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Imbalances over the Pacific

Soyoung Kim [a,*], Jaewoo Lee [b]

[a] Department of Economics, Seoul National University, San 56-1, Sillim-Dong, Gwanak-Gu, Seoul 151-746, Republic of Korea
[b] MaebongGil 15, OksuDong, SeongdongGu, Seoul, 133-100, Republic of Korea

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ABSTRACT

This paper examines various theories of current account (trade) imbalances between the U.S. and China, by estimating a structural VAR model with long-run zero restrictions. The factors that we examine include: productivity differential, fiscal policy, consumption/saving choice, and real and nominal demand side factors comprising monetary policy, and reserve accumulation. On average, technology shocks are found to play a dominant role in explaining the trade balance movement between China and the U.S. However, in the particular period of 2004–07 when global imbalances peaked, we find that demand shocks played an unusually large role. This contrast between the average tendency and the rather abnormal development in the mid-2000s provides general equilibrium evidence for several theories of current account (trade) balance imbalance. But it also shows that the experience of the mid-2000s does not have to repeat itself, given that it was an atypical development different from the average tendency.

1. Objective

Despite some easing during the global financial crisis since 2008, global current account imbalances remain significant, and will probably return to the fore of global debate as the US-originated crisis enters the concluding chapter. The debate will be not only about the level of imbalances, but also on how the imbalances will be influenced by post-crisis adjustments (e.g. structural rebalancing within China). In this paper, we look into macroeconomic origins of global imbalances, especially the imbalances between the US and China which were at the center of the global imbalance debate before the crisis.

Several prominent culprits of the global imbalances have been put forward over the years.

- Spectacular productivity growth in the US was viewed to have attracted large capital inflows, as it generated an economic boom in the U.S. (Engel and Rogers, 2006).
- At varying phases, including the Iraq war years, government deficit was viewed as a contributor to the imbalance (Chinn, 2005; Chinn and Ito, 2008). Twin deficits have been a traditional explanation of CA imbalances.
- Private consumption/saving choices were regarded to play an important role on both sides of the Pacific. Excess consumption and borrowing were attributed to the U.S., while excess precaution and saving were attributed to China (Bernanke, 2005; Blanchard and Milesi-Ferretti, 2009).

* Corresponding author. Tel.: +82 2 880 2689.
E-mail addresses: soyoungkim@snu.ac.kr (S. Kim), jaewoo.lee@alum.mit.edu (J. Lee).

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- The role played by China in controlling the foreign exchange markets, such as market intervention, was most fiercely debated (Frankel, 2005; Roubini, 2007). This debate led to a search for "deep parameters" of the perceived exchange rate weakness, predicated on the view that monetary intervention was just a surface image while various structural distortions—e.g. artificially low cost of capital—were driving the multi-decade weakness in the exchange rate (see Ahuja et al. (2012) and references therein).

We take a macro-econometric approach to current account imbalances between the U.S. and China. We construct a VAR system which, by capturing all major macroeconomic factors, enables us to identify the main drivers of imbalances and compare their contributions. We examine the trade balance in our VAR estimation, for the trade balance mostly determines current account imbalances, in particular between the U.S. and China.

We find an interesting contrast between the usual drivers of trade imbalances and those that played prominent roles over 2004–07, during which time the global imbalances peaked. Consumption shocks, demand shocks, and reserve accumulation are found to have played prominent roles in driving trade imbalances over 2004–07. But in usual times, their roles paled by the side of productivity. On average, technology shocks were the dominant driver of trade imbalances.

These results will help us not only understand the causes of imbalances so far, but also form a view on how and whether global imbalances will evolve once the crisis is over. The average pattern is more likely to prevail, and it is less likely to bring back the unusual developments in 2004–2007.

In Section 2, we explain the baseline empirical model. In Section 3, we discuss the empirical results and interpret them. In Section 4, we report various extended experiments. In Section 5, we conclude with a summary of results.

2. Empirical method

Let the underlying economic relationship be described by the following structural vector moving average (VMA)-form equation:

$$y_t = G(L)e_t \tag{1}$$

where $G(L)$ is a matrix polynomial in the lag operator L, y_t is a 5×1 data vector corresponding to our five-variable model, and e_t denotes a vector of structural disturbances. Under the assumption that structural disturbances are mutually uncorrelated, $\text{var}(e_t)$ becomes a diagonal matrix (Λ) of the variances of structural disturbances.

This structural model needs to be identified from the estimated reduced-form VAR model:

$$B(L)y_t = u_t, \tag{2}$$

where $B(L)$ is a matrix polynomial in the lag operator L, and $\text{var}(u_t) = \Sigma$.

Among various ways of uncovering the structural system (1) from the estimated reduced-form system (2), the long-run restriction method pioneered by Blanchard and Quah (1989) is adopted in this paper. Blanchard and Quah (1989) suggest the method of imposing zero restrictions on the elements of long-run structural parameters $G(1)$.

Consider the following moving-average representation of a structural VAR model (corresponding to Eq.(1)) that includes five variables.

$$\begin{bmatrix} d(\log(Y_t^{US}/N_t^{US}) - \log(Y_t^C/N_t^C)) \\ d(\log G_t^{US} - \log G_t^C) \\ d(\log C_t^{US} - \log C_t^C) \\ d(\log Q_t^{US,C}) \\ TB_t^{US,C} \end{bmatrix} = \begin{bmatrix} G_{11}(L) & G_{12}(L) & G_{13}(L) & G_{14}(L) & G_{15}(L) \\ G_{21}(L) & G_{22}(L) & G_{23}(L) & G_{24}(L) & G_{25}(L) \\ G_{31}(L) & G_{32}(L) & G_{33}(L) & G_{34}(L) & G_{35}(L) \\ G_{41}(L) & G_{42}(L) & G_{43}(L) & G_{44}(L) & G_{45}(L) \\ G_{51}(L) & G_{52}(L) & G_{53}(L) & G_{54}(L) & G_{55}(L) \end{bmatrix} \begin{bmatrix} e_{T,t} \\ e_{G,t} \\ e_{C,t} \\ e_{D,t} \\ e_{N,t} \end{bmatrix} \cdot Gij(1) = 0 \quad \text{for } ij = 12,13,14,15,23,24,25,34,35,45 \tag{3}$$

where Y/N is labor productivity, G is (real) government consumption, C is (real) private consumption, and superscript "US" and "C" imply that each variable is the U.S. and Chinese variable, respectively. $Q^{US,C}$ is the real exchange rate of the U.S. against China, $TB^{US,C}$ is the trade balance of the U.S. against China. $e_{T,t}$, $e_{G,t}$, $e_{C,t}$, $e_{D,t}$, and $e_{N,t}$ are technology, government-consumption, private-consumption, real-demand, and nominal-demand shocks, respectively.

Note that all structural shocks represent shocks to the differences between economic conditions of U.S. and China. For example, $e_{T,t}$ is a shock to the differences between U.S. and Chinese technology conditions. Identifying shocks to the differences between the economic conditions of U.S. and China is consistent with the premise that trade imbalances are caused by the differences between the two countries.

Technology shocks capture changes in productivity growth, government consumption shocks reflect changes in fiscal policies, and private consumption shocks mirror changes in consumption/saving of the private sector. Real-demand shocks capture all other determinants of the real exchange rate in the long run, largely real distortions that have short-term and long-term effects on the real exchange rate. Nominal-demand shocks capture all other cyclical demand shocks, which do not have long-term real exchange rate effects and is primarily nominal in nature, including monetary shocks.