

Multi-scale Foreign Exchange Rates Ensemble for Classification and Fixed Exchange Rate system of Trends in Forex Market

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Abstract

Foreign exchange OR Forex market is the largest trading market in the world. Predicting the trend of the market and performing automated trading are important for investors. Recently, machine learning techniques have emerged as a powerful trend to predict foreign exchange (FX) rates. In this paper, we propose a new classification method for identifying up, down, and sideways trends in Forex market foreign exchange rates. A multi-scale feature extraction approach is used for training multiple classifiers for each trend. As well as the Fixed Exchange Rate system will be discussed. The results show superiority of ensemble classifier over individual ones.

Keywords: *Foreign Exchange, Multi-scale Features, Multivariate Gaussian Classifier, Bayesian Voting.*

1. Introduction

A futures exchange or futures market is a central financial exchange where people can trade standardized futures contracts defined by the exchange.[1] Futures contracts are derivatives contracts to buy or sell specific quantities of a commodity or financial instrument at a specified price with delivery set at a specified time in the future. Futures exchanges provide physical or electronic trading venues, details of standardized contracts, market and price data, clearing houses, exchange self-regulations, margin mechanisms, settlement procedures, delivery times, delivery procedures and other services to foster trading in futures contracts.[2] Futures exchanges can be organized as non-profit member-owned organizations or as for-profit organizations. Futures exchanges can be integrated under the same brand name or organization with other types of exchanges, such as stock markets, options markets, and bond markets.[3] Non-profit member-owned futures exchanges benefit their members, who earn commissions

and revenue acting as brokers or market makers. For-profit futures exchanges earn most of their revenue from trading and clearing fees.[4].

Futures exchanges establishes standardized contracts for trading on their trading venues, and they usually specify the following: assets to be delivered in the contract, delivery arrangements, delivery months, pricing formula for daily and final settlement, contract size, and price position and limits.[5] For assets to be delivered, futures exchanges usually specify one or more grades of a commodity acceptable for delivery and for any price adjustments applied to delivery. For example, the standard deliverable grade for CME Group's corn futures contract is "No. 2 Yellow", but holders of short positions in the contract can deliver "No. 3 Yellow" corn for 1.5 cents less the delivery price per bushel.[6] The location where assets are delivered are also specified by the futures exchanges, and they may also specify alternative delivery locations and any price adjustments available when delivering to alternative locations. Delivery locations accommodate the particular delivery, storage, and marketing needs of the deliverable asset. For example, ICE frozen concentrate orange juice contracts specify delivery locations as exchange-licensed warehouses in Florida, New Jersey, or Delaware,[7] while in the case of CME live cattle contracts, delivery is to exchange-approved livestock yards and slaughter plants in the Midwest.[8] The futures exchange also determines the amount of deliverable assets for each contract, which determines a contract's size. Contract sizes that are too large will dissuade trading and hedging of small positions, while contract sizes that are too small will increase transaction costs since there are costs associated with each contract. In some cases, futures exchanges have created "mini" contracts to attract smaller traders. For example, the CME Group's Mini Nasdaq 100 contract is on 20 times the Nasdaq 100 index.[9].

2. Foreign exchange clearing and margin mechanisms

Futures exchanges provide access to clearing houses that stands in the middle of every trade. Suppose trader A purchases US\$145,000 of gold futures contracts from trader B, trader A really bought a futures contract to buy US\$145,000 of gold from the clearing house at a future time, and trader B really has a contract to sell US\$145,000 to the clearing house at that same time. Since the clearing house took on the obligation of both sides of that trade, trader A do not have worry about trader B becoming unable or unwilling to settle the contract - they do not have to worry about trader B's credit risk. Trader A only has to worry about the ability of the clearing house to fulfil their contracts.[10]

Even though clearing houses are exposed to every trade on the exchange, they have more tools to manage credit risk. Clearing houses can issue Margin Calls to demand traders to deposit Initial Margin moneys when they open a position, and deposit Variation Margin (or Mark-to-Market Margin) moneys when existing positions experience daily losses. A margin in general is collateral that the holder of a financial instrument has to deposit to cover some or all of the credit risk of their counterparty, in this case the central counterparty clearing houses. Traders on both sides of a trade has to deposit Initial Margin, and this amount is kept by the clearing house and not remitted to other traders.

