

Arbitrage Opportunities in Dollar Trading Due to Unexpected Political Events: An Empirical Note

Srinivas Nippani
Texas A&M University – Commerce

We examine the impact of U.S. Government partial shutdown in 2013 on the values of the Dollar Index, the British Pound and the Euro. We show that the value of the Dollar index did not decline during the shutdown period. There was a significant drop in the value of the Dollar index and a corresponding increase in the values of the British Pound and the Euro on October 17, 2013, following the signing of the agreement creating arbitrage opportunities for market participants because of the interaction of political risk on currency risk.

INTRODUCTION

After a strong political disagreement, the U.S. Congress passed a bill by increasing the debt limit on October 16, 2013. Later, on the same day, President Barack Obama signed the bill into law, ending the partial shutdown that persisted from October 1, 2013, to that day. This resulted in a significant increase in the yield of short-term Treasury bills as shown by Nippani and Smith (2014). The purpose of this study is to see if the shutdown impacted the value of the U.S. Dollar, i.e., to see if the political risk created by this event impacted exchange rates. It is found that there was a general drop in the value of the dollar index, a basket index that measures the value of the dollar against several other currencies' values and an increase in the value of the British Pound and Euro on the day following the agreement. It is possible to create trading strategies to profit from similar arbitrage opportunities in the future.

There are several studies in the empirical literature that examine the impact of political events on exchange rates. Political risk is manifested in events that could impact financial markets. Blomberg and Hess (1997) studied exchange rate models when political factors are included and provided evidence that the political model outperforms the random walk model in pound/dollar, mark/dollar, pound/mark and other exchange rates. Bachman (1992) studied the effect of political risk on the forward exchange bias in the case of elections and mentions, "politics provides useful information for foreign exchange traders which economists should not ignore". Lobo and Tufte (1998) examined the weekly volatility of five major world currencies relative to the U.S. Dollar through five presidential terms and found that the volatility of all these exchange rates is impacted by political factors. Examining the impact of political risk with regards to the Mexican market, Bailey and Chung (1995) used the country's currency and sovereign debt markets as proxies for exchange rate and political risks. The implication from this study is that exchange rate and political risks can be gauged by currency and sovereign debt markets. Their results suggest common factors in emerging market equity, currency and sovereign debt markets. In a major study of the U.S. exchange rate market, Hardouvelis (1988), examined exchange rates and interest rates' response to new information in the first announcement of fifteen U.S. macroeconomic series. The

findings of the study show that markets reacted primarily to monetary news, but also to news about the trade deficit, domestic inflation, and variables that reflect the state of the business cycle. An interesting point to note is mentioned in another study by Fornari, Monticelli, Pericoli and Tivegna (2002) who actually studied the impact of scheduled and unscheduled news on several financial variables in Italy. One of their most important findings is that exchange rates show more conditional variance than long-term interest rates. They argue that this is contrary to the conventional view. If this were true of the U.S. markets, the impact of an unexpected political event like a partial government shutdown would definitely impact the dollar index more than long-term interest rates. As mentioned earlier, Nippani and Smith (2014) examined the impact of this unexpected political standoff on interest rates. However, they did not examine exchange rates reaction to the shutdown fallout. This study attempts to fill this gap.

The other motivation for this paper is that the articles in the popular press discussing the impact of the shutdown on the U.S. dollar and the dollar index. For example, Blackden, Braithwaite, Harding, Mackenzie and Politi (2013)¹ mentioned:

The U.S. Treasury has said the U.S. could run out of money to pay its bills as early as October 17 if there is no deal...

"A default would be unprecedented and has the potential to be catastrophic: credit markets could freeze, the value of the dollar could plummet, U.S., interest rates could skyrocket," the Treasury said yesterday, citing "negative spillover effects around the world".

Hong (2013)² discusses the consequences in an article mentioning that the value of the Dollar fell for the fifth consecutive day. She stated:

"The U.S. dollar extended its losses against major currencies for a fifth straight day, dragged down by economic data and the ongoing government shutdown.

