DATA ANALYSIS REPORT

IMPLICATIONS OF THE U.S. CURRENT ACCOUNT BALANCE ON THE WORLD ECONOMY

International Finance (ECON4017): Individual Assignment
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OVERVIEW

This data report examines the impact of the U.S. current account balance in Canada and the United Kingdom. During 2022, Canada was the biggest purchaser of U.S. good exports ($365.5 billion), and the third biggest supplier of goods ($436.6 billion). Meanwhile, the United Kingdom was the 5th largest purchaser of U.S goods ($76.2 billion) for that period (Office of The United States Trade Representative, 2023).

This report studies the association between the U.S current account balance with the current account, GDP, unemployment rates, public debt, money supply, interest rates, and exchange rates from both Canada and the UK.
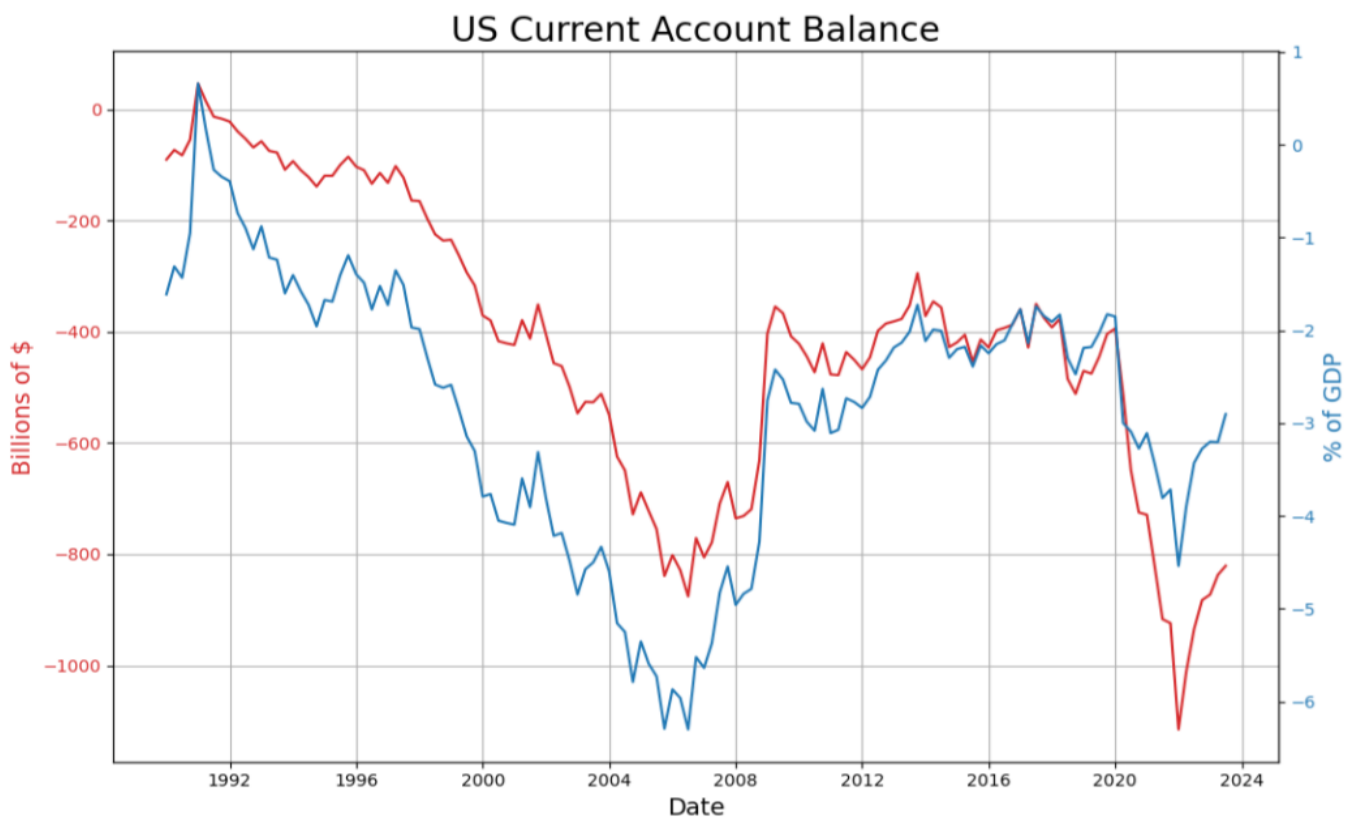

Figure 3: U.S. Current Account Balance in USD and as a % of GDP.

DATA AND METHODOLOGY

The macroeconomic data has been obtained from the Federal Reserve Bank of St. Louis Economic Data (FRED), the National Statistical Office of Canada, and the office for National Statistics[1].

This paper showcases the association between the U.S. current account balance with a different number of statistical variables. It does so by estimating linear regression trends with one explanatory variable using OLS. It also comments on the statistical significance of the model parameters. When it is beneficial to do so, this paper uses natural log conversions to improve the linearity of the model[2].

Following the results, the subsequent chapters provide a technical discussion making use of the current literature and material from the lectures.

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        PERIOD  US_CA_USD  US_CA_%GDP     US_GDP       US_U    US_PD    US_MS  \
0  1990-01-01    -90.039   -1.610571  10047.386   5.400966  3051.958  3166.8
1  1990-04-01    -72.861   -1.310329  10083.855   5.450982  3143.754  3201.6
2  1990-07-01    -82.374   -1.432192  10090.569   5.747424  3233.313  3224.5
3  1990-10-01    -54.310   -0.949784   9998.704   6.189306  3364.820  3259.3
4  1991-01-01     46.579    0.659931   9951.916   6.700399  3465.189  3287.7

    US_R  CD_CA_USD  CD_CA_%GDP  ...    USD_CAD    CD_R  UK_CA_USD  UK_CA_%GDP  \
0   8.28  -6.256574   -4.279058  ...   0.855066  13.38  -9.936209   -3.958149
1   8.29  -4.617326   -3.107426  ...   0.859623  13.90 -10.074056   -3.860988
2   8.20  -4.415707   -2.919947  ...   0.865951  12.61  -6.378658   -2.259684
3   7.31  -5.141962   -3.428401  ...   0.862143  11.78  -6.874273   -2.304129
4   6.12  -5.574405   -3.714078  ...   0.863782   9.92  -5.042625   -1.744884

    UK_GDP_USD      UK_U     UK_PD      UK_MS    USD_UK   UK_R
0  1080.646040  6.987146   191.956  282.854740  1.656863  14.82
1  1116.341972  6.975026   215.088  290.215835  1.673987  14.76
2  1266.556440  7.135823   227.538  326.235024  1.861838  14.87
3  1330.146460  7.524648   236.016  346.927070  1.945182  14.35
4  1320.245459  8.062524   216.808  341.263387  1.905754  13.45

[5 rows x 24 columns]
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Figure 4: First 5 Entries of the Data Frame

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[1] Details on the exact webpages used for every source are listed in the bibliography. The appendix includes the details on how the final data frame has been obtained.