Clearing houses calculate day-to-day profit and loss amounts by 'marking-to-market' all positions by setting their new cost to the previous day's settlement value, and computing the difference between their current day settlement value and new cost. When traders accumulate losses on their position such that the balance of their existing posted margin and their new debits from losses is below a threshold called a maintenance margin (usually a fraction of the initial margin) at the end of a day, they have to send Variation Margin to the exchange who passes that money to traders making profits on the opposite side of that position. When traders accumulate profits on their positions such that their margin balance is above the maintenance margin, they are entitled to withdraw the excess balance.[11]

The margin system ensures that on any given day, if all parties in a trade closed their positions after variation margin payments after settlement, nobody would need to make any further payments as the losing side of the position would have already sent the whole amount, they owe to the profiting side of the position. The clearinghouse does not keep any variation margin.[12] When traders cannot pay the variation margin they owe or are otherwise in default the clearing house closes their positions and tries to cover their remaining obligations to other traders using their posted initial margin and any reserves available to the clearing house.[13] Several popular methods are used to compute initial margins. They include the CME-owned SPAN (a grid simulation method used by the CME and about 70 other exchanges), STANS (a Monte Carlo simulation-based methodology used by the Options Clearing Corporation (OCC)), TIMS (earlier used by the OCC, and still being used by a few other exchanges).

Traders do not interact directly with the exchange, they interact with clearing house members, usually futures brokers, that pass contracts and margin payments on to the exchange. Clearing house members are directly responsible for initial margin and variation margin requirements at the exchange even if their client's default on their obligations, so they may require more initial margin (but not variation margin) from their clients than is required by the exchange to protect themselves. Since clearing house members usually have many clients, they can net out margin payments from their client's offsetting positions. For example, if a clearing house member have half of their clients holding a total of 1000 long position in a contract, and half of their clients holding a total of 500 short position in a contract, the clearing house member is only responsible for the initial and variation margin of a net 500 contracts [14].

3. Multiple exchange rates: merits and demerits in international economics

Immediately after the Second World War, almost 50 countries of the world were having a complex system of multiple exchange rates. The prominent among them were West Germany, Argentina and a number of Latin American countries. By 1950's, the system was completely abandoned because of its complexities.

Under this system, different rates of exchange were fixed for imports and exports of different commodities. The object of fixing different rates of exchange was to obtain the maximum possible amount of foreign exchange by maximizing exports and reducing imports to the minimum extent, see Figure 1 [15]. It was believed that this

system was more effective in curing the problem of balance of payments deficit faced by a country.

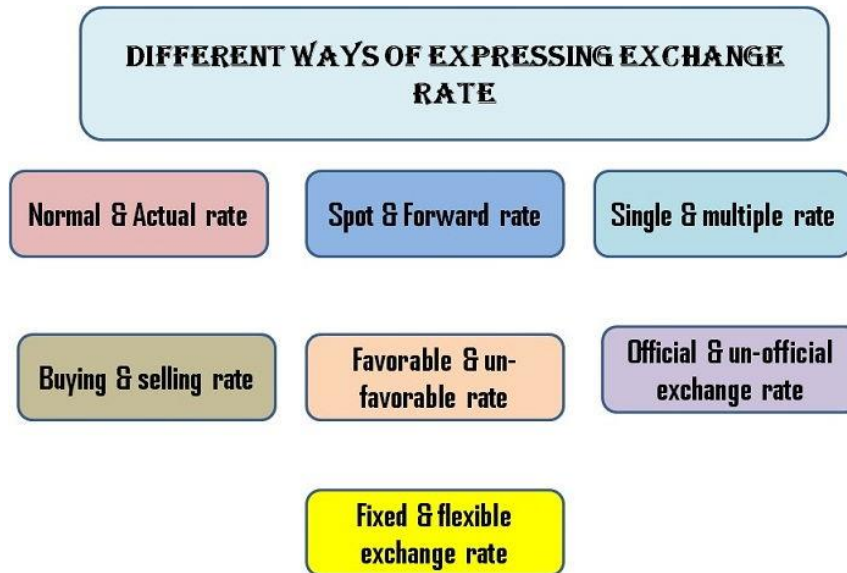


Figure 1: Multiple Forex

Under the multiple exchange rates system, there was not only sufficient inducement to the exporters to enlarge their exports; there could be an additional incentive for them. They were allowed to sell a part of their foreign exchange earnings from exports at the unofficial higher rate of exchange. They could have the opportunity to import capital goods, raw material or technical know-how at some preferential and favourable rate of exchange.

