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Comments on Cline and Williamson's 'Estimates of the Equilibrium Exchange Rate of the Renminbi?'

Jeffrey Frankel
Harpel Chair, Kennedy School of Government
Harvard University

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Bill Cline and John Williamson have performed a timely and useful service in providing a well-executed survey of recent estimates of the proper value of the yuan. The literature is by now large enough to merit a survey, while the topic remains one of the hottest policy questions of international finance in recent years. The width of the range of estimates is an appropriate subject of consideration in its own right: a failure for experts to come to even a rough consensus on whether a currency is undervalued or overvalued would call into question giving the IMF or the US Treasury legal mandates to assess the correct value and to levy penalties if corrections by the erring government are not forthcoming.

A technical point

At the risk of sounding too professorial, I begin with a technical point. Table 1 and the rest of the paper report percentage appreciation needed to eliminate undervaluation, as distinct from percentage undervaluation. I feel strongly that all these numbers ought to be converted to logs. I understand fully that saying the word "logarithm" in a Congressional hearing will probably clear the room faster than an anthrax scare. But in academic papers we do it in logs, I believe that across the street at Brookings they would do it in logs, and my judgment is the Petersen Institute should do it too. My recommended phrasing is "the percentage undervaluation of the yuan is estimated at X%", followed by the word "logarithmically" either in parentheses or in a footnote.

Even judged purely from the standpoint of user-friendliness by non-specialists, I think this phrasing is likely to be, if anything, less confusing than the repeated practice of reporting two numbers, one for percentage undervaluation (say 50%) and another for required appreciation to return to equilibrium (100%) which causes the uninitiated reader to wonder why on earth these two numbers are not the same. For example, the authors report (correctly) both my estimates that the RMB was 36% undervalued relative to the average normal Balassa-Samuelson relationship, and that a 56 percent revaluation would be required to reverse it. To me, citing two numbers seems potentially confusing to non-economists. Better to emphasize the single log number, as I do (45%), which represents both the percentage undervaluation and the percentage appreciation that would be needed hypothetically to get to long-run equilibrium.

The authors' choice as to how to report percentages can also have the effect of making the numbers sound large ("100%" rather than "50%").

Approach 1: PPP enhanced by Balassa-Samuelson

The first category of techniques for estimating the value of the renminbi is labeled by the authors the "enhanced-PPP" approach. It computes absolute PPP (Purchasing Power Parity) for individual countries relative to the Balassa-Samuelson line, that is, relative to the usual relationship under which the real exchange rate on average rises with the level of productivity or real income (across countries, but also across time as well).

The authors are skeptical of the enhanced-PPP approach. Some of their concerns are justified but not, I think, all.

(1) One place where I think they have a good point is that many of the calculations of "overvaluation," including my own, have been made relative to the dollar. But this approach neglects the possibility that the dollar itself is overvalued (or undervalued). Better to calculate the overvaluation of the yuan relative to some weighted basket, rather than relative to the dollar alone. There is nothing at all in the "enhanced-PPP approach" that prevents this.

(2) Another place where I agree with them is in their judgment that the most recent enhanced-PPP study, by Cheung, Chinn and Fujii (2008) – though otherwise excellent – doesn't use the most appropriate standard errors, and thereby conveys less confidence in their own estimates than is merited. The Balassa-Samuelson relationship itself is highly significant statistically, and so I think it is appropriate to conclude that large deviations from it are significant.[1] China may not quite make it into the 5% of currencies most out of line by the Balassa-Samuelson criterion (as I think the Cheung et al application of a "95% confidence" criterion would require, at least in their original draft); but this shouldn't preclude us from saying that the calculation shows that it is undervalued.

(3) Most importantly, they question the reliability of the Chinese price data in the Penn World Table, which are the basis of the absolute PPP calculations, and they specifically suggest a downward bias.[2] They also go on to make an excellent point, that such measurement errors, to the extent they are important, distort not only the variable measured on the vertical axis, but also the real income or productivity measure on the horizontal axis. The possibility that the PWT data were subject to measurement error, and that this might be especially true of the data for China in particular because of a paucity of genuine within-country data, has long been evident. In the past there has been

[1] I say as much in my own comment on the paper by Cheung, Chinn and Fujii (Frankel, 2008).
[2] Summers and Heston (1991) and and Keidel (1994).

little information available on why the measurement errors for China should be strongly biased in a particular direction as the authors assert.[3]

