

**MARKET
INSIGHTS**

The deflation question

Dr. David Kelly, CFA

J.P. Morgan

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Dr. David Kelly, CFA
Managing Director
Chief Market Strategist
J.P. Morgan Funds

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Throughout his career, David has developed a unique ability to explain complex economic and market issues in a language that financial advisors can use to communicate to their clients. He is a keynote speaker at many national investment conferences. David is also a frequent guest on CNBC and other financial news outlets and is widely quoted in the financial press.

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Foreword

In recent years, even as the U.S. and global economies struggled to find their footing at the bottom of a deep recession, many voices argued that inflation was about to make a comeback. The case for higher inflation centered on huge budget deficits, a falling dollar and an enormous increase in the money supply engineered by the Federal Reserve (Fed).

These arguments were always weak from a theoretical perspective, as we noted at the time¹. However, since then, inflation warnings have been quieted due to a sharp slowdown in the growth of the money supply, a rebound, albeit temporarily, in the dollar and signs of waning economic stimulus from the government sector. Perhaps most important in dousing inflation fears have been the numbers themselves: in the last year, core U.S. inflation has fallen to its lowest year-over-year rate since the early 1960s.

However, we live in an age of national neurosis, and no sooner had the voices of inflation been quieted than a new chorus swelled to warn of an impending deflationary disaster. It must be said that the case for deflation is stronger than the one for inflation ever was. However, like all investment issues, it should be examined in a balanced and logical way. In this white paper, we define what deflation means and the problems it poses for the economy. We outline a model to predict inflation and discuss the probable evolution of some drivers of this model, leading to a base case forecast of inflation over the next five years. We also review some policy measures that central banks and governments are taking and can take to combat deflationary pressures. Finally, we consider what all of this means for investors, and how they might position a portfolio to protect against the possibility of deflation while still taking advantage of the more benign scenario of very low inflation.

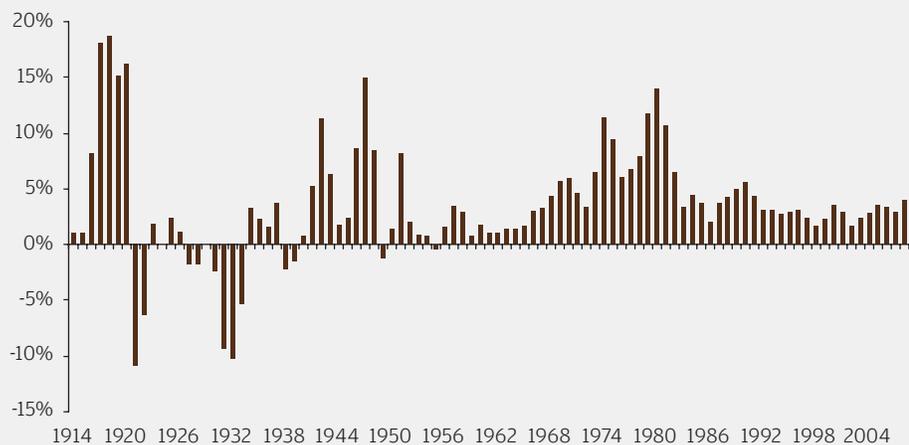
¹See The Inflation Question, David Kelly, J.P. Morgan Asset Management, June 2009

The deflation question

The problem with deflation

Deflation, simply defined, is when prices in the economy are generally falling. It is a relatively rare problem. While deflation occurred more frequently early in the 20th Century, as shown in the chart below, there have only been three years in the last 70 when prices actually fell in the United States. (It should be noted that one of those years was 2009, when a collapse in energy prices, following a bubble the prior year, amplified the impact of the global financial crisis, resulting in an average 0.4% decline in overall consumer prices for the year. Since then, energy prices have stabilized, so that, despite a slow downward drift in core inflation, both overall and core consumer prices were up about 1% year-over-year in July 2010.)

CHART A: CPI, 1914-2009
Annual percent change



Source: BLS, J.P. Morgan Asset Management.

Deflation is generally caused by a lack of demand in the economy or an excess supply of goods and services. For consumers, a world of falling prices might seem preferable to one of rising prices. However, there are three big economic problems caused by deflation:

1. Wages may need to fall. If prices of goods and services are falling by 5% per year and labor productivity is growing by 2% per year, companies will need to cut wages by 3% per year just to maintain their profit margins. In practice, companies have a very hard time imposing an annual pay cut on employees and may instead lay off workers or close parts of their businesses, exacerbating the unemployment problem.