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3.1 Merits of Multiple Exchange Rates:

The main merits claimed for this system of exchange rates were as follows [16]:

3.1.1 More Effective:

The exchange depreciation and devaluation are not likely to bear desired results if the elasticities of demand for imports and exports are less than unity. The multiple exchange rates system permitted the exchange depreciation selectively for goods in case of which the elasticity co-efficient related to demand for imports and exports were more than unity and exchange appreciation remained enforced in case of other goods.

3.1.2 Off-Setting of BOP Disequilibrium:

The multiple exchange rates are the most appropriate in tackling the situation in which a country has a BOP deficit with a particular country or countries but an overall surplus. The lowering of exchange rate in case of only those commodities exported to and imported from those countries can adjust the BOP deficit without affecting the overall surplus. The fixed or flexible exchange rate is suited to adjust the overall BOP deficit or surplus. Neither of the two systems can have a differential effect.

3.1.3 Achievements of Desired Capital Flows:

If a country wants to achieve a higher capital inflow from one country and to prevent capital outflow to another country, the multiple exchange rates can serve the purpose with a high degree of success. A higher exchange rate applicable to the first and lower exchange rate applicable to the second can do the needful. In addition, the multiple exchange rates can be used for channelizing the foreign capital into more desirable lines of production.

3.1.4 Proper Planning of Imports:

A developing country wants to restrict the import of luxury goods and other consumer goods. At the same time, it wants to enlarge the import of capital goods, intermediate goods, primary goods and technical know-how. A single uniform rate of exchange cannot facilitate such desired change in the composition of imports.

The multiple exchange rates can be very effective in this respect. Through proper planning of imports by selective application of rates of exchange on different categories of importable goods, a country can raise its development potential.

3.1.5 Diversification of the Economy:

This system of exchange rates can permit the diversification of industries in a country through favourable rate of exchange. These can ensure protection to decaying industries from foreign competition. A series of new export goods industries can be developed. The processing industries and defence industries can be encouraged through more favourable rates of exchange. The industrial diversification through varied exchange rates can raise production, income, foreign exchange earnings and the level of domestic employment.

3.1.6 Additional Government Revenues:

As the multiple rates of exchange bring about expansion and diversification of industries, the government becomes able to realise additional revenues from excise duties and other domestic taxes.

3.1.7 Reduction in the Cost of Living:

The multiple exchange rates allow the import of necessary consumer goods at low prices. The competition from cheap foreign produced goods keeps the prices of domestically produced consumer goods also low. The import of cheap primary and intermediate goods keeps the cost-push factors in check.

Thus, the multiple exchange rates bring about a reduction in the cost of living and consequent improvement in the living standards of the people. This system of exchange

rates can assist in price-stabilisation policies. The additional tax revenues obtained by the government can be harnessed in financing anti-inflationary policies.

3.1.8 Protection:

Through appropriate changes in exchange rate, the weak and sick industries in the home country can be protected from competition from the foreign produced goods, while at the same line, the growth of export industries can be promoted and necessary capital goods imports can be maintained through the favourable exchange rates.

3.1.9 Better Terms of Trade:

The multiple exchange rates can be used selectively to keep export prices at a higher level, while keeping import prices at a relatively lower level. In this way, a country practicing multiple exchange rates, can secure better or more favourable terms of trade.

3.2 Demerits of Multiple Exchange Rates:

This system of exchange rates is objected by critics on account of some of its demerits which are as below [17]:

3.2.1 Highly Complex and Cumbersome:

In this system of exchange rates, a country has a very complex and cumbersome structure. A large number of different rates of exchange are applicable to different categories of goods. It calls for large administrative machinery, bureaucratic red-tape and corruption. The authorities are required to have a highly complex system of trade and exchange controls to sustain it. The system can be likened to tight-rope walking when there are too many ropes.