Several weeks after the Peterson Institute conference, however, the authors were proven spectacularly right when the Asian Development Bank (2007) and IBRD (2007) released the preliminary results of a new study of absolute PPP, under the International Comparison Project, using much more extensive data, in particular for China, than have previously been available. According to the new numbers, which pertain to 2005, China's price level is 42 % of the US price level. This is far less of an undervaluation against the dollar. The new numbers show China's real income per capita to be 9.8 % of the US level. Using estimated Balassa-Samuelson coefficients from either Rogoff (1996) or Frankel (2006) -- .37 or .38 -- this implies that the appropriate long run equilibrium real exchange value for the RMB is 42 % of the US price level.[4] By these calculations, the RMB is exactly where it should be, vis-à-vis the dollar.

Three qualifications are necessary, and each suggests some remaining undervaluation. First, as Cline and Williamson point out, there is no guarantee that the dollar is not itself overvalued or undervalued. By the PPP criterion it is probably by now undervalued globally, particularly when one includes the depreciation of 2007, which would imply that the RMB is too.[5] Second, since the new International Comparison Project (ICP) numbers on prices and real incomes are both more up-to-date and more reliable than those previously available, it makes sense to re-estimate the Balassa-Samuelson estimation. Arvind Subramanian (2008) has done this, and he computes that the RMB is still 15% below where it ought to be. Third, the price data for China might not sufficiently take account of the effect of lower prices in rural districts, which would again imply that the RMB is more undervalued than the latest numbers suggest. Certainly, however, the new ICP numbers imply that the RMB is far less undervalued under the extended-PPP approach than we had previously thought.

I am less convinced by the author's remaining two critiques of the enhanced PPP approach.[6]

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[3] I was not particularly persuaded, for example, by an argument of the authors that seemed to me circular: "It is also well known that China is an extreme outlier, with low domestic prices. The presumption is thus that China's prices have been measured unreliably at below actual levels." But perhaps we should have granted Cline and Williamson extra credibility on this claim in that it runs the opposite direction from the claims of their colleagues at the Petersen Institute that the RMB is undervalued: Bergsten (2006), Goldstein (2003, 2004), and Goldstein and Lardy (2003, 2005).

[4] To say that Chinese income is 9.8% of US income is to say that there is a gap of 2.32 in log terms. Multiply by .37 or .38 to get the estimate that the price level gap should be .87 in log terms, i.e., that the Chinese price level should be 42% of the US price level.

[5] Relative to developing Asia, Chinese prices are an estimated 3% above average, according to ADB (2007). China's income is 14 % above the average for developing Asia, which implies that its prices should be 5 % above the Asian average. So by this calculation the RMB is undervalued by a mere 2%, relative to the Asian average.

[6] It may sound like I have just agreed with 3 out of 5 of the authors' critiques of enhanced-PPP as a methodology. But the third point was merely a critique of the numbers available before 2007.

(4) They say "there is ample historical experience (including that of China today) to show that the deviation of the PPP/market exchange rate ratio (PPP/er) from the international norm can be a wholly misleading guide as to whether the country has a current account surplus or deficit…" But I can't think of anyone who ever claimed that this ratio is a good guide to whether the country is in surplus or deficit; so I don't see how it can be misleading. They point out that China only established large trade surpluses over the last five years, whereas the yuan has been "undervalued" on the enhanced-PPP basis for a lot longer: "the enhanced-PPP seems to show chronic undervaluation for China going back a quarter-century, whereas policy concerns about undervaluation have escalated only in recent years." I hope we are not going to use as the economic criterion for overvaluation what country the US Congress chooses in any particular decade as scapegoat for the US deficits or other "escalating policy concerns."

In China's case, the most natural explanation for the large trade surplus is that this has been a period when previously-high trade barriers between China and the rest of the world have come down, most conspicuously in the form of China joining the WTO and the West ending barriers like the Multi-Fiber Agreement (and the earlier quasi-sanctions that the US arrayed against China, in the form of annual dangling of renewal of MFN or NTF status). The combination of tumbling barriers with a substantial pre-existing cost advantage explains the rapid increase in China's trade balance.

