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Comment   Jeffrey Frankel

When one reads in the second paragraph of this nice chapter, "there are very few studies that simultaneously assess the Chinese exchange rate and trade/current account balance," one's first reaction is: "That is true; I wonder why analysts haven't addressed them together. This will be a useful contribution." And the chapter does turn out to be a useful contribution; the authors do their usual careful job with the econometrics, while linking directly to some of the most important questions in international macroeconomic policy today.

One doesn't have to read much further, however, before being reminded why quantitative research on the Chinese exchange rate and trade balance has been stunted. There are reasons to be pessimistic about getting good results econometrically. First, as the authors say, "the data pertain to an economy experiencing rapid structural changes." Second, the exchange rate has usually been de facto fixed, in the past under a dual exchange rate system and even today supported by capital controls. Neither the domestic financial market, nor international capital flows, nor the exchange rate itself are determined by market forces. Flexibility in the nominal exchange rate has been so low and the current "misalignment" probably so high, that there is little hope in estimating an econometric equation to determine the exchange rate. According to some theories, one gets the same real exchange rate regardless of the regime: if nominal flexibility is suppressed, then fundamentals show up in the price level instead. But we know that, in practice, if a country like China holds the nominal exchange rate fixed at a time, it will prevent or at

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least delay real adjustment from occurring.[1] This is especially true if the authorities sterilize their reserve inflows, as the People's Bank of China was remarkably successful at doing, at least through 2007. One need not pass judgment on the wisdom of Chinese policy, let alone call it "manipulation," to realize that the renminbi (RMB) has been sufficiently insulated from market forces that models designed for other countries are unlikely to work well in this context.

Cheung, Chinn, and Fujii (CCF) estimate the RMB to be undervalued on the order of 50 percent in log terms. This is close to some other estimates of purchasing power parity (PPP)-based relationships, such as my own 45 percent (in log terms), relative to the line representing the Balassa-Samuelson (B-S) relationship. In other words, it is not just that China's absolute prices are at current exchange rates only an estimated 23 percent of prices in the United States, but they are low by 45 percent even after taking into account what is normal for countries at China's stage of development, as measured by income per capita. Admittedly, the extant range of estimates of undervaluation is far larger once one ventures beyond the B-S/PPP approach.

Large as the CCF point estimate is, probably their most important message is that the standard error on their calculation is so large that this undervaluation is not statistically significant. I hadn't done this particular test myself, but one probably shouldn't be surprised. It continues in the train of negative findings regarding models of exchange rate determination that has been the dominant tradition ever since Meese-Rogoff. And one can eyeball from the graphs that the R^2 of the relationship is sufficiently low that most countries will find themselves within the "normal range of variation" around the B-S line.[2]

Note that this is very different from saying that the B-S relationship itself is not statistically significant. It is significant, in the results of CCF, as in my results[3] and those of many others before us. What then should one make of the undervaluation estimate for the RMB? I will come back to this later.

Sticking to the chapter itself for now, there are two directions to go, from the finding of statistical insignificance. The first is to note that the absence of statistically significant predictive power, or even stable explanatory power contemporaneously, undermines the argument of those who would say that the RMB is clearly undervalued based on economic fundamentals. The authors write, "These findings highlight the great degree of uncertainty

1. The evidence does not suggest that nominal exchange rate regimes strongly affect the speed of adjustment of the real exchange rate (Chinn and Wei 2008). But this may just reflect that prolonged misalignments are as possible under floating exchange rates as under fixed rates, even though arising from different causes.

2. I am here using the term "Balassa-Samuelson relationship" to refer to the correlation between real exchange rates and real income or labor productivity. As CCF point out, there are other theories that could explain the correlation besides the one that Balassa and Samuelson had in mind, which was faster productivity growth in tradables than nontradeables.

3. See Frankel (2006).

surrounding empirical estimates of equilibrium real exchange rates, thereby underscoring the difficulty in accurately assessing the degree of RMB undervaluation." One could point out that the disagreement among economists, using different economic models, particularly the tendency of some prominent international economists (though a minority)[4] to say that the RMB is very fine where it is, thank you, undermines the claim that any objective mode of inquiry would find the RMB clearly undervalued.