The monetary authorities have to perform a very tough task of maintaining the stability of multitudes of officially fixed exchange rates. In view of its complexity and cumbersome character, the affected countries, GATT and IMF considered fiscal measures like taxes, subsidies and licenses as better than the multiple exchange rates.

3.2.2 Adverse Effect on Home Industries:

If the multiple exchange rates allow cheap imports from abroad, the domestic production is likely to be affected badly. It became evident in the cases like meat industry in Peru and wheat flour industry in Ecuador.

3.2.3 Discriminatory:

The multiple exchange rates are discriminatory in nature. If there is an over-all depreciation of currency, the adverse effect is widely spread over many commodities and many countries. On the opposite, the multiple exchange rates hit specific countries much harder. In view of its discriminatory effect, the international economic and political relations are likely to get worsened.

3.2.4 Black Marketing:

The multiple exchange rates lead to arbitrage. The foreign exchange is bought in the cheaper market and sold in the dearer market. Thus, this exchange system promotes black marketing. The importers may import products at the more favourable rates and

re-export the products at still more favourable exchange rates, applicable to different items of exports.

3.2.5 Wasteful:

The system of multiple exchange rates is wasteful. It sometimes leads to large stock-piling of exportable goods in anticipation of more favourable reclassifications of some of them. The accumulation of inventory stocks signifies those investible resources have not been properly utilised.

3.2.6 Not a Sound Method for Financing Development:

It is claimed that the multiple exchange rates assist in mobilisation of large amounts of investible resources from the possible trade surplus. In addition, the additional tax revenues can also be utilised for financing the development programme in a less developed country. In fact, the multiple exchange system cannot serve as a sound method for financing development. It is not necessary that the multiple exchange system can generate sufficiently large export surplus to help finance a development programme. As regards, the additional tax revenues, it may be pointed out that such revenue receipts are likely to be uncertain and unpredictable on account of unexpected changes in trade composition and the balance of payments position. The mobilisation of additional tax revenue, through heavily taxing exporters, violates the canons of equity and economy. The development resources can be generated through the creation of large surplus only if this system of exchange rates brings about a substantial reduction in imports. There can be relatively greater reduction in the import of only those commodities, the demand for which is relatively more elastic. In less developed countries, over the development process, the import of foodstuffs, raw materials, machinery and advanced technical know-how is inelastic. Therefore, the multiple exchange rates may not be effective in bringing about a desired reduction in imports. The capacity to export being also limited, the multiple exchange rates may fail to cause adequate enlargement of exports. In fact, the LDCs remain confronted with persistent BOP deficits. From the above reasoning, it becomes clear that this system does not provide a sound way for financing development programme in the developing countries.

3.2.7 Absence of Requirements for Success:

The multiple exchange rates can achieve success in adjusting BOP disequilibrium, if certain requirements are fulfilled. Firstly, there should be complete knowledge about elasticities of demand for and supply of exports and imports. Secondly, the long-time must be given for making adjustments. Thirdly, there must be the adequate availability of reserves of gold and other acceptable currencies for making adjustments. In actual reality, these requirements cannot be fully met. Therefore, the multiple exchange rates cannot achieve the desired results.

3.2.8 Less Effective than Quantitative Restrictions:

The quantitative restrictions such as import licenses, export licenses, exchange controls have proved to be relatively more effective in restraining imports than the multiple exchange rates. Even an unfavorable exchange rate applied in the case of a

certain category of goods may not succeed in reducing import as in case of luxury goods. It is possible that the rich do not bother about the higher import prices of luxury goods and continue to import them as before. In addition, the multiple exchange rates may be offset by monetary or fiscal policies pursued in either the home country or the foreign countries. It is for such reasons that economists had serious reservations about the effectiveness of multiple exchange rates relative to the quantitative controls. To be more effective, the multiple exchange rates should be properly coordinated with the quantitative restraints. Each set of policies should reinforce the other in encouraging exports, restricting imports and mopping up of export receipts for furthering the development process. The deficiencies of the multiple exchange rates are believed to outweigh their merits. Consequently, the world has developed stronger preference for managed float to a complicated and cumbersome system of multiple exchange rates which proved to be of a doubtful effectiveness.

