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Michael McAleer

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# Presidential Cycles in the USA and the Dollar-Pound Exchange Rate: Evidence from Over Two Centuries *

**Rangan Gupta** **

Department of Economics

University of Pretoria South Africa

**Mark E. Wohar**

College of Business Administration

University of Nebraska at Omaha, USA

and

School of Business and Economics

Loughborough University, UK

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** rangan.gupta@up.ac.za

## Abstract

In this paper, we analyze the impact of the U.S. presidential cycles on the dollar relative to the British pound over the longest possible monthly period of 1791:01 to 2018:10, based on GJR (or threshold generalized autoregressive conditional heteroscedasticity (GARCH)) model. The usage of over two centuries of data controls for sample selection bias, while a GJR model accommodates for omitted variable bias. We find that over the entire sample period, the Democratic regime has indeed depreciated the dollar relative to the pound. However, during the post Bretton Woods era, the depreciation of the dollar is not statistically significant under the Democratic presidents.



**Keywords:** Exchange Rate, U.S. Presidential Cycles
**JEL Codes:** C32, D72, F31

## 1. Introduction

Historically, Democratic administration in the (United States) U.S. has been associated with expansionary economic policies that are likely to yield higher inflation (see for example, Hibbs (1986), Alesina and Rosenthal (1995), Alesina et al., (1997)) and, consequently, might affect the relative value of the country's assets and devalue the U.S. dollar. On the other hand, studies like Santa-Clara and Valkanov (2003), and more recently Pástor and Veronesi (2017), report that Democratic administration is associated with higher stock returns, and this may attract investors to U.S. market and appreciate the U.S. dollar.

In other words, speaking intuitively, the impact of the U.S. presidential cycles on the dollar is ambiguous a priori, and would depend on the strength of the above competing effects during the sample period under investigation.

Not surprisingly, the (limited) existing literature (see for example, Lobo and Tufte (1998), Chrétien and Coggins (2009), and Ashour and Sarkar (2014)) involving the impact of a Democratic or Republican government on the relative price of the U.S. dollar, provides mixed evidence. While Chrétien and Coggins (2009) indicates a depreciation in the values of the U.S. dollar relative to the Canadian dollar when the Republicans are in power, Ashour and Sarkar (2014) points towards no impact of the presidential cycles on the value of the dollar relative to the British pound, the Euro, and the Japanese Yen. Lobo and Tufte (1998), however had earlier indicated an improvement in the value of the dollar to the yen and the pound, but no impact on the same relative to the German Mark and the Canadian dollar, during the Republican regimes.

Given that this is an empirical question, to answer it in a definitive manner, we in this paper look at the impact of the U.S. presidential cycles on the dollar relative to the British pound over the longest possible, based on data availability, monthly period of 1791:01 to 2018:10. In the process, we rule out the possibility of our results being driven by the sample selection bias associated with the above studies (concerned with only post World War II data), when studying the impact of Democratic and Republican regimes (as captured by a dummy variable) on the dollar-pound exchange rate.

At the same time, realizing that we are looking at over two hundred years of data, over which the strength of the two opposing effects are likely to vary, we impart a time-varying nature to our study by analysing the relationship based on sub-samples, identified statistically using formal tests of multiple structural breaks.

Understandably, the choice of the pound as the relative currency is not only driven by our need to look at the entire historical evolution of the dollar, but also due to the importance the pound commanded as a currency traditionally. From an econometric perspective, we use an appropriate model from the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) family, to analyze the impact of the presidential cycles on the dollar-pound return.

The need to use a GARCH-based error structure controls for possible biases due to omitted variables, which in turn, are strictly related to heteroskedasticity effects (Caporin, et al., 2018). To the best of our knowledge, this is the first paper to study the impact of U.S. presidential cycles on the dollar-pound exchange rate return covering over two centuries of data.

The remainder of the paper is organized as follows: Section 2 discusses the data and methodology, Section 3 presents the results, while Section 4 concludes.

