Implications of Chinese Yuan on China’s competitiveness

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Implications of Chinese Yuan on China’s competitiveness

Md Akther Uddin\textsuperscript{1} Mehdi Baddou\textsuperscript{2} Rosana Gulzar Mohd\textsuperscript{3}

Abstract

The stability and level of strength or weakness in exchange rates are prime considerations of monetary authorities and businesses, both domestic and international. This paper thus analyses the RMB’s appreciation and depreciation against its major trading partners’ currencies namely the USD, EUR, JPY, AUD and MYR. It also includes a review of their volatilities and most importantly, the economic implications of the RMB rates on exports and foreign investment flows. The Renminbi has come a long way since its pegged days of 1994 to 2005. Most recently, head of the International Monetary Fund (IMF), Christine Lagarde herself, has endorsed its inclusion into an elite basket of the fund’s reserve currencies. The Renminbi is now on a managed floating system and allegations of manipulation remain, especially with notable pauses in the currency’s rises during the global financial crisis and in the second quarter of 2015. But the upward trend is undeniable, given that the Chinese economy is now the world’s number two in size and the Renminbi is now the world’s second most-used currency for trade finance. Its volatility has similarly picked up with the end of the peg and its increasing use worldwide. Ironically, an appreciating currency, albeit a managed one, bodes well for China’s economy now as it is engineering a shift away from being led by exports to being driven by domestic consumption. A strong Renminbi will encourage more import consumption, something that the government would like to see. But challenges remain. China’s still largely closed markets and questions about the country’s political, legal and economic institutions may constrain the international use of its currency. And while the Renminbi has shot up in use, international sales in the currency still account for less than 3% of global transactions. The greenback continues to dominate as the currency for trade settlements. Thus while the wind is definitely beneath the Renminbi’s sails, officials will likely need to skilfully navigate through potential turbulences ahead.

Key words: currency volatility, exchange rate, devaluation, RMB, USD, EUR, AUD and MYR

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Introduction

The analysis of exchange rates is a vital aspect of international finance studies because of the globalised nature of current markets and their interconnectedness. It mainly affects governments, some of whom act through their central banks, and businesses. Central banks are mainly concerned with whether their local currencies are over or undervalued and the impacts on their domestic economies. Firms on the other hand, are occupied with their exposure to exchange rate risks which affect their balance sheets and profits. Central banks thus intervene in the foreign exchange market to stabilise the value of their currencies, while companies hedge their exposures to avoid exchange rate volatility.

A study of China’s Renminbi is particularly interesting as it reflects both the central bank’s management of the currency as well as its impact on the economy through the businesses. Of significance is the latest proclamation by Lagarde, head of the IMF, who said that the Chinese’s Renminbi should be included as an IMF reserve currency\(^4\). If approved, the Renminbi will join the ranks of the dollar, yen, euro and pound. The Renminbi has come a long way since its pegged days of 1994 to 2005. Now, China’s economy ranks as the world’s number two in size and its currency is among the top five most used in the world, according to the Society for Worldwide Interbank Financial Telecommunication (SWIFT), an international financial transactions agency. China also counts a number of the world’s key economies as its trading partners:

In line with China’s drive to play a bigger role in the world’s economy, it moved its currency, in 2005, to a managed floating system based on a basket of major currencies that includes the US dollar. The currency is still allegedly managed based on China’s economic needs. Economists have noted periods of pauses in the Renminbi’s appreciation, especially during the global financial crisis and in the second quarter of 2015\(^5\). The country is at a crossroad of development where the government is trying to shift gears from being export-driven to being led by domestic

\(^5\) Bloomberg. (2015). China Keeps a Tight Rein on Yuan a Decade After End of Peg
consumption. This entails skilful maneuvers in the currency markets because it requires a similar shift from keeping the currency undervalued to letting it strengthen albeit at a pace that will not be destructive to the rest of the economy. A stronger currency makes imports cheaper, thus whetting the domestic consumption’s appetite. While China is at the cusp of achieving ‘IMF reserve currency’ status soon, its historical nemesis, Japan, draws on past mistakes to warn its Chinese neighbour of a looming crisis if the revaluation is not well-handled. Japan’s warnings come as its economy has become dependent on the success of its Chinese neighbour.

According to Japanese officials, if China liberalises its currency too quickly and before it fixes other problems in the economy, such as high debt, Beijing may struggle to contain capital outflows, which will likely hit its US$3.5 trillion currency reserves. Both Japanese Prime Minister Shinzo Abe and Finance Minister Taro Aso have called on China to address structural problems, such as bad loans and excess industrial capacity, and to provide transparency of policymaking.

Given China’s economic crossroad and the shift needed in its currency’s valuation against major trading partners, this paper analyses implications of the RMB’s appreciation and depreciation in four periods namely its pegged years of 2001 to 2005, its post-pegged years are divided into the pre-crisis years of 2005-2008, the global financial crisis in 2008 to 2010 and the post-crisis years of 2010 to 2015.