4. Types of foreign exchange market

The foreign exchange market, also known as the forex market, is a global marketplace for trading in currencies. It is a decentralized market that allows you to buy and sell foreign exchange. The market is an over-the-counter market and the foreign exchange rates will be dictated by it. It involves the buying, selling and exchanging of currencies at the market rate. With regard to trade rate, forex is the largest in the world. Let us take a look at different types of foreign exchange markets, see Figure 2 [18].

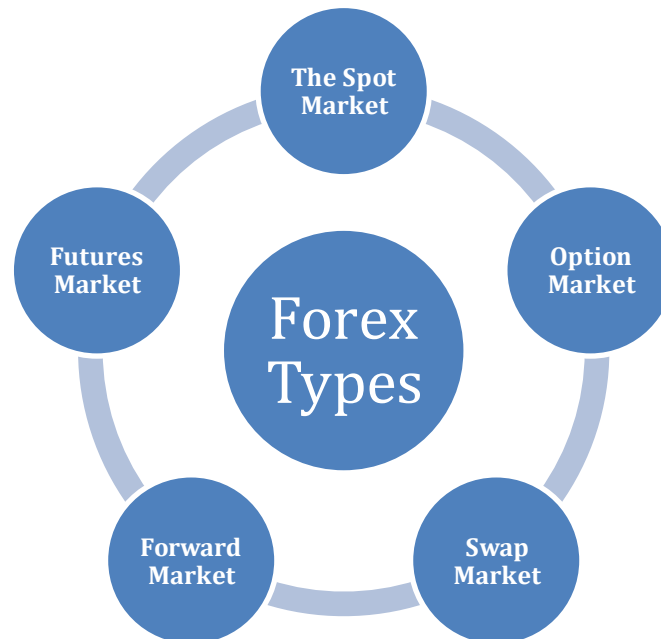


Figure 2: forex Types

i. The Spot Market

In the spot market, transactions involving currency pairs take place. It happens seamlessly and quickly. The transactions require instant payment at the prevailing exchange rate which is also known as the spot rate. The traders in the spot market are not exposed to the uncertainty of the market, which can lead to an increase or decline in the price between the agreement and trade.

ii. Futures Market

The transactions in the futures market require future payment and distribution at a previously agreed upon exchange rate which is known as the future rate. The transaction or agreement is more formal in nature which ensures that the terms of the transaction are set in stone and cannot be altered. Traders who conduct the majority of the

transactions enjoy a consistent return on the assets. Regular traders prefer a future market transaction.

iii. Forward Market

The third type of foreign exchange market is the forward market where deals are similar to future market transactions. In this case, the parties will negotiate the terms of the transactions and the terms agreed-upon can be negotiated and altered as per the needs of the concerned parties. The forward market has higher flexibility as compared to the futures market.

iv. Swap Market

When there is a simultaneous borrowing and lending of two types of currencies between two investors, it is known as a swap transaction. Here, one investor borrows a currency and in turn, pays in the form of a second currency to the second investor. The transaction is done to pay off their obligations without having to deal with a foreign exchange risk.

v. Option Market

In the options market, the currency of exchange from one denomination to the other is agreed upon by the investor at a specific rate and on a specific date. The investor has a right to convert the currency on a future date but there is no obligation to do so. These are the five types of foreign exchange markets that exist in the country. In short, the market enables easy and quick conversion of currency from one denomination to another. If you want to start forex trading, simply open a demit trading account and start investing. The transactions can be done in all conversions of currencies. Globalization has led to a surge in the number of foreign exchange transactions that are carried out in the year.

5. Fixed exchange rate system

A fixed exchange rate, often called a pegged exchange rate, is a type of exchange rate regime in which a currency's value is fixed or pegged by a monetary authority against the value of another currency, a basket of other currencies, or another measure of value, such as gold. There are benefits and risks to using a fixed exchange rate system. A fixed exchange rate is typically used to stabilize the exchange rate of a currency by directly fixing its value in a predetermined ratio to a different, more stable, or more internationally prevalent currency (or currencies) to which the currency is pegged. In doing so, the exchange rate between the currency and its peg does not change based on market conditions, unlike in a floating (flexible) exchange regime. This makes trade and investments between the two currency areas easier and more predictable and is especially useful for small economies that borrow primarily in foreign currency and in which external trade forms a large part of their GDP [19]. A fixed exchange rate system can also be used to control the behaviour of a currency, such as by limiting rates of inflation. However, in doing so, the pegged currency is then controlled by its reference value. As such, when the reference value rises or falls, it then follows that the value(s) of any currencies pegged to it will also rise and fall in relation to other