The authors' example of Japan perhaps gives one more genuine cause for worry (especially Figure 2). How can Japan have consistently run such large current account surpluses in recent decades even though its currency has been greatly overvalued relative to the Balassa-Samuelson relationship (though more so in 1995 than in 1985 or today)? One possible answer is that the Balassa-Samuelson relationship applies more strongly to Japan than to other countries: the rate of growth of productivity in traded goods and the rate of increase in the relative price of nontraded goods have both been higher in Japan over the postwar period than would be typically be implied by its rate of growth of real income. Still, their point is a good one.

(5) Their fifth criticism of the enhanced-PPP approach is that it is not suited to normative statements. The readership wants an estimate of how much China should revalue, preferably *right now*. I certainly didn't intend my estimate of a 45% "undervaluation" relative to the Balassa-Samuelson relationship to be interpreted as a statement that the currency should be revalued by anything like that in a short period of time. I got closer to a normative argument with the following logic. According to my estimates, from one decade to the next, the typical country closed almost exactly ½ of its deviation from the B-S relationship. That alone would be sufficient to produce an estimate that the RMB would appreciate at 22 % over the next ten years, or 2.2% per year. But in addition we expect China to continue to experience higher productivity growth than its trading partners. The standard Balassa-Samuelson effect (which is a movement *along* the curve, rather than a movement *to* the curve), assuming that Chinese

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Now that we have the new absolute PPP numbers from the ICP, the enhanced PPP approach is more useful.

growth continues on the order of 6 % greater than US growth, would require adding another 2.3 % of real appreciation per year (.38 times the relative growth rate). The total is a predicted rate of real appreciation of 4 ½ % per year. My prescriptive conclusion was that it would be better to take this real appreciation of 4 ½ % per year in the form of nominal appreciation, rather than build in an inflationary bias (above the world rate) of this magnitude. [7] Of course these numbers need to be substantially revised in light of the new price numbers released December 2007 by the Asian Development Bank and World Bank.

Approach 2: Exchange Rate Equations

The second category of studies the authors look at is called BEER: Behavioral Equilibrium Exchange Rates. I agree with their identification of the shortcoming of these approaches, in the present context, which is that they are only capable of delivering a statement about the valuation of a given currency today *relative to its own past history*. As with the simpler relative PPP calculations, one needs to be able to assert a particular year when one believes the currency in question was in equilibrium, or else to assert that it was in equilibrium on average during the sample period.[8] I don't think this will work for China because the hypothesis – my hypothesis, anyway – is that the yuan may have been undervalued for a long time, at least as long as the period during which it has had the semblance of a market economy. (I would like to hear the authors elaborate on the sentence, "everyone agrees that the RMB was severely overvalued in the early 1980s." I suspect that it depends on one's definition of overvaluation.) Particularly for the study that allows a break at the time of the Chinese devaluation (unification) in 1994, I don't see how one can presume the post 1994 period was properly valued on average. The hypothesis under consideration is that the currency has been undervalued throughout this period. One cannot test a hypothesis by means of an assumption that rules out the hypothesis a priori.

MacDonald and Dias do not get a significant effect on the real interest rate. I am surprised to read the authors explain this on the grounds that "this is not surprising since real interest rates are now more a world rather than a national variable." It is very clear in theory, and also in practice, that even if capital mobility is perfect and domestic and foreign assets are perfect substitutes, this only implies uncovered interest parity, not real interest parity, and that as a result the real interest differential should indeed be an important determinant of countries' exchange rates, as in Dornbusch overshooting.[9] In the case of China, I agree that the lack of an effect is not surprising, but for the opposite reason: China retains important capital controls and domestic interest rates are not yet

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[7] As Ron McKinnon has emphasized repeatedly, to build in a trend real appreciation of 4 ½ % per year is eventually to build in real interest rates 4 ½ % below world levels, which is not desirable. For this reason, I would favor an abrupt nominal revaluation of, perhaps, 10 % in the first year.

[8] "…this is only as good as the assumption of an equilibrium average real exchange rate over the sample period." (p.8)

[9] Dornbusch (1976), Frankel (1978). A recent example for a financially open emerging market currency is Frankel (2007).

fully market determined. In other words financial liberalization has been too little, not too much, to see this effect show up.

I share the authors' bottom line that "the necessary assumption of average equilibrium over the estimation period makes even the internationally-based BEER approach less reliable."

