Currency Competition, Exchange Rate Regimes and Quantitative Easing (1)

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Introduction

- What do we mean by currency competition? Currencies compete to be used as the medium of exchange in international transactions. They also compete to be used as an international store of value, including as an international reserve currency in the official foreign exchange reserves of central banks and monetary authorities around the world.
- For example, the U.S. Dollar is used as a medium of exchange in the international trade of Taiwan. It is used instead of the local currency, the New Taiwan Dollar, because the trading partners of Taiwan trust the ability of the U.S. Dollar to hold its value more than the ability of the New Taiwan Dollar and they believe that more people around the world will be prepared to accept the former than the latter.
- Currency competition is totally different from the competitive devaluation of currencies. Competitive devaluation of currencies means different countries try to lower the values of their respective currencies relative to their competitors so as to make their exports cheaper and thus gain a competitive advantage in international trade.

Introduction

- What do we mean by an exchange rate regime? An exchange rate regime is the mechanism or system through which the exchange rate of the currency of a country or region relative to the currencies of the other countries and regions is determined.
- From the end of the Second World War to 1971, the world operated on the Bretton Woods System, under which the exchange rates between the currencies of any two member countries of the International Monetary Fund were relatively fixed. Occasionally, the exchange rate of a country or region would be adjusted upwards, that is, revalued, if it had persistent trade surpluses, or downwards, that is, devalued, if it had persistent trade deficits, so as to bring its international trade into balance.
- Otherwise, the relative exchange rates were quite stable, with the result that all currencies were considered to be equally trustworthy, because they could always be converted into one another according to these stable fixed parities. A country that managed to accumulate a large quantity of another country's currency could exchange the currency with that country for gold at a fixed parity if it so wished.

Introduction

- In 1971, the United States unilaterally abolished the Bretton Woods System, and put the entire world, or almost the entire world, on a system of floating exchange rates, which are determined daily in the foreign exchange markets.
- These are generally referred to as “floating” rate regimes, although it is possible to further distinguish between the freely floating and the managed floating rate regimes. The latter is sometimes also referred to as a “dirty float”.
- And exceptionally there are a few countries and regions that have adopted the fixed rate regime, fixing its exchange relative to another currency. For example, the exchange rate of the Hong Kong Dollar has been fixed at HK$7.8 per US$ since 1983. One can also envision an exchange rate that is fixed to the weighted average of a basket of currencies, but such an exchange rate regime will also be referred to as floating-rate rather than fixed-rate.

Introduction

- For many economies, especially smaller ones, the exchange rate is probably too important a price to be left entirely to the vagaries of the foreign exchange market, which is often dominated by professional speculators such as hedge funds. Thus, they often practice a version of the "managed float".
- While it is desirable that exchange rates should be able to adjust to changes in market conditions, they have become extremely volatile in recent years. It is difficult to see how such a high degree of volatility benefits anyone except the currency traders, bankers and professional speculators.
- Volatility and long-term instability of exchange rates reduce international trade as well as long-term cross-border investments, including both direct and portfolio investments. They also tend to destabilize the real economies as well as reduce their real rates of growth.

Introduction

- One point that is worth noting is that the exchange rate is a relative price, not an absolute price, since it has been delinked from gold.
- In a world with n economies, only (n-1) of them can freely choose their respective exchange rates. The currency of one country has to serve as the numeraire currency. This role is currently played by the U.S. Dollar. Its exchange rate vis-a-vis all other individual currencies is determined in the foreign exchange markets in all the countries. The U.S. central bank does not intervene at all directly or overtly in the foreign exchange markets. (But see the discussion below on quantitative easing.)

Introduction

- Timely interventions and the creation and maintenance of stable and sustainable expectations in the foreign exchange markets are sometimes both necessary and beneficial. There have been quite a few examples of successful intervention.
- During the 1997-1998 East Asian currency crisis, the Chinese Government kept the Yuan/US$ exchange rate unchanged despite strong market sentiments and speculation that it should/would devalue. The Chinese decision was an important factor in the subsequent stabilization of the crisis and the relatively speedy recovery of the East Asian economies.
- More recently, in the aftermath of the Tohoku Earthquake and Tsunami, the Group-of -Seven (G-7) countries saw it fit to intervene in the Japanese Yen market to stabilize the Yen/US$ exchange rate—a recognition that excess exchange rate volatility would be harmful not only to Japan but also to the world and moreover, it is too risky to leave it to the market "to take care of it."

Introduction

- Quantitative Easing (QE) is a policy of a central bank that increases the money supply and liquidity in the economy by purchasing securities of its own country, mostly bonds, of both short and long maturities, from the commercial banks as well as the public at large, with the goal of bringing down both the short and the long-term interest rates so as to stimulate additional (new) real investment in the country.
- However, it may not succeed in stimulating additional new investment but it can generate many side effects, some of which can be quite negative.

Currency Competition and Substitution

- The currencies commonly used as media of international exchange and international stores of value and as international reserve currencies have undergone major changes. In the immediate aftermath of the Second World War, there were two major international reserve currencies, the British Pound and the U.S. Dollar. However, after 1971, the U.S. Dollar has become the sole dominant currency, until the Euro was introduced in the late 1990s.
- In the charts that follow, the shares of each currency used in world settlement at selected dates between 2010 and 2016 are presented in the order of the sizes of their relative shares, starting from the highest, from left to right, and compared to the shares of the respective country/region in world trade.
- A country's share of world trade is an important, but not the only, determinant of whether its currency is widely used as a medium of international exchange. Every country prefers to use its own currency for the settlement of its international transactions because it minimizes both risks and transactions costs.

Currency Competition and Substitution

- For example, when Taiwan trades with Indonesia, it is in the interests of both sides to agree to invoice, clear and settle their transactions in one of their own currencies because then either the exporter or the importer will have no currency risk and there is only the cost of one currency conversion, from either NT$ to Indonesian Rupiah or vice versa.
- However, under the currently most common alternative of using the U.S. Dollar as an invoicing, clearing and settlement currency for international transactions, there will be two currency conversions, between the US$ and respectively the NT$ and the Indonesian Rupiah. In addition, both the Taiwan and the Indonesian traders will have to assume currency risks.

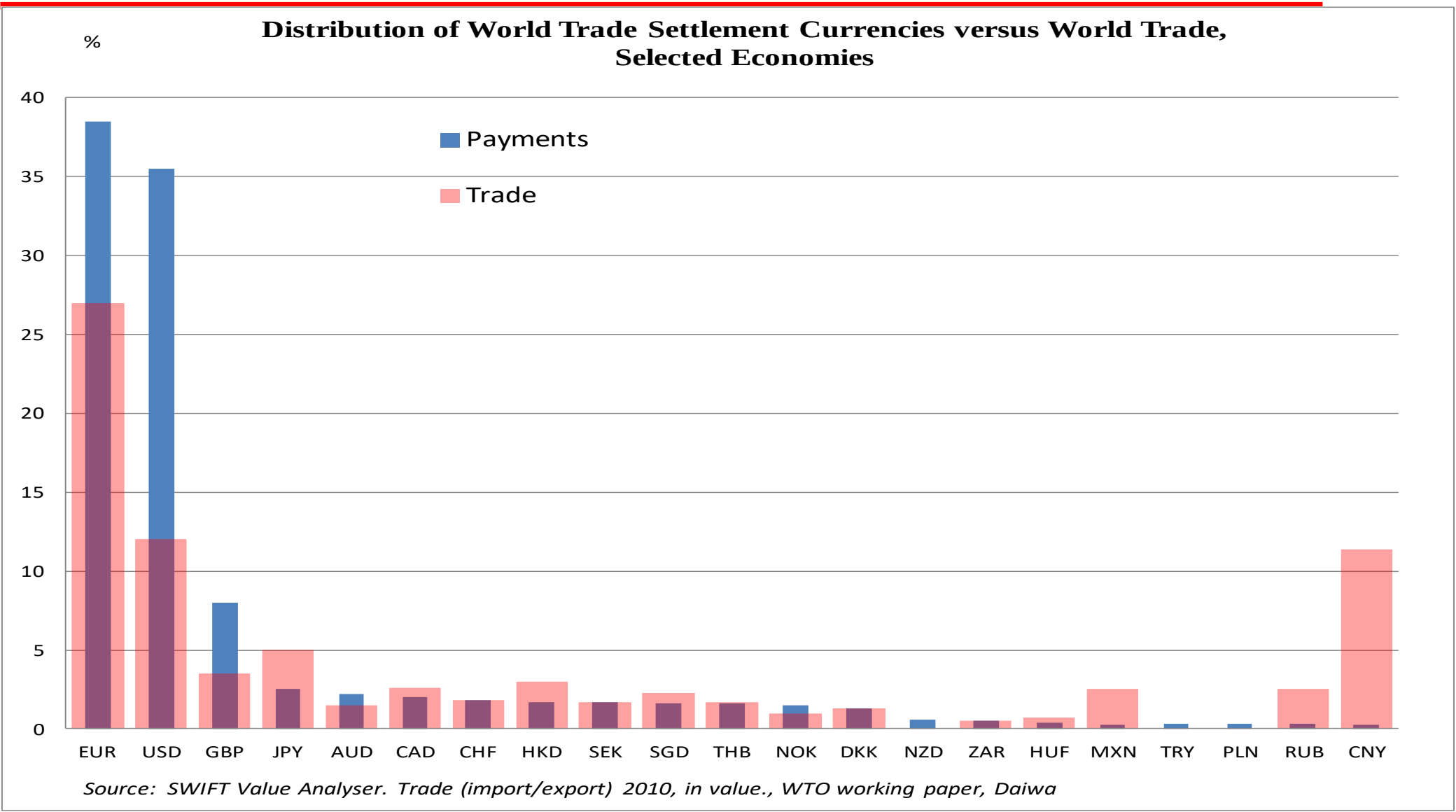
Currency Competition and Substitution

- An economy which is able to invoice, clear and settle transactions in its own currency has the additional advantage that it does not need to maintain a large foreign exchange reserves for transactions purposes besides the reduction in its transactions costs and currency risks.
- But if the two trading partners do not trust and do not want to hold each other's currency, they will have to use the currency of a third country that both of them trust and accept (frequently this turns out to be the US$), and incur the additional costs and risks.
- That is why the currencies of some countries and regions, such as the United States and the Euro Zone, are used by other countries and regions as the invoicing, clearing and settlement currencies, and that is also why they can account for a much larger share of world payments than their own respective shares of world trade.

