

The Monetary Approach to Exchange Rate Determination; An Inconsistent Paradigm!!!

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Abstract The exchange rate plays a vital role in a country's level of foreign trade, which is critical to most free market economies in the world. Mostly, an exchange rate is used as one of the most important determinants of a country's relative level of economic health. Due to its significance in international trade, many researchers have tried to develop models which build relationships between forces that determine the magnitude and movement of the exchange rates. This paper accumulates theoretical and empirical findings of monetary approach to exchange rate determination. Conventionally, the monetary approach to exchange rate determination claims that devaluation of the currency will improve the trade balance. However, there have emerged facts which defy this claim. Findings as summarized in this paper, suggest that, the monetary approach is an inconsistent approach. Thus, while it holds true to some countries, data from some other countries have been found to extremely contradict with this approach. Generally, despite the availability of models which are used to predict or determine exchange rate pattern, such models have been brutally attacked by empirical facts.

Keywords Monetary Approach, Exchange Rate, Literature Review, Trade Balance, Balance of Payments, Foreign Exchange Rate

1. Introduction

The field of economics is a host of numerous models which are used in determination and forecasting of various economic variables. One of the famous area studied using models is international economics where exchange rate forms an important part. Scholars have developed different models used to determine and forecast exchange rates using other economic variables. One of these models is called the monetary approach and it links the exchange rate and the trade balance of the balance of payments. However, variable prediction using economic models sometimes lacks prediction consistence. This paper reviews the monetary approach to exchange rate determination if it is consistently accurate. The monetary approach to exchange rate determination purports that; devaluation of country's currency improves trade balance. The remaining part of this section review the exchange rate regimes ever used in international economics.

1.1. Historical Background of the Exchange Rate Regimes

Trade between nations or international trade has a long historical background; its roots are found from when

commerce emerged. To effects international trade, exchange rate becomes more important in order to convert one currency into another. The patterns of exchange rates are dictated using various exchange rate regimes. The history of exchange rate regime is scholarly divided into pre- World War I (Gold standard), the Britton woods agreement, and the free floating regime. This section highlights the attributes of each regime.

1.1.1. The Gold Standard

In the pre-1914 era, most of the major trading nations accepted and participated in an international monetary system called the gold standard[1]. Under the gold standard, countries used gold as a medium of exchange and a store of value. During this period a nation's monetary unit was defined according to weights of gold. Because of London's dominance in international finance in period before 1994 the gold standard as an international monetary system worked adequately until the World War I interrupted the trade patterns and ended the stability of exchange rates. The period between the years 1914 to 1945 is characterized by major world wars which brought economic disorders eventually marks the failure of the gold standard. During this period, the value of currencies fluctuated fairly widely in terms of gold during World War I and in the early 1920s. Several attempts were then made to restore the gold standard during the 1920s. However, these attempts failed, mainly because of the Great Depression of 1929–32 and the international financial crisis of 1931.

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Published online at <http://journal.sapub.org/ijfa>
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1.1.2. Bretton-Woods Agreement

The international monetary disorder of the 1930s justified the relative rigidity of the postwar par value system designed at Bretton Woods in 1944[2]. This disorder necessitated the formulation of another accord to cater out exchange rate patterns in the world. With this regards, the Bretton Woods Agreement was signed by representatives of 44 countries at Bretton Woods, New Hampshire, in 1944, to establish a system of fixed exchange rates. Under this system, each currency was fixed by government action within a narrow range of values relative to gold or some currency of reference. The US dollar was used most frequently as a reference currency to establish the relative prices of all other currencies[2].

In the Bretton-Woods Agreement, currencies from around the world were fixed to the U.S. dollar, which in turn was fixed to gold prices in hopes of bringing stability to global Foreign exchange events[1]. At one hand, all currencies were allowed to fluctuate around that value but only within a narrow trading range. On the other hand, central banks were allowed to intervene in the event that their country's currency moved or threatened to move outside that trading range. If the fixed value of a country's currency shifted outside that trading range, that country had the right under the articles of the agreement to declare that a fundamental imbalance is in existence. As a result of this fundamental imbalance, it created a revaluation or devaluation of the country's currency[1]. In 1971, the accord finally failed; however, it did manage to stabilize major economies of the world.

