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THE INFLUENCE OF ECONOMIC POLICY UNCERTAINTY, INFLATION AND FTSE100 INDEX PERFORMANCE ON EXCHANGE RATE: EVIDENCE FROM THE UK

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ABSTRACT

The exchange rate plays a significant role in a country's trade with other countries, balance of payments and economic performance, making the determinants of exchange rate attract more and more scrutiny. This study investigates the influence of economic policy uncertainty, inflation and stock market performance on the exchange rate. The methodology consists of an ordinary least squares regression on a time series dataset covering seven years (2015-2021). The empirical results achieved through this study are in line with those of the literature in demonstrating the impact of economic policy uncertainty and inflation on the exchange rate. The findings suggest that one unit increase in CPIH and economic policy uncertainty index result in a decline of about 0.072 and 0.066 units in the effective exchange rate of the pound, respectively. The econometric model also captures a positive relationship between FTSE100 index value and the effective exchange rate, with a unit increase in FTSE100 index value resulting in a rise of 0.16 unit in the effective exchange rate of the pound. With the econometric model offering a satisfactory explanatory power to reveal the impact of these three variables on the level of exchange rate, the findings could be useful for policy makers, authorities and investors in their predictions, decisions or actions concerning the value of their local currency.

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1. INTRODUCTION

In a time of severe economic challenges being faced around the world and deficits in government budgets being increasingly disputed over, economic policy uncertainties have increased across countries. This is also coupled with an ever-increasing inflation that is mainly driven by the rise in food and energy costs, which are exacerbating the living costs for everyone. With many major markets looking to find directions and investors showing more prudence in parallel with the worsening market sentiment, stock markets have gone through wild fluctuations. This paper, therefore, investigates how the three indicators of economic and market performance – economic policy uncertainty, inflation and stock market performance – influence the effective exchange rate.

Investigating the determinants of exchange rates have long been of great importance as exchange rate volatility has the potential to undermine economic performance. When exchange rate volatility is higher, companies' net worth can also become more volatile due to reduced business profitability, and it becomes more challenging for companies to finance their investments, causing reduced productivity and GDP growth (Aghion et al. 2009; Braun and Larrain, 2005). A rising volatility in the exchange rate can cause greater uncertainty in inflation, and therefore increased interest rates, followed by reduced investment and consumption (Grier and Grier 2006). A highly volatile exchange rate can also alter relative costs of production, thereby increasing the firms' exposure to transaction risk in their global trade operations (Baum and Caglayan, 2010).

There are several reasons for specifically choosing UK economy and market to test the influence of economic policy uncertainty, inflation and stock market performance on exchange rate, with the major one being the fact that effective exchange rate of Sterling went through a historic plunge in time of Brexit, the reasons of which deserve scrutiny for a reliable assessment through the study

of determinants of the Sterling exchange rate. To this end, the economic policy uncertainty index used for capturing the uncertainty around economic policies through the number of economic policy uncertainty related newspaper articles is able to provide reliable records allowed by the consistent media coverage before and after Brexit, as well as during COVID.

Secondly, statistical interpretation of the influence of the rising inflation after Brexit and during the post-pandemic period on exchange rate fluctuations is also significant given the potential impact of such a trend on the value of currency. Moreover, considering the fact that how FTSE100-listed companies, representing over 80% (Barclays, 2022) of the total market capitalisation of LSE (London Stock Exchange), perform is an important indicator of how well the LSE – the most international stock exchange with companies originating in over 60 countries – does, investigating the influence of FTSE100 performance on exchange rates has the potential to be useful, since it serves as the main body in the functioning and growth of business and the overall economy.

Based on the idea that expectations regarding fundamentals and economic policies are the main determinants of the exchange rates, this paper suggests that a greater economic policy uncertainty and inflation cause more revisions to be made on the expectations of the fundamental factors determining the value of the currency and the level of the exchange rate, causing a higher volatility in exchange rate, while also arguing that higher FTSE100 index values lead to higher exchange rate. Using empirical data for the last 7 years in UK, the findings of this study provide enough evidence to conclude that economic policy uncertainty and inflation at higher rates in UK result in a depreciated Sterling effective exchange rate, while higher FTSE100 index values bring along a stronger exchange rate. The magnitudes of the impacts vary, with the greatest one being by FTSE100 index values, followed by CPIH and Economic Policy Uncertainty Index. Monthly historical data for FTSE100, Economic Policy Uncertainty and Consumer Price Index with

Housing are found to be predictors of monthly average effective exchange rate index of GBP from January 2015 to December 2021.

This study offers empirical contributions by adding new insights to the literature on the determinants of exchange rates. Prior studies have well established that the inflation can significantly affect the value of a currency. This study finds that a reliable estimate on the exchange rate can be reached through combining the inflation data with two other important factors as independent variables, economic policy uncertainty index and FTSE100 index value.

In practice, this study will primarily contribute to the literature by building a single model that explains the influence of three factors on the exchange rate, by not relying on a single macroeconomic factor, inflation. Economic policy uncertainty index will be relied on to clearly display how economic uncertainties can result in depreciated sterling through a time series analysis. Taking into account the performance of the market value of FTSE100-listed companies, an important market and business growth indicator for the UK economy, allows for taking a wider approach towards the determinants of exchange rates on a single econometric model, as another contribution to the literature.

Secondly, many studies focusing on the relationship between the exchange rate and stock market performance investigate how exchange rate influences stock market performance. With this paper aiming to reveal how exchange rate is impacted by the stock market performance, the relationship therein is scrutinized from the other way around, focusing on how FTSE100 index monthly average value may result in appreciated or depreciated currency.

Another important aspect of this study is that it extends over a period of 7 years from now, covering Brexit, UK's departure from the European Union as a highly influential phenomenon, followed by

yet another phenomenon with huge impact on a global scale, COVID-19. Building a model that is aimed to be reflective of not only the "normal" times, but also these two non-normal times stands as a clear contribution to the previous studies on the exchange rate determinants.

The rest of the paper will provide a broader review of the relevant literature, description of the data, methodology and the econometric model used for the study and empirical results, followed by a summary and concluding remarks.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This section provides a broader discussion of the literature on the importance of exchange rates, exchange rate forecasting models, what differences this study offers compared to them and grounds for why the three factors investigated in this study (economic policy uncertainty, inflation and stock market performance) can influence the exchange rate.

Importance of Exchange Rates in Economy

The previous studies on exchange rate volatility and economic performance reveal a negative relationship between the two. The adverse impact of a greater exchange rate volatility on various economic performance indicators including growth, productivity, consumption and domestic investment is put forward with evidence in studies conducted by Bahmani-Oskooee and Hajilee (2013), Bahmani-Oskooee and Xi (2014), Schnabl (2009), Aghion et al. (2009) and Braun and Larrain (2005). A rise in unemployment rate is also caused by a greater exchange rate volatility, as suggested with evidence by Feldmann (2011). Although the evidence on how exchange rate volatility affects the international trade are not all the same, higher exchange rate volatility causes reduced international trade, even if the extent of this impact is not necessarily great and changes from one country to another as shown by a recent study (Auboin and Ruta, 2012). All in all,

exchange rate volatility is widely found to influence the overall economic performance in a negative way, with repercussions on the currency's value, and this relationship is stronger in times of economic challenges, as evidenced by Krol (2014). All these papers conclude in support of the negative relationship between the exchange rate volatility and economic performance, requiring government authorities, policymakers and central banks to keep a close eye on the determinants of exchange rates to ensure continuous growth and a sustainable economy.