The dollar fell to an eight-month low against the euro and a 19-month low against the Swiss franc, as investors grew increasingly concerned about the federal budget and debt ceiling stalemate in Washington. If lawmakers don't raise the government's borrowing limit by Oct. 17, that could plunge the country into another financial crisis, the Treasury Department said in a report Thursday."

Shellock (2013)³ argued,

"Meanwhile, the dollar remained on the back foot amid expectations that Fed tapering was being pushed further and further back.

The dollar index, a measure of the currency's value against a weighted basket of counterparts, fell to a fresh eight-month low, as the euro held above \$1.36 in the wake of Wednesday's European Central Bank policy meeting. The dollar eased 01 percent against the yen."

If the popular press is right, there would be a major impact of the shutdown and debt ceiling debate on the value of the U.S. Dollar. This is another motivation for this paper.

The third motivation for the paper is the impact it is likely to have for financial planners and advisors. Financial advisors are well aware of the impact of stock market volatility and its impact on clients. According to several experts, an understanding of the impact of the changes in the value of the U.S. Dollar will help protect client portfolios. White and Tonaszuck⁴ (March 23, 2015) emphasized the ripple effect the U.S. Dollar had on other markets in their weekly commentary of the advising firm LPL

Financial. In another article published on the website of Thun Financial Advisors, Kuenzi (2011)⁵ mentioned how currency issues are “most vexing” and “least well understood” for investors. Several other advisors and money managers mention the importance of the value of the dollar and its impact on stock and other markets. This means that any potential changes in the value of the dollar index due to an unexpected government shutdown could have implications for other markets as well. As such, it is important to study this shutdown and see if it actually impacted the U.S. Dollar index.

To sum up, no prior study examines the impact of a shutdown on the value of the U.S. Dollar, the outcry in the popular press about the event’s impact and the knowledge that financial advisors and other market participants can glean from this event serve as the motivation for this paper. In the next section, the data and the hypotheses for the study are presented. The empirical evidence is presented in section three followed by concluding remarks in the final section.

DATA AND HYPOTHESES

The data for the study was obtained from the *Bloomberg Database*. The daily closing values for the Dollar Index (DI), the three-month LIBOR rate (LIBOR) and the closing spot prices of the British Pound and Euro from January 1, 2013, to December 31, 2013, were secured. According to the *Bloomberg Database* website “The U.S. Dollar Index indicates the general international value of the U.S. Dollar. The USDX does this by averaging the exchange rates between the USD and major world currencies. The ICE U.S. computes this by using the rates supplied by some 500 banks.” The three-month LIBOR rate is used as a proxy for interest rates. Data on the daily values of EURUSD, the spot price of 1 EUR in U.S. Dollars was also collected. The Euro is the official currency of the European Economic and Monetary Union. Finally, the GBPUSD spot exchange rate which gives the price of GBP in USD was also obtained. The British Pound Sterling is the official currency of the United Kingdom.

There are two hypotheses studied here. The first is for the period of disagreement between the U.S. Congress and White House, the period of the shutdown ending late on October 16, 2013. Since default looked imminent and was considered a possibility by the markets at that time, it is hypothesized that “the value of the U.S. Dollar Index will drop significantly and the values of Euro and British Pound rise correspondingly during this sixteen day period.” This is examined by the variable called “Shutdown” in the study. The next is for the day after the shutdown period ended, October 17, 2013. The hypothesis for the variable called “October 17” is “Since default was no longer a possibility, it is expected that the U.S. Dollar Index will recoup its losses from the shutdown period and the Euro and the British pound will shed their gains from the shutdown period”.

EMPIRICAL EVIDENCE

To examine the impact of the shutdown crisis, the percentage change in the daily values of the dollar index, the spot rate of Euro and the spot rate of the British Pound were examined. The daily percentage change is defined as the change in the index/spot price as compared with the previous closing value.

$$\% \text{ Change in Dollar Index} = ((DI_t - DI_{t-1}) / DI_{t-1}) * 100 \quad (1)$$

$$\% \text{ Change in (spot) Euro Value} = ((EURUSD_t - EURUSD_{t-1}) / EURUSD_{t-1}) * 100 \quad (2)$$

$$\% \text{ Change in (spot) British Pound Sterling} = ((GBPUSD_t - GBPUSD_{t-1}) / GBPUSD_{t-1}) * 100 \quad (3)$$

The descriptive statistics for the entire data was calculated for the whole sample period. This includes the Dollar index, percentage change in the Dollar index, the EURUSD, the percentage change in Euro Value, the GBPUSD, the percentage change in British Pound Sterling and the three-month LIBOR rate. The descriptive statistics are given in Table 1 below.

