



*This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.*

# Time for Real Assets to Trump 60/40

Josh Silva  
Q4 2016

From 1981 to today, something as simple as a stamp has gone from a cost of \$0.18 to \$0.47. How do CIOs with long term investment horizons protect their constituents from such heavy evaporation of purchasing power over the long run? For some time now, it seems the concept of inflation and the impact it can have on investor portfolios has been relegated to the world of academia. Any investor who really experienced the last time inflation was over 10% was born in 1960 and had just begun their careers. In the recent past, practitioners who have rung the bell to warn of rising inflation and responded with investments in commodities, TIPs and MLPs have had a volatile ride and been viewed by some as the “person who cried wolf”. For a variety of reasons, most recently driven by global central bank policies to manufacture low rates, the threat of inflation has not been a real concern. At this point, the quote attributed to Mark Twain regarding ‘history rhyming’ seems appropriate. While there is little risk that CPI will jump to 10% any time soon, it is clear what the repercussions of rising rates have on a static portfolio of equities and fixed income. This paper is an effort to provide an historical context, frame the current environment and provide investors with some thoughts on how to protect their portfolios purchasing power going forward.

Before 1977, the sole objective of the Federal Reserve (the Fed) was to spur economic growth. In 1977, Congress amended the Federal Reserve Act, incorporating the concurrent objective of managing the inflation rate. This was known as the “dual mandate.”

The Board of Governors of the Federal Reserve System and the Federal Open Market Committee shall maintain long run growth of the monetary and credit aggregates commensurate with the economy’s long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates. (Federal Reserve Act, Section 2A)

Most people tend to make investment decisions based on rising and falling economic growth. They tend to forget about what happens when inflation rears its ugly head. The Fed’s dual mandate shows how critical attention to inflation is to an investment portfolio.

For more than 30 years we have enjoyed a stable and benign inflation environment that has produced a 30-year bull market in bonds and nurtured strong equity returns. This begs the following questions:

- How will the market respond to higher inflation?
- How will the market respond to rising interest rates?
- What are the best investments to make during this new market cycle?



*This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.*

I like to refer to the 30-year bull market in bonds as an “asset-nurturing environment.” A portfolio that is comprised only of equities and bonds should perform well during a period of falling inflation/falling rates. If a company’s input costs and debt repayment values drop, the value of the stock tends to increase. Since inflation has been low for so long, the question of how a 60/40 portfolio does during a rising inflation cycle is rarely brought up. In fact, with bond yields being the lowest they have been in generations, people are now, more than ever, moving into these passive investment strategies. I find this incredibly odd.

First, a 60/40 portfolio should outperform during periods of low inflation and underperform during periods of high inflation. Simply put, bond prices tend to rise during periods of falling inflation (e.g., the 1970s) and equities tend to underperform due to the input costs discussed above. One of the main reasons we saw the bull market in equities begin in 1982 was due to the Fed’s aggressive inflation-fighting action just prior, which allowed for our “asset-nurturing environment” to begin. This can be seen in the 30-year bull market in bonds and the bull market in equities caused by rising growth and equity P/E expansion.

Second, having an underperforming portfolio during a time of rising CPI can have tremendous impact on the purchasing power of a typical saver. If one’s portfolio underperforms the rate of inflation, a negative real return is produced. The goals of this paper are to:

1. Show how an investor should prepare for higher rates
2. Analyze whether a 60/40 passive portfolio becomes a high-risk investment
3. Question if adding real assets provides a tail hedge for inflation
4. Show what happens if bonds are in a bubble

## Macroeconomic States

I kept asking the question: What happens if we move out of this “asset-nurturing environment” into one with rising inflation and rising yields? A possible solution was to diversify one’s portfolio to include an allocation to real assets. I created our new simple allocation consisting of 50% equity and 30% bonds, plus our two real asset portfolios consisting of 10% commodities and 10% real estate.