The important features of the system were that the value of gold was fixed at \$35 per ounce and that each country was obligated to define its monetary unit in terms of gold or dollars. While other currencies were not required to exchange their currencies for gold, US dollars remained convertible into gold at \$35 per ounce. Also, each currency was permitted to fluctuate within ± 1 percent of par value by buying or selling foreign exchange and gold as needed. However, if a country's currency became too weak to maintain par value, it was allowed to devalue its currency up to 10 percent without formal approval by the IMF[1].

1.1.3. Free-Floating Regime

In late 1971 and 1972, two more attempts were made to establish free-floating currencies against the U.S. dollar: the Smithsonian Agreement and the European Joint Float. At this time, to "float" a currency simply meant to create a policy by which a strong economic currency is used, such as the U.S. dollar (USD), which in turn is anchored to the price of gold as a benchmark to bring stability to a volatile global economic situation[1]. All other weaker economic currencies are then fixed against the USD and allowed to fluctuate, or float, no more than 1 percent on either side of the fixed rate. If the fixed rate moved more than 1 percent, the central bank of that country was required to intervene in the market until the exchange rate was brought back to within the 1 percent

band. The Smithsonian Agreement and the European Joint Float agreement were similar to the Bretton-Woods Accord but allowed a greater range of fluctuation in the currency values and widened the band in which currencies were allowed to trade. The Smithsonian Agreement was just a modification of the Bretton-Woods Accord, with allowances for greater fluctuation, whereas the European Agreement aimed to reduce the dependence of European currencies on the U.S. dollar. But after the failure of these agreements, nations were allowed to peg their currencies to "freely float," eventually being mandated to do so in 1978 by the IMF[1]. From this time, currencies are allowed to freely float according to economic performance of the country.

1.2. Exchange Rate Determination in the Free Floating Regime

This paper draws its focus on determination of exchange rate in the floating exchange regime. The forces that guide the determination of exchange rates have for years drawn serious concerns from many scholars all around the global. Many models have been developed to give insights on how exchange rates are derived, determined, and if possible forecasted. Prominent of all the exchange rate determination models, is the one that link exchange rates to the performance of the balance of payments. The balance of payments can be explained using a number of approaches; these are absorption approach, elasticity approach, and monetary approach. While other approaches play important role in international economics, the monetary approach creates even a clearer picture for demand and supply of rival currencies in the foreign currencies markets.

This paper therefore, presents an empirical assessment of the relationship between the real exchange rate and the balance of payments using a monetary approach of the balance of payments under the regime of a freely floating exchange rate. The paper accumulates theoretical and empirical views from many scholars all around the world.

2. Theoretical View of Monetary Approach as Used in Exchange Rate Determination

Most of the large industrialized economies floated their exchange rate in early 1973, after the demise of the post-war Britton Woods system of fixed exchange rates[3]. But long before the dismissal of the Britton woods exchange system, scholars have had tried to develop models that are useful in determination and forecast of exchange rates[3]. Such efforts resulted into a number of good models in exchange rates. One of the prominent model suggested that, the balance of payments (mainly the trade balance) influences the exchange rate pattern; this is what is referred as monetary approach of the balance of payment.

By the early 1980s however, what seemed to be empirical successes in the literature had been overturned and most key empirical findings began to turn negative, a state of affairs

that continues through the present day[3]. Researchers started to experience negative result when trying to establish accuracy of a variety of the predictive exchange rate models, see for example Meese and Rogoff,[4] in which the key finding was that no existing structural exchange rate model could reliably out-predict the seemingly random walk of exchange rates at short- and medium-run horizons, even when aided by actual future values. Mussa[5] made following comments; among others: (1) the nature of the spot rate is approximately a random walk; (2) most changes in exchange rates are unexpected; (3) countries with high inflation rates tend to depreciate, and at approximately the inflation differential in the long run; and (4) actual exchange rate movements appear to overshoot movements in predicted exchange rates.