TABLE 1
DESCRIPTIVE STATISTICS

| Description | Euro Value | % Change in Euro Value | Dollar Index | % Change in Dollar Index | British Pound Value | % Change in Pound Value | LIBOR |
|--------------------|------------|------------------------|--------------|--------------------------|---------------------|-------------------------|---------|
| Mean | 1.3285 | 0.0164 | 81.4402 | 0.0022 | 1.56494 | 0.00828 | 0.26732 |
| Median | 1.3289 | 0.0307 | 81.3610 | 0 | 1.55740 | 0.02554 | 0.27225 |
| Mode | 1.3579 | 0 | 82.0870 | 0 | 1.51630 | 0 | 0.30500 |
| Standard Deviation | 0.0265 | 0.4575 | 1.2869 | 0.4046 | 0.04331 | 0.46710 | 0.01949 |
| Range | 0.1022 | 2.6987 | 5.4550 | 3.0043 | 0.16900 | 2.90225 | 0.06915 |
| Minimum | 1.2780 | -1.1066 | 79.1250 | -1.5409 | 1.48670 | -1.38062 | 0.23585 |
| Maximum | 1.3802 | 1.5922 | 84.5800 | 1.4634 | 1.65570 | 1.52163 | 0.30500 |
| N | 261 | 261 | 261 | 261 | 261 | 261 | 261 |

It can be seen from the table above that the mean of the percentage change in Euro Value is 0.016, while the percentage change in Dollar index is close to zero. The same is the case with the change in the value of the British Pound. The median and mode values of the dollar index are also zero confirming the reliability of the mean as an average. The standard deviation is about 0.46 for the percentage change in Euro Value and percentage change in British Pound Value.

In order to examine the impact of the events, the following regression equation(s) were used:

$$\% \text{ Change in Dollar Index}_t = \beta_0 + \beta_1 \text{LIBOR} + \beta_2 \text{Shutdown} + \beta_3 \text{October 17} + \varepsilon_t \quad (4)$$

$$\% \text{ Change in Euro Value}_t = \beta_0 + \beta_1 \text{LIBOR} + \beta_2 \text{Shutdown} + \beta_3 \text{October 17} + \varepsilon_t \quad (5)$$

$$\% \text{ Change in British Pound Value}_t = \beta_0 + \beta_1 \text{LIBOR} + \beta_2 \text{Shutdown} + \beta_3 \text{October 17} + \varepsilon_t \quad (6)$$

In the above regressions, the variables are:

% Change in Dollar Index/Euro Value/British Pound Value = Daily percentage change in Dollar index/Euro Value/British Pound Value

LIBOR = The three-month LIBOR rate is used in regressions to control the changes in interest rates.

Shutdown: The shutdown Period is from October 1, 2013, to October 16, 2013, which hypothetically should have a negative coefficient for the percentage change in Dollar index and positive coefficients for daily changes in Euro and the British Pound values.

October 17: The day after the shutdown ended and the government reopened which hypothetically should recoup the dollar index's lost value during the shutdown period as default was no longer a possibility. For the daily changes in the British Pound and Euro values should go down to compensate for the gains if any during the shutdown period. The results of the regressions are presented in Table 2 below.