[2] On the appendix, I also provide the jupyter file I used to obtain the estimates. In general, performing a natural log transformation does not yield better linear approximations. Moreover, it is not convenient to do so since the data fluctuates between positive and negative values.
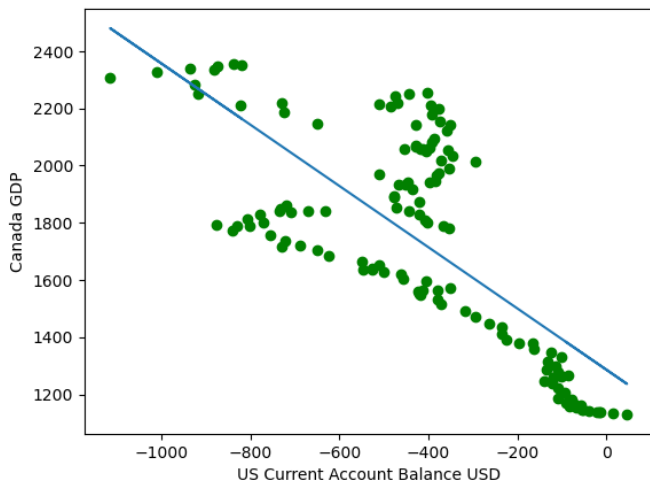
RESULTS

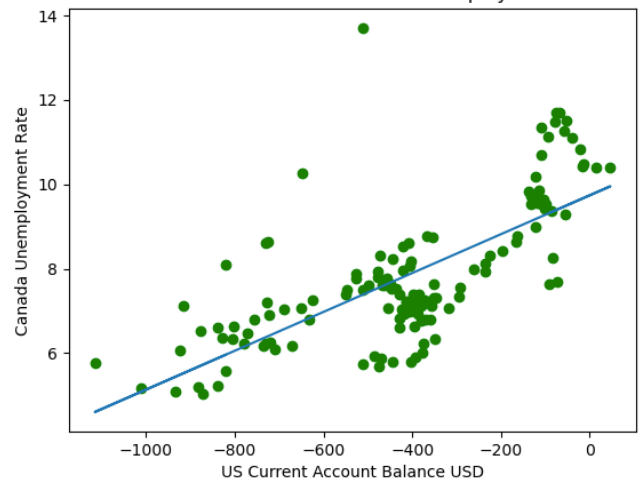U.S. Current Account Balance vs Canada Current Account Balance
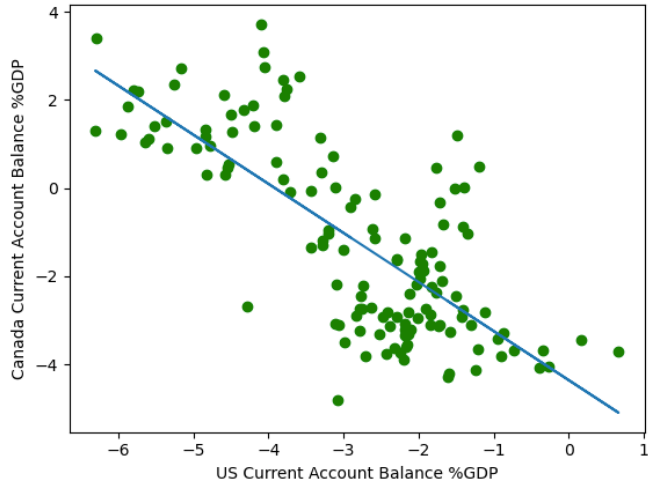
U.S. Current Account Balance vs Canada Current Account Balance
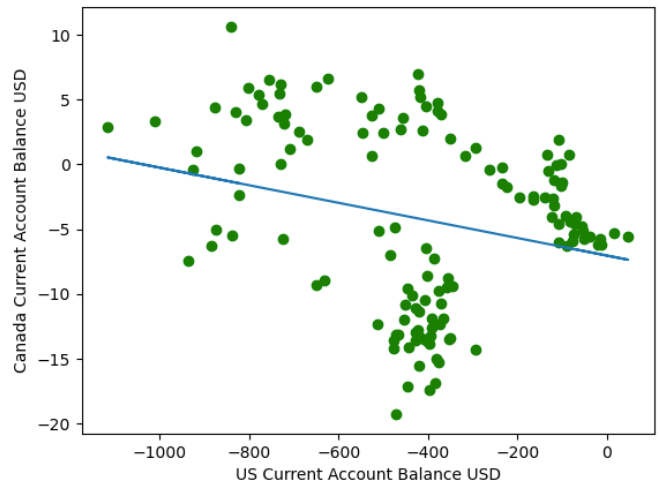
U.S. Current Account Balance vs Canada GDP

