

charles
SCHWAB

INVESTMENT
MANAGEMENT



Charles Schwab
Investment Management
Perspectives™

Preparing for inflation: The importance of a well-diversified portfolio

September 2015

Own your tomorrow™

This discussion reflects the views of
Emre Erdogan, Jake Gilliam, and Natallia Yzhova.



Emre Erdogan,
Ph.D., CFA,
Research Analyst,
Multi-Asset
Strategies



Jake Gilliam,
CFA, AIF®,
Senior Multi-Asset
Class Portfolio
Strategist



Natallia Yzhova,
Research Analyst

With the overall health of the U.S. economy continuing to improve, inflation appears poised to begin rising at a moderate, but slightly faster pace. In light of this potential outcome, we believe that it's important to dispel some common misconceptions about rising prices and the impact on various asset classes. Specifically, our research suggests that neither commodities nor Treasury Inflation-Protected Securities (TIPS) provide standalone panaceas for inflation, and that a comprehensive, one-stop investment solution doesn't exist. Instead, our findings suggest that a thoughtful, well-diversified approach to investing is a far more prudent—and potentially rewarding—strategy to employ.

Widely held beliefs vs. our viewpoints

Improving economic conditions

Following the “Great Recession” and the subsequent period of slow growth, low inflation, and uneven recovery in the U.S., the Federal Reserve (Fed) implemented many extraordinary policies in an effort to stimulate economic activity.¹ These policies appear to have helped, with the U.S. economy continuing along a pathway of improvement. In response, the Fed appears poised to start “normalizing” interest rates at some point this year.

A “healthy” level of rising prices

In order for the economy to continue along the pathway toward self-sustainability, a “healthy” level of inflation is generally considered necessary. Rising prices for goods and services can reflect improving economic conditions and a reasonable level of wage growth that are translating into increased consumer demand. This would become the case in an ideal scenario. Yet even this healthy level of inflation has the potential to affect the performance of an investor’s portfolio, as well as one’s future spending power.

To help investors better prepare for the implications of this reality, we’ve analyzed different sources of inflation and present information about how various asset classes have responded. We challenge widely held beliefs that certain traditional asset classes are suitable standalone, inflation-protecting securities. Instead of a one-stop approach, we encourage a blended methodology, believing that investors should address inflation risks in a diversified manner to help avoid overexposure to unintended risks and reduce reliance on any one asset class. We’ve captured these widely held beliefs and our viewpoints in the table below.

We challenge widely held beliefs that certain traditional asset classes are suitable standalone, inflation-protecting securities.

Widely held beliefs	Our viewpoints
Commodities are essential inflation fighters.	Commodities are risky compared with other asset classes that we studied, and helped in only half of the inflationary environments we examined.
TIPS provide inflation protection in any environment.	TIPS were the worst-performing asset class in nearly 20% of inflationary environments that we sampled.
Stocks and bonds afford poor inflation protection.	In nearly one-third of the inflationary environments we researched, stocks and bonds generally outperformed other asset classes that we examined.
All inflation is the same.	Inflation is caused by various factors, leading to dramatically different asset class performance.
Money market funds are poor inflation fighters.	In nearly 45% of the inflationary environments that we examined, money market funds outperformed inflation.

What is inflation, and why should you care?

From the Vietnam War, to crude oil supply shocks, to the housing market bubble, many factors have affected the path of inflation over the past five-plus decades. The chart below illustrates this history, showing inflation since 1960 as gauged by changes in the consumer price index (CPI).