Currency Competition and Substitution

- This is what currency competition is about—to become the most widely used currency in international transactions and international repositories of wealth.
- It is important to note that the choice of a currency as a medium of international exchange can change quite quickly. In 2010, even after the European sovereign debt crisis broke out, the Euro was still the most widely used currency for invoicing, clearing and settlement purposes, accounting for almost 40% of the total world payments, but only a little more than 25% of total world trade. The U.S. Dollar was a close second, accounting for a little over 35% of world payments but only around 12% of world trade. The British Pound was third, accounting for not quite 9% of the world payments and 3% of world trade. The Renminbi was in the 21st place in terms of its share of total world payments despite its more than 10 percent share in world trade.

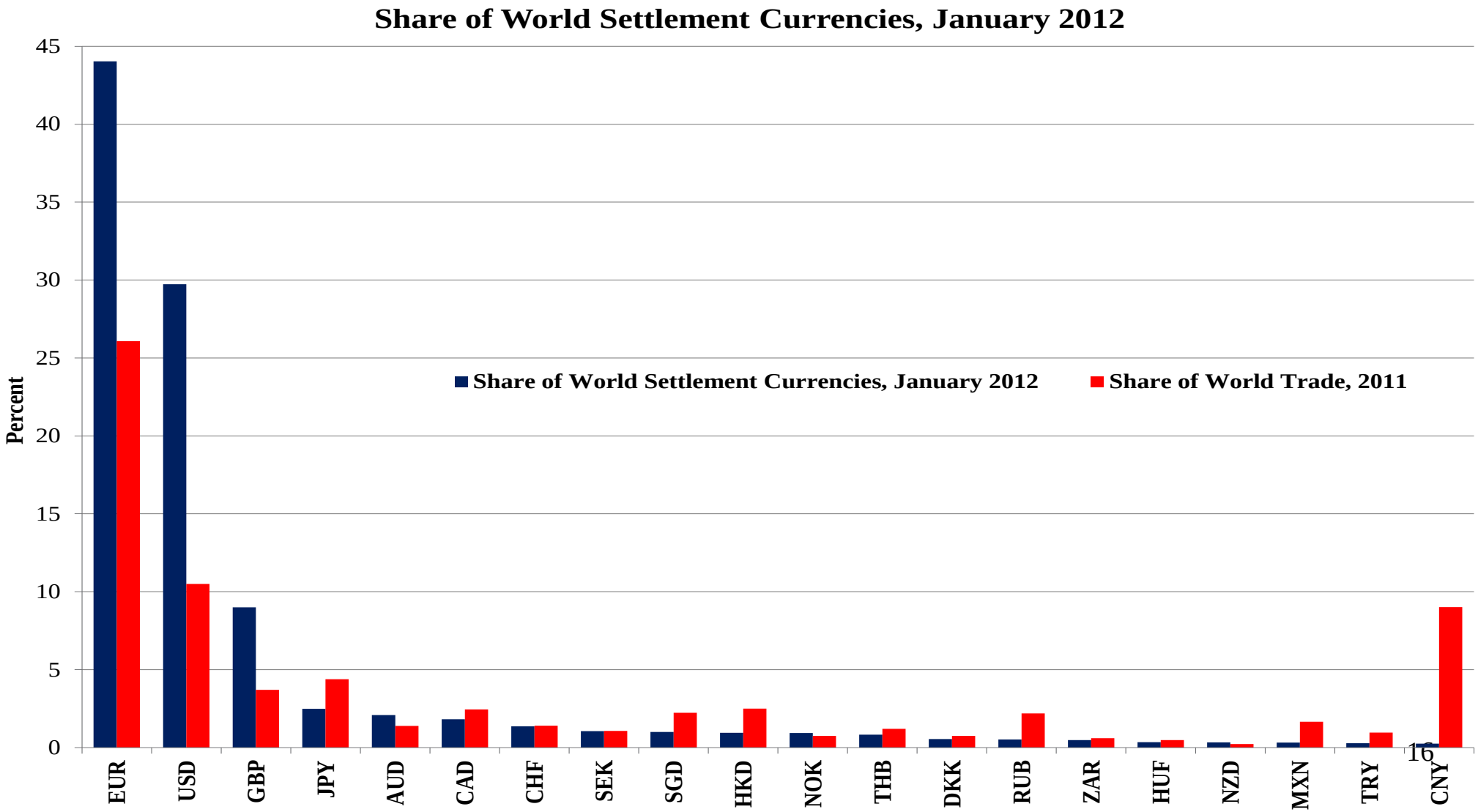
Distribution of World Trade Settlement Currencies versus World Trade, 2010



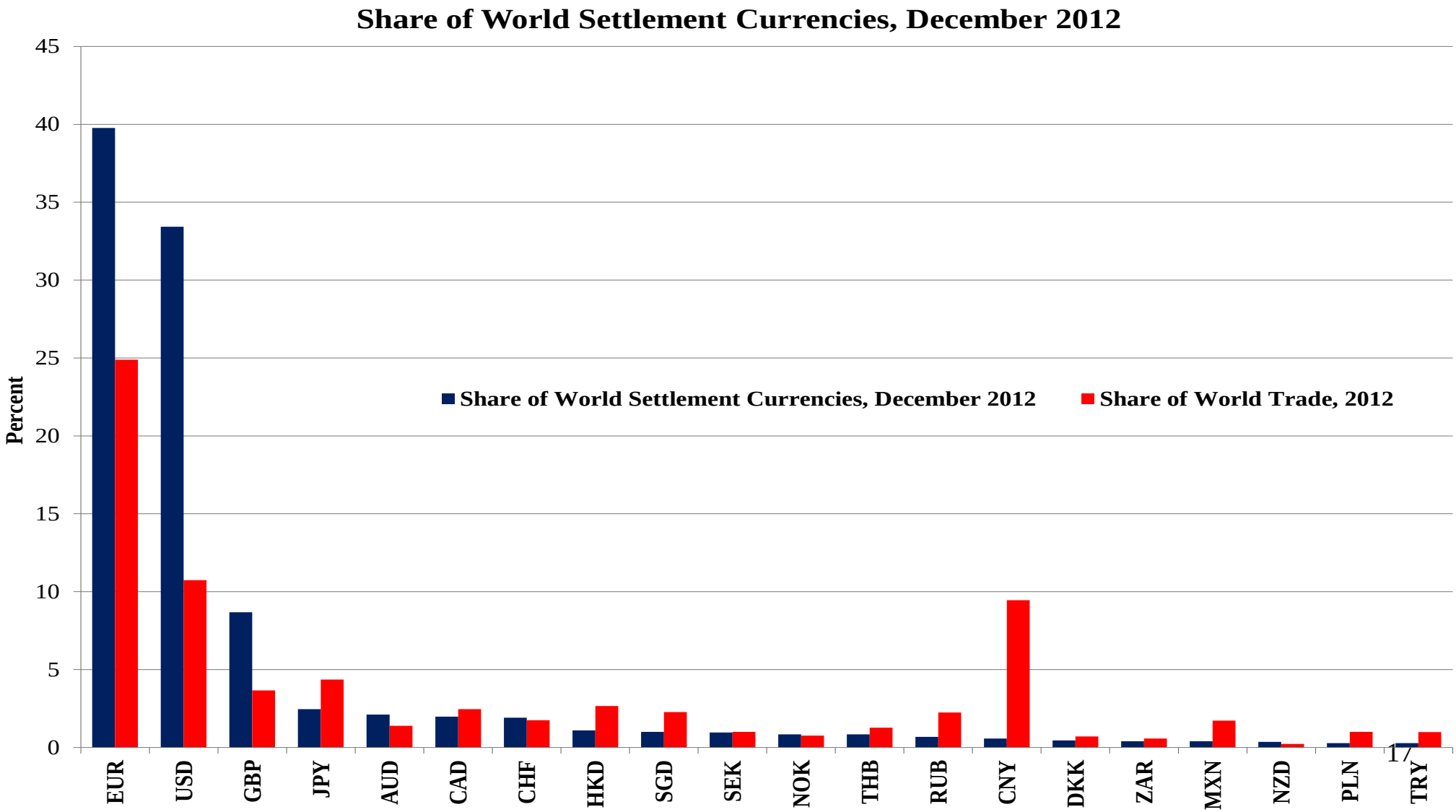
Currency Competition and Substitution

- In January 2012, the Renminbi became the 20th most used currency for world payments, with 0.3%, despite a world trade share of 9%. The Euro's share of world payments went up to 44%, followed by the U.S. Dollar with almost 30%. (This was a period during which the U.S. Dollar was devaluing with respect to almost all of the other currencies because of the "Quantitative Easing" in the U.S.)
- By December 2012, the Renminbi advanced to the 14th place. The share of the Euro fell to just below 40% and that of the U.S. Dollar rose to more than 33%.
- By December 2013, the Renminbi advanced to the 8th place, ahead of the Hong Kong Dollar. The share of the U.S. Dollar rose to almost 40% and the share of the Euro fell to 33.2% even though the shares of world trade of the United States and the Euro Area remained essentially unchanged.