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6 Reuters. (2015). Wary of capital outflows, Japan urges China to go slow on Yuan reform
### Research Objectives

This report aims to answer the following key issues:

1. How has the RMB appreciated or depreciated over the long run vis-à-vis other reference currencies? [Focus is on long-term trends]

2. How volatile has the RMB been vis-à-vis other reference currencies? [Focus is on short-term fluctuations]

3. Implications on the RMB’s competitiveness in terms of exports and foreign investment flows [Focus is on economic implications]
Empirical Analysis and Results

Chinese Yuan versus United States Dollar (RMB/USD)

Table 1: RMB/USD 2001-2015

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<tbody>
<tr>
<td>RMB/USD</td>
<td>0.065%</td>
<td>-0.001%</td>
<td>0.170%</td>
<td>0.056%</td>
<td>0.035%</td>
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</table>

2001-2005

The RMB/USD pair is described by currency website xe.com as the most popular Yuan exchange rate. The Renminbi was pegged at 0.12 to the US dollar for more than 10 years since 1994. A cornerstone of China’s economic policy is to maintain a lower exchange rate, which is conducive for exports but the country has also made strides into liberalising the currency in the hope of gaining the ‘IMF reserve currency’ status.

2005-2008

Only in July 2005 was the currency allowed to appreciate against the dollar. It was also moved to a managed floating system against a basket of major currencies that included the US dollar. The move was expedited due to pressure from China’s major trading partners and after the country’s entry into the World Trade Organisation in 2001. Over the next three years, the Renminbi was allowed to appreciate by about 21% to 0.146 to the dollar.

2008-2010

In July 2008, China halted the Renminbi’s appreciation as worldwide demand for Chinese products slumped due to the global financial crisis. The currency’s gains in the past decade have been tightly managed and punctuated by a restored peg in the two years ended June 2010. As China’s central bank, the People’s Bank of China’s (PBoC) bought dollars to stem its currency’s rise, its currency reserves ballooned to almost US$4 trillion before sliding to US$3.7 trillion at the end of June 2015 as the PBoC switched to selling the dollar.

2010-2015

In June 2010, China resumed its policy of letting the Renminbi gradually appreciate. By October 2015, the currency has risen by 31% to 0.1575 compared to its pegged level of 0.12 to the dollar 10 years ago. Demand for the currency has been boosted by China’s efforts to internationalise its use. The country has expanded the Renminbi clearing-bank network to 17 cities including London, Seoul, Sydney and Johannesburg. Most recently, IMF head, Lagarde said that the Chinese’s Renminbi should be included in the elite basket of currencies that comprise the IMF’s lending reserves. Winning IMF reserve-currency status would boost China’s efforts to establish the country as a global economic power. In the words of Chia Liang Lian, co-head of emerging-
market debt at Western Asset Management, “the world’s focus appears set to tilt from greenback to redback in the coming decade.”

**Volatility**

![Volatility RMB/USD graph](source: Authors’ calculations)

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<tbody>
<tr>
<td>RMB/USD</td>
<td>0.00033</td>
<td>0.00000</td>
<td>0.00057</td>
<td>0.00011</td>
<td>0.00049</td>
</tr>
</tbody>
</table>

In line with the currency’s pegged and non-pegged periods, trading of the Renminbi was subdued up till July 2005 when the currency was permitted to appreciate against the dollar. Over the next three years, the pair recorded the highest level of volatility, at 0.00057, compared to the other periods of analysis. The spike was especially pronounced in the preceding years of the global financial crisis in 2008. This is understandable given that the currency had moved to a managed floating system where its trading led to the appreciation. The volatility then fell to 0.00011 between 2009 and 2010 as China slowed the Renminbi’s appreciation given the worldwide slump in exports following the crisis. In the last few years, the volatility rose again,

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7 Bloomberg. (2015). China Keeps a Tight Rein on Yuan a Decade After End of Peg
especially in August 2015 when China surprised world markets by devaluing its currency by around 2%. The country said the devaluation reflected market forces but the move jolted global markets on fears it meant the economy was in worse shape than previously thought.  

**Correlation of RMB/USD with other major pairs**

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<tr>
<th>Currency Pair</th>
<th>Correlation</th>
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<td>RMB/USD</td>
<td>1</td>
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<tr>
<td>RMB/EUR</td>
<td>0.36</td>
</tr>
<tr>
<td>RMB/JPY</td>
<td>0.29</td>
</tr>
<tr>
<td>RMB/AUD</td>
<td>-0.24</td>
</tr>
<tr>
<td>RMB/MYR</td>
<td>0.67</td>
</tr>
</tbody>
</table>

RMB/USD has the highest correlation of 0.67 with RMB/MYR, compared to the other pairs analysed. This is because the ringgit, like the Renminbi, was pegged to the US dollar from 1998 to 2005. The Renminbi was pegged from 1994 to 2005. The RMB/USD also has relatively high correlations with the other currency pairs. This is understandable because the US, Germany, Japan and Australia are among China’s top 10 trading partners. For example, Germany is China’s 5th largest importer and exporter in August 2015. This perhaps explains the 0.36 correlation between RMB/USD and RMB/Euro. The correlation with RMB/AUD is notably negative. This is likely due to a confluence of factors such as Australia being China’s 6th biggest import partner and the US being both a significant import and export market for China. In general however, there are many factors which influence the correlations of the currency pairs.

