

## Reply to the Referee Report 1, dated March 2, 2010

As clearly stated in the abstract, the aim of this paper is to obtain better than those existing estimates of the RMB misalignment series using the commonly accepted RER evaluation modelling framework for time-series data. Our paper is motivated by the current policy issue not making *innovation* to the theoretical framework. Looking into the extant estimates, we find discernible lapses in the use of data and econometric techniques. That is where our *value-added* comes in, as summarised in the abstract and described in sections 2 and 3 of the paper. Since the referee still finds the description not clear enough, we shall try to explain again.

1. The data coverage: we use time-series data of quarterly frequency for the period 1994Q1-2009Q2 covering 70% of China's trading partners. None of the extant estimates use such an up-to-date and extensive data set. For example, the sample period used in Cheung et al (2007) is 1975-2004 in annual frequency; the period is extended to 2005 in Cheung et al (2009); although their data sets cover more countries than ours, the sets use fixed country weights. Cheung et al (2009) find a change from the 2007 vintage data to the 2008 data produce conflicting estimates. The problem is overcome in our paper, as we use quarterly trade weight series to keep the weights up to date. The sample period is 1982-2002 in Dunaway et al (2009), also annual in frequency. Funke and Rahn (2005) use quarterly data for 1985Q1-2002Q4, and their country coverage is limited to Japan, UK and the euro zone, far too narrow for the Chinese trade. There's another data related issue: key variable choice. The previous studies either use relative per capita income or the relative prices as the key explanatory variable. We have tried both and present the alternative estimates.
2. Econometric techniques: None of the previous papers has addressed the issue of heterogeneity. Their estimates are based on either cross-section, or pooled-data or panel regressions. These methods assume homogeneity in the parameters of interest without testing it. The assumption is rejected in our paper and we have thus conducted economy by economy modelling experiments. As for the long-run estimation, the panel estimates of most of the papers are based either on standard cointegration procedure, eg Funke and Rahn (2005), or simple dynamic models without considering the possible unit-root problem, eg see Dunaway et al (2009). We have carried out unit-root tests for all the relevant time series and tried both the cointegration route and the single-equation route, as the latter doesn't require nonstationarity or cointegration.
3. The existing meta-studies: we are aware of the literature and cited Cline and Williamson (2008) as we find it best summarise most of the relevant estimates and the underlying methods; we update their summary by Table 1.

4. Structural break: It is exactly the worry about structural breaks, especially in relation to the East Asian financial crisis in 1997, that we have conducted both full sample and sub-sample estimation. In fact, we have experimented more during the economy-by-economy modelling experiments and compared the results. We haven't reported all the results for keeping the paper short and focused. Again, none of the previous studies have considered this issue.
5. Link between the policy debate on bilateral nominal exchange rate and the research on misalignment estimates based on REER. This has been clearly stated in many works, most notably those published by IMF. We do not see any need to repeat the reasons here. However, we would like to point out that Cheung et al (2007), one paper that the referee recommends us, estimate the currency misalignments by pooled regression using bilateral real exchange rates, which is conceptually wrong as the reference rates should be the long-run equilibrium REER. On the other hand, because our approach is to estimate the bilateral equilibrium real exchange rate first, and then take the weighted equilibrium real exchange rate as equilibrium of REER, no further calculations are needed.
6. Use of the term 'significant': the word used in the paper is based on the general sense of the word, not the rigorously defined statistical sense, as no critical probability is attached. As the paper serves mainly policy makers rather than academics, we don't see much danger in such use. We would use 'statistically significant' together with a certain probability percentage as the critical value if we had intended the statistical definition. Besides, the difficulty in calculating confidence intervals for misalignment estimates is already discussed by Cheung et al (2009).

References not already cited in the paper:

- Cheung et al. (2007) "The Overvaluation of Renminbi Undervaluation," *Journal of International Money and Finance* 26, 762-785.
- Dunaway et al. (2009) "How Robust are Estimates of Equilibrium Real Exchange Rates: The Case of China", *Pacific Economic Review* 14, 361-375.