

Is China a Currency Manipulator? An Appraisal of the Evidence

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Abstract

The suspected undervaluation of yuan is alleged to be the main cause of rising levels of trade deficits in the United States. The major objective of the present research is to investigate and further analyze if and how changes in the value of China's currency in the last 31 years (for which we have reliable monthly data) has produced an imbalance in the US-China trade patterns. This research is designed to clarify and empirically assess the extent to which the relative value of yuan against the US dollar has impacted United States imports from China.

Key words: Exports; Currency Manipulation; Exchange Rate
JEL: F15, F12, F18

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Received Date: Aug 20, 2019;

Accepted Date: Aug 26, 2019;

Published Date: Aug 29, 2019

Publisher: Scholars Insight Online Publishers

Citation: Hashemzadeh N. Is China a Currency Manipulator? An Appraisal of the Evidence. *Scholars Insight J Bus Manag.* 2019; 1:101.

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Introduction

Warning about the inappropriateness of Mercantilism Theory of Trade, John M. Keynes wrote "... the mechanism of foreign trade is self-adjusting and attempts to interfere with it are not only futile, but greatly impoverish those who practice them because they forfeit the advantages of the international division of labor. We could not agree more. Over the years, and since the final collapse of the gold standard in 1971, the U.S treasury has managed to market its currency as the global medium of exchange by using her financial prominence in conjunction with her global, political and military status to support a strong dollar policy. With the threat of wide-ranging tariffs and an all out trade war looming, majority of international trade experts acknowledge that a competitive exchange rate between the dollar and other major currencies will make American goods more attractive to foreign buyers. Notwithstanding, and for several decades, maintaining a strong dollar policy has been a major obstacle in reducing US trade deficit with China and the rest of the world thus resulting in loss of US exports and loss of millions of US jobs.

The philosophy of maintaining the value of the "king dollar" against a broad array of world currencies has been instrumental in shaping the US trade policy since the crash of the dollar/gold relationship in the mid-1970s [1]. Theoretically, if the US allowed the exchange rate between the US Dollar (USD) and yuan (CNY) to adjust to its competitive level, the US trade deficit with China and the rest of the world would narrow considerably resulting in much greater US exports and restoration of millions of US jobs. A "strong dollar" policy has created the conditions for the dollar to become abnormally overvalued, large foreign account deficits and low domestic savings rate since the 1990s. On numerous op ed. and public appearances, Larry Kudlow, the present director of the National Economic Council of the President,

and his colleagues, Stephen Moore and Art Laffer have been advocating a strong dollar policy for a long time [2,3]. An overvalued dollar continues to be major factor in increasing US trade deficits with its overseas trade partners. As Robert E. Scott has noted "absent aggressive efforts to reduce the overvalued dollar, policies of trading partners and the vagaries of financial markets will soon lead to a rising dollar, putting continued upward pressure on the trade deficit, and downward pressure on employment and output in U.S. manufacturing." (Feb. 2018, Working Economics Blog [4].

Objective of the Research

The fundamental goal of the present investigation is to gain some understanding about the relationship US imports and the exchange rate between the US dollar and the Chinese yuan. Obviously, under the current exchange rate regime, the price of Chinese made products compared with domestically produced products are cheaper and consequently more attractive by American retailers and more affordable by consumers. The prevailing strength of the dollar, artificially as it may be, will further expand US current account deficits with China. Nonetheless, as long as China is willing to accept "paper" for its exports, the current situation does not present an eminent and ready danger to the US economy.

The Dominance of the USD and the Consequential Trade Deficit

The flight of US manufacturing to China and other low-cost destinations continues to be blamed on Chinese expansionist and exploitative trade policies. It is alleged that the Central Bank of China maintains an artificially low exchange rate vis-à-vis the dollar and other currencies to promote and expand its own domestic industries and service operations. To date, there is plenty of evidence that few

countries in the developed world have been able to avert transfers of jobs from their labor-intensive industries to regions of the world with lower labor costs and “relaxed” labor related standards. Conventional economic theory predicts that when a nation (i.e. the US) imports more than it exports to a given country (here in China), the value of its currency (the US Dollar) should decline relative to the value of the Chinese currency (yuan). Nonetheless, this predictable outcome does not seem to have worked when viewed in the chronicles of the United States and China trade history. In an exhaustive study of the local market effects of import competition in the United States, David H. Autor, David Doran, and Gordon Hanson [5] suggest that although “trade with China yields aggregate gains for the US economy, it has contributed to “public ambivalence toward globalization and certain anxiety about increasing trade with China”