Despite these controversies, theoretically, the proponents of the monetary approach suggest that, nominal exchange rate depreciation is said to improve the trade balance[6]. In analyzing the influence of the balance of payment, scholars adopt the following approaches;

2.1. Elasticity (BRM) Approach

Theoretically, the conventional view of the balance of payment is that, nominal devaluation of the currency improves the trade balance (Frankel and Rose, 1994). This view is based on a conventional equilibrium approach to the balance of payment known as the *Elasticity Approach* proposed by Bickerdike[7], Robison[8] and Metzler[9] and is often referred after the initials of these proponents as BRM approach. The essence of this approach is the substitution effect of consumption and production induced by relative price. The BRM model has been credited by literature as providing a sufficient condition for an improvement of trade balance if exchange rate deteriorates. In addition, Marshall and Lerner (ML) argue that for positive effect of devaluation on the trade balance and implicitly for the stable market, it is imperative that the absolute value sum of the demand elasticities for imports and exports must exceed unity (1). Therefore, when the exchange rate is above the equilibrium there is excess of supply for the foreign currency and when the exchange rate is below the equilibrium there is excess demand for the foreign currency. Generally, the BRM and Marshall-Lerner conditions have been the basic assumptions for those who support devaluation as a mean to stabilize the foreign exchange market and to improve trade balance.

2.2. The Absorption Approach

Another approach based on the balance of payments immersed in the mid 1950s; this is called the *absorption approach*. This approach was championed by authors like, Harberger[10], Meade[11], and Alexander[12,13] who all together shifted the focus of economic analysis of the balance of payments to the view of aggregate expenditures. The core assumption of this approach is that, any improvement in the trade balance requires an increase of income over domestic expenditures. According to this

approach, the direct effect of the exchange rates is on the relative prices, income and expenditure, and ultimately on the trade balance.

2.3. The Monetary Approach

The monetary view of the balance of payments or the global monetarist approach emerged late 1950s[3]. The monetary approach emerged in 1950s first as a monetary approach to the balance of payment and then was refocused to the exchange rates[14]. The first champion of the monetary approach is Palok[15], later redefined by Hahn[16], Pearce[17], Prais[18], Mundell[19,20], Johnson[21,22], and other followers. These monetarists suggest that the balance of payment is a monetary phenomenon. Thus, since the exchange rate is the price of one currency expressed in terms of another currency, the balance of payment should be expressed from the point of view of supply and demand of money. The model starts with the reasonable statement that, as the exchange rate is the relative price of foreign and domestic money, it should be determined by the relative supply and demand for these moneys[3]. This simply suggests, if people demand more money than is being supplied by the central bank then the excess demand for money would be met by inflow of money from abroad, hence the trade balance will improve. On the contrary, if the central bank supplies more money than is demanded, the excess supply of money is eliminated by outflow of money to the other countries and this will worsen the trade balance. It is inherent therefore that, any excess demand for goods, services and assets, resulting in a deficit of the *balance of payments*, reflects an excess supply or demand of the stock of money. It seems the central point of the monetary approach to the balance of payment is that balance of payment deficits or surpluses reflect stock disequilibrium between demand and supply in the market for money[23].

With monetary approach therefore, it is important to emphasize the role of demand and supply of money in determining the exchange rates. Thus, similar to any merchandise which is for sale, the foreign exchange value is subjected to the law of supply and demand[24]. This is the reason why the exchange rate will be explained using the same geometric artifices which are used to explain the formation of prices in general. Therefore, according to this approach, the exchange rate between two currencies is the ratio of their values determined on the basis of money supply and money demand positions of the two countries[25].

2.4. The Occurrence of the J-Shape

It is suggested that currency depreciation improve balance of trade (or current account balance) in the long run but the response of trade balance takes a "J" shape to the right. A J-curve postulates that after real depreciation or devaluation, the trade balance is expected to deteriorate at first, then improve because the increased value of imports initially would dominate the increased volume of exports, and increased volume of exports would outweigh the increased

value of imports later[26]. Thus, Currency depreciation is said to improve the trade balance only after passage of some time; in the short run it worsens the trade balance before improving it resulting in a pattern that resembles the letter *J* and hence the term “J-Curve phenomenon”[27]. Magee[28] characterized this phenomenon as consisting of a period during which contracts already in transit in specified currencies and at old prices dominate the short-run response of the trade balance. Over time, new contracts made after devaluation begin to dominate and the “pass-through” of the devaluation or depreciation is achieved. In the second phase, Krueger[29] has pointed out that the elasticities could increase and thus depreciation improves the trade balance. The delayed response of trade balance improvement can also be due to lags. There are at least five lags between devaluation and its ultimate impact on trade[30]. Thus, if the trade balance was deteriorating before devaluation, it will continue to deteriorate even after devaluation until these lags are realized and trade balance begins improving. These lags are recognition lags, decision lags, delivery lags, replacement lags, and production lags[30].