Approach 3: FEERs

The third approach is FEER, Fundamental Equilibrium Exchange Rate, which is of course the authors' own preference. John Williamson has made us so familiar with this approach over the years, that I have surprised myself in thinking about the definition they offer here: "The basic idea is to search for a set of exchange rates that will simultaneously achieve internal and external balance in every country (Meade, 1951)." But I would have thought it a basic proposition, of Meade in particular, that exchange rates are not in themselves sufficient to achieve simultaneously internal and external balance. The Tinbergen-Meade principle is that if one has N policy goals, one must have at least N independent policy instruments. Since countries have goals for both internal and external balance, they need a second policy instrument in addition to the exchange rate: an "expenditure-reducing" instrument (in Harry Johnson's classic terminology) such as monetary or fiscal policy. Perhaps the authors are dismissing the internal balance consideration because "In an era when long-run Phillips curves are widely believed to be vertical…there is not much room for arguing about levels of internal balance." If so, I disagree. They seem to think that agreeing on where the desirable point of external balance lies is the main issue of difficulty, while I believe that deciding where internal balance lies is at least as difficult as where external balance lines.

Admittedly, there is also a wide range of disagreement about external balance. On the one hand, Dooley, Folkerts-Landau and Garber believe that China is deliberately keeping its currency undervalued as part of an intelligent development strategy, and some of my colleagues believe that other countries should do the same (e.g., Dani Rodrik, 2007), while others have said that it makes perfect sense for the US to be running a current account surplus due to its comparative advantage as the world's banker (e.g., Caballero, Farhi and Gourinchas, 2006). In other words, one view is that external balance for China implies a trade surplus. On the other hand, as the authors point out, the traditional view is that a poor country that has a low capital/labor ratio, or at a country that is rapidly and successfully developing, ought to be importing net capital inflows from abroad, which means running a trade deficit. My own view is somewhere in between. The choice is arbitrary, but 0 is as good a number as any (under the Polonius principle: "neither a borrower not a lender be").

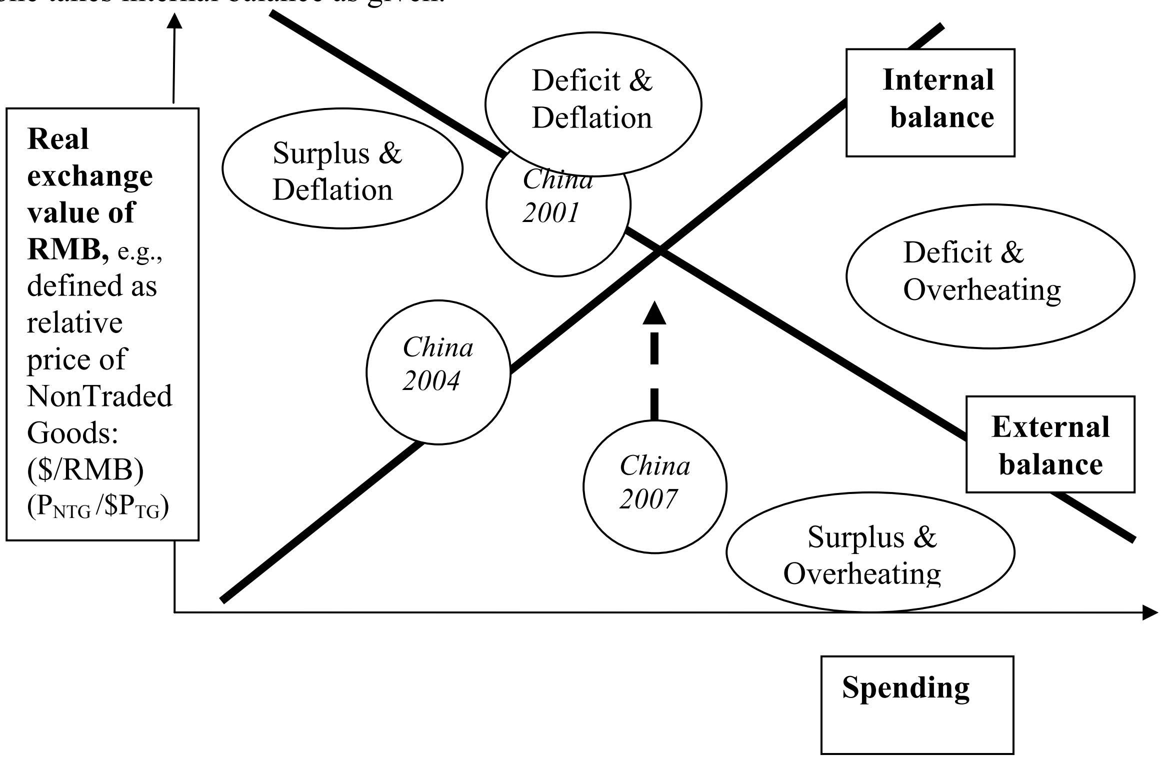
The question is indeed hard to settle convincingly. But so is the internal balance question. The difficulty of choosing optimal targets for either external balance or internal balance, in such a way that a majority of reasonable economists are convinced, is the prime reason why I have long felt that there are limits to the practical usefulness of the FEER approach developed by my beloved friends at the Institute. Indeed, it is part of why there are limits to the practical usefulness of *any* attempt to say what the correct values of most currencies are. (I see the RMB as a rare exception, in that almost all of the different criteria that one might apply, even if one limits the list to those from the perspective of domestic Chinese interests, happen to have pointed the same direction in recent years.)

