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경제학 석사 학위 논문

# **Global Current Account Imbalances**

## **: The Role of Currency Internationalization**

글로벌 경상수지 불균형: 통화 국제화의 역할

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# **Global Current Account Imbalances : The Role of Currency Internationalization**

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## **Abstract**

This paper explores the role of currency internationalization as the medium-term determinants of global current account imbalances, particularly the U.S. current account deficit. In theory, different processes and degrees of currency internationalization across countries can lead to asymmetric changes in international lending and borrowing (or current account) across countries. The higher degree of currency internationalization a country has, the more access it has to international financial markets. That is, a country with a high degree of currency internationalization is likely to be able to borrow with less cost. Therefore, the country is likely to end up with current account deficits. I adopt a panel regression for 45 countries that includes the standard determinants of the current account imbalance as well as a measure of currency internationalization. I find that 1) the degree of currency internationalization is negatively associated with current account balances and 2) the U.S. current account deficit is well explained by the degree of currency internationalization.

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*Keywords:* global imbalance; current account; currency internationalization

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## 1. Introduction

The current account of the United States has been in deficit over the last three decades. This trend is inconsistent to the neoclassical theory that the capital flows from rich to poor countries under some plausible assumptions (Lucas, 1990). There are several empirical explanations to this “Lucas Paradox”, and it is inconclusive which factors affect the dynamics of current accounts.

A number of papers emphasize that these imbalances are due to the U.S fiscal deficit, exorbitant spending, and low savings rate (Chinn and Prasad, 2003; Chinn and Ito, 2005, 2007; Gruber and Kamin, 2007). On the other hand, many authors argue that the excessive savings of East Asian countries combined with their interventions to foreign exchange markets play the most significant role in the current account imbalances between the United States and East Asian countries, notably China (Bernanke, 2005; Dooley et al., 2004, 2014; Gruber and Kamin, 2007). None of them, however, successfully explains the huge U.S. current account deficit.

This paper focuses on the heterogeneous capability of each country to borrow and lend in international financial markets using their national currencies. The hypothesis of this paper is that the process and degree of currency internationalization has led to asymmetric changes in the ability of each country to borrow and lend internationally. In other words, the higher degree of currency internationalization a country has, the more access it has to international financial markets, thereby borrowing with less cost.<sup>1</sup> It can be also said that a country with an international currency could roll over its debts more easily and less costly which would represent its capability to borrow without bounds if possible. Thus, increasing its consumption by borrowing would be the optimized decision for an agent to maximize its utility.

Since the Second World War, the U.S has attained the monopolistic position to issue an international currency, and its status as a key currency has been even consolidated after the Nixon shock, which has brought the U.S. means to spend beyond its income. Having considered its role as a reserve currency, means of payment, and store of values, the U.S. current account deficit may have been viewed as the monopolistic profit. That is, the U.S.

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<sup>1</sup> Certainly, the U.S borrowing cost, 10-year Treasury rate, has been declining since the early 1980s.

current account deficit, or over-borrowing, may be the outcome of forward looking, rational, and the dynamic decision of international lending and borrowing.

The objective of this paper is to empirically determine the fundamental factors of the unresolved U.S. current account deficit over the last three decades. Using the panel data of 45 countries over the period between 1982 and 2006, I adopt a panel regression approach, as in Chinn and Prasad (2003) and Gruber and Kamin (2007).<sup>2</sup> Regression models including the standard determinants of the current account identified in the literature - macroeconomic variables as well as structural variables - cannot explain the large U.S. current account deficit of recent years (Gruber and Kamin, 2007). But when this standard model is augmented by a variable representing the degree of currency internationalization, it does a good job of accounting for the large U.S. deficit.<sup>3</sup> The results of this paper lend support 1) to the view that “the dollar effect” contributes to answer the question why the surplus savings of East Asian countries end up in the U.S. and 2) to the suggestion that other currencies should be internationalized, which undervalues the dollar, to adjust global current account imbalances.

The remainder of this paper consists of the following. Section 2 reviews different explanations that have been put forward for global current account imbalances. Section 3 describes the empirical framework and data used in this paper. Section 4 presents the results of the basic panel regressions and their implications while Section 5 lays out the estimation results of the model with the addition of the structural variables. Section 6 provides alternative specifications to test the robustness of the estimates. Section 7 concludes.

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<sup>2</sup> I exclude countries with missing data, especially fiscal balance data, for several period and most of African and Middle East countries from the sample to mitigate concerns about measurement error. The sample of this paper are chosen to focus mainly on the patterns of current accounts between advanced countries and Asian countries.

<sup>3</sup> The estimation results suggest that the currency internationalization variable is an important determinant of not only the U.S. deficit, but also the pattern of current accounts in general.

## **2. Explanations for global current account imbalances**

Global current account imbalances are one of the main areas that recent international economics literatures are focusing on. Many economic and structural factors are introduced as contenders for these imbalances. To date, however, an empirically consistent explanation of the global current account imbalances, especially the U.S. current account deficit, is elusive. This section reviews some of the answers for the causes of global current account imbalances.

### *2.1 Relative Income*

The neoclassical theory predicts that new investment will occur more in the poorer country until capital-ratios are equalized, which reduces current account balances (Lucas, 1990). Moreover, the stages of development hypothesis suggests that countries, moving from a low to an intermediate stage of development, tend to import the capital and, therefore, run current account deficits (Chinn and Prasad, 2003).<sup>4</sup>

### *2.2 Productivity*

From an intertemporal approach, a country's current account deficit is the optimizing decision of a country to borrow with the expectations of their robust performance to the rest of the world. Countries with higher labor productivity growth may attract more capital inflows because of its higher expected rates of return, which may be the case for the U.S. current account deficit (Engel and Rogers, 2006).<sup>5</sup>

### *2.3 Fiscal Balance*

A number of models (Chinn and Prasad, 2003; Chinn and Ito, 2007) predict government budget surpluses, or deficits, would lead to current account surpluses, or deficits, in that the current account balance is the difference between national saving and investment over the medium-term. That is, in the absence of a full Ricardian offset via private savings, the increase in government savings would raise national savings.<sup>6</sup> In this

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<sup>4</sup> The estimation results from Chinn and Prasad fail to explain the stages of development hypothesis.

<sup>5</sup> Engel and Rogers (2006), however, do not include Emerging countries, even China, into their model.

<sup>6</sup> Chinn and Prasad (2003) finds the government budget balance to GDP ratio is not significantly correlated with the current account to GDP ratio for industrial countries.

regard, The U.S. fiscal deficit along with its low savings rate is often blame for current account imbalances.

#### *2.4 Net Foreign Assets (NFA)*

From an intertemporal perspective, the current account is closely related to initial NFA positions given that the current account balance is the sum of trade balance and the return of a country's stock of NFA or payment on its net foreign liabilities (Chinn and Prasad, 2003). NFA positions are not only an important factor to explain current account imbalances, but also an important indicator of global imbalances (Sun, 2012). Widening stock imbalances would make debtor economies more vulnerable, increasing the risk of the hard landing of current account imbalances (Aslam et al., 2014). Despite the need for the research solely on global stock imbalances, this paper will focus on the role of initial NFA positions in current account imbalances.

#### *2.5 Global Saving Glut: exchange rate interventions or financial crises*

The excessive savings of East Asian countries are one of the leading factors for current account imbalances since current account balance can be interpreted as the difference between national saving and investment (Bernanke, 2005). The causes of the excessive savings are different from studies.

For one, Asian countries with development strategies to boost trade balances may artificially manipulate their exchange rates, overvaluing the dollar and undervaluing the national currencies, thereby widening current account imbalances (Dooley et al., 2004, 2014).

The experience of 1997 Asian crises is a rival for the "global saving glut" hypothesis (Gruber and Kamin, 2007). The current account balances of countries that experienced 1997 Asian crises were rapidly recovered. Further, this episode may induce the precautionary savings motives of Asian countries or cause restrictions of these countries to borrow internationally.<sup>7</sup>

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<sup>7</sup> Prades and Rabitsch (2012), using a simulation approach, suggest that many emerging market countries that have experienced crises after an initial liberalization of their capital accounts have subsequently faced increased limitations in their ability to borrow internationally.

Whether the exchange rate intervention or the history of financial crises, it seems clear that there must be some relationships between the excessive savings and the current account surpluses of East Asian countries. Gruber and Kamin (2007) empirically prove that the current account surpluses can be explained by 1997 emerging market financial crises, while fail to identify why those savings flow particularly to the U.S.

