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Research paper

Trade war and the balanced trade-monetary theory

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Abstract:
One of the longest-lasting controversies in the international macroeconomic literature is the purchasing power parity theory. It is the most controversial subject that has been tested with various econometric models in different timeframes and geographic data sets. It is a common assumption used regarding the exchange rate and the validity of the Law of One Price. The present article aimed to present a new model to estimate the fair value of exchange rate which is one of the most critical factors in trade balance among countries, based on balanced trade-monetary theory by assessing the under or over-valuation of currencies. We can assume that a country with a strong economy should have strong money and vice versa. The results showed undervaluation of the dollar versus Yuan, Pound and Yen by 1.41, 1.149, and 1.126 times, respectively in 2018. Therefore, among the U.K., China, and Japan, Japan and the U.K. had a better trade balance with the U.S. than China. Keywords: GDP per-capita, balanced trade ratio, Balanced Trade-Monetary Theory, Purchasing Power Parity (PPP), Consumer Price Index (CPI).

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1 Introduction

Consumer Price Index (CPI) and Purchasing Power Parity (PPP) theory have conceptual similarities. Consumer price index measures changes in goods and services price levels over a period of time in a country, while purchasing power parity measures differences in price levels between countries or regions within a country; and, as seen in relative PPP, they are both related to the inflation rate. CPI percentage

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changes determine the inflation rate and PP percentage change shows the difference between inflation rates the economies of two countries. Purchasing power parity measures differences in price levels between countries or regions within a country; and, based on Purchasing Power Parity (PPP) theory, in the usual economic situation, the foreign exchange rates have to be adjusted to the difference in the inflation rate of the countries (Lucien and Taylor, 2008).

The question this research seeks to answer is: what factors determine the spot exchange rate? And also: what factors determine the trade-monetary balance between countries?

Part of the answer to these questions is related to the subject of purchasing power parity. In fact, the idea behind purchasing power parity theory is that currency exchange rates are changed and set in order to stabilize purchasing power. In general, the relative purchasing power parity principle makes the percentage of exchange rate changes equal to the difference in inflation between two countries (Ross et al., 2011). Purchasing power parity theory is based on the unit price law. Accordingly, goods and services prices must be the same in all places. Thus, the exchange rate between countries should remain in balance if the purchasing power is the same (Gemphi, 2017).

Undoubtedly, the one-factor inflation approach cannot establish an accurate balance in the economy in general and in the monetary system in particular. This study aimed to develop a new model to determine the balance of trade and fair value of foreign exchanges relative to one another, especially the value of the U.S. dollar versus the Chinese Yuan, the British pound, and the Japanese Yen. In this study, a new ratio (balanced trade ratio) and a new theory (Balanced Trade-Monetary Theory) were introduced in the monetary-trade field. In other words, given the importance of trade balance between countries with the approach of real exchange rates of their currencies to each other, and to maintain international trade fairness and avoid more trade wars, this study seeks to develop a new balanced trade-monetary model.

2 Literature Review

Most of the earliest studies about the effects of exchange-rate risk assumed that when there is no risk reduction structure, higher volatility brings trade volume down. Ethier (1973) discussed the effect of uncertainty on trading decision-making and showed that if traders do not have enough awareness about how the exchange rate affects their firm, their volume of trade will be decreased. But this uncertainty can be controlled; for example, forward markets can be helpful in a situation where risk aversion traders reduce the volume of exports in the country (Clark, 1973). On the other hand, Baron (1976) claimed that forward markets are adequate to make traders confident about the amount of exchange they need to hedge. Hooper and Kohlhagen (1978) studied the theory that makes traders risk-averse in evaluating

exchange rate volatility on cost and amount in trades including both supply and demand effects.

However, some studies have obtained opposite results regarding this relationship and concluded that the higher exchange rate volatility gets, the higher the trade volume becomes. Viaene and de Vries (1992) showed that because the two sides of trading are importers and exporters, their corresponding roles have a reversed effect and in the end, have a positive coefficient on variables of the other side partners. The study by Franke (1991) showed that in some conditions there may be the possibility of firms benefiting from higher volatility and getting higher of its export as a consequence. Sercu)1992) demonstrated that volatility can cause a rise in trades, as it increases the probability of delivering a higher price than trade cost. Sercu and Vanhulle (1992) proposed a theory about increasing volatility to escalate the valuation of exporting firms and Impellent exports. Dellas and Zilberfarb (1993) used asset-market approach to justify positive effects. Broll and Eckwert (1999) claimed that higher volatility enhances traders' option to export, and as regards the potential gain increase, the volume of trade will expand subsequently.