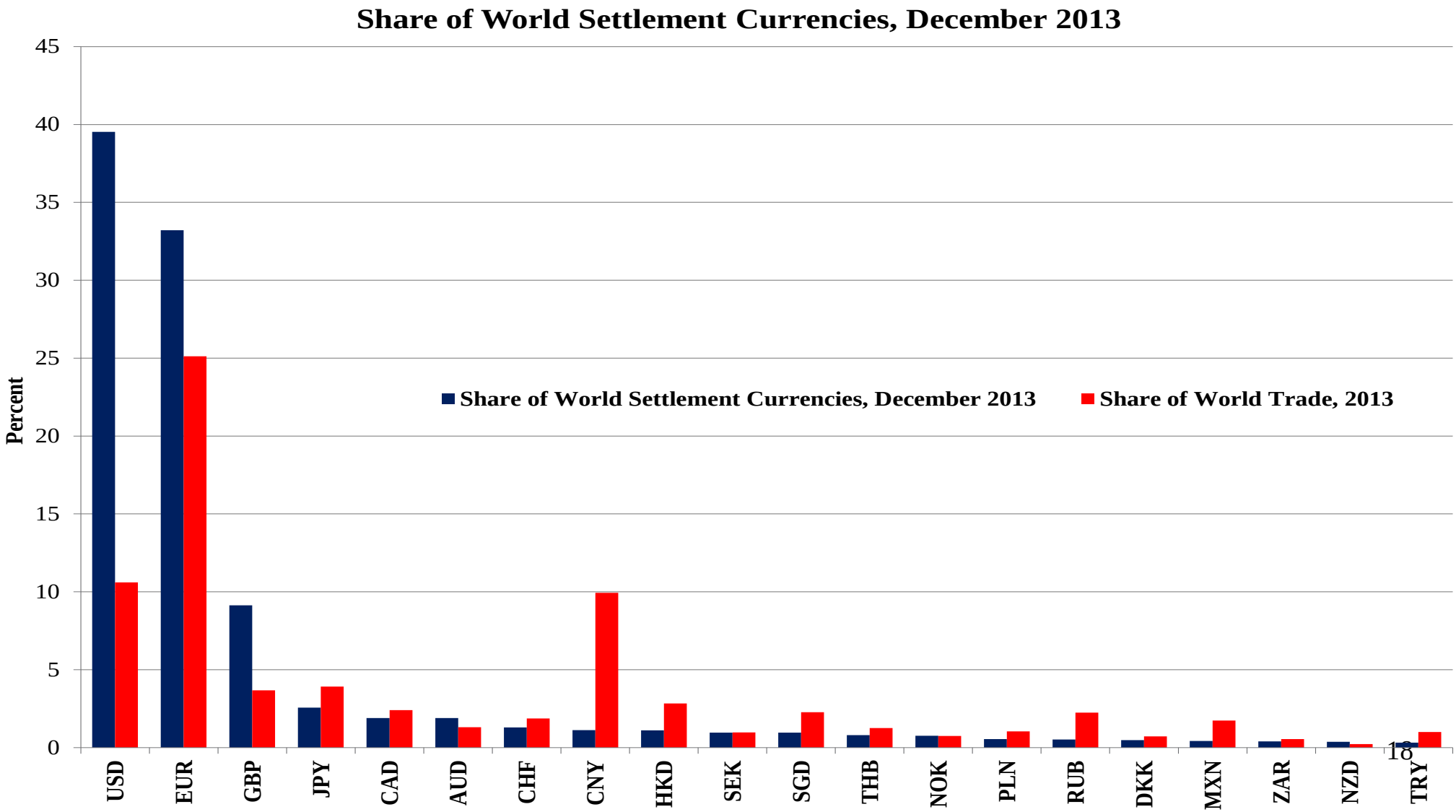
Distribution of World Trade Settlement Currencies versus World Trade, Jan. 2012



Distribution of World Trade Settlement Currencies versus World Trade, Dec. 2012



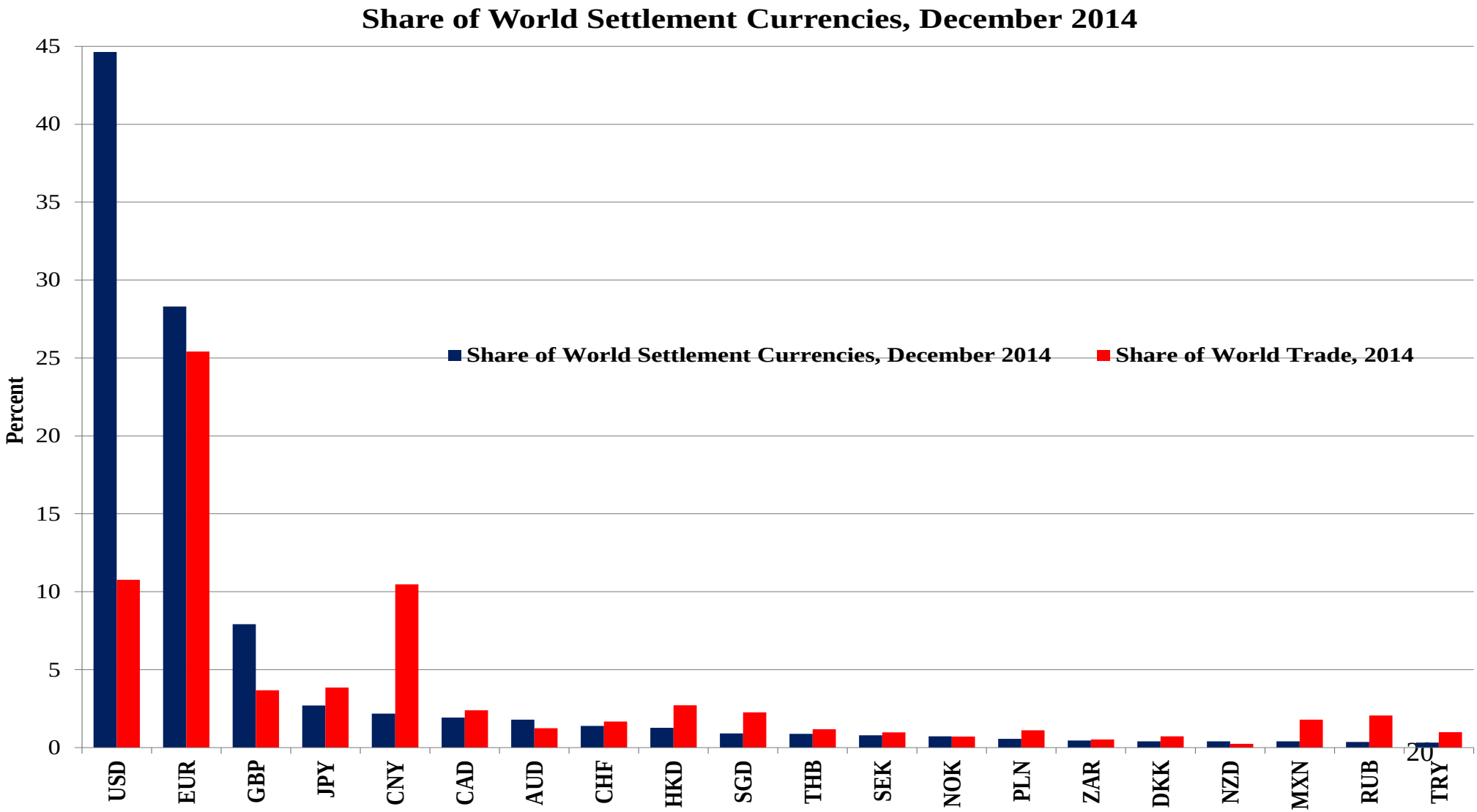
Distribution of World Trade Settlement Currencies versus World Trade, Dec. 2013



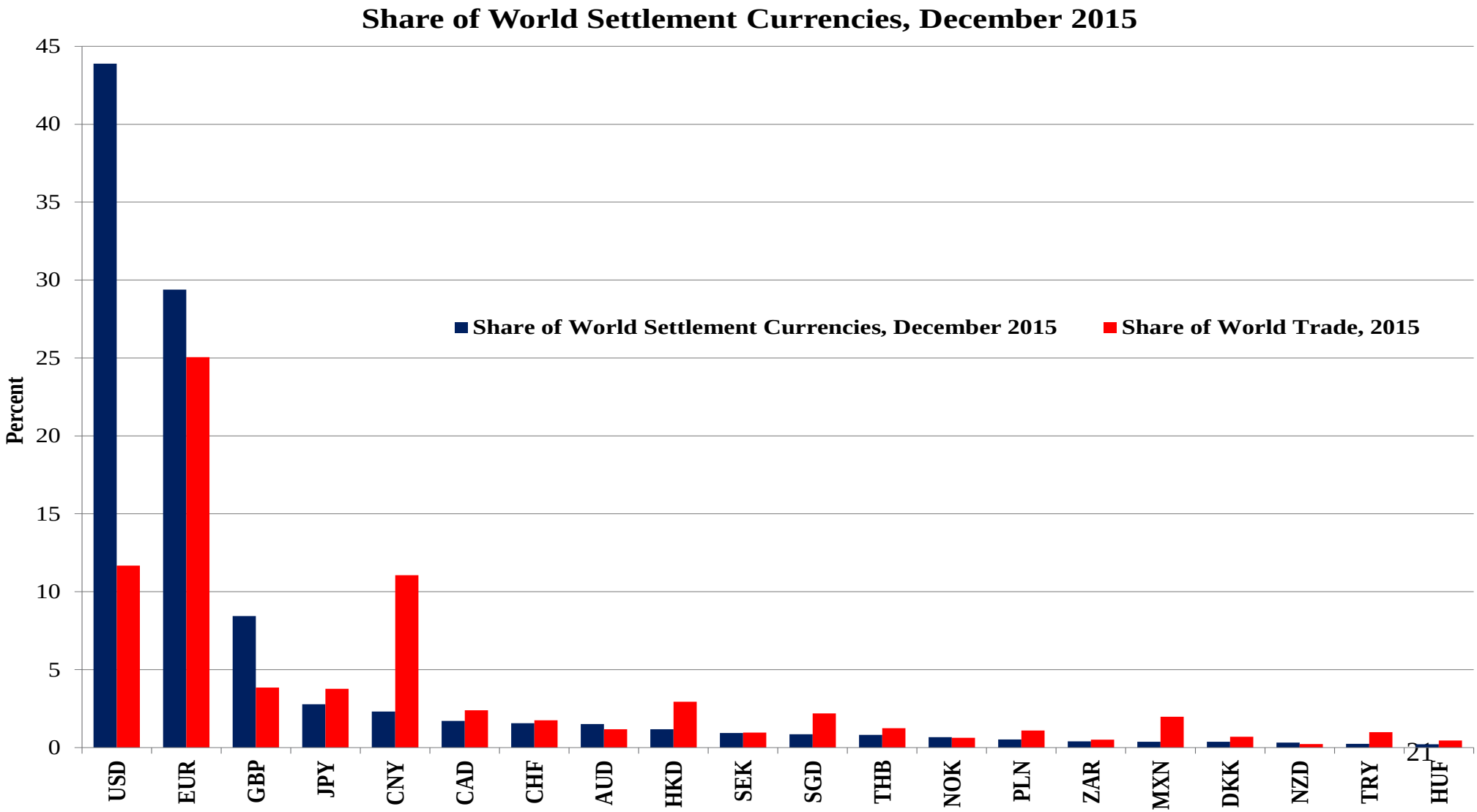
Currency Competition and Substitution

- By December 2014, the Renminbi became the 5th most used currency for world payments, with 2.2%, despite a world trade share of 10.5%. The U.S. Dollar's share of world payments went up to almost 45%, followed by the Euro with a little more than 28%.
- By December 2015, the Renminbi remained in the 5th place for world payments, with 2.3%. The share of the U.S. Dollar was just below 44% and that of the Euro just above 29%.
- By July 2016, the Renminbi remained in the 5th place behind the British Pound and the Japanese Yen, with 1.9%. The share of the U.S. Dollar fell to 41% and the share of the Euro rose to 31% even though the shares of world trade of the United States and the Euro Area remained essentially unchanged.
- Throughout the period 2010-2016, the U.S. Dollar and the Euro combined accounted for more than 70% of world payments.