Furthermore, with the floating exchange rate system dominating the international monetary system since the collapse of the Bretton Woods system of monetary management, exchange rates have become increasingly important for the economy of countries both as variable for business operations and as macroeconomic policy variable (Moosa, 2000). The presence of a stable and competitive exchange rate promotes economic development (Guzman et al. 2017). It also serves as an essential economic policy instrument, through which exchange rate management is done to give a country a higher level of competitiveness in the global market (Pilbeam, 1991). An exchange rate policy that is adopted by a country is also essentially effective in ensuring the balance between monetary and trade policies (Karakostas, 2021).

As Schnabl (2008) concluded in his work, a stable exchange rate and growth have a positive relationship, as the stability of exchange rate brings along trade and capital inflows at a higher rate. The existence of a negative relationship between the exchange rate (real effective) volatility and economic growth was also shown by Janus & Riera-Crichton (2015).

Regarding the level of exchange rate in developing markets, undervalued currency, thereby a lower exchange rate is critical for economic growth (Rodrik, 2008), which falls in line with the relationship that Alagidede & Ibrahim also established. Their work suggests that overvaluation or

appreciation of exchange rate can have harmful effects on the growth in case of underdeveloped countries, which is another motivation to investigate which factors affect the exchange rate in what way, as an overvalued rate is not necessarily a merit as evidenced by these works. Without analysing what factors function as more influential determinants of the exchange rate and without getting a full understanding of their impact, either positive or negative, it is not likely for policymakers to design and adopt economic and monetary policies that are suiting their prioritised targets – growth, price stability, boosting trade with other countries etc. – the most.

Above all, however, what is consistent across countries with varying development levels in literature is that economic growth gains a higher pace when there is a stable exchange rate, rather than a volatile one, as concluded by Vieira et al. (2011). Janus & Riera-Crichton's findings are also in line with this conclusion, in supporting the negative association between the real effective exchange rate volatility and economic growth. As the literature suggests, it is well-established that a volatile exchange rate brings along negative results with regards to trade and economic growth regardless of whether the countries in question have developed or emerging markets.

As such, a 1999 study by Doroodian puts forward that an uncertain exchange rate has a significantly adverse effect on trade flows in developing markets such as, South Korea, India and Malaysia. As also put forward by Bahmani-Oskoee (1991), the level of uncertainty in exchange rate and trade flows have a negative relationship in case of developing countries. Similarly, a 1993 study (Chowdhury) revealed that the export volume in all G-7 countries is influenced negatively by the volatility in the exchange rate. The same association applies to import volumes as well, as suggested by Arize & Shwiff (1998). Their findings suggest that an important long-term negative impact of exchange rate uncertainty on import volume exists in each G-7 country, excluding Canada and Germany.

In light of these literature that highlight how important exchange rate and its stability for a country's economy in terms of trade volumes and growth regardless of the scale of their economies, exchange rate and its determinants require further scrutiny, where this study involves to shed light on how three major factors in economy (economic policy uncertainty, CPIH and FTSE100 index value) act as exchange rate determinants. The associations identified through the econometric model built in this study can be referred to and relied on while making policy decisions, according to what economic and monetary policies are adopted. In particular, for developing countries that prioritise increasing their export volume to boost their growth, undervalued currency is usually preferred more, as an overvalued one would make their goods more expensive to be bought by other countries' nationals. This works the other way around for developed countries like UK, where the people have a wider reach to goods from other exporting countries, due to their increased buying power driven by a more valuable local currency.

Therefore, depending on the features of the economic and exchange rate policy adopted, each country needs to balance its exchange rate according to its expectations, in a way that ensures an appropriate balance between imports and exports, sustainable trade patterns, consistent manufacturing and stable buying power for their nationals. This undoubtedly requires having a full understanding of what factors affect exchange rate and building predictive models that successfully captures the relationship between the determinants of the exchange rate and the exchange rate itself. Given the size of the foreign exchange market, a forecasting model with high explanatory power has also been desired by FX investors all around the world, whether institutional or retail. To these ends, a number of approaches adopted to produce the best estimates of future exchange rates through investigating how certain economic factors/indicators influence the exchange rate of a country worth mentioning, with a discussion on their advantages and

drawbacks, in order that the motive of the new estimation approach this study aims to bring becomes clearer.

Exchange Rate Forecasting Models

A number of models attempting to provide accurate exchange rate forecasts based on a variety of factors' impact on exchange rate have been built to date. They essentially suggest that exchange rate is predictable through investigating their relationship with other factors, or the influence of other factors on it, which is also argued by this study, providing evidence of linear relationships of exchange rate with other variables. Although there is no consensus on the classification of exchange rate prediction models, some scholars categorise them as fundamental, technical and alternative models, while a group of researchers name a fourth category where efficient market hypothesis models fall into (Mačerinskienė and Balčiūnas, 2013). Fundamental models provide forecasts on future exchange rates by taking macroeconomic variables into account for calculations, while historical data of the same exchange rate provides the basis for exchange rate determination in technical models. Models that are out of convention fall into the alternative class, while those under the efficient market hypothesis models category base their models on the assumption that future levels can never be predicted as the markets are assumed to be efficient.

One of the oldest exchange rate forecasting models involves relating the purchasing power parity in an economy to the value of its local currency (Taylor, 2004) This model is known to hold in the long run despite not being clear for how long the deviation from the parity will persist or to what extent the deviation will occur (Haidar, 2011). Purchasing power parity model (Cassel, 1918) takes solely the price indices of goods and services into account for estimations, making this model relatively less complicated than other models. There are, however, some drawbacks to the usage

of this model, one of which is the unclarity about which goods and services are better be included to be compared in the basket (Simpson, 2010). Another drawback for the predictions based on purchasing power parity is that protectionist policy is not applicable to the countries that are compared. The two economies taken into account for the relative purchasing power parity must also be comparable to be able to make a forecast about how the local currency's value will move in the future.

Uncovered Interest Rate Parity, another widely used model, has also both advantages and disadvantages. While estimations can have more accuracy in the future, as the deviations from the parity are lower than they were in the past, the model's assuming investors to be neutral to risk is not true. Unlike the model's assumption, investors are not rational (Kohler, 2008) and their heterogeneous beliefs result in bubbles' forming. (An example to these is the high level of deviations from uncovered interest rate parity, supported by carry trade.) Also, given the fact that free flow of capital and risk neutrality apply to interest rate parity as two main conditions and investors are not risk-neutral, uncovered interest rate parity is found not to hold all the time, whereas covered interest rate parity usually holds (Eaton, 1983). Portfolio balance model (McKinnon and Oates, 1966) (Girton, 1971) built for exchange rate forecasting, however, assumes that investors are risk-averse, which is an advantage of the model in that regard (Mačerinskienė and Balčiūnas, 2013); yet, a disadvantage the model has is that the investments cannot be held in an instrument other than domestic money and foreign/domestic bonds, coupled with the assumption that foreign nationals never hold their assets in the domestic market (Argy, 1989).

For the exchange rate forecast, the impact of fiscal and monetary policies to the exchange rate is assessed by using the Mundell-Fleming Keynesian (1960s) model, whose main drawback is that it is quite a complicated model due to the high number of variables needed to be estimated

(Mačerinskienė and Balčiūnas, 2013). Flexible price monetary model introduced by Frenkel is also based on monetary policy assessment to make exchange rate predictions (1976). An advantage that this model offers is that the direction of change is predicted successfully (Moosa, 2013); however, the assumptions (PPP and uncovered interest rate parity) that the model bases upon may not be holding in reality given the lack of enough evidence for the assumptions, which would undermine the reliability of the model's estimations (Yong, 2000).