TABLE 2
REGRESSION ANALYSIS

Panel A

Dependent Variable: % Change in Dollar Index (R-Squared = 0.026786, F= 2.357782*, N=261)

| <u>Explanatory Variable</u> | <u>Coefficient</u> | <u>Standard Error</u> | <u>t-value</u> |
|-----------------------------|--------------------|-----------------------|----------------|
| Intercept | -0.254674 | 0.357558 | -0.712260 |
| LIBOR | 0.967782 | 1.328079 | 0.728708 |
| Shutdown Period | 0.044439 | 0.122989 | 0.361325 |
| October 17 | -0.999833 | 0.403825 | -2.475910*** |

Panel B

Dependent Variable: % Change in Euro Value[@] (R-Squared = 0.019798, F= 1.730259, N=261)

| <u>Explanatory Variable</u> | <u>Coefficient</u> | <u>Standard Error</u> | <u>t-value</u> |
|-----------------------------|--------------------|-----------------------|----------------|
| Intercept | 0.141400 | 0.398342 | 0.354971 |
| LIBOR | -0.478853 | 1.509849 | -0.317153 |
| Shutdown Period | -0.019842 | 0.082269 | -0.241181 |
| October 17 | 1.016327 | 0.042644 | 23.83269*** |

Panel C

Dependent Variable: % Change in Pound Value (R-Squared = 0.053398, F= 4.832443***, N=261)

| <u>Explanatory Variable</u> | <u>Coefficient</u> | <u>Standard Error</u> | <u>t-value</u> |
|-----------------------------|--------------------|-----------------------|----------------|
| Intercept | 0.919697 | 0.407095 | 2.259169** |
| LIBOR | -3.390643 | 1.512077 | -2.242375** |
| Shutdown Period | -0.212654 | 0.140029 | -1.518646 |
| October 17 | 1.242616 | 0.459772 | 2.702679*** |

***, **, * indicate values significant at 1%, 5% and 10% levels respectively. [@]The estimates of this regression are heteroskedasticity-consistent standard errors and covariance based on White Correction.

Panel A of Table 2 presents the results of the regression with the Percentage change in the Dollar Index as the dependent variable. The F-Value for the regression is significant at 10% level. The intercept and LIBOR are both not significant at any conventional level of significance. For the shutdown period, it was hypothesized that the coefficient will be negative and significant but the estimate is neither negative nor significant. For the day following the signing of the debt bill October 17, the coefficient is both negative and significant. The coefficient is -0.999, and has a t-value of -2.47 significant at 1% level. This implies that the dollar index fell significantly on the day following the signing of the bill increasing the debt limit ending the shutdown.

Panel B presents the results of the regression with the daily percentage change in Euro Value (the spot price of 1 Euro in U.S. Dollars) as the dependent variable. Hypothetically, the coefficients of Shutdown and October 17 should be of the opposite signs of the previous regression. Consistent with the previous regression, the coefficient for the intercept and LIBOR are not significant at any conventional level. Surprisingly, the same is true for the Shutdown period. Equally surprisingly, the coefficient of October 17 is positive with a value of 1.016 with a t-value of 23.83, significant at 1% level. The estimates of this regression are adjusted for heteroskedasticity using the White correction.