Distribution of World Trade Settlement Currencies versus World Trade, Dec. 2014



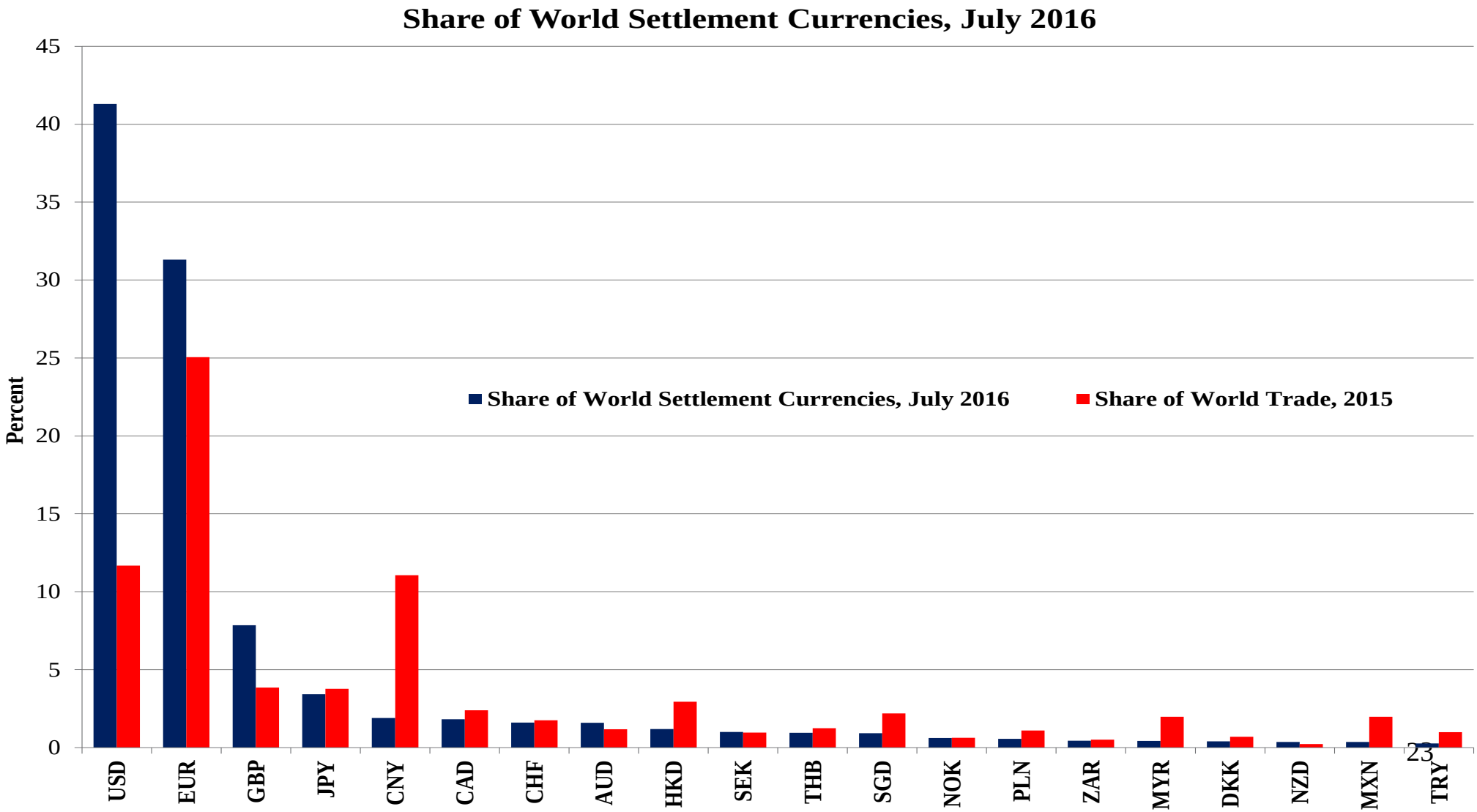
Distribution of World Trade Settlement Currencies versus World Trade, Dec. 2015



Currency Competition and Substitution

- By July 2016, the U.S. Dollar accounted for 41.3% of world settlement, even though the U.S. itself accounted for only 11.7% of world trade in 2015, followed by the Euro, which accounted for 31.3% of world settlement (with the Euro Area accounting for 25% of world trade). The Chinese Yuan, with not quite 2%, was in the fifth place in terms of world settlement, while China also accounted for 11.1% of world trade.
- In contrast, the Japanese Yen accounted for 3.4% of world payments with Japan accounting for 3.8% of world trade in 2015.
- If the Japanese experience is any guide, it shows that there is still a great deal of room for the Renminbi to grow in terms of its share of world settlement.
- This would eventually mean even less need for the People's Bank of China to maintain a high level of official foreign exchange reserves for transactions purposes.
- The British Pound may be expected to begin to lose its share of the world payments in the aftermath of "Brexit".

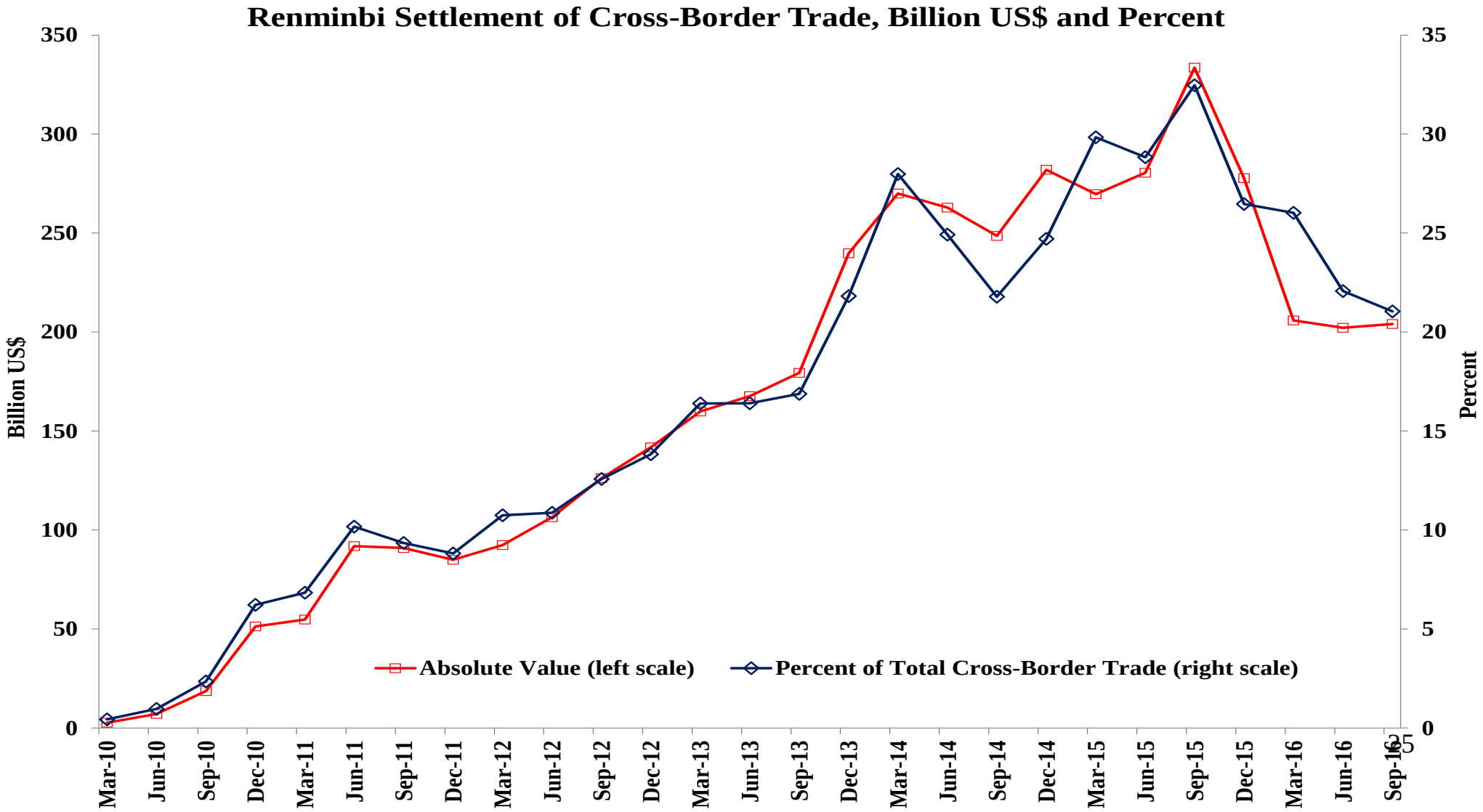
Distribution of World Trade Settlement Currencies versus World Trade, July 2016



Currency Competition and Substitution

- In the following chart, the percentage of Chinese international trade invoiced, cleared and settled in Renminbi over time is presented. It also shows how far the Renminbi has come as a currency for international exchange, but also how much further it needs to go to reach the same level as the Japanese Yen.
- The Renminbi would have made more progress if it were not for its unexpected and unexplained devaluations in August 2015 and January 2016. This shows how important confidence can be to the use of a currency.
- Recall that at one time, the New Taiwan Dollar was commonly used in cross-strait trade but the devaluation of the NT$ during the 1997-1998 East Asian currency crisis essentially put an end to the practice.

Renminbi Settlement of Chinese Cross-Border Trade, Billion US$ and Percent



Currency Competition and Substitution

- Besides the share in world trade of the issuing country, what else determines how much a currency will be used as an international medium of exchange?
- The first and foremost consideration is whether the currency is accepted readily and widely outside the issuing country. If it is, then there is no problem for a recipient of the currency to use it for other purposes. This is the network effect at work—the more people accept a currency, the more other people are likely to accept it.

Currency Competition and Substitution

- In a way, accepting a foreign currency is like choosing a second language. Most people will choose to learn a second language that has the widest use, other things being equal. (Of course the language of a close neighboring country is also a possibility.) The scale is important. The ease to learn or the elegance of the language is much less important.
- For this reason, once a language establishes itself as the most popular first or second language in the world, it is extremely difficult to dislodge, More people will want to learn and use it, and it will become even more useful and attractive to others. The choice of a currency for international exchange is similar. However, there have been and will be changes over time. For example, the British Pound is no longer as widely used as it was in the 1960s. And the Euro, which was at one time even more widely used than the U.S. Dollar, has fallen behind too.

Currency Competition and Substitution

- There is also a “safe haven” effect. People want to keep their wealth in a safe currency and in a safe place, especially in times of turmoil. The U.S. Dollar is a “safe haven” currency, but so is the Swiss Franc. However, this has more to do with the choice of an international store of value, rather than a medium of international exchange. Expectations of what is safe and what isn’t can make a difference, and these expectations, if widely held, can be self-fulfilling.
- A currency widely used as a medium of international exchange by a country is likely to wind up with a significant share in the foreign exchange reserves of that country.