The authors do indirectly address the issue of internal balance when they talk about cyclically-adjusted trade balances. But this requires a lot more discussion. In the first place, I think one must be explicit about the distinction about the appropriate exchange rate conditional on current spending versus the appropriate exchange rate conditional on an assumed change in spending policy that would permit the restoration of internal and external balance simultaneously. This would make a huge differences in some contexts, that of the United States, for example. My view is that the dollar is not necessarily overvalued currently if one takes the current trajectory of budget deficits and low national saving as given – quite relevant in that George W. Bush's Administration has been unwavering in its commitment to tax cuts despite the resultant deficits – but is much more clearly at too high a level if the standard of comparison is what would be appropriate if one were free to adjust fiscal policy and other settings as part of an overall package of orderly adjustment. (This position is the same that I had in 1983-84,[10] and should not be an unfamiliar one; e.g., it is consistent with that of Paul Krugman in an old debate with Ron Mckinnon).

In the second place, although it is much less clear that China's spending policies have tended too far in one direction or the other over the last couple decades than is the case with the Unites States – China was suffering from deflation in 2001 – I believe that China has crossed the internal balance line during the past few years, and is now on the "excess demand" side. It is true that Chinese private saving is extremely high, and I agree with the authors that one should not presume that this is necessarily optimal. But its investment is also very high. A growth rate in excess of 11%, the reaching of chokepoints and bottlenecks, rising inflation (particularly in food and raw material inputs), and a bubble in the Shanghai stock market all point to excess demand rather than excess supply. Thus if one cyclically adjusted China's trade surplus, it would look even larger than it does today. The authors don't even seem to consider this possibility, instead citing others' estimates as to how much cyclical adjustment would *reduce* China's trade surplus. ("..it is necessary to determine how much of the present current account divergence from target is strictly cyclical and transitory, a step that turns out to be critical for China." Apparently Jonathan Anderson believes there is excess heavy industrial capacity, and many others as well are cited implicitly as presuming that China is on the excess supply side of internal balance. The authors themselves agree. This seems to me out of date.) Thus even if one accepts the methodology that implicitly assumes spending policies are adjusted at the same time as the exchange rate, one will get very different numbers for the recommended revaluation depending on one's estimates of the needed adjustment in spending policies.

[10] *Economic Report of the President*, 1984.

Apparently the authors feel that the range of possibilities runs roughly between the areas that I have labeled China2001 and China2004 in the graph. In that case, when trying to decide what exchange rate change would restore external balance, it is indeed true that it makes a huge difference, first, whether you think of the question as predicated on the current level of spending. At "China 2004" this would imply an appreciation, but at "China2001"it might not. Furthermore, if you are assuming that an appropriate change in spending policy is part of the adjustment process, then "China2001" would actually imply a devaluation, but China2004 would imply a small revaluation, while China2007 would imply a substantially larger revaluation. My own view is that China over the last four years has crossed over to the vicinity of the area I have labeled China2007. If so, only a revaluation is needed, roughly speaking, to return to both external and internal balance.[11] But most of the time, the answer will depend on whether or not one takes internal balance as given.



[11] I certainly don't mean to imply that revaluation of the currency is the only policy change China should make. Rather appreciation should be part of a broad strategy of more fully developing the domestic economy: health care and other services, retirement plans, social safety nets, infrastructure, environmental protection, etc. My point is only that it is not clear to me that a big overall monetary and fiscal expansion should be part of the package.

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