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8 Reuters. (2015). Wary of capital outflows, Japan urges China to go slow on Yuan reform
Effects of Inflation Differentials on Exchange Rate Trends

According to the purchasing power parity (PPP) theory, changes in exchange rate during a period should equal the inflation differential for that same period. In effect, PPP says that currencies of countries with higher inflation should depreciate against currencies of countries with relatively lower inflation. In the first period of analysis, 2001-2004, although China’s inflation rate was mostly below the US, the currency did not appreciate because it was pegged to the US dollar. In

Source: World Bank data

Table 2: RMB/USD 2001-2015

Source: http://www.oanda.com/currency/historical-rates/
the years preceding the crisis, China’s Renminbi should in theory, depreciate against the dollar since its inflation was higher but its appreciation gathered momentum. Between 2008 and 2010, despite the inflation differential, the Renminbi’s rise was less significant because China halted the appreciation due to the slump in demand for Chinese products following the financial crisis. Following 2010, although China has a higher inflation rate than the US, its currency continued appreciating when according to the PPP theory, it should have depreciated. This would have established the law of one price, which is when the ‘exchange-rate’ between home currency and domestic goods equals the exchange rate between home currency and foreign goods. The currency instead appreciated because of pent-up demand following currency controls. Although the Chinese officials still try to manage the currency by preventing a decline or appreciation whenever it does not fit the economic agenda, economists believe the currency’s gradual ascent is inevitable as the size of China’s economy is now larger than Japan and Germany and the Renminbi is now the world’s second most-used currency for trade finance⁹.

Implications

The Chinese government is at a crossroad with regards to the structure of its economy. After a few decades of blistering growth, it is now engineering a shift away from exports and towards more reliance on domestic consumption. Thus, while it has focused on keeping the currency undervalued in the past, officials now welcome a strong Renminbi. A strong currency will reduce the price of imports and increase the price of exports. Domestically, the lower import prices should encourage consumption, something the government is encouraging.

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⁹ Bloomberg. (2015). China Keeps a Tight Rein on Yuan a Decade After End of Peg
China’s efforts to internationalise the currency is also bearing fruit with the IMF recently saying it deserves reserve currency status. While this marks a major economic milestone for the country and is likely to accelerate global demand for Chinese assets, judgments that the Renminbi will dethrone the US dollar anytime soon is perhaps premature\textsuperscript{10}. China’s largely closed markets and questions about the country’s political, legal and economic institutions may constrain international use of the currency for years to come. Although the Renminbi has enjoyed an exponential increase in its use for trade settlements, international sales in the currency still account for less than 3% of global transactions. On the other hand, the greenback is used for 80% of global trade given the depth of dollar-denominated markets and the US economy’s relative strength, safety and endurance\textsuperscript{11}. Thus while the wind is definitely beneath the Renminbi ’s sails, officials will need to skillfully navigate through potential turbulences ahead.

\textsuperscript{11} Ibid
Chinese Yuan versus Euro (RMB/EURO)

Table 3: RMB/EUR 2001-2015

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<tbody>
<tr>
<td>RMB/EUR</td>
<td>0.021%</td>
<td>-0.330%</td>
<td>0.164%</td>
<td>0.093%</td>
<td>0.157%</td>
</tr>
</tbody>
</table>

2001-2005

From 2001 till 2004, RMB depreciated 15.50% against EUR. In 2001, Chinese Yuan was at EUR 0.128 while it dropped to EUR 0.09 in December 2004. The trade between China and Europe was growing. Weaker Yuan helped boosted Chinese export to EU countries specially, Germany, Italy, Spain and France (The People’s Bank of China, 2015). At that time, Chinese economy had gone through a major structural change, in 2003 it achieved double digit growth for the first time and the trend continued in 2004 and further.
2005-2008

After China entered into managed float, from January 2005 till December 2008, the Yuan appreciated almost 6.97% against EUR and was exchanged at EUR 0.092 in May 2008. Interestingly, EU trade deficit with China stood at EUR 170.8 Billion in 2008 which justifies the growing demand for Chinese currency in Eurozone countries to settle their current account balance which push RMB to appreciate.

2008-2010

Chinese Yuan gained 1.52% in December 2010. Yuan was exchanged for EUR 0.113 compared to EUR 0.108 in January 2009, while average change in RMB/EUR was 0.093% for this period. Aftermath of global financial crisis, Chinese economy suffered significantly, and economic growth declined to 9.21% in 2009 from 14.16% in 2007, inflation was -0.7% and 4.8% respectively. In that period, EU trade deficit reduced to 132.85 Billion which indicates slowing down in export of Chinese goods to the EU countries which means less demand for Chinese goods in Eurozone countries (European Central Bank, 2015).

2010-2015

During this time, Chinese Yuan appreciated 0.157% (average periodic change) against Euro. In January 2011 RMB/EUR was 0.113 which increased to 0.151 in April 2015, an appreciation of RMB by 12.53%. The Yuan dropped to a four-year low after 11th August 2015 devaluation, as slowing exports from the world's second-largest economy sparked fears about global growth and disinflation. China let its currency depreciate against basket of currency, which include, USD, EUR, JPY, and KRW. As the basket contains dollar, and the dollar has been so strong, every other currency in the basket has depreciated against it e.g. Euro had dropped over 15% against
USD. RMB was relatively overvalued in terms of this last currency move that start a little over year ago.

