclays Capital.

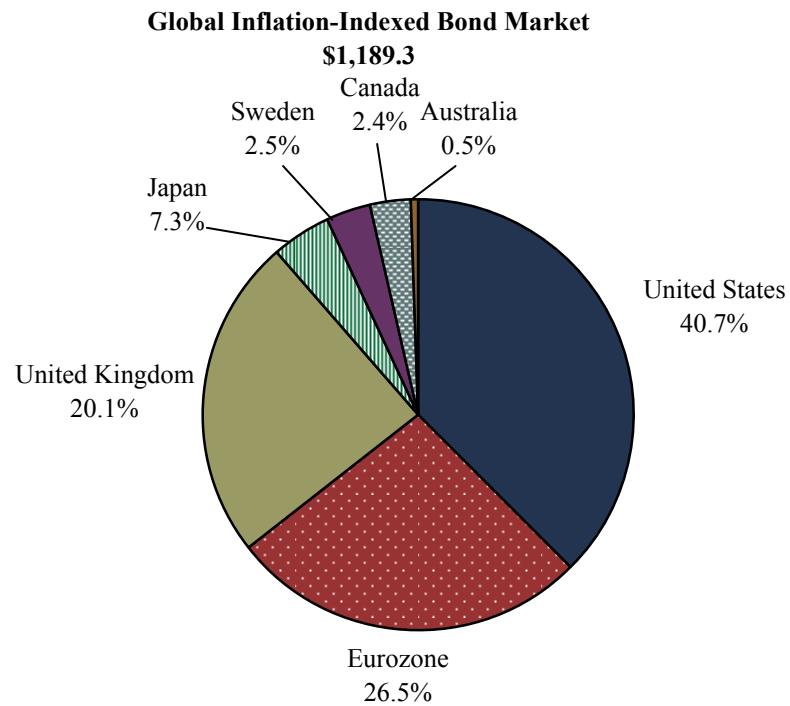
Notes: Based on the constituents of the Barclays Global Inflation-Linked Bond indices. Accrued inflation indicates the adjustment to nominal principal since issuance for each underlying bond.

Table J

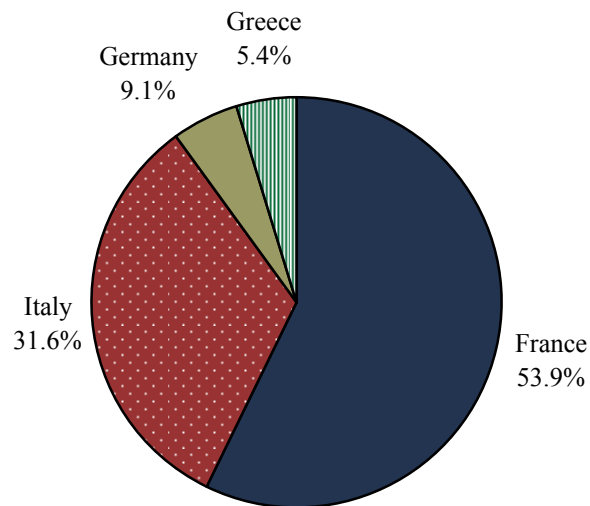
GLOBAL INFLATION-INDEXED BOND MARKET

As of November 30, 2008

(US\$ billions)