Old Portfolio	60%/40%
New Portfolio	50%/30%/10%/10%

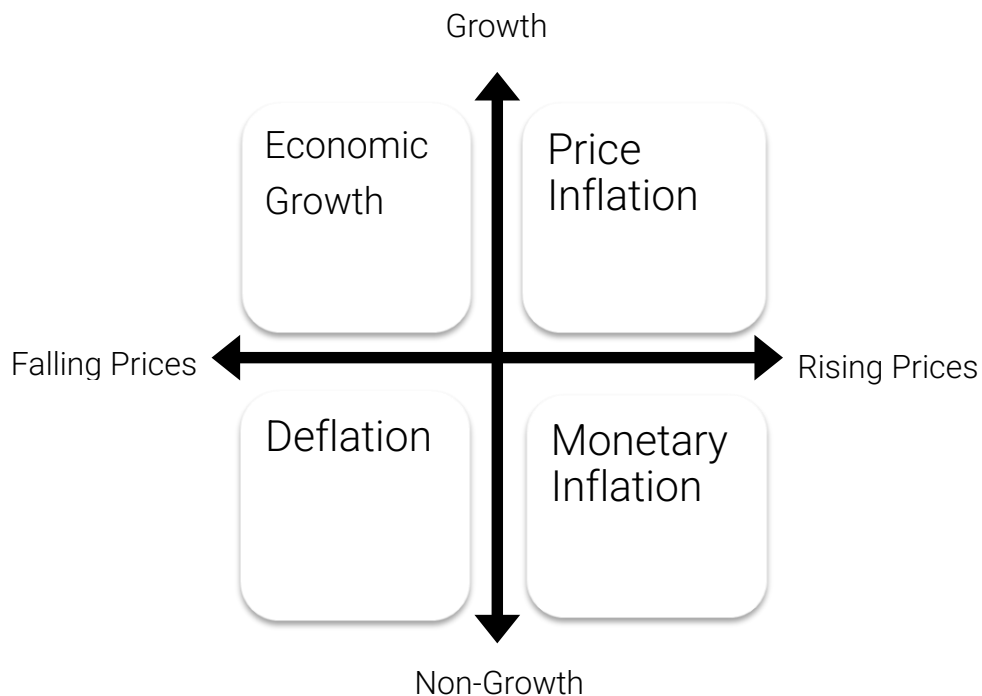
I will attempt to prove that the cost associated with this “inflation hedge” through portfolio diversification is less than an investor would think and has the ability to reward if the market moves away from the “asset-nurturing environment.”

The team ran multiple macroeconomic scenarios during different economic periods to see which asset classes tend to outperform during each of four macroeconomic states shown in the chart below.



*This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.*

## Four Macroeconomic States

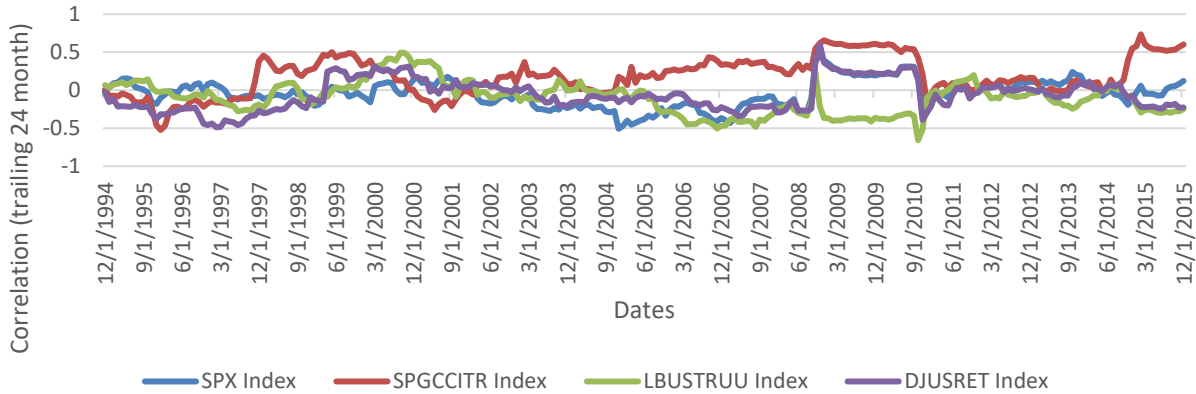


We also wanted to see what asset classes are the most correlated to movements in inflation. The following chart shows commodities have the highest correlation to CPI, followed by real estate. Commodities tend to outperform during rising CPI and underperform when CPI is falling. Real estate tends to correlate with CPI in a high CPI environment and to not correlate to CPI in a low CPI environment.



