China's Changing Competitive Position: Lessons from a Unit-Labor-Cost-Based REER

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Abstract:

This paper calculates a unit labor-cost based real effective exchange rate for China for the period 1987-2002. It examines carefully which data sources can be used given the known limitations of Chinese data and constructs to them together with internationally available unit labor cost estimations for a number of industrialized countries, including Korea and Taiwan. It is found that gauged by the ULC measure the increase in manufacturing competitiveness from the late 1980s to the mid 1990s has been even more remarkably than given known industrial-price-based measures for real effective exchange rates suggest. However, since then, Chinese manufacturers have lost more ground than previously thought.

Keywords: China, international competitiveness, real exchange rate

JEL-Classification: F14, F16

Introduction

Today, it is widely accepted in the policy realm that labor in China is so cheap that the country will have a competitive edge in manufacturing for at least a decade to come. However, it is often neglected, that labor costs are only one determinant for national competitiveness. Almost equally important are the productivity developments in the country concerned as well as the nominal exchange rate.

While productivity growth in manufacturing in China has been undisputedly high (even though the exact magnitude has been deputed), wages in the sector have also picked up over recent years. Moreover, there has been much debate lately whether China should let its currency appreciate, which would further dampen international competitiveness. In order to better gauge how the international competitiveness has changed over the last decade, one would need to compare the overall cost development through bost domestic price increases relative to foreign price increases and changes in the nominal exchange rate.

For such an exercise, a real effective exchange rate (REER) would be the best choice. Such an index would show the change in the real exchange rate relative to the most important trade partners. Up to now, the only widely available REER index for China is from JP Morgan. However, the investment bank's index is based on industrial good's final prices. Especially in an economy in which market power and therefore mark-ups over production costs shift rapidly, this might not be the best gauge for international competitiveness. A real effective exchange rate based on unit labor costs would be a more appropriate tool.

This paper tries to construct such an unit-labor-cost-based REER and compares the results with the industrial-prices-based REER. The rest of the paper is structured as follows: Section 2 explains which data has been used to construct the index. Section 3 presents the results and interprets them. Section 4 touches shortly on the issue of possibly overstatement of Chinese GDP growth and its consequences on the ULC-REER index and section 5 concludes.

Data

A Real effective exchange rate (REER) is defined as a country's weighted bilateral real exchange rate:

$$REER = \sum_{i}^{j} \alpha_i \frac{P}{e_i P_i}$$

with α_i denoting the weight of country i, P denoting the domestic price level, e_i denoting the bilateral nominal exchange rate with country i and P_i denoting the price level in that country. As we try to construct a unit-labor-cost-based REER, P and P_i stand for the respective unit labor costs. Thus we need three kind of data: Unit labor costs for China and its most important trading partners, nominal bilateral exchange rates and the trade weights.

As it is standard in international unit labor cost comparison, we only need the relative change in unit labor costs in a common currency, not an absolute value for the labor costs of one unit of production. The resulting REER thus can – as is again standard – be only interpreted as a relative gauge of competitiveness changes over time, not as an absolute measure of competitiveness.

Fortunately, unit labor costs indices in US dollars are readily available from the US Bureau of Labor Statistics (BLS) for the United States, Canada, Denmark, Norway, Sweden, United Kingdom, Germany, Belgium, the Netherlands, France, Italy, Taiwan, Korea and Japan. Also easily available from the IMF is the bilateral US dollar-Renminbi exchange rate.

What poses more of a problem are unit labor costs for China. To compute them, both data for the wage sum paid and the real value added in manufacturing would be used as unit labor costs are defined as wage costs per unit of output. Again, real value added is provided by the Chinese government and can be easily obtained from the World Bank's World Development Indicators. Getting a decent proxy for the wage sum in manufacturing is more tricky. I opted for the wage (per worker) data from the ILO's Laborsta database and the corresponding number on employment in manufacturing. The ILO gets this data from official Chinese sources, but the Chinese employment data seems to reasonably accurate (Young 2003) and the development of the wage sum follows a similar trend as total private consumption, an indication, that the numbers might also be of acceptable quality. The wage data from the ILO includes not only contracted wages, but also bonuses paid, a part of wages which is of increasing significance in the Chinese economy. With Value Added *VA*, the wage rate

W and employment N in manufacturing as well as the nominal exchange rate e known, it is easy to compute a unit labor cost index in US dollars:

$$ULC = e\frac{WN}{VA}$$

Table 1 presents the thus derived index of unit labor costs in dollar terms along with the BLS indices for Japan, Taiwan, Korea, the USA and Germany.