Other experts, including, Josh Bivens [7] have projected that absent a reversal, the dollar’s fall over the 2002-2003 period would have added “between \$98 billion and \$159 billion to U.S. gross domestic product ... owing to the increased competitiveness of net exports from the United States.” Bivens noted that the consequential growth in GDP would have created between 333,000 and 530,000 jobs, in the manufacturing sector of the US economy [8]. Martin Feldstein, the former president of the National Bureau of Economic Research and a Professor of Economics at Harvard University, has consistently promoted the necessary conditions for creating global competitiveness in foreign exchange markets. He has repeatedly blamed US enormous debt for an over-valued dollar. Speaking before the Economic Summit of the Stanford Institute for Economic Policy [9], he stated “my theme this evening is that America needs a competitive dollar. More specifically, we need competitive exchange rate relative to the other major currencies of the world– an exchange rate that will make American goods more attractive to foreign buyers and that will cause American consumers and firms to choose American made goods and services.”

For several decades, both under both Democrats and Republicans leadership, the US Treasury has aggressively promoted a very different theme. In a contribution to the National Bureau of Economic Research (NBER) working paper series, Feldstein noted that in the US, “the message has been that a strong dollar is good for America.” I think it is time to change the message. He added that “the message should be that we need a competitive dollar abroad and a strong dollar at home” [10]. In a previous presentation before the American Economic Association, he proposed that “although there is no natural measure of how high a currency is, the magnitude of the U.S. trade and current account deficits makes it clear that the dollar is very high relative to a long-run equilibrium level. The trade deficit in 2006 was about \$750 billion or nearly six percent of GDP and the current account deficit was some \$100 billion larger. These enormous deficits are unprecedented for the United States or for any other major industrial economy” [11].

In a 2007 US-China case study, published by the Federal Reserve Bank of New York, Linda Goldberg and Eleanor Wiske Dillon argued that due to its dominance as the global currency, “a weaker dollar will boost foreign demand for U.S. exports, but would not keep U.S. import prices from raising enough to reduce demand significantly.” These authors argue that as long as the dollar remains as “the dominant currency of invoicing across non-European countries”, dollar depreciation is unlikely to have significant impact on the U.S. import prices, although it could have a positive impact on the U.S. exports [12]. In an exhaustive research that addresses the economic effects of the exchange value of the dollar, Craig K. K. Elwell proposes that “economic theory suggests that the dollar’s path can be influenced by a variety of factors that could confer to the United States both benefits and costs, and in some circumstances a depreciating currency can be, on balance, beneficial” [13]. In a similar theme, Jared Bernstein, a senior fellow at the center on Budget and Policy Priorities, argued for “dethroning the king dollar”. Bernstein states “that an overvalued dollar which was

“once a privilege is now a burden, undermining job growth, pumping up budget and trade deficits...To get the American economy on track, the government needs to drop its commitment to maintain the dollar’s reserve –currency status [14].” Likewise, in another op-ed, Michael W. Klein of the Brookings Institute contended that “currency manipulation is not like pornography—you don’t know it when you think you see it. It’s hard to define and even harder to prove. At one level, any country that has a fixed exchange rate—such as France, Germany, Greece, and China—is, by definition, a currency manipulator. The question is whether a country has kept its currency artificially cheap to boost exports [15]. Gregory Mankiw, a professor of economics at Harvard, and former chairman of the Council of Economic Advisers under President George W. Bush, (April 2017) was quite explicit when he acknowledged that the “value of the dollar in foreign-exchange markets is just a price. Like other prices, whenever it changes, some people gain, and others lose. It is not useful to think of a stronger or a weaker dollar as either good or bad. One has to look at the situation at hand and the underlying drivers of the change.”(New York Times, May 12, 2017, P. BU3 [16]. Nevertheless, Bob McTeer, a career economist and former Dallas Fed President, (January, 2015) has consistently argued that “from the broad macro perspective, a stronger dollar benefits the domestic population by improving their terms of trade with the outside world.” He attempts to explain the negative impact of a strong dollar on the pretext that the legislators hear conflicting opinions from exporter’s vis-à-vis importers [17]. In an academic study of US-China tradepattern, Alastair Waithe [18] uses the purchasing power parity (PPP theory) to examine the US-China trade relationship using data from January 1994 through August 2009. He fails to explain any connection between the dollar and yuan using the PPP theory. Importantly, he finds no support that the yuan is undervalued and “the Chinese government needs to take steps to ensure its appreciation [19].

