

# The U.S. Economy under Global Imbalances

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The ongoing financial crisis is allegedly linked with global imbalances which stood out markedly in the last decade. Why and how the U.S. current account balance deteriorated and whether it will be sustainable should be discussed for avoiding another world-wide crisis. One of the dominant researches, Caballero, Fahri, and Gourinchas (2008a), succeeds to explain this mechanism and provide with insights. An introduction to this influential research along with portraying some unresolved problems is essayed for a subsequent full-fledged analysis of this complicated issue.

## 1. Introduction

According to the National Bureau of Economic Research (NBER)<sup>1</sup>, after entering a recession in December 2007, the United States managed to exit in June 2009. A recession of 18 months is the longest in the post-war period.<sup>2</sup> As of the end of 2010, however, the U.S. economic outlook is yet to be bullish. The Federal Reserve Chairman Ben Bernanke told the Congress in July 2010 that the economic outlook was “unusually uncertain.” This remark was translated in the market as he suggested that the U.S. economy might fall into a double-dip recession. Responding to his remark, the market

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1 The NBER identifies the business cycle of the United States.

2 The second longest recession in the post-war period was recorded twice: November 1973 to March 1975 during the first Oil Shock, and July 1981 to November 1982. Both recessions lasted 16 months.

plunged: the Dow index fell under \$10,000, which induced money into risk-free assets. As a consequence, in November 2010, the Federal Reserve stepped in another accommodative measure, so-called QEII (Quantitative Easing Two), by purchasing securities equivalent to US\$600 during the subsequent 8 months.

Meanwhile, the Obama administration aims at improving the trade balance by doubling U.S. exports over the next five years. This is considered too ambitious because an appreciation of the renminbi (RMB) by as much as 40 per cent is necessary for improving trade balance with China, the main cause of the U.S. trade deficit.

The U.S. has been afflicted with the “Twin Deficit” in both the current account and fiscal balance for more than a quarter century. The current account balance of the U.S., though it improved temporarily under the Clinton administration in the era of “New Economy,” which ended in 2001 with the burst of the IT bubble, resumed deteriorating under the Bush administration. As a prompt policy response for the burst of the IT bubble, the Fed precipitated lowering policy interest rate with a record-high speed. This accommodative monetary policy allowed a consumption and housing boom along with the sky-rocketing current account deficit, which surpassed 6% of GDP in 2006.

Whether the U.S. current account deficit is sustainable or not had been discussed since as early as the 1990s. Mann (2004), *inter alia*, suggested that the sustainability problem of the U.S. current account deficit should be discussed from the viewpoint not only of the current account balance and the external debt amount but of the portfolio allocation among the investors worldwide.

This paper is to approach the mechanism of the deteriorating the U.S. current account deficit specifically in the global view. It should also be paid attention to if this problem has something to do with the ongoing financial

crisis. Among a number of theoretical attempts which addressed this issue, Caballero, Fahri and Gourinchas (2008a) seems to satisfy our needs, employing a global framework. The rest of this paper is engaged in introducing the outline of Caballero *et al.* (2008) and examining its empirical consistency.

## 2. A Theoretical Framework of Global Imbalance

Caballero *et al.* (2008a) proposed a model of global imbalance. Their model is characterized by assuming two country groups in the world: the United States, and the rest of the world, and attempting global equilibrium.

### 2.1 A Closed Economy

As the first step, they set up a model in a closed economy, where infinitesimal agents save only in identical trees producing an aggregate dividend of  $\delta X_t$  per unit of time. Agents are defined to be born at a rate  $\theta$  per unit of time and die at the same rate. Population mass in this economy is constant and equal to one. Since agents receive a perishable endowment of  $(1-\delta)X_t$ , which they save in its entirety till their death, the return on the tree can be represented by using the interest rate in the economy  $r_t$  as a sum of income and capital gain.

$$r_t V_t = \delta X_t + \dot{V}_t,$$

where  $V_t$  refers to the value of total savings by agents at time of  $t$ .