## *2.6 Currency Internationalization*

Classical economics theory often assumes complete market that rules out the differences in countries' ability to borrow internationally. However, in the real world, there exists the heterogeneity in the process and degree of currency internationalization to cause asymmetric accessibility to international financial markets, largely characterized by risk premium differences across countries. In other words, when countries attempt to borrow in international financial markets, borrowing would be cheaper if they are better able to issue debts denominated in their national currencies (Eichengreen et al., 2007).

The U.S. is the first, arguably the only, country who has succeeded to fully internationalize its own currency since the Second World War, which might enable the U.S. to have a dominant advantage to borrow internationally. A number of papers point out "the dollar effect" as the fundamental, underlying sources of global imbalances (Ferguson, 2005; Bordo, 2005; Gruber and Kamin, 2007; Feldstein, 2008, 2011; Yang, 2012; Dooley et al., 2004, 2014).<sup>8</sup> Some even argue that the U.S. has no incentives or willingness to adjust these imbalances because continuing the large current account deficit would constitute a permanent gift to the U.S., thus suggest that other currencies, such as the euro and yuan, should be internationalized to dismantle the monopolistic position of the dollar for the adjustment of global current account imbalances (Yang, 2012; Feldstein, 2008, 2011).

## *2.7 Quality of Government Institutions*

The Quality of government institutions is considered to affect current accounts through diverse channels. For instance, legal development may be interacted with financial openness or financial development (Chinn and Ito, 2008). Mendoza et al. (2009)

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<sup>8</sup> However, none of them include the currency internationalization variable to their empirical models.

emphasize that the heterogeneity of government institutions would lead countries to face different constraints: the different level of financial developments. That is, global external imbalances are the equilibrium outcome of financial integration across countries with heterogeneous domestic financial markets. These explanations suggest that the quality of government institutions is negatively correlated to current accounts.

### *2.8 Level of Financial Development*

It is obvious that a country with the greater level of financial development would attract more investment opportunities because the well-functioning financial system is likely to help resources flow from the capital-abundant but less investment opportunities to whom the capital-deficient but higher productivities. However, how financial development affects savings rate is rather ambiguous (Chinn and Prasad, 2003). People may be more willing to save as financial markets become more accessible while precautionary savings would be substituted for other financial intermediates as the U.S. does in its developed asset markets.

### 3. Empirical Framework and Data

The empirical approach of this paper relies largely on the methodology developed by Chinn and Prasad (2003) and Gruber and Kamin (2007).<sup>9</sup> The sample of this paper consists of observations on 45 countries over the period between 1982 and 2006. Variable definitions and data sources are presented in Appendix. The non-overlapping 5 year averages of annual observations for each country are used to find the medium-term determinants of current accounts. The medium-term saving-investment balance perspective has several benefits. First, it can mitigate some concerns about measurement error in annual data. Moreover, this method allows to control for short-term variations in current accounts by isolating specific frequencies such as cyclical influences, temporary shocks, and nominal rigidities.

The primary method of analysis consists of panel regressions with the ratio of the current account balance to GDP as the dependent variable. For all of the regressions, I include period fixed effects, allowing the average current account balance to GDP ratio across the cross-section to vary from period to period. No country fixed effects are included because controlling country specific means would remove much of the cross country differences in current accounts that this paper is interested in explaining. Most of the independent variables are calculated as ratios to sample averages, in that the current account is a relative measure.

#### *3.1 Relative income*

As noted above, labor-intensive capital-poor developing countries are expected to import the capital, and hence run current account deficits. To capture this dynamics, the ratio of real per capita income to its sample mean is included in the regressions.

#### *3.2 Income growth rate*

The change in the growth rate of real per capita income is used as a proxy for the change in productivity growth. The growth rate is constructed as the 5 year average of the difference of annual growth from the GDP-weighted sample mean.

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<sup>9</sup> The approach of Gruber and Kamin (2007) jumps off from the research of Chinn and Prasad (2003).

### *3.3 Fiscal Balance*

The government budget balance is calculated as the ratio to GDP and expressed as the difference from the GDP-weighted mean ratio for the sample.

### *3.4 Net Foreign Assets*

A country's net foreign asset (NFA) position directly affects its net investment income, and therefore its current account balance.<sup>10</sup> Since the NFA position is the accumulation of past current account balances, its lagged value is included expressed as a ratio to GDP.

### *3.5 Demographics*

The dynamics of demographics have been put forward to explain the U.S current account deficit, given that the U.S. is a country which absorbs the influx of relatively young migrants (Cooper, 2008). Thus, the youth and old-age dependency ratio are included in the regressions. The youth dependency ratio is defined as the ratio of people younger than 15 to the working-age population, 15-64, while the old dependency ratio is defined as the ratio of people older than 64 to working-age population. Both measures are entered into the regressions as deviations from a GDP-weighted sample mean.

### *3.6 Trade Openness*

Chinn and Prasad (2003) suggest that country specific characteristics that reflect macroeconomic policies could be relevant for current account determinants. I include trade openness into the model as the sum of imports and exports relative to GDP because trade openness is identified as a proxy for policy choices, such as tariff regimes.

### *3.7 Oil Balance*

Oil-exporting countries typically have favorable current account positions on average. To control this effect, the nominal oil balance to GDP ratio is included in the regressions.

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<sup>10</sup> NFA positions data are from Lane and Milesi-Ferretti (2011).

### *3.8 Financial Crisis*

Financial crisis is identified by Gruber and Kamin (2007) as a determinant of East Asian current account surpluses.<sup>11</sup> Adopting the method of Gruber and Kamin (2007), the financial crisis variable is based on a list of systemic banking crises developed by Caprio and Klingebiel (2003).<sup>12</sup> I transform crisis dummies into relative measures by subtracting from the value of each country's zero/one crisis dummy a GDP-weighted average of these dummies.

In addition to the financial crisis variable, an interaction term, the financial crisis variable multiplied by the openness variable, is included as a control variable because more open economies tend to have larger tradable goods sectors and thus be able to adjust their current account balances more flexibly in response to financial crisis.

### *3.9 Quality of Government Institutions*

Mendoza et al. (2009) and Ito and Volz (2013) suggest that the quality of government institutions may be an important determinant for current accounts as investors would prefer to invest in countries with better institutions such as the protection of investor rights.<sup>13</sup> I include in a subset of the regressions the quality of government institutions variable described in Kaufmann et al. (2010), expressed as an average of six separate sub-indexes: voice and accountability; political stability; government effectiveness; regulatory burden; rule of law; and control of corruption. The Kaufmann et al. dataset is only available for 1996 onwards (1996, 1998, 2000, and 2002-2006). For each country, I match the average of the 1996 and 1998 indicators to the 1992-1996 period and the average of the 2000 and 2002 values to the 1997-2001 period

### *3.10 Level of Financial Development*

As in Gruber and Kamin (2007), I use the ratio of private credit to GDP expressed as a deviation from its GDP-weighted sample mean, as a proxy for financial development.

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<sup>11</sup> Gruber and Kamin (2007) find that the model with the addition of the currency crisis variable does not change the estimation results from the model with the systematic banking crisis variable.

<sup>12</sup> I use an update dataset by Luc Laeven and Fabian Valencia (2012).

<sup>13</sup> Both papers focus on countries' legal systems. Mendozzi et al. (2009) construct the model that incorporates the heterogeneity of each country's legal system into the limited liability constraint while Ito and Volz (2013) build the panel regressions to empirically check the role of legal development on the current account imbalances between the U.S. and China.

### 3.11 *Capital account openness (KAOPEN)*

The degree of capital openness may affect current accounts since the balance of payments identity implies that current account deficits are offset by inflows on the capital account (Chinn and Ito, 2008). I use the Chinn-Ito index (2012) as an indicator of KAOPEN, thus include an index for each country, expressed as a deviation from its GDP-weighted sample mean.

### 3.12 *Currency Internationalization: COFER*

This paper uses the IMF composition of official foreign exchange reserves (COFER) data as a proxy for the degree of currency internationalization. Official foreign exchange reserves reported under COFER consist of the monetary authorities' claims on nonresidents, in the form of foreign banknotes, bank deposits, treasury bills, short-and long-term government securities, and other claims usable in the event of balance of payments needs while do not include holdings of currency by the issuing country. Thus, the share of each currency in COFER would represent the degree of a currency's status as an international currency. I include the share of each currency in allocated official foreign reserves as an explanatory variable, expressed as a deviation from a GDP-weighted sample mean.<sup>14</sup>

Figure 1 and 2 describes changes in the currency shares of allocated official foreign reserves from 1982 to 2006. The shares of allocated reserves seem to vary over time, but the stable dynamics of currency composition can be found. The share of the dollar which reached its peak at 2001, more than 70 percent of allocated reserves, has been dominant, as expected, even after the introduction of the euro.