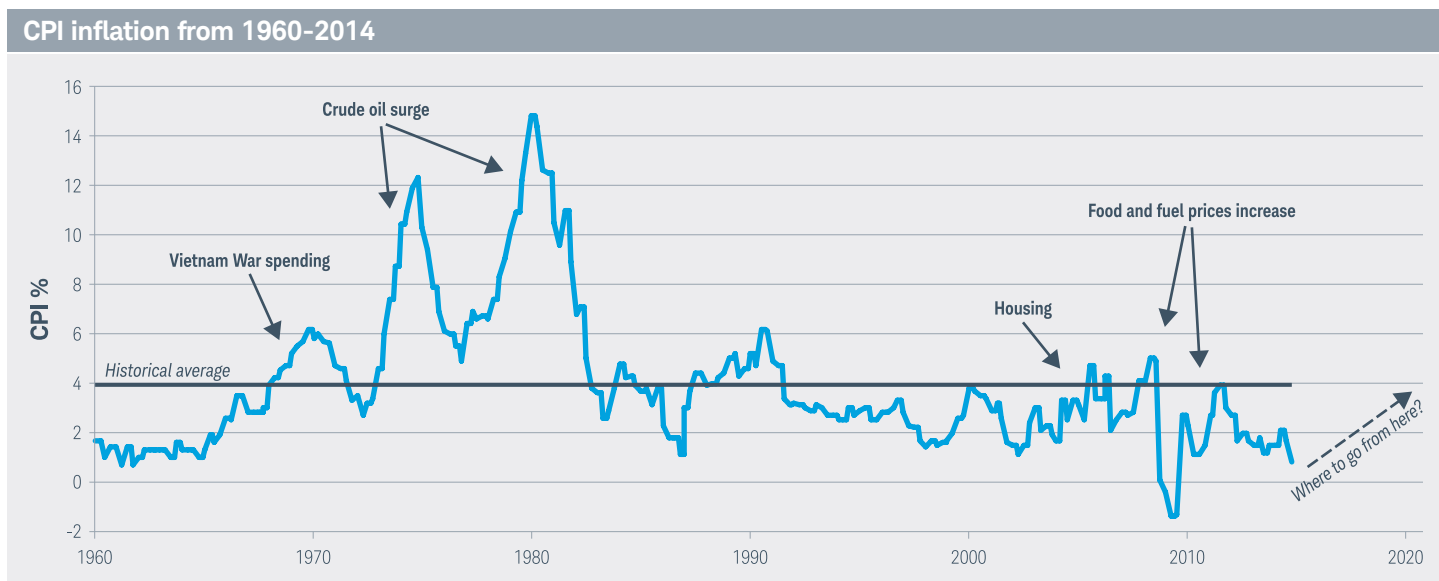
Not all inflationary catalysts are created equal

As shown below, inflation hasn't always risen slowly and steadily, and it can be caused by a variety of catalysts. Moreover, the performance of an asset class can vary depending upon the underlying catalyst for inflation. This has led us to the conclusion that adopting a well-diversified investment approach to prepare for the effects of inflation may represent a far more effective solution than narrowly confining such an approach to only one security type or another.

Purchasing power erosion

Inflation measures changes in the cost of living and in the purchasing power, or value, of money.² Specifically, inflation is the rate at which the prices of goods and services are rising, and, correspondingly, purchasing power is falling. For example, if inflation were to rise 2% in a given year, then something that cost \$100 at the start of a year would instead cost \$102 one year later.

As the chart illustrates, inflation hasn't always risen slowly and steadily, and it can be caused by a variety of catalysts.



Sources: Bloomberg, CSIM.

“Demand-pull” inflation

As demonstrated in the table below, a variety of factors can fuel inflation. First, inflation can rise due to increased aggregate demand in an economy. This “demand-pull” inflation can be a positive development and may be caused by a reduction in interest rates, wage growth, an increase in government expenditures, tax cuts, a rise in exports, an increase in the quantity of money, as well as other factors that can potentially elevate aggregate demand (see the Demand-pull inflation chart in the Appendix). Given the length of time that interest rates have been historically low, and in light of the overall trend toward economic improvement, we believe that a “demand-pull” inflationary scenario may eventually begin to emerge.

For perspective on what such an environment might look like, “demand-pull” inflation was observed in the U.S. during the late 1960s. In 1960, inflation was rising at approximately 2% per year, as measured by the CPI. The CPI continued to increase in subsequent years, reaching approximately 3% by 1966. While this time period illustrated that demand-pull inflation can accompany a reasonable level of economic growth, there’s another type of inflation that is less common but that investors shouldn’t ignore.