U.S. Current Account Balance vs Unemployment Rate

U.S. Current Account Balance vs Canada Public Debt

U.S. Current Account Balance vs Canada Money Supply

U.S. Current Account Balance vs USD/CAD Exchange rate

U.S. Current Account Balance vs Canada Interest Rates

U.S. Current Account Balance vs UK Current Account Balance

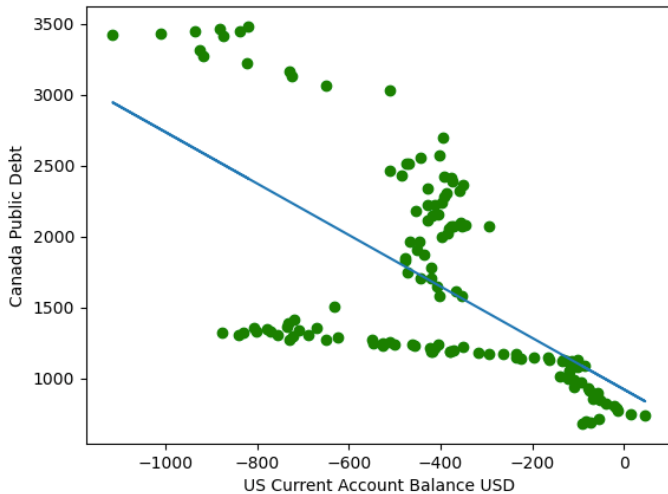## U.S. Current Account Balance vs UK Current Account Balance
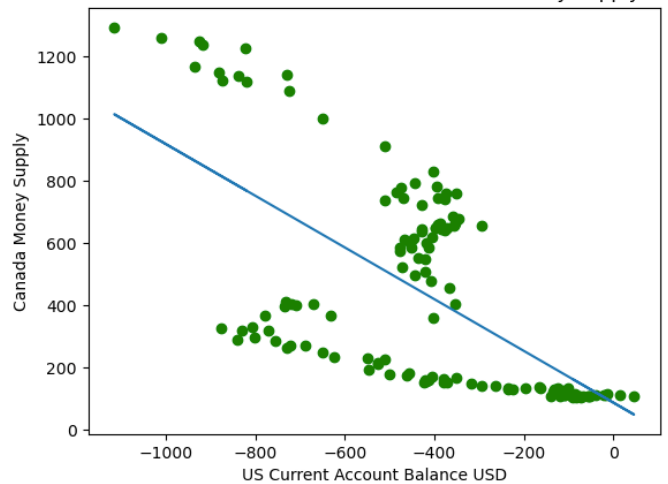
U.S. Current Account Balance vs UK GDP

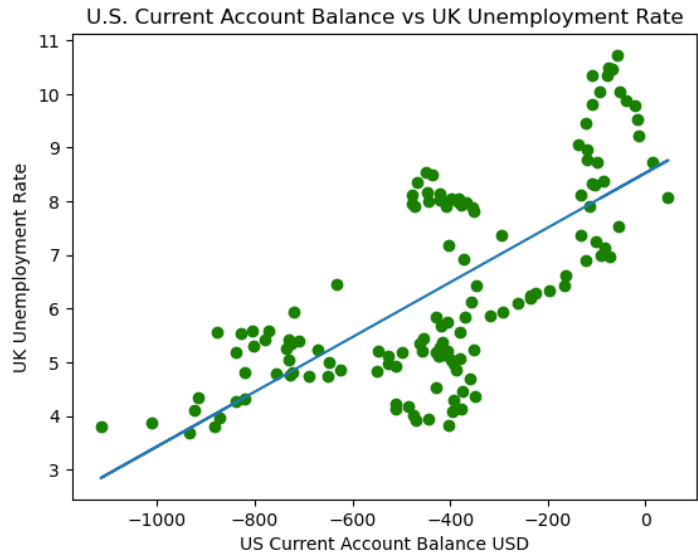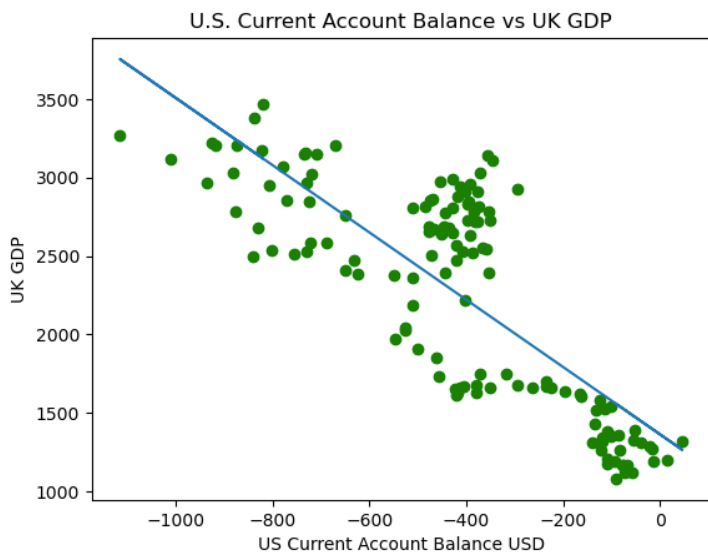## U.S. Current Account Balance vs UK Unemployment Rate
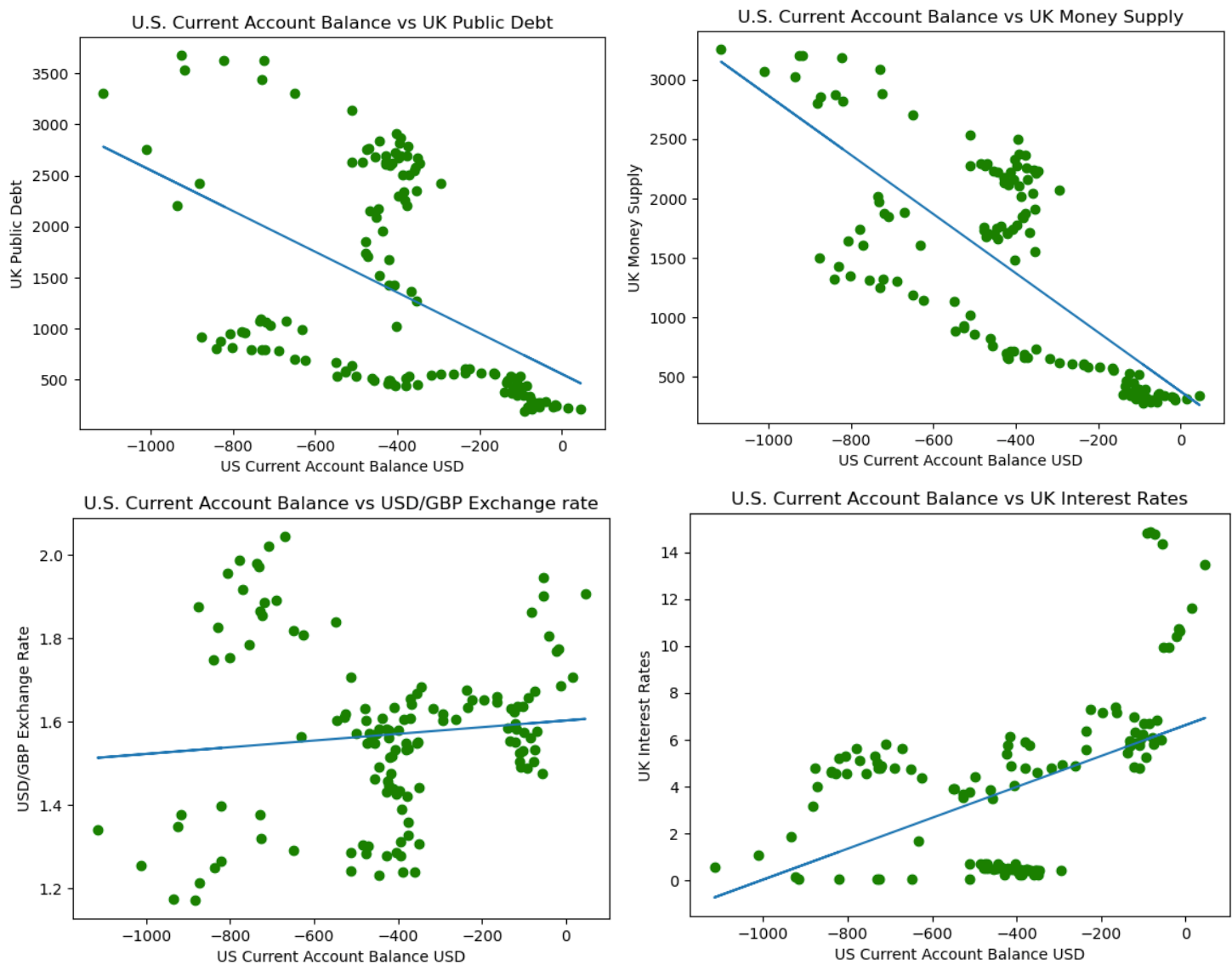
Figure 3: Linear regressions of the U.S current account with UK and Canadian macroeconomic variables