I also include as an explanatory variable an interaction term, COFER multiplied by the institutions variable in Section 5. The rationale for this is that increasing the degree of currency internationalization is likely to differently affect current accounts in accordance to the degree of institutional development of issuing countries.

Finally, the fact that currency internationalization refers to a currency's use outside the issuer's borders, including for purchases of goods, services, and financial assets in

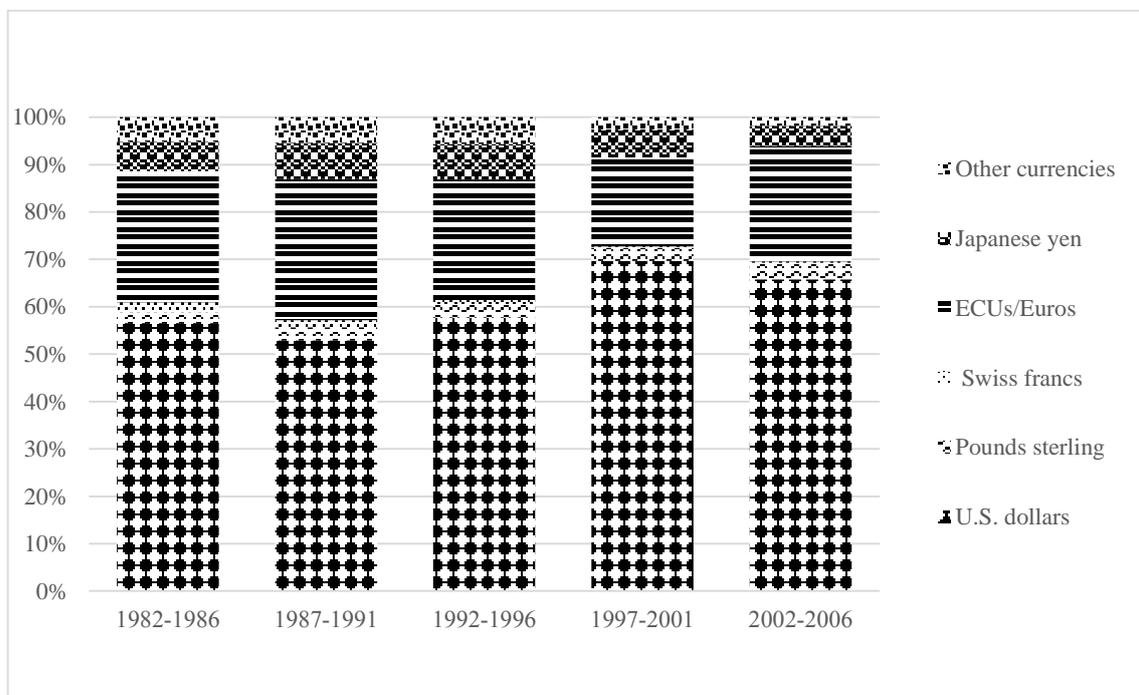
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<sup>14</sup> For convenience sake, the term 'COFER' will be used as the currency internationalization variable hereafter.

transactions by nonresidents raises the question whether the currency share of foreign exchange reserves represents currency internationalization (Kenan, 2009).<sup>15</sup> There are other measures: a currency's use in international transactions and trading volumes in foreign exchange markets. The general picture of currencies' uses by these measures, however, do not make much differences from that described in COFER (Goldberg and Tille, 2008; Maziad et al., 2011).

Nevertheless, to improve the model's ability to capture the more detailed influence of currency internationalization in current accounts, the financial deepening variable, the capital account openness variable, and their interaction terms are included in Section 5.

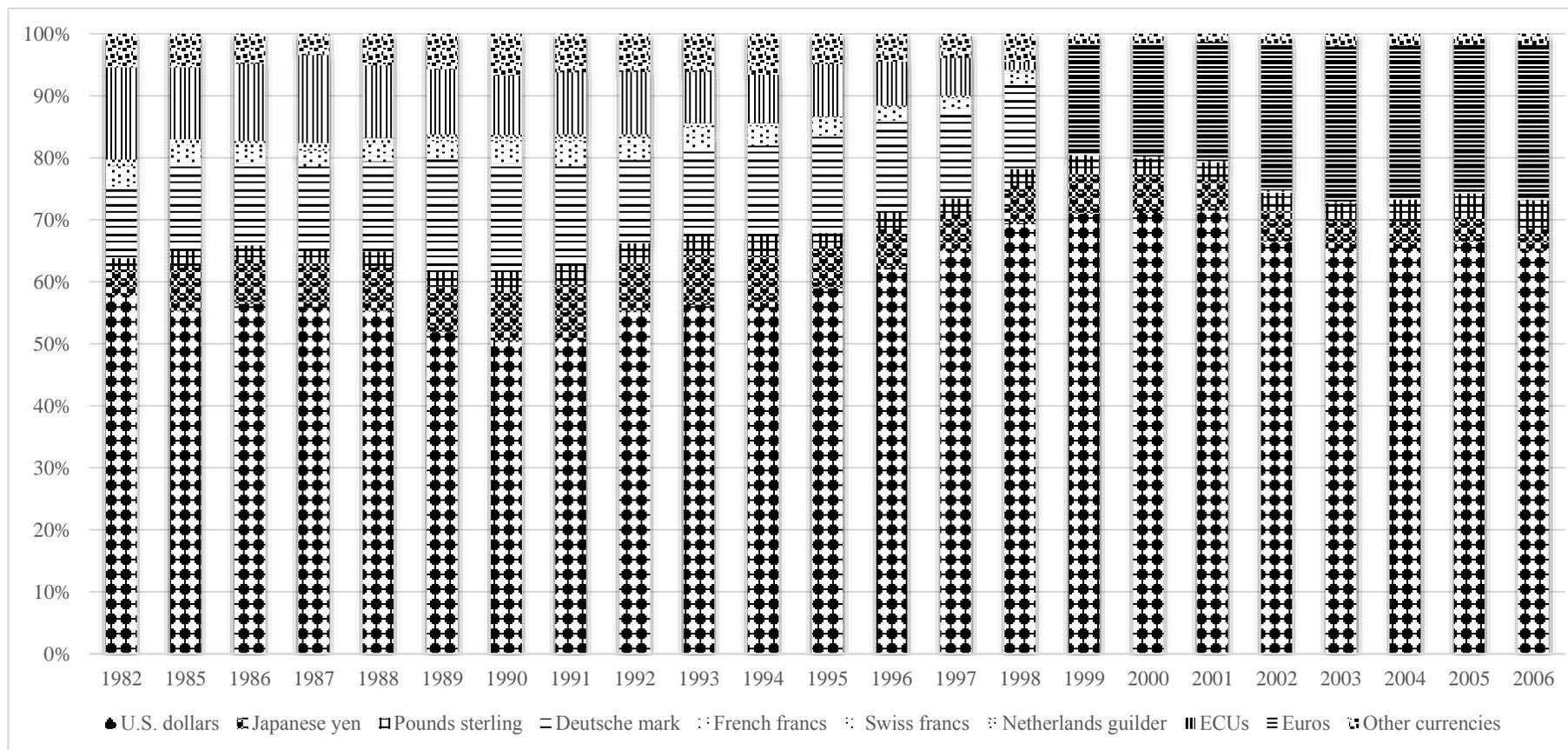
<Figure 1. Composition of Foreign Exchange Reserves: Averages, 5 periods>



Share of allocated foreign exchange reserves  
Source: IMF COFER

<sup>15</sup> The increasing share of unallocated official foreign reserves shown in Figure 3 casts doubts on COFER as a proxy for the degree of currency internationalization.