“Cost-push” inflation

This second main type of inflation is “cost-push” inflation (see the Cost-push inflation chart in the Appendix). Historically speaking, “cost-push” inflation has usually been caused by an increase in raw material prices such as oil. Unlike “demand-pull” inflation,

“cost-push” inflation tends to have disproportionately weighted economic repercussions. We believe that investors should always take this inflationary scenario into consideration when attempting to structure their portfolios for long-term success.

One prime example of “cost-push” inflation was in the U.S. during the late 1970s, when these elevated inflation levels were driven by an increase in commodity prices. Specifically, the Organization of the Petroleum Exporting Countries (OPEC) raised the price of crude oil by approximately 400% in 1974. Then, in 1979 and 1980, OPEC raised prices even further, with a barrel of Brent crude oil surging to approximately \$117, based on March 2015 inflation-adjusted dollars. In response, the CPI surged, peaking at nearly 15% in March 1980. This “cost-push” inflation, and its primary catalyst, is featured alongside “demand-pull” inflation in the table below.

Furthermore, sometimes “demand-pull” and “cost-push” inflation work in conjunction (see the Overlapping inflation chart in the Appendix). For example, the CPI increased by a low rate in 2002, around 1%. However, inflation slowly rose to more than 4% by 2006. The increase in inflation during this period was driven by both increases in commodity prices and an increase in aggregate demand.³

As demonstrated in the table below, a variety of factors can fuel inflation.

Sources of inflation ⁴	
“Demand-pull” inflation	“Cost-push” inflation
<ul style="list-style-type: none">Interest rate reductionsIncreased government expendituresTax cutsIncreased exportsWage increaseIncreased quantity of money	<ul style="list-style-type: none">Commodity supply crises

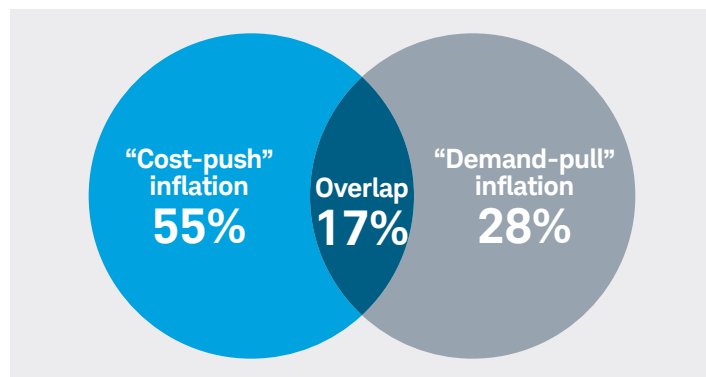
Inflationary catalysts over time

approaching a new era of “controlled inflation,” where many central banks are actively implementing policies to confine rising prices to within targeted zones.

Frequency of inflation catalysts

In the diagram below, we show the proportion of time certain sources of inflation—measured on a quarterly basis—increased between January 1, 1982, and December 31, 2014 (see the Appendix for details).

Frequency of sources in quarterly inflation



Sources: Bloomberg, The World Bank.

Asset class responses

To better understand how inflation can affect portfolio returns, we analyzed sources of inflation and their impact on various asset classes. We summarized some potential catalysts for “demand-pull” and “cost-push” inflation in the table on the previous page. We measured the catalysts for inflation in various ways. “Demand-pull” inflation was gauged as an increase in GDP, but we also added wage growth, while measuring supply shock—the primary catalyst for “cost-push” inflation—as increases in commodity prices concurrent with a faster pace of inflation.

We started our analysis from January 1, 1982, due to data availability, thereby excluding periods that in some instances included abnormally high inflation. Sources overlapped in a few instances, and we closely examined these periods separately. This methodology was chosen because we believe that we are

Asset class performance

The table below represents best- and worst-performing asset classes under different inflationary environments, based on the combination of total returns and Sharpe ratios that we calculated over the previously identified timeframes (see the Demand-pull, Cost-push, and Overlapping inflation charts in the Appendix).