## 2. Data and Methodology

The main variable of interest is the dollar-pound exchange rate, and in particular its return. We define log-returns ($r_t$, that is, the first difference of the natural logarithm of dollar-pound exchange rate ($p_t$)), that is, $r_t = \ln(p_t) - \ln(p_{t-1})$. The corresponding exchange rate data are obtained from the Millennium of Macroeconomic database maintained by the Bank of England.

The data are available for download from:
https://www.bankofengland.co.uk/statistics/research-datasets.

Figure A1 in the Appendix plots the unconditional exchange rate return, while Table A1 provides the summary statistics for the same. Exchange rate return is found to have negative skewness and excess kurtosis, resulting in non-normal distribution as indicated by the overwhelming rejection of the null of normality under the Jarque-Bera test. Further, the West

and Cho (1995) modified Ljung-Box statistics, which are robust to conditional heteroskedasticity, provided no significant evidence of autocorrelation in the exchange rate return.

With respect to the squared return, the Ljung-Box statistics gave clear indication of serial correlation, and the Engle (1982) Lagrange multiplier statistic offer significant evidence of ARCH effects. Thus, these results provided support to modelling exchange rate returns using a GARCH process.

As far as data on the presidential cycles is concerned, we obtain it from the following website: http://www.enchantedlearning.com/history/us/pres/list.shtml.

This information is used to create a dummy (*D*) that captures presidential cycles, taking a value of one for months during which a Democratic president was in office and zero otherwise. It must be pointed out that there were presidential cycles over which both Democratic and Republican parties were in office together (for example, 1801-1829), for which the dummy variable took the value of one. Also, in years 1791-1801 and 1841-1845, 1849-1853, and 1865-1869, presidents came from Federalist, Whig and National Union parties respectively. For these years, the dummy variable is assigned the value zero.

Based on availability of data on the dollar-pound exchange rate, our analysis covers the period of 1791:01 to 2018:10, with the first observation lost to the computation of returns, which in turn gave us a total number of observations equal to 2733 (i.e., 1791:02-2018:10).

To relate exchange rate return with the U.S. political cycles, we use the GJR (or threshold generalized autoregressive conditional heteroscedasticity (GARCH)) model of Glosten, Jagannathan and Runkle (1993). Note that, the choice of the GJR model over a family of other GARCH models was based on the ability of the former to better fit the data, in terms of standard goodness-of-fit measures. This, in turn, is possibly a reflection that the impact of negative price moves on future volatility is different from that of positive ones. Complete details on the estimations of various symmetric and asymmetric GARCH models are available upon request from the authors.

Formally, the GJR model used in this paper can be described as follows, by assuming the return process ($r_t$) is given by:

$$r_t = \mu + \theta D_t + \varepsilon_t \quad (1)$$

where, $\varepsilon_t = e_t(h_t)^{1/2}$ is the stochastic disturbance term, where $e_t$ is assumed to be *i.i.d.* with zero mean and unit variance, and:

$$h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 \varepsilon_{t-1}^2 d_{t-1} + \beta h_{t-1} \, . \quad (2)$$

The conditional variance $h_t$ depends on the mean volatility level ($\alpha_0$), the lagged error ($\varepsilon_{t-1}^2$) and the lagged conditional variance ($h_{t-1}$). The asymmetric effect is captured by the $\varepsilon_{t-1}^2 d_{t-1}$ term, where $d_t = 1$ if $\varepsilon_t^2 < 0$; and $d_t = 0$ otherwise. The shocks have an asymmetric impact on conditional variance if the estimate of $\alpha_2$ is statistically significant. Note that the GJR model requires the parameters, $\alpha_0$, $\alpha_1$, and $\alpha_2$, to be positive (McAleer, 2014).

Understandably if the estimate of $\theta$ is statistically significant in equation (1), then the U.S. political cycles explains the return on the U.S. dollar relative to the British pound. As indicated earlier in the introduction, the sign of $\theta$ can be positive or negative.

## 3. Empirical Results

The results from the estimation of the GJR model for the full-sample are reported in column 2 of Table 1. All the parameters in the volatility equation are significant, and $\alpha_2$ being positive highlights the fact that positive innovations are more destabilizing than negative innovations, i.e., depreciations result in increased volatility than appreciations. More importantly, the impact of the dummy variable capturing the political cycles is positive and significant in the returns equation, suggesting a depreciation of the US dollar during Democratic regimes. This finding is in line with the Democratic governments being expansionary and hence inflationary, which in turn results in a loss of value for the dollar.