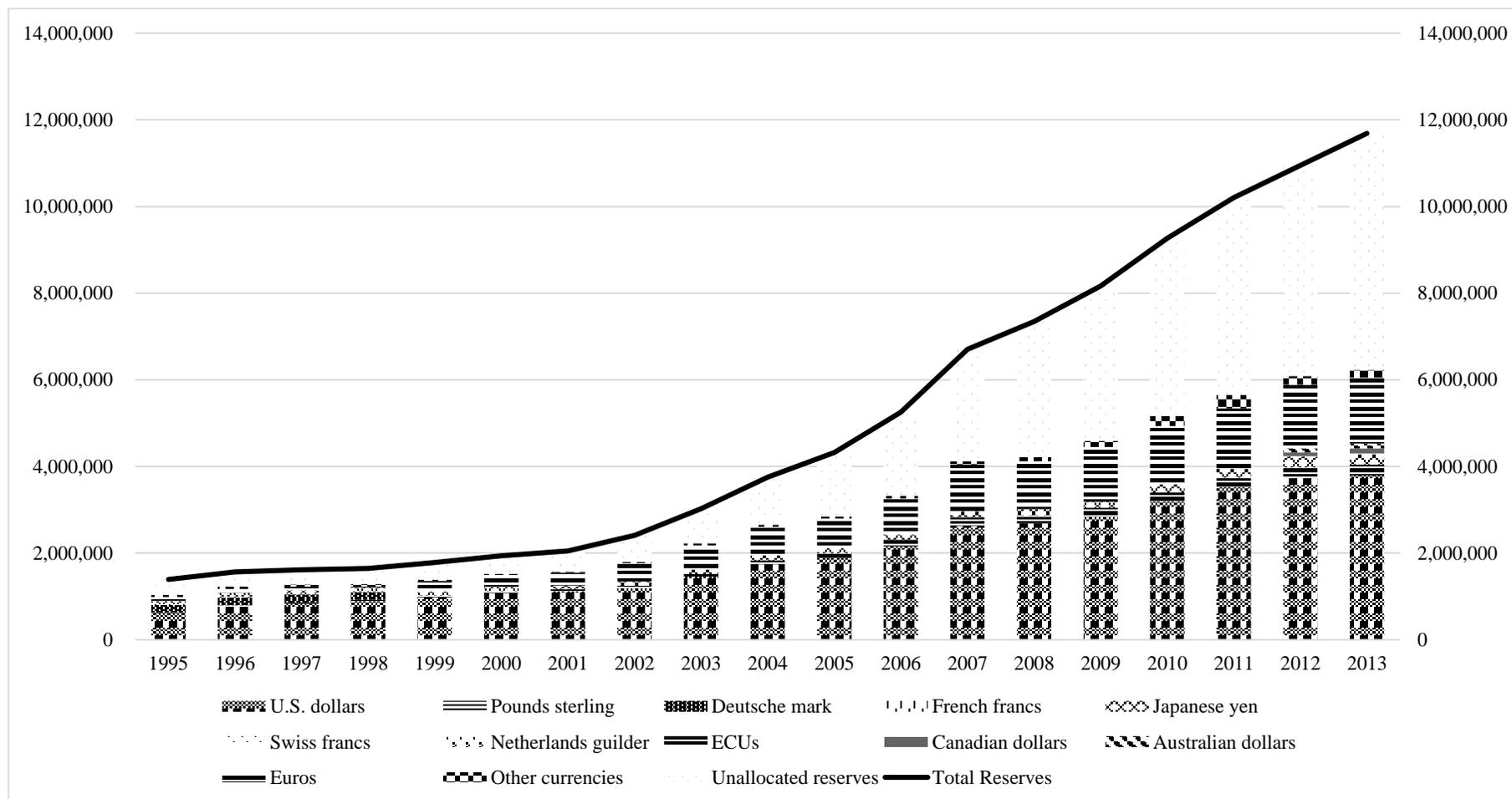
<Figure 2. World Currency Shares of Allocated Reserves>



Source: IMF COFER

Note: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain have possessed the identical degree of currency internationalization, the euro, since 1999.

<Figure3. World Currency Shares of Total Foreign Reserves>



In millions of U.S. dollars  
Source: IMF COFER

#### **4. Basic Estimation Results**

I present the summary statistics of the data in Table 1. The second and third sub-tables show the dynamics of variables of large surplus and deficit countries each, based on current accounts in the 1997-2001 period. The data are consistent with some of the hypotheses described in Section 2. Larger surpluses are associated with: higher per capita income levels, smaller government budget deficits, relatively young demographics, more frequent financial crises (except the 1992-1996 period), and lower degrees of currency internationalization. However, at least in these bilateral comparisons, large surpluses are also associated with higher growth rates per capita, higher degrees of openness, better government institutions, and higher levels of financial development.

Table 2 presents the basic estimation results based on the method of Gruber and Kamin (2007). The model is estimated over the data organized into period averages for five different periods: 1982-1986, 1987-1991, 1992-1996, 1997-2001, and 2002-2006. Both a constant and separate time dummies for each period are included in the model but not shown.

Column 1 describes the results from the model with the standard macro-variables. All of the coefficients have the expected signs. Larger current account balances are associated with: higher per capita incomes, lower growth rates, higher fiscal balances, higher net foreign asset positions, lower shares of youth-elderly in the population, higher degrees of openness, and positive oil balance.

Column 2 and 3 present the estimated results of the regression models that include separate dummy variables for the U.S. during the period 1997-2001 and 2002-2006 and for each of the major developing Asian countries in the sample during the 1997-2001. These separate dummies have the effect of eliminating these observations from the regression, while the coefficients on these dummies represent the difference between their actual current accounts and the model's prediction.

The U.S dummy variable during the 1997-2001 and 2002-2006 period are included to examine how well the model predicts the U.S current account deficit, while each of the Asian countries dummy variables during the period 1997-2001 is included to investigate the effect of the 1997 Asian crises in the current accounts of countries that experienced the crises.

Table 1. Summary statistics

|                                | Total Sample       |           |           |           |           |
|--------------------------------|--------------------|-----------|-----------|-----------|-----------|
|                                | 1982-1986          | 1987-1991 | 1992-1996 | 1997-2001 | 2002-2006 |
| Current account (% of GDP)     | -1.69              | -0.70     | -1.03     | 0.20      | 1.62      |
| Per capita income(\$)          | 13,939             | 15,761    | 16,975    | 19,356    | 21,335    |
| Growth rate per capita         | 1.82               | 2.35      | 2.56      | 2.16      | 2.78      |
| Fiscal balance (% of GDP)      | -4.68              | -2.80     | -3.51     | -1.75     | -1.67     |
| Lagged NFA (% of GDP)          | -15                | -23       | -17       | -20       | -21       |
| Elderly ratio (%)              | 13                 | 14        | 15        | 15        | 16        |
| Youth ratio (%)                | 50                 | 46        | 43        | 40        | 37        |
| Openness (%)                   | 58                 | 60        | 64        | 72        | 78        |
| Financial Deepening (% of GDP) | 50                 | 59        | 67        | 78        | 88        |
| Number of Banking crises       | 45                 | 25        | 30        | 45        | 5         |
| Government institutions        |                    |           | 0.79      | 0.80      | 0.77      |
|                                | Large CA surpluses |           |           |           |           |
|                                | 1982-1986          | 1987-1991 | 1992-1996 | 1997-2001 | 2002-2006 |
| Current account (% of GDP)     | 0.02               | 0.78      | 0.70      | 4.81      | 6.57      |
| Per capita income(\$)          | 17,194             | 19,761    | 21,356    | 23,950    | 26,244    |
| Growth rate per capita         | 2.99               | 3.99      | 3.27      | 2.03      | 3.18      |
| Fiscal balance (% of GDP)      | -1.79              | -0.20     | -2.71     | -0.71     | -0.25     |
| Lagged NFA (% of GDP)          | -1.15              | -0.52     | 10.63     | -1.89     | -1.19     |
| Elderly ratio (%)              | 14                 | 15        | 16        | 17        | 18        |
| Youth ratio (%)                | 41                 | 38        | 36        | 33        | 30        |
| Openness                       | 73                 | 79        | 85        | 97        | 107       |
| Financial Deepening (% of GDP) | 63                 | 83        | 93        | 101       | 99        |
| Number of Banking crises       | 4                  | 7         | 16        | 28        | 3         |
| Government institutions        |                    |           | 0.92      | 0.91      | 0.92      |
| COFER (%)                      | 0.11               | 0.94      | 0.72      | 2.67      | 5.18      |
|                                | Large CA deficits  |           |           |           |           |
|                                | 1982-1986          | 1987-1991 | 1992-1996 | 1997-2001 | 2002-2006 |
| Current account (% of GDP)     | -3.29              | -2.02     | -2.60     | -4.17     | -2.91     |
| Per capita income(\$)          | 12,781             | 14,172    | 14,904    | 17,077    | 19,016    |
| Growth rate per capita         | -0.05              | 1.64      | 1.98      | 2.09      | 2.38      |
| Fiscal balance (% of GDP)      | -5.91              | -4.17     | -3.64     | -2.52     | -2.44     |
| Lagged NFA (% of GDP)          | -25.84             | -45.88    | -37.82    | -36.13    | -44.58    |
| Elderly ratio (%)              | 13                 | 14        | 15        | 16        | 16        |
| Youth ratio (%)                | 50                 | 46        | 43        | 41        | 38        |
| Openness                       | 42                 | 42        | 45        | 52        | 55        |
| Financial Deepening (% of GDP) | 42                 | 43        | 53        | 68        | 83        |
| Number of Banking crises       | 17                 | 12        | 9         | 12        | 2         |
| Government institutions        |                    |           | 0.85      | 0.89      | 0.81      |
| COFER (%)                      | 0.89               | 4.07      | 4.43      | 7.91      | 10.70     |