The table below represents best- and worst-performing asset classes under different inflationary environments.

Asset class performance vs. inflation source			
Asset class performance	Inflation source		
	“Demand-pull” inflation	Overlap	“Cost-push” inflation
Best performers	SP500, R2000, ST Bonds, Treasury bills	SP500, R2000, REITs, Treasury bills	Commodities, TIPS
Worst performers	Commodities	AGG, TIPS, FX(\$)	FX(\$), Treasury bills

Sources: Bloomberg, The World Bank. See pg. 9 for asset class definitions; see page 10 for definitions of the inflation regimes.

Separating fact from fiction

What our research revealed

Commodities have traditionally been considered an important part of an effective inflation preparation plan. However, our research shows that including commodities in one's portfolio when an economy is experiencing healthy growth can introduce additional risk that we believe is not always offset by improved returns. Approximately one-third of the time, investors would have been better off investing in several other asset classes, instead. In fact, equities and fixed income securities generally would have provided a more balanced solution—a particularly important consideration for risk-averse investors—while outperforming commodities in particular, as

demonstrated in the charts below. These charts display asset class performance under the inflation regimes that we identified, as well as their relative risk according to Sharpe ratio calculations.

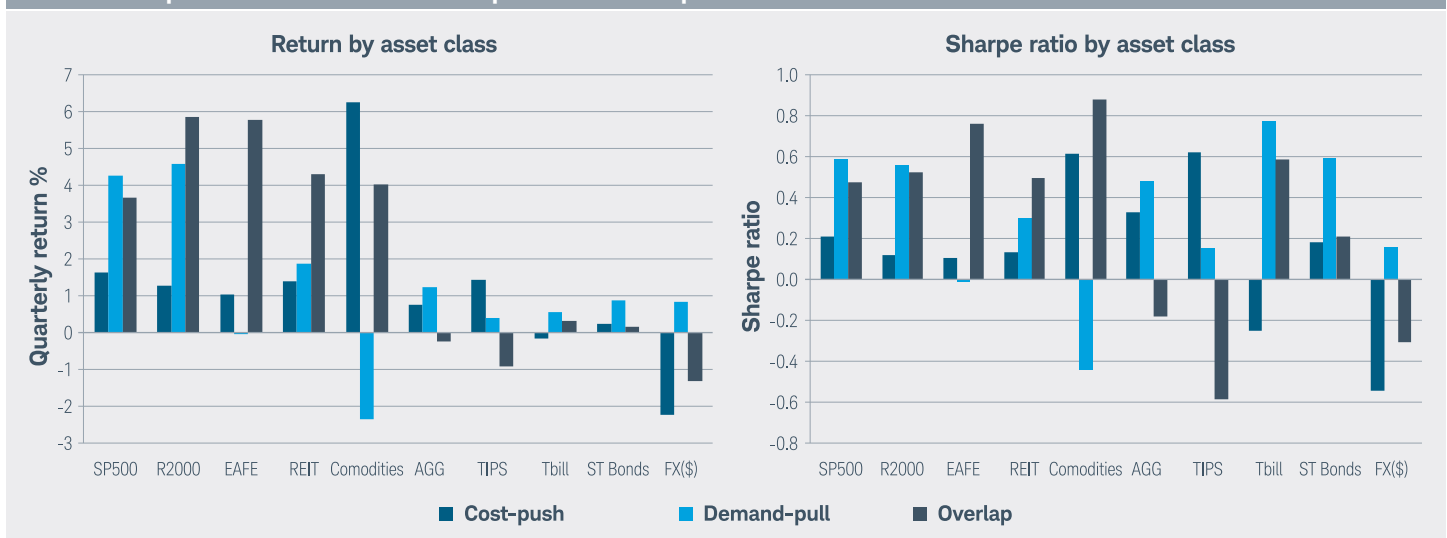
During “cost-push” environments that resulted from supply shocks, commodities performed quite well, as shown in the chart at left below. However, this isn't surprising given that increases in the prices of the asset class itself drove inflation during these periods. TIPS, REITs, and the S&P 500 Index also performed relatively well.