In general, OLS gives statistically significant parameters for a 5% significance level. The parameters with a p-value higher than 5% are:

- Slope coefficient of U.S CA vs USD/CAD exchange rate (5.4%)
- Slope coefficient of U.S CA vs UK CA (13%)
- Slope coefficient of U.S CA vs USD/GBP exchange rate (23.3%)

Moreover, there seems to be a prominent "Z"-shaped pattern in some scatter plots. It is useful to graph these variables with respect to time to gain an insight into the reasons behind this occurrence.

DATA ANALYSIS REPORT

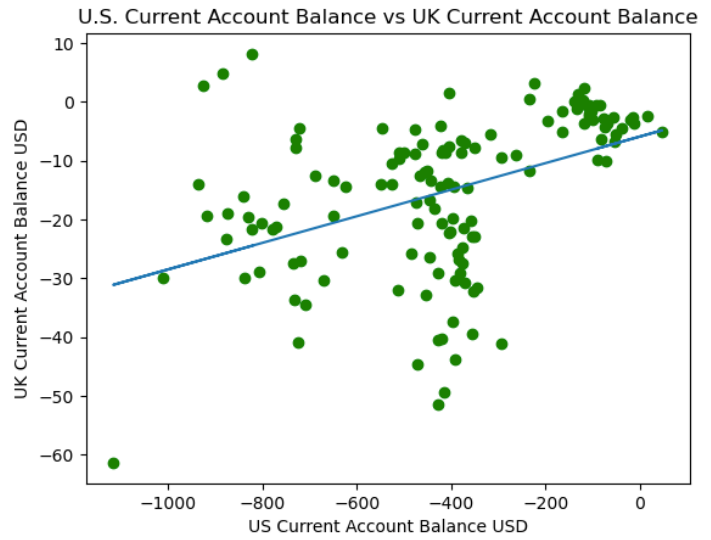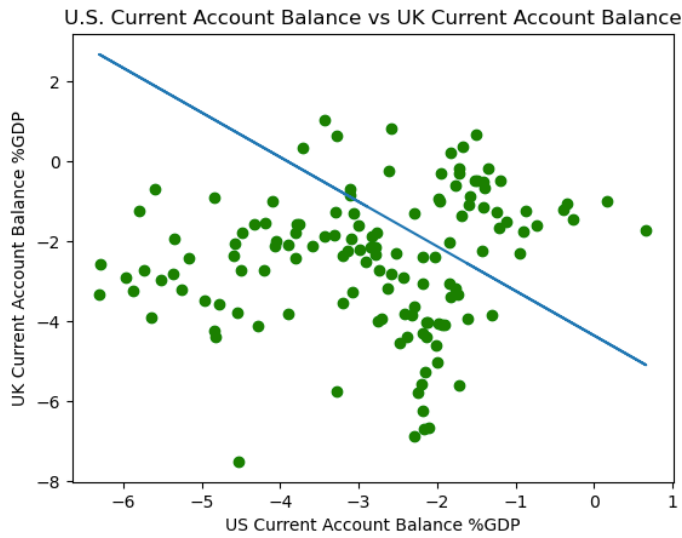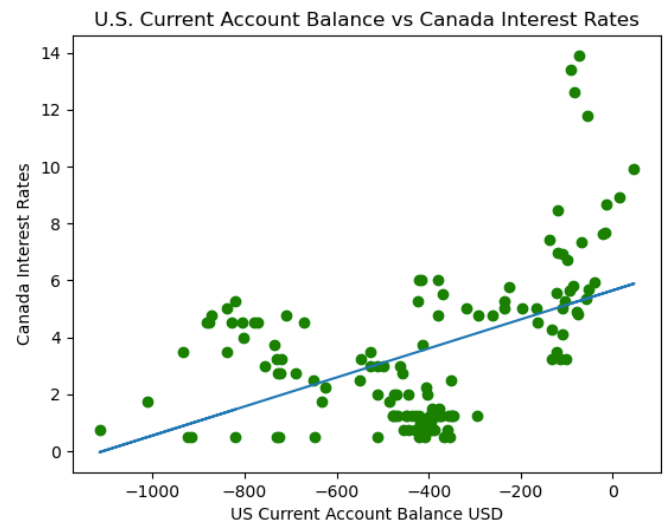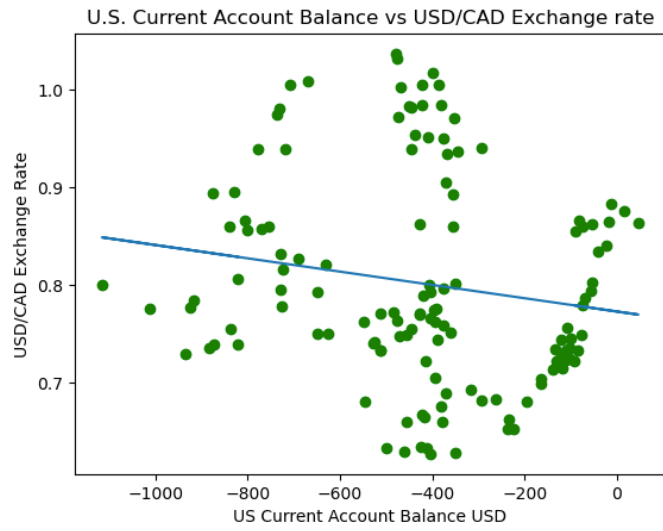## US Current Account Balance and Canadian GDP