China has been able to produce and export low-priced goods to the US and the rest of the world in the last 30 years. Her economy has grown by about 10% in the last 30 years and she has become the largest exporter in total world trade. Despite the tough talk of tariffs and other trade restrictions on Chinese exports, she will continue to export more to the United States than it imports. Besides, being one of the largest holders of US foreign debt, China will remain an important trade partner with the United States and is capable to draw on her large labor force to produce “low cost” light manufacturing and consumer goods. In conclusion, I have to agree with Harvard Economist, Martin Feldstein who wrote “the best hope for a smooth adjustment of both the global and U.S. imbalances would be a substantial fall of the dollar followed by a significant rise in the U.S. saving rate and a policy of fiscal stimulus in other countries. Achieving this will require both good policies and good luck”[20].

Like many of my fellow economists, I believe that the notion that currency manipulation by the Chinese Central bank and certain European countries are behind US job flight to overseas manufacturers is just a myth. It is indeed naïve to conceive that low skill and low wage jobs in industries such as garment and apparel industries will ever return to the United States. As Adrian Wood has suggested, the emergence as exporters of labor-intensive manufactures of such giant countries as China and India will greatly expand the effective world supply of unskilled labor, to the serious detriment of the unskilled in developed countries. In an intensive investigation of the China-US trade data, Yin-Wong Cheung, Menzie Chinn and Xin Nong, using the Penn effect, reported that while there was some notable misalignment of yuan in “mid-2000’s, the currency appears to be near equilibrium by 2011.” In general, the mainstream trade experts believe that the U.S. current policy of escalating the trade war with China and her other trading partners will fail to kindle the rebirth and replication of the manufacturing jobs in the “rust belt” in Ohio and other regions. Besides outsourcing, millions of light manufacturing jobs have been

eliminated by hasty introduction and increasing expansion of robotics in the work place.

Data Sources

The data used in the enquiry was extracted from the United States Census Bureau, the Commerce Department, the World Bank as well as the International Monetary Fund (IMF). Exports, imports and net exports of goods from China are shown in Figure 1.

As shown in Figure 1, China has been able to produce and export low-priced goods to the US for nearly 30 years. Her economy has grown by about 10% in the last 30 years enabling her to become the largest exporter of goods in total world trade. With minor fluctuations, Chinese net exports to the US (shown in orange) continue to expand. Despite the tough talk of tariffs and other trade restrictions, the observed trade pattern between the two economies will continue. This has made China the largest holders of US foreign debt and is the most important trade partner with the United States.

USD/CNY Exchange Rate

Figure 2, shows the yearly averages between the US dollar (USD) and the Chinese Currency (CNY) over the period 1985-2017. Although the study is based on monthly data, Figure 2, is based on yearly averages to better demonstrate the long-run behavior of the dollar-yuan exchange rate. From the graph, we can extract three distinct sub-periods. In the first period that extends from 1985 through 1994, the US dollar appreciated considerably against yuan reaching his highest level in 1994, when one US dollar exchanged for 8.5 yuan. From 1994 through 2006, we do not observe any remarkable adjustment between the two currencies. From 2006, yuan perceptibly appreciated against the dollar until 2015 when it reversed direction. The extent to which the dollar-yuan exchange rates impacted US imports from China will be analytically explored in the sections that follow.