Currency Competition and Substitution: The Benefits of Seigneurage

- And what are the advantages for the issuer of that currency?
- Under the Bretton Woods system, since all currencies are in principle equal, there is not that much seigneurage to be had.
- One advantage is seigneurage: in the same way that a government benefits from being able to print money that it can use to purchase goods and services domestically, the supplier of the medium of international exchange also enjoys the same privilege. It can simply buy goods and services worldwide with pieces of paper that it can simply print at will. In particular, it can run much larger trade deficits for longer periods than other countries.

Currency Competition and Substitution: The Benefits of Seigneurage

- And the more volatile the exchange rates of the other currencies, the better for the currency because it will then be in even greater demand.
- And if it so happens that it is also a "safe haven" currency, the issuing country will further benefit because the worse the rest of the world economy becomes, the more capital will want to flow into that currency and country.
- A country that supplies the bulk of the medium of international exchange does not need to maintain foreign exchange reserves for transaction purposes, because almost all other countries are ready to accept its currency for international transactions. For example, the U.S. does not maintain any official foreign exchange reserves.

The Internationalization of the Renminbi: The Benefits and Costs of Seigneurage

- The U.S. is the major beneficiary of seigneurage, that is, the provision of the international medium of exchange. As long as most countries rely on the U.S. Dollar for the invoicing, clearing and settlement of their international transactions, they will need to hold U.S. Dollar balances or US$-denominated bonds (and since 2008 with hardly any interest).
- A country with seigneurage does not need to balance its trade, as other countries are willing to accept its currency and bonds as payment for their exports (but these are only pieces of paper).
- However, in order for an economy to benefit from seigneurage, it must be prepared to run a large trade deficit vis-a-vis the rest of the World as a whole. Otherwise, it derives little real benefit.

Currency Competition and Substitution: The Costs of Seigneurage

- However, for a mercantilist country which is unwilling to run a large trade deficit, the potential real benefit from its currency becoming a major medium for international exchange and hence also widely held as an international reserve currency is small. In fact, other countries may have difficulties acquiring and holding that country's currency even if they want to do so.
- A potential cost is the risk of other central banks and monetary authorities holding a country's currency and bonds deciding to sell them en masse all of a sudden. This can greatly de-stabilize not only the exchange rate but also the credit and financial markets and the capital market in general.

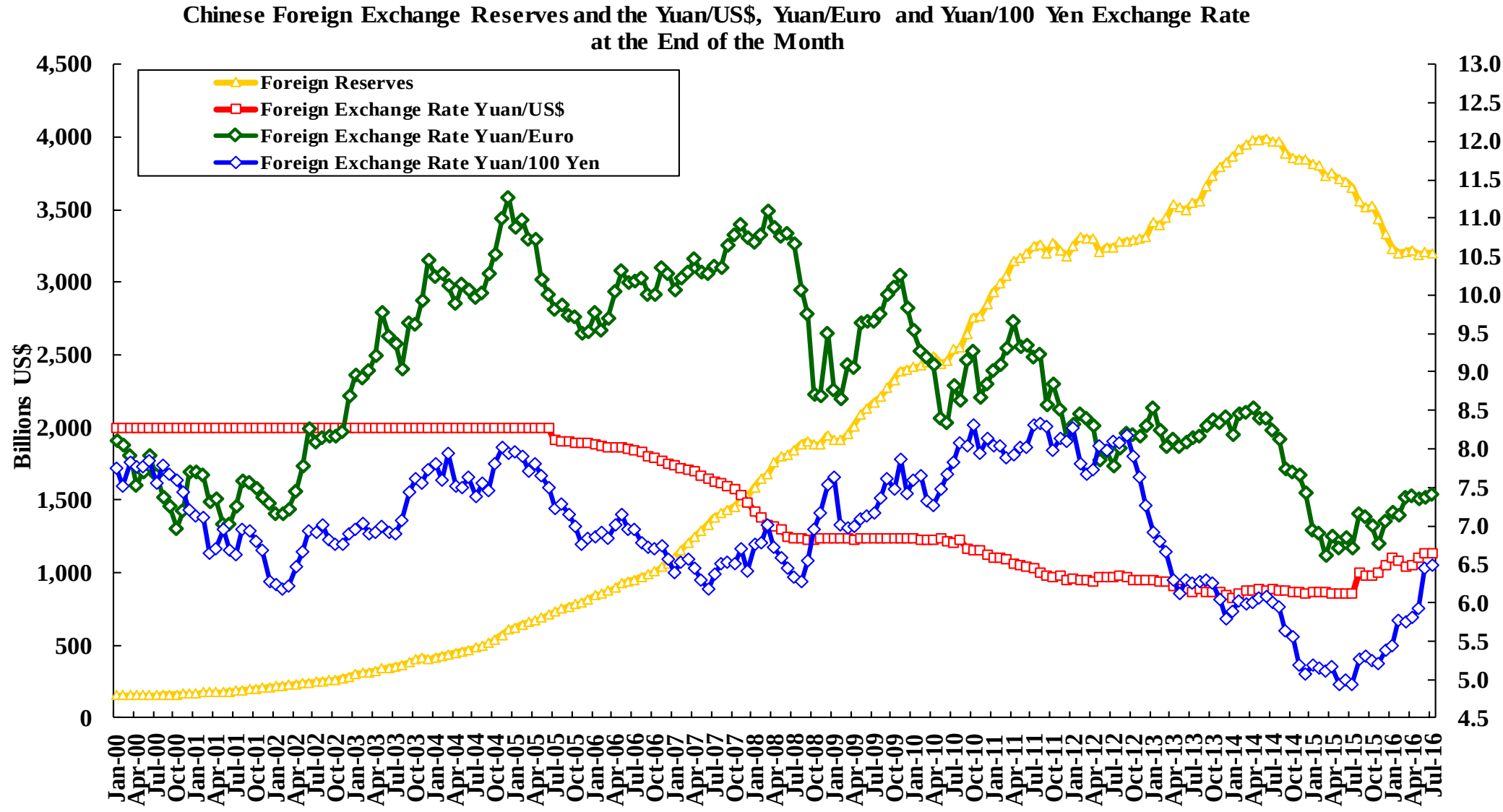
Currency Competition and Substitution: The Costs of Seigneurage

- Thus, Japan may not see much advantage to have the Yen to be used as a major international currency, and may even be reluctant to have large amounts of Yen bonds held by East Asian central banks for fear that they may all of sudden decide to sell for domestic political reasons such as a visit by major Japanese government officials to the Yasukuni shrine.
- So unless a country is too big to fail, such as the U.S., it can be risky to have large amounts of its currency and bonds widely held by other central banks and monetary authorities.

Alternative Exchange Rate Regimes

- We have identified the different possible exchange rate regimes in the introduction. The freely floating-rate regime is most susceptible to speculative attacks, in either direction, and often leads to excessive volatility of the exchange rate.
- Volatility of relative exchange rates is a serious impediment to international trade and long-term capital flows, much more so than tariffs and other protectionist measures. With volatile exchange rates, one does not know whether one should export or import, or where to locate one's production facilities.
- A stable exchange rate contributes to the domestic economic development of an economy and to its active participation in the global economy as a trading partner and as either an investor- or an investee- country.

The Yuan/US$, Yuan/Euro and Yuan/100 Yen Exchange Rates



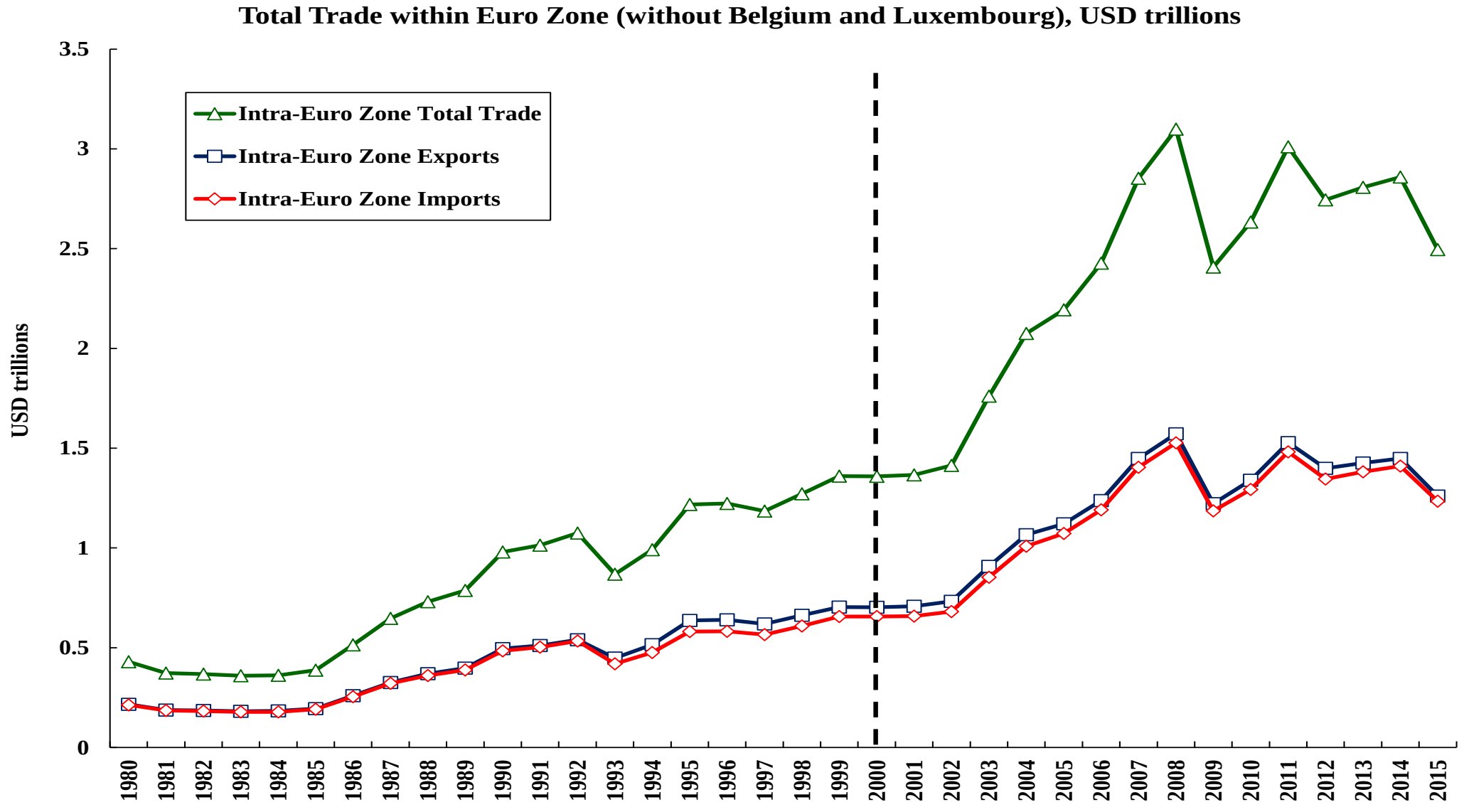
Alternative Exchange Rate Regimes

- The observed exchange rate volatility is largely unrelated to international trade flows or to direct investment flows, which have been quite stable on the whole. It may, however, be related, in part, to short-term portfolio investment flows. It is mostly caused by the volatile short-term speculative international capital flows.
- However, exchange rate volatility in itself also in turn attracts further speculation, and hence may lead to even more short-term international capital inflows or outflows from hedge funds and other speculators taking advantage of the volatility to speculate on short-term exchange rate changes.