This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.

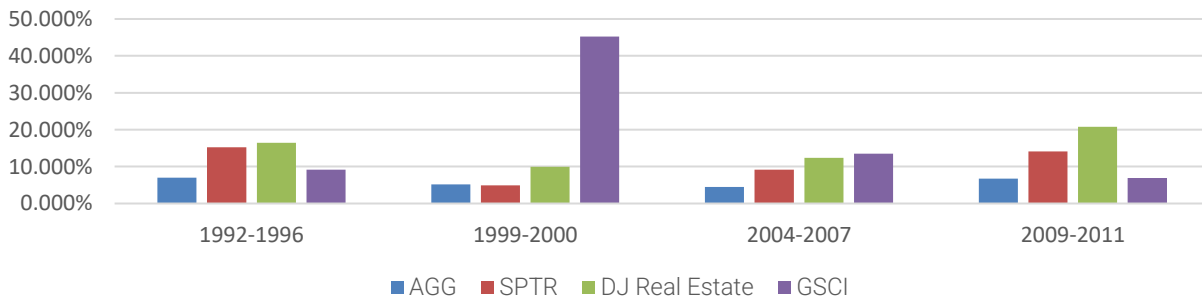
### Correlation to CPI (12/1994 - 12/2015)



The composition and volatility of the indices or benchmarks referenced herein are materially different from that of Passaic’s Strategies. There is no guarantee that a Strategy’s performance will meet or exceed any index or benchmark.

The next chart shows how our two real asset categories have done well during times of high inflation where CPI is generally above 2.5%. We chose 2.5% because the Fed states 2% inflation is the target rate for inflation; therefore, 2.5% gives a bit of room for our high inflation period. In fact, from 1999-2000 our commodity bucket showed real outperformance and from 2009-2011 we saw similar results in real estate. This shows that during periods of high inflation allocations to real assets makes sense.

### Asset Performance CPI > 2.5%



The composition and volatility of the indices or benchmarks referenced herein are materially different from that of Passaic’s Strategies. There is no guarantee that a Strategy’s performance will meet or exceed any index or benchmark.

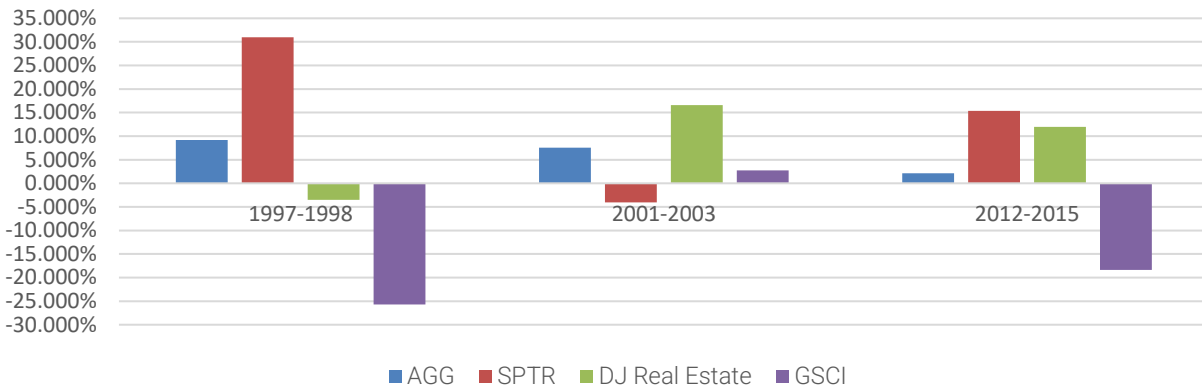
More recently we have not had inflation at all, but rather deflation. The topic of inflation has been received so poorly of late that many funds and allocators tend to avoid the conversation altogether, choosing to focus on commodities and how poorly they have performed. Below you can see how the same asset classes have performed in prior low inflation environments. One can see that the last 3 years are actually a repeat of what



This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.

happened in the last low inflation growth cycle of the late 1990s. History repeats itself but also tends to look a bit different.