Given that we cover 228 years of monthly data, it is likely that the relationship between political cycles in the US and the return of the pound-dollar exchange rate has undergone structural changes. In light of this we conduct the powerful multiple structural break tests of Bai and Perron (2003), to detect 1 to $M$ breaks in the relationship between $r_t$ and $D_t$, allowing for heterogenous error distributions across the breaks (with an aim to control for the heteroskedastic error structure). Based on the test, we however could not detect any structural break.

However, when we look at the data plot of the dollar-pound exchange rate returns in Figure A1, we observe massive depreciation and appreciation respectively at 1857:10 and 1857:11, and in general three observable regime based on the volatility of the exchange rate returns, and hence we re-conduct the analysis over the following three sub-samples: 1791:02-1857:09; 1857:10-1971:07; 1971:08-2018:10, with the last sub-sample corresponding to the post-Bretton Woods era. The sub-sample results are reported in Columns 3 - 5 of Table 1.

As far as the impact of the political cycle is concerned, the Democratic regime continues to cause a depreciation in the all the sub-samples just like the full-sample, but the effect is statistically insignificant in the first and the last sub-samples (i.e., the post-Bretton Woods period). [Based on daily data, we obtained the same statistically insignificant depreciation impact of the democratic regimes on the dollar-pound exchange rate. Complete details of these results are available upon request from the authors.]

The latter result, based on recent data, is in line with the findings of Ashour and Sarkar (2014), but contradicts those of Lobo and Tufte (1998). In sum, we conclude that Democratic regime have indeed depreciated the dollar historically, but in recent years (as well as in the early years of the dollar exchange rate), the inflationary and the higher stock return effects tend to cancel each other to result in an insignificant impact on the dollar.

## 4. Conclusion

The scarce literature on the U.S. political cycles and the value of the dollar provides mixed evidence. This result is however, not surprising, given that it is believed that the Democratic regime being expansionary and hence inflationary can depreciate the currency, but can also

simultaneously appreciate it, as this regime is associated with higher stock returns. Naturally, the impact on the value of the dollar would be contingent on the strength of these two effects.

Given this, we examine the impact of the U.S. presidential cycles on the dollar relative to the British pound over the longest possible monthly period of 1791:01 to 2018:10, and in the process, control for sample selection bias.

In addition, we use a model with heteroskedatic error structure (GJR) to accommodate for omitted variable bias, as well as, conduct sub-sample analysis to account for regime changes. We find that while over the full-sample the Democratic regime has indeed depreciated the dollar relative to the pound, this result no longer holds in the post Bretton Woods era, wherein though the dollar did depreciate, the effect has been statistically insignificant. Our results highlight the importance of tracking history and hence, the entire evolution of a market if possible, but also the need to account for regime changes to draw appropriate conclusions, since the (opposing) forces that affect financial markets are time-varying in nature.

Given that the outcome of the U.S. presidential election - the largest election in the developed world - is a signal about future policies with a global impact, it would be interesting to analyze, as part of future research, the impact of U.S. political cycles on the historical evolution of currencies of other developed and emerging markets, which is of course contingent on the availability of long-span data.

## References


Alesina, A. and Rosenthal, H. 1995. Partisan Politics, Divided Government, and the Economy, New York, NY, Cambridge University Press.

Alesina, Alberto, Roubini,P., and Cohen,D.G., 1997. Political Cycles and the Macroeconomy (MIT Press, Cambridge, MA).

Ashour, S., and Sarkar, S., 2014. U.S. Presidential Cycle and Foreign Exchange Market. Mimeo, University of Texas at Arlington.

Bai, J. and Perron, P., 2003. Computation and analysis of multiple structural change models. Journal of Applied Econometrics, 18(1), 1-22.

Caporin, M., Pelizzon, L., Ravazzolo, F., and Rigobon, R., 2018. Measuring sovereign contagion in Europe. Journal of Financial Stability, 34, 150–181.