**Volatility**

![Volatility RMB/EUR](image)

*Source: Authors’ calculations*

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<tbody>
<tr>
<td>RMB/EUR</td>
<td>0.209%</td>
<td>0.218%</td>
<td>0.154%</td>
<td>0.256%</td>
<td>0.227%</td>
</tr>
</tbody>
</table>

RMB/EUR volatility differs across time period chosen with relative high volatility noticed in 2009-2010 (0.256% adjusted quarterly, relative low volatility during 2005-2008 (0.154% adjusted quarterly) and moderate volatility in pegged period (0.218% adjusted quarterly) and 2011-2015 period (0.227% adjusted quarterly). As for EUR, it was strongest valued at 0.092 in May 2008 which was almost equal to EUR 0.0958 in January 2004 pegged period. The Chinese Yuan has appreciated to as high as EUR 0.151 in April 2015 which was almost equal to EUR 0.1414 in June 2001. The mean exchange rate value calculated throughout the sample period is EUR 0.113, and the standard deviation is of about 1.51%. Thus volatility levels of RMB/EUR
are very low in our sample but this is could be due to considerable influence of the People’s Bank of China (PBoC) in controlling RMB.

<table>
<thead>
<tr>
<th>Currency Pair</th>
<th>Correlation</th>
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</thead>
<tbody>
<tr>
<td>RMB/EUR</td>
<td>1.00</td>
</tr>
<tr>
<td>RMB/USD</td>
<td>0.36</td>
</tr>
<tr>
<td>RMB/JPY</td>
<td>0.51</td>
</tr>
<tr>
<td>RMB/AUD</td>
<td>0.67</td>
</tr>
<tr>
<td>RMB/MYR</td>
<td>0.56</td>
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</table>

**Correlation of RMB/EUR with other major pairs**

The RMB/EUR exchange rate has shown a combination of relatively strong correlations with the currencies in our sample period. It has shown a strong correlation of 0.67, 0.56 and 0.51 with RMB/AUD, RMB/MYR and RMB/JPY respectively. Thus, these exchange rates strongly move together in terms of their values with the RMB/EUR rates. But RMB/EUR is relatively weakly correlated with RMB/USD (0.36), this could be due to RMB/USD pegged influence and in the recent past, major currencies depreciated against USD but RMB remained unchanged. Consequently, we have seen RMB devaluation against the basket of currencies against which it has been pegged to.

**Effects of Inflation Differentials on Exchange Rate Trends**

![Inflation % Graph]

*Source: World Bank data*
On the aggregate supply, depreciation of home currency can affect the price level directly through imported goods that domestic consumers pay. In 2001-2004 (pegged period), RMB depreciated by 15.50% against EUR when inflation was 1.72% higher in China. The average inflation during pegged period (2001-2004) was approximately 1.25% in China. During 2005-2008 (managed float/pre-crisis) period RMB appreciated by 6.97% while the average inflation was 3.50%, which was higher than European (1.7%) which goes against the PPP theory, which states currency of a country with higher inflation tend to depreciate (Shapiro, 2014). During 2009-2010 period, RMB appreciated only 1.52% while average inflation was pretty stable at 1.3%. In 2011-2015 period, RMB has appreciated against EUR by 9.22%, before PBoC devalued RMB in August 2015.

Implications
The GDP growth of China was higher during the first four years (2005-2008) of managed float before the global financial crisis. The average GDP growth from 2005 to 2008 (managed float regime) was estimated at 11.94% a year, compared to about 9.94% during last four years of pegged regime period (2001-2004). During the global financial crisis, in 2008 and 2009, the economic growth decreased to 9.63% in 2008 from 14.16% in 2007 and inflation turned negative. In 2009, real interest rate in China (5.42%) was higher than EU (2%). According to Fisher effect (Shapiro, 2014) funds would flow into the China and consequently, economy has recovered but not with the pace before financial crisis. From 2010 to 2015, the economy has faced deflationary pressure, in 2014 inflation decreased to 2% from 5.4% in 2011 might be due to global economic slowdown and fall in oil price (Zang, 2015). According to exchange rate theories, lower inflation, lower real interest rate and higher economic growth help appreciating
domestic currency. All these key macroeconomic indicators were generally favorable for China during the pegged exchange rate policy compared to managed float regime (Song et al., 2014).

China is now the EU's 2nd biggest trading partner behind the United States and the EU is China's biggest trading partner, constituting to 14.1% share of China total imports and exports in 2012, this amounted to 546 USD billion in value. The EU records a significant trade deficit with China. During the pegged years, exchange rates should not have an impact on balance of payments of the two countries as they remain constant. It is however alleged in literature that the fixed exchange rates peg of RMB/USD was in fact quite undervalued, consequently RMB/EUR which should have helped the Chinese exports to the EU area and discouraged EU exports into China. The undervalued Yuan had been under criticism of US and EU government for many years. But this might have alternatively provided an incentive to the EU investors to invest in China.

Following the peg, EUR has significantly depreciated (18.31%) against the RMB, and hence the competitiveness of Eurozone exports into China should have increased. Consequently, terms of

![Eurozone Visible Trade Balance with China](source: Eurostat)
trade shows that Eurozone exports to China have increased steadily from EUR 51.75 billion in 2005 to EUR 164.78 billion in 2014. At the same time, Chinese exports to EU increased steadily and almost doubled in 9 years, from EUR 161.1 billion in 2005 to EUR 302.049 billion in 2014. More importantly, Chinese export to EU compare to import from EU has declined gradually since 2008-09 global financial crisis. In spite of threefold increase in EU export to China in this time period, EU still faces a significant trade deficit with China, in 2014 it stood at 137.27 billion (Li et al., 2015).