Alternative Exchange Rate Regimes

- Stable relative exchange rates among economies that are in approximately balance of payments equilibrium vis-à-vis the World can enhance the international trade and investment flows among them significantly, much more so than a free trade area or a common market among them.
- The introduction of the Euro as a single currency for countries in the Euro Zone is a good example—intra-Euro Zone trade tripled to approximately 3 trillion Euro (or US$4 trillion) after the introduction of the Euro in the late 1990s even though there had been no tariffs among the major countries in the Euro Zone since the 1960s.

Intra-Euro Area Trade, Billions Euro, Pre-and Post the Introduction of the Euro



Alternative Exchange Rate Regimes

- The volume of foreign exchange transactions in the World is huge—currently it may be estimated at approximately US$5 trillion a day or US$1.5 quadrillion annually and definitely dwarfs everything else. The volume is far too large than can be justified by the "real" international transactions, that is: international trade, foreign direct investment, and foreign portfolio investment (even if we take into account that the stocks of the direct investment and portfolio investment can be much bigger than the annual flows and that they may need hedging).

Alternative Exchange Rate Regimes

- The total annual worldwide international trade flows amount to US$25 trillion in 2015, or less than 2% of total annual foreign exchange market turnover in 2015.
- Of the total annual worldwide international trade flows, only those conducted in a different currency from either the exporting country or the importing country need to be funded in foreign exchange or hedged.
- For example, intra-Euro Zone international trade, amounting to some US$4 trillion, will be conducted entirely in Euros and do not generate any demand for foreign currency or hedging.
- Similarly trade conducted among countries in a currency area does not generate demand for foreign exchange. But the trade volumes within these currency areas (including the West African CFA Franc of the West African Economic and Monetary Union (UEMOA) and the Central African CFA Franc) are probably relatively small with the exception of the Euro Zone.

Alternative Exchange Rate Regimes

- Thus, the bulk of these foreign exchange transactions, estimated to be more than 90 percent, does not seem to serve a useful social purpose.
- Does the World really need such a high volume of foreign exchange transactions to help "discover" the equilibrium exchange rates? Or is there too much "noise" relative to "signal"? Is there a better way of determining the relative exchange rates?

Alternative Exchange Rate Regimes

- Moreover, exchange rate volatility, as opposed to exchange rate flexibility, does not benefit anyone except the currency speculators. The benefits of a daily fluctuating exchange rate freely determined in the market are exaggerated. In any case, the foreign exchange market is also subject to manipulation by the currency speculators who dominate the foreign exchange markets.

Alternative Exchange Rate Regimes

- In fact, while the theory of comparative advantage tells us that voluntary trade between two trading partner countries always benefit both even though possibly to varying degrees. This is the intellectual basis for supporting international trade, and in particular, free trade.
- Also, it has also been well demonstrated that foreign direct investment undertaken in the absence of special privileges will always benefit both the investor-country and the investee-country. The same is true of long-term foreign portfolio investment.
- However, there is no similar argument in favor of short-term speculative international capital flows, for either the country of origin or the country of destination. It is simply an article of faith that the freer the movement of capital, the better.

Alternative Exchange Rate Regimes

- Moreover, short-term capital flows cannot be productively employed in the destination country because of a double mis-match: currency mis-match and maturity mis-match. Borrowing in a foreign currency when the potential revenue is in the domestic currency and borrowing short-term funds to finance long-term projects are formulae for an economic disaster down the road.
- Moreover, short-term non-trade related capital inflows that can be withdrawn at a moment's notice, do not really benefit the destination country and on the contrary may do significant harm, as the East Asian currency crisis of 1997-1998 demonstrated. Short-term capital inflows cannot be usefully deployed in the destination country and when they are used to finance long-term investment they invariably lead to trouble because of maturity mismatch.

Alternative Exchange Rate Regimes

- It is also not clear what good short-term capital outflows do to the origin country. (For example, Under "Quantitative Easing II and III" of the U.S., a great deal of capital flowed out of the U.S. If the capital had stayed in the U.S., it might have done the U.S. economy some good; but if it simply flowed out of the U.S., it is not clear how it benefitted the U.S. economy.)

Alternative Exchange Rate Regimes

- The volatility of exchange rates tends to discourage both trade and direct investment. (The Eurozone's experience testified to this possibility—intra Eurozone trade increased significantly after the introduction of the single currency, the Euro.)
- It may therefore be desirable for two close trading partner countries to agree to restrict the magnitude of the fluctuations in their relative exchange rate. In fact, this was what led to first the European currency snake and subsequently the single Euro currency for the Euro Zone.
- Prof. Robert A. Mundell, Nobel Laureate in Economic Sciences, sometimes referred to as the Father of the Euro, has proposed stabilizing the Euro-US$ exchange rate within a range, say, between US$1.1 and US$1.2 per Euro by agreement between the Euro Zone and the United States, with each side being responsible for intervening when its currency becomes too high relative to the other. This would be efficient and incentive-compatible. It would stabilize expectations and hence reduce hence currency speculation and exchange rate volatility.

Alternative Exchange Rate Regimes

- The same proposal can be applied to other currency pairs, especially between those countries and regions who are each other's major trading partners, thus facilitating the flow of trade and direct investment between them and reducing the overall volatility of exchange rates in the World.
- In the long term, exchange rate volatility can be greatly reduced with a return to a quasi-gold standard, with fixed nominal relative exchange rates that are periodically adjusted if necessary and a mechanism for resolving persistent trade surpluses or deficits vis-à-vis the World—achieving flexibility without volatility.

Alternative Exchange Rate Regimes

- What lessons can be learnt from the 1997-1998 East Asian currency crisis, the 2008 global financial crisis, the 2013 tapering crisis and the 2015 Swiss Franc crisis?
- Free and unregulated short-term capital flows, both outbound and inbound, can be greatly de-stabilizing to the foreign exchange market and the capital market of an economy.
- Short-term capital inflows and outflows pose particular risks to developing economies because they unnecessarily increase the degree of volatility of the exchange rate and therefore discourage international trade and long-term international direct and portfolio investment.
- A freely floating exchange rate regime attracts speculators and is subject to attacks.

Alternative Exchange Rate Regimes

- One way to discourage and reduce short-term capital flows is the imposition of a Tobin tax on both inbound and outbound capital flows, but not current account flows. This is, in effect, a currency conversion tax on the entry and exit of capital.
- The Tobin tax was first proposed by the late Prof. James Tobin, Nobel Laureate in Economic Sciences, as a currency transaction tax. It can be applied it to cross-border capital account currency exchange transactions.
- The Tobin tax can function as a device for discriminating between long-term and short-term capital flows. Suppose a Tobin tax of 1% is imposed on all capital flows. Then a one-month round-trip from U.S. Dollars into Renminbi and vice versa will imply a cost of 24% per annum, which should be sufficient to discourage most currency speculators.

Alternative Exchange Rate Regimes

- Moreover, a Tobin tax can enable the so-called “Impossible Trinity”. The “Impossible Trinity”, a concept due to Prof. Robert Mundell, Nobel Laureate in Economic Sciences, states that it is impossible for an economy to have all three of the following at the same time:
- (1) A fixed exchange rate
- (2) Free capital movement (absence of capital controls)
- (3) An independent monetary (i.e. interest rate) policy
- However, the imposition of a Tobin tax makes it possible to maintain an interest rate differential between domestic capital and international capital, making it possible for the domestic central bank or monetary authority to have some degree of flexibility in its monetary, and in particular, interest rate policy.

The Effects of Quantitative Easing:
A Brief History of Quantitative Easing

- In order to save the U. S. financial system, the U.S. Federal Reserve Board undertook a series of "Quantitative Easing" measures, referred to as QE1, QE2 and QE3, purchasing U.S. Government and agency securities and mortgage-backed securities held by financial institutions.
- "Quantitative Easing I (QE1)" was initiated by the U.S. Federal Reserve Board on 25th November 2008, in the aftermath of the collapse of Lehman Brothers. At the time, the World economy was shell-shocked from the freezing up of the entire financial system. Financial institutions did not trust one another and credit had all but dried up.
- Quantitative easing, as opposed to just easing, implies that not only would short-term credit be easily available, as indicated by the extremely low federal funds interest rate for overnight money, but also that the Federal Reserve Board would try to bring down medium and long-term interest rates by purchasing U.S. Treasury and other securities of such maturities in large quantities on a regular basis.

The Effects of Quantitative Easing: A Brief History of Quantitative Easing

- At the start of QE1, the U. S. Federal Reserve Board announced that it would purchase up to US$600 billion in U.S. agency mortgage-backed securities (MBS) and agency debt, mostly from U.S. financial institutions, in an attempt to restore liquidity to the financial system and shore up the financial balance sheets of the financial institutions. On 18th March 2009, the Federal Reserve Board expanded the programme by an additional US$1.05 trillion for the purchase of U.S. Treasury and agency securities.
- "QE1" was successful in rescuing the major financial institutions in the U.S. and preventing the U.S. financial system from collapsing.

The Effects of Quantitative Easing:
A Brief History of Quantitative Easing

- As the U.S. real economy did not seem to respond to QE1, QE2 was launched by the Federal Reserve Board on 3rd November 2010, when it began to purchase an additional US$600 billion of longer dated U.S. Treasury securities, at a rate of US$75 billion per month, with the objective of lowering the longer-term interest rates so as to stimulate real investment by U.S. firms. This programme was concluded in June 2011, followed by "Operation Twist" in September 2011.
- "Operation Twist" was a plan to purchase US$400 billion of bonds with maturities of 6 to 30 years and to sell the same quantity of bonds with maturities of less than 3 years, thereby lowering the longer-term interest rates without increasing the money supply. In June 2012, the Federal Reserve Board expanded "Operation Twist" by adding a further US$267 billion.