2. Conventional monetary policy ceases to work. When the Federal Reserve wants to stimulate the economy, it cuts short-term interest rates directly and tries to engineer a decline in long-term interest rates. The idea is that, if interest rates are low enough, people will be enticed to borrow and invest money in new businesses, new cars and new houses, helping the economy grow.

In theory, this should work in an environment of rising prices and wages. If I take out a 5% mortgage to buy a house and home prices are rising 5% per year, and my income is also rising by 5% per year, I should be able to service the loan and build equity in the house very easily. However, if home prices and wages are falling by 5% per year, then I'm going to struggle to make the payments and actually watch the equity in my house decline. In fact, in this kind of scenario, even if I could borrow the money at 0% interest, I'd probably decide not to buy the

house because, with falling prices, I'd be losing money on the deal. And, for obvious reasons, the banking system can't operate with an interest rate of 0% or less on loans.

3. A “wait and see” mentality may take hold. However, perhaps the most damaging aspect of deflation is that it discourages people from making economic decisions. If you are ready to buy a house, but you think prices might be lower a year from now, you may decide to “wait and see.” If you are considering buying some equipment for your business, but you think that prices will fall going forward, you may postpone your purchases. If you are considering hiring an employee, but you are afraid you are going to have to cut your prices, you may decide to put it off. It is this collective decision to “wait and see,” rather than “do it now,” that has the greatest potential to slow economic growth.

The risk of deflation

Recognizing the problems caused by deflation, what is the risk that the United States is going to succumb to it over the next few years?

At the present time, this is a relatively close call. The overall Consumer Price Index (CPI) inflation rate in the 12 months ended in July was 1.1%, while the core rate, excluding food and energy, was 1.0%. In the short-run, the core inflation rate is a steadier measure of inflation. However, for the purposes of evaluating the risk of deflation over the next few years, it is perhaps best to look at the overall rate.

One way to estimate the risk of deflation is to put together a simple econometric model of overall inflation.

The dependent variable is the percentage change in overall CPI inflation, on a quarterly basis, from the first quarter of 1983 to the third quarter of 2010. We decided to start in 1983, largely because inflation dynamics appear to have changed significantly since the 1970s, and we don't want the equation to struggle to provide an explanation of the 1970s at the cost of providing a good explanation of more recent inflation trends. We also decided to start the forecast from the fourth quarter 2010. We felt that halfway into the third quarter, it was probably best to estimate inflation for the quarter from monthly data, rather than start the forecast in an obviously wrong direction.

The independent variables are divided into two groups: three exogenous variables that tend to drive inflation, and two measures of slack or excess supply in the economy itself.

The price of crude oil, farm output prices and the exchange rate of the U.S. dollar compose the first group. Higher crude oil and agricultural commodity prices obviously add to inflation, while a falling dollar should boost import prices.

In the second group, we include the unemployment rate and the vacancy rate of rental property. We also include an AR(1) term to correct for auto-correlated errors, which may, to some extent, reflect the persistence of inflation expectations and their impact on price setting. We also use a “dummy” variable to exclude data from the fourth quarter of 2008, when the plunge in CPI during the financial crisis seemed to be greater than could be easily explained by any model.

The statistical output from this model is shown in the Appendix. With an R-squared of .69, the model explains roughly 69% of the variance in quarterly inflation rates since 1983. Obviously,

we would like to be able to explain more of the inflation story, but it is important not to torture the data until it starts lying to you.

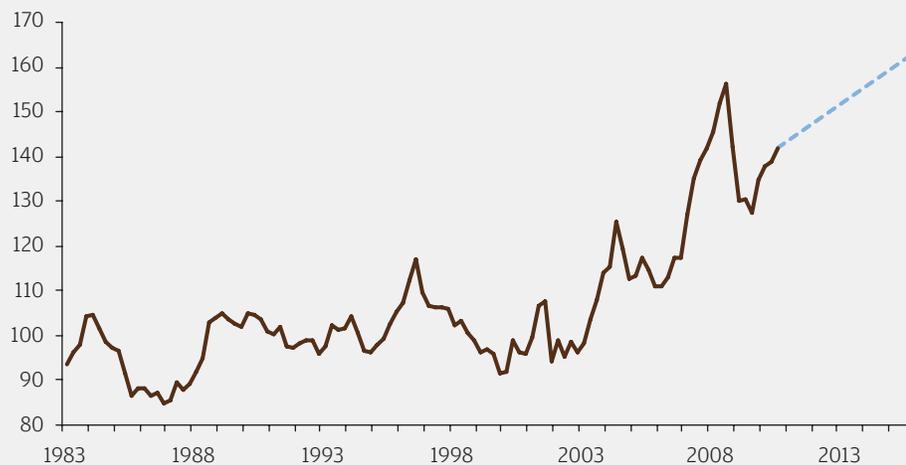
So now that we have a model, what does it tell us about inflation going forward? Here we have to make some assumptions, which are described and shown below.