On the other hand, the accumulated savings in the economy by agents up to time  $t$  are represented as

$$\dot{W}_t = -\theta W_t + (1 - \delta)X_t + r_t W_t.$$

Accumulated savings decrease with withdrawals of agents, while they increase as new generations are allocated with the endowment  $(1 - \delta)X_t$  and are provided with the return on accumulated savings  $W_t$ .

The equilibrium condition that saving must be equal to the value of trees,

$W_t = V_t$ , will produce the following equilibrium interest rate:

$$r_t = \frac{\dot{X}_t}{X_t} + \delta\theta.$$

This equilibrium interest rate rises as the economy grows while output  $X_t$  is initially assumed as exogenous. The second term assures that an increase of  $\delta$  or  $\theta$  will raise the interest rate. A rise in  $\delta$  increases the supply of assets by lifting the share of income that is capitalizable<sup>3</sup>. Meanwhile, an expansion of  $\theta$  decreases the asset prices by lowering financial wealth demand.

Assuming a constant growth of the total endowment,  $X_t$ , in the economy at the rate of  $g$ , the equilibrium interest rate in this autarky economy can be described as

$$r_t = g + \delta\theta.$$

## 2.2 A Small Open Economy

As the second step, a small open economy is considered. Under the assumption of a given world interest rate,  $r$ , as  $g < r < g + \theta$ , the current account at time  $t$  is denoted as

$$CA_t \equiv \dot{W}_t - \dot{V}_t,$$

where current account surplus is defined to increase according as the economy's net asset demand rises.

The steady state of this economy can be obtained from the first two equations in the previous subsection. The supply of assets in the steady state is represented by

$$V_t = \int_t^\infty \delta X_s e^{-r(s-t)} ds.$$

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3 The parameter  $\delta$  denotes the share of the present value of the economy's future output,  $PV_t$ , which is represented as  $PV_t = \int_t^\infty X_s e^{-r(s-t)} ds$ .  $\delta PV_t$  can be capitalized today and transformed into a tradable asset  $V_t$ . Caballero *et al.* (2008a) considers  $\delta$  as an index of financial development rather than the share of capital in production at the most basic level.

Assumptions of a given world interest rate  $g$  and  $g < r < g + \theta$  generate following asymptotic formula:

$$\frac{V_t}{X_t} \xrightarrow{t \rightarrow \infty} \frac{\delta}{r - g}.$$

Meanwhile, the demand for assets in the steady state is denoted by

$$W_t = W_0 e^{(r-\theta)t} + \int_0^t (1 - \delta) X_s e^{(r-\theta)(t-s)} ds.$$

Like the supply side of the financial assets, the asymptotic expression for demand side will be as follows:

$$\frac{W_t}{X_t} \xrightarrow{t \rightarrow \infty} \frac{1 - \delta}{g + \theta - r}.$$

The current account balance normalized by the size of the economy can be calculated as

$$\frac{CA_t}{X_t} \xrightarrow{t \rightarrow \infty} -g \frac{r_{aut} - r}{(g + \theta - r)(r - g)}.$$

As a consequence, when the world interest rate  $r$  is lower than the equilibrium interest rate in the closed economy,  $r_{aut}$ , the current account will register deficit, while the converse case will yield surplus in the current account.

### 2.3 Global Equilibrium with Two Large Regions

As the third step, two large regions in the world are incorporated into the two-country model: the United States as “U,” and the rest of the world as “R.” Across the regions  $i = \{U, R\}$ , where common parameters  $g$  and  $\theta$  are assumed,

$$r_t V_t^i = \delta^i X_t^i + \dot{V}_t^i,$$

and

$$\dot{W}_t^i = -\theta W_t^i + (1 - \delta^i) X_t^i + r_t W_t^i$$

hold as in the closed-economy model described above, when an

instantaneous return from hoarding a unit of either tree,  $r_t$ , is also assumed common in the both regions.