Large surplus defined as over 2% of GDP in 1997-2001 Period. Sample includes 15 countries

Large deficit defined as over 2% of GDP in 1997-2001 Period. Sample includes 13 countries

Table 2. The main results with COFER, 1982-2006

|                  | 1                    | 2                    | 3                    | 4                    | 5                      |
|------------------|----------------------|----------------------|----------------------|----------------------|------------------------|
| Relative Income  | 0.007<br>(0.005)     | 0.0110**<br>(0.005)  | 0.0116**<br>(0.005)  | 0.0122**<br>(0.005)  | 0.0115**<br>(0.005)    |
| Income growth    | -0.0835<br>(0.106)   | -0.00231<br>(0.109)  | 0.0307<br>(0.112)    | 0.0406<br>(0.110)    | 0.0328<br>(0.106)      |
| Fiscal Balance   | 0.0908<br>(0.071)    | 0.0869<br>(0.070)    | 0.096<br>(0.070)     | 0.0849<br>(0.069)    | 0.0846<br>(0.068)      |
| initial NFA      | 0.0254***<br>(0.007) | 0.0308***<br>(0.007) | 0.0313***<br>(0.007) | 0.0335***<br>(0.007) | 0.0328***<br>(0.007)   |
| ODR              | -0.128*<br>(0.075)   | -0.0918<br>(0.075)   | -0.082<br>(0.075)    | -0.059<br>(0.075)    | -0.0733<br>(0.073)     |
| YDR              | -0.0461<br>(0.028)   | -0.0161<br>(0.029)   | -0.0121<br>(0.029)   | -0.00875<br>(0.029)  | -0.0198<br>(0.027)     |
| Trade Openness   | 0.0116**<br>(0.006)  | 0.00642<br>(0.006)   | 0.01<br>(0.006)      | 0.00793<br>(0.006)   | 0.0078<br>(0.005)      |
| Oil Balance      | 0.102***<br>(0.0352) | 0.0937***<br>(0.034) | 0.0934***<br>(0.034) | 0.0917***<br>(0.034) | 0.0946***<br>(0.034)   |
| Financial Crises |                      |                      | -0.00596<br>(0.017)  | -0.0073<br>(0.017)   | -0.00752<br>(0.013)    |
| Crises*Openness  |                      |                      | 0.000504<br>(0.0004) | 0.000503<br>(0.0003) | 0.000564***<br>(0.000) |
| COFER            |                      |                      |                      | -0.0672**<br>(0.028) | -0.0671**<br>(0.028)   |
| CHN              |                      | 0.0307<br>(0.034)    | 0.0268<br>(0.034)    | 0.0254<br>(0.033)    |                        |
| HK               |                      | -0.0284<br>(0.035)   | -0.0115<br>(0.037)   | -0.0117<br>(0.037)   |                        |
| Indonesia        |                      | 0.0477<br>(0.034)    | 0.0221<br>(0.036)    | 0.025<br>(0.036)     |                        |
| KOR              |                      | 0.0394<br>(0.034)    | 0.0141<br>(0.036)    | 0.0146<br>(0.035)    |                        |
| MYS              |                      | 0.0813**<br>(0.035)  | -0.00301<br>(0.062)  | 0.00181<br>(0.061)   |                        |
| PHP              |                      | -0.00442<br>(0.034)  | -0.0349<br>(0.037)   | -0.0326<br>(0.037)   |                        |
| THI              |                      | 0.0861**<br>(0.035)  | 0.0445<br>(0.041)    | 0.0475<br>(0.041)    |                        |
| USA              |                      | -0.0557**<br>(0.024) | -0.0559**<br>(0.024) | -0.0155<br>(0.029)   | -0.0158<br>(0.029)     |
| N                | 225                  | 225                  | 225                  | 225                  | 225                    |
| R-sq             | 0.328                | 0.389                | 0.401                | 0.418                | 0.406                  |

Panel regression with unreported constant and period fixed effects

Standard errors in parentheses

\* p&lt;0.10, \*\* p&lt;0.05, \*\*\* p&lt;0.01

The estimation results are similar to most of the coefficients estimated by Gruber and Kamin (2007). These results well explain the emergence of Asia's surpluses, but, the model augmented by the financial crisis variable still does not explain the large U.S. current account deficit, reporting the coefficient on the U.S. dummy variables is below zero and statistically significant, as shown in Column 3. The U.S. current account balance is significantly below the model's prediction, with the miss being more than 5 percentage points of GDP.

Note that the coefficients on fiscal balances in Table 2, which range from 0.084 to 0.096, are not statistically significant and quite small; most of coefficients on the fiscal balance variable are significant and range from less than 0.1 to a little over 0.4 described in Chinn and Prasad (2003), and Chinn and Ito (2005), Gruber and Kamin (2007). This might have come from the sample differences across countries and over periods. However, statistical significances of the coefficients on the fiscal balance variable, 78%-86%, are not far from the 90% level.<sup>16</sup>

Column 4 and 5 represent the regression models with the addition of COFER to empirically investigate the role of currency internationalization in current account imbalances. The resultant coefficients on most variables are analogous to those in Column 2 and 3. The U.S. dummy variables are no longer statistically significant and the coefficients are much smaller in the magnitude than those shown in Column 2 and 3, indicating the model augmented by COFER well predicts the U.S. current account deficit.

In addition, the sign of the coefficient on COFER seems likely to support the hypothesis that countries with higher degrees of currency internationalization could more easily borrow internationally to service their external debts, and therefore run larger current account deficits. The estimated coefficient suggests that a 1 percentage point increase in the share of allocated reserves is associated with about a 0.07 percentage point decrease in the current account to GDP ratio. This represents significant evidence that the internationalization of other currencies, not the dollar, would expedite to adjust global current account imbalances, even without the incentives of the U.S. for the adjustment of global imbalances (Yang, 2012; Maziad et al., 2011).

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<sup>16</sup> Furthermore, the model with the annual data in Section 6 shows that the coefficient on the fiscal balance variable is statistically significant and is more line with the literature.

## 5. Structural developments and current account imbalances

As describe in Section 2, structural variables such as the quality of government institutions, financial development, and financial openness may affect current accounts directly or through other channels. Particularly, the marginal effect of currency internationalization in current accounts might vary across countries conditional on the levels of structural developments. To improve the model's ability to capture the more detailed dynamics of current accounts across countries, I first add to the model the quality of government institutions described in Kaufmann et al. (2010) in Section 5.1. Since those variables are only available for 1996 onwards, the estimation in this Section is restricted to the last three panels: 1992-1996, 1997-2001, and 2002-2006. Additionally, Section 5.2 presents the estimation results the specifications augmented by other structural variables; the degrees of financial development and financial openness. The introduction of these variables in the model would also mitigate some concerns about COFER as an indicator of currency internationalization.

### 5.1 *The quality of government institutions*

Table 3 describes the estimation results with the addition of the quality of government institutions variable as well as its interaction term with COFER. Note that I only include the financial crisis variables without Asian country dummy variables.

Column 1 and 2 replicate the same models shown in Section 4 for comparison. The model without COFER in Column 1 still over-predicts the U.S. current account balances. Column 2 describes similar results to those in Section 4. All in all, restricting the sample to the last three periods does not greatly change the estimates.

The institutions variable is introduced to the model in Column 3. Contrary to the unconditional positive correlation suggested in Table 1, the coefficient on this variable is negative and significant, which supports the hypothesis described in Section 2; countries with higher degrees of institutions attract more foreign capital inflows, lowering current accounts. It, however, does not explain the large U.S. current account deficit; the coefficient on the U.S. dummy variable remains large and significant.