This is a very important point, as the "misalignment" or even "manipulation" is the position of U.S. politicians of both parties and could well result in Congress passing the aggressive sort of legislation that it has been threatening for years. It is also in some sense now the position of the International Monetary Fund (IMF), explicitly in its recent Article IV consultations and implicitly in the research agenda associated with the Multilateral Consultative Group on exchange rate surveillance. And if one cannot come up with a clear unambiguous answer to the question for the RMB, what hope is there for other exchange rates, where it is typically far more difficult still to pronounce the currency unambiguously undervalued or overvalued. Often, as for the U.S. dollar, one criterion like PPP can point in one direction, while other criteria, like the current account balance or overall balance of payments, point just as clearly in the opposite direction. This is not the case with China.

The econometric approach taken by the chapter itself goes in the direction of concluding, "We can never reliably say what determines exchange rates; so let's just take them as given, and go on to the other half of the topic, the effect of exchange rates, however they are determined, on trade flows." Here statistical significance is more easily obtained, but some of the point estimates are less than what one would normally expect, as the authors note. Exports are found to respond to depreciation in the usual positive way. But imports are also found to respond positively to depreciation. This is not what is normally expected (though it apparently is what Marquez and Schindler also found).

I have one thought here. It has probably already occurred to CCF (and Marquez as well), so let me phrase it as a question. We know that Chinese trade is heavily dominated by gross exports that have high import content.[5] Most obviously, many of the imports are raw materials or intermediate inputs that go into production generally, and especially production of exports. The econometricians have separate statistics on "parts and processing imports"; the perverse sign applies at least as strongly to "ordinary imports" as to these. But I suspect that even among "ordinary imports," a lot is reexported after the contribution of some domestic value added. So the question is this: could the perverse sign of the effect of the exchange rate on imports reflect

4. See Mundell, McKinnon, Cooper, and Dooley and Garber.
5. See Koopman, Wang, and Wei (2008).

that component of imports which is closely tied to exports, where the sign is clear?[6] Perhaps the authors should consider adding an additional term to equation (7), so it reads:

$$im_t = \gamma_0 + \gamma_1 y_t + \gamma_2 q_t + \gamma_3 w_t + X_4 ex_t + u_i.$$

The additional terms is exports, ex_t, and the coefficient X_4 represents their import content. Because exports are endogenous, the equation would have to be identified by means of foreign income y_t^*, which enters the export equation. Perhaps controlling for exports would restore γ_2, the coefficient on the real exchange rate, to its conventional sign.

I want to return now to the question how to think about residuals from the B-S relationship. Cheung, Chinn, and Fujii say, "It is indeed a puzzle that the CNY path is different from the one predicted by the Balassa-Samuelson hypothesis." This refers not just to the magnitude of the residuals, but to the movement over time: the failure of the Chinese currency to appreciate in real terms as the economy has experienced rapid growth in income per capita.

Let me begin by suggesting a distinction between the B-S relationship and the B-S effect.[7] Most discussion of B-S talks as if countries are always on the B-S line, except perhaps for minor regression errors. Specifically, the B-S effect is the proposition that for every 1 percent increase in labor productivity or income per capita, there is a .3 percent real appreciation (or whatever the estimate is); in other words, all movements are implicitly assumed to be movements along the line. But we know the residuals are large *and we have lots of well-articulated theories to explain this,* theories of real effects following from monetary disturbances, or other demand-side disturbances. These theories encompass a large share of open-economy macroeconomics outside B-S. There is no reason why we have to choose between B-S and theories of devaluation or monetary policy. Both are important. The theories of devaluation and monetary policy are the obvious candidates to explain the residuals from the B-S relationship (or some share of those residuals; nothing fits perfectly).

Real exchange rates are influenced not solely by the long-term trend of the B-S effect nor solely by the short-term fluctuations of monetary policy and nominal exchange rate changes, but rather are influenced by both.[8] A reasonable characterization is that in the long run, B-S factors dominate, but in the short run, monetary factors can pull the real exchange rate away from the B-S equation. This framework contains the powerful prediction that if

6. We also know that exports are much larger than imports for China; so either way, we are left with the conclusion that a real appreciation would reduce the trade surplus, as desired.

7. This is in addition to the distinction vis-à-vis "the Balassa-Samuelson theory," flagged in my second footnote.

8. One does not necessarily need prices of nontraded goods to be sticky—let alone prices of traded goods—to get the result that devaluations or changes in monetary policy can have transitory effects on the real exchange rate in the short run. See Dornbusch (1973).

a country lies substantially off the B-S regression line in one year, it can be expected to return part way—not necessarily all the way—to the regression line over the subsequent decade. This claim has important implications for our ability to make predictions and, furthermore, is borne out by data from the last two decades.

