Cal Parker

Surro

Economics 187

16 June 2023

Clash of the Titans: How the Euro and Dollar Changed after 'Whatever it Takes'

I selected my topic and case study to find a possible reason for explaining the US Dollar's (USD) dominance as the global currency. Before starting my project, I was overly curious about the frequency of the USD for international trade, its abundance in equity and debt markets, and its strength during periods of global economic deterioration. I was drawn into the topic because of the recent developments of the BRICS organization and its intentions of moving away from the USD. Initially, I had thought that the USD was so widely used because of its ability to maintain its value better than rivaling currencies and the size of the US economy along with its dependence on exports. I had thought that there would be more competition between currencies for obtaining a global reserve currency status, leading to more currencies eventually catching up to the dollar. Contrary to my beliefs, it seems that the success of the USD is most likely the direct result of being used during the Bretton-Woods agreement. While the answer to solving what makes a global reserve currency might not be as straightforward as other economic questions, I believe it is still worth understanding the common characteristics of the USD as a global reserve currency to discover changes in common economic activities that can explain strong and weak currencies for trade and financial transactions.

In recent years, there has been growing interest to understand the reasons for populations' preferences for specific currencies over others and what factors will motivate agents to use other currencies as the global economy evolves. Many credible authors have written articles related to the US dollar's ongoing success as the global reserve currency. There is a consensus agreement

that the USD is the leading currency for economic agents to prefer when settling international transactions. There are multiple aspects to consider when deciding to use a specific currency to settle international transactions. The three most important areas of economic research regarding global currency preferences come from financial transactions, international trade invoicing, and foreign currency reserve composition.

One of the primary reasons the USD is so frequently used for foreign exchange markets is because of its liquidity. As a consequence of such immense liquidity, the USD has the lowest bid-ask conversion spread among currencies issued by advanced economies like the Euro, Yen, and Pound (Galati et al., 2008). Most researchers agree that a highly liquid medium of exchange is currently the best explanation for determining a global reserve currency. A population will usually prefer a currency that provides the most cost-efficient option. The Euro is currently the closest competitor to the USD because of its similar liquidity levels. Since the establishment of the Euro, researchers have noticed the benefits to the Euro area due to its common selection of a single currency and reduced trade barriers. Countries or regions like the European Union (EU) compete to have the most used currency because it will naturally result in having the highest liquidity, and consequently, the lowest conversion charges to support expansion. It is not guaranteed that the USD will remain the incumbent during times of global or focused uncertainty just because it had the lowest bid-ask spreads in the past.

The second aspect that explains the dollar's dominance is its frequent preference to invoice international transactions. This is very similar to the previous explanation for the dollar's dominance, except that it is responsible for trading and not entirely transfers of wealth. One research article that uses data from previous authors' research shows that the USD is responsible for substantially more trade invoicing than the share of exports that are delivered by

the US. The amount of dollars used for invoicing transactions is around four times as large as the value of exports from the US and was used in around 40% of all transactions from 1999 to 2019 (Boz et al., 2020). While the US economy might not have the largest exporting presence in the world, the USD is not limited to the exports of the domestic producer of the currency. The extreme liquidity of the USD makes it easy for counterparties to agree on a commonly held currency to ensure fulfilled transactions. There have been significant improvements in the Euro's presence in trade invoicing also. Boz found that the Euro's share of invoicing is around 46%, placing itself in a suitable position to exploit an important aspect of the global currency market and possibly replace the USD if it can match the dollar on other market frontiers. However, the EU makes up around 36% of all global trade invoicing volume, so the relative importance of the Euro is still minimal.