Additionally, we identified some time periods where a mix of “demand-pull” and “cost-push” inflation had occurred. In these environments, the data was unable to clearly identify which set of inflationary forces represented the bigger driver of rising prices. However, the data did reveal that a well-diversified mix of asset classes would have generated solid returns, as the chart on return by asset class below demonstrates. TIPS, one of the asset classes traditionally used to hedge inflation, were the worst performers in these environments.

The benefits of diversification

Taking all of our findings into account, we concluded that some asset classes traditionally recommended as inflation hedges might be quite risky under certain circumstances, especially when used as standalone solutions. Conversely, several asset classes believed to be poor performers—like equities and nominal bonds—held up remarkably well under certain scenarios, depending upon the inflationary catalysts. More importantly from our perspective, none of the asset classes that we sampled performed well under all inflationary scenarios.

Asset class performances in “demand-pull” and “cost-push” environments



Sources: Morningstar, Bloomberg, The World Bank, CSIM.

Conclusion

A thoughtful, well-diversified approach is the most effective means to prepare for inflation.

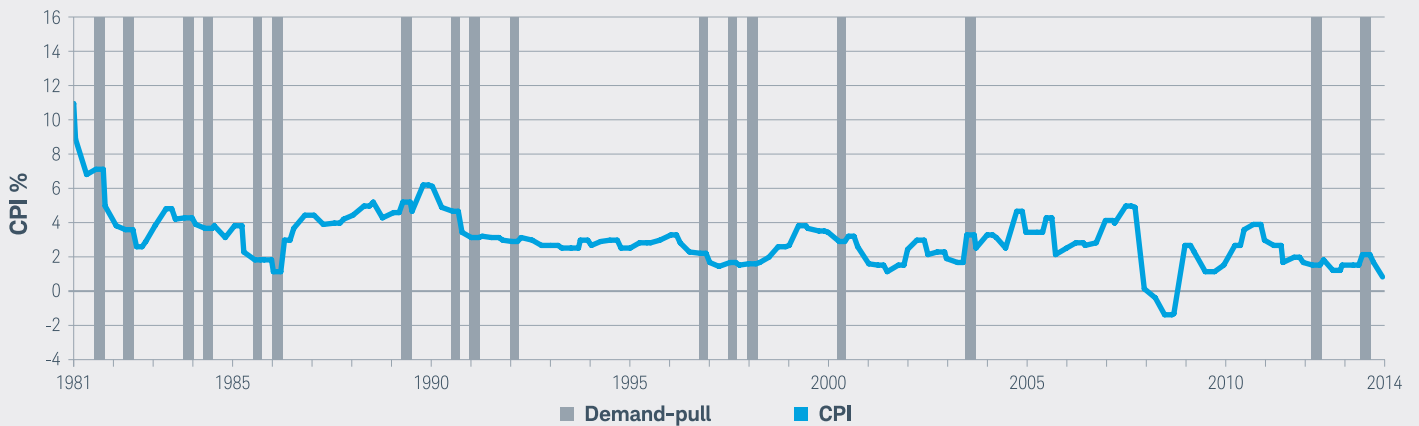
A thoughtful, well-diversified approach is the most effective means to prepare for inflation. Standalone investment strategies may not be sufficient in today's constantly evolving marketplace. A variety of catalysts can fuel inflation, and these catalysts may be categorized into "demand-pull" or "cost-push" environments, or some combination of the two. Although each of these scenarios resulted in rising overall prices during the periods that we sampled, our studies suggest that the nature of the underlying inflation itself plays a material role in determining security performance. Contrary to some widely held beliefs, TIPS and commodities are not single-stop inflation solutions. Also contrary to popular belief, money market funds and bonds proved to be effective inflation-fighting vehicles under certain conditions.⁵ These collective findings also revealed that none of the major asset classes that we sampled were perfect inflation fighters under all scenarios. If the goal is to achieve better long-term results than can be generated by TIPS or commodities alone, then a well-diversified approach to investing—one that includes allocations to traditional assets such as stocks, bonds, and cash—should be considered. In other words, to properly prepare for the effects of inflation, investors need to diversify to win.