A second caveat might be the computation of weights α_i. There has been much debate how to most appropriately compute the trading partners weights. Recently, there has been a shift towards including the effects of a change in the competitors' unit labor costs on third (export) markets. JP Morgan, but also the US Fed now take into account the weight competitors have in the main export markets (Hargreaves and Strong 2003). However, as this approach neglects the impacts of competitor's competitiveness on domestic firms producing for the domestic market, it is not necessarily a complete proxy (Ellis 2003). Especially in the case of China, where a lot of outsourcing from industrial and other emerging economies has taken place, the companies working on processing trade face fierce competition from the upstream producers for further out- or even insourcing.[1] Moreover, since the inclusion of third market effects requires a lot of computations, it makes the final index less transparent. I therefore opted for a simple straightforward weighting by export and import shares with data taken from the United Nations' Comtrade Database:

$$\alpha_i = \frac{X_i + M_i}{\sum_i X_i + \sum_i M_i}$$

with X_i denoting Chinese exports to country i, M_i Chinese imports from country i. As the availability of competitors' unit labor cost is limited, only those countries for which they are easily available (see above) are included.

Another aspect which complicates the picture is the question whether to change the weights over time or keep them constant. Simply using different weights each periods would lead to a biased time series: Suppose that a China trades with two countries A

[1] Lately, there even have been reports that Japanese companies are again insourcing production from China.

and B, A having a dollar unit labor cost index above China's, B having a dollar unit labor cost index below China's. If now country's B share in trade with China increases, the overall REER index would show a loss in competitiveness even if both bilateral exchange rates remained constant (Ellis 2001). Conseqeuntly, JP Morgan uses fixed weights for computing its REER. However, keeping the weights constant might be misleading in circumstances in which trade patterns change significantly, which has been the case for China.

Consequently, I have calculated two alternative REER series: One based on fixed 2000 trade weights and one in which the series with rolling trade weights has been spliced each period, following Ellis (2001):

$$REER_t = REER_{t-1} \frac{\sum_i^j \alpha_{t-1,i} \frac{P_t}{e_{t,i} P_{t,i}}}{\sum_i^j \alpha_{t-1,i} \frac{P_{t-1}}{e_{t-1,i} P_{t-1,i}}}$$

The rationale behind this formula is straightforward: The REER index is changed by the amount it would have changed had the trade weights remained constant from the preceding period. Thus it only catches price, not quantity effects.

Results

Table 3 and Figure 1 present the resulting two unit-labor-cost-based REER indices compared to JP Morgan's industrial-prices-based REER. As can be seen, the constant weight and rolling weight computed unit-labor-cost-based REERs track each other rather closely. However, the magnitude of change differs significantly between the industrial-prices-based and the unit labor cost-based indices. The new ULC-REER index shows a much stronger increase in competitiveness in the early 1990s. Second, China's relative competitive position does not appear to be as adversely influenced by the Asian crisis in 1998 as it is suggested by the JP Morgan index. Together with the fall in Chinese manufacturing employment during this time, this suggests that firms have reacted to the fall in demand with a productivity-increasing labor shedding.

Finally, based on unit labor costs, China has been loosing relative competitiveness to a much larger degree since the late 1990s. According to this measure, China has appreciated by almost 25 percent since the de facto-pegging of the Renminbi in the Mid-1990s, while JP Morgan's index shows only an appreciation of less than 20 percent and a slight improvement in competitiveness lately. However, as JP Morgan is using industrial prices, this might just be the consequence of increased competition and falling margins. The underlying competitive position of the Chinese companies seems rather to be eroding following the ULC-REER index.

Three distinct reasons can be made out for this: First, Chinese unit labor costs have picked up since the late 1990s. Second, unit labor costs in the manufacturing sector in other countries have been declining, notably in the United States and in Korea and Taiwan. While the latter experienced a large drop in unit labor costs as a consequence of the nominal devaluation during the Asian crisis, the US experienced downward pressure on unit labor costs when the 2001 recession kept wages down while productivity continued to increase strongly. Thirdly, Taiwan where unit labor costs continued to fall after the Asian crisis, has a growing importance in China's trade; since Taiwanese producers are delivering a lot of intermediary products to the Chinese mainland, its share in the bilateral trade has continuously increased.