In other ways, some researchers concluded that there is no strong relationship between the volatility of exchange rate and volume of international trade. Willett (1986) argued that the empirical evidence at the time did not show a significant relationship to expected reduction of trade. In brief, theoretical literature predicts that volatility has positive, negative, and neutral impacts on trades and macroeconomic indexes.

The currency exchange market is, in fact, a secondary market; therefore, there is no definite place and time for currency exchanges and these exchanges take place in most commercial and investment banks all over the world. Currency exchange is carried out through telecommunication, computers and other communication tools; for instance, the Society for Worldwide Interbank Financial Telecommunications (SWIFT), a Belgian nonprofit institution (Ross et al., 2011). Taylor (1995), Ragoff (1996), Taylor and Peel (2000), Sarno and Taylor (2002), and Lothian and Taylor (2008) have made significant contributions to purchasing power parity theory literature. Sue et al. (2012) validated the reliability of long-term purchasing power parity (PPP) for BRICS countries using linear and nonlinear root tests via fixed variables. They showed that purchasing power parity theory is valid for all BRICS countries. Steven, Miguel and Ramirez (2015) demonstrated that indirect pieces of evidence suggest that the long-term absolute purchasing power parity may exist between Mexico and the United States, but due to data constraints, this relationship cannot be tested directly. So it is not clear whether the long-term absolute purchasing power parity exists between the United States and Mexico. They also confirmed the relative purchasing power parity between Mexican Peso and USD by OLS estimation. Lothian (2016) examined three periods of 1870-1914, 1921-1939, and the post-WWII period of 1959-1998. Prices behavior varies from country to country and overall findings indicate that purchase power parity theory holds when

the foreign exchange rate is adjusted to the inflation rate; in other words, when foreign exchange rate pricing is proper. Wu, Bahmani Chang (2018) revisited purchasing power parity (PPP) for the G6 countries (i.e., Canada, Italy, Japan, France, Germany, the UK) using monthly data over the 1971M12013M12 period. Their empirical results indicated that PPP holds in two out of six countries (i.e., France and Germany). Guris and Traolu (2018) investigated the validity of relative purchasing power parities in the BRICS countries (Brazil, Russia, India, China and South Africa) analyzed for the January 1993March 2015 period. Non-linear stationarity analysis was used in the study. Their findings showed that all of the BRICS countries have a non-linear structure; the PPP approach was valid for Brazil and South Africa, but not for Russia, India and China in the relevant period. Truong and Ha (2018) tested the validity of purchasing power parity (PPP) hypothesis using panel methods for nine countries in Southeast Asia in terms of US Dollar and Japanese Yen. Their results showed that the absolute PPP is rejected by the panel unit root test for Southeast Asian countries over the January 1995 to February 2017 period. However, when they used developed panel unit root that accounts for structural breaks in the data, and tested the PPP hypothesis over the July 1997 to August 2008 period, the PPP proposition seemed to hold for after the 1997 Asian financial crisis and before the 2008 global financial crisis. In addition, they used recently developed panel cointegration tests and found the long-run relationship between the nominal exchange rate and the relative prices the relative PPP.Their results offer more evidence of Japanese Yen based in favor of cointegration in long-run compared with the US Dollar as the base currency. Zayed, Chowdhury and Hasan (2018) investigated the Balassa-Samuelson hypothesis in Bangladesh to examine purchasing power parity (PPP) during 1972-2016. The main objective of this study was to determine whether or not purchasing power parity (PPP) holds in Bangladesh during the analyzed period. Johansen Long-Run Cointegration test was used through regression analysis to test the long-term relationship among real exchange rate, relative price, relative productivity, government share and terms of trade of Bangladesh during 1972-2016. Johansen Long Run Cointegration test has shown that there exists a long-term relationship among the variables, and purchasing power parity (PPP) does not hold in Bangladesh. It recommends a better understanding of volatility and persistence of real exchange rate as transaction costs and nonlinearity matter for purchasing power parity (PPP). Zhao. L and Zhao. Y (2018) conducted an empirical investigation of the purchasing power parity (PPP) hypothesis for China before July 1937. Using the monthly data from 1922 to 1937, they found clear and consistent evidence in favor of the purchasing power parity relationship. This naturally leads to the conclusion that the degree of Chinese market integration with the West was substantial before July 1937. These findings offer an empirical interpretation of the rise and fall of the Chinese price level during the Great Depression. It also has further implications of the impact of the American Silver Purchase Act of 1934 and the effect of the 1935 currency reform