CHART B: Crude Oil Prices, 1983-2015
West Texas Intermediate, quarterly, USD per barrel



Source: NYME, FactSet, J.P. Morgan Asset Management.

CHART C: Farm Prices Received Index, 1983-2015
Quarterly data



Source: FactSet, USDA, J.P. Morgan Asset Management.

1. Oil: Crude oil prices, which soared to \$140 per barrel in the second quarter of 2008 and slumped to \$43 a barrel on average in the first quarter of 2009, averaged \$78 a barrel in the second quarter of 2010. World demand for oil is increasing again, with the Energy Information Administration (EIA) forecasting global oil demand to rise from just over 84 million barrels a day in 2009 to just over 87 million barrels a day in 2011². This increased demand is being driven almost exclusively by consumption in the developing world. The EIA projects that this will boost crude oil prices by roughly \$1 a barrel per quarter to \$85 a barrel by the end of 2011. While many factors can, and very likely will, push oil prices off this trajectory, a reasonable forecast might just be to extrapolate this forward, assuming a continued tightening in world oil supplies.

2. Farm prices: Following a boom in the 1970s, farm output prices stagnated from the early 1980s to the early 2000s as productivity improvements in global agriculture offset the world's rising demand for food. However, in recent years, with the huge growth in living standards in the developing world, farm commodity prices have once again begun to rise. We assume that this pressure continues boosting agricultural commodity prices by roughly 3% per year over the next five years.

²Short-Term Energy Outlook, August 10, 2010, Table 3a

3. The dollar: For much of the 2000s, the value of the U.S. dollar fell. Two key factors driving the dollar down were the big U.S. trade deficit and the fact that the world economy was outpacing the U.S. in growth. This long dollar slide came to an abrupt halt in 2008, when fears of financial contagion pushed investors into the safe haven of U.S. dollars. Since then, the dollar has zig-zagged, largely reflecting the temperature of global financial stress.

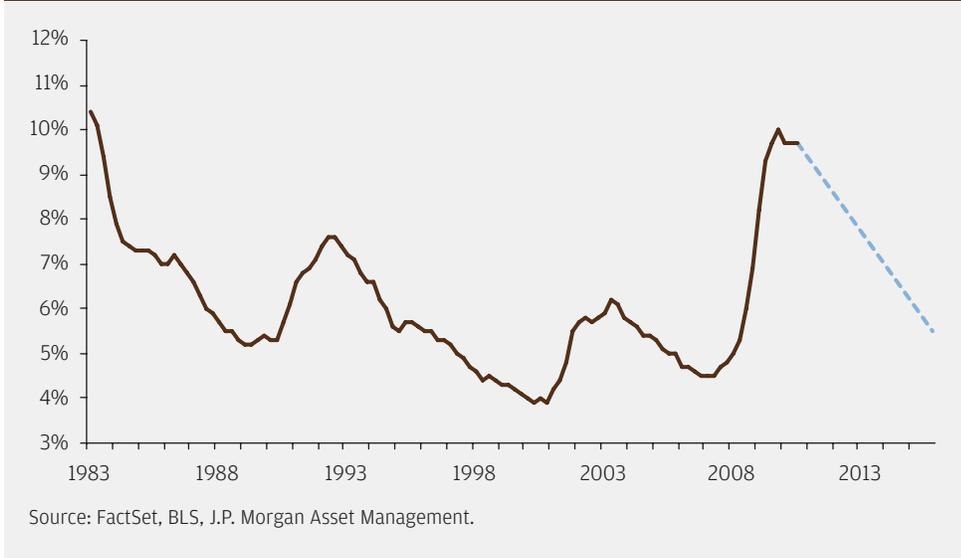
However, over the past year it has become clear that the decline in the dollar so far has only dealt with about half of the U.S. trade problem: the current account trade deficit rose to roughly 3.5% of gross domestic product (GDP) in the second quarter of 2010 from a low of 2.4% of GDP a year earlier. Moreover, the world economy clearly continued to beat the U.S. in growth. Given these imbalances, we believe it is reasonable to expect the dollar to resume its steady decline in the years ahead.