**Eurozone Inflation-Indexed Bond Market**

\$315.4



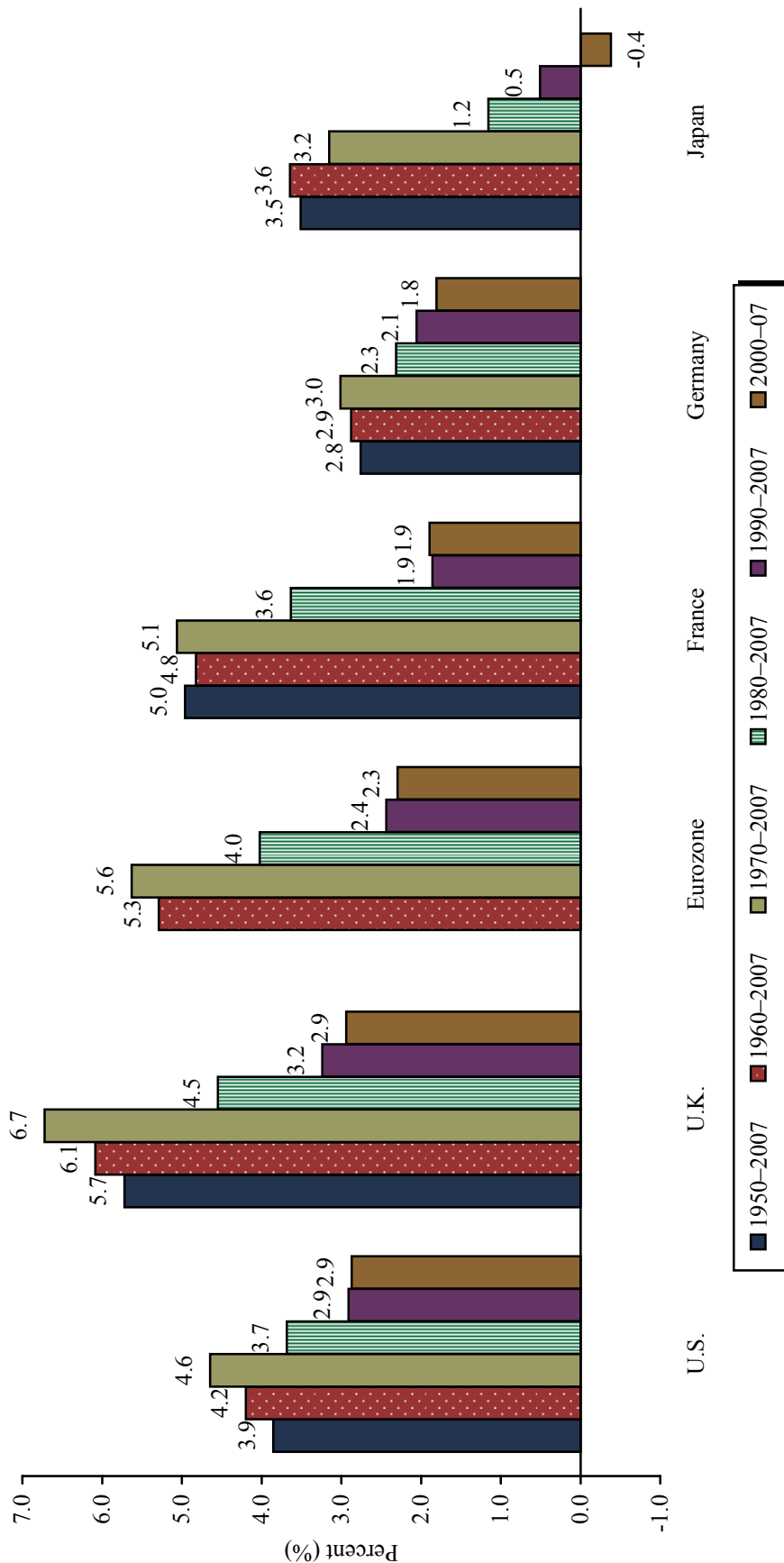
Source: Barclays Capital.

Note: Figures may not total due to rounding.