Chrétien, S., and Coggins, F., 2009. Election outcomes and financial market returns in Canada, North American Journal of Economics and Finance, 20, 1-23.

Engle, R.F., 1982. Autoregressive conditional heteroskedasticity with estimates of U.K. inflation. Econometrica, 50, 987–1008.

Glosten, L.R., Jagannathan, R., and Runkle, D.E. (1993). On the relation between the expected value and volatility of the nominal excess return on stocks. The Journal of Finance, 48, 1779-1801.

Hibbs, D., 1986. Political Parties and Macroeconomic Policies and Outcomes in the United States. American Economic Review, 76, 66–70.

Lobo, B.J., and Tufte, D., 1998. Exchange rate volatility: Does Politics Matter?, Journal of Macroeconomics, 20(2), 351-365.

McAleer, M. (2014). Asymmetry and leverage in conditional volatility models. Econometrics, 2(3), 145-150.

Pástor, L, and Veronesi, P., 2017. Political Cycles and Stock Returns. National Bureau of Economic Research (NBER) Working Paper No. 23184.

Santa-Clara, P. and Valkanov, R., 2003. The Presidential Puzzle: Political Cycles and the Stock Market. Journal of Finance, 58, 1841-1872.

West, K.D., and Cho, D., 1995. The predictive ability of several models of exchange rate volatility. Journal of Econometrics, 69, 367–391.

# Table 1

## GJR Results from Full- and Sub-Samples

| | Sample Period | | | |
|---|---|---|---|---|
| **Model Parameters** | 1791:02-2018:10 | 1791:02-1857:09 | 1857:10-1971:07 | 1971:08-2018:10 |
| $\mu$ | -0.0755*** | -0.0208 | -0.0223 | -0.0865 |
| $\theta$ | 0.7120*** | 0.0088 | 0.3858*** | 0.0980 |
| $\alpha_0$ | 0.0881*** | 0.0262*** | 0.0919*** | 1.0564*** |
| $\alpha_1$ | 0.8707*** | 0.1977*** | 1.4708*** | 0.1414** |
| $\alpha_2$ | 1.8885*** | 0.0705** | 1.3128*** | 0.1117* |
| $\beta$ | 0.4326*** | 0.7956*** | 0.2885*** | 0.6157*** |
| Log-Likelihood | -5400.7770 | -1233.5970 | -1903.6350 | -1264.6100 |

**Note:** ***, **, and * indicate significance at the 1, 5 and 10 % levels, respectively. The mean and volatility equations of the model are given by, respectively:

$r_t = \mu + \theta D_t + \varepsilon_t$ and $h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 \varepsilon_{t-1}^2 d_{t-1} + \beta_0 h_{t-1}$.

# Appendix

## Table A1
## Summary Statistics

| Statistic | Dollar-Pound Exchange Rate Return (*r*) |
|---|---|
| Mean | -0.0457 |
| Median | 0.0000 |
| Maximum | 60.4282 |
| Minimum | -61.1064 |
| Std. Dev. | 2.5785 |
| Skewness | -0.4157 |
| Kurtosis | 234.7517 |
| Jarque-Bera | 6116173.0000 (0.0000) |
| Modified Ljung-Box ($p$=36): $r$ | 40.2100 (0.2890) |
| Modified Ljung-Box ($p$=36): $r^2$ | 670.1100 (0.0000) |
| ARCH-LM ($q$=2) | 1.0678 (0.3439) |
| ARCH-LM ($q$=12) | 0.5106 (0.9093) |
| Observations | 2733 |

**Note:** Std. Dev: denotes standard deviation; Jarque-Bera test statistic corresponds to a test of the null hypothesis of normality; Ljung-Box statistics correspond to a test of the null hypothesis that the $p$ autocorrelations are zero. Modified Ljung-Box statistics are robust to conditional heteroscedasticity; ARCH-Lagrange Multiplier (LM) statistics correspond to a test of the null hypothesis of no ARCH effects from lag 1 through $q$; entries in parentheses correspond to the $p$-values of the various test statistics.

## Figure A1

## Dollar-Pound Exchange Rate Return