Investment flows also show vast untapped potential, especially when taking into account the size of the both economies. Similarly, a weaker EUR encourages foreign investment flows into the country as the assets of EU appear cheaper to investors in China. China accounts for just 2-3% of overall European investments abroad (European Comission, 2015), whereas Chinese investments in Europe are rising, but from an even lower base. In general, there are many other factors which influence balance of payments.
Chinese Yuan versus Japanese Yen (RMB/JPY)

In August 2015, China’s exports and imports from Japan represented 6% and 8.50% respectively out of total exports/imports\(^1\). Although Japan is China’s third trading partner, its weigh in China’s international trade dropped from 16% and 11% in 2001 for exports and imports\(^2\). In the following, we will look at the relationship of the two currencies and the performance of RMB against JPY.

Appreciation/Depreciation

Table 4: RMB/JPY 2001-2015

![RMB/JPY Graph](www.oanda.org)

The long run trend shows that the Chinese Renminbi appreciated against the Yen by 7.1 basis point (bp). Despite the ups and downs of the RMB against the Yen, it looks like the Renminbi strengthened against the Yen. The real relationship might not be accurate given the managed float regime China is adopting and the significant quantitative easing implemented by Bank of


Japan (BoJ) to increase inflation and boost domestic consumption. In the following we will zoom on different periods of time to assess the RMB performance against the JPY.

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<tbody>
<tr>
<td>RMB/JPY</td>
<td>0.071%</td>
<td>-0.111%</td>
<td>0.053%</td>
<td>-0.107%</td>
<td>0.309%</td>
</tr>
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</table>

**2001-2004**

During this period, the RMB was pegged to the US dollar. The average change suggests that RMB depreciated against JPY by 11.1 bp. It is most likely due to the fall of the US dollar in 2002 and 2003 because of the rising US trade deficit. Remember that the RMB was, until July 2005, pegged to the US dollar and therefore dollar’s change in valuation will directly impact on Chinese Renminbi.

**2005-2008**

This period was characterized by unpegging the Renminbi from the US dollar and the adoption of the basket currency regime. The basket was composed of USD, JPY, EUR and KRW. We noticed that the Renminbi slightly appreciated against the Yen by 5.3 bp for maybe some other trade factors. This trend is a bit intriguing because inflation rates, during this period, were higher in China than in Japan.

**2009-2010**

The post financial crisis period has impacted world economies namely China. PBoC decision to cut interest rates to stimulate growth in 2008 is reflected in the depreciation of the RMB against the Yen by 10.7 bp though the bilateral trade remained on average stable.
2011-2015

The strong appreciation of the Chinese Renminbi by more than 30 bps was driven by the continuing Yuan devaluation by China’s monetary authorities. High levels of inflation persisted until mid-2013 when BoJ started their quantitative easing process to increase inflation and hence prompt the Japanese to increase their consumption.

Volatility

![Volatility RMB/JPY](image)

*Source: Authors’ calculations*

Overall, it seems that RMB/JPY rate is very volatile in both the long and the short run. Both countries use managed change regime to stimulate growth and therefore the exchange rate variations depend on inflation levels in China and Japan.

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<tbody>
<tr>
<td>RMB/JPY</td>
<td>0.2609</td>
<td>0.2223</td>
<td>0.2623</td>
<td>0.2181</td>
<td>0.3101</td>
</tr>
</tbody>
</table>
The short run volatility is obvious in both graph and table above. We can see how much the RMB/JPY exchange rate fluctuates namely in 2009 and mid-2014. The former can be explained by the disturbances caused by the financial crisis while the latter is due to the QE policy adopted by Japanese central bank to boost the economy.

The correlation of RMB/JPY with other major pairs

Among all the other currency pairs we are studying in the present report, RMB/JPY shows a stronger correlation with two currency pairs RMB/EUR and RMB/MYR. The first correlation can be interpreted by the fact that the largest market China and Japan have in common—in terms of billions of US dollars—is the European Union market (especially German market). Japan is also the third trading partner for both China and Malaysia. The three markets are to some extent interconnected. Any impact on RMB/JPY exchange rate is likely to affect RMB/MYR. Interestingly, the lowest correlation is with RMB/USD although the American market is vital for both China and Japan’s external trading. This can be explained by the fact that the trading between China and Japan is not anymore in US dollar terms since 2012 when China and Japan agreed to bypass the US dollar dependence and use their own currencies for their bilateral exchanges. Therefore whatever happens to RMB/USD is less likely to affect directly the RMB/JPY exchange rate.

Effects of Exchange Rate Trends to Inflation Differential
Looking at the different inflation levels in China and Japan enables us to analyze further the parity between their currencies and compare it with our previous analyses. We notice that for the past 14 years, inflation in China was often higher than inflation in Japan. The depreciation in the first period is due to the significant increase of China’s inflation despite the rise of Japan’s inflation rate in 2002. Similarly in mid-2006, first quarter of 2009 and after mid-2013, Japan’s inflation levels were higher than China’s. Still it doesn’t explain the Yuan’s appreciation in 2005-2008 for example. According to PPP theory, the Yuan should depreciate because of the high inflation in China especially in 2007-2009 but our calculations show a net appreciation by 5.3 basis points. The only explanation we can think of is that the Yuan is highly overvalued. In the other periods the Yuan depreciated because of the persistent devaluations led by PBoC. The exceptional spike spotted in the graph in 2014 was an unprecedented event in the last 14 years.