The Statistical Model: Quantity Demanded and Price

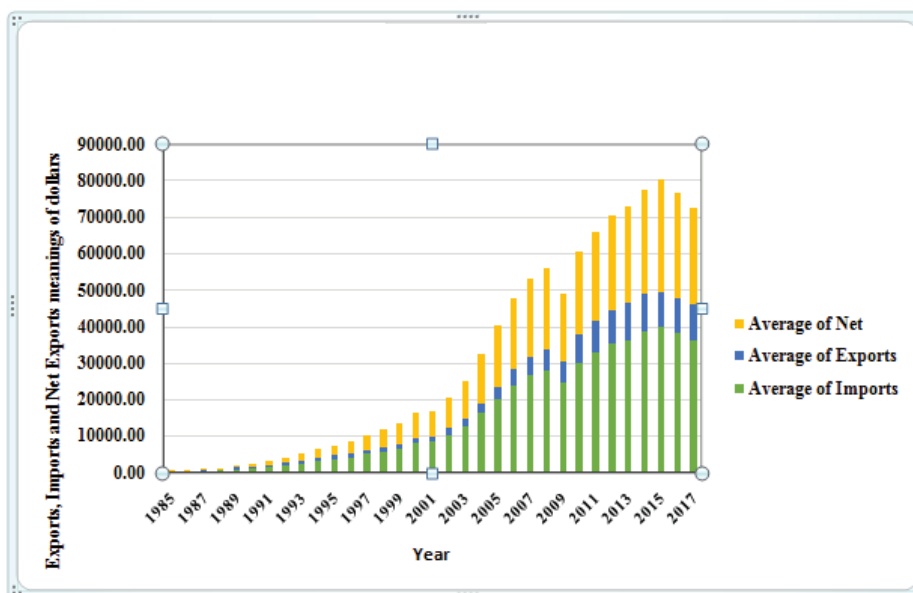


Figure 1: U.S. Imports (green), U.S Exports (blue), and Net Trade Deficit (yellow): 1985-2017

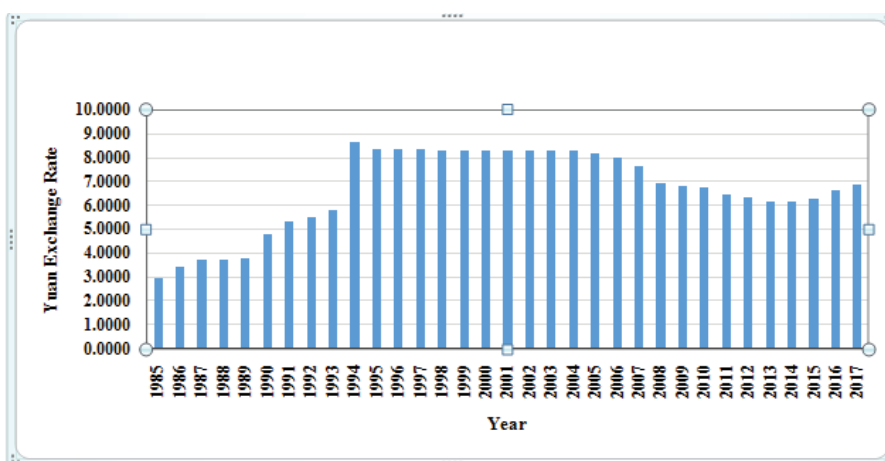


Figure 2: USD/CNY Exchange Rate: 1985-2017

Since the abolition of the gold standard in the last century, countless experts have attempted to explain the behavior of exchange rates in the short-run and the long-run. Overall, the results have been less than informative in predicting exchange rate behavior among well-managed currencies in the short-run. In a previous contribution, the author confirmed the notion that “exchange rate dynamics may be characterized by” chaotic behavior [11]. Other contemporary researchers including David Allen, et al., have confirmed that non-linear regression neural network models “provided the best fit for forecasting behavior of well-managed exchange rates.” They showed that the Chinese yuan exchange to be the “most amenable to prediction, but all series produced large errors and low coefficients of determination. In this paper, I attempt to demonstrate the empirical, and nonetheless, the fundamental, relationship between U.S. imports from China and the dollar/yuan exchange rate.

A fundamental principle in demand theory embraces the notion that that quantity of goods and services demanded over a time is inversely related to the average price level of what the consumers are able and willing to buy. In a competitive economy lower prices of imports, regardless of the point of origin, serves as a potent and sustainable driver for increased demands for “cheaper” substitutes. To better explore this principle, we will be transforming the US import data into natural logarithm to render it more amenable for further analysis. This transformation is statistically justified due to the colossal magnitude of US imports in contrast with the historical levels of exchange rates.

The descriptive statistical properties of the data used in estimating the relationship between US imports and the value of yuan are shown in Table 1. These include the number of observations, exports and imports (in billions of US dollar) maximum and minimum and measures of dispersion.

The Log-Linear Model

The statistical model presented below uses the natural logs of US imports (the dependent variable) and the US dollar/yuan as the explanatory variable in a quadratic equation model as specified below. Using the natural logarithm of imports as the dependent variable was justified due to the enormous magnitude of the import data relative to the limited range of the exchange rate data. In addition, the transformation made the empirical relationship between these variables more definitive.

Table 1: Descriptive Statistics.