currencies and commodities with which the pegged currency can be traded. In other words, a pegged currency is dependent on its reference value to dictate how its current worth is defined at any given time. In addition, according to the Mundell–Fleming model, with perfect capital mobility, a fixed exchange rate prevents a government from using domestic monetary policy to achieve macroeconomic stability. In a fixed exchange rate system, a country's central bank typically uses an open market mechanism and is committed at all times to buy and/or sell its currency at a fixed price in order to maintain its pegged ratio and, hence, the stable value of its currency in relation to the reference to which it is pegged. To maintain a desired exchange rate, the central bank during a time of private sector net demand for the foreign currency, sells foreign currency from its reserves and buys back the domestic money. This creates an artificial demand for the domestic money, which increases its exchange rate value. Conversely, in the case of an incipient appreciation of the domestic money, the central bank buys back the foreign money and thus adds domestic money into the market, thereby maintaining market equilibrium at the intended fixed value of the exchange rate.[20] Under this system, the central bank first announces a fixed exchange-rate for the currency and then agrees to buy and sell the domestic currency at this value. The market equilibrium exchange rate is the rate at which supply and demand will be equal, i.e., markets will clear. In a flexible exchange rate system, this is the spot rate. In a fixed exchange-rate system, the pre-announced rate may not coincide with the market equilibrium exchange rate. The foreign central banks maintain reserves of foreign currencies and gold which they can sell in order to intervene in the foreign exchange market to make up the excess demand or take up the excess supply [21]. The demand for foreign exchange is derived from the domestic demand for foreign goods, services, and financial assets. The supply of foreign exchange is similarly derived from the foreign demand for goods, services, and financial assets coming from the home country. Fixed exchange-rates are not permitted to fluctuate freely or respond to daily changes in demand and supply. The government fixes the exchange value of the currency. For example, the European Central Bank (ECB) may fix its exchange rate at $\text{€}1 = \$1$ (assuming that the euro follows the fixed exchange-rate). This is the central value or par value of the euro. Upper and lower limits for the movement of the currency are imposed, beyond which variations in the exchange rate are not permitted. The "band" or "spread" in Figure 3 is $\text{€}0.6$ (from $\text{€}1.2$ to $\text{€}1.8$).[22].

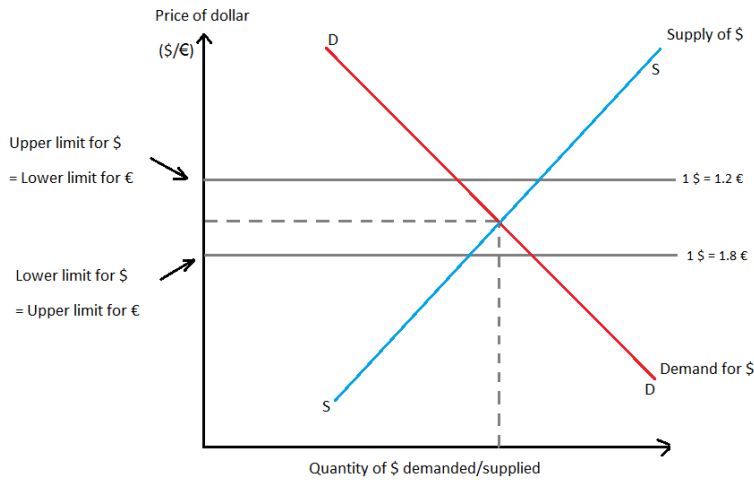


Figure 3 Mechanism of fixed exchange-rate system

Figure 4 describes the excess demand for dollars. This is a situation where domestic demand for foreign goods, services, and financial assets exceeds the foreign demand for goods, services, and financial assets from the European Union. If the demand for dollar rises from DD to $D'D'$, excess demand is created to the extent of cd . The ECB will sell cd dollars in exchange for euros to maintain the limit within the band. Under a floating exchange rate system, equilibrium would have been achieved at e [23]. When the ECB sells dollars in this manner, its official dollar reserves decline and domestic money supply shrinks. To prevent this, the ECB may purchase government bonds and thus meet the shortfall in money supply. This is called sterilized intervention in the foreign exchange market. When the ECB starts running out of reserves, it may also devalue the euro in order to reduce the excess demand for dollars, i.e., narrow the gap between the equilibrium and fixed rates.