### Asset Performance CPI < 2.5%



The composition and volatility of the indices or benchmarks referenced herein are materially different from that of Passaic’s Strategies. There is no guarantee that a Strategy’s performance will meet or exceed any index or benchmark.

The two equity bull markets (1997-1998 and 2012-2015) proved to be very difficult for commodities, while the equity bear market of 2001-2003 was not as difficult an environment for commodities. These difference show how highly correlated commodities can be to the dollar. The two equity bull markets were also a period of a strong dollar while the bear market was a period of a weak dollar. Weak dollar policy supports commodities and real estate and shows why an allocation to real assets is important to protect one’s purchasing power.

**What we are trying to show is that real assets, commodities and real estate, not only high correlation to CPI, but also generate outsize returns in either direction when CPI has a significant move. In other words, having an allocation to real assets will help portfolios during periods of rising inflation and also in periods of falling dollar.**

One of the interesting things to note is the performance of bonds from 2004-2007. The Fed kept rates low even though inflation was rising. The 10-year note yield stayed between 4% and 5%, and we saw a massive tightening of credit that helped the performance of the Barclays Aggregate. With the 10-year note now just above 2% and credit already extremely tight, I think achieving this performance in bonds will be difficult to repeat. **Again, the rising inflation regime proved to be a boon for commodities and real estate.**

Another period of rising inflation that is interesting is 2009 to 2011. I referred to this as monetary inflation created by the Fed (lowering of the dollar through economic policy), or the dreaded stagflation of the ‘70s. We will discuss the stagflation period of the 1970s a bit later. In our analysis below we included precious metals versus a portfolio of passive commodities to show if just a little tactical nature is added to one’s commodity investment, how much alpha can be added, as well. We believe this continues to show how



*This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.*

important it is to have a real asset component and how it can help long-term performance. Said another way, bond portfolio returns were achieved in a much higher interest rate environment – repeating this this performance in AGG will be difficult.

<b>1/2009 –1/2012</b>	<b>SPX</b>	<b>AGG</b>	<b>GSCI</b>	<b>DJ Real Estate</b>	<b>Precious Metals</b>
<b>Annual Return</b>	14.11%	6.77%	6.93%	20.75%	21.49%
<b>Annual Volatility</b>	18.67%	2.77%	21.88%	29.71%	22.12%
<b>Ratio</b>	0.76	2.44	0.32	0.70	0.97

Going back to 1992 and our period of “nurtured growth,” our equities and bonds have been the best asset classes for risk-adjusted returns, as expected. During that time, a 60/40 portfolio was wonderful. We also showed that real assets have a decent correlation to CPI with a wide variety of returns as CPI moves around.

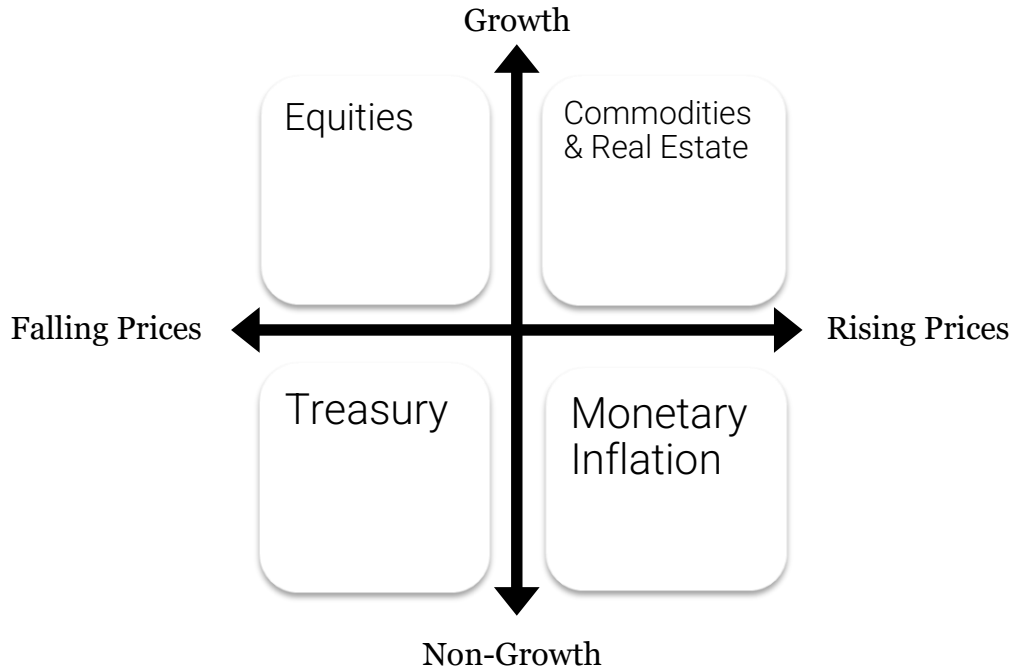
<b>1/1992–1/2016</b>	<b>SPX</b>	<b>AGG</b>	<b>GSCI</b>	<b>DJ Real Estate</b>
<b>Annual Return</b>	9.028%	5.807%	0.159%	10.200%
<b>Annual Volatility</b>	14.45%	3.55%	21.48%	19.42%
<b>Ratio</b>	0.62	1.64	0.01	0.53