Variable	N	Mean	SE Mean	St.Dev	Minimum	Q1	Median	Q3	Maximum
Exports	378	3329	178	3459	199	625	1446	5558	13148
Imports	378	14381	712	13837	265	2217	7936	26531	45718
Balance	378	-11052	542	10538	-36294	-20326	-6505	-1496	156
Rate	378	6.6558	0.0889	1.7278	2.8160	5.5972	6.8276	8.2772	8.7251

Exports, Imports, Current Account Balance, US dollar/yuan Exchange Rate

Table 2: Analysis of Variance.

Source	DF	SS	MS	F	P
Regression	2	598.480	299.240	468.45	.000
Error	375	239.548	0.639		
Total	377	838.028			
Sequential Analysis of Variance					
Source	DF	SS	F	P	
Linear	1	309.486	220.17	.000	
Quadratic	1	288.994	452.41	.000	

$$1a: \text{Lng}(\text{imports}) = \alpha + \beta_1 (\text{USD/CNY}) + \beta_2 (\text{USD/CNY})^2 + e_i,$$

Where $\text{Lng}(\text{imports})$ represent US imports and USD/CNY is the exchange rate between the US dollar and the Chinese yuan and $+ e_i$, is the error term. In this format, the coefficients of the dollar/yuan exchange rate show the percent change in US imports that would result from a unit change in the exchange rate. Applying the long-linear model to the data set yields the following equation:

$$1.b: \text{Lng}(\text{imports}) = 5.717 + 4.521(\text{USD/CNY}) - 0.329(\text{USD/CNY})^2$$

$$S = 0.799246 \quad R\text{-Sq} = 71.4\% \quad R\text{-Sq}(\text{adj}) = 71.3\%$$

As shown in Table 2, the coefficients of both explanatory variables (the linear and the quadratic) are significant with F-values: 220.17 for the linear term and 452.41 for the quadratic term, respectively. The overall adjusted R-squared is 71.3 percent; implying that the proportion of variance in net imports which could be predictable from the variance in exchange rate between US dollar and yuan is quite high. The corresponding F-statistics in the F column are for testing the significance of the linear and nonlinear terms as separate groups. The p-value for the F test is the probability of recording an F-value as far from zero, and this equals the probability of getting as large an F-ratio as the one evaluated from the data.

Alternatively, the estimated equation might be expressed as:

$$2: \text{Imports} = e^{[5.717 + 4.521(\text{USD/CNY}) - 0.329(\text{USD/CNY})^2]}$$

Given that the dependent variable (imports is in natural log, the estimated coefficient of USD/CNY (the explanatory variable), we can infer that as the Chinese currency depreciates by a small amount US imports (in due time) will likely increase by $[(e^{5.717e})^{4.52(e)} - 0.329 - 1] * 100$

The fitted line plot shown in Figure 3, plainly demonstrates that that most of actual observations fall in the 95% of the confidence interval of the fitted regression trajectory.

Given that the dependent variable (imports is in natural log, from the estimated coefficients of yuan (the explanatory variable), we can infer that if the Chinese currency depreciates from 0.25 cents to 0.20 cents, the natural log of imports increases from 18.5 to 20.2—which is 9.1 percent increase in natural log of imports. However, there does exist a minimum price for yuan below which it becomes unprofitable

for Chinese exporters to increase exports to the United States. Based on the graph this minimum net export from China to the US is reached when the value yuan drops to 14.2 cents or seven yuan to one US dollar

Conclusion and Recommendation

Our empirical investigation of the trade data between China and the United States supports a significant and non-linear relationship between US imports and the value of the yuan. Given that the dependent variable, imports is in natural log, we can infer that if the Chinese currency depreciates from 33 cents to 14 cents, the natural log of imports increases from approximately 4 to 9 which is 125 percent increase in natural log of imports. However, there does exist a minimum price for yuan below which it becomes unprofitable for China to increase exports to the United States. Based on the graph, net exports from China to the US begins to diminish when the value of yuan drops to approximately 14.2 cents or less. While our findings demonstrate a strong correlation between US imports and the value of yuan, there are many other unaccounted factors such as much lower labor cost, environmental and manufacturing regulations and easier access to the global market that have invigorated many US manufacturing to outsource its production to China.

Acknowledgement

The author wishes to thank several anonymous reviewers for their helpful comments. Their contributions immensely improved the quality of this contribution.

I also like the College of Business and Economics for supporting the research through the summer research program. Last, but not least, the author would like to thank Nelson Valdivieso Díaz, Dan Farhat, and Connie Leathers for their assistance with this project.

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