Microstructure approach model (Lyons, 2000) addresses the assumption issue by relaxing most of the assumptions in other fundamental exchange rate forecasting models, as well as allows measuring the influence of news or other specific factors on exchange rate. In case of FX market, however, information about order flow is quite limited and the flow differs because of the heterogeneity of the market participants. Similarly, difficulty in reaching data as they are not usually made publicly available and can only be provided by the largest dealers is evident. The lack of empirical studies on microstructure models can also be regarded as a disadvantage of them. (Sager, 2008; Rime et al., 2008; Vitale (2007). Another model attempting to give best estimations for future exchange rates is the Post-Keynesian approach models suggested by Harvey (1999) focusing on assessing future economic prospects, whose drawback is its assumption that people buy currency only for the purposes of purchasing assets in the foreign country (Mačerinskienė and Balčiūnas, 2013).

Essentially different from the rest of the models, behavioural finance is an approach that focuses on psychology and behaviours of market participants which are important to be addressed (Rasekhi et al., 2011). Yet, this approach may not fully represent the market as it covers investors and speculators, which is only a segment of the participants of the market. Lastly, as opposed to rest of the models discussed above, the theory of chaos models argue that the relationship between

exchange rates and their determinants is a non-linear one, and therefore cannot be predicted with the movements in the market occuring in a chaotic way, although this assumption was disproved by several studies (Gilmore, 2001; Moosa and Bhatti (2010). The linear relationships that are found to exist between exchange rate and the other factors in this study's model is also in line with the studies arguing the existence of linearity, thereby allowing measurability and predictability.

In comparison, the model that this study aims to build, does not suffer from the disadvantages found to exist in prior prediction models. First of all, the time series data used for estimations are not unwieldy and none of the data requires private authorisation or request for access, which allows to use the model across countries with the equivalent datasets. Similarly, the number of variables used for estimation is low, making the model less complex than other models. Another point to consider is that the data used for estimation is almost non-sensitive to investors' irrationality (excluding FTSE100 variable) as the focus is on effective exchange rate of Sterling rather than a bilateral exchange rate (i.e. GBP/USD), which focuses better on the value of Sterling, therefore affected less by the bilateral FX trade, where investors' transactions to hold or sell their investments have a more direct impact on the rate. Moreover, unlike what relative purchasing power parity method requires, ensuring the comparability of two countries to predict the future rate is not needed.

Given the strengths and drawbacks of the existing models, this study focuses on a combination of three factors – economic policy uncertainty, inflation and stock market performance – and builds a model that reveals their relationship with the exchange rate.

Relevance of the Three Factors (economic policy uncertainty, inflation and stock market performance) to the Exchange Rate

In the past, researchers attempting to measure economic policy uncertainty used to base their estimations on certain events creating uncertainty such as the passage of legislative bills (Bernhard and Leblang, 2007) or elections. Adopting this approach, they concluded that political events have an impact on exchange rate volatility, studying the influence of uncertainties in policy on exchange rate through GARCH (generalised autoregressive conditional heteroscedasticity) model (Krol, 2014). Findings from some other studies that focus on pre and post-election periods as drivers of economic policy uncertainty also fall in line with these results. While Julio and Yook (2012) found evidence that shows reductions in investment by companies near elections, presence of higher levels of volatility in equity market caused by elections is also suggested by the findings from earlier studies (Boutchkova et al., 2012 and Bialkowski et al., 2008).

This approach, however, fails to capture how the policy implementation will evolve in time. Therefore, rather than studying two windows separated by a single event, this study makes use of an index as a tool to see how economic policy uncertainty evolves over time, by which the study draws on a continuous measure of economic policy uncertainty instead of an event-based measure. This allows the model to identify a statistically significant relationship between the uncertainties in economic policies and the exchange rate level over time. The indices calculated by Baker, Bloom and Davis (2016) provide a measurement of economic policy uncertainty in UK, US and other countries through a normalised index of the amount of news articles that discuss economic policy uncertainty related issues. The study by Bloom et al. found a significant relationship between economic policy uncertainty and economic performance. According to their findings, increased risks that come along with a higher level of economic policy uncertainty reduce real GDP, investment and employment. With exchange rate performance being related to these

parameters in economic terms, this research finds its motive to investigate the potential relationship between economic policy uncertainty and exchange rate.

There have been a bulk of empirical evidence suggesting that fluctuations in a currency's foreign exchange rate drives inflation (Forbes 2015; Fischer 2015; Mishkin 2008). The impact inflation has on an FX rate is also usually known to be negative, which is further supported by the fact that a very low rate of inflation does not necessarily bring along a favourable exchange rate, while a significantly high rate of inflation is highly likely to have an adverse impact on a country's currency, causing decreased exchange rates (Stocker and Yilmazkuday, 2019).

On the other hand, inflation is also closely linked to interest rates, as a rising inflation in most cases is addressed by increased interest rates, which in return can halt the depreciation of a country's currency against other currencies, or even make it stronger. In this regard, a positive relationship between inflation and exchange rate, was suggested by Joof et al. (2020), and inflation was found to drive exchange rate because rises in inflation was followed by interest rate raises, which caused appreciation in local currency's value, thereby a higher exchange rate against foreign currencies. Similarly, Clarida and Waldman established a statistically significant positive relationship between the inflation and nominal exchange rate through studying how nominal exchange rates respond to inflation announcements in windows of 10 minutes in ten countries and a number of other inflation measures (Clarida et al., 2007). Therefore, given the fact that not all the literature concludes the same way, the nature of the relationship between inflation and the exchange rate deserves scrutiny, for which starting with the Purchasing Power Parity would be useful.

According to Gustav Cassel (1921) who came up with the theory of exchange rates, which is also termed as purchasing power parity, if an exchange rate is not at parity, that is in disequilibrium, requiring either the exchange rate or the purchasing power to adjust until the point where the parity is achieved, with this idea being based on arbitrage. It is now realised by economists that PPP would hold only if all of the goods of a country were being traded internationally, which does not apply in reality, with most goods not being traded internationally (Econlib, 2022). Economists, however, still makes use of the RPPP concept as a starting point in predicting the changes in exchange rates, which involves having a comparative look towards two countries' inflation rates. For instance, in terms of bilateral exchange rate, if Israel has an annual inflation of 20%, while that in U.S. is 4%, it is highly likely that Israel's local currency will depreciate against the U.S. dollar (Econlib, 2022). With the buying power of the currency decreasing due to inflation, the same amount of money buys less, which also makes the currency less valuable against other foreign currencies.

Whether these relationships work in case of UK, where recent years have seen an increasing inflationary pressure mainly due to Brexit (Breinlich et al., 2017) and COVID-19, causing food supply blockages, supply chain issues and labour shortages (BOE, 2021), is investigated with monthly inflation in UK being regressed on monthly average effective exchange rate of Sterling.

Regarding the relationship between the stock market performance and exchange rates, the concept has been long discussed in terms of whether it is the exchange rates affecting the stock market, or the stock markets have an influence on the path FX rates follow. It is theoretically the latter, which means if the stock market is going up, investors' confidence in the economy of the country is also increasing, attracting more foreign investment and demand for the local currency. When, however, the stock market does not perform well, the investor confidence decreases and foreign investors

usually convert back to their own currencies, which causes depreciation in the local currency. (Cattlin, 2018)

There are a number of models suggested in the literature to capture how the stock market and exchange rate market is related to each other. According to the flow-based model built by Dornbusch and Fischer (1980) exchange rate volatilities have an impact on global trade, which affects the real income and output of companies. The impact of exchange rate fluctuations on the balance sheet of the company is therefore reflected in its stock price, with the assumption that the discounted PV of a company's expected future cash flows make up the main factor determining the price for its stock. This flow-based model therefore argues that a positive correlation exists between stock prices and exchange rates, whereas another model called the portfolio balance model captures a significant negative association between stock prices and exchange rates (Branson et al., 1977). Stock price changes are likely to have an influence on the capital account transactions, which is considered by this study as a major exchange rate determinant. Therefore, the estimations obtained through the model built by Branson et al. basically suggests that a stock market that performs well, attracts more capital from abroad into the country, leading the stock market to rise, which in return, results in the appreciation of the currency. As opposed to these suggested associations, however, there is no assumed association between the stock market and exchange rates according to Frankel's (1992) study. His theory is, therefore, based on the assumption that a common factor, such as an interest rate, drives the changes in both stock and exchange rate markets (Ajayi and Mougoue, 1996).