Going back to that period, we can read in many articles that the Japanese Yen fell to six-year low against the US dollar. This is the result of BoJ’s decision to inject more money in the economy to meet their inflation target of 2%. The governor of BoJ Haruhiko Kuroda said in one his statements: “We decided to expand the quantitative and qualitative easing to ensure the early achievement of our price target”15. In line with PPP theory, China’s inflation rate is negatively correlated with China’s Yuan. Higher is the inflation compared to Japan, in this case, more is the Yuan’s depreciation.

**Implications**

Japan is China’s third trading partner and their trading balance with Japan registered a surplus since 201116. The overall appreciation trend of the Renminbi might not be in favor of Chinese

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15 http://www.reuters.com/article/2014/10/31/us-japan-economy-boj-idUSKBN0IK0B120141031
exporters to the Japanese market and also might reduce China’s exports since they will be more expensive. Yet, in 2013, China’s trade surplus amounted to USD 30 billion. From foreign direct investments (FDIs) perspective, a strong Renminbi will impact negatively the FDIs coming from Japan on one hand, but will boost the Chinese investments in the Japanese market on the other hand. As an illustration, FDIs from China to Japan went from USD 140 million in 2013 to USD 594 million in 2014\(^\text{17}\). A slight appreciation of the Renminbi shouldn’t worry monetary authorities much unless Japan keeps targeting inflation and weakening their currency.

\(^{17}\) https://www.jetro.go.jp/en/reports/statistics/
Chinese Yuan versus Australian Dollar (RMB/AUD)

Table 5: RMB/AUD 2001-2015

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</thead>
<tbody>
<tr>
<td>RMB/AUD</td>
<td>0.001%</td>
<td>-0.299%</td>
<td>0.293%</td>
<td>-0.657%</td>
<td>0.275%</td>
</tr>
</tbody>
</table>

2001-2005

From 2001 till 2004, RMB depreciated 14.00% against AUD. In 2001, Chinese Yuan was at AUD 0.217 while it dropped to AUD 0.157 in December 2004. The trade between China and Australia was growing. During this time, Australia’s trade deficit with China increased more than double due to weaker Yuan boosting Chinese exports to Australia (Reserve Bank of Australia, 2015).

2005-2008

In this time period, the Yuan appreciated almost 14.00% at one point against AUD and was exchanged at AUD 0.218 in December 2008, the strongest Yuan against AUD after pegging. In
2006 Chinese economy was growing at 12% while it was above 14% in 2007. During this period, inflation in China increased from 1.8% in 2005 to 5.9% in 2008 while in Australian Inflation was 2.7% and 4.4% respectively. Higher inflation in China in 2008 is likely to have caused the Yuan to depreciate in the first half of the year. The weaker currency is then likely to have led to higher imports of Chinese goods into Australia. The growing demand for Chinese currency to settle the current account balance in Australia is the most likely reason for the RMB appreciation in this period.

**2008-2010**

Chinese Yuan depreciated by 15.4% against AUD in the span of two years. In December 2010, Yuan was traded for AUD 0.151 compared to AUD 0.215 in January 2009, while average change in RMB/AUD was -0.657% for this period. Depreciation in RMB could be due to global financial crisis, Chinese economy suffered significantly like Australian, and economic growth declined to 9.21% in 2009 from 14.16% in 2007, inflation was -0.7% and 4.8% respectively. In that period, Australia’s trade surplus increased to EUR 23.25 Billion which indicates slowing down in export of Chinese goods to Australia which indicates less demand for Chinese goods in Australia even in spite of weaker Yuan, which is counter intuitive.

**2010-2015**

In this time period, Chinese Yuan’s, average change (appreciation) was 0.309% against AUD. In January 2011 RMB/AUD was 0.152 which increased to 0.218 in September 2015, net appreciation of RMB by 15.7%. At the same time, AUD had dropped over 15% against USD while RMB appreciated by 0.098%, RMB was relatively overvalued as average inflation in China (3.2%) was still higher than Australia (2.58%).

Volatility

![Volatility RMB/AUD](image)

*Source: Authors' calculations*

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<tbody>
<tr>
<td>RMB/AUD</td>
<td>0.360%</td>
<td>0.446%</td>
<td>0.288%</td>
<td>0.487%</td>
<td>0.295%</td>
</tr>
</tbody>
</table>

Volatility differs between each time period, relative high volatility was observed in 2009-2010 (0.487%), relative low volatility during 2005-2008 (0.288%) and moderate volatility in pegged period (0.446%) and 2011-2015 period volatility decreased (0.295%). The mean exchange rate value calculated throughout the sample period is RMB/AUD 0.178, and the standard deviation is about 2.73%. Thus volatility levels of RMB/AUD can be considered as relatively low to moderate, as they are major trading partner and RMB has been highly regulated against its major trading partners including Australia.
Correlation of RMB/AUD with other major pairs