$$\text{Defining } x^R \equiv \frac{X_t^R}{X_t} \text{ along with } W_t = \sum_i W_t^i, V_t = \sum_i V_t^i, \text{ and } X_t = \sum_i X_t^i,$$

solutions above can be transformed into

$$\begin{aligned} r_t V_t^i &= (\delta^U - x^R(\delta^U - \delta^R))X_t + \dot{V}_t \\ \dot{W}_t &= -\theta W_t + (1 - \delta^U + x^R(\delta^U - \delta^R))X_t + r_t W_t. \end{aligned}$$

Solutions for global equilibrium proceeds are produced as the following equations as in the closed economy:

$$\theta W_t = X_t,$$

and

$$r_t = g + (\delta^U - x^R(\delta^U - \delta^R))\theta.$$

The world equilibrium in this two-country model is sought under the following two assumptions. First, the world is assumed to be symmetric initially as  $\delta^U = \delta^R = \delta$ ,<sup>4</sup> but an unexpected decline in  $\delta^R$  at  $t = 0$  leads to  $\delta^R < \delta^U$ . This impact instantaneously lowers  $r$  while  $V$  and  $W$  remain unchanged. This assumption corresponds to the damaged financial environment after the Asian and Russian crises in the 1990s. The second assumption is so-called “home bias” that agents prefer local assets to overseas ones for saving before they run out of local assets. It implies that changes in local wealth match the changes in the value of local “trees” one for one as  $W_{0+}^R = V_{0+}^R$  and  $W_{0+}^U = V_{0+}^U$ . Through a direct impact on consumption, changes in wealth ultimately result in a deterioration of current account as follows:

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4 It is also assumed that there are no net capital flows across the economies.

Therefore,  
 $\frac{W_t^U}{x^U} = \frac{V_t^U}{x^U} = \frac{V_t^R}{x^R} = \frac{W_t^R}{x^R}$  holds.

5 Furthermore, a larger deficit is foreseen before converging to the new converged growth path.

6 The interest rate  $r_t$  remains constant after dropping at date  $t = 0$  as.

$$r_t = r_{aut}^U - x^R(\delta^U - \delta^R)\theta < r_{aut}^U.$$

$$\frac{CA_t^U}{X_t^U} = -g \frac{(\delta^U - \delta^R) x^R \theta}{(\theta + g - r^+)(r^+ - g)} < 0. \quad ^5$$

Meanwhile, the interest rate declines under the U.S. autarky  $r_{ate}$ .<sup>6</sup>

Consequently, large and long-lasting current account deficits as well as a decline in the interest rates are simultaneously predicted. This predicts asymptotic deficits of the U.S. current account. It also predicts that the size of the permanent current account deficit in the U.S. relative to its output should increase in the relative size of the rest of the world.

## 2.4 Extensions of the Benchmark Model.

Caballero *et al.* (2008a) attempted extensions of the basic model. First, they attempted “fast growth and integration of low- $\delta$  regions” case, where they applied  $g^R > g^U$  instead of  $g^R = g^U$  while maintaining the previous assumption of  $\delta^U - \delta^R > 0$ . If we assume that the additional growth in the rest of the world ( $R$ ) is not enough to offset the effect of a lower  $\delta^R$  on interest rate, the asymptotic current account deficit in the United States relative to its output is larger when  $g^R > g^U$  than when  $g^R = g^U$  as

$$\lim_{\substack{t \rightarrow \infty \\ g^R > g^U}} \frac{CA_t^U}{X_t^U} < \lim_{\substack{t \rightarrow \infty \\ g^R = g^U}} \frac{CA_t^U}{X_t^U} < 0.$$