Table K

GLOBAL AVERAGE ANNUAL INFLATION

Average Annual Inflation Since 1950, 1960, 1970, 1980, 1990 and 2000



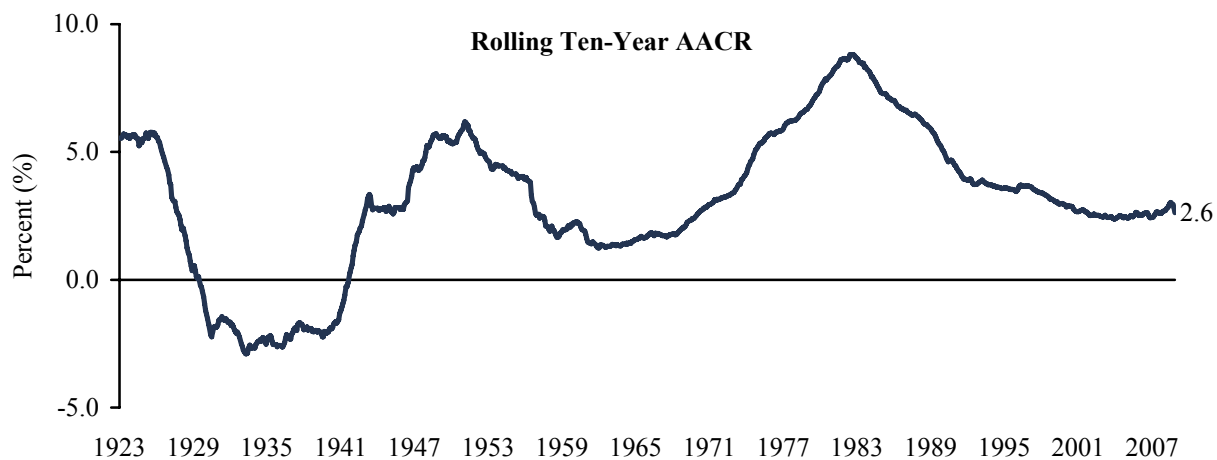
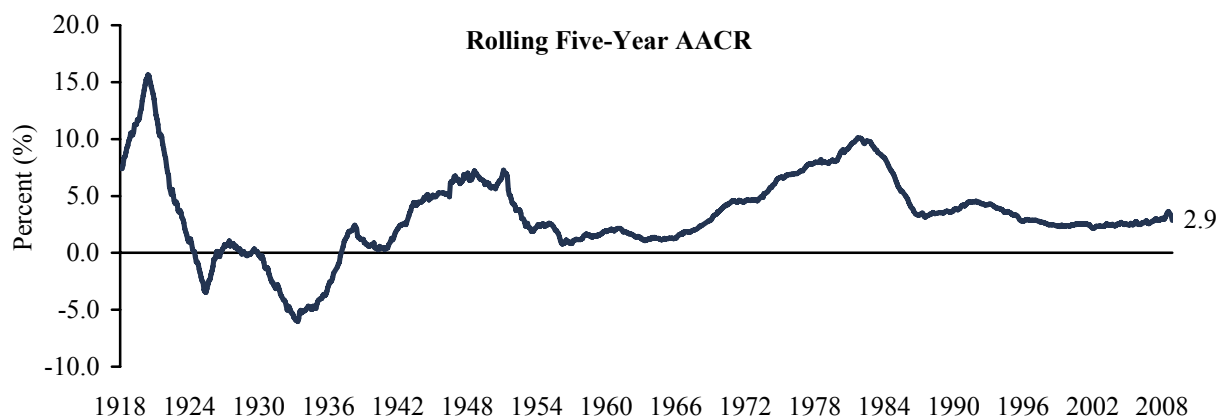
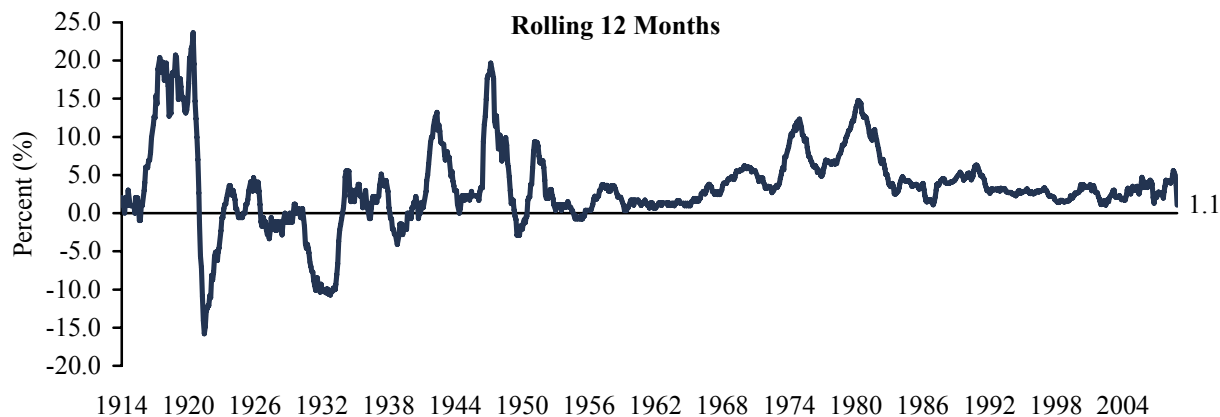
Source: Global Financial Data, Inc.

Notes: Inflation trends are based on annual data. Eurozone composite provided by Global Financial Data, Inc. and is based on published figures for individual member countries. Inflation data for the Eurozone composite begin in 1961.

Table L

HISTORICAL U.S. INFLATION

February 1, 1913 – November 30, 2008



Sources: Thomson Datastream and U.S. Department of Labor - Bureau of Labor Statistics.

Notes: Graphs are based on monthly data for the U.S. CPI-U Index. Data for 2008 are through November 30.