<table>
<thead>
<tr>
<th></th>
<th>RMB/AUD</th>
<th>RMB/USD</th>
<th>RMB/EUR</th>
<th>RMB/JPY</th>
<th>RMB/MYR</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMB/AUD</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>RMB/USD</td>
<td>-0.24</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>RMB/EUR</td>
<td>0.67</td>
<td></td>
<td></td>
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<tr>
<td>RMB/JPY</td>
<td>0.45</td>
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<td></td>
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<tr>
<td>RMB/MYR</td>
<td>0.29</td>
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</table>

The RMB/AUD exchange rate has shown a combination of relatively strong to moderate correlations with RMB/EUR (0.67) and RMB/JPY (0.45) but negatively correlated with RMB/USD (-0.24), which can be explained as RMB/USD was pegged for a long time but when PBoC decoupled RMB with USD and moved to managed float, RMB/AUD remained relatively stable till 2008-09 financial crisis, consequently many macroeconomic variables disintegrated in this period and RMB appreciated against AUD significantly from 2011 to 2015. However, AUD depreciated against USD in this time period while RMB remained fixed and overvalued before August 2015 devaluation. However, in the long run, RMB/AUD tends to converge with our given currencies except RMB/USD.

Effects of Exchange Rate Trends to Inflation Differential

![Graph showing Inflation % from 2001 to 2014 for China and Australia](Source: World Bank data)
In 2001-2004 (pegged period), RMB depreciated by 14.00% against AUD but according to PPP it should have appreciated as average inflation in Australia (3.125%) was higher than China (1.25%). During 2005-2008 (managed float/pre-crisis) period RMB appreciated by 14.00% while the average inflation in China was 3.50% and in Australia it was 3.225%, consequently RMB depreciated by 15.4% in 2009-2010. In 2010-2015 period, RMB has appreciated against AUD by 15.7%, before PBoC devalued RMB in August 2015. At that time, average inflation in China was higher (3.20%) than Australia (2.58%), PPP theory justifies consequent devaluation of Yuan against currency of basket including AUD.

**Implications**

Analysis shows that average inflation (2.45%) in China from 2001 to 2014 was lower than Australia (2.86%). According to PPP theory Australian dollar should depreciate but actually RMB appreciated by 0.20% in our sample period. At the same time, average GDP growth in China (9.79%) was higher than Australia (3%). Theoretically, we expect a significant appreciation in RMB as higher growth is associated with stronger currency but due to exchange rate control and occasional devaluation by PBoC artificially kept RMB undervalued to gain export competitiveness against major trading partners.

![Australia’s Visible Trade Balance with China (AUD Billion)](image)

*Source: Australian Bureau of Statistics*
Australia is China’s seventh biggest trade partner, total trade volume in 2014 stood at AUD 152.46 Billion. On the other hand, China is now the Australia’s number one trading partner. Australia’s export to China increased from AUD 64.29 Billion in 2010 to AUD 98.21 billion in 2014, a 52.87% increase. However, China’s export to Australia increased only AUD by 13.2 Billion in the same period. Subsequently, it creates huge trade deficit for China. It implies balance of payment theory (Madura, 2012) that in China, there is more demand for AUD than RMB in Australia as it imports more from Australia compared to export, consequently, AUD should appreciate which would make Australian goods more expensive in China consequently Australian exports to China will reduce. This explanation indeed supports the recent Yuan devaluation.
Chinese Yuan versus Malaysian Ringgit (RMB/MYR)

As a trading partner, Malaysian market is less significant for China’s international trade than the US or Japan. In 2013, exports and imports from Malaysia were 1.6% and 2.1% respectively out of the total China’s external trade. On the other side, Chinese market is one of the main important markets for Malaysia in terms of both exports (12.1%, in 2014) and imports (16.9%, in 2014)\textsuperscript{18}.

Appreciation/Depreciation

Table 6: RMB/MYR 2001-2015

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline
\hline
RMB/MYR & 0.4 & 0.45 & 0.5 & 0.55 & 0.6 & 0.65 & 0.7 & & & & & & & & \\
\hline
\end{tabular}
\caption{RMB/MYR 2001-2015}
\end{table}

Source: www.oanda.com

\textsuperscript{18} BNM, Annual report 2014
Overall, RMB has appreciated by 9.2 basis points (bp). We assume that the relative low dependence of the Chinese economy on Malaysian market enables the Renminbi to stay immune, to some extent, from Bank Negara Malaysia (BNM) monetary policies. Therefore, the fluctuations would most likely be driven by PBoC decisions. To check further, let us break down the 14 years into different periods and analyze the figures.

### 2001-2004

During this period, although the Renminbi and Ringgit were both pegged to the US dollar, the Renminbi depreciated slightly against the Ringgit by 0.2 bp. This depreciation was fueled by high China’s inflation rates in 2004 caused by increases in food costs\(^\text{19}\).

### 2005-2008

The Renminbi has appreciated against the Ringgit by 10.4 bp. This change represents the first post-US-dollar-peg area\(^\text{20}\). The RMB/MYR price didn’t vary much although inflation in Malaysia was higher in the first half of the period. The following half, it was China’s inflation turn to soar which seems to have cancelled the inflation differential in average. Nevertheless, the stable price variation can also be caused by China’s monetary authorities’ control of the Yuan.

### 2008-2010

The echoes of the financial crisis seem to have heavily hit the Chinese currency and therefore caused the Renminbi depreciation by 16.9 basis points. The graph shows quite the opposite\(^\text{21}\).