A change in the exchange rate has two effects on trade flows--price effect and volume effect. The price effect implies that currency depreciation will cause imports to be more expensive and domestic exports to be cheaper for foreign buyers at least in the short run. Since the volume of goods imported and exported might not change drastically in the short run, the trade balance may initially deteriorate[27]. However, the volume of trade changes eventually in response to the depreciation. In other words, the price effect is generally believed to dominate the volume effect in the short run. In the long run, however, if the Marshall-Lerner condition holds, the volume effect takes over and reverses the effect, and the trade balance improves. The total effect when plotted over time with trade balance on the y-axis will yield the J-curve[27].

3. Experience from Previous Studies

The relationships between the balance of payment and exchange rate have a long scholarly history; many scholars have pumped in enough wisdom to make it understandable. Here, a brief overview is provided of the literatures for various economies ranging from the developing to the developed economies. The review in this part accumulates various famous studies in different countries which adopts floating exchange rate regimes.

Rose and Yellen[31] used bilateral trade data in their seminal paper and did not find support for the J-curve effect nor evidence of a long-run relationship in the case of U.S. data for the period 1960 to 1985.

Also Bahmani- Oskooee and Brooks[32], analyzing bilateral disaggregated U.S. trade data with respect to six major trading partners did not find any relationship between trade balance and exchange rates. Shin and Smith[33] also did not find evidence of a J-curve effect. However, they did observe a significant long-run reciprocal relationship

between the trade balance and the exchange rate, indicating that a real depreciation of the U.S. dollar has a favorable effect on the U.S. trade balance. Shirvani and Wilbratte[34] used a Vector Error Correction Model (VECM) approach for the United States with respect to G7 countries. They found instead an evidence of a reversed L-curve effect. Demirden and Pastine[35] employ Sim's Value -At -Risk (VAR) methodology and demonstrate in a simple empirical example that feedback effects in a flexible exchange rate environment may be significant, resulting in a J-curve effect.

Felmingham[36] tested the J-curve proposition in Australian data for the period 1965 to 1985. He did not find evidence for the J-curve phenomenon. On the other side, Marwah and Klein[37] found evidence of an S-curve for both Canada and the United States utilizing disaggregated data in a regression analysis for the 15 years period (1977-1992). According to their results, the trade balance initially declines after depreciation, followed by a trade balance improvement - the typical J-curve effect. However, after several quarters there seems to be a tendency for the trade balance to worsen resulting to S-shape.

Furthermore, Bahmani-Oskooee and Alse[38] tested 41 developed and less developed countries for the existence of the J-curve effect applying the Engle-Granger two-step procedure. The results indicated that the trade balance and real effective exchange rate existed for only fourteen countries. In the countries exhibiting a relationship, there was some evidence of the J-curve effect.

Gupta-Kapoor and Ramakrishnan[39] analyzed the impact of the yen appreciation on Japanese trade balance data with respect to seven major trading partners employing a VECM. The estimated impulse response function indicated the existence of a J-curve for Japan. Jung and Doroodian[40] obtained similar results for Japan. They applied the Shiller lag model to first differences finding support for the J-curve effect.

Concerning the developing economies, there has been development of international economics research, predominantly emerging Asian markets. Baharumshah[41] employs VAR model for the bilateral trade balances of Thailand and Malaysia with the United States. And Japan for the period 1980 to 1996. He finds positive long-run relationship between trade balance and the exchange rate. The evidence on the short-run response of the trade balance supporting the J-curve effect is mixed mainly with delayed J-curve seems to apply to Thai data, whilst no support for the J-curve was found in Malaysian data. In addition, Bahmani - Oskooee and Kantipong[42] tested on disaggregated data the J-curve between Thailand and her main trading partners Germany, Japan, Singapore, United Kingdom, and the United States for the period 1973 to 1997. They find evidence of the J-curve in bilateral trade with the U.S. and Japan only.

Upadhyaya and Dhakal[43] test the effectiveness of devaluation on the trade balance for eight developing countries (Colombia, Cyprus, Greece, Guatemala, Mexico, Morocco, Singapore, and Thailand). Their empirical finding is contradictory; regarding Thailand, they provide evidence

that seems to suggest that only in the Mexican case devaluation improve the trade balance in the long-run. Stučka[44] found evidence of a long-run relationship between the trade balance and exchange rates.