The Effects of Quantitative Easing: A Brief History of Quantitative Easing

- A third round of quantitative easing (QE3) was launched by the Federal Reserve Board on 13th September 2012, committing to the purchase of US$40 billion of agency mortgage-backed securities (expanded to US$85 billion and to include U.S. Treasury securities in December 2012) per month until the labour market improves "substantially".
- In May 2013, Chairman Ben Bernanke of the Federal Reserve Board raised the possibility of "tapering" and eventually ending QE3 publicly for the first time (minutes of the Federal Open Market Committee (FOMC) meeting released on 22nd May 2013). On 19th June 2013, Chairman Bernanke announced a plan for the "tapering" of the Federal Reserve Board's purchases of securities. This news was not well received by the stock market. On 18th September 2013, however, the Federal Reserve Board decided to hold off on the "tapering" plan.

The Effects of Quantitative Easing: A Brief History of Quantitative Easing

- On 18th December, 2013, the FOMC finally decided to reduce monthly asset purchases by US$10 billion in January 2014. Thus began the actual "tapering". On 29th January 29, 2014, a further reduction of US$10 billion was authorised.
- The new Chairman of the U.S. Federal Reserve Board, Dr. Janet Yellen, was sworn in on 3rd February 2014 and reaffirmed the tapering policy at the 19th March 2014 meeting of the FOMC.
- Subsequently an announcement was made that the bond purchase program will finally be terminated in October of 2014, marking the end of "Quantitative Easing".

The Effects of Quantitative Easing: The Objectives of the QEs

- QE1 was launched essentially to restore liquidity to the financial system and to take the mortgage-backed securities off the balance sheets of the major U.S. financial institutions so as to prevent a complete financial meltdown.
- QE2 and QE3 were meant to stimulate the real economy by lowering the real rate of interest so that more domestic investment would be forthcoming.
- QE2 and QE3 also had the effect of enabling the U.S. Dollar to devalue significantly with respect to almost all of the major currencies in the World, with the possible exception of the Euro. This has helped to increase U.S. exports and decrease U.S. imports, other things being equal.

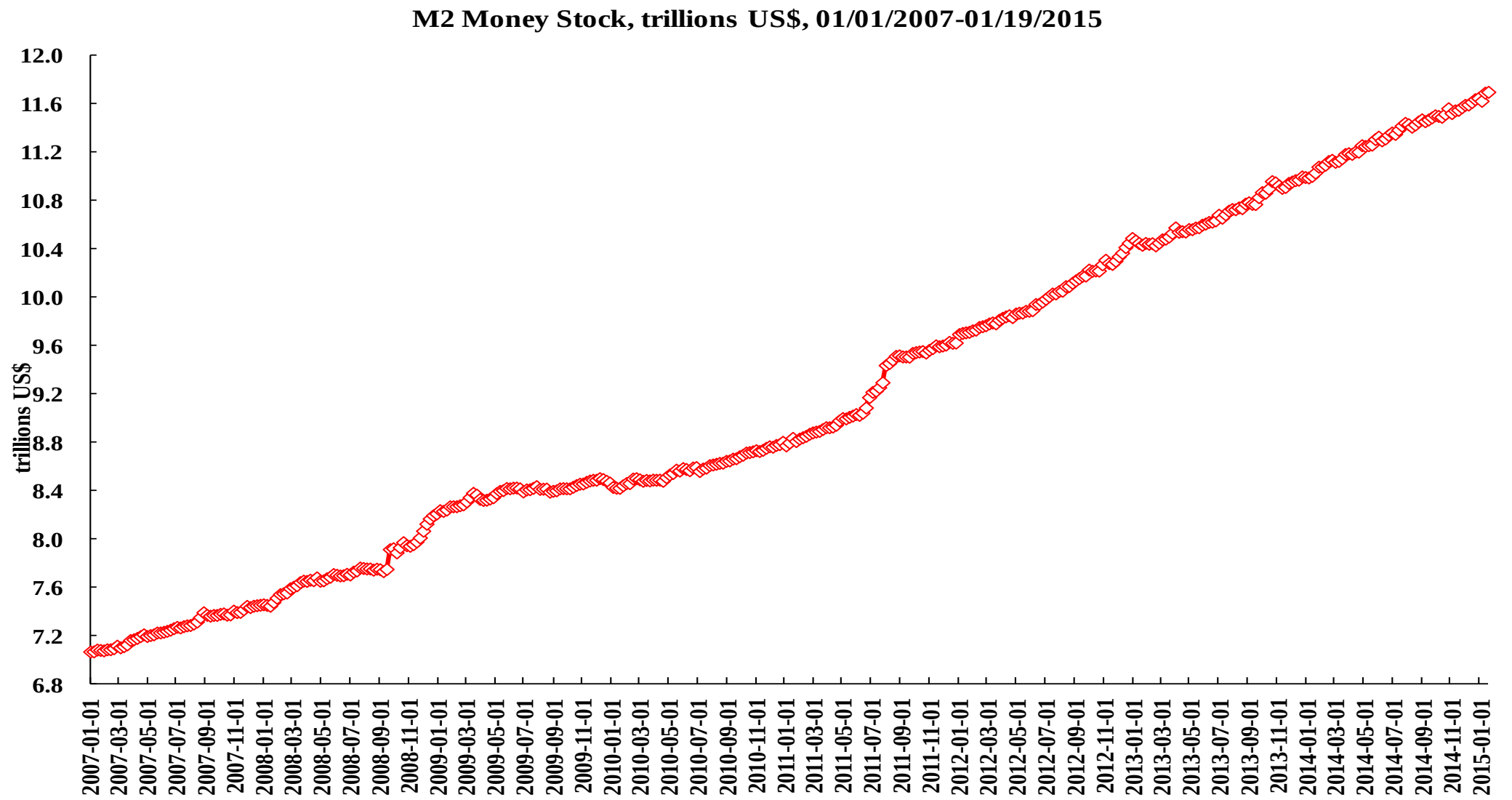
The Effects of Quantitative Easing: The Objectives of the QEs

- The QEs can be viewed as a form of currency manipulation as given the already low domestic rates of interest in the U.S., the excess liquidity created by the QEs was bound to leave the U.S. en masse to seek higher yields elsewhere in the absence of U.S. capital control, thus driving up the exchange rates of the other currencies relative to the U.S. Dollar.
- As the U.S. is ideologically incapable of intervening directly in foreign exchange markets, the QEs are one of the very few feasible options for engineering a devaluation. It could have bought foreign currencies directly and thereby drive up the prices of the other currencies and effectively devalue the U.S. Dollar. "Jawboning" is another feasible, but probably less effective, option.

The Effects of Quantitative Easing: The U.S. Economy

- With QE1, the U.S. money supply was increased quickly and the short-term interest rate was also driven quickly to almost zero, and it has stayed there since.
- However the long-term interest rate remained relatively high until the introduction of "Operation Twist" under QE2.
- QE3 was quite effective in keeping the long-term interest rate low, until the possibility of "tapering" was introduced to the market in May 2013, which led to a jump in the long-term interest rate.
- Successive QEs have also led to large increases in the U.S. money supply (M2).

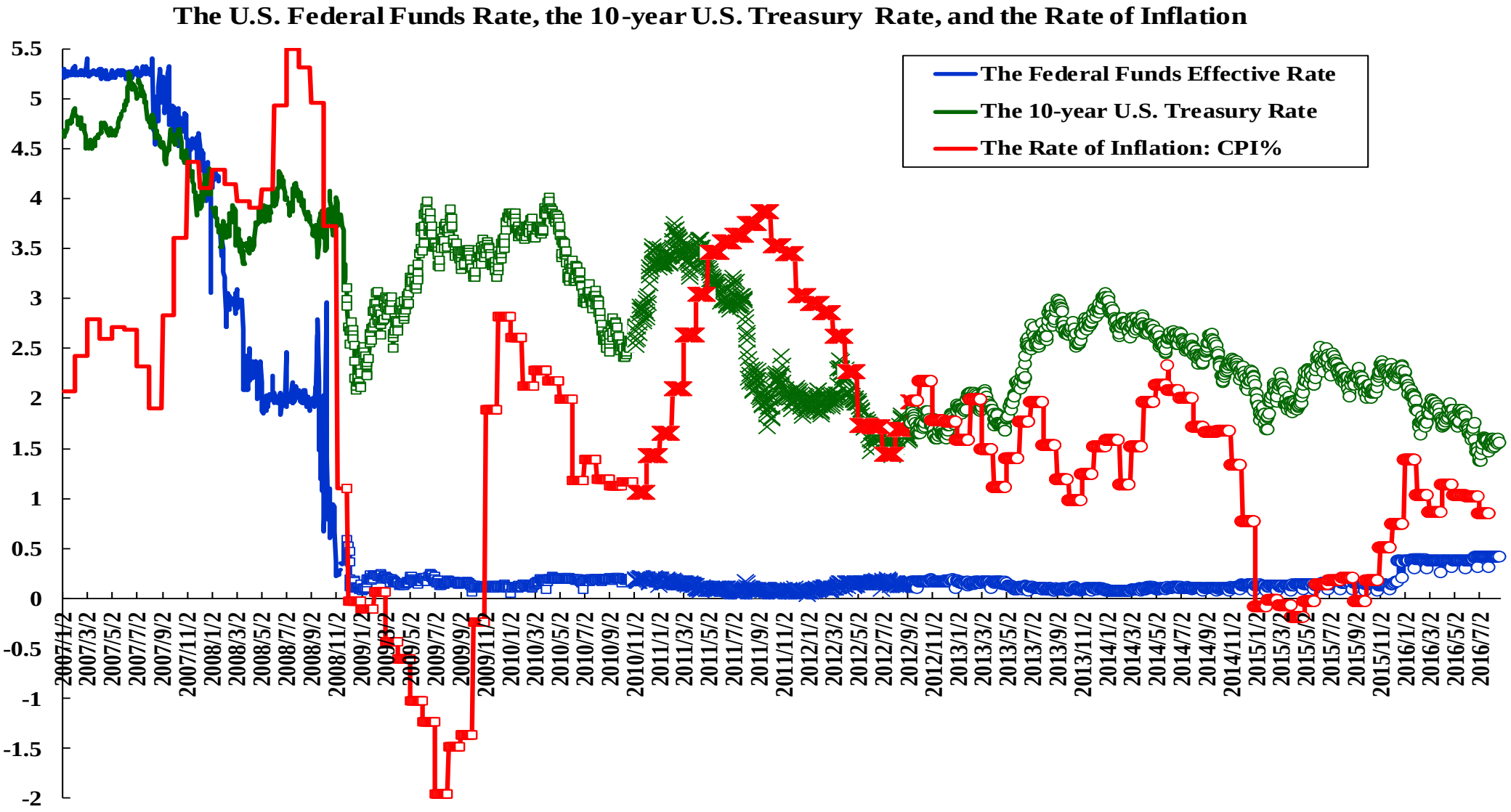
U.S. Money Supply (M2), trillions US$, 01/01/2007-01/19/2015