4. The unemployment rate: To a large extent, the direction of the unemployment rate will be determined by the pace of economic growth, which in turn will be impacted by deflation concerns. However, if the economy can achieve and sustain economic growth of above 4%, the unemployment rate should decline by about 1% per year over the next few years.

CHART D: Nominal Trade-Weighted Exchange Rate Index, 1983-2015
Major currencies, quarterly

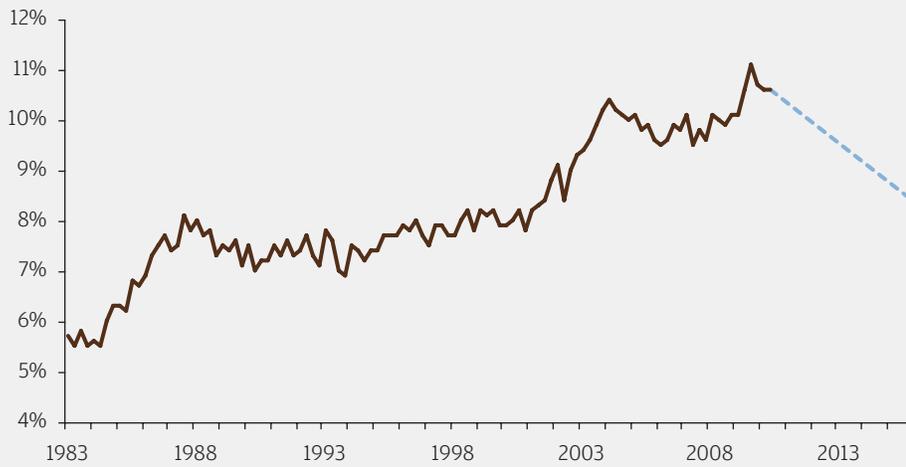


CHART E: Unemployment Rate, 1983-2015
Quarterly data, seasonally adjusted



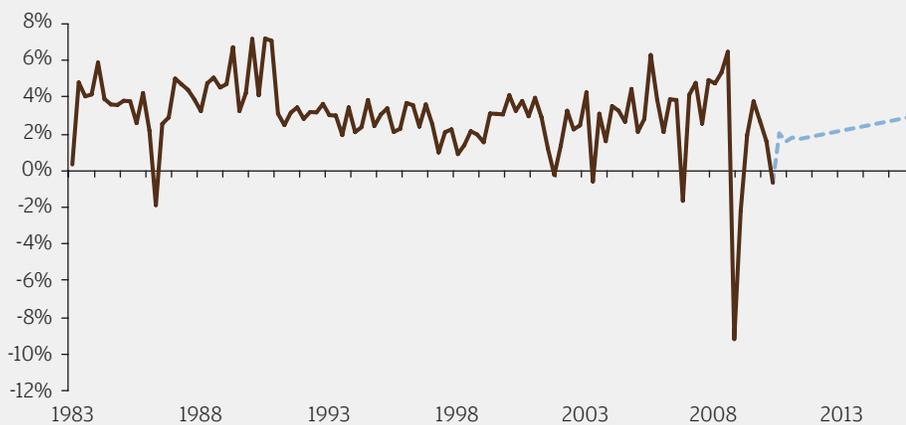
5. Rental Occupancy Rates: Finally, occupancy rates on rental housing and apartments should gradually rise going forward. The pace of home-building remains extraordinarily slow for both single-family and multi-family dwellings and, given population growth, demand should gradually rise.

CHART F: Rental Vacancy Rates, 1983-2015
Quarterly data, seasonally adjusted



Source: U.S. Census, J.P. Morgan Asset Management.

CHART G: CPI, 1983-2015
Annual percentage change



Source: Federal Reserve, BLS, U.S. Census, FactSet, J.P. Morgan Asset Management.

It should be emphasized that beneath these assumptions is a broader underlying assumption that the U.S. economy will avoid a double-dip recession. We believe that this is the most likely path. Double-dip recessions are very rare - in fact there has been only one double-dip recession since World War II - the twin recessions of 1980 and 1981-82. This in turn reflects the reality that recessions are concentrated in the most cyclical areas of the economy, such as home-building, autos, business equipment spending and inventories. If these areas are already very suppressed in the wake of a recession, as is the case right now, it is very hard for them to fall ever further and push the economy into a second recession.