on the Chinese economy. Fischer and Lipovská (2018) developed a new ready-to-use quick and simple index based on the prices of Nespresso coffee capsules and showed the main challenges of such indices as well as the PPP concept. For the purpose of their research, they collected the data on the Nespresso capsules prices. Also, taking into account the popularity (demand side) of the capsules types, the Espresso line was chosen as the basis for which all further calculations are made. The Nespresso Index provided them with clear evidence that the Law of One Price cannot work in the recent world because of three key features. Firstly, differences in taxes make the perfect parity impossible. Secondly, price discrimination prevents rational subjects from arbitrage. Finally, the changes in the exchange rate make such indices highly volatile.

Rani and Kumar (2018) concluded that there is a long-term correlation between import-export and economic growth in BRICS countries throughout the 1967-2014 period by using Pedroni's cointegration analysis. And in brief, they found the bidirectional causal dependence between ELG and GLE hypothesis.

The triangular PPP hypothesis asserted that the US price level has no role in the dollar-euro exchange rate. Wang and Liu (2018) argued that by applying the Chinese economic trend, selected currencies between three leading economies and de facto peg of the renminbi (RMB) make a triangle and play the main role in the dollar-euro exchange rate. Bahmani-Oskooee and Wu (2018) applied a modified unit root test on sharp shifts and smooth breaks in 34 OECD countries and their model supported PPP theory in 18 countries.

Applying unit root test to wavelet-based decomposed real exchange rate provides a predictor approach whose value provides guidance about real exchange rate behavior in the future and increases efficiency in modeling exchange rate framework (Vo and Vo, 2019).

Khan (2020) provided a system dynamic model for exchange rate behavior based on the nonlinear relationship among interest rate, inflation, oil price, terms of trade, and PCI that can be customized and exerted by oil-exporting countries for the purpose of forecasting the exchange rate.

Nagayasu (2021) explained all the indistinct literature on PPP that encumber it to be a substantial economic theory by founding causality based on time-varying and multidirectional characteristics, from data of emerging markets. Eventually, PPP validation is based on parameters like exchange rate regimes, economic structure, and openness in international relations, and in the best way, it is a long-term concept.

Tajdini et al. (2021) offered a novel riskbased approach that is based on the variety range of volatility of the exchange rates that can inscribe the extreme changes, yet could not be clarified by common theories.

3 Methodology

3.1 Purchasing Power Parity Theory

The purchasing power parity theory establishes the idea that the ratio of the price level and exchange rate between two countries must be equivalent. This means that a product should cost the same in two countries once you account for the exchange rate and its effects on the economy of each country over time. This effect is known as the Law of One Price. Relative purchasing power parity relates the change in two countries' expected inflation rates to the change in their exchange rates. Inflation reduces the real purchasing power of a nation's currency. If a country has an annual inflation rate of 10%, that country's currency will be able to purchase 10% less real goods at the end of one year. Relative purchasing power parity examines the relative changes in price levels between two countries and maintains that exchange rates will change to compensate for inflation differentials. The relationship can be expressed as follows:

$$E(S_t) = S_0 \times [1 + (h_{FC} + h_{US})]^T \tag{1}$$

3.2 Balanced Trade-Monetary Theory

In this theory, in addition to the adherence of exchange rate to the inflation difference of two countries, the exchange rate is affected by the mean difference of GDP per capita of two countries and standard deviation of GDP per capita as well as standard deviation of the dollar versus exchange rate during the study period. Adherence of the foreign exchange rates to only the inflation difference in former years is challenging, i.e. the market cannot be expected to evaluate and calculate the foreign exchange rates using the one-factor inflation approach of the purchasing power parity theory relative to the inflation rates in the previous years. In this theory, in addition to the inflation difference in the previous years, other factors such as the annual rate of GDP per capita, the standard deviation of the annual rate of GDP per capita and standard deviation of the dollar versus exchange rate are involved in determining the exchange rate value. Hence, the four-factor theory of purchasing power parity is modeled by formulae 2, 3 and 4. In these formulae, hFC is the mean domestic inflation rate, hUS is the mean inflation rate in the U.S., S_0 is the current exchange rate of each country per U.S. dollar, $E(S_t)$ is the future exchange rate of each country per U.S. dollar, r_{gpcUS} is the mean rate of GDP per capita in the U.S., r_{gpcFC} is the mean rate of GDP per capita of each country, σ_{gpcFC} is the standard deviation of the rate of GDP per capita of each country, EX is the mean standard deviation of the U.S. dollar versus the exchange rate of each country, $\frac{IMPORT}{EXPORT}$ represents the import/export ratio of each country, $r_{gpcUS} - r_{gpcFC}$ is the intensity of GDP per capita of each country, $e^{\sigma_{EX}}$ is the instability of the exchange rate of each country, and $e^{\sigma_{gpcFC}}$ is the instability of

GDP per capita of each country.

$$E(S_t) = S_0 \times [1 + (h_{FC} - h_{US}) + \frac{r_{gpcUS} - r_{gpcFC}}{e^{\sigma_{gpcFC}}}] \quad (2)$$

by adding the import to export ratio, the expected value is estimated as follows:

$$E(S_t) = [S_0 \times [1 + (h_{FC} - h_{US}) + \frac{r_{gpcUS} - r_{gpcFC}}{e^{\sigma_{gpcFC}}}]^T] \times e^{\sigma_{EX}} \times \frac{IMPORT}{EXPORT} \quad (3)$$

Finally, a new balanced trade ratio is developed according to Equations 4 and 5 for the trade-monetary balance between countries.

$$blanced\ trade\ Ratio = \frac{MV_t}{E(S_t) \times 10} \quad (4)$$

To get fair values of the U.S. dollar versus the exchange rate of each country modeling was done as follows:

$$FV_t = \frac{MV_t}{(1 + blanced\ trade\ Ratio)} \quad (5)$$

where MV_t is the market values of the U.S. dollar versus the exchange rate of each country and balanced trade ratio is an innovative ratio for the monetary-trade balance between countries. Also, the rationale for using number 10 in the balanced trade ratio denominator was to use a large number of trial and error methods to find the optimal model and to consider other factors affecting the monetary-trade balance.

3.3 Undervaluation or Overvaluation

And finally, by dividing the market value of each country's currency by the fair value of each country's currency, undervaluation and overvaluation can be determined.

$$Undervaluation\ or\ overvaluation = \frac{MV_t}{FV_t} \quad (6)$$

where FV_t is the fair values of the U.S. dollar versus the exchange rate of each country, MV_t is the market values of the U.S. dollar versus the exchange rate of each country and balanced trade ratio is an innovative ratio for the monetary-trade balance between countries. Also, the rationale for using number 10 in the balanced trade ratio denominator was to use a large number of trial and error methods to find the optimal model and to consider other factors affecting the monetary-trade balance. The data and statistics were obtained from the official website of the World Bank and were analyzed by Eviews 8 software. In general, the Balanced Trade-Monetary Theory argues that in order to create the business balance "a country with a strong economy should have a strong currency and vice versa".

3.4 Conceptual Model

In this part, we introduce a conceptual model based on 5 independent and 4 dependent variables. This model is developed based on the conceptual model of this article: Investigating the fluctuations of exchange rate based on monetarybehavior approach (Tajdini, Mehrara, and Taiebnia, 2021) The advantage of the model over the monetary-behavior approach model is the introduction of an independent variable of the market value of the exchange rate. Therefore, in this model, the fair value exchange rate is calculated based on the market value of the exchange rate and the other 5 variables. The five independent variables are, the lower the inflation rate, the lower the standard deviation of the inflation rate, the higher GDP per capita rate, the lower GDP per capita standard deviation, and the lower the import-to-export ratio, the stronger the country's currency versus the dollar. So, the conceptual model is:

4 Results

As shown in Table 1 and Figures 1 and 2, the mean annual inflation rate is 0.028, mean annual rate of GDP per capita is 0.082, mean standard deviation of annual

rate GDP per capita is 0.017, mean standard deviation of the annual exchange rate of the dollar versus Yuan is 0.029, and import/export ratio is 0.86 in China. Considering the annual inflation rate of 0.022 and mean annual rate of GDP per capita of 0.014 in the U.S. as well as the purchasing power parity theory, due to the small inflation difference between China and the U.S. over the past 23 years, the value of each Yuan should not have changed much compared to 1994. However, using the new model and Balanced Trade-Monetary Theory, this study found the cost of carry of 0.225, the balanced trade ratio of 0.41 and fair value of 4.91 units for the U.S. dollar versus Yuan during the study period, as follows.

$$\begin{aligned} E(S_{CHINA}) &= 8.62 \times [1 + (0.026 - 0.022) + \frac{0.014 - 0.082}{e^{0.17}}]^{23} \times e^{0.029} \\ &= 8.62 \times 0.225 \times 1.03 \times 0.86 = 1.7 \end{aligned} \tag{7}$$

$$blance\ trade\ Ratio = \frac{MV_t}{E(S_t) \times 10} = \frac{6.92}{1.7 \times 10} \simeq 0.41$$

$$FV_t = \frac{MV_t}{(1 + TajRatio)} = \frac{6.92}{(1 + 0.41)} = \frac{6.92}{1.41} \simeq 4.91$$

$$Undervaluation = \frac{MV_t}{FV_t} = \frac{6.92}{4.91} \simeq 1.41$$

Furthermore, as indicated in Table 2 and Figures 3 and 4, the mean annual

Table 1: Statistical data on the returns of monetary and trade variables in both China and the United States

The name of the economic variable	N	Max returns	Min returns	Average return	Middle return	Std
Inflation rate of China	23	0.17	-0.0114	0.028	0.019	0.038
Inflation rate of USA	23	0.038	-0.003	0.022	0.023	0.01
Annual rate per capita of China	23	0.13	0.06	0.082	0.081	0.17
Annual rate per capita of USA	23	0.034	-0.037	0.014	0.017	0.016
Import/export ratio in China	23	0.92	0.75	0.86	0.89	0.056
exchange rate	23	0.064	-0.09	-0.011	-0.004	0.29

inflation rate is 0.02, mean annual rate of GDP per capita is 0.03, mean standard deviation of annual GDP per capita is 0.085, mean annual standard deviation of the dollar versus Pound is 0.07, and the import/export ratio is 1.065 in the U.K. Moreover, based on the annual inflation rate of 0.022 and the mean annual rate of GDP per capita of 0.014 in the U.S. as well as the purchasing power parity theory, due to the small inflation difference between the U.K. and the U.S. over the past 23 years, the value of each Yuan should not have changed much compared to 1994. But based on the new model developed in the present study and Balanced Trade-Monetary Theory, the cost of carry of 0.68, the balanced trade ratio of 0.152 and the fair value of 0.67 were calculated for the dollar versus Pound during the study period.

$$\begin{aligned} E(S_{UK}) &= 0.65 \times [1 + (0.02 + 0.022) + \frac{0.014 - 0.03}{e^{0.085}}]^{23} \times e^{0.07} \\ &= 0.65 \times 0.68 \times 1.073 \times 1.065 = 0.505 \end{aligned} \tag{8}$$

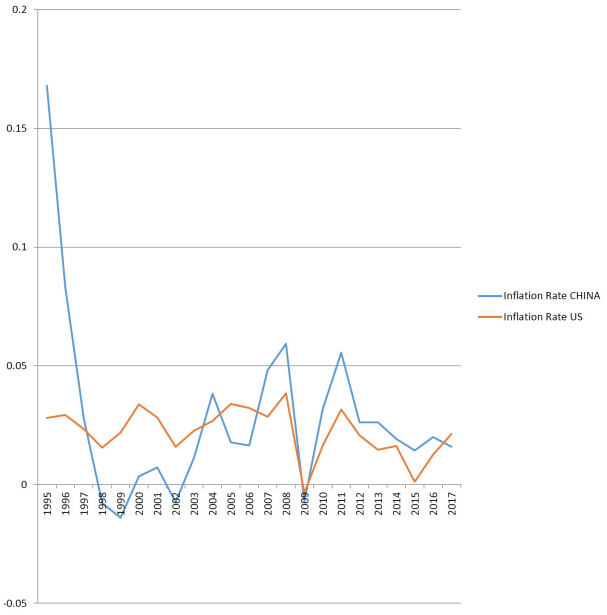

Figure 1: annual Inflation rate in China and the United States

Figure 2: annual rate of GDP per capita in China and the United States

$$blance\ trade\ Ratio = \frac{MV_t}{E(S_t) \times 10} = \frac{0.77}{0.505 \times 10} \simeq 0.152$$