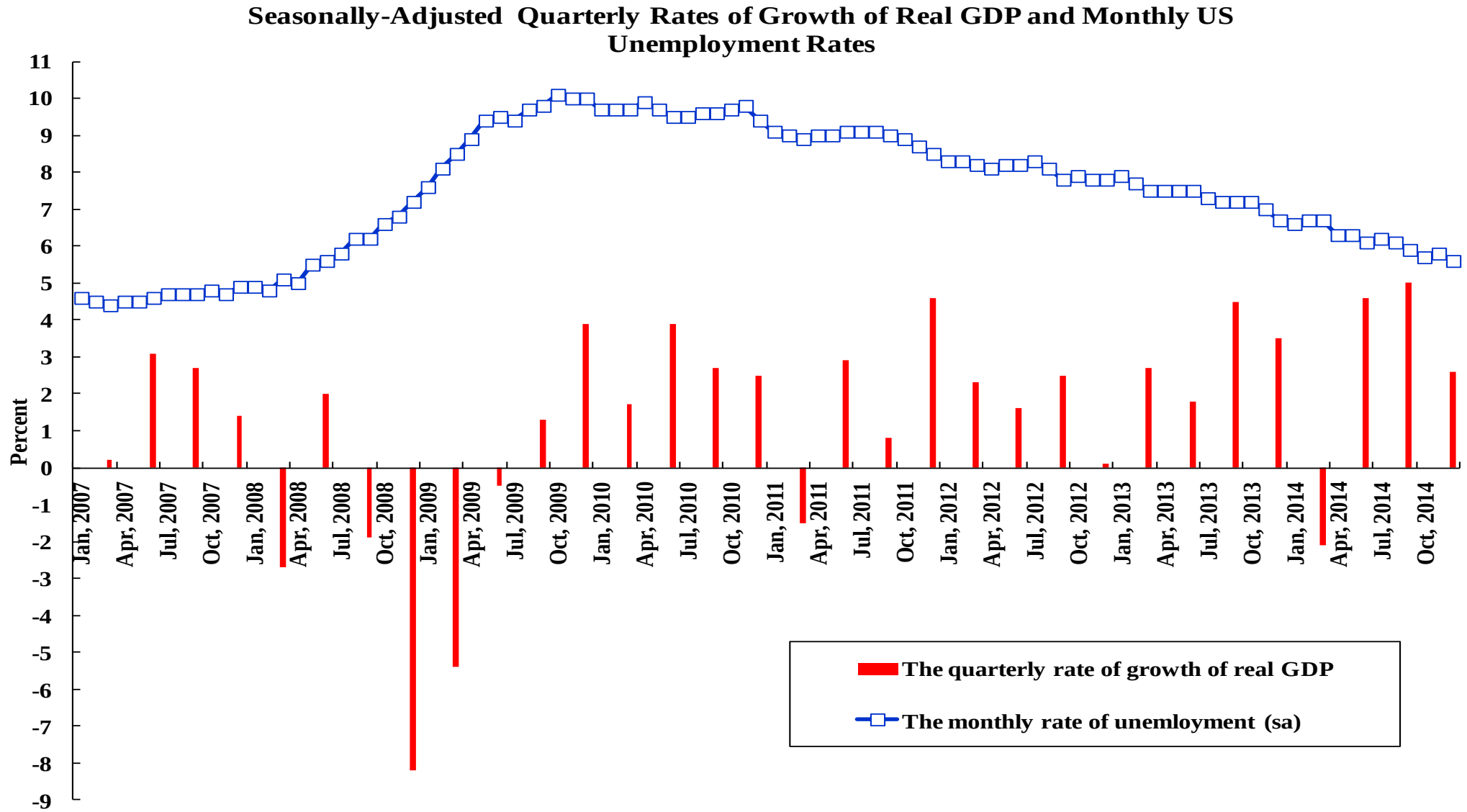
The Effects of Quantitative Easing: The U.S. Economy

- As is well known, one can pull on a string but not push on a string. Lowering the rate of interest to effectively zero and massive release of liquidity in the U.S. have not increased U.S. gross domestic investment significantly, casting serious doubt on the effectiveness of an easy monetary policy.
- In fact, the real rate of interest, the difference between the nominal rate of interest and the rate of inflation (measured by the consumer price index (CPI)), in the U.S. has been negative since November 2009 (see the following Chart). The U.S. economy is in a classical "liquidity trap" situation.
- The U.S. unemployment rate took a long time to come down, in part because of disappointed job-seekers leaving the labour force, but it finally reached a low of 5.6% (and very recently went back up to 5.7%). The rate of growth of U.S. real GDP, which reasonably robust, remained low relative to the experience of past economic recoveries.

U.S. Federal Funds Rate, the 10-year U.S. Treasury Rate, and the Rate of Inflation



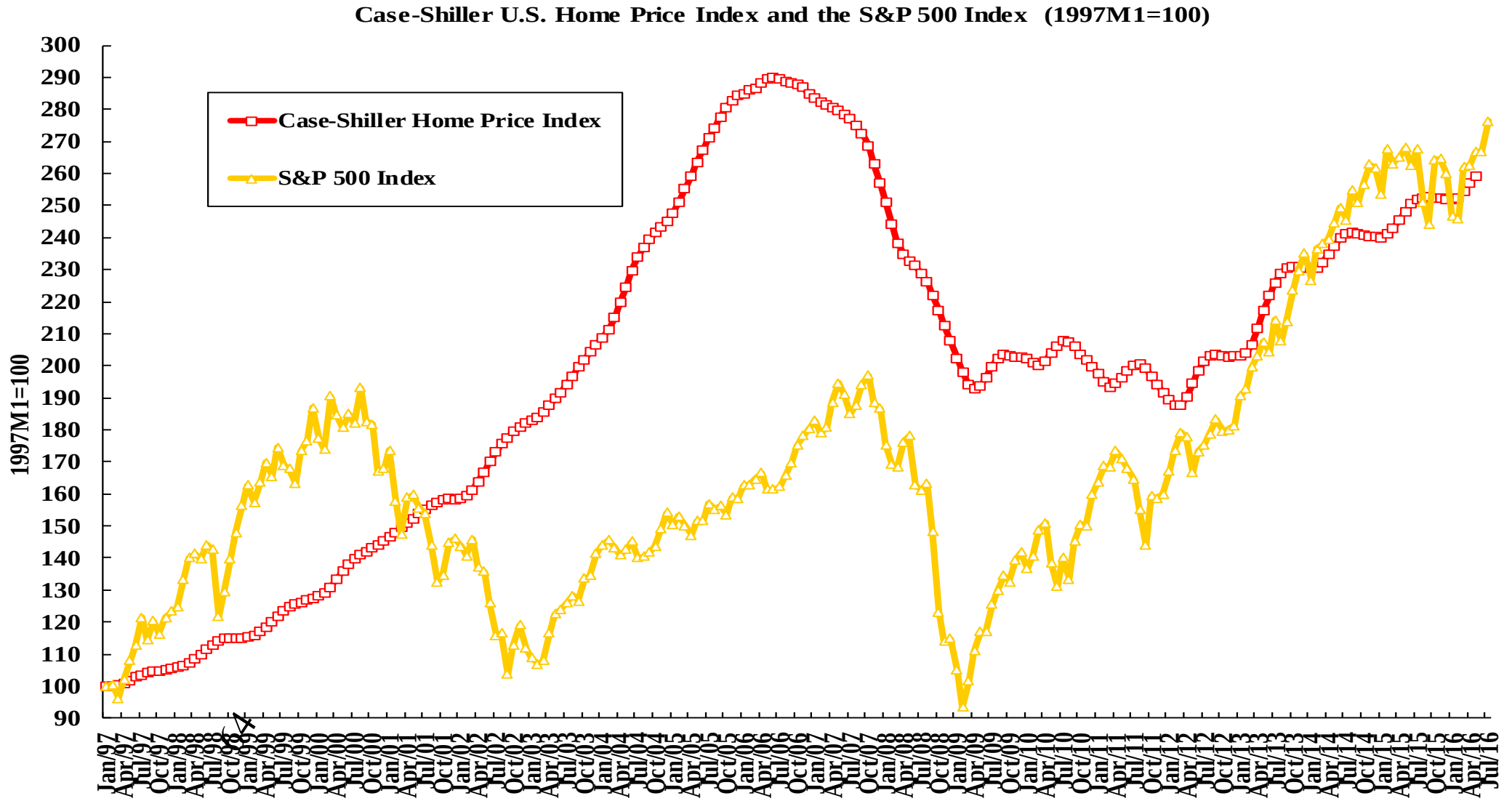
Seasonally-Adjusted Quarterly Rates of Growth of US Real GDP & Monthly US Unemployment Rates



The Effects of Quantitative Easing: The U.S. Economy

- The ultra-low interest rates in the U.S. drove up the U.S. stock market as evidenced by the S&P 500 stock price index.
- However, it took the decline in the long-term interest rates to push the price of housing back up moderately, at a level still far short of its peak in 2006.

Case-Shiller U.S. Home Price Index and the S&P 500 Index (1997M1=100)



The Effects of Quantitative Easing: The World Economy

- The excess liquidity released through the QEs and the excessively low interest rates in the U.S. have led to a massive exodus of short-term capital from the U.S. to the rest of the World seeking higher yields.
- This massive liquidity drove up the exchange rates of most other currencies relative to the U.S. Dollar (thus effectively devaluing the U.S. Dollar), except for the Vietnamese Dong, and lowered interest rates almost everywhere, which in turn fueled a rise in asset prices (real estate and stock prices) worldwide. These trends were partially reversed with the public introduction of the possibility of "tapering" in late May 2013. The changes in the exchange rates of East Asian economies are presented in the following Charts and tables.
- In some of the economies, such as Brazil, India, Indonesia and Turkey, the massive inflow of capital caused economic boomlets.

The Effects of Quantitative Easing: The World Economy

- Japan, as part of its Abenomics initiatives, has countered with its own QE in December2012, and reversed the appreciation of the Japanese Yen vis-a-vis the U.S. Dollar. This is sometimes referred to as "Qualitative and Quantitative Easing (QQE)".
- Moreover, in anticipation of the tapering and possible termination of the QEs, the exchange rates of many currencies already began to devalue with respect to the U.S. Dollar in May 2013 but had also since recovered because the U.S. Federal Reserve Board has slowed down on normalizing the "interest rate".