Putting these assumptions into the model gives us the following expected year-over-year path for inflation. It suggests that, while current slack conditions should push inflation down to about 1.5% growth in the fourth quarter of 2010, a continued removal of that slack, along with a falling dollar and rising exchange rate, can offset the impact of slack itself on the inflation rate over the next few years. In other words, while it will be close, the U.S. economy should avoid a bout of sustained deflation.

Dealing with deflation

On balance, we believe that the U.S. economy should avoid a double-dip recession and that developing nations should continue to experience strong growth. If this transpires, then the U.S. should avoid outright deflation. However, there are enough “if’s” and “should’s” in those two last sentences to make it worth considering what deflation might mean for both policy makers and investors.

As we already mentioned, the first problem for the Fed or any central bank is that conventional monetary policy is not effective at stimulating the economy in the presence of deflation. If the Fed encountered an actual deflationary situation, it would likely ramp up quantitative easing as an unconventional means of stimulating the economy. However, as detailed in Appendix A1, evidence from Japan in recent years, or in the United States over the past year, suggests that, while unconventional measures can deal with a financial crisis, they are not particularly good at stimulating the economy. In the end, even if you expand the money supply within the banking system, households and businesses need to be convinced to borrow and spend.

Fiscal policy has more potential. Conventional fiscal stimulus consists of broad increases in federal spending, which can get bogged down in red tape or tax cuts that households use to augment their savings. This has been tried over the past few years and has not proven effective. However, it is possible to design fiscal stimulus that provides incentives to buy, such as temporary tax breaks on purchases of new vehicles, houses or business equipment. If these programs give individuals and companies a reason to “do it now” rather than “wait and see,” they can be effective. However, it is not very clear that a political debate in Washington on how to deal with deflation would actually result in such enlightened solutions.

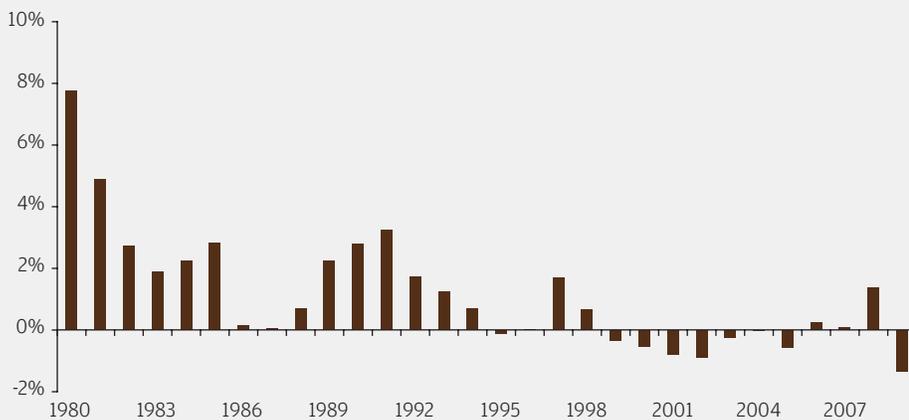
For investors, if deflation were to emerge, long-term Treasury bonds might turn out to be the best-performing asset, with cash also providing a decent return, at least in real terms. However, betting that way today is clearly dangerous, given extremely low yields in both areas. If the economy muddles through and earnings continue to rise, stocks should beat cash and cash might well beat Treasury bonds. This being the case, it probably makes sense to maintain a diversified portfolio – one that can provide some protection in the form of cash or Treasuries to guard against the possibility of deflation, while investing in stocks and other riskier assets to profit from the probability that deflation does not occur.

Appendix

(A1) Why the United States isn't Japan

One of the reasons the threat of deflation evokes such fear among investors is that the two best-known episodes of deflation in modern history have been associated with very bad outcomes for both the economy and markets. Those two episodes occurred in the United States in the 1930s and in Japan over much of the past 20 years (as is shown in the chart below).

CHART H: Japanese CPI, 1980-2009
Annual percentage change



Source: OECD, FactSet, J.P. Morgan Asset Management.

It is easy enough to see why the United States today is in a very different macroeconomic position than in the early 1930s. Back then, the economy experienced a four-year recession with a 27% decline in real GDP and an unemployment rate that averaged 25% in 1933. The most recent U.S. recession, while technically the deepest since World War II, clearly is not in the same league as the Great Depression.

However, Japan over the last two decades has some more troubling parallels with the current U.S. situation. In both cases, an economic slump was triggered by asset bubbles and, in both cases, monetary and fiscal policy appeared relatively powerless

to arrest a steady deflation. That being said, there are differences as well.