$$FV_t = \frac{MV_t}{(1 + blance\ trade\ Ratio)} = \frac{0.77}{(1 + 0.152)} = \frac{0.77}{1.152} \simeq 0.67$$

$$Undervaluation = \frac{MV_t}{FV_t} = \frac{0.77}{0.67} \simeq 1.149$$

Table 2: Statistical data on the returns of monetary and trade variables in both U.K and the U.S

The name of the economic variable	N	Max returns	Min returns	Average return	Middle return	Std
Inflation rate of UK	23	0.045	0.0005	0.02	0.02	0.01
Inflation rate of USA	23	0.038	-0.003	0.022	0.023	0.01
Annual rate per capita of UK	23	0.157	-0.2	0.03	0.042	0.085
Annual rate per capita of USA	23	0.034	-0.037	0.014	0.017	0.016
Import/export ratio in UK	23	1.12	0.98	1.065	1.07	0.04
exchange rate	23	0.16	-0.11	0.007	0.008	0.07

Figure 3: annual Inflation rate in the UK and US

Furthermore, as shown in Table 3 and Figures 5 and 6, the mean annual inflation rate is 0.00119, mean annual rate of GDP per capita is 0.000941, mean standard deviation of annual GDP per capita is 0.091, mean annual standard deviation of

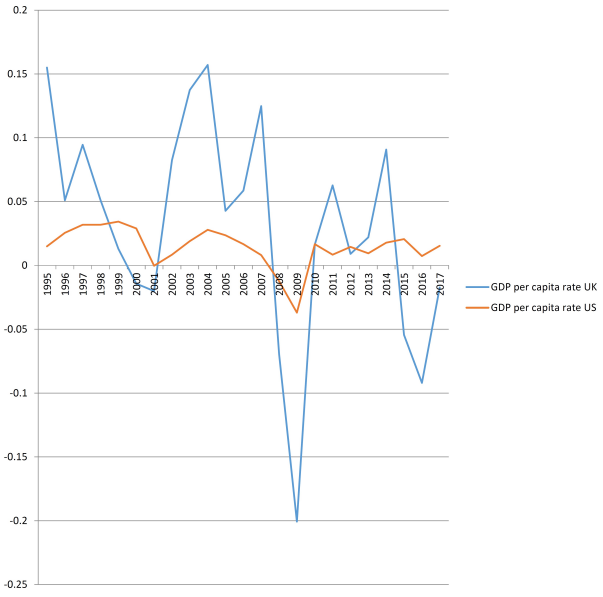

Figure 4: annual rate of GDP per capita in the UK and US

the dollar versus Yen is 0.099, and import/export ratio is 0.95 in Japan. Also, considering the annual inflation rate of 0.022 and mean annual rate of GDP per capita of 0.014 in the U.S. as well as the purchasing power parity theory, each Yuan has had a cost of carry of 0.616 and a fair value of 63 units for the dollar versus Yen over the past 23 years. But using the new model and the Balanced Trade-Monetary Theory, the present study calculated the cost of carry of 0.83 and the balanced trade Ratio of 0.126 and the fair value of 99.61 for the dollar versus Yen during the study period, as shown below.

$$\begin{aligned} E(S_{JP}) &= 102.208 \times [1 + (0.00119 - 0.022) + \frac{0.014 + 0.000941}{e^{0.091}}] \times e^{0.099} \\ &= 102.208 \times 0.83 \times 1.104 \times 0.95 = 89.2 \end{aligned} \tag{9}$$

$$blance\ trade\ Ratio = \frac{MV_t}{E(S_t) \times 10} = \frac{112.16}{(89.2 \times 10)} \simeq 0.126$$

$$FV_t = \frac{MV_t}{(1 + blance\ trade\ Ratio)} = \frac{112.16}{(1 + 0.126)} \frac{112.16}{1.126} \simeq 99.61$$

$$Undervaluation = \frac{MV_t}{FV_t} = \frac{112.16}{99.61} \simeq 1.126$$

Table 3: Statistical data on the returns of monetary and trade variables in both Japan and the United States