Table 3. The model with the Institutions variable, 1992-2006

|                         | 1                      | 2                      | 3                      | 4                       | 5                       |
|-------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|
| Relative Income         | 0.0155*<br>(0.008)     | 0.0142*<br>(0.008)     | 0.0319***<br>(0.010)   | 0.0318***<br>(0.010)    | 0.0249**<br>(0.010)     |
| Income growth           | 0.071<br>(0.192)       | 0.0735<br>(0.187)      | -0.00825<br>(0.190)    | -0.0121<br>(0.184)      | 0.0318<br>(0.182)       |
| Fiscal Balance          | 0.064<br>(0.129)       | 0.0484<br>(0.126)      | 0.0862<br>(0.127)      | 0.0712<br>(0.123)       | 0.177<br>(0.130)        |
| initial NFA             | 0.0294***<br>(0.0096)  | 0.0315***<br>(0.0094)  | 0.0186*<br>(0.0102)    | 0.0199**<br>(0.0099)    | 0.0228**<br>(0.0098)    |
| ODR                     | -0.0475<br>(0.117)     | 0.0264<br>(0.117)      | -0.0439<br>(0.114)     | 0.0359<br>(0.114)       | 0.119<br>(0.118)        |
| YDR                     | 0.0103<br>(0.048)      | 0.017<br>(0.047)       | -0.0427<br>(0.051)     | -0.04<br>(0.050)        | -0.00753<br>(0.051)     |
| Trade Openness          | 0.0125<br>(0.008)      | 0.0122<br>(0.008)      | 0.0218**<br>(0.009)    | 0.0223***<br>(0.008)    | 0.0209**<br>(0.008)     |
| Oil Balance             | 0.120**<br>(0.0564)    | 0.121**<br>(0.0550)    | 0.107*<br>(0.0553)     | 0.107**<br>(0.0535)     | 0.0980*<br>(0.0529)     |
| Financial Crises        | -0.0018<br>(0.021)     | -0.00489<br>(0.021)    | -0.012<br>(0.021)      | -0.0162<br>(0.020)      | -0.0117<br>(0.020)      |
| Crises*Openness         | 0.000593**<br>(0.0003) | 0.000629**<br>(0.0002) | 0.000594**<br>(0.0002) | 0.000633***<br>(0.0002) | 0.000629***<br>(0.0002) |
| COFER                   |                        | -0.118***<br>(0.0429)  |                        | -0.127***<br>(0.0417)   | -0.261***<br>(0.0740)   |
| Quality of institutions |                        |                        | -0.0260***<br>(0.0099) | -0.0281***<br>(0.010)   | 0.0366<br>(0.031)       |
| COFER*Institution       |                        |                        |                        |                         | 0.00112**<br>(0.001)    |
| USA                     | -0.0578**<br>(0.029)   | 0.0164<br>(0.039)      | -0.0560**<br>(0.028)   | 0.024<br>(0.038)        | 0.02<br>(0.037)         |
| N                       | 135                    | 135                    | 135                    | 135                     | 135                     |
| R-sq                    | 0.368                  | 0.405                  | 0.402                  | 0.445                   | 0.467                   |

Panel regression with unreported constant and period fixed effects

Standard errors in parentheses

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

In Column 4, the coefficient on the U.S. dummy variable is no longer significant while the coefficient on COFER is significant and larger in the magnitude. These results support the hypothesis that COFER, not the quality of government institutions, has a significant role in explaining the U.S. current account deficit.

Since currency internationalization would distinctively affect the current account of a country in accordance to its degree of institutional development, I additionally include an interaction term, COFER multiplied by the institution variable as described in Column 5. The coefficients on COFER and the interaction term provide more room to interpret the effect of currency internationalization on global current account imbalances. Not only statistically significant is the coefficient on COFER, but also becomes much bigger in the magnitude. The coefficient on the interaction term is also significant and positive. The sign of this coefficient would indicate that there are offsetting effects for countries with higher degrees - positive - of government institutions but magnifying effects for those with lower levels - negative - of institutional development.<sup>17</sup>

For the U.S. with the institutional development level of 130 or higher, a 1 percentage point decrease in COFER is associated with about a 0.11 percentage points increase in the U.S. current account to GDP ratio which is the similar marginal effect without the institutions variable. This offsetting effect would come from that the higher level of the U.S. government institutions reduce changes in the U.S. current account balance.

The effect of currency internationalization is reversed for countries with lower levels of government institutions such as China, around -40. When the share of the yuan in COFER increases by 1 percentage point, the current account to GDP ratio of China decreases by about 0.3 percentage points, which is much greater change than that without the institutions variable.

These analysis may suggest that the hasty currency internationalization of the yuan not accompanied by institutional development would lead to the sudden drop of the China's current account, and therefore cause the hard-landing of the Chinese economy. Thus, the global imbalances is likely to last further, in that the institutional development to the extent for

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<sup>17</sup> 13 countries out of 45 countries have the negative values of the indicator of government institutions while 32 countries have the positive ones.

currency internationalization would take some years, even decades (Yang, 2012; Feldstein, 2008, 2011).

### *5.2 The degrees of financial development and financial openness*

Development in domestic financial markets and the degree of financial openness, as well as institutional development, could also affect current accounts. Moreover, the introduction of these variables in the model is expected to improve the model's ability to check if COFER is an appropriate indicator for currency internationalization to explain the pattern of current account balances. Thus, I include the financial development variable, financial openness variable (KAOPEN) to the model in this section.

Column 1 is presented to provide baselines to compare results. The coefficient on KAOPEN is negative, consistent with arguments of Chinn and Prasad (2003), but not significant as described in Column 3. The coefficient on the financial deepening variable is negative but statistically not significant as shown in Column 4. The sign of this coefficient may support that the depth and breadth of U.S. financial markets is a determinant to account for the U.S. current account deficit.

It is worth emphasizing that the coefficients on COFER in all the specifications are still significant and negatively associated with current account balances. In addition, the coefficients on COFER and the U.S. dummy variable in Column 2, 3, and 4 are remarkably consistent to those in Column 1. These results may be important evidence that COFER is an appropriate indicator of currency internationalization. The results shown in Column 5, with additions of KAOPEN, the financial deepening variable, and its interaction terms, would represent similar implications with those in Column 5 of Table 3. The different levels of structural developments - financial development, capital openness, and government institutions - have offsetting and magnifying effects on current account balances when countries attempt to internationalize their currencies.

Table 4. The model with the structural variables, 1992-2006

|                           | 1                      | 2                      | 3                      | 4                      | 5                       |
|---------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|
| Relative Income           | 0.0144*<br>(0.008)     | 0.0312***<br>(0.010)   | 0.0317***<br>(0.010)   | 0.0318***<br>(0.010)   | 0.0261**<br>(0.010)     |
| Income growth             | 0.0683<br>(0.190)      | -0.0137<br>(0.188)     | -0.0423<br>(0.191)     | -0.0274<br>(0.192)     | 0.0363<br>(0.185)       |
| Fiscal Balance            | 0.0619<br>(0.128)      | 0.0847<br>(0.125)      | 0.0845<br>(0.125)      | 0.0811<br>(0.125)      | 0.155<br>(0.130)        |
| initial NFA               | 0.0290***<br>(0.0095)  | 0.0178*<br>(0.0101)    | 0.0166<br>(0.0102)     | 0.0199*<br>(0.0109)    | 0.0247**<br>(0.0106)    |
| ODR                       | 0.0122<br>(0.119)      | 0.0192<br>(0.116)      | 0.0455<br>(0.121)      | 0.0247<br>(0.123)      | 0.094<br>(0.132)        |
| YDR                       | 0.0131<br>(0.048)      | -0.0415<br>(0.051)     | -0.0396<br>(0.051)     | -0.0427<br>(0.051)     | -0.0176<br>(0.052)      |
| Trade Openness            | 0.0130*<br>(0.008)     | 0.0226***<br>(0.008)   | 0.0251***<br>(0.009)   | 0.0246***<br>(0.009)   | 0.0217**<br>(0.009)     |
| Oil Balance               | 0.121**<br>(0.0557)    | 0.108**<br>(0.0545)    | 0.120**<br>(0.0568)    | 0.106*<br>(0.0592)     | 0.108*<br>(0.0567)      |
| Financial Crises          | -0.00364<br>(0.021)    | -0.0143<br>(0.021)     | -0.0133<br>(0.021)     | -0.0113<br>(0.021)     | -0.00907<br>(0.020)     |
| Crises*Openness           | 0.000609**<br>(0.0002) | 0.000612**<br>(0.0002) | 0.000580**<br>(0.0002) | 0.000605**<br>(0.0002) | 0.000613**<br>(0.0002)  |
| COFER                     | -0.0850**<br>(0.043)   | -0.0897**<br>(0.042)   | -0.0847**<br>(0.042)   | -0.0828*<br>(0.042)    | -0.684***<br>(0.245)    |
| Institution               |                        | -0.0269***<br>(0.0098) | -0.0258***<br>(0.0099) | -0.0230**<br>(0.0104)  | 0.0976**<br>(0.0377)    |
| COFER*Institution         |                        |                        |                        |                        | 0.00216***<br>(0.00066) |
| KAOPEN                    |                        |                        | -0.013<br>(0.0162)     | -0.0102<br>(0.017)     | -0.233**<br>(0.0899)    |
| COFER*KAOPEN              |                        |                        |                        |                        | -0.00406**<br>(0.0017)  |
| Financial Deepening       |                        |                        |                        | -0.00941<br>(0.011)    | 0.015<br>(0.042)        |
| COFER*Financial Deepening |                        |                        |                        |                        | 0.000<br>(0.0008)       |
| USA                       | -0.00431<br>(0.039)    | 0.000469<br>(0.038)    | 0.000782<br>(0.038)    | 0.00505<br>(0.038)     | -0.016<br>(0.039)       |
| N                         | 135                    | 135                    | 135                    | 135                    | 135                     |
| R-sq                      | 0.388                  | 0.425                  | 0.428                  | 0.432                  | 0.492                   |

Panel regression with unreported constant and period fixed effects

Standard errors in parentheses

\* p&lt;0.10, \*\* p&lt;0.05, \*\*\* p&lt;0.01

## 6. Alternative specifications: Robustness checks

It may be argued that any variable whose value in the U.S. is notably large could over-predict the statistical significance of that variable. To check if the statistical significance of COFER merely comes from the dominant share of the dollar in the currency composition of allocated foreign official reserves, I exclude the U.S. from the sample to the regressions in Section 6.1.