With many different estimations and suggestions that empirical findings bring on the relationship between the stock market and exchange rate (Gokmenoglu, et al., 2021), this study reinvestigates

the possible association between the two, with an aim to finding a statistically significant impact of stock market on exchange rates.

Hypothesis

H0: Economic policy uncertainty, inflation and FTSE100 index value have no influence on Sterling's effective exchange rate.

H1: Economic policy uncertainty, inflation and FTSE100 index value have influence on Sterling's effective exchange rate.

Given the hypothesis, this study builds a model, whose estimations provide evidence to reject the null hypothesis that suggests no impact of Economic policy uncertainty, inflation and FTSE100 index value on effective exchange rate of GBP. The estimations eventually do not only provide statistically significant evidence in support of the alternative hypothesis, but also reveal clear directions, with economic policy uncertainty and inflation having a negative and FTSE100 having a positive relationship with the Sterling's effective exchange rate.

3. DATA DESCRIPTION

This section provides technicalities for the formation of datasets, as well as displays the historical data on line graphs, which are aimed to serve for a better understanding of the trends each time series follows across years. This trend and data analysis is conducted with references to major events with economic impact, having direct influence on economic policy uncertainty, inflation and stock market performance in UK between 2015 and 2021.

3.1. EFFECTIVE EXCHANGE RATE

This study takes monthly average Effective exchange rate index for Sterling as an indicator of the value of the currency. The data is retrieved from the Bank of England's resources for the purposes of this study and starts with January 2015 to end by December 2021, corresponding to 84 rows of data.[1] Effective exchange rate, also termed as exchange rate index (ERI), is basically an overall measure of a currency's exchange rate when measured against a number of other currencies, which diverts from bilateral exchange rate, which is used for the rate of a currency against another. (BOE, 2018)

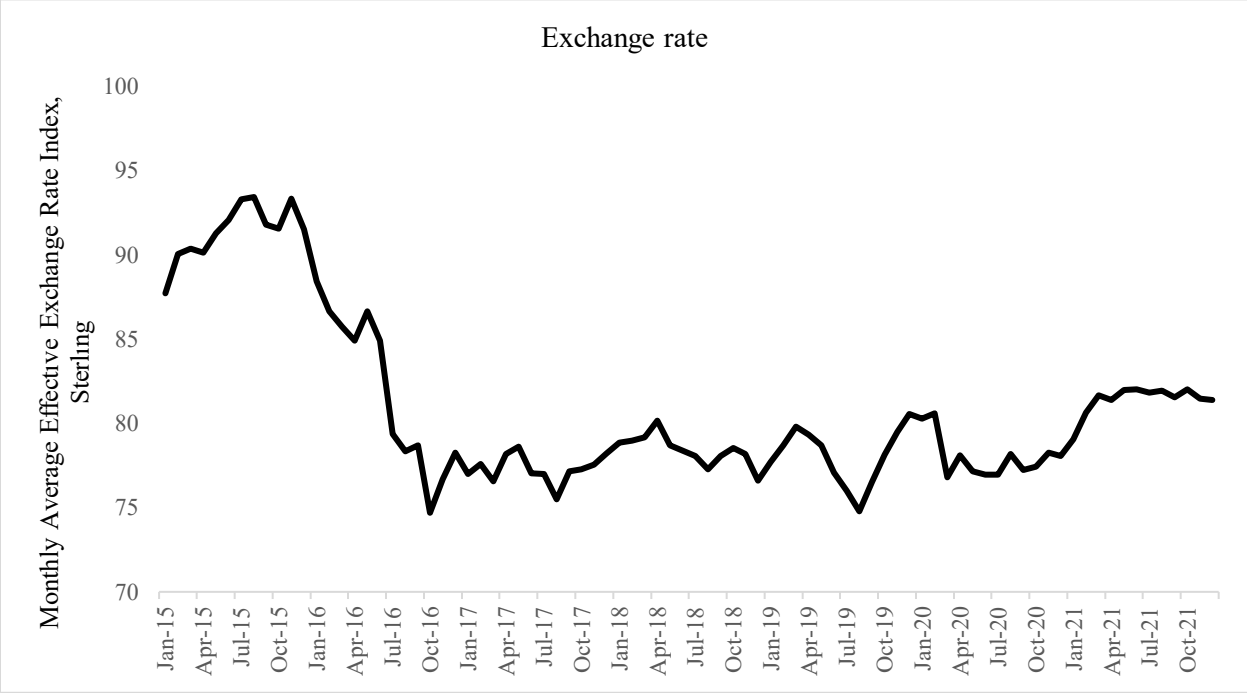
Calculation of ERI usually involves taking the weighted geometric average of bilateral exchange rates indexed and expressing them in an index format in relevance to a reference period, which is in our case January 2005 = 100, following ERIs indexed to 1990 = 100 for 21 major world currencies. This change brought substantial reform to the way ERI is calculated by the Bank, with a focus on compromising between simplicity, in order to make regular re-weighting possible and not going far from the IMF method (BOE, 2018).

The index used for the purposes of this study lists new data in time series format as rebased to Jan 2005 = 100, as well as incorporates several key features different from the previous calculation methods adopted in 1990 and 1995 following IMF's. Not only the data for trade flows were updated through adding the trade in services, but also a commitment was made for annual reweighting, with a view to making the rates more precise indicators of the currency's effective exchange rate level against other international currencies. (BOE, 2018). With all these being explained, sterling ERI by Bank is used in this study as the representative of the changes in the

[1] Exchange rate data is sourced from the Bank of England in monthly time series format: *https://www.bankofengland.co.uk/boeapps/database/fromshowcolumns.asp?Travel=NIxIRxSUx&FromSeries=1&ToSeries=50&DAT=RNG&FD=1&FM=Jan&FY=2015&TD=31&TM=May&TY=2022&FNY=&CSVF=TT&html.x=224&html.y=46&C=IIU&Filter=N*

value of Sterling rather than bilateral rates or other indices. Although the sterling ERI is currently re-weighted on annual basis, it remains as referenced to Jan 2005 = 100, with the index available on daily, monthly and quarterly basis. This study retrieves monthly average effective exchange rate data so that the relationship with monthly inflation rate can be statistically captured.

Figure 1 | Line graph for the effective exchange rate index



Monthly average GBP effective exchange rate has fallen significantly since the Brexit vote, which is apparently because of the negative outlook becoming present among foreign investors for the UK's economy outside the EU (Coyle, 2021). As seen from the graph above, early 2021 saw nearly 15% weaker pound sterling compared to the last day before the referendum to leave EU took place in June 2016. Referring further back in time, to December 2015, when the EU Referendum Act received Royal Assent, the British pound had been around 20% stronger than it was in 2021.

The last six years have seen Brexit as one of the major factors affecting the value of sterling and exchange rate volatility, which is further supported by the fact that the sterling went through its

largest fall on a single day in 30 years, following the referendum result (Blitz and Lewis, 2016). October 2016 witnessed the lowest monthly average rate at 74.69, followed by sustained fluctuations in the remaining period. With uncertainties increasing and political instabilities persisting, pressure on financial institutions to sell the pound increased, driving further fall in its value with more and more organisations deciding to sell the sterling-denominated assets they hold. As is also seen from the figure above, prospects for increased trade barriers can be stated as another major reason leading the GBP value to fall over the years following UK's decision to leave the EU, its largest trade partner (Ward, 2021).