The composition and volatility of the indices or benchmarks referenced herein are materially different from that of Passaic’s Strategies. There is no guarantee that a Strategy’s performance will meet or exceed any index or benchmark.



This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.

## An Asset Class for Each Macro State



Above we have created a table of assets that does well during the four economic periods described earlier in the paper. We will now create two simple investment portfolios and compare results. The first is 60% stocks represented by S&P 500 Total Return (SPTR) and 40% bonds represented by Barclays Aggregate Total Return Index (AGG). The second is our more diversified portfolio consisting of 50% SPTR, 30% AGG and our two real asset portfolios consisting of 10% commodities (GSCI) and 10% real estate (DJ Real Estate). We will compare our portfolios back to January 1992; this is when the DJ Real Estate Index came into existence. Our return and volatility for the two portfolios are shown below.

1/1992 – 1/2016	60/40	50/30/10/10
Annual Return	7.99%	7.75%
Annual Volatility	8.82%	9.42%
Ratio	0.91	0.82

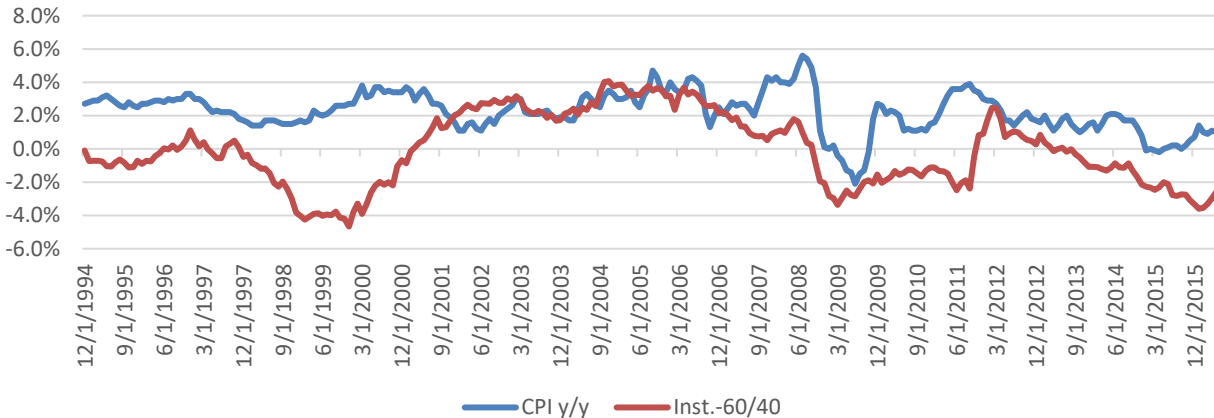
The composition and volatility of the indices or benchmarks referenced herein are materially different from that of Passaic’s Strategies. There is no guarantee that a Strategy’s performance will meet or exceed any index or benchmark.

Continuing with our theme of low inflation and “nurtured” growth, one can compare our two diversified portfolios. My interpretation of these numbers is that during a period of time when the 60/40 portfolio should outperform, it only cost 25 bps annually to add our inflation diversification. With the risk that current low yields are now presenting, this does not seem like much to give up in performance for this diversification.