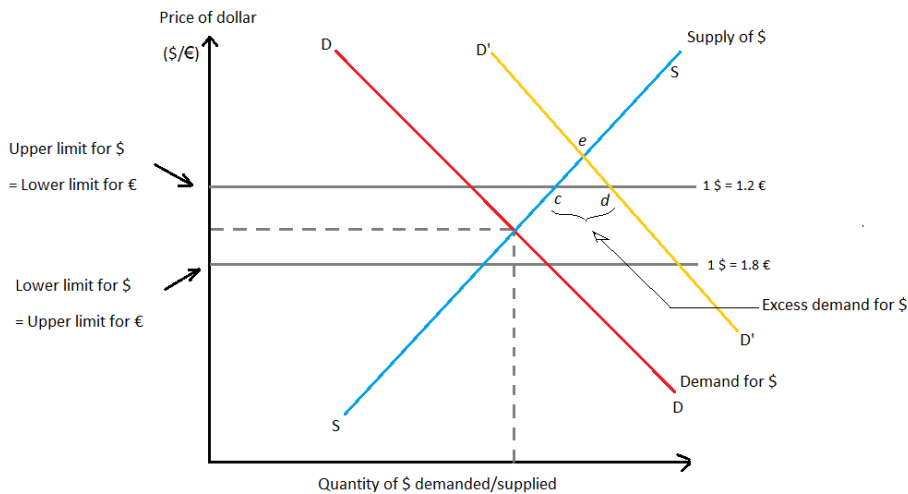


Figure 4 Excess demand for dollars

Figure 5 describes the excess supply of dollars. This is a situation where the foreign demand for goods, services, and financial assets from the European Union exceeds the European demand for foreign goods, services, and financial assets. If the supply of dollars rises from SS to $S'S'$, excess supply is created to the extent of ab . The ECB will buy ab dollars in exchange for euros to maintain the limit within the band. Under a floating exchange rate system, equilibrium would again have been achieved at e [24]. When the ECB buys dollars in this manner, its official dollar reserves increase and domestic money supply expands, which may lead to inflation. To prevent this, the ECB may sell government bonds and thus counter the rise in money supply. When the ECB starts accumulating excess reserves, it may also revalue the euro in order to reduce the excess supply of dollars, i.e., narrow the gap between the equilibrium and fixed rates. This is the opposite of devaluation.

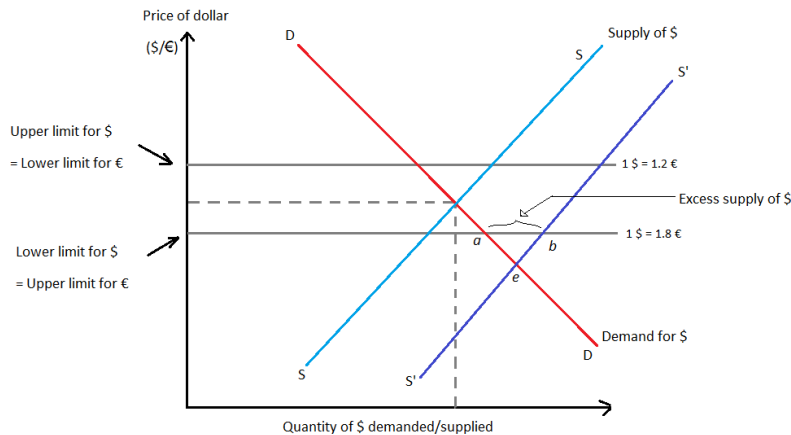


Figure 5 Excess supply of dollars

Fig.3 describes the excess supply of dollars. This is a situation where the foreign demand for goods, services, and financial assets from the European Union exceeds the European demand for foreign goods, services, and financial assets. If the supply of dollars rises from SS to $S'S'$, excess supply is created to the extent of ab . The ECB will buy ab dollars in exchange for euros to maintain the limit within the band. Under a floating exchange rate system, equilibrium would again have been achieved at e [25]. When the ECB buys dollars in this manner, its official dollar reserves increase and domestic money supply expands, which may lead to inflation. To prevent this, the ECB may sell government bonds and thus counter the rise in money supply. When the ECB starts accumulating excess reserves, it may also revalue the euro in order to reduce the excess supply of dollars, i.e., narrow the gap between the equilibrium and fixed rates. This is the opposite of devaluation.