The last indication of global currency preference is the foreign exchange currency composition of official government reserves. One possible reason is that the dollar provides a superior store of value compared to other competing currencies. A study from the Bank of International Settlements (BIS) found that "crisis-hit economies tend to increase the dollar share of their reserves by 6–14% at the expense of the euro" (Ito, et al., 2019). Reserve managers prefer to hold the USD because they believe it will outperform the Euro during times of economic deterioration. This claim supports a possible explanation for a store of value providing investors an alternative aspect to preferring one currency over another. Even though the USD had an advantage over the Euro after the GFC, this data shows that we are able to model the dynamics of the global currency market during times of economic uncertainty. This could provide a clue for how global reserve currencies ascend the ranks to overthrow an incumbent and dominate the market. With a massive transition away from paper currency to digital records,

there appears to be even greater competition between currencies and even easier access to invest in the best assets.

These three primary reasons for establishing a global reserve currency nearly exhaust the most important facets of economic activity that could explain the dollar's dominance. A global reserve currency would provide the most cost-efficient option for financial and economic activity and the safest option for preserving wealth. However, there may be more research needed to determine if a global reserve currency will naturally obtain all three aspects provided that there is no clear incumbent with all three. Since the dynamics of the foreign currency market haven't changed drastically over the past 50 years, it is difficult to conclude whether or not the only meaningful metric of a currency's success is due to its networking properties. This would imply that a currency's only feasible method of competition is through expanding its currency presence around the world enough to motivate people to switch from one currency to another because of costs. Thankfully, with the help of the internet and consistent recordkeeping, the future is getting bright enough to illuminate the best ideas or expose the ideas that need improvement.

There were many issues I ran into that limited the scope of possible topics and results that I could produce for my project. The three biggest issues I ran into were searching for relevant information for my topic, retrieving that information to use for analysis, and programming calculations for observing relationships between groups of data. Two of these issues are limiting only because I don't have enough experience with econometric data analysis; these aspects are reasonably within my control to change and with more experience in coding and awareness of data sources, I would have been much more efficient when creating my research. However, the remaining aspect of creating a research project, which is accessing data that I would want to use for my project, was not in my control and is most likely to always be an issue for any researcher

when creating and studying a topic for a project. If there were no limits to collecting data and importing the appropriate tables for my project, I would get as much data as I could about trade invoicing, financial market transactions, debt and asset levels for national reserves, and try to find a specific moment that indicated a transition away from the USD or movement towards a competing currency like the Yen, Euro, Pound and possibly Renminbi. At the beginning of my research process, I wanted to find a way to calculate the size of currency blocs and measure their changes, relative to the size of the economies the currencies belong to and relative to other currency blocs, over time and through important economic events. I needed financial transaction data and trade invoicing data for this to happen, but found myself limited to only financial transaction data. From the articles I read, support is growing from government officials and financial institutions to make invoicing data publicly available because of the benefits of market transparency between counterparties.

To test my assumption for why the dollar has maintained its success as the global reserve currency for so long, I used the most recent natural economic cycle to understand the dynamics of how currencies react to economic deterioration. As a clear indicator of a transition from chaos to order after the Global Financial Crisis (GFC) and European Debt Crisis (EDC), I compared the movement of the Euro to the USD after Mario Draghi's "Whatever it takes" speech. Draghi's speech marks a valuable moment for understanding how investors evaluated their decisions after the GFC and EDC. Initially, I believed that Draghi's speech would mitigate fears of further Euro deterioration and motivate foreign investors to seek safety in the Euro in case of further economic deterioration. I believed that Draghi's speech serves a dual purpose in contributing to answering what can lead a currency to obtain the status of a global reserve currency. I had thought that would indicate a moment when investors reduce their fears of the Euro, leading to

greater demand and liquidity, reducing the bid-ask spreads for the Euro, and leading more investors and reserve managers to adjust their allocations according to the Euro's increased turnover. I decided to focus on the Euro and the USD for my project because they make up the vast majority of the foreign exchange market and global currency reserve composition currently.