This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.

### Real Assets Outperform During Rising Inflation



When we compare our institutional real asset portfolio minus 60/40 to CPI we can see how and where our underperformance and outperformance occur. What we noticed is as CPI rises our institutional real asset portfolio outperforms the 60/40 and during falling CPI the reverse occurs.

We now analyze different periods from 1992 to 2015 that we would define as equity bull market, equity bear market, rising inflation, and falling inflation. I compared how the two portfolios behaved and what information can be drawn from it. Finally, I looked at the late 1970s and early 1980s and how our portfolios behaved.

#### Equity Bull Markets 1992-1999, 2003-2007, 2010-2016:

Date	1992	1993	1994	1995	1996	1997	1998	1999
60/40 %	7.5	9.9	-0.4	29.9	15.2	23.9	20.6	12.3
50/30/10/10 %	7.8	8.8	0.2	28.1	19.4	20.0	11.2	13.8
CPI%	2.9	2.7	2.7	2.5	3.3	1.7	1.6	2.7

The composition and volatility of the indices or benchmarks referenced herein are materially different from that of Passaic’s Strategies. There is no guarantee that a Strategy’s performance will meet or exceed any index or benchmark.

What is most striking during the 1992 to 2000 period is in 1996, the time of highest inflation with CPI of 3.3, our institutional portfolio outperformed at 4.2%. During the period of lowest inflation (1998) the 60/40 portfolio outperformed by 9.4%.

From 2003 to 2007, a period considered to have relatively high inflation, the institutional real asset portfolio generally outperformed.





*This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.*

Date	2003	2004	2005	2006	2007
60/40 %	18.9	8.3	3.9	11.2	6.1
50/30/10/10 %	21.3	11.6	6.7	11.2	6.3
CPI%	1.9	3.3	3.4	2.5	4.1

Comparing 2010 to 2015, a period of generally low inflation produced different results. The period of 2010 is difficult to analyze due to the aggressive nature of Fed action, but I thought it would be interesting to have as a comparison.

Date	2010	2011	2012	2013	2014	2015
60/40 %	11.7	4.4	11.3	18.6	10.6	1.1
50/30/10/10 %	13.1	3.9	11.2	15.6	8.1	-2.2
CPI%	1.5	3	1.7	1.5	0.8	0.7

This analysis shows us in a period of low inflation our real asset portfolio underperforms except in 2010. In 2010 the Fed was aggressively fighting deflation and therefore propped up a number of inflation assets.

Equity Bear Markets 2000 - 2003, 2008 - mid-09

Date	2000	2001	2002
60/40 %	-0.8	-3.8	-9.2
50/30/10/10 %	6.7	-5.4	-4.4
CPI%	3.4	1.6	2.4

Date	2008	2009
60/40 %	-20.1	18.3
50/30/10/10 %	-25.6	19.4
CPI%	0.1	2.7

**The composition and volatility of the indices or benchmarks referenced herein are materially different from that of Passaic’s Strategies. There is no guarantee that a Strategy’s performance will meet or exceed any index or benchmark.**

When we look at these two periods of equity bull markets again, one can see how much our real asset portfolio is correlated to CPI. In 2000 with high CPI, we have almost greater than a 7% outperformance, and in 2008 with our lowest CPI our real asset portfolio underperforms by just under 6%.

What we believe we have found is that during a period of generally low inflation, which we would consider the entire time period of 1992-2015, there was not much of a cost to being more diversified into real assets. In fact, one sacrificed 25 bps annually. We also showed in more detail how correlated our real asset portfolio is to CPI and how in periods of higher CPI the outperformance one received from being invested in real assets.



*This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.*

Let’s look again at our 60/40 portfolio. One of the issues currently is that our 40% invested in 10-year notes is now yielding 2.5%. It is not near the 4%-6% yield where most of those returns occurred previously. The 60% equity portion is also very different. It occurred during a period of falling rates and falling inflation. This allowed for P/E expansion due to falling input costs. P/E of the S&P is now near 20%. Equity P/E’s generally fall and approach single-digit levels during times of high inflation and rising interest rates. The current 60/40 portfolio no longer has much room for error. Also, from a historical perspective, CPI has not remained this low for this long in a very long time.