Finally, in order to gauge the robustness of the results at higher frequencies, I reestimate the panel regressions using annual data in Section 6.2.

### *6.1 Regressions excluding the U.S.*

Table 5 presents the estimation results from the models that replicate those of Table 2, but exclude the U.S. data from the sample.<sup>18</sup> The coefficients described in Table 5 suggest the coefficients on COFER are robust to exclusion of the U.S. data. The coefficients on COFER are still negative and statistically significant and other coefficients do not make much differences.

### *6.2 Regressions with annual data*

Although there could be considerable noise and measurement error in annual data, I re-estimate the baseline OLS specifications with COFER and the institutions variable as described in Table 3 and also include lagged values of the current account to GDP ratio to check if the baseline results in Section 4 are sensitive at higher frequencies. The results are reported in Table 6. The coefficients on the lagged current account to GDP ratio are in the range of 0.65-0.86, indicating rather limited persistent in this variable even at an annual frequency.

Table 6 presents different results in the magnitude and statistical significance for some estimated coefficients. The coefficients on the income growth variable are statistically significant at the 99% level and larger in the magnitude, from -0.24 to -3.92 which may support that global current account imbalances are the outcome of optimizing behavior of forward looking agents (Engel and Rogers, 2006).

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<sup>18</sup> The models that replicate the specifications in Section 4 also have similar results.

Fiscal balances remain positively correlated to current account balances, but its coefficients become significant at the 99% level. This might imply that the Ricardian equivalence is much less applicable at higher frequencies. The alternative specifications at higher frequencies, however, do not make much differences in COFER that this paper is interested in. The coefficients on COFER are statistically significant and negative as described in Section 4. These results suggest that COFER well explains the U.S. current account deficit even at higher frequencies.

Table 5. The model excluding the U.S. data, 1982-2006

|                  | 1                     | 2                       | 3                    | 4                    | 5                    |
|------------------|-----------------------|-------------------------|----------------------|----------------------|----------------------|
| Relative Income  | 0.0121**<br>(0.006)   | 0.0119**<br>(0.005)     | 0.0127**<br>(0.006)  | 0.00854<br>(0.006)   | 0.00917<br>(0.006)   |
| Income growth    | 0.00235<br>(0.110)    | 0.027<br>(0.108)        | 0.034<br>(0.113)     | 0.00199<br>(0.108)   | 0.0338<br>(0.110)    |
| Fiscal Balance   | 0.0766<br>(0.071)     | 0.0857<br>(0.070)       | 0.0863<br>(0.071)    | 0.0875<br>(0.069)    | 0.0952<br>(0.069)    |
| initial NFA      | 0.0313***<br>(0.007)  | 0.0310***<br>(0.007)    | 0.0317***<br>(0.007) | 0.0338***<br>(0.007) | 0.0340***<br>(0.007) |
| ODR              | -0.1<br>(0.076)       | -0.105<br>(0.074)       | -0.0902<br>(0.076)   | -0.0122<br>(0.080)   | -0.00525<br>(0.079)  |
| YDR              | -0.0159<br>(0.029)    | -0.0232<br>(0.028)      | -0.0119<br>(0.029)   | -0.00977<br>(0.029)  | -0.0066<br>(0.029)   |
| Trade Openness   | 0.00541<br>(0.006)    | 0.00879<br>(0.006)      | 0.00896<br>(0.006)   | 0.00589<br>(0.006)   | 0.00906<br>(0.006)   |
| Oil Balance      | 0.0932***<br>(0.0346) | 0.0957***<br>(0.034)    | 0.0928***<br>(0.035) | 0.0943***<br>(0.034) | 0.0943***<br>(0.034) |
| Financial Crises |                       | -0.00602<br>(0.014)     | -0.00611<br>(0.017)  |                      | -0.00295<br>(0.017)  |
| Crises*Openness  |                       | 0.000547***<br>(0.0002) | 0.000495<br>(0.0004) |                      | 0.000413<br>(0.000)  |
| COFER            |                       |                         |                      | -0.149***<br>(0.047) | -0.145***<br>(0.047) |
| CHN              | 0.031<br>(0.034)      |                         | 0.0273<br>(0.034)    | 0.0283<br>(0.033)    | 0.0249<br>(0.033)    |
| HK               | -0.0264<br>(0.036)    |                         | -0.00995<br>(0.038)  | -0.0335<br>(0.035)   | (0.020)<br>(0.037)   |
| Indonesia        | 0.0489<br>(0.034)     |                         | 0.0239<br>(0.037)    | 0.0491<br>(0.033)    | 0.027<br>(0.036)     |
| KOR              | 0.0396<br>(0.034)     |                         | 0.0149<br>(0.036)    | 0.0396<br>(0.033)    | 0.017<br>(0.035)     |
| MYS              | 0.0831**<br>(0.035)   |                         | 0.000498<br>(0.062)  | 0.0838**<br>(0.034)  | 0.0126<br>(0.061)    |
| PHP              | -0.00334<br>(0.034)   |                         | -0.0332<br>(0.038)   | -0.00306<br>(0.033)  | -0.0294<br>(0.037)   |
| THI              | 0.0875**<br>(0.035)   |                         | 0.0468<br>(0.042)    | 0.0868**<br>(0.034)  | 0.051<br>(0.041)     |
| N                | 220                   | 220                     | 220                  | 220                  | 220                  |
| R-sq             | 0.387                 | 0.386                   | 0.398                | 0.416                | 0.426                |

Panel regression with unreported constant and period fixed effects

Standard errors in parentheses

\* p&lt;0.10, \*\* p&lt;0.05, \*\*\* p&lt;0.01

Table 6. The model with the annual data, 1982-2006; 1992-2006

|                           | 1                         | 2                         | 3                         | 4                      | 5                      |
|---------------------------|---------------------------|---------------------------|---------------------------|------------------------|------------------------|
| Relative Income           | -0.00118<br>(0.002)       | -0.000326<br>(0.002)      | -0.00000758<br>(0.002)    | -0.00478<br>(0.004)    | -0.0058<br>(0.004)     |
| Income growth             | -0.244***<br>(0.031)      | -0.241***<br>(0.031)      | -0.238***<br>(0.031)      | -0.392***<br>(0.053)   | -0.387***<br>(0.053)   |
| Fiscal Balance            | 0.104***<br>(0.025)       | 0.102***<br>(0.025)       | 0.0991***<br>(0.025)      | 0.186***<br>(0.050)    | 0.195***<br>(0.050)    |
| initial NFA               | 0.00690**<br>(0.0029)     | 0.00735**<br>(0.0029)     | 0.00840***<br>(0.0029)    | 0.00884**<br>(0.0044)  | 0.00914**<br>(0.0044)  |
| ODR                       | -0.0730**<br>(0.031)      | -0.0796**<br>(0.031)      | -0.0715**<br>(0.031)      | -0.00384<br>(0.050)    | 0.019<br>(0.052)       |
| YDR                       | -0.0461***<br>(0.012)     | -0.0456***<br>(0.011)     | -0.0445***<br>(0.011)     | -0.0197<br>(0.022)     | -0.0157<br>(0.022)     |
| Trade Openness            | 0.00698***<br>(0.002)     | 0.00636***<br>(0.002)     | 0.00569**<br>(0.002)      | 0.00713**<br>(0.003)   | 0.00759**<br>(0.003)   |
| Oil Balance               | 0.0218<br>(0.015)         | 0.0211<br>(0.015)         | 0.021<br>(0.015)          | -0.00432<br>(0.024)    | -0.00183<br>(0.024)    |
| Financial Crises          | -0.00741<br>(0.005)       | -0.00775<br>(0.005)       | -0.00837*<br>(0.005)      | -0.00782<br>(0.008)    | -0.00714<br>(0.008)    |
| Crises*Openness           | 0.000200***<br>(0.000072) | 0.000206***<br>(0.000072) | 0.000215***<br>(0.000072) | 0.000122<br>(0.000093) | 0.000123<br>(0.000093) |
| COFER                     |                           |                           | -0.0266**<br>(0.0118)     | -0.0352*<br>(0.0187)   | -0.0833**<br>(0.0346)  |
| Institution               |                           |                           |                           | -0.0043<br>(0.004)     | 0.0175<br>(0.014)      |
| COFER*Institution         |                           |                           |                           |                        | 0.000379*<br>(0.000)   |
| Lagged<br>Current account | 0.666***<br>(0.023)       | 0.661***<br>(0.023)       | 0.654***<br>(0.023)       | 0.861***<br>(0.033)    | 0.851***<br>(0.034)    |
| USA                       |                           | -0.0206*<br>(0.011)       | -0.00501<br>(0.013)       | 0.0196<br>(0.016)      | 0.0162<br>(0.016)      |
| N                         | 1121                      | 1121                      | 1121                      | 495                    | 495                    |
| R-sq                      | 0.584                     | 0.585                     | 0.587                     | 0.733                  | 0.735                  |