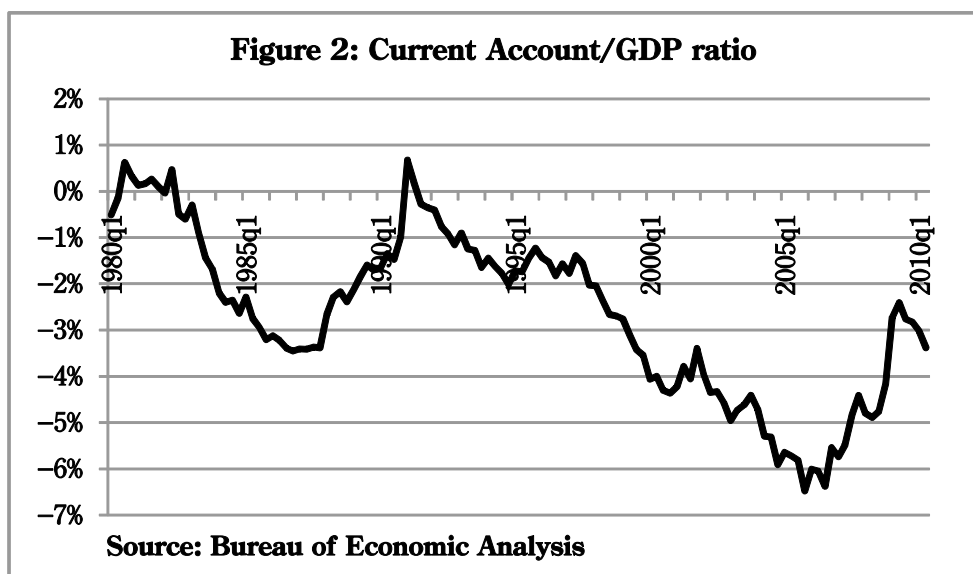
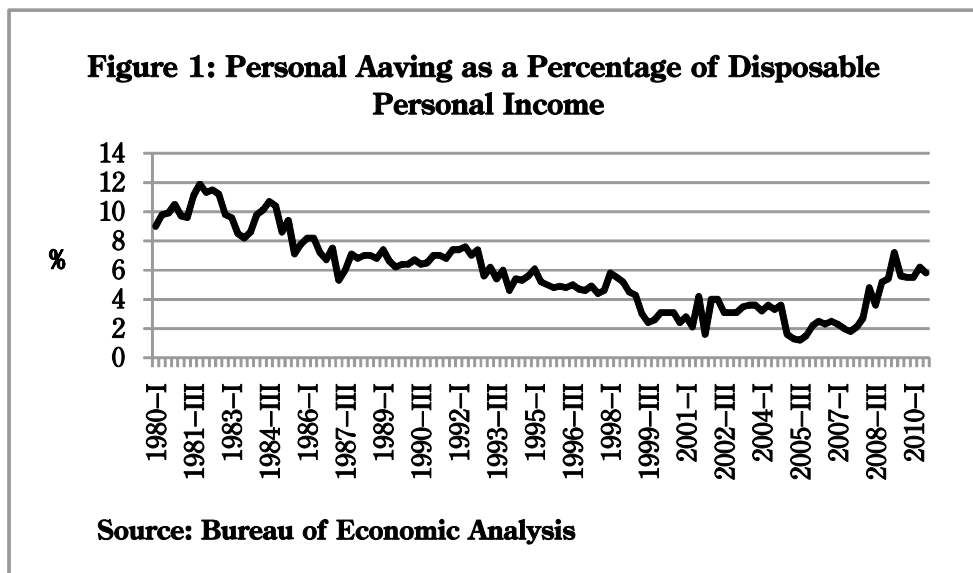
This challenges the implication of standard models that capital flows from low to high growth economies.

Another extension refers to “the fast growth and integration of low- $\theta$  regions” case, in which saving-glut economies like China are formalized. If we keep assuming the “home bias” and the “lower autarky interest rate” in the rest of the world, this low- $\theta^R$  scenario leads to the same conclusion as in the low- $\delta^R$  case by assuming  $\theta^U - \theta^R > 0$  and  $g^R > g^U$  while maintaining the previous assumption  $\delta^U = \delta^R = \delta$ . This conclusion suggests that the demand for financial assets by the rest of the world grows as its growth rises. This happens because the growing demand for financial assets in the developed