6. Fixed exchange rate advantages and disadvantages

6.1 Advantages of Fixed Exchange Rate:

This policy has several advantages. First, it stabilizes the currency, which makes it easier for businesses to plan and grow. Second, a fixed exchange rate makes it easier for countries to borrow money since investors know exactly how much they will be paid in foreign currency. Finally, it gives people confidence in their currency, which helps to attract investment and promote trade. In a nutshell, the following are advantages of fixed exchange rates [26], [27]:

Avoid currency fluctuations: If you're looking to avoid currency fluctuations, a fixed exchange rate is the perfect solution. With a fixed exchange rate, your currency remains the same regardless of how the market is performing. This means that you will be able to maintain your purchasing power regardless of how the market is changing. Additionally, it's important to note that a fixed exchange rate also eliminates the opportunity for arbitrage. Arbitrage is when one party takes advantage of a different price on two different markets. By having a fixed exchange rate, this opportunity is eliminated, which is an important safety feature.

Encourages investment: A fixed exchange rate system encourages investment in the country by making it more stable than a floating rate system. A fixed-rate system usually means that the currency is pegged to another currency. This creates stability for businesses and investors because they know what their currency will be worth in terms of other currencies. This prevents them from experiencing wild fluctuations in their assets or income. A fixed exchange rate system also helps to promote trade between countries because it makes it easier for people to convert their money into the currency of the country, they want to invest in. This increases investment and growth in both countries.

Keeps inflation low: A fixed exchange rate is a policy where the currency of a country is fixed to another currency. This prevents the country's inflation from increasing and helps to keep the prices of goods and services affordable for citizens. It also helps to create a more stable economy.

6.2 Disadvantages of Fixed Exchange Rate:

There are a few disadvantages to using a fixed exchange rate. One disadvantage is that it can lead to artificially high inflation rates over time. Another disadvantage is that it can make it difficult for countries to adjust their currency values when their exports or imports become more expensive or cheaper than expected. Other drawbacks are as follows [28], [36]:

Might hinder macroeconomic objectives: The fixed exchange rate system has been criticized for conflicts with other macroeconomic objectives, such as achieving sustainable economic growth. Under a fixed exchange rate system, the government sets a single currency value for all countries, which means that its value is not determined by market forces. This can lead to fluctuations in the currency's value and make it difficult for businesses to get loans in foreign currencies. Additionally, it can be risky for countries that have a high dependency on exports because their currency may become too weak against other currencies.

Less flexibility: One of the disadvantages of a fixed exchange rate is that it limits the country's flexibility. For example, if the country's currency is weak, it will have to devalue its currency in order to boost exports. This can lead to higher inflation and reduced economic growth. Another disadvantage is that it can create trade deficits. This means that the country imports more than it exports, which can lead to financial problems.

Require higher interest rates: Fixed exchange rate requires higher interest rates to keep the currency stable. This makes it difficult for businesses to borrow money in foreign currencies and export their goods. It also makes it more expensive for people to purchase foreign goods.

Difficulty in keeping the value of the currency: One of the disadvantages of a fixed exchange rate is that it can be difficult to keep the value of the currency stable. This can be especially problematic when there is a large deficit or an excess of currency in one country. When this happens, the value of the currency will decline, making imports more expensive and exports cheaper. This can cause a major economic problem.

7. Conclusion

In this paper, we presented a radically new approach for automated trading in the Forex market. The key methodological development is in introducing a classification

method which uses multi-scale. features extracted from FX rate. The underlying distribution of each scale feature was calculated as a classifiers and Bayesian voting method used to find the ensemble of these classifiers. Recall, precision, and average accuracy showed the superiority of the ensemble classifier. Experimental results showed that the proposed system is able to identify up and down trends in the FX rate signal accurately. Future direction for improvement includes extracting more features from FX rate and analysing the performance of other ensemble methods to combine the results of classifiers.

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