1 economics

1.1 The story of two companies

In order to illustrate the basic economic consequences related to the exchange rate, we introduce a fictional story about two companies; MingFix from China producing porcelain fixture and Fluttr from the US mass manufacturing pop art. In the following example we put place these two companies in a fictual world where the Chinese RMB is undervaluated:

Based on a very successful prototype, Fluttr has decided to massproduce 250000 miniature christmas trees made in parts with porcelain fixtures and in their search for a supplier they've come across MingFix who can produce fixtures at a rate much cheaper than american companies producing similar products. A contract is signed and Fluttr owes MingFix the net sum of 23 million RMB. However, Fluttr being an american company will have to exchange their dollars to RMB to fulfil their part of the contract, something they do by selling their dollars to a chinese bank.

Since the RMB is undervaluated in our hypothetic scenario both Fluttr and MingFix benefits from trading in RMB. For Fluttr it's advantegous because a good exchange rate makes the porcelain fixtures cheaper for them to buy, and MingFix benefits because it increases their ability to compete on an international market as long as they aren't reliant on importing products from the US.

The christmas trees were a great succes and Fluttr are looking into out sourcing the production and decides to invest in Chinese factory facilities in partnership with MingFix. To start production they invest 42 mllion RMB in China in the form of wages, land rent, buildings machinery and laywers typing up contracts. This money is based on Dollars as before, and again the People's bank of China steps in to sell RMB to Fluttr for their Dollars. Both Fluttr and MingFix benefit from a cheap exchange rate once again, since this gives them more value for their money on Chinese soil.

Half a year down the road Fluttr starts to see their market shares in porcelain christmas trees diminishing due to a new Chinese competitor calling themselves Flittle and selling similar products for much cheaper. While the Dollar RMB exchange rate original benefitted Fluttr, they are now at a disadvantage by having large part of their design and administration working in the US. This makes their profit margins for each product sold much smaller than Flittle who benefits from a cheap exchange rate when they export their goods because the dollars their consumers pay are exchanged to RMB's at a beneficial rate.

Fluttr are forced to lay off a large part of their staff in the US as a response and since none of the executives are willing to relocate to China and start a new life there under better circumstances for their company, they instead spend their evenings writing angry letters to their senators pushing them to put pressure on China to increase the value of the RMB. They might have benefitted from the exchange rate for a while, they readily admit, but there is no way they can compete with an entirely Chinese company and they would much rather give up their collaboration with chinese suppliers than competing against chinese companies.

It's important to remark in this hypothetical case that there can be many more reasons why a Chinese product might be cheaper than an American equivalent, even under the assumption that the RMB is undervalued. However in the counter scenario where the Chinese RMB is not undervaluated, several things change. Fluttr might be less reluctant to enter the Chinese market given that they have less purchasing power per Dollar. It might well be that an alternative American supplier of porcelain fixtures can provide competing prices. This difference is even more pronounced when it comes to investing in Chinese production facilities. Both the initial investment as well as the goods produced by the facilities become more expensive as the RMB increases in value in relation to the American Dollar.

1.2 A bit of analysis

The above example shows in a simplistic way how the exchange rate that People's Bank of China charges for changing Dollars into RMB could have an impact on american and chinese companies. Both the size and fairness of this impact are however heavily disputed on a diplomatic level between China and the US as well as in academic circles.

To understand these arguments, it's necessary to introduce a few fundamental concepts. We base these concepts on introductory texts in economics that are generally agreed upon in the field of economics. However as will become obvious once we explore the arguments on either side of the debate, even fairly fundamental issues can sometimes be interpreted in more than one way. We will try as best we are able to illustrate these ambiguities in an impartial fashion.

1.3 foreign exchange market

Money is a tradable good and different currencies can be traded against each other in the foreign exchange market. Market participants such as private persons, corporations, commercial banks and national banks can exchange a certain amount of a currency for another amount of another currency. This exchange takes place either at commercial banks and currency exchanges on an open market as with the Dollar, or by trading with state owned banks under tighter restrictions as with the RMB. The exchange rate as introduced in the story of Fluttr and MingFix is the price of a currency A in terms of currency B. On an open market, the exchange rate is determined by supply and demand for a currency. If at some point the demand for more US dollar rises, for example because a international corporation invests in the US and pays workers there a wage in US dollars, the price of the dollar on the currency market will be higher, i.e. you will get fewer US dollars for one euro. However nations can chose to exercise a tighter control of the value of their currency by different measures.

On of the means nations have to control the value of their currency is their national bank. In principle, each national bank has an unlimited supply of its own currency, because they can - figuratively speaking - print a discretionary amount of money in their own currency.[1] A national bank can therefore influence the exchange rate of its currency against other currencies. If the national bank of the US, the US Federal Reserve decides to print more US Dollars and uses them to buy euros, the price of the dollar in terms of euro depreciates, i.e. you will get more US dollars for one euro.

1.4 The tempting misuses of a national Bank

In our story about MingFix and Fluttr we show how manipulating an exchange rate can be beneficial for a nation focused on export and foreign investments. However this behaviour forces trading competitors to take similar steps in order to protect their own exports, which easily leads to a situation where countries are competing to devaluating their currencies in order to compete. Historically this behaviour was recognized as nonbeneficial for all partners involved and international institutions was instantiated to create a set of rules for all partners involved. The most prominent of these today are the IMF (International Monetary Fond), the WTO (World Trade Organization) and the EU (European Union).

