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The Exchange Rate and Global Imbalances

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The Exchange Rate and Global Imbalances

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Abstract

China's role in the evolution of global imbalances is assessed, in the context of standard models of current account balances, as well as recent interpretations (e.g., the "saving glut" and "asset shortage"). The exchange rate is interpreted as an equilibrium price. Then, the evidence for how the exchange rate affects the trade balance is reviewed, in a partial equilibrium framework. The empirical evidence supports the view that exchange rate movements can affect the volume of trade flows.

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1. Introduction

China's current account and exchange rate has loomed large in debates surrounding the development and impact of global imbalances. In Section 2, I examine the determinants of the Chinese current account and exchange rates, treating them as endogenous variables. In Section 3, I consider the exchange rate as at least partly exogenous, subject to the control of the policy authorities. Section 4 concludes.

2. The Current Account and Exchange Rate as Equilibrium Outcomes

2.1 Interpretations of the Imbalances

Global imbalances typically pertain to the development of large current account surpluses and deficits during the first decade of the 2000's. Although there are many conventional models of the current account, there is no single standard theory or hypothesis that convincingly explains the unprecedented scale and persistence of the imbalances observed over the past decade.

Prominent explanations include (1) trends in national saving and investment rates, (2) the global saving glut, and (3) distortions in financial markets. These explanations are not mutually exclusive. However, what is true is that China figures into most of these explanations.

The saving-investment approach takes the perspective from the national saving identity which states that the current account is equal to the budget balance and the private saving-investment gap. This is a tautology, unless one imposes some structure and causality. A systematic approach involves modeling the current account by explicitly focusing on the determinants of private investment and saving, and adding those variables to the budget balance. The "global saving glut" explanation was first expounded by Bernanke (2005). This argument views excess saving from Asian emerging market countries, driven by rising savings and collapsing investment in the aftermath of the financial crisis, as the cause of the U.S. current account deficit. The burgeoning surpluses of the oil exporters, ranging from the Persian Gulf countries to Russia, also play a role. From this perspective, the U.S. external imbalance is a problem made abroad; the lack of well-developed and open financial markets encourages countries with excess savings to seek financial intermediation in well-developed financial systems such as the United States. This view implies a solution may only arise in the longer term, as better developed financial systems mitigate this excess savings problem.

The Caballero-Farhi-Gourinchas (2008) hypothesis recasts the saving glut problem as one that asserts that countries with more developed financial markets should have weaker current accounts. As the authors state, “capital flows from China, with its underdeveloped capital markets, to the United States, which has a comparative advantage in producing safe financial assets.”¹ Obstfeld and Rogoff (2010) are skeptical that such factors are important.

2.2 Empirical Assessments

Chinn, Eichengreen and Ito (2011) examine a sample of 23 industrial and 86 developing countries over the four decades 1970-2008, with an aim to explaining current account balances. They find the effect of financial development, its interactions with legal development and capital account openness are supportive of the Caballero et al. interpretation of global imbalances with statistically significant coefficients for the subsample of emerging markets; those with better developed financial markets and legal institutions or open capital accounts tend to have weaker current account balances, or experience the least tendency for capital to flow out.

Nonetheless, emerging market economies appear to have run unusually large surpluses in the 2001-5 period, consistent with the idea that they were fixated on minimizing financing vulnerabilities and accumulating reserves following the Asian crisis. Such behavior is not evident for emerging markets as a group in 2006-8, with the exception of China, which does seem to run significantly larger surpluses than is explainable using observed variables.

The cross-country perspective highlights the fact that China’s recent behavior is anomalous. The unique aspect of Chinese behavior extends to both saving and investment. While the level of national investment of China has been fairly high in recent years, that of national saving has been even higher. Hence, understanding the impact of financial globalization on China requires an examination of the growth imbalances that have contributed to China’s unique saving behavior. While household saving was the main contributor to the aggregate saving before 2000 (see Chamon and Prasad, 2010), both household and corporate savings have been the main contributors since then (Prasad, 2011). During the last few years of the sample period, or the global imbalances years, household saving became the largest contributor again. However,

¹ Caballero, Farhi and Gourinchas (2008) model the saving glut explanation as a shortage of assets in the developing world. Mendoza, Quadrini and Rios-Rull (2009) model financial development as the increase in the degree of enforcement of financial contracts.

it is also noteworthy that during the same period, government saving has been rising rapidly after having played a minor role for a long while.²

More recent assessments have sought to augment these current account regressions with new variables, such as proxy measures for social protection – which has been viewed as particularly important in the Chinese context – as well as foreign exchange intervention (see IMF, 2012, and Gagnon, 2012). These variables explain an increased proportion of the surge in the Chinese current account during the 2000s.