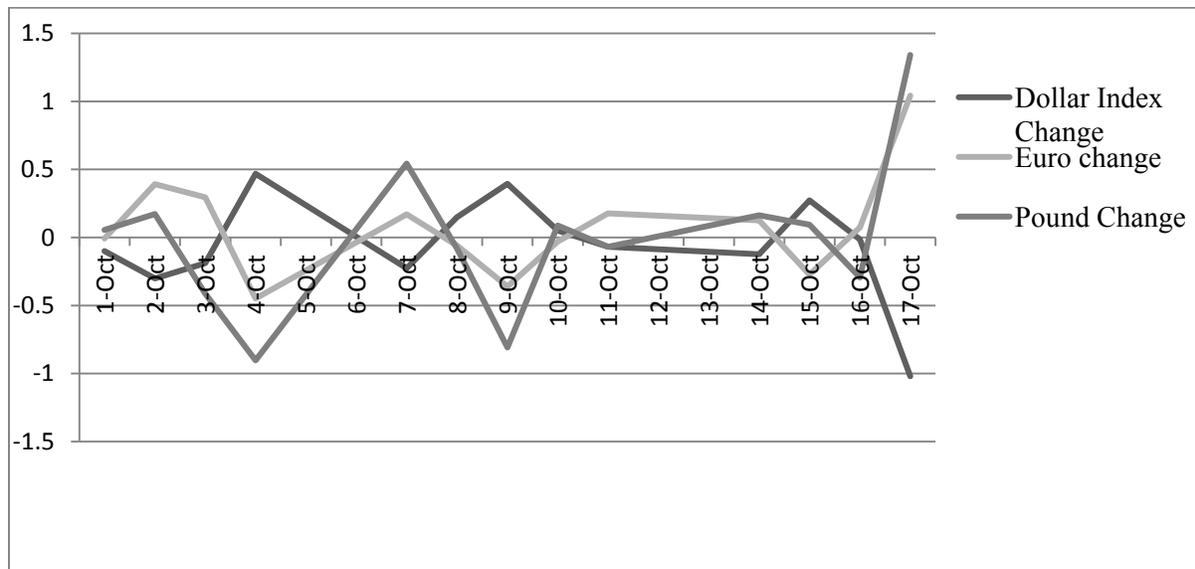
Panel C shows the results of the regression with the daily percentage change in the British Pound (the spot price for 1 British Pound in U.S. Dollars) as the dependent variable. Contrary to the earlier two regressions, the intercept is positive and significant at 5% indicating that the value of the British Pound was positively influenced by other factors. LIBOR has a negatively significant coefficient of -3.39 with a t-value of -2.24 indicating a negative relationship with the value of the British Pound in U.S. Dollars. Consistent with the other two regressions, Shutdown Period is not significant. The most interesting result is the coefficient of October 17, which is both positive and significant (at 1%) indicating that more U.S. dollars were needed to buy the British Pound on October 17. While this is contrary to the hypothesized sign, it is nevertheless an interesting finding.

Overall, it appears that there are no effects on any of the dependent variables of the Shutdown period, but significant effects are seen on the day immediately following it. In the next section, analysis of results and concluding remarks are provided.

CONCLUSIONS

The study examines the impact of the October 2013 shutdown of the U.S. Government and finds that during the actual shutdown period the value of the dollar did not diminish enough to provide statistically significant returns to the investor. In fact, the dollar index did not lose value during this time nor did the purchase price of Euro and British Pound go up enough to be statistically significant. This leads to the rejection of the first hypothesis that the study that the U.S. Dollar index fell substantially during the shutdown period and the values of the British Pound and Euro increased. Another interesting finding is that the dollar index did drop significantly on October 17, 2013, the day immediately following the debt agreement. This is contrary to the hypothesized effect and therefore, the second hypothesis of the study is rejected too. This can also be seen in the price of the Euro and the British pound which went up that day. The daily percentage values of the three dependent variables in the regressions are shown in Figure 1 below.

FIGURE 1
DAILY PERCENTAGE CHANGES IN THE DOLLAR INDEX, BRITISH POUND AND EURO
FOR THE PERIOD OCTOBER 1, 2013 TO OCTOBER 17, 2013



As is clearly seen from the chart above, while the three variables did show gains and losses during the shutdown period (October 1 to October 16), there is a clear increase in the value of the Euro and British Pound on October 17. With the Dollar index, there is a corresponding drop in value on that day. This shows the aftereffects of the debt disagreement. In fact based on the results of the regressions, it appears that there is more of an after effect than an immediate effect during the shutdown period. This could be due to the fact that international pundits in the financial world did not believe that the debt ceiling debate is over. For example, writing in the *Financial Times* in London, Strauss (2013)⁶ mentions,

“A resolution of debt talks in Washington has only added to pressure on the dollar this week, as investors begin to assess the economic impact of the government shutdown.

The dollar fell against all major currencies on Thursday and yesterday. The dollar index - the U.S. currency's value measured against a basket of six major rivals - was down nearly 1 percent on the week.”

Similar sentiments were expressed in the *Wall Street Journal*. Headlines such as "Deal Or no Deal: Behind the Scenes, Silence, Distrust and Hardball⁷" and "Deep Divide Lingers After Impasse Ends --- Pessimism Greets Lawmakers as Leaders Start Negotiations on Broad Budget Deal⁸" appeared informing the impact of the long drawn out debt disagreement was far from over. This could possibly be the reason for the significant drop in the value of the dollar index on October 17 and the resulting increase in the price of Euro and British Pound.