Statistical Uncertainties

Whenever a statistic is concerned with the Chinese economy, the first question is how reliable the input data is and what kind of bias they might exhibit. For this paper's calculations, the value added for manufacturing is the prime candidate of misreported statistics. It has been repeatedly argued that Chinese GDP figures – and consequently value added figures – overestimate the actual growth, both for measuring mistakes in the relevant price indices as well as for intentional tampering with the statistical raw data on local levels of government (e.g. Keidel 2001; Rouen 1997).

If however, value added in manufacturing were over-reported while wages and employment are reasonably correctly reported, the result would be an understatement of the actual real appreciation. If this misreporting applied to the whole time frame, the curve would tilt upward, resulting in a larger loss of competitiveness since the mid-1990s than already reported. The understatement of the real appreciation and loss in competitiveness would be more pronounced in times of economic slow-down, which seem to be particularly vulnerable for over-reporting of real GDP. This could particularly be the case for the period of 1998/99 in the aftermath of the Asian crisis. However, these caveats would not question the basic result from the ULC-REER, namely that China's manufacturing has lost competitiveness to a non-neglectable degree since 1995. Moreover, the fact, that the ULC-REER tracks JP Morgan's price based REER index over a large part of the time period rather closely might be a hint that overstatement over the period as a whole is not as severe as sometimes assumed.

Conclusion

This paper has shown that using a unit-labor-cost-based real effective exchange rate, the swings in Chinese international competitiveness over the two recent decades has been even larger than suggested by the so far mainly-used industrial-prices-based real effective exchange rate. During the early reform years, the Chinese manufacturing sector improved its competitiveness by enormous margins. Since 1995, however, competitiveness has been deteriorating again with a constant real appreciation of the Renminbi in unit labor terms.

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Data Used

Unit Labour Costs: US Bureau of Labor Statistics: International Comparisons of Manufacturing Productivity and Unit Labor Cost Trends, Supplementary Tables, Table 10. For the years 1987 to 1991, West German data was used for Germany.

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Value-added in Chinese manufacturing: World Bank: World Development Indicators, Series NAMFG__K_W._CO09.

Employment and Wage rate in Chinese manufacturing: ILO LABORSTA database. Tables 2B and 5A .

Trade Flows: Relevant Series from UN COMTRADE database, China as reporting country.

Tables and Graphs

Table 1: Unit Labor Costs Manufacturing, US-Dollar Basis, 1992=100

	Germany	Japan	Korea	Taiwan	USA	China
1987	74.9	85.1	60.6	66.3	86.9	115.6
1988	76.9	93.3	77.8	75.5	86.7	127.6
1989	73.0	87.2	91.6	85.2	90.5	120.3
1990	87.3	83.9	93.0	89.7	93.7	98.7
1991	87.5	91.8	100.3	91.1	97.6	98.4
1992	100.0	100.0	100.0	100.0	100.0	100.0
1993	98.7	115.3	102.6	98.1	100.6	104.6
1994	98.2	125.8	106.8	99.0	98.5	78.0
1995	114.2	131.6	124.3	99.2	94.8	84.8
1996	111.6	109.5	125.9	95.4	93.5	82.4
1997	94.0	97.4	100.2	89.5	91.9	77.0
1998	92.9	92.2	65.8	77.4	92.8	72.3
1999	91.5	101.0	68.8	78.3	91.3	72.2
2000	79.7	98.4	70.4	78.1	92.3	74.6
2001	79.5	88.0	66.5	69.4	94.1	76.5
2002	83.9	89.1	72.4	63.8	90.2	79.3

Source: For Germany, Japan, Korea, Taiwan and USA: BLS;
China: Own Calculation based on World Bank, ILO data