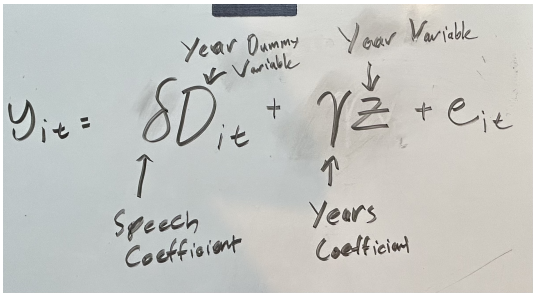
To start with simply observing the data, I created two plots. The chart on the right is an ordinary time series plot of the levels of the Euro and the USD in official foreign currency reserves and the chart on the left linear regression for both the USD and Euro foreign currency reserves regressed against time. We can see that the USD (Blue) has recently outperformed the Euro (Orange) since 2003.


Upon closer investigation, we can see that the USD began a slightly accelerated increase around 2013 and the Euro remained at a regular rate of change throughout the entire 20-year period. Although the slopes for both series appear to be diverging rapidly at the beginning of their observations, this acceleration could instead be a return to normal after the GFC. Of course, we have to do much more than just a time series regression to understand the changes in the currency allocations.

After performing a basic time series analysis, I set up a pooled ordinary least squares (OLS) regression model as a preliminary test to see how the data would perform as a whole

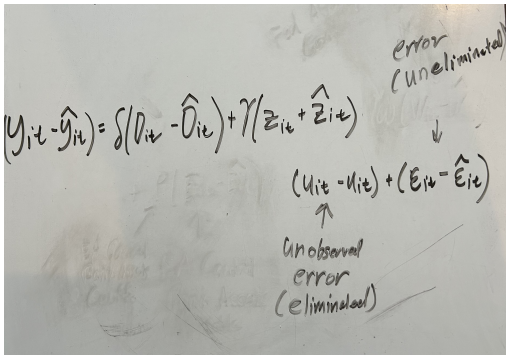
when regressed on a dummy variable indicating the moment after Mario Draghi's speech and time. My results were not good as shown by an image of my summary below. My adjusted R-squared was very low and my Speech dummy variable had no statistical significance.

```
==============================================================================
============================ Pooled OLS Model ============================
                            OLS Regression Results
==============================================================================
Dep. Variable:                  Level   R-squared:                       0.388
Model:                            OLS   Adj. R-squared:                  0.355
Method:                 Least Squares   F-statistic:                     11.74
Date:                Fri, 16 Jun 2023   Prob (F-statistic):           0.000113
Time:                        14:48:45   Log-Likelihood:                -1179.0
No. Observations:                  40   AIC:                             2364.
Df Residuals:                      37   BIC:                             2369.
Df Model:                           2
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const      -4.398e+14   1.73e+14     -2.539      0.015   -7.91e+14   -8.89e+13
Year         2.2e+11   8.63e+10      2.549      0.015    4.51e+10    3.95e+11
Speech     -1.162e+11      1e+12     -0.116      0.908   -2.14e+12    1.91e+12
==============================================================================
Omnibus:                        8.000   Durbin-Watson:                   0.061
Prob(Omnibus):                  0.018   Jarque-Bera (JB):                2.407
Skew:                           0.097   Prob(JB):                        0.300
Kurtosis:                       1.814   Cond. No.                     1.39e+06
==============================================================================
```