There are several implications of this study. Firstly, it has implications for academics. Hardouvelis (1988) examined the response of exchange rates to new information contained in the first announcement of fifteen U.S. macroeconomic variables. It was found that markets respond primarily to the monetary news. They also react to trade deficit, inflation and other variables that affect the business cycle. This study adds to those findings in showing that even a debt ceiling debate leading to a shutdown has an impact on exchange rates. This is the first major study to examine the impact of a government shutdown on exchange rates. Thus, this adds to existing literature in a unique way.

There are implications for market participants who trade in the dollar index. The Dollar index is traded as a futures contract on the Intercontinental Exchange (ICE). It is also available in exchange-traded funds, options and mutual funds. Traders can take up positions in exchange traded funds like the UUP (Deutsche Bank Long U.S. Dollar Index futures Index) or UDN (Deutsche Bank Short U.S. Dollar Index futures Index). Market participants who are willing to take risks would be better prepared if a similar scenario occurs in the future for obtaining arbitrage profits. For example, we now know that a shutdown period may not actually impact the U.S. Dollar as negatively as was believed by the popular press. We also know that the index fell substantially immediately following the shutdown. Selling the Dollar index (or ETFs that reflect its value) short during the next shutdown period and then buying it back immediately after could get aggressive market participants higher profits. A reverse of this strategy could be employed with regards to the British Pound and Euro. An ETF like UUP that is a good bargain on the day after the shutdown ended. The reason for this is that this ETF is long on the U.S. Dollar. On October 17, 2013, the price of UUP was \$21.45. It ranged between \$21.51 and \$21.70 during the shutdown period. This ETF dropped \$0.25 from its lowest two days prior and \$0.24 from the previous day. Selling it short during the shutdown period and buying it immediately thereafter would be a good strategy to make arbitrage profits. Conversely, an ETF like the UDN would be a good buy during the shutdown period itself. The price of UDN ranged from \$26.94 to \$27.22 during the shutdown period. On October 17, 2013, it ended at \$27.25, higher than at any time during the shutdown and 31 cents off the previous day's close of 26.94. Buying this kind of ETF fund during the shutdown period and selling it immediately afterwards would be a good arbitrage strategy.

The findings help market participants by showing that the U.S. Dollar index is not impacted during the shutdown period. Financial advisors should not forget the ripple effects of one market on others and help their clients who are investing for the long-term horizon. They can help their clients ride out this

short-term impact of the shutdown by informing them that selling securities in a major loss could seriously imperil their ability to achieve long-term goals. In the case of clients who insist on some measure of reassurance, advisors could help them obtain arbitrage by investing in long and short positions in ETFs like UUP and UDN, depending on the portfolio of the client. As mentioned by Garmaise (2006), advisors should not assume that investors with longer-term investment horizons will also have increasing patience in evaluating investment results. The currency risk of the U.S. Dollar was the topic in an earlier study by Davis (2004) who mentions the importance of this topic to financial advisors. This study adds political risk and its impact on currency risk. Financial advisors, White and Tonaszuck (2015) pointed out that focusing only on one market without considering what is happening in others leaves investors in danger of missing vital directional clues and potential profits. They mention the currency ripple effects as measured by the U.S. Dollar index as an example.

Government shutdowns are possible in the future, especially if the Congress and the White House have different views on the debt ceiling. It is possible for the informed trader to trade in Euros, the Dollar Index or the British Pound and make arbitrage profits. As mentioned by Rogers (1997), models can be developed with regard to interest rates and exchange rates for many countries at once. There are several websites⁹ offering option trading strategies for the dollar index. Incorporating information provided in this study could help financial advisors better by providing them a greater appreciation of the risk and potential returns of arbitrage opportunities in dollar trading, especially at a time when debt ceiling debates show potential disagreement.

This study also has implications for banks and other financial institutions that write forward contracts for international trade. These institutions can now better appreciate the risk associated with writing contracts which expire around the period when a debt ceiling disagreement is likely to occur. Sometimes spending bills are passed by Congress without much disagreement,¹⁰ as in October, 2015. Finally, the study provides informational advantages to traders in the international markets who can better time their dealings with regards to foreign exchange transactions, when government shutdown is on the horizon.

ENDNOTES

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