1. Japan consistently has had a much higher personal savings rate than the United States. While a high savings rate may sound like a positive, it has prevented Japanese consumers from adding to domestic demand.
2. Japan's annual population growth has been just 0.2% over the past 20 years, also stifling the economy's ability to generate growth in private sector demand. The U.S., by contrast, has seen annual population growth of roughly 1.1% per year.
3. In December 1989, when the Japanese Nikkei stock market index peaked, the yen was trading at 144 yen to the dollar. Since then, it has generally strengthened (standing at 85 yen to the dollar as this is being written), reducing the potential for imported inflation while simultaneously impeding the growth of Japan's export industries.
4. Finally, and most importantly, Japan's asset bubbles were far more severe than the housing and stock market bubbles that have hurt the U.S. economy over the past decade. Because of this, both stock prices and land prices needed to fall much further and longer to get to reasonable valuations. In the U.S., price/earnings ratios on stocks, and affordability indexes on homes are already close to their cheapest levels in decades, suggesting that, barring some outside surprise to the economy, falling asset prices should not be a drag on economic growth or overall inflation going forward.

(A2) Regression output

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.019064	0.002951	6.461046	0.0000
@PCH(WTI)	0.015325	0.002170	7.061478	0.0000
@PCH(WTI(-1))	0.009166	0.002041	4.491291	0.0000
@PCH(EXCH(-2))	-0.006102	0.009272	-0.658143	0.5119
@PCH(FARMPRICE)	0.016810	0.008233	2.041712	0.0438
@PCH(FARMPRICE(-1))	0.010822	0.007979	1.356289	0.1780
RUC(-1)	-0.000288	0.000239	-1.204077	0.2314
RENTVAC	-0.001276	0.000281	-4.542725	0.0000
D2008Q4	-0.020983	0.003224	-6.508937	0.0000
AR(1)	0.224378	0.099428	2.256678	0.0262
R-squared	0.688490	Mean dependent var		0.007260
Adjusted R-squared	0.660732	S.D. dependent var		0.005070
S.E. of regression	0.002953	Akaike info criterion		-8.726026
Sum squared resid	0.000881	Schwarz criterion		-8.481925
Log likelihood	494.2945	Hannan-Quinn criter.		-8.627002
F-statistic	24.80305	Durbin-Watson stat		2.096845
Prob (F-statistic)	0.000000			
Inverted AR Roots	.22			

Dependent Variable:

@PCH(CPI)

Method: Least Squares

Sample: 1983Q1 2010Q3

Included observations: 111

Convergence achieved after 5 iterations

CHART I: Actual vs. Fitted

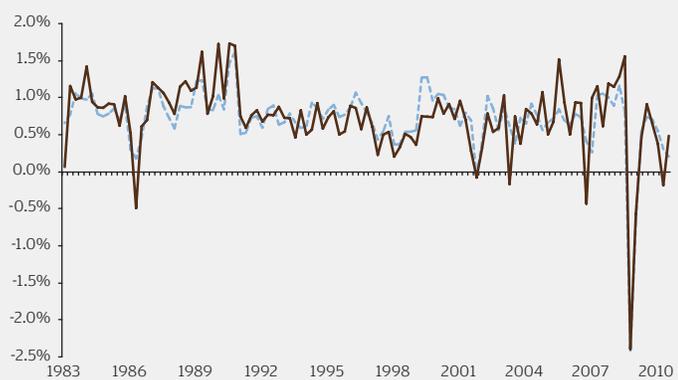
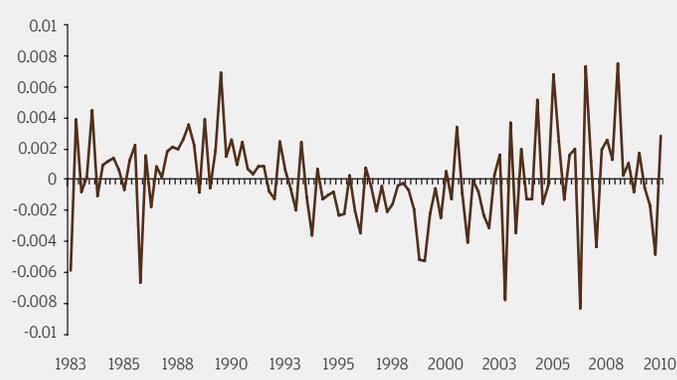


CHART J: Residual



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