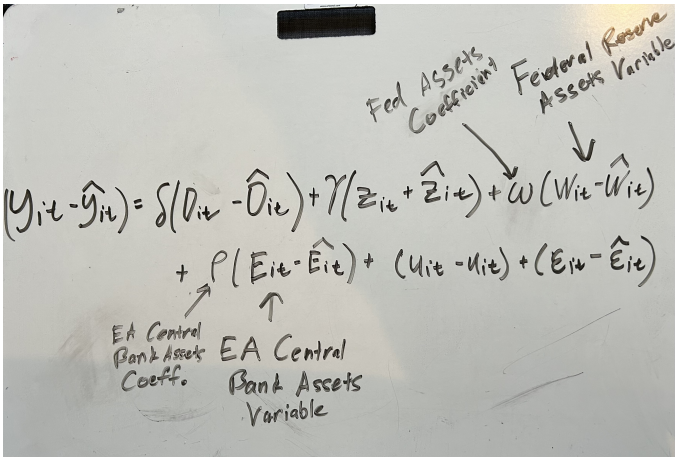

These results do make sense because they include both sets of data that would not share all of the same unobserved confounding variables that each series would have individually; the confounders are duplicated for the pooled regression line. While my dummy variable for Draghi's speech is unlikely to improve significantly enough to become statistically significant, there is still a possibility that the adjusted R-squared could be improved using a fixed effects (FE) estimator in the regression. So, to test my assumption, I ran an FE regression model to compare with my first model. Below is my summary output.

```
==============================================================================
============================ FE Regression Model ============================
                            OLS Regression Results
==============================================================================
Dep. Variable:                  Level   R-squared:                       0.874
Model:                            OLS   Adj. R-squared:                  0.864
Method:                 Least Squares   F-statistic:                     83.32
Date:                Fri, 16 Jun 2023   Prob (F-statistic):           2.89e-16
Time:                        14:58:00   Log-Likelihood:                -1147.4
No. Observations:                  40   AIC:                             2303.
Df Residuals:                      36   BIC:                             2310.
Df Model:                           3
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
Intercept  -4.412e+14   7.97e+13     -5.539      0.000   -6.03e+14   -2.8e+14
Year          2.2e+11   3.97e+10      5.544      0.000     1.4e+11      3e+11
Speech     -1.162e+11    4.6e+11     -0.253      0.802   -1.05e+12   8.17e+11
Value_USD   2.728e+12   2.31e+11     11.788      0.000    2.26e+12    3.2e+12
==============================================================================
Omnibus:                        8.528   Durbin-Watson:                   0.157
Prob(Omnibus):                  0.014   Jarque-Bera (JB):                3.110
Skew:                           0.351   Prob(JB):                        0.211
Kurtosis:                       1.828   Cond. No.                     1.39e+06
==============================================================================
```



My FE Regression model provided much better results than the pooled OLS regression model. My Adjusted R-squared is significantly higher, my AIC and BIC are both lower, and while my dummy variable for Draghi's speech is still insignificant, it is slightly less insignificant, which doesn't change much at all for this variable still. After considering which economic variables might explain increased levels in the USD and Euro, I ran an additional FE regression as an experiment. My new regression model includes the levels of central bank net assets for the Federal Reserve (WALCL) and central banks within the European Union (ECBASSETSW).

```
================================================================================
========================== FE Regression Model ==========================
                            OLS Regression Results
================================================================================
Dep. Variable:                  Level   R-squared:                       0.879
Model:                            OLS   Adj. R-squared:                  0.861
Method:                 Least Squares   F-statistic:                     49.44
Date:                Fri, 16 Jun 2023   Prob (F-statistic):           1.23e-14
Time:                        16:36:08   Log-Likelihood:                -1146.6
No. Observations:                  40   AIC:                             2305.
Df Residuals:                      34   BIC:                             2315.
Df Model:                           5
Covariance Type:            nonrobust
================================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
--------------------------------------------------------------------------------
Intercept  -5.117e+14   1.54e+14     -3.326      0.002   -8.24e+14   -1.99e+14
Year        2.552e+11   7.67e+10      3.326      0.002    9.92e+10    4.11e+11
Speech     -1.387e+10   5.16e+11     -0.027      0.979   -1.06e+12    1.03e+12
ECBASSETSW   1.24e+05    1.8e+05      0.687      0.496   -2.43e+05    4.91e+05
WALCL       -2.28e+05   1.94e+05     -1.176      0.248   -6.22e+05    1.66e+05
Value_USD   2.728e+12   2.33e+11     11.690      0.000    2.25e+12    3.2e+12
================================================================================
Omnibus:                       12.473   Durbin-Watson:                   0.167
Prob(Omnibus):                  0.002   Jarque-Bera (JB):                3.288
Skew:                           0.277   Prob(JB):                        0.193
Kurtosis:                       1.709   Cond. No.                     7.33e+09
================================================================================
```




Using these variables, the adjusted R-squared is slightly worse, my AIC and BIC are worse, and these variables show no statistical significance. From these three points, it seems like these variables are definitely not worth including in the model.