The sharp falls seen from December 2015 to October 2016, can, however, also be attributed to the financial institutions' preference to sell pound-denominated investments, given the fact that currency trading or trading in financial assets constitute the highest share in currency transactions, as a result of which they act as the main reason behind the volatilities in the exchange rate, particularly in the short term. This suggestion is further supported by the fact that financial institutions make up 57.8% of UK's total foreign exchange turnover, with only 4.9% of currency exchange volume taken up by non-financial customers (BIS, 2019). Considering also the fact that the exchange rate of GBP started to fall quickly before any changes affecting the trade between the UK and EU actually took place, as seen in the figure and discussed above, the role of the easily mobile money in the fall of sterling's value becomes more evident. Moreover, goods and services trade is not the main source of FX transactions, while not changing in a sharply manner in short term (BIS, 2019).

The analysis above serves an invaluable role in highlighting the importance of the model that this study builds, as it is able to provide statistically significant exchange rate estimations with its

regressors through capturing their relationship with the exchange rate that suffered the unprecedented impact of Brexit and COVID-19 and fluctuated widely.

3.2. ECONOMIC POLICY UNCERTAINTY INDEX

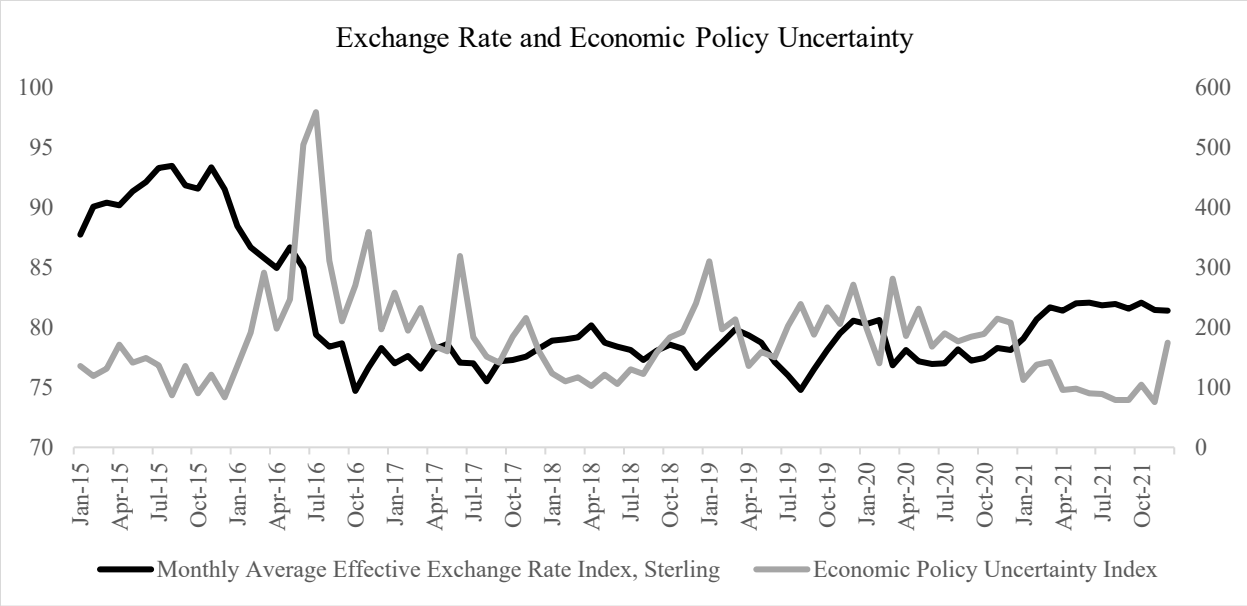
Rather than an event-based approach in understanding the impact of economic policy related events on economy and exchange rate, Economic Policy Uncertainty Index[2] data is relied on to see how economic policy uncertainty is influencing exchange rate over time (Baker et al., 2016). The method of construction of the index is based on economic policy uncertainty related articles appearing on newspapers. This involves capturing relevant terms from 11 major newspapers in UK[3]. In particular, the index is constructed based on the number of news articles that contain the terms uncertain or uncertainty and economic or economy, as well as those related to policy that include Bank of England, regulation, spending, tax, policy, budget and deficit (Baker et al., 2016).

The method to construct the index involves normalising each paper-specific monthly series to standard deviation "1" before 2011, following which they are summed across papers. The series is eventually normalised to the mean of 100 before 2011 (Baker et al., 2016).

Figure 2 | Line Graph for the GBP effective exchange rate and economic policy uncertainty

[2] Economic policy uncertainty data indexing economic uncertainty related news is structured by Scott R. Baker of Northwestern University, Nick Bloom of Stanford University and Steven Davis of University of Chicago. The data for UK's economic policy uncertainty is retrieved in monthly time series format from https://www.policyuncertainty.com/uk_monthly.html

[3] These newspapers include The Financial Times, The Times and Sunday Times, The Telegraph, The Daily Mail, The Daily Express, The Guardian, The Mirror, The Northern Echo, The Evening Standard and The Sun.



As is seen from the chart above, EPU index successfully captures the wild rises and fluctuations in economic policy uncertainty around Brexit starting in December 2015, with the number of monthly average economic policy uncertainty related articles peaking at 558 in July 2016 following its leap to 504 in June, when the referendum to leave EU took place. The time series also successfully captures March 2020 at a high of 281 – the month that witnessed the declaration of COVID-19 as a pandemic. When the above fluctuations in the economic policy uncertainty indicator and those in the value of currency particularly in times of Brexit and COVID-19 are taken into consideration, EPU and its relationship with the exchange rate stand out as an important factor to be considered through an econometric model based on a time series analysis to make the best estimates of exchange rate changes.

3.3. CONSUMER PRICE INDEX WITH HOUSING

With Consumer Prices Index including owner occupiers' housing costs (CPIH) becoming ONS's lead inflation index as of 21 March 2017, this study assigns it as the indicator of inflation in UK. It functions as the most thorough measure for inflation as it also includes housing costs of owner

occupiers and Council Tax, which CPI index does not cover. Putting these differences aside, it is identical with CPI as both includes the same series.