US Current Account Balance and Canadian Public Debt

US Current Account Balance and Canadian Money Supply
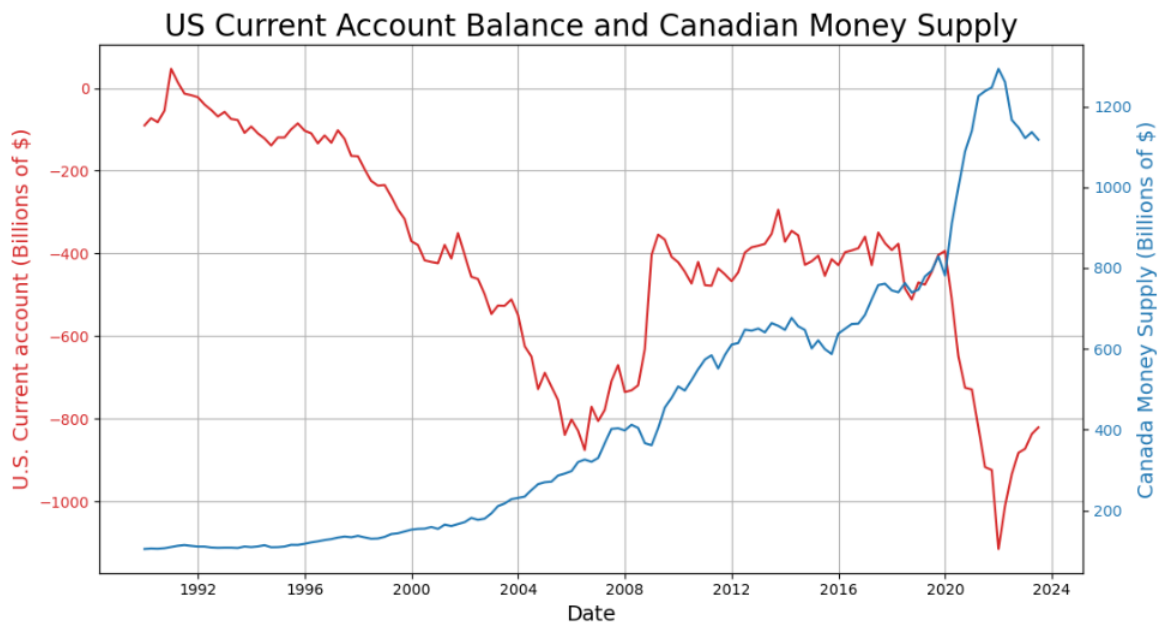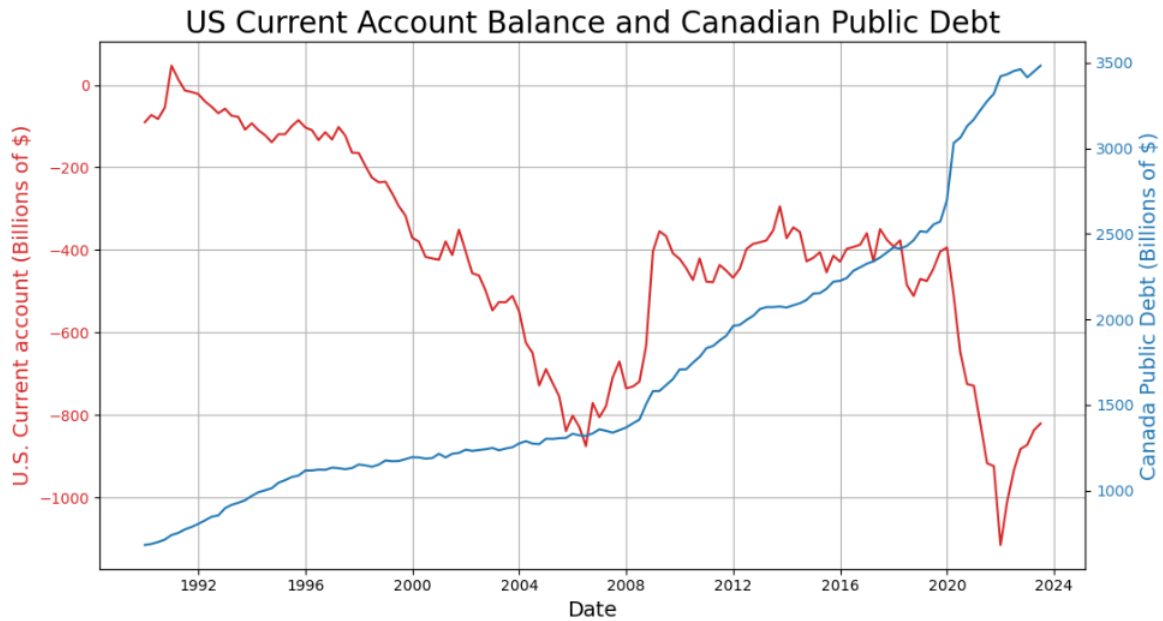
Figure 4: "Z-shaped" pattern anomaly