Here are examples of what I have in mind as possible explanations, anytime one observes a country lying well below the B-S line:

Macro influences such as:

- Devaluation in the presence of either sticky goods prices or nontraded goods.
- "Exogenous" depreciation under floating, with either sticky prices or nontraded goods.
- Monetary contraction/deflation, with a fixed exchange rate.
- Increased demand for currency, for example, arising from rapid supply-led growth, with a fixed exchange rate.

In the case of China, it is the last of these cases that is the relevant one. The RMB was de facto fixed to the dollar for the last ten years or so.[9] If one goes back further, the exchange rate regime was different, but the currency has never floated or been determined in a flexible way. Yet China has experienced tremendous growth in productivity and real income over the last quarter-century, perhaps the greatest the world has ever known. So even if the RMB had been on the B-S line thirty years ago, it would not be on it today. According to some theories, the exchange rate regime makes no difference: if the exchange rate is held fixed, then the economic fundamentals that would show up as a nominal appreciation under floating will instead show up in the form of inflation. You will get the same real exchange rate either way. But this is not how the world works. In addition to heavy foreign exchange intervention, the authorities made heavy use of capital controls and sterilization, with the result that the trend rate of increase in the money supply did not noticeably exceed the trend rate of growth of the real economy during the years 2005 and 2006 despite the large balance-of-payments surplus. The large reserve inflows finally in 2007 to 2008 showed up in accelerating money growth, an overheating economy, and inflation, as some of us predicted they would. But the dollar peg had already greatly delayed and diminished the effect on the real exchange rate.

This puts the CCF finding regarding the estimated undervaluation of the RMB in a very different light. Ideally, we would add to the B-S equation additional terms to capture monetary influences that in the short or medium run pull the real exchange rate away from its equilibrium value.

9. The Chinese authorities in 2005 announced a more flexible regime. But Frankel (2009), Frankel and Wei (2007), and others statistically infer the true regime and find that it is still rather close to a dollar peg.

Possible variables include real interest rates, acceleration in the real money supply, sudden nominal devaluations or revaluations. I tried some of these recently and got nowhere. But that may reflect a failure of my specification. For example, none of these terms would capture the presumed source of the large Chinese residual: an essentially fixed exchange rate during a period of rapid supply-side growth. So we need a better specification to capture the intermediate-term macro influences. In the meantime, my point still holds. Whether the distance between China's real exchange rate and the B-S line is statistically significant is not necessarily the point.

I am not suggesting that one should pronounce the RMB substantially undervalued based solely on a point estimate. For one thing, aside from statistical significance, I don't think any of us has really known or felt entirely comfortable with what goes into the estimated Chinese price level in the Penn World Table. Cline and Williamson (2008), for example, argued that the data were biased in the direction of exaggerating the true undervaluation.[10]

I can tell you how I think of the RMB problem, when we turn from the mores of scholarly papers to the world of policy. I can think of four or five independent criteria for addressing the question whether China should, in its own interest, allow the RMB to float upward. For most countries, some of these criteria would point in opposing directions. Correspondingly, for most countries, I am not willing to proclaim publicly that I view their currencies as either overvalued or undervalued. For China, it seems to me that the criteria tend all to point in the same direction:

1. PPP/B-S.
2. Trade balance/balance of payments/level of reserves.
3. Overheating economy.
4. Desirability of an economy as large as China's having its own monetary policy, without relying on capital controls to continue to insulate against disturbances in the future.
5. Desirability of choosing a time of strength to make the move away from a peg, rather than waiting for a time of weakness or even crisis.

It is on this basis that I do take the stand that China should let the currency appreciate. (This has nothing to do with pressure from U.S. politi-

10. Soon after the NBER conference, such doubts were proven spectacularly right when the International Bank for Reconstruction and Development (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 had previously been available. According to the new numbers, which pertain to 2005, China's price level was 42 percent of the U.S. 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 percent of the U.S. level. Because the new International Comparison Project numbers on prices and real incomes are both more up to date and more reliable than those previously available, it makes sense to reestimate the B-S estimation. Subramanian (2008) has done this; he computes that the RMB is 15 percent below where it ought to be. Certainly the new International Comparison Project numbers imply that the RMB is far less undervalued under the B-S criterion than had previously been estimated.

cians, which I regard as ill-advised for a whole other set of reasons). What the CCF paper has to offer—the estimate of undervaluation relative to B-S and estimates of what effect an appreciation would have on exports and imports—are useful inputs to these considerations.

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