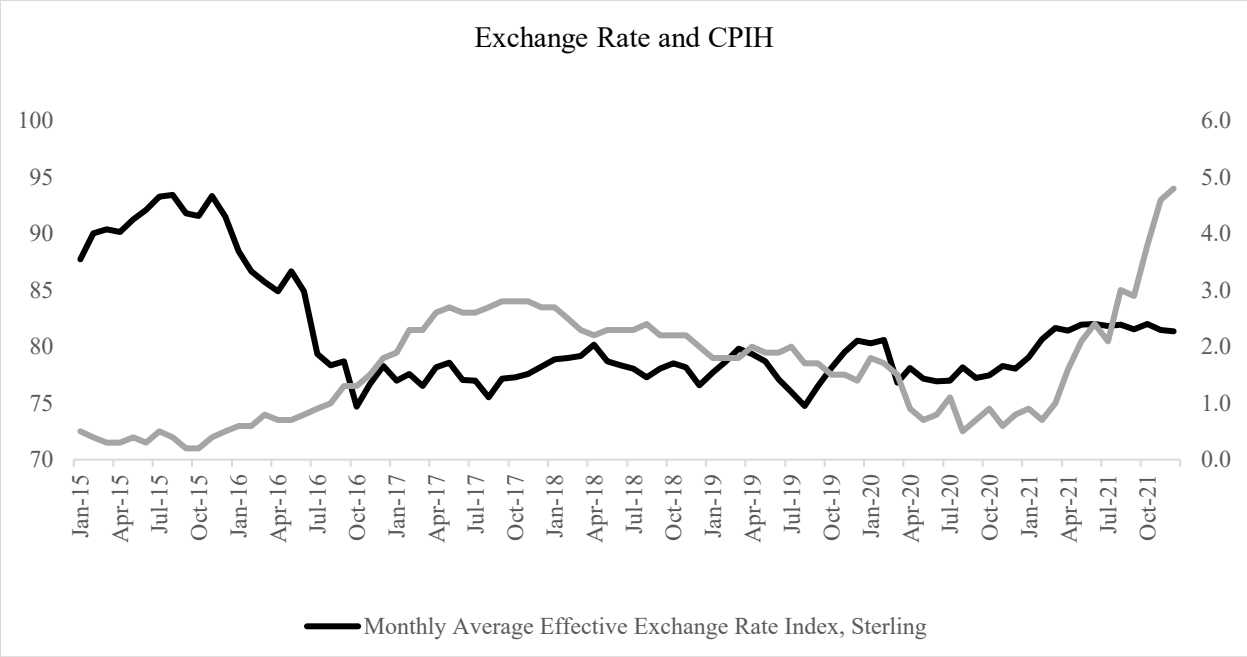
CPIH data is produced monthly and refers to prices at a set point in time, which is, in most cases, the 2nd or 3rd Tuesday each month. CPIH index measures the changes in the price of a basket including various items with fixed composition, quantity and quality whenever feasible. The specific items chosen (nearly 700 in number) function as the representative of price movements, and prices are only gathered for the selected items (from goods and services). Further details on the background of CPIH, as well as the method of selection of items and the creation, validation and quality of the output, are provided by the Office for National Statistics[4].

The categories under the CPIH are based on an international classification system called COICOP (Classification of Individual Consumption According to Purpose) which involves 12 divisions under which goods and services are listed. CPIH weighting is done based on expenditure of all private households, foreign visitors in UK and those residing in institutional households.

2015 equals 100 is the basis for the official CPIH series that were initiated in 2013. This study extracts monthly CPIH data ranging from January 2015 to December 2021[5].

Figure 3 | Line Graph for the effective exchange rate and CPIH

[4]https://www.ons.gov.uk/economy/inflationandpriceindices/methodologies/consumerpriceinflationincludesall3indicescpihcpiandrpiqmi#methodology-background
[5]Monthly Consumer Price Index with Housing data is retrieved in time series format from https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/l55o/mm23



The CPIH factor to be used in our model, successfully captures the price instability in UK market following the EU Referendum Act's receiving Royal Assent in December 2015, when the monthly inflation was at a low of 0.5% before rising up to 2.8% in September 2017. Although August 2020 witnessed a low of 0.5%, monthly inflation surged in post-COVID period to peak at 4.8% by the end of 2021. When the close relationship between the inflation and exchange rate established through the relative purchasing power parity[6] is considered, having CPIH as one of the regressors in an exchange rate forecast model proves to be essential, also given the fact that the above trends in CPIH had reflections in overall economy, as well as in the value of the currency.

3.4. FTSE100 INDEX

[6] As an economic theory, relative purchasing power parity suggests that inflation rates and exchange rates in two countries balance out over time, which should not be a short time horizon for the theory to hold true (Simpson, 2010).

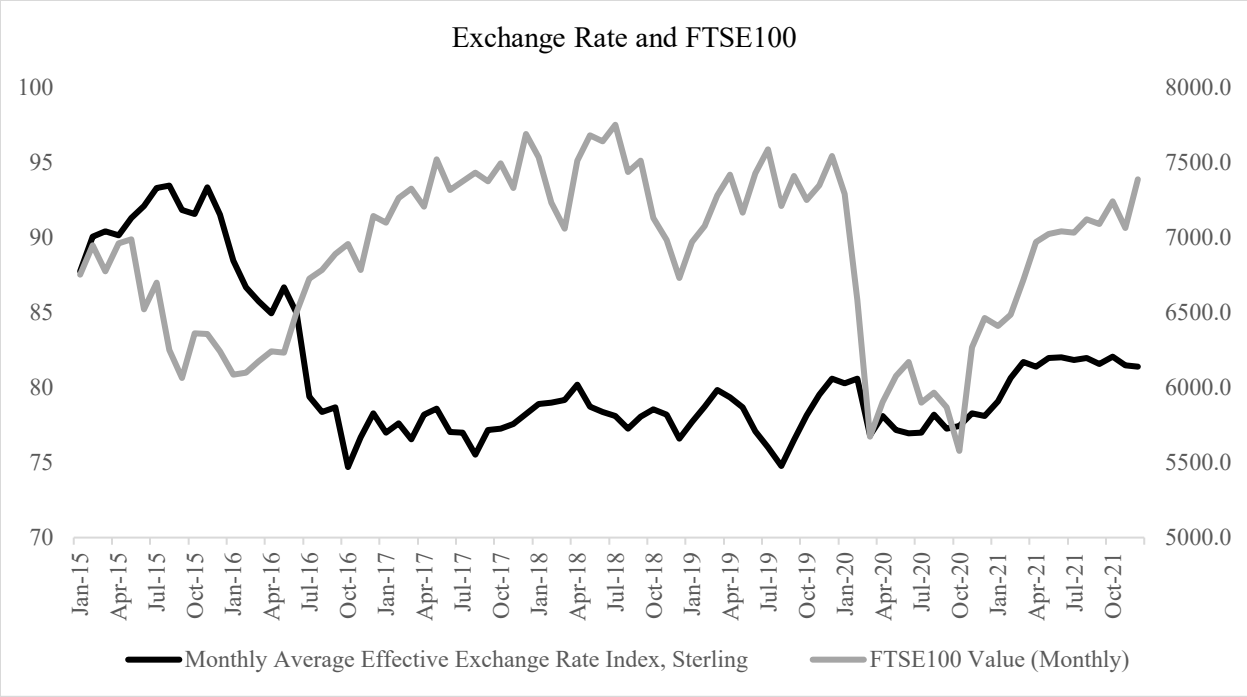
As a major indicator of performance of the broader market, FTSE100 value data is used for the purposes of this study that involves capturing the impact of stock market performance on exchange rate. As a market cap weighted index, tracking and measuring the performance of 100 largest UK-listed blue-chip companies – not necessarily British but must be listed and traded on the LSE (London Stock Exchange) – FTSE100 (Footsie)[7] is representative of over 80% of the market capitalization of LSE (Barclays, 2022).

FTSE100 quotation is made as up or down, based on a measurement against the closing price in the previous day. The calculation is made continuously every trading day from 8 in the morning until 4.30 in the evening, when LSE closes.

The series used for building the model in this study is made up of monthly average of daily average FTSE100 prices/values starting with January 2015 to end in December 2021[8]. The mean values calculated monthly are representative of the FTSE100 performance over months, with each month matching the effective exchange rate of Sterling, which is also monthly.

Figure 4 | Line Graph for the effective exchange rate and FTSE100 Index Value

[7] London Stock Exchange Group maintains FTSE as its owner and the acronym 'FTSE' is for Financial Times and the London Stock Exchange, which are the parent companies.
[8] Monthly average FTSE100 values are retrieved in time series format from https://uk.investing.com/indices/uk-100-historical-data



As the chart above reveals, monthly average market value of FTSE100 index value showed a surge in the years after Brexit and peaked at 7,748, before experiencing a dramatic drop to lows of 5,672 in March 2020 and 5,577 in October 2020 with the impact of COVID-19. With the FTSE100 index monthly time series capturing how the stock market performs over the period of 7 years, including it as a factor in exchange rate forecast model allows to investigate whether how the stock market moves has an influence on how exchange rate changes across time.