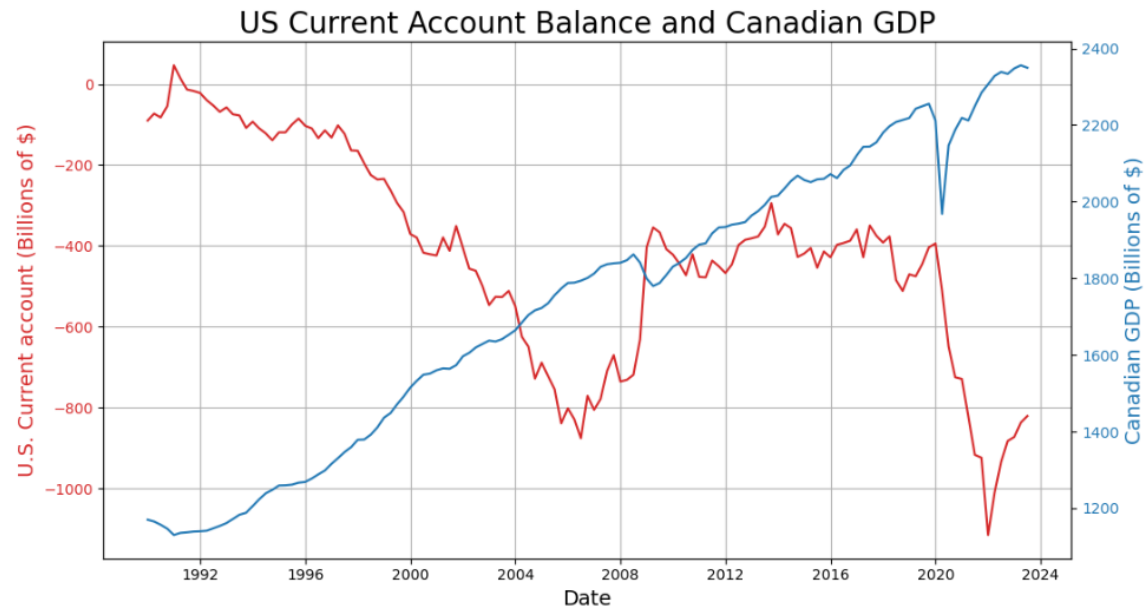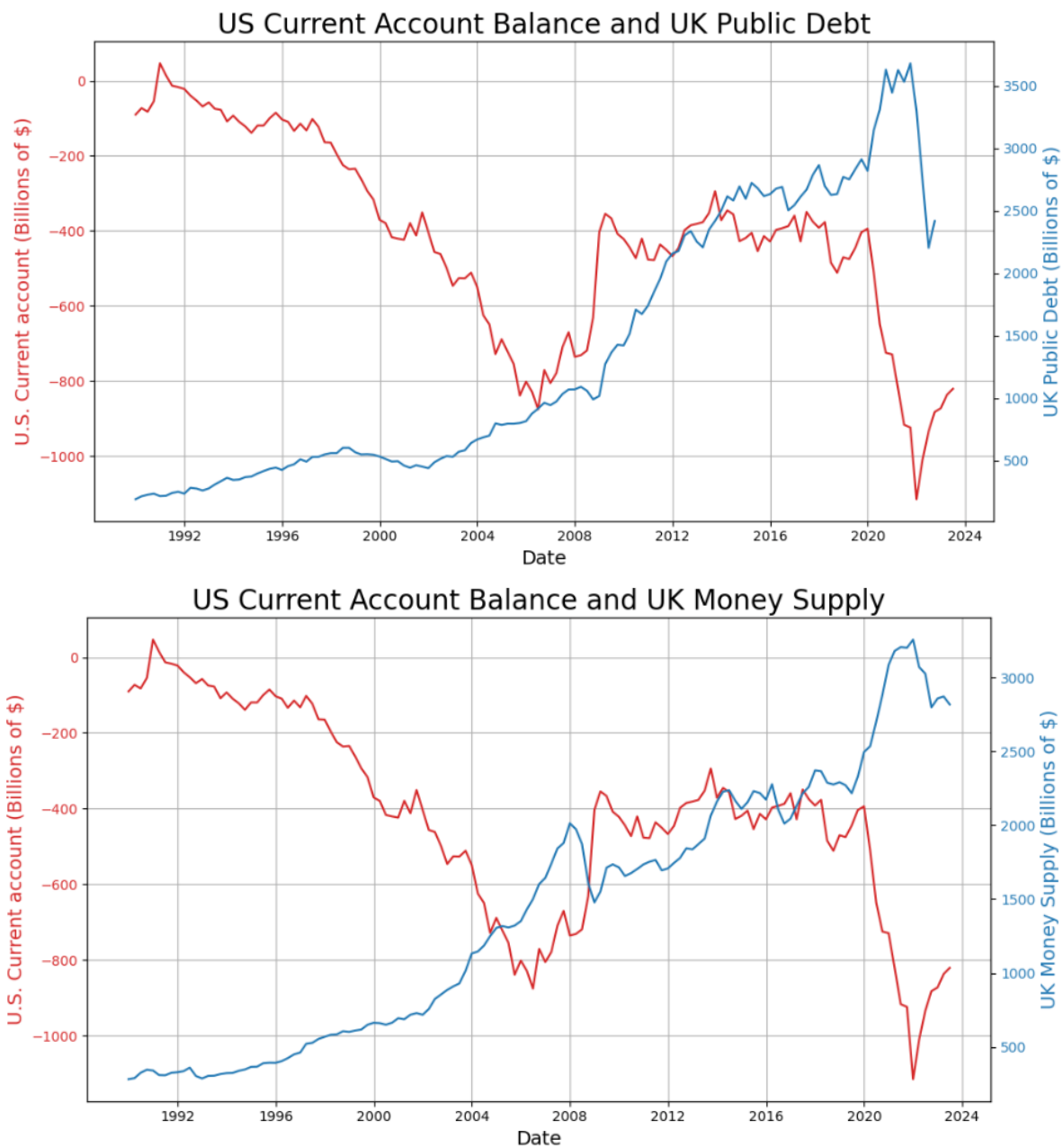
These graphs show there is a negative relationship up until 2006-2007, a positive relationship until 2020, and a negative relationship thereafter. This is consistent with the Z-shaped trend in the scatter plots.