While escaping from a serious crisis might not seem like the ideal moment for national leaders to deliver an encouraging speech, there were almost no resorts of safety in financial markets following the GFC. This provided certain economies, like Europe, to advance their currency position globally and take advantage of the uncertainty. From the results I provided earlier, I wouldn't expect much to come out of Draghi's speech to explain the causes of currency preferences and global currency order. However, his speech provided economists, in the private and public sectors, with greater awareness of how unconventional monetary policy could explain

other economic variables that could indirectly contribute to currency liquidity and possibly the support of a global reserve currency maintaining its competitive stronghold.

Economics is often referred to as the dismal science because of its many topics that are difficult to test and make consistent conclusions. There are countless examples of theories, such as the Philips Curve, that require exceptions to maintain credibility. When searching for an explanation of data with infrequent recording periods, like quarters or years, there will always be variables to control for that could interfere with the results of an investigation. This was one of the primary reasons my question is so difficult to answer; there is too much space between observations to conclusively assume the changes in the landscape of the foreign currency market. The most important data for measuring changes in foreign currency reserves, financial transactions, and trade invoicing has only been around for the last 40 years when the USD has upheld its dominance as the global reserve currency with minimal variation. I do not doubt that most economic questions, including this one, will be resolved in future generations with help from the internet and further transparency. With enough data over time, that is variation in an independent variable, patterns will emerge that explain how currencies are selected in the international markets. There would be greater information about which variables and qualities of a currency are most valuable for economic agents for satisfying transactions. While I hadn't answered the question I started my project with, I do believe that my work could provide a piece of understanding of how impactful a currency's domestic monetary policy might affect its store of value for determining its order in the foreign exchange market. With enough data about transactions and currency movement, I do believe that there is a complete answer to how the order of currencies is decided that is compatible with standard economic models.

I am confident that there are ways to make conclusions that accurately represent the effect of Mario Draghi's speech on the European debt markets and currency stability. Initially, I wanted to find a way to answer why the US dollar is the global reserve currency using any substantive argument. Every professional economist is aware of the difficulties of matching the theories of economics to the data available. As a student aspiring to reach the same level as the professionals, I quickly found my ambitions halted by the nature of the dismal science after realizing that a critical source of information I wanted to investigate was unobtainable. I believe that my transition from an amateur economist to a professional economist won't come if I receive the title during my career, but when I can take full advantage of my resources and education to produce results without the substantial limitations I faced during this project. My belief doesn't come out of resentment for not completing an ideal project, but a consideration of the journey I have traveled so far and the path I expect to take in the near future.

Works Cited

Board of Governors of the Federal Reserve System (US), Assets: Total Assets: Total Assets (Less Eliminations from Consolidation): Wednesday Level [WALCL], retrieved from FRED, Federal Reserve Bank of St. Louis; fred.stlouisfed.org/series/WALCL, June 16, 2023.

Boz, Emine, et al. "Patterns of Invoicing Currency in Global Trade: New Evidence." *Journal of International Economics*, vol. 136, 2022, p. 103604, doi.org/10.1016/j.jinteco.2022.103604.

Currency Composition of Official Foreign Exchange Reserves [COFER], retrieved from the IMF, International Monetary Fund; data.imf.org/?sk=e6a5f467-c14b-4aa8-9f6d-5a09ec4e62a4, June 16 2023.

European Central Bank, Central Bank Assets for Euro Area (11-19 Countries) [ECBASSETSW], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/ECBASSETSW, June 16, 2023.

Galati, Gabriele, and Philip Wooldridge. "The Euro as a Reserve Currency: A Challenge to the Pre-Eminence of the US Dollar?" *International Journal of Finance & Economics*, vol. 14, no. 1, 2009, pp. 1–23, doi.org/10.1002/ijfe.379.

Ito, Hiro, and Robert N McCauley . "The Currency Composition of Foreign Exchange Reserves." *BIS Working Papers No 828* , Dec. 2019, www.bis.org/publ/work828.pdf.