4. METHODOLOGY

Aiming to investigate the influence of economic policy uncertainty, inflation and stock market performance on the exchange rate, this study uses Multiple Ordinary Least Squares regression method[9].

The main econometric model for this study is as follows:

$$EXCHRATE = \beta_0 + \beta_1 EPU + \beta_2 CPIH + \beta_3 FTSE100 + \varepsilon$$

where:

EXCHRATE is the time series data for the monthly average effective exchange rate of Sterling,

EPU is the time series monthly economic policy uncertainty index,

CPIH (Consumer Price Index with Housing) is the data series representing monthly inflation in UK,

FTSE100 is the time series for monthly average value of FTSE100 index

NB: *All variables are run in their log-transformed forms to de-emphasize the outliers and stabilise the variance of each series.*

Unit Root Analysis

As a unit root test, Augmented Dicky Fuller Test (1979) is run on each of the variables to test the stationarity of each time series, which is essential to be able to make consistent and reliable estimates when doing time series analysis. The model equations for this test are:

$$\boldsymbol{EXCHRATE} = c + \beta_t + \alpha EXCHRATE_{t-1} + \phi \Delta EXCHRATE_{t-1} \phi \Delta EXCHRATE_{t-2} \ldots + \varepsilon_t$$

$$\boldsymbol{EPU} = c + \beta_t + \alpha EPU_{t-1} + \phi \Delta EPU_{t-1} \phi \Delta EPU_{t-2} \ldots + \varepsilon_t$$

[9] Ordinary Least Squares regression method allows to minimise the sum of squared vertical distances between the observed and predicted values, by which unknown parameters in a linear regression model are estimated. OLS is the most popular method used to perform a regression analysis and estimate econometric models as it produces the best possible results in standard situations (when the model satisfies the assumptions of the regression method).

$$\boldsymbol{CPIH} = c + \beta_t + \alpha CPIH_{t-1} + \phi\Delta CPIH_{t-1}\,\phi\Delta CPIH_{t-2} \ldots + \varepsilon_t$$

$$\boldsymbol{FTSE100} = c + \beta_t + \alpha FTSE100_{t-1} + \phi\Delta FTSE100_{t-1}\,\phi\Delta FTSE100_{t-2} \ldots + \varepsilon_t$$

where,

$EXCHRATE_{t-1}$, EPU_{t-1}, $CPIH_{t-1}$ and $FTSE100_{t-1}$ are for the lag 1 of the time series,

$\Delta EXCHRATE_{t-1}$, ΔEPU_{t-1}, $\Delta CPIH_{t-1}$ and $\Delta FTSE100_{t-1}$ are for the first difference of the series at time "t-1".

Table 1 | Statistics from the ADF unit root test

Variables	**First difference**			
	Intercept		**Intercept & Trend**	
	T-stats.	Prob.	T-stats.	Prob.
EXCHRATE	-5.994***	0.000	-5.547***	0.000
EPU	-256.570***	0.000	-255.645***	0.000
CPIH	-118.137***	0.000	-125.142***	0.000
FTSE100	-12. 359***	0.000	-12.034***	0.000

*** p<.01, ** p<.05, * p<.1

NB: *Augmented Dicky-Fuller unit root test critical values at 1% are* ***-3.534*** *and* ***-4.077*** *for the Intercept and Intercept & Trend, respectively.*

With T-statistics exceeding the critical values and p-values being zero, the results from the unit root test provide evidence that the variable is generated by a stationary process at 1% significance level, which allows for a reliable time-series analysis. (Before the test, exponential smoothing[10] is applied to reduce wide variances through eliminating outliers or other statistical noises such as

[10] Montgomery, Johnson, and Gardiner (1990) and Abraham and Ledolter (1983) and provide useful explanations for exponential smoothing, and Chatfield (2005) further highlights its relevance and applicability to modern time-series.

aperiodic variation the time series in this study has.) With DF test estimations evidencing the presence of stationarity in each time-series, cointegration test becomes irrelevant.

5. EMPIRICAL FINDINGS

This section provides descriptive statistics and estimations that the econometric model specified in the methodology section produces, as well as the results from post-estimation tests.

5.1 DESCRIPTIVE STATISTICS

Table 2 | Summary Statistics for each time series

Variable	Number of observations	Mean	Standard deviation	Minimum value	Maximum value
EXCHRATE	84	80.93455	5.038985	74.6939	93.4381
EPU	84	180.7184	82.87811	75.3175	558.2236
CPIH	84	1.639286	0.982377	0.2	4.8
FTSE100	84	6893.316	541.6601	5577.27	7748.76

The highest level reported for monthly average effective exchange rate for Sterling was 93.43 whereas the lowest rate was 74.69 over the period (2015-2021). The mean rate over 7 years was 80.93. Economic Policy Uncertainty had a wider fluctuation ranging between 75.31 at the lowest and 558.22 at the highest, indicating drastic changes in the extent of economic policy uncertainties throughout the same period. The time series for consumer price index with housing shows an average monthly inflation of around 1% for the 7-year period, with the highest rate being 4.8% and the lowest 0.2%. Finally, the years 2015-2021 witnessed the highest monthly average FTSE100 index value of 7748.76, whereas it was once down at a low of 5577.25. The mean price over the period was reported as 6893.31.

5.2 MAIN RESULTS

Ordinary Least Squares Regression Estimation

Table 3 | OLS Regression Estimations: Regression coefficients and statistics

	(1) EXCHRATE	(2) EXCHRATE
EPU	-0.0662***	-0.0662***
	(0.0098)	(0.0106)
CPIH	-0.0720***	-0.0720***
	(0.0065)	(0.0055)
FTSE100	0.1603***	0.1603***
	(0.0599)	(0.0602)
Constant	3.3343***	3.3343***
	(0.5374)	(0.5391)
Observations	84	84
F	72.7605	102.30
Df_m	3.0000	
Df_r	80.0000	
R2	0.7318	0.7318
Adjusted R2	0.7217	
Root mse	0.03216	0.03216

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

NB: *The estimations on the righthand side are produced through the OLS regression run with robust standard errors, providing similar standard errors compared to the OLS run without it, which further confirms that the model is not subject to heteroskedasticity and correlation issues.*

The multiple ordinary least squares model estimations provide an R-squared value of 0.73 that indicates the proportion of the variance for the dependent variable (EXCHRATE) that is explained by the independent variables (EPU, CPIH, FTSE100) in the model. Based on the model's R^2, 73% of the observed variation are explained by the inputs, establishing the evidence in support of the relationship between the independent variables of economic policy uncertainty, consumer price index with housing and FTSE100 index monthly average value on the dependent variable of Sterling's exchange rate. With a quite similar Adjusted R^2 (0.7217), it is safe to suggest that addition of each independent variable improves the model more than would be expected to occur by chance. In line with the study's main hypothesis, the model suggests a negative relationship between economic policy and exchange rate, which negatively relates also with inflation (CPIH), while there is a positive relationship between monthly FTSE100 index value and monthly average effective exchange rate.

In particular, the multiple ordinary least squares regression estimations reveal a statistically significant relationship between 7 years of monthly data reported for economic policy uncertainties and monthly average effective exchange rate index in UK. Based on the OLS regression result, the coefficient on EPU is negative and statistically significant at the 1% significance level, indicating that there is a negative relationship between EPU and EXCHRATE. Economically, the model predicts that one unit increase in EPU will result in approximately 0.066 unit decrease in the exchange rate. Consistent with the main hypothesis, the economic policy fluctuations will drive fluctuations in GBP exchange rate, as a rise in monthly economic policy uncertainty index leads to a decrease in monthly average effective exchange rate of Sterling.