Table 2: Trade Weights used for computing the index by country and year, in %

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
BEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.3	1.4	1.3
CAN	4.5	4.6	2.9	3.6	3.5	3.3	2.2	2.2	2.4	2.3	2.0	2.2	2.1	2.4	2.4	2.1
DEU	11.2	10.7	10.0	9.4	9.2	8.6	8.6	8.2	7.9	7.2	6.5	7.1	7.0	6.7	7.5	7.4
DNK	0.8	0.6	0.5	0.6	0.5	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.4
FRA	3.5	3.3	3.8	4.5	3.7	3.0	2.5	2.3	2.6	2.3	2.8	3.0	2.9	2.6	2.5	2.2
GBR	3.8	3.5	3.5	4.0	2.8	2.7	3.2	3.0	2.8	2.9	3.1	3.4	3.5	3.4	3.3	3.1
ITA	4.7	5.0	5.0	4.0	4.0	3.8	3.4	3.2	3.0	2.8	2.4	2.4	2.4	2.4	2.5	2.5
JPN	44.7	43.2	39.9	36.0	35.4	35.0	33.4	33.3	33.6	33.4	31.2	28.8	28.6	28.5	28.2	27.2
KOR	0.0	0.6	2.0	4.4	6.0	7.0	7.0	8.0	9.7	10.9	12.0	10.1	10.5	11.7	11.4	11.6
NLD	2.7	2.8	2.7	3.0	2.8	2.6	2.1	2.2	2.5	2.6	3.0	3.2	2.9	2.8	2.9	2.9
NOR	0.7	0.4	0.5	0.4	0.5	0.4	0.2	0.2	0.3	0.3	0.5	0.3	0.4	0.4	0.3	0.4
SWE	1.0	0.9	0.9	0.8	0.8	0.9	0.8	0.9	0.8	0.9	0.9	1.3	1.1	1.2	1.0	0.7
TWN	1.2	2.4	3.5	4.8	6.5	7.9	11.6	10.5	9.7	9.9	9.4	9.5	9.6	10.2	10.1	11.6
USA	21.2	22.0	24.9	24.6	24.2	24.4	24.6	25.6	24.5	24.2	25.9	28.3	27.4	26.0	26.2	26.5

Table 3: Unit-Labor-Cost Based REER for China, 1995=100

	Changing Weight ULC-REER	Constant Weights ULC-REER	JP Morgan REER
1987	182.3	184.1	
1988	189.6	192.0	
1989	183.9	185.9	
1990	143.5	144.6	125.9
1991	135.5	136.3	114.6
1992	130.1	130.9	113.8
1993	131.7	132.6	132.2
1994	95.9	96.4	95.4
1995	100.0	100.0	100.0
1996	104.1	103.9	106.2
1997	107.9	107.5	113.5
1998	109.0	108.1	119.7
1999	106.4	105.8	113.4
2000	113.5	113.3	116.0
2001	122.3	122.1	121.9
2002	125.8	126.0	119.0
2003			113.4

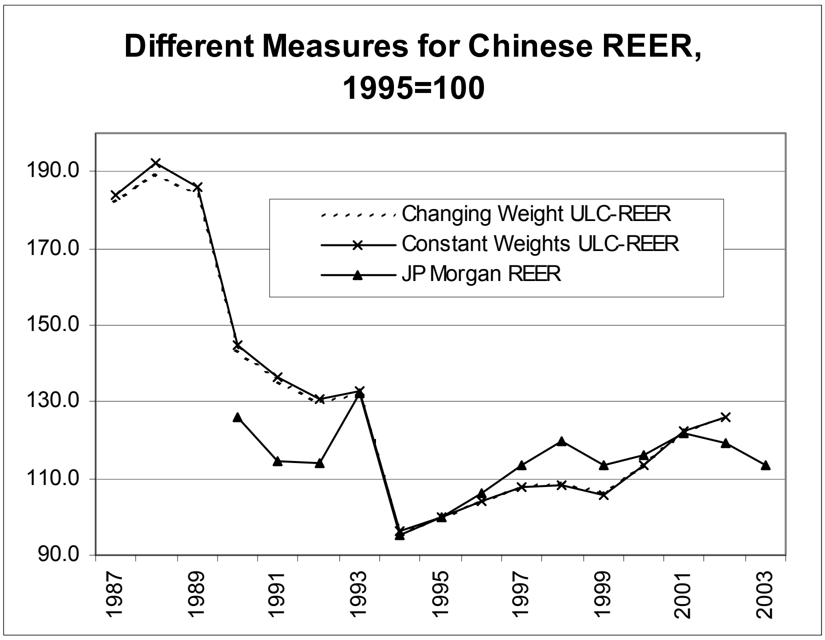

Figure 1: Different Measures for Chinese REER, 1995=100