The Name of economic variable	N	Max returns	Min returns	Average return	Middle return	Std
Inflation rate of Japan	23	0.027	-0.013	0.00119	0.0005	0.009
Inflation rate of USA	23	0.038	-0.003	0.022	0.023	0.01
Annual rate per capita of Japan	23	0.122	-0.184	-0.000941	0.0045	0.091
Annual rate per capita of USA	23	0.034	-0.037	0.014	0.017	0.016
Import/export ratio in Japan	23	1.15	0.83	0.95	0.91	0.097
exchange rate	23	0.2	-0.14	0.004	0.0124	0.099

Figure 5: annual Inflation rate in Japan and the United States

5 Conclusion and suggestions

Fair trade is one of the most important and critical factors involved in the well-being and balance of international trade as well as economic well-being among countries, in general. A method to achieve this balance of trade is estimating the fair value of exchange rate between countries, which is of greater significance for the top economic powers of the world, including the U.S., China, the U.K., and Japan because the economic and commercial well-being of these countries affect the whole world economy. The present study aimed to present a new model to determine the fair value of the U.S. dollar versus Yuan, Pound, and Yen during the 1995-2017 period. The findings showed the values of 8.62, 0.65, and 102.208 for the U.S. dollar versus Yuan, Pound, and Yen, respectively in 1994, and the World Bank data indicated the mean inflation rate of 0.028, mean annual rate GDP per

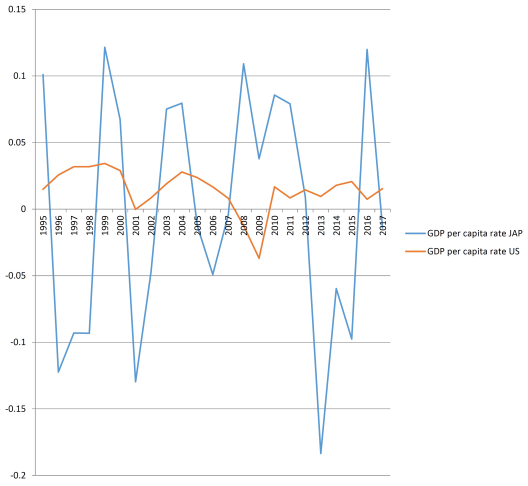

Figure 6: the annual rate of GDP per capita in Japan and the United States

capita of 0.082 and standard deviation of GDP per capita of 0.017 in China; mean inflation rate of 0.02, mean annual rate GDP per capita of 0.03, and mean standard deviation of GDP per capita of 0.085 in the U.K.; mean inflation rate of 0.00119, mean GDP per capita of -0.000941, and standard deviation of GDP per capita of 0.091 in Japan; and mean annual rate of GDP per capita of 0.014 in the U.S. Hence, based on the purchasing power parity theory, due to the small inflation difference among China, the U.K. and the U.S. over the past 23 years, the value of the dollar versus Yuan should not have changed much compared to 1994. However, in the current study, using a new model and based on the Balanced Trade-Monetary Theory, the cost of carry of 0.255 and the future exchange rate of 1.7 for the dollar versus Yuan, the cost of carry of 0.68 and the future exchange rate of 0.505 for the dollar versus Pound, and the cost of carry of 0.83 and the future exchange rate of 89.2 for the dollar versus Yen were calculated during the study period. However, the market values of the dollar versus Yuan, Pound and Yen were 6.92, 0.77 and 112.16, respectively in 2018. The results of this study were indicative of undervaluation of the dollar versus Yuan, Pound, and Yen by 1.41, 1.149 and 1.126 times in 2018. Among the U.K., China and Japan, Japan and the U.K. had a relatively better trade balance with the U.S. than China from 1994 to 2017. And the fair value of 4.91 for the dollar versus Yuan, the fair value of 0.67 for the dollar versus Pound, and the fair value of 99.61 for the dollar versus Yen were calculated during the study period In this research, valuable findings have been presented to demonstrate the balance of trade between countries. The researchers interested in commerce and exchange rate are suggested to carry out further studies to fill the gaps in the present study and develop a comprehensive model to complete the multi-factorial

Balanced Trade-Monetary Theory. The results of this study can be important in two aspects: first, it provides a universal model for trade balance between countries, and consequently a strategy to reduce more trade war, and second, to provide a strategy for ethical justification to establish the fair trade tariffs between countries.

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