2.3 The exchange rate

The determinants of the current account and the real exchange rate should in principle be the same. Indeed, as noted in Cheung et al. (2010), budget balances or government spending, net foreign assets, and measures of income per capita often make it into empirical models of the RMB.

The most prominent assessments of the Chinese real exchange rate have focused on the price approach, linking in particular the real exchange rate to per capita income. This relationship -- the Penn effect -- is the robust empirical positive association between national price levels and real per capita incomes across countries documented by a series of studies.³ Typically, this relationship has been rationalized by the Balassa (1964) and Samuelson (1964) models, which incorporate internal and external balance. In the short- to medium-term, however, these conditions are not guaranteed. Thus, this estimated exchange rate measure is properly interpreted as a long-run measure and is ill-suited (on its own) to analyzing short run phenomena.

Cheung et al. (2010) find the estimated degree of RMB undervaluation in 2006 is quantitatively large at the 50% plus level.⁴ Nonetheless, there is a high level of (sampling) uncertainty surrounding the point estimate, and the estimated misalignment is not statistically significant at conventional levels. Moreover, using the post-2005 International Comparison Program benchmark data, they find a much smaller degree of misalignment, in the single digits.

3. The Exchange Rate as a Policy Instrument

² See Ma and Yi (2010). Du and Wei (2009) and Wei and Zhang (2010) identify the sex ratio as a specific demographic factor that drives Chinese saving behavior.

³ Kravis, Heston and Summers, 1978; Summers and Heston, 1991.

⁴ These results are robust to the inclusion of additional regressors (capital controls, institutional development).

A common interpretation holds that the exchange rate is managed by the Chinese authorities in a manner that affects the trade balance, either for mercantilist reasons, or as a means of self-insurance. In the former perspective, the developing countries of East Asia have followed an export led development strategy based upon currency undervaluation. The second interpretation attributes the motivation for large scale reserve accumulation to the desire for self-insurance. Foreign exchange reserves can reduce the probability of an output drop induced by capital flight or sudden stop. This self-insurance motivation rose substantially in the wake of the East Asian crises (Aizenman and Marion (2003) and Aizenman and Lee (2007)).

Once one takes the exchange rate as a quasi-exogenous variable, then one can ask how the trade balance, roughly equal to the current account, behaves in response to exchange rate changes in a partial equilibrium context. Several studies have examined Chinese trade flows over the period ranging from the mid-1990s to the mid-2000s (Marquez and Schindler, 2007; Garcia-Herrero and Koivu, 2007; Aziz and Li, 2008). Generally, some amount of disaggregation is necessary to obtain sensible results (for instance, into ordinary and processing trade flows). While typically, it is possible to explain exports, imports often exhibit unexpected signs with respect to price, or income.

The difficulty in interpreting the results regarding price elasticity arises partly because of the role of China in the integrated production chain. Only a portion of the total value of exports constitutes Chinese value-added; the rest is accounted by imported components. One can account for the impact of vertical specialization directly by creating value-added trade weighted real exchange rates (Bems and Johnson, 2012). Bems, et al. (forthcoming) indicate very high income elasticities for exports, which declines from 5.5 to a more reasonable 2.3 when a proxy measure for the supply side is included. On the import side, the income elasticity is 0.6, when exports (for which some 70% of imports are used for) are included. The estimated export and import price elasticities are fairly low, at 0.3 and -0.4 respectively.

Using conventional price measures, Cheung, Chinn and Qian (forthcoming) find that for exports, while there is some diversity of responses to income and exchange rate variables, Chinese trade flow behavior largely accords with conventional wisdom: Higher rest of world income results in higher Chinese exports, while a stronger RMB results in lower exports. However, the income elasticity is imprecisely estimated, varying widely depending upon the inclusion or exclusion of a linear time trend. In addition, the price elasticity varies widely

between goods exported from SOEs, foreign invested firms, and private firms. The latter appear to behave in a more price-sensitive fashion than the other firm types. As their share of exports continues to rise, one should expect the overall price elasticity to increase, holding all else constant. For Chinese real exports, they find that the income elasticity is approximately six, while the exchange rate elasticity is near unity – after accounting for the entry into the WTO.

In line with previous studies, Cheung, Chinn and Qian do not always obtain sensible import estimates; manufactured imports, which constitute about 70% of Chinese imports, exhibit a positive (rather than negative) price elasticity, except when relative productivity is included. Productivity enters either because it proxies for supply, or because the CPI-deflated real exchange rate variable is a poor proxy for the relevant real exchange rate (either the PPI deflated or unit labor cost deflated).

4. Concluding Thoughts

The global imbalances of the 2000's have been associated with oil exporting nations and China. Two, not necessarily exclusive, ways of looking at the role of China is to focus on saving and investment behavior, or on the exchange rate. The substantial reduction of the Chinese current account surplus in 2011-2012 in the absence of substantially faster currency appreciation suggests that exchange rates are in and of themselves only one important factor. However, that observation does not imply that the exchange rate is unimportant as a determinant of the current account.