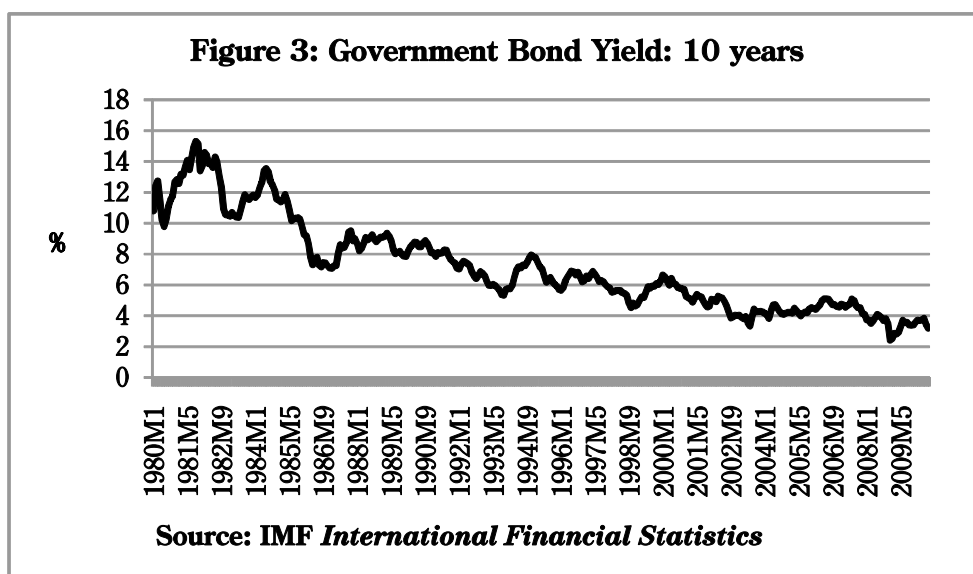
countries cannot be absorbed in their region, so that the fund outflows to the United States to entail interest rates drop and larger current account deficits.

### 3. Empirical Consistency and Remaining Problems

Empirical evidence assures, in general, that Caballero *et al.* (2008a) succeeded in explaining the expanding global imbalances. In contrast to the economic boom in the rest of the world, specifically in emerging economies, the current account deficit of the United States kept ballooning. In the meantime, the long-term interest rate continued declining as was named as “Greenspan’s Conundrum.” The heterogeneity in countries’ ability to







produce financial assets for global savers, which was modeled in Caballero *et al.* (2008a), can be evaluated to be relevant.

Figures 1 to 3 assure that the benchmark model of Caballero *et al.* (2008a) is generally consistent with the empirical evidence. Yield of long-term (10-year) government bond has constantly been declining for more than a quarter century. Meanwhile, the savings rate vis-à-vis disposable personal income, though it had also been declining since the early 1990s through the middle of the 2000s, reversed to rise in the late 2008. The ratio of the current account deficit to GDP followed the same trend. After registering a record-high 6.4% in the third quarter of 2006, it started improving until it reached 2.4% in the second quarter of 2009.

However, simplified analysis by Caballero *et al.* (2008a) abstracts from numerous international, specifically nominal, variables. Caballero *et al.* (2008b), On the other hand, factors in commodity prices to demonstrate that the persistent imbalances, the subprime crisis, and the volatile oil and asset prices are tightly interconnected. Global asset scarcity led to large capital flows toward the U.S. and to the creation of asset bubbles that eventually crashed. Shortage of assets in the world economy triggered a partial recreation of the bubble in commodities and oil markets in particular.

Obstfeld and Rogoff (2009) also argued that the global imbalance and the financial crisis in the latest years are intimately connected. The interaction among the Fed's monetary stance, global real interest rates, credit market distortions, and financial innovation created the toxic mixture of conditions that made the U.S. the epicenter of the global financial crisis. Exchange rate and other economic policies followed by emerging markets contributed to the U.S.' ability to borrow cheaply abroad and thereby finance its unsustainable housing bubble.