Appendix

Indices we used:

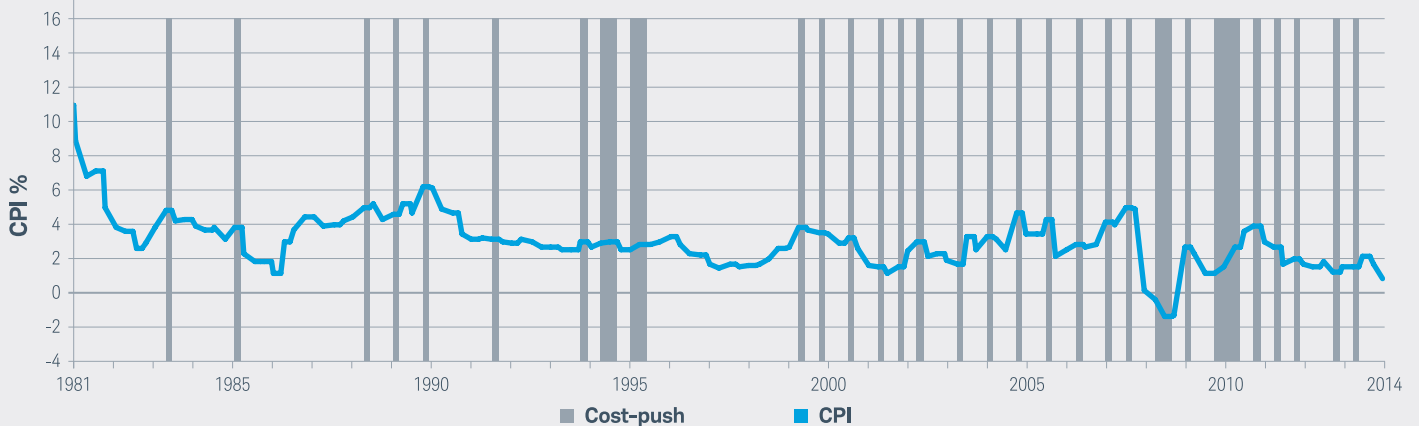
Asset Class	Index
SP500	S&P 500 Index (Total Returns)
R2000	Russell 2000 Index (Total Returns)
EAFE	MSCI EAFE (Total Net Returns)
REIT	FTSE EPRA NAREIT Developed NR
Commodities	Bloomberg commodity index total return (DJ UBS Commodity Index TR)
AGG	Barclays U.S. Aggregate Bond Index TR
TIPS	Barclays U.S. Treasury TIPS TR
ST Bonds	Barclays U.S. Govt/Credit 1-3 Yr. TR
FX(\$)	US Dollar Spot Index

Demand-pull inflation



Source: Bloomberg.

Cost-push inflation



Source: The World Bank.

Appendix (continued)

Asset class returns are from Morningstar except the FX(\$) which is from Bloomberg. All of the returns used in this paper are quarterly excess returns over the inflation rate for the respective period.

REITs index returns are from the Wilshire U.S. REIT Index before 02/28/2005 and from FTSE EPRA NAREIT Developed NR after 03/01/2005.

Commodity index returns are from S&P GSCI Total Return CME before 12/31/1990 and from Bloomberg commodity index total return (DJ UBS Commodity Index TR after 01/01/1991).

Definition of the inflation regimes:

Inflation is measured by quarterly change in seasonally adjusted CPI. Source: Bloomberg.