The regression model also provides a statistically significant estimate of the relationship between monthly consumer price index with housing data and monthly average effective exchange rate of

Sterling. The variable of interest, CPIH, attracts a negative and significant coefficient (-0.072), predicting that a unit increase in the inflation indicator (CPIH) will result in 0.072 unit decrease in monthly average effective exchange rate of Sterling. In support of the main hypothesis of this study, the fluctuations in the monthly inflation trend drive fluctuations in Sterling exchange rate, with an increase in monthly CPIH causing a decline in monthly average effective exchange rate of GBP. With this relationship being statistically significant at 1% significance level, the model provides evidence establishing the impact of inflation on the exchange rate.

According to the multiple regression model's estimates, a significant relationship also exists between monthly average FTSE100 index value and the monthly average effective exchange rate. Based on the OLS estimations, FTSE100 index value (FTSE100) has a positive relationship with the effective exchange rate (EXCHRATE), with one unit increase in the former predicted to result in an increase of 0.16 unit increase in the latter. This relationship is statistically significant at 1% significance level and acts in line with the main hypothesis of this study suggesting that fluctuations in monthly average value of FTSE100 index drive fluctuations in GBP's monthly average effective exchange rate, which is further evidenced by the positive relationship identified between the two through the model's estimations.

In light of the statistical evidence, the null hypothesis that economic policy uncertainty, inflation and FTSE100 index value have no influence on Sterling's effective exchange rate is rejected and the alternative hypothesis that economic policy uncertainty, inflation and FTSE100 index value has an influence on effective exchange rate of Sterling is accepted.

5.3. POST-ESTIMATION

Multicollinearity

Taking into account that a high level of correlation would be a strong signal for the presence of multicollinearity, any correlation between independent variables is investigated.

Matrix of correlations

Table 4 | Correlation between regressors

Variables	(1)	(2)	(3)
(1) EPU	1.000		
(2) CPIH	-0.103	1.000	
(3) FTSE100	-0.117	0.066	1.000

As seen above, correlations between independent variables (regressors of the OLS) are low at around -10% for EPU-CPIH and FTSE100-EPU, followed by CPIH-FTSE at just above 5%. With this being the case, each independent variable remains statistically significant for their impact on the dependent variable (EXCHRATE).

Heteroskedasticity

As the OLS model in this study is made up of log-transformed variables, it is not likely for residuals or error terms to have unequal scatter, which is further supported by the following test.

Bausch-Pagan/Cook-Weisberg Test for Heteroskedasticity

Table 5 | Heteroskedasticity Test Results

Assumption	**Normal error terms**
Null hypothesis	Constant variance
Chi2(1)	2.11
Prob > chi2	0.1459

Testing for heteroskedasticity, the above test provides no evidence to infer the presence of heteroskedasticity with p-value being nearly 0.15.

Regression Assumptions

In addition to being checked for heteroskedasticity, and correlation issues through the matrix of correlation, the model is further exposed to analysis through variance inflation factor, Shapiro-Wilk W normality test, specification link test and Cook's distance to assess whether the multiple ordinary least squares regression satisfies the OLS assumptions according to Gauss-Markov Theorem[11]. As shown below, variance inflation factor, Shapiro-Wilk W normality test, specification error test, cook distance values and Bausch-Pagan / Cook-Weisberg heteroskedasticity test satisfy the desired values. With these results, the tests performed show no violation of the OLS assumptions, proving that the coefficient estimates are BLUE[12].

[11] Ordinary Least Square Regression assumes linearity, as well as endogeneity of regressors. Error term should be normally distributed and constant variance (homoscedasticity) should exist, while autocorrelation should be non-existent, which would otherwise not allow linear regression in an analysis. There should be no multicollinearity observed between variables (Blackwell, 2016).

[12] BLUE is the abbreviated form of Best Linear Unbiased Estimator, which is possible to exist when the OLS estimators are linear, unbiased and possess the least variance among the class of all of the linear and unbiased estimators. Still, it is important to note this theorem holds only when the model satisfies the OLS assumptions explained above. (Shaffer, 1991).

Table 6 | Test results for BLUE

	Post-estimation / test	Desired value
No multicollinearity problem	Variance inflation factor FTSE100: 1.86 CPIH: 1.84 EPU: 1.02	< 5.00
Residuals are normally distributed	Shapiro-Wilk W normality test	> 0.01
No specification problem	Specification link test	> 0.05
No influential observations	Cook's distance	<1.00
No heteroskedasticity problem	Chi2(1): 2.114 p-value: 0.146	> 0.05

6. SUMMARY AND CONCLUSION

The study reaches its aim to build a robust model providing evidence to suggest the existence of a statistically significant impact of economic policy uncertainty, inflation and stock market performance on the exchange rates, as well as reveals the extent to which the three factors are influencing the exchange rate. The econometric model is able to capture an influence of these three factors on the exchange rate over a period of 7 years, with economic policy uncertainty and inflation being negatively associated with the effective exchange rate, and FTSE100 value having a positive relationship with it, which also make them statistically significant predictors of the effective exchange rate of sterling. The findings further suggest that a unit increase in economic policy uncertainty will result in a drop of approximately 0.066 unit for the effective exchange rate. A similar relationship is also evident between the inflation and exchange rate, with one unit increase in the former causing a decrease of 0.072 unit in the latter. Finally, regarding how stock

market performance can influence the effective exchange rates, the model estimations suggest that a unit increase in FTSE100 value will increase the exchange rate by 0.16 unit.

The econometric model proving to provide statistically significant estimations does not only provide a better explanation of the influence of economic policy uncertainty, inflation and stock market performance on the exchange rate, but also establishes these three factors as significant indicators of what trends the exchange rate will follow. The model could therefore be used by institutional or retail investors, businesses or policy-makers to have better estimates for the exchange rate levels, either independently or in combination with fundamental exchange rate determination/forecasting models. Such an approach would allow taking more related factors into account and therefore increase the possibility of achieving better predictors of the rate with the support of the model. Moreover, policy-makers can tailor their economic or monetary policies to affect the three factors found to have influence on exchange rate by this study in a way that they in return create the desired impact on the exchange rate according to what is prioritised, whether an undervalued or overvalued currency.

The study sheds light on how effective economic policy uncertainty, inflation and stock market performance could be on the exchange rate by demonstrating the statistical relationship between them. Potential limitations might still exist, which could, however, encourage future research. The model can extend to provide estimations on key bilateral exchange rates such as GBP/EUR or GBP/USD, as well, which can further minimise the impact of less used currencies, although the basket of currencies in the calculation of the Sterling effective exchange rate already works on a weight-basis. Daily time series data for the same variables can also be used if the aim is to see relationships for a shorter term. In terms of applicability to a wider world of economies, the model could also study the relationship on focus in emerging markets, and more factors such

as interest rates can be added to the model as long as they do not bring along multicollinearity issues.

Moreover, running the same regression model on time series data of exchange rate, EPU, CPIH and average stock market index values from more countries can further confirm the explanatory and predictive power of the model, as well as make it more extrapolatable for other economies. Testing the model across different economies of different scales could give more evidence for the extent of the applicability and adaptability of the model. An increase in the number of sample countries can also allow for adopting a more comparative approach, identifying differences and including extra measurements for better estimates and even inspire further motives for research in pursuit of new factors that can act as statistically significant predictors/determinants of the exchange rate level or volatility.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this empirical study are publicly available through the sources cited in the text.

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