## Historically High Inflation 1970s Style

I will now show a period when inflation and rates were high and how our two portfolios performed. I will also show how I believe bond markets and equity markets will act during our next period of inflation.

Let’s now look at a period of very high inflation from 1977-1981. During a period that could be considered a bear market in bonds, rates moved higher. This was also a period that due to high interest rates and inflation; equities were also considered to be in a bear market. Since we have no data set for real estate, we will compare our standard 60/40 to a new diversified 50/30/20, where the 20% real asset part is only commodities. During this period, CPI went from 5% to 15%. In 1981 we saw 10-year note yields go from 7% to 16%. In addition, P/E on the S&P 500 was sub-10.

### HYPOTHETICAL RETURNS – SEE END NOTES FOR ADDITIONAL INFORMATION

Annual Return	4.78%	8.20%
Annual Volatility	10.25%	10.30%
Ratio	0.47	0.80

In comparing the two portfolios, we find that during a period of high inflation we achieve a real outperformance from our diversification. This outperformance is almost 4% on an annual basis. In fact, even though our 60/40 portfolio produces positive results, it is substantially lower than the inflation rate of about 8.5%, on average.

The composition and volatility of the indices referenced herein are materially different from that of the Strategy. There is no guarantee that the Strategy’s performance will meet or exceed any index. Any benchmark or index performance is provided for purposes of comparison and does not reflect the deduction of fees, brokerage commissions, taxes or other expenses of investing



*This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.*

## Conclusion

What conclusions can we draw from all this data? What does this mean in our current macro environment? First, during periods of inflation, a diversification into real assets improves returns. Second, we can conclude that during our recent low inflation macro environment the cost of this “hedge” was not very high, only 25 bps. When we look at the last real rise in CPI that occurred in the late 1970s, our small allocation into real assets produced a decent outperformance.

So what does this all mean for our current market? First, the 10-year is yielding 2.5%; second, the S&P 500 current P/E is around 22. Finally, we have just come out of a period of high deflation and CPI is currently sitting around 2%.

CPI at 2% and is coming off a historically low level. One of the main missions of the Fed is to raise inflation closer to the 2% or 3% level. I would actually argue they are looking for closer to 4%. They feel this inflation will help the economy and keep us away from its ugly sibling deflation. Since fighting the Fed is not an option, it makes sense now to think about how to design a portfolio that deals with the possibility of higher inflation.

If the Fed does achieve its goals of higher inflation, what is going to happen to the bond market? In general, bond yields should be relatively close to CPI levels. If we have a 4% CPI, bond yields should be around 4%. I am not saying this is a rule, but a general assumption. Let’s now say bond yields rise to 4%, not anywhere near the 6% average we have had over the last 30 years. The current yield on the 10-year Treasury is 2.5%, which makes the duration around 9. This means the principal on that bond will drop around 12% when yields move from 2.5% to 4%. In our 1970s example, bond yields started at 7% before they exploded to 16%;

assuming an average yield of 10% drops our duration to 6.5. Therefore, if yields move up 8%, we only lose 15%. The other big difference is that capital loss is offset by a gain on the average coupon of 9% versus an average of 3% in our current macro state. In other words, with yields where they currently are the 40% bonds part cannot have the same type of returns as in the 1970s. In fact, it will have a significant negative impact on performance.

The equity portion also does not look very rosy. If we see inflation and yields go higher, history has proven that equity P/E’s need to go lower. In 1972 the P/E on the S&P was around 19 and CPI was 3.5%. In 1974 CPI had grown to 12% and the P/E of the S&P fell below 8. I am not saying this is going to happen again, but that type of extreme move is possible. In that backdrop, the risk to a higher inflation environment on a 60/40 portfolio is dramatic. Higher inflation can, and probably will, have a dramatic impact on both equity and fixed income allocations.

Bill Gross said the other day that the past 30 years of investing has been unprecedented. Maybe he is right, maybe he is wrong—that is why we have a market. If the cost of diversification is only 25 bps during the current low inflation, nurturing-growth environment of the last 30 years, why wouldn’t one diversify? If Bill



*This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.*

Gross is correct, the risk of being wrong on the 60/40 portfolio is, in our humble opinion, dramatic. Being an options person who is asked to find a way to hedge an equity portfolio due to falling growth all the time, would one buy a put on hedging growth if it only costs 25 bps a year? I know I would.