However deciding exactly when the rules are broken and a country is gaining an unfair advantage can be difficult in practice. China has been accused by prominent US politicians of 'manipulating' its currency and keeping

[1]The process is somewhat more complicated than printing bank notes, but the effect is the same for the purposes of this section.

the Chinese currency, the Renminbi[2] ‘undervalued’. The next section will analyze how this alleged manipulation takes place and what it means for a currency to be undervalued.

1.5 nominal undervaluation, currency manipulation

Macroeconomic theory postulates, that for every two currencies at every moment, there is an equilibrium exchange rate. The equilibrium exchange rate is determined by supply and demand for each currency in the foreign exchange market. The accusation against China of ‘manipulating’ its currency can therefore be restated: It claims that China is keeping a fixed exchange rate *below* the equilibrium rate. According to textbook economics this can be done in three ways:[3]

1. The government can shift supply and demand for its currency by intervening on the foreign exchange market. Buying foreign exchange and selling the local currency drives the price of foreign exchange up and that of the local currency down.

2. The government can shift supply and demand by means of monetary policy, namely by keeping interest rates low. Lower interest rates mean lower returns for foreign investors. If foreign investors refrain from investing locally, the demand for the local currency decreases, driving the price of the local currency down.

3. The government can impose foreign exchange controls, forbidding foreigners to buy the local currency, therefore again reducing demand and therefore the price of that currency.

Yet each of these practices have legitimate purposes making it difficult to argue that the mere use of these techniques necessarily indicates a manipulative monetary policy. For example Switzerland has since the onset of the great recession applied the first technique to ’peg’ the swiss franc to the euro. In essence the Swiss National Bank (SNB) offers every vendor CHF 1.20 in exchange for an euro. Since the SNB controls the money supply of Switzerland, it will never run out of CHF and the exchange rate of the Swiss franc. As a consequence the euro will never be lower than 1.20 until the SNB changes its exchange rate policy. As another example, the national bank of Denmark controls the supply of Danish kroner so that the exchange

[2]abbreviated to CNY. The basic unit of the Renminbi is the Yuan.
[3](**?**, pp. 514)

rate of the kronor and the euro constantly remains at 0.134 (with a small bandwith of +/-2.25%). Neither of these techniques have provoked action from any of the international bodies governing currency manipulation.

1.6 China criticism

Without being able to pinpoint illegal measures, how can we argue that a currency is indeed undervalued? The logical approach to answer this question would seem to be a comparison between the equilibrium exchange rate and the current exchange rate. However while attempted, this method proves difficult to the point where many economists argue that there is no reliable method to determine the 'right' exchange rate of a currency.[4]

Critics of China therefore base their case on circumstantial evidence rather than on hard empirical methods using one of two methods. Either they can try to correlate the currency value with another economic factor and show a discrepancy either temporal or compared to other countries with normally valuated currencies. Alternatively it can be argued that China's economic policy couldn't have any other valid purposes than to keep its currency undervalued.

The argument against how China conducts its economic policy compared to the measures a country would take to undervaluate their currency is stated by Goldstein and Lardy[5] as follows:

1. The Chinese government has intervened on the foreign currency market on a massive scale: It has been buying foreign currencies, mainly US Dollars (in the form of US government debt) in exchange for RMB to the amount of 10% of its GDP, i.e. 10% of the value of all goods and services produced in China.

2. Interest rates in China are relatively low, with real (i.e. adjusted for inflation) interest rates actually being negative for the most part since 2006.

3. China imposes foreign exchange controls that prevent international investors or other governments to buy RMB.

As a result, critics of Chinas exchange rate regime say, China's export sector has become extremely competitive. Indeed, China's exports exceed its imports by far; in absolute terms, such a current account surplus (i.e.

[4] among others: **?**GoldsteinLardy2008

[5] (**?**, pp. 40)

the amount by which the value of exports exceed the value of imports) is unprecedented, though not so much in relative terms.

1.7 nominal vs. real exchange rates

If the Chinese government chooses option (1) above and buys foreign currency paying with RMB, it is increasing the amount of money in the economy.[6] According to standard economic models[7] an increase in the money supply raises the price level in the domestic economy, leading to inflation.[8] As a result, goods produced in China would become more expensive on the world market not due to currency appreciation, but because production costs (e.g. wages of Chinese workers) rise with inflation. According to this model, even though the People's Bank of China (PBC) keeps the *nominal* exchange rate fixed, the *real* exchange rate, i.e. the exchange rate would float.[9] Therefore, inflation would in the long run offset the competitive advantage of Chinese goods on the world market gained by the low(er) nominal value of the RMB.

China has indeed seen some inflation during the last ten years. But so did other countries - the real and the nominal exchange rate roughly moved in unison during the last ten years.[10]Critics of China attribute this to China's *sterilization* of the money inflows. Since 2003, China hast prevented about 40% of the money inflows of entering the monetary base by raising reserve requirements of Chinese commercial banks.[11]Raising reserve requirements limits the amount of loans the commercial banks can issue, therefore 'extracting' money out of the economy. This in turn limits inflation and prevents the real value of the RMB to rise. This is another manifestation of China manipulating the RMB exchange rate: Not only does it keep the nominal exchange rate artificially low, it also intervenes on the real exchange rate, preventing the 'natural' offset on nominal currency manipulation.

[6] In economical jargon it is expanding the *monetary base*, what (other things equal) leads to an increase in money supply

[7] (**?**, pp. ?)

[8] Maybe quickly explain the assumed mechanism?

[9] (**?**, p. 509)

[10] source: http://www.clevelandfed.org/research/trends/2010/1110/01intmar.cfm

[11] IMF, via Cleveland Fed, http://www.clevelandfed.org/research/trends/2010/1110/01intmar.cfm

1.8 China apology

1.9 newest developments; the situation by now (2012)