Panel regression with unreported constant and time fixed effects

Standard errors in parentheses

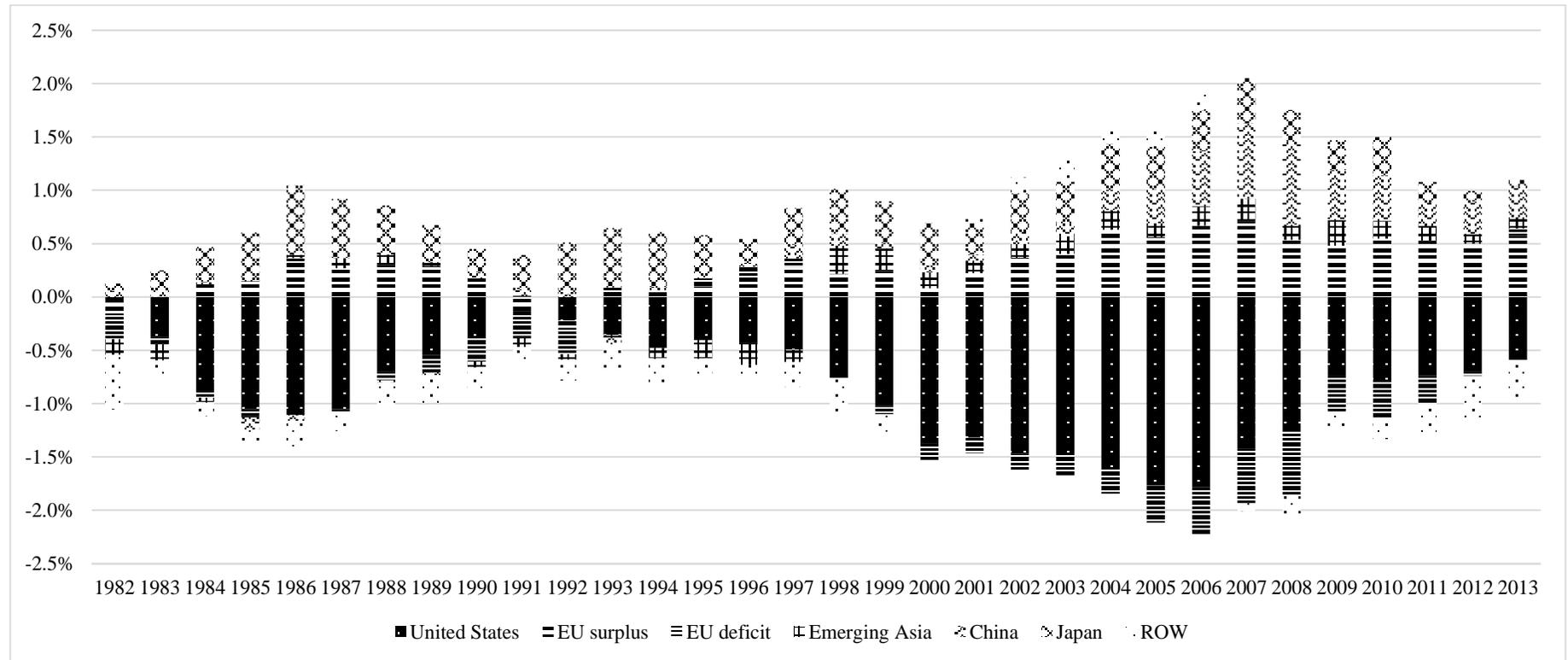
\* p&lt;0.10, \*\* p&lt;0.05, \*\*\* p&lt;0.01

## 7. Conclusion

The aim of this paper is to investigate the causes of the U.S. current account deficit which has lasted for more than thirty years. I find that the model with COFER explains much of the U.S. current account deficit as shown in Section 4. COFER is negatively correlated with current account balances and its coefficient is statistically significant in all the specifications. This supports the portrayal of COFER as a general factor for decreasing current account balances. This empirical finding lends support to the view that internationalization of currencies other than the dollar is requisite to resolve the global current account imbalances (Yang, 2012; Feldstein, 2008, 2011; Dooley et al, 2004, 2014). I also find that there are offsetting and magnifying effects in response to changes in the degree of currency internationalization with the addition of the structural variables; the government institutions, the financial deepening, and the capital account variable. This might suggest that the adjustment process of global current account imbalances would require time and cost, thus these imbalances are likely to last over some periods of time.

The empirical work has left a number of important questions open for future work. For instance, the advent of the euro could be the empirically valuable ground to explore effects of currency internationalization on the dynamics of current account imbalances. Since 1999, some of European countries have been enjoying lower cost of borrowing than when they used their own national currencies and vice versa. It would be worth analyzing the patterns of current account balances of European countries for the period before and after the euro. Another important challenge is to improve the measure of currency internationalization. Although the regressions that include structural variables and exclude the U.S. from the sample resolve this problem to some extent, the increasing share of unallocated foreign reserves in COFER makes it more difficult to proximate the indicator of currency internationalization. Hence, the empirical works in this paper point to some interesting directions towards further research on global imbalances.

<Figure 4. Current account imbalances (percent of world GDP)>



Source: IMF, *World Economic Outlook*, April 2014

## Appendix. Data

| Series  | Sources <sup>a</sup>  |
|---|---|
| Current account                                   | WEO   |
| Nominal GDP                                       | WEO   |
| Per capita income                                 | WDI   |
| Fiscal balance                                    | WEO, OECD, GFS, ADB, BOK  |
| Net foreign asset position                        | Lane and Milesi-Ferretti (2011)                                     |
| Population data                                   | UN  |
| Imports and Exports                               | WDI, OECD   |
| Oil: Imports and exports                          | Energy Information Agency - Department of Energy                    |
| Financial crisis indicators                       | Caprio and Klingebiel (2003), Luc Laeven and Fabian Valencia (2012) |
| Indicators of institutional quality               | Kaufmann et al. (2010)  |
| Indicators of capital account openness            | Chinn and Ito (2012)  |
| Private credit                                    | Beck et al. (2013)  |
| Composition of official foreign exchange reserves | IMF's COFER   |

Sample: Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Brazil, Canada, Chile, China, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Republic of Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Oman, Pakistan, Philippines, Portugal, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States, Venezuela

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<sup>a</sup> WEO: World Economic Outlook Database April 2014; WDI: World Development Indicators (2014); OECD: OECD Economic Outlook 2014; GFS: IMF's Government Finance Statistics 2014; ADB: ADB's Statistical Database System; BOK: Bank of Korea's Economic Statistics System; UN: UN's Demographic Yearbook; Lane and Milesi-Ferretti (2011): Undated and extended "External Wealth of Nations" dataset, 1970-2011.

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# 글로벌 경상수지 불균형

## : 통화국제화의 역할

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### 초록

본 연구에서는 글로벌 경상수지 불균형, 특히 미국의 경상수지 적자의 중단기 결정요인들을 실증적으로 분석한다. 패널회귀분석을 방법론으로 하여, 1) 통화 국제화의 정도가 경상수지와 음의 상관관계를 가지고 2) 기존의 거시변수들 외에 통화국제화가 경상계정에 미치는 영향을 포함시킨 모형이 미국의 경상수지 적자를 상당히 잘 설명하는 것을 발견했다. 이러한 결과들은 달러 외의 다른 통화들의 국제화가 글로벌 경상수지 불균형을 조정하는데 도움을 줄 수 있다는 것을 나타낸다. 그러나, 제도적 발전, 국내 금융시장의 발달, 그리고 자본자유화 등과 같은 구조적인 발전수준들을 고려한 모형의 추정결과들은 글로벌 불균형이 한동안 지속될 수 있음을 시사한다.

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주요어: 글로벌 불균형; 경상수지; 통화국제화

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