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<tbody>
<tr>
<td>RMB/MYR</td>
<td>0.092%</td>
<td>-0.002%</td>
<td>0.104%</td>
<td>-0.169%</td>
<td>0.266%</td>
</tr>
</tbody>
</table>

\(^{19}\) [http://news.bbc.co.uk/2/hi/business/3713351.stm]

since RMB/MYR price increased in this period. In one year only, 1 Renminbi reached an unprecedented pic of 0.5351 Ringgit. This supports actually our previous suspicions about the overvaluation of the Yuan. An overvalued Yuan means that Malaysian imported products became cheaper and therefore helped increasing China’s imports from the peninsula. This is bolstered by the trade balance deficit China registered with Malaysia in 2007-2009\textsuperscript{21}.

2010-2015

The Chinese Renminbi resumed its appreciation with an increase of 26.6 basis points. The change in price graph shows significant ups and downs all along the five years. Moreover, the RMB/MYR exchange rate raised greatly in the last quarter of 2014 because of the high inflation rates in Malaysia.

Volatility

\begin{center}
\begin{tabular}{|c|c|c|c|c|c|}
\hline
\hline
RMB/MYR & 0.0043 & 0.0001 & 0.0036 & 0.0052 & 0.0077 \\
\hline
\end{tabular}
\end{center}

\textit{Source: Authors’ calculations}

The overall trend shows low volatility levels despite the significant appreciation and depreciation the Renminbi had against the Ringgit. In 2001-2004 period, the volatility was almost stable because both currencies were pegged to the US dollar. The central banks didn’t have a genuine freedom to manage their exchange rate that were driven by the dollar trends. In the following four years, the volatility increased much after unpegging the Renminbi from the US dollar. In 2009-2010, the volatility kept increasing especially after the financial crisis outbreak and PBoC’s efforts to devalue its currency to save its export-led economy. The same rising trend remained until 2015 but with more aggressive speed as we can see from the graph above. In absolute terms, RMB/MYR looks highly volatile but in relative terms, the volatility rates don’t seem considerable when compared to RMB/JPY for example.

**Correlation of RMB/MYR with other major pairs:**

The correlation figures show high correlation of RMB/MYR first with RMB/USD and RMB/JPY, and second with RMB/EUR. Such levels of correlation are expected when we know that the three markets (US, Japan and EU) represent about 27.5% share in Malaysian total trade in 2014. China alone represents 14.3% share of Malaysia’s external trade. China’s economy depends on the American, Japanese and European markets to sustain its growth development and hence, any impact on the three currency pairs is likely to impact RMB/MYR exchange rate because it will influence the import and export business between China and Malaysia.

22 BNM, Annual Report 2014
Effects of Exchange Rate Trends to Inflation Differential

The graph shows very dynamic inflation fluctuations from both sides in the past 14 years. The inflation differences between China and Malaysia support our previous analyses. For instance, based on PPP theory implications, we should expect an appreciation of the Chinese currency in the 2001-2004 period since inflation in Malaysia was higher than the one in China. However, the sharp increase of China’s inflation in late 2003 caused the Yuan to depreciate by 0.2 bp. In 2005-2008, inflation levels in Malaysia were higher than in China which enabled the latter’s currency to strengthen against the Ringgit. In the following two years both countries registered decreasing inflation rates in average but China’s rate was higher and hence caused its currency to depreciate. Although the graph shows more inflation in China than in Malaysia during the 2011-2015 period, we think that the increase of Malaysian inflation relatively to China in mid-2013 set off the depreciating effect in the beginning of the period and caused the Renminbi to appreciate in average.

Source: Datastream
Implications

The relative relationship between the Renminbi and the Ringgit seems to be very volatile and unpredictable. Both countries use managed float regimes and therefore inflation levels influence significantly the valuation of the two currencies. PBoC target economic growth and uses managed float as a tool to meet its growth objectives. Malaysian market is not very important for China when compared to the US, Japan, Germany or even Hong Kong. Monetary authorities shouldn’t worry much about the behavior of the RMB against the MYR. From international traders’ perspective, the appreciating overall trend of the Renminbi might hurt Chinese exporters’ competitiveness in Malaysian markets making their products more expensive. On the other hand, a strong RMB is always welcome for Chinese importers.

Furthermore, movement of capital between the two countries is very volatile. Both China’s inwards and outwards FDIs have been decreasing since 2012\(^{23}\) with a significant fall in China’s investments in Malaysia in 2015, due most likely to the higher inflation rates in Malaysia.

\(^{23}\) Foreign Direct Investment in Malaysia by Blocks of Countries, Monthly Statistical Bulletin Sep 2015, BNM website
**Conclusion**

The forces shaping the future direction of the Renminbi are already at play, from a change in economic driver to achieving the acclaimed IMF reserve currency status. With the end of the peg, the currency has been on an ascent albeit at a managed pace as government officials need to bear in mind its impact on other sectors of the economy such as manufacturing and international trade. Economists believe the currency has more room to rise as China flexes its muscle as the almost world power. But whether the country is able to maintain its trajectory depends on the government’s astuteness in navigating its economy, people and the strength of its currency. The story on the Renminbi, it seems, has just begun.

(7,065 words)
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