For more information about Passaic Partners, please contact [info@passaicpartners.com](mailto:info@passaicpartners.com).

---

**END NOTES:**

**HYPOTHETICAL OR BACKTESTED RETURNS:** This material contains hypothetical, back-tested and/or model performance data, which are the results of the retroactive application of a model developed with the benefit of hindsight and should not be relied upon for investment decisions. They do not represent the results of actual trading using client assets and, as such, they have many inherent limitations, some of which are described below. Hypothetical returns are unaudited, are calculated in U.S. dollars using the internal rate of return, can reflect the reinvestment of dividends, income and other distributions, and make assumptions regarding trading costs and investment fees that may differ substantially from those experienced in an actual trading environment resulting in a reduction in performance. Additionally, these results do not take individual investor taxes into consideration. Model/target portfolio information presented, including, but not limited to, objectives, allocations and portfolio characteristics, is intended to provide a general example of the implementation of the strategy and no representation is being made that any client account will or is likely to achieve profits or losses similar to those shown. In fact, there are frequently sharp differences between hypothetical performance results and the actual results subsequently achieved by any particular trading program. One of the limitations of hypothetical performance results is that they are prepared with the benefit of hindsight. In addition, simulated trading does not involve financial risk, and no simulated trading record can completely account for the impact of financial risk in actual trading. For example, the ability to withstand losses or to adhere to a particular trading program in spite of trading losses are material points which can also adversely affect actual trading results. There are numerous other factors related to the markets in general or to the implementation of any specific trading program which cannot be fully accounted for in the preparation of hypothetical performance results and all of which can adversely affect actual trading results. Because there are no actual trading results to compare to the hypothetical, backtested and/or model performance results, clients should be particularly wary of placing undue reliance on these hypothetical results. Perspectives, opinions and testing data may change without notice. Detailed back-tested and/or model portfolio data is available upon request.

**IMPORTANT DISCLOSURES:**

The information contained herein, including any attachments, is provided by Passaic Partners LLC ("Passaic" or the "Adviser") on a confidential basis to the intended recipient solely for informational purposes. Any dissemination, re-distribution, or other use of this message by any recipient is unauthorized. The composition and volatility of the indices referenced herein are materially different from that of the Strategy. There is no guarantee that the Strategy's performance will meet or exceed any index. Any benchmark or index performance is provided for purposes of comparison and does not reflect the deduction of fees, brokerage commissions, taxes or other expenses of investing.

This document may contain expressions of opinion, which are subjective and may be unsubstantiated, and should not be relied upon in making an investment decision or for any other purpose. This document should not be the basis of an investment decision and does not constitute an offer to sell or solicitation of an offer to buy any security. Although the information in this document has been obtained from sources believed to be reliable, Passaic makes no representation or warranty, express or otherwise, and no reliance should be placed, on the fairness, accuracy, completeness, or timeliness of the information contained herein. Forward-looking statements contained herein, including those relating to future financial expectations, involve certain risks and uncertainties that could cause actual results to differ materially from such statements. No assurance can be given that any account will meet its investment objectives or avoid losses. Different time periods and market or economic conditions may yield different results. There are substantial risks to investing in the strategy or strategies described herein, which should be considered speculative and may only be appropriate for part of an investor's portfolio. There is always the possibility of loss of investment.



PASSAIC | PARTNERS™

*This document was prepared by Josh Silva while he was at Harvest Volatility Management in Q4 2016. The content has not been changed or updated.*

The strategy may be leveraged and/or may engage in other speculative investment practices that may increase the risk of investment loss. Investing in options involves risk of loss, and an investor must be prepared to bear the loss of his/her entire investment. This material is not intended to represent the rendering of accounting, tax, legal or regulatory advice. A change in the facts or circumstances of any transaction could materially affect the accounting, tax, legal or regulatory treatment for that transaction. Potential investors should consult, and must rely on their own professional tax, legal and investment advisors as to matters concerning the strategy and their investments in the strategy.