References

- Aizenman, Joshua and Jaewoo Lee, 2007, "International Reserves: Precautionary versus Mercantilist Views, Theory and Evidence," *Open Economies Review*, 18(2): 191-214.
- Aizenman, Joseph and Nancy P. Marion, 2003, "The High Demand for International Reserves in the Far East: What's Going On?" *Journal of the Japanese and International Economies*, 17(3): 370-400.
- Aziz, Jahangir and Xiangming Li, 2008, "China's Changing Trade Elasticities," *China and the World Economy* 16(3): 1-21.
- Balassa, Bela, 1964, "The Purchasing Power Parity Doctrine: A Reappraisal," *JPE* 72 (6): 584-596.
- Bems, Rudolfs, Joshua Felman, David Reichsfeld, and Shaun Roache, forthcoming, "Why has China's Current Account Surplus Declined?" *IMF Working Paper*.
- Bems, Rudolfs, and Robert C. Johnson, 2012, "Value-Added Exchange Rates", *NBER Working Paper* No.18498.

- Bernanke, Benjamin, 2005, "The Global Saving Glut and the U.S. Current Account," Remarks at the Sandridge Lecture, Richmond, VA, March 10.
- Caballero, Ricardo, Emmanuel Farhi, and Pierre-Olivier Gourinchas, 2008, "An Equilibrium Model of 'Global Imbalances' and Low Interest Rates," *AER*, 98(1): 358-393.
- Chamon, Marcos, and Eswar Prasad, 2010, "Why Are Saving Rates of Urban Households in China Rising," *AEJ: Macroeconomics* 2(1): 93-130.
- Cheung, Yin-Wong, Menzie Chinn and Eiji Fujii, 2010, "China's Current Account and Exchange Rate," *China's Growing Role in World Trade*, edited by Rob Feenstra and Shang-jin Wei (U.Chicago Press for NBER), pp. 231-271.
- Cheung, Yin-Wong, Menzie Chinn and Eiji Fujii, 2007, "The Overvaluation of Renminbi Undervaluation," *JIMF* 26(5): 762-785.
- Cheung, Yin-Wong, Menzie Chinn, and XingWang Qian, forthcoming, "Are Chinese Trade Flows Different?" *JIMF*.
- Chinn, Menzie D., Barry Eichengreen, and Hiro Ito, 2011, "A Forensic Analysis of Global Imbalances," *NBER Working Papers* No. 17875.
- Du, Qingyuan, and Shang-jin Wei, 2010, "A Sexually Unbalanced Model of Current Account Imbalances," *NBER Working Paper* No. 16000.
- Gagnon, Joseph, 2012, "Global Imbalances and Foreign Asset Expansion by Developing Economy Central Banks," *Working Paper* No. 12-5 (Washington, DC: Peterson Institute for International Economics, March).
- Garcia-Herrero, Alicia and Tuuli Koivu, 2007, "Can the Chinese Trade Surplus Be Reduced through Exchange Rate Policy?" *BOFIT Discussion Papers* No. 2007-6 (Helsinki: Bank of Finland, March).
- IMF, 2012, "External Balance Assessment (EBA): Technical Background of the Pilot Methodology," *Mimeo* (Washington, DC: IMF, August).
- Kravis, Irving B., Alan Heston, and Robert Summers, 1978, *International Comparisons of Real Product and Purchasing Power* (Baltimore: The Johns Hopkins University Press).
- Ma, Guonan, and Wang Yi, 2010, "China's High Saving Rate: Myth and Reality." *BIS Working Paper* No. 312 (June).
- Marquez, Jaime and John W. Schindler, 2007, "Exchange-Rate Effects on China's Trade," *RIE* 15(5): 837-853.
- Mendoza, Enrique G., Vincenzo Quadrini, and Jose-Victor Ríos-Rull, 2009, "Financial Integration, Financial Deepness and Global Imbalances," *JPE* 117(3): 317-416.
- Obstfeld, Maurice and Kenneth Rogoff, 2010, "Global Imbalances and the Financial Crisis: Products of Common Causes." in *Asia and the Global Financial Crisis*, ed. by Reuven Glick and Mark M. Spiegel (SF: Federal Reserve Bank of San Francisco).
- Prasad, Eswar (2011), "Rebalancing Growth in Asia" *International Finance* 14(1): 27-66.
- Summers, Robert, and Alan Heston, 1991, The Penn World Table (Mark5): an expanded set of international comparisons. *QJE* 106 (2): 327-368.
- Wei, Shang-jin, and Xiaobo Zhang, 2010, "The Competitive Saving Motive: Evidence from Rising Sex Ratios and Savings Rates in China," *NBER Working Paper* No. 15093.