ANALYSIS OF THE RESULTS

The relationship seen in the current account balances of the U.S, UK, and Canada can be explained by considering the trading activities of each country. In general, for countries that trade a lot amongst each other, we expect the current accounts to be negatively correlated on average. This occurs because one country tends to be the bigger exporter while the other tends to be the bigger importer of goods and services. Take, for example, Canada's trading activities from the U.S. As Canada imports more goods than it exports, and is a very large trading partner, we expect, on average, to observe a negative correlation between current accounts.

The continuous rise in the U.S current account deficit is associated with an increase in the demand for foreign goods, and a foreign increase in U.S assets (Blanchard, Giavazzi and Sa, 2005). Moreover, (Batdelger and Kandil, 2012) contend that fluctuations in the current account balance are connected to fluctuations in the budget deficit. Additionally, (Gruber and Kamin, 2007) propose a model in which financial crisis influence the current account balance. This contributes to explain some of the associations observed in the linear regression analysis.

From Gruber and Kamin, the 2007-2008 financial crisis, which originated in the U.S, caused an increase in the U.S. current account balance. This decrease in the current account deficit, is triggered by an increase in the money demand in a period of crisis. This is achieved by selling financial assets and it is implied by the balance of payments identity. Since the UK and Canada were eventually affected by the same crisis, we expect the correlation between macroeconomic variables during that period to be higher. Concretely, the regressions reveal that a reduction in the current account deficit in the U.S. is associated with an increase in the public debt, and unemployment rates in both the UK and Canada. Following this line of thought, the research from (FERRERO, 2015) showcases a global negative correlation between housing prices and the current account.
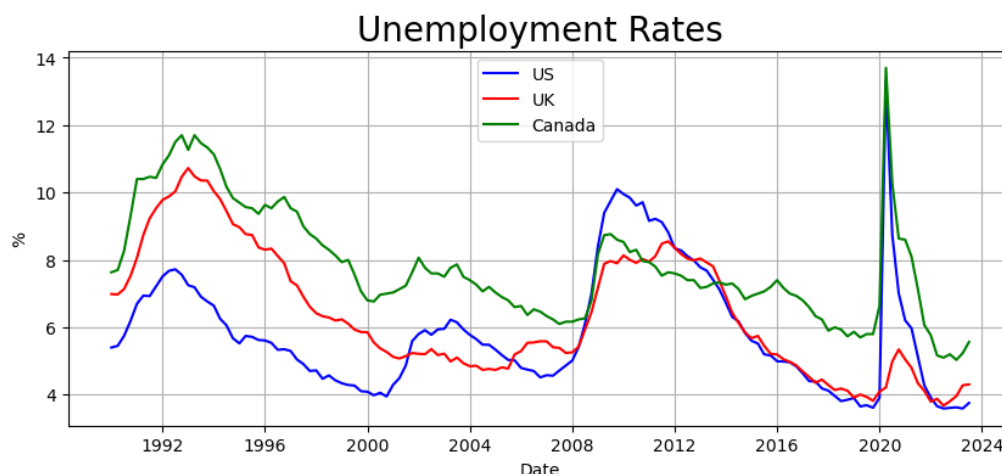
Figure 5: U.S., UK, and Canadian Unemployment Rates
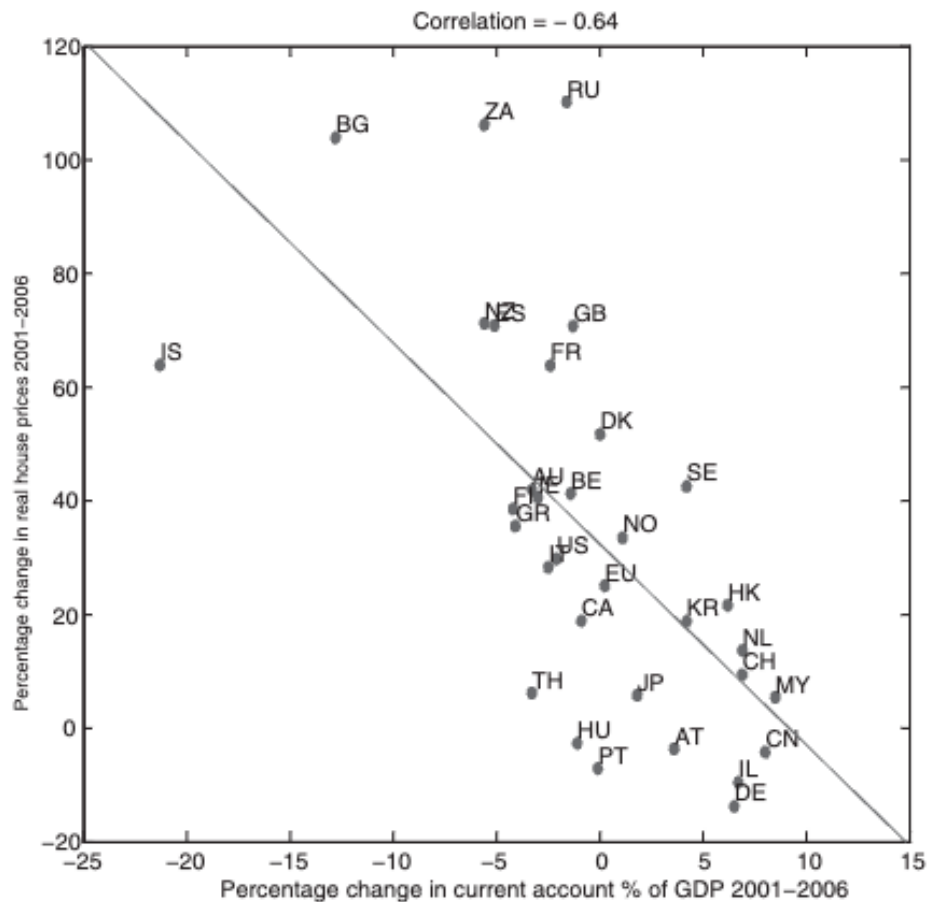
Figure 6: (FERRERO, 2015), % change in current account as % of GDP with % change in real house prices

This effect can also be observed following the early 1990s recession and the COVID crisis. Moreover, there is a high level of correlation between the U.S. monetary policy imposed by central banks in response to periods of crisis and the global economy. In fact, (FERRERO, 2015) argues that the U.S expansionary monetary policy is responsible for the global low interest rates observed in the last couple of decades.
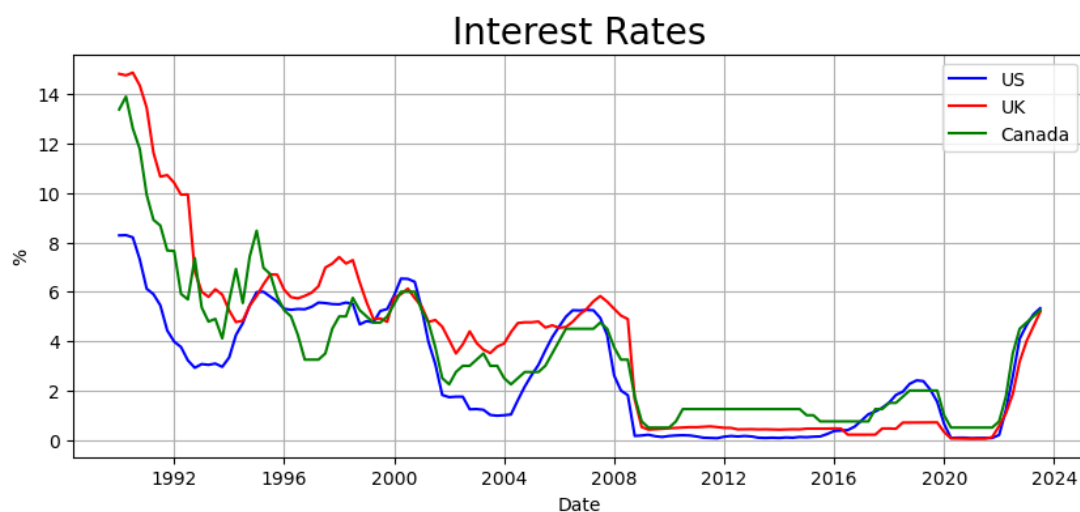
Figure 7: U.S., UK, and Canadian Interest Rates