It seems that, as is observed from Figure 2, the U.S. current account deficit has bottomed out during the course of 2006. But, Blanchard and Milesi-Ferretti (2009)<sup>7</sup> warns that "stopping in midstream is dangerous. While imbalances are smaller, the world economy is fragile. Failure to act on the remaining domestic and systemic distortions that caused imbalances would threaten the nascent recovery." They propose, as a way of attacking domestic distortions, to increase private and public U.S. savings together with moving from export-led towards more domestic-demand led growth in a number of emerging market countries. On the other hand, for attacking systemic distortions, they argue that, by building better liquidity conditions, international financial society should alleviate worries about current account deficits and external debt.

Both Obstfeld and Rogoff (2009) and Blanchard and Milesi-Ferretti (2009) suggest that the international policy cooperation should be required for

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7 Blanchard and Milesi-Ferretti (2009) proposed the following three stages of global imbalances.

A. Productivity booms and relative investment prospects in the US and Asia (1996-2000)

B. Declining U.S. saving, declining investment in surplus countries (2001-2004)

C. Asset price booms, oil prices, and reserve accumulation (2005-2008)

Global imbalances should not, as Blanchard and Milesi-Ferretti (2009) pointed out, be labeled as good or bad for themselves. It is the natural consequence of the aggregate behavior of savings, investment and portfolio choices.

avoiding another world-wide imbalance and financial crisis. After having agreed to shun competitive currency devaluations and to adopt indicative guidelines for current account balances in the previous month, G20 countries discussed the proposal to set specific numerical targets for current account balances in November 2010. Though it failed to obtain consensus among participant countries<sup>8</sup>, this attempt was the first attempt to address the global imbalance in the international framework.

Eichengreen (2007), on the other hand, from the viewpoint of the comparison between 1960s and the late 2000s, points out that the United States has little incentive to precipitate the requisite and inevitable adjustment, and that exchange rate adjustments will rather have to be forced by high-growth countries like Asia.

Global imbalances, according to the view of Caballero *et al.* (2008a), Obstfeld and Rogoff (2009), and Blanchard and Milesi-Ferretti (2009), culminated in the ongoing worldwide financial crisis. A number of countries have sought exit strategies from a temporary response toward a “once-in-a-century” crisis. However, the global imbalance has not gone forever. The current account balance of the United States has resumed deteriorating in the last couple of years. It is, therefore, necessary to continue researches on the issue of global imbalance both theoretically and empirically.

#### <References>

Blanchard, Olivier, and Gian Maria Milesi-Ferretti (2009), “Global Imbalances: In Midstream?” IMF Staff Position Note SPN/09/29.

Caballero, Ricardo J., Emmanuel Fahri, and Pierre-Olivier Gourinchas

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<sup>8</sup> The United States originally floated ideas of guiding China’s current account surpluses to 4% of GDP, but backed away from numerical targets after objections from China and other emerging economies.

- (2008a), “An Equilibrium Model of ‘Global Imbalances’ and Low Interest Rates,” *American Economic Review* Vol.98 No.1, pp.358–93.
- Caballero, Ricardo J., Emmanuel Fahri, and Pierre–Olivier Gourinchas (2008b), “Financial Crash, Commodity Prices and Global Imbalances,” *Brookings Papers on Economic Activity* (Fall), pp.1–55.
- Eichengreen, Barry (2007), *Global Imbalances and the Lessons of Bretton Woods*, The MIT Press: Cambridge, Massachusetts.
- Mann, Chatherine L. (2004), “Managing Exchange Rates : Achieving Global Re–balancing or Evidence of Global Co–dependency?” *Business Economics* (July), pp.20–9.
- Obstfeld, Maurice, and Kenneth Rogoff (2009), “Global Imbalances and the Financial Crisis: Products of Common Causes,” Paper prepared for Federal Reserve Bank of San Francisco Asia Economic Policy Conference, Santa Barbara, CA, October 18–20, 2009.
- Wilson, Dominic, and Roopa Purushothaman (2003), “Dreaming with BRICs: the Path to 2050,” Goldman Sachs Global Economics Paper No.99.