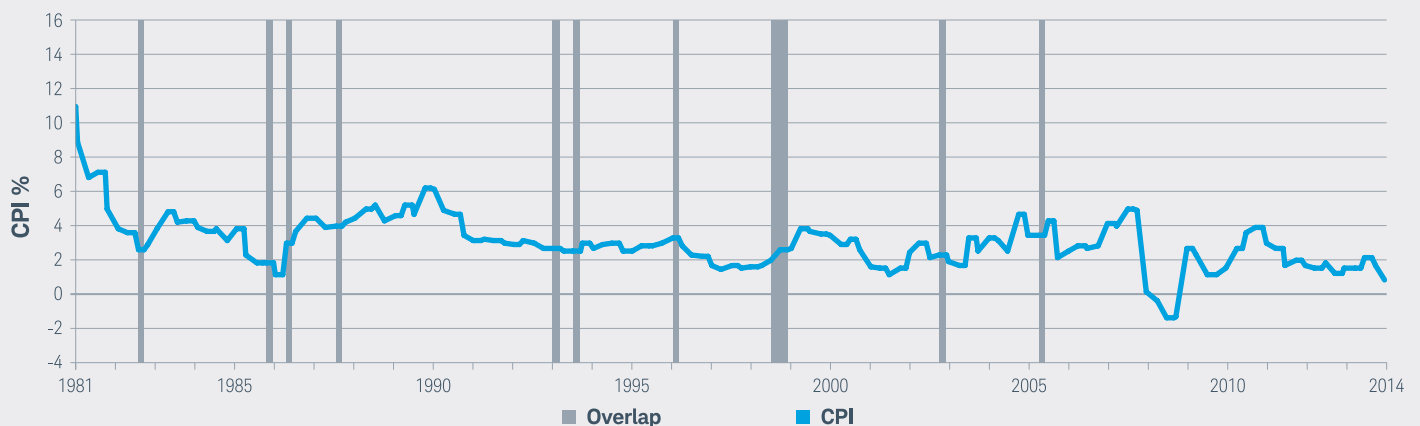
Increase in aggregate demand is measured by the quarterly increase in seasonally adjusted real GDP. Source: Bloomberg.

Changes in commodity prices are the average price change of an equally weighted price changes of energy, non-energy (beverages, food, raw materials, fertilizers, metals and minerals) and precious metals. Source: The World Bank.

Change in wages is the change in the inflation adjusted Wage & Salary from the GDP report U.S. Nominal Dollars SAAR.

Sources: Bureau of Economic Analysis and Charles Schwab Investment Management.

Overlapping inflation



Sources: Bureau of Economic Analysis and Charles Schwab Investment Management.

Bibliography

- 1. Fed.** Current FAQs. *Board of Gov of the Federal Reserve System*.
[Online] [Cited: March 17, 2015.]
http://www.federalreserve.gov/faqs/money_12848.htm.
- 2. What is inflation** and how does the Federal Reserve evaluate changes in the rate of inflation? *Current FAQs*.
[Online] Federal Reserve, April 30, 2014.
[Cited: January 5, 2015.] http://www.federalreserve.gov/faqs/economy_14419.htm.
- 3. U.S. Bureau of Labor Statistics.** *Monthly Labor Review*. April 2014. <http://www.bls.gov/opub/mlr/2014/article/one-hundred-years-of-price-change-the-consumer-price-index-and-the-american-inflation-experience.htm> (accessed August 17, 2015).
- 4. Parkin, Michael.** *Economics*. s.l. : Addison Wesley - Pearson, 2007.
- 5. Money market funds** in 2012 History of Money Market Funds. *Investment Company Institute (ICI)*.
[Online] February 13, 2012.
[Cited: December 30, 2014.] http://www.ici.org/pdf/12_mmf_history.pdf.



Emre Erdogan, Ph.D., CFA

Research Analyst, Multi-Asset Strategies

Emre Erdogan is a Research Analyst for Charles Schwab Investment Management, Inc. (CSIM). He is responsible for designing and implementing asset allocation models for Schwab's multi-asset strategies. His role includes researching strategic asset allocation; maintaining and enhancing glide paths for the Schwab Target Funds; and strengthening portfolio construction and risk management capabilities.

Prior to joining CSIM in 2011, Mr. Erdogan was a quantitative developer in the Research & Development Group at Bloomberg LP, where he built U.S. and international equity and fixed income multi-factor risk models. Prior to that, he was a quantitative analyst at ING Investment Management.