In the case of Turkey, Akbostanci[45] finds support for a favorable long-run relationship between the exchange rate and the trade balance. The generalized impulse response function indicates in the short-run an S-shaped trade balance response to devaluation. This view with respect to the positive long-run relationship is supported in Bahmani-Oskooee[42]. However, Kale[46] obtains conflicting results, providing evidence of a negative long-run impact of devaluation on the trade balance. In the short-run Kale finds evidence of a delayed J-curve effect.

Basically, the evidences suggest that the J-curve is not an empirical regularity, it is an empirical phenomenon; it may occur or it may not. For some countries, the J-curve effect predominantly applies, for some it does not. The evidence supports the existence of a favorable stable long-run relationship between the trade balance and the exchange rate, with a few exceptions, most notably the United States.

Bahmani-Oskooee[42] investigated the long-run response of Middle Eastern countries' trade balances to devaluation by applying the Engle-Granger and Johansen-Juselius cointegration methodology. The evidence suggests that there exist a favorable long-run effect of a real depreciation on the trade balance for all seven countries (Bahrain, Egypt, Jordan, Morocco, Syria, Tunisia, and Turkey).

Wilson[47] examined the relationship between the real trade balance and the real exchange rate for bilateral merchandise trade between Singapore, Korea and Malaysia with respect to the United States and Japan. No evidence of a J-curve effect was found, with the exception of Korean trade with the United States.

4. Conclusions

This paper emerged and is grounded on the fact that though the monetary approach to exchange rate determination is widely used in exchange rate determination; this paradigm is not consistently accurate. Monetary approach argues that depreciation of a currency in long-run results into improved balance of trade position and that an appreciation of a domestic currency over foreign currency will deteriorate the balance of payments. The paper collected literatures concerning the assertion that in monetary view the balance of payments plays an important role in exchange rate patterns and movement. Literatures as reviewed in this paper suggest that, while the monetarists' creed holds to some countries, other countries have never experienced improvement of their trade balance after depreciation of the currency. Thus, what is believed to be a monetarist creed is a just a phenomena; it is not a regular, consistent and predictable event. Below are some of the methodologies used in the monetary approach and their findings used in the

reviewed literatures.

4.1. The Disaggregated Method

This method disaggregates exports and imports into specific countries and studies the trend of the currencies of the two countries. When this approach was used for data in USA against its six major trading partners, the finding suggested no short or long-term relationship and sometimes resulted into an S-curve. This was the case in Marwah and Klein[37]

4.2. Vector Error Correction Model (VECM) Method

This methodology is used when co-integration has been detected between series to test if there exists long-term equilibrium relationship between them. This method also resulted into conflicting conclusions, for example, when the USA data were used; the curve resulted into a delayed L-Curve instead of a J-curve. This was the case in Shirvani and Wilbratte[34]

4.3. Value -At -Risk (VAR) Method

Generally, the Value at Risk measures the potential loss in value of a risky asset or portfolio over a defined period for a given confidence interval. For instance, if the VAR on an asset is \$ 100 million at a one-week, 95% confidence level, there is a only a 5% chance that the value of the asset will drop more than \$ 100 million over any given week. This method proved relationships in USA; however, the methodology is not popular, it is found only in Demirden and Pastine[35]

4.4. Engle-Granger Method

Engle-Granger methodology tries to establish causal links between variables. Studies which used this method resulted into inconstant findings, for example, out of 41 countries studied in one study, only 14 displayed a J-curve while the remaining displayed no relationship, this was the case in Bahmani-Oskooee and Alse[38]

4.5. J-Curve Occurrence

The J-curve predominate the monetary approach research, the curve suggests that when the currency is devalued the Trade balance first deteriorate before it improves. Findings suggest that the curve is not a consistent event, it is found in some whilst it does not exist in others. This inconsistency occurred in most of the studies.

Generally, the above methodological summary suggests that the monetary approach to exchange rate determination provides no consistent outcomes. The review find that the approach hold true in some countries and untrue to others. Most methodologies also have provided positive results in some countries and negative results to others. Therefore, Literatures in this paper suggest that, the monetary approach is a statistical phenomena and not a financial regularity.

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