Furthermore, there is a negative association between the U.S. current account balance and the Canadian and British GDP, this correlation is anticipated during times of crisis as it has been argued. Finally, although the OLS regression yields the association with the exchange rates statistically not significant, plotting the values can provide valuable insights.
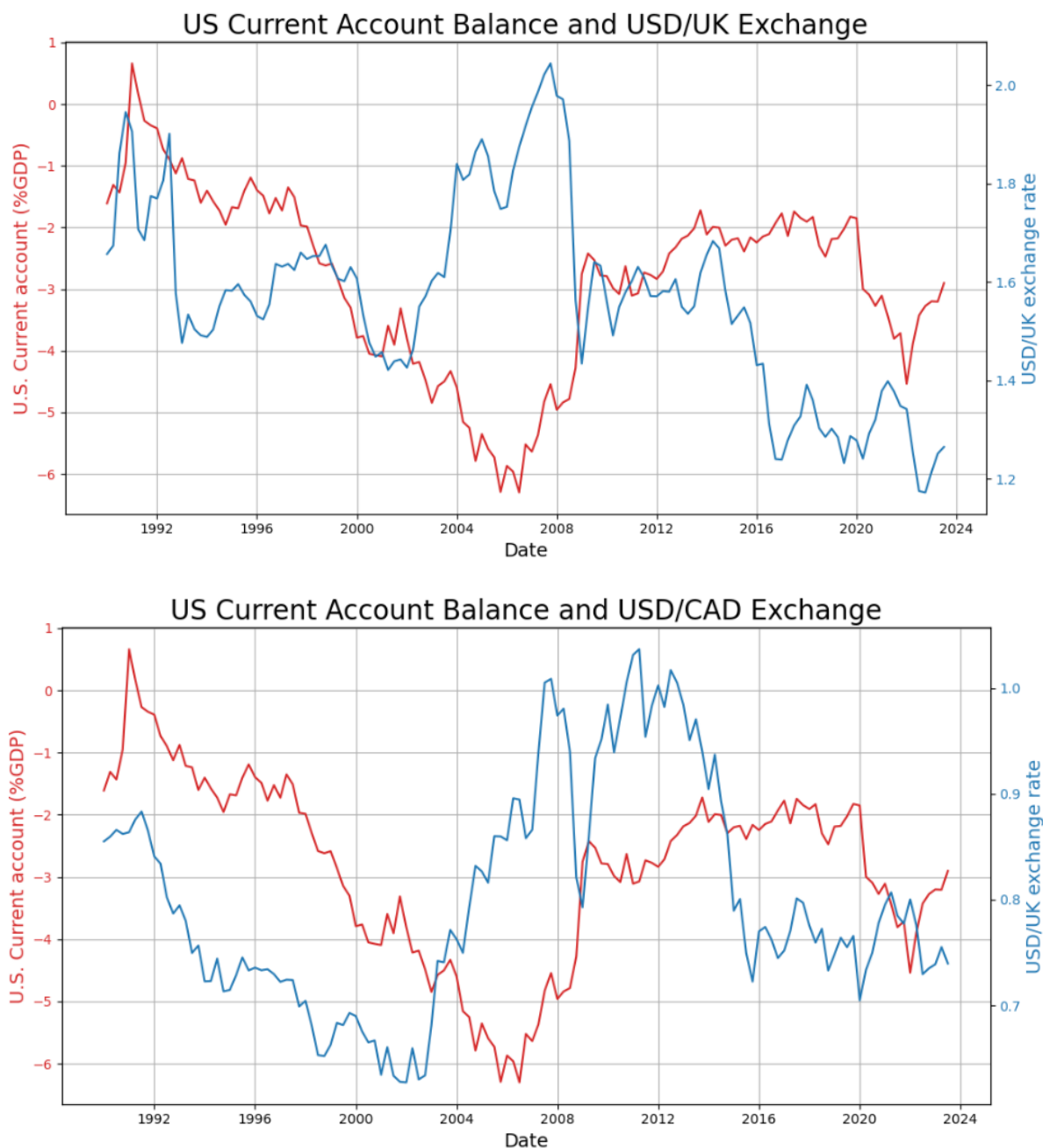
Figure 8: U.S. current account balance, USD/GBP, and USD/CAD exchanges

These graphs display a dollar depreciation previous to the 2007-2008 financial crisis. At first, this seems to contradict the interest parity condition. However, this only gives an insight into the future expectations of investors. According to (Dimitriou, Kenourgios and Simos, 2017), there are strong levels of correlation between the USD, CAD, and GBP exchange rates during times of financial crisis.

In summary, this report highlights the influence of U.S current account fluctuations on the global economy. The analysis indicates that a current account deficit decrease is associated with a period of financial crisis which, in turn, increases unemployment rates, public debt, and decreases the GDP of Canada and the UK. Moreover, a decrease in the current account balance is associated with lower interest rates, this suggests an increased in the demand for money during such periods. This paper is consistent with the research of (Dimitriou, Kenourgios and Simos, 2017), (FERRERO, 2015), and (Gruber and Kamin, 2007) in showing that fluctuations in the current account have a bigger impact during times of financial crisis. Furthermore, one can observe a generalized depreciation of the dollar before the global financial crisis which has little effect on relative interest rates. This underscores investors' expectations of crisis correlation, according to the uncovered interest parity condition in foreign exchange markets.

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APPENDICES

Appendix 1

Attached to this submission there are 2 excel files "DATAFRAME.xlsx" and "CLEAN DF.xlsl". The first one includes the raw data from the websites listed in the bibliography. This data is given with quarterly frequency and converted into billions of dollars. The second file includes only the columns that are expressed in billions of dollars and up until the third quarter of 2023.

Appendix 2

I have also attached to this submission the jupyter file (python) I have used to obtain both the regressions and the OLS parameter statistics. I include both the original document "RegressionsAndGraps.ipnyb" and a pdf file "RegressionsAndGraphs.pdf". This should allow anyone to replicate the results that I have obtained.