Mr. Erdogan earned a Ph.D. in Operations Research from Columbia University and is a CFA charterholder.



Jake Gilliam, CFA, AIF®

Senior Multi-Asset Class Portfolio Strategist

Jake Gilliam is the Senior Multi-Asset Class Portfolio Strategist for Charles Schwab & Co., Inc. He is a member of Charles Schwab Investment Management's (CSIM) Asset Allocation and Sub-Advisor Oversight Committees. He contributes to strategic decisions for all multi-asset class portfolios as well as several single asset-class portfolios within CSIM and Schwab Bank Collective Trust Funds. He works closely with the Chief Investment Officers, Portfolio Managers, Research, and Subadvisor Oversight teams on a frequent basis. Mr. Gilliam also represents CSIM's multi-asset class strategies to the institutional marketplace, clients, and the media.

Previously, he was the day-to-day Senior Portfolio Manager for Schwab Target Funds and Head of Sub-Advisor oversight for CSIM. Additionally, Mr. Gilliam developed the Schwab Corporate and Retirement Services Institutional Investment Analyst team and oversaw the due diligence process for maintaining the Schwab Focus List™. Earlier in his career, he also worked as a sell-side Equity Research Associate covering the food retail and restaurant industries.

Mr. Gilliam earned a bachelor of business administration (BBA) in Finance from Ohio University, and is a board member of the Ohio University College of Business Finance Advisory Council. He is a Chartered Financial Analyst (CFA) charterholder and a member of the CFA Society of Cleveland. He has earned the Accredited Investment Fiduciary® (AIF) designation, awarded by the Center for Fiduciary Studies, University of Pittsburgh.



Natallia Yazhova

Research Analyst

Natallia Yazhova is a Research Analyst for Charles Schwab Investment Management, Inc. (CSIM). She is responsible for developing and maintaining quantitative models and software to support CSIM's multi-asset strategy funds.

Prior to joining CSIM in 2015, Ms. Yazhova spent nearly seven years at Mesirow Financial. Ms. Yazhova served as a Currency Management Analyst responsible for passive and overlay hedging implementation since 2011. Prior to that, Ms. Yazhova was a Quantitative Analyst for the International Equity team, where she worked on factor based top-down strategy to asset allocation and research across countries, regions and sectors. From 2006 to 2008, she was an Accountant/Business Controller at Bear Stearns Asset Management providing operational, compliance and accounting support for four hedge funds.

Ms. Yazhova earned a Master of Science in Computational Finance from Carnegie Mellon University, Tepper School of Business, and a Bachelor of Technology in Computer Information Systems from the Globe Institute of Technology.

Charles Schwab Investment Management

At Charles Schwab Investment Management, our goal is to provide foundational products with consistent performance that enable investors to build well-diversified portfolios. Learn more at www.csimfunds.com.

Past performance is no guarantee of future results.

There are many other ways of measuring inflation. For simplicity, we focused on the CPI in this white paper.

The opinions expressed are subject to change without notice, and are not intended to serve as investment advice, a recommendation, offer, or solicitation to buy or sell any securities, or recommendation regarding specific investment strategies. Information and data provided have been obtained from sources deemed reliable, but are not guaranteed. Charles Schwab Investment Management makes no representation about the accuracy of the information contained herein, or its appropriateness for any given situation. Some of the statements in this document are forward looking and contain certain risks and uncertainties. The views expressed are those of Emre Erdogan, Jake Gilliam, and Natallia Yazhova, and are subject to change without notice based on economic, market, and other conditions. Past performance is no guarantee of future results.

Charles Schwab Investment Management, Inc. (CSIM) and Charles Schwab & Co., Inc. are separate but affiliated companies and subsidiaries of The Charles Schwab Corporation.

©2015 Charles Schwab Investment Management, Inc. All rights reserved. Member SIPC. REF (0815-5446) MKT87487 (09/15) 00151607



Own your tomorrow™