International Financial Integration and Increasing Demand for International Liquidity ‡

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1. Introduction

1.1. International financial integration

Since the second half of the 1990s, international capital flow has enlarged tremendously. Specifically, gross foreign assets and liabilities relative to GDP in a number of countries has increased rapidly, with the increase in gross cross-holdings of assets (Lane and Milesi-Ferretti, 2003). Lane and Milesi-Feretti call this phenomenon *increasing international financial integration*.

On the other hand, the U.S. current account deficit has grown rapidly since 1998, both as a percentage of the GDP and in nominal value. It reached 670 billion dollars or 5.7% of the GDP in 2004. Growing literature have recently discussed about sustainability of the U.S. current account deficit, future scenarios of global adjustment, the implicit international monetary order, and so on[1].

Is it accidentally that the U.S. current account deficit began to grow tremendously around 1998 just after the international financial integration had started to proceed? Although a number of authors analyze the effect of the international financial integration on the adjustment of global imbalances and stress the so-called valuation effect (Gourinchas and Rey 2004, Lane and Milesi-Ferretti 2004), few authors investigate a relationship between the expansion of the global balance sheet and the origin of the U.S. current account deficit. This paper investigates the effects of the international financial integration on demand for international liquidity and on the current account balances.

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[1] A partial list of them is Blanchard et al.(2005), Dooley et al.(2003, 2004a, 2004b), Dooley-Garber(2005), Edwards(2005), Eichengreen(2004), Obstfeld-Rogoff(2005), and Iokibe(2006).

Let us imagine a simple story: a gross increase in international capital flow may stimulate global demand for the international liquidity, or liquid asset denominated in the U.S. dollar, which is in turn connected with an increase in deficit of the U.S. current account balance. We will examine the possibility of this story by investigating basic accounting identities.

1.2. Related literature

McKinnon(2001) insists that the United States, as a center country of the international monetary system, can issue to the rest of the world liquid claims on itself that never have to be redeemed, as a central bank issues fiat money within its own natural monetary domain. He stresses that a current account deficit of the U.S. is not necessary to provide international liquidity for which demand is growing because the U.S. can provide liquidity by lending long and borrowing short as an international financial intermediary, as Despres et al.(1966) provoked[2]. On the other hand, Tokunaga (2006) pointed out that either by a current account surplus or by external borrowing, countries other than the center country can acquire a deposit denominated in the international currency terms which is necessary for expanding external investment[3]. Regrettably, these papers do not present formal analytical frameworks: thus, an implication of their proposition on the current account dynamics is unclear. The purpose of this paper is to bridge this gap.

2. International Liquidity

2.1. Liquidity in a closed economy

Following Holmstrom-Tirole (2000), liquidity or a liquid asset can be defined as "one that the firm can quickly resell or pledge as collateral at its value *and* whose market value is unlikely to be depressed when the firm needs resources."[4] It seems harmless to apply the same definition to liquidity for an institutional investor and an individual household.

Firm's demand for liquidity mainly comes from two motives: transaction motive and insurance motive. First, a cash-in-advance constraint for wage and intermediate payments needs liquidity (Hori-Ando, 2002). This transaction motive makes the firm's demand for liquidity as an increase function of output. Second, firms will not continue an enterprise or a project in the future if they are hit by a large liquidity shock. So,

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[2] Mckinnon (2001), p.232.
[3] Tokunaga (2006), p.299.
[4] Holmstrom and Tirole (2000), p.295.

firms need some liquidity as insurance for future liquidity shocks (Hormstrom-Tirole, 1998). This insurance motive makes firm's liquidity demand as an increase function of future uncertainty and a decreasing function of accessibility to refinancing.

2.2. International liquidity

Various definitions about international liquidity have been presented. According to the classical and orthodox definition, international liquidity is an internationally liquid asset denominated in the international currency with which importers can directly accomplish import settlements. Chang-Velasco (1998) proposed a fresh definition that we should call foreign currency assets acceptable in the short term as international liquidity. Under their definition, a negative liquidity shock is such that foreign currency acceptable in the short term comes to be less than short-term foreign debt.

A parallel consideration with liquidity in a closed economy makes it clear that firm's demand for international liquidity comes from the same two motives: transaction motive and insurance motive. Internationally operating firms face a cash-in-advance constraint for foreign wage payments or for imported input payments. The international liquidity demand incurred by a transaction motive like this can be thought of as an increase function of import or FDI. A need for insurance for unexpected shortage of international liquidity also invokes demand for international liquidity, and this demand may be an increase function of future uncertainty and difficulty in refinance. In particular, firms or banks in emerging countries would tend to have this insurance motive more strongly.[5]

3. Country Balance Sheet, International Liquidity and the Current Account

3.1. Target International Liquidity

The U.S. dollar is the key currency in the international monetary system. This means that countries must possess some dollar denominated deposits, or dollar assets which can be easily converted into dollar deposits, for import settlements. Thus, growth of international trade, or of world income, induces an increase in world demand for the international liquidity.

The demand for the international liquidity may be also stimulated by growth of international financial trade. This is because it seems convenient for international investors to keep at hand dollar-denominated liquid assets which can be easily

[5] Hirose-Toyofuku (2002) presents a compact survey on the theory of firm's demand for liquidity and its application to explanations of the Asian Crises.

exchanged for any asset denominated in any currency. The professionals in the financial market carefully watch the movement and the mood in the market, and try to sell at a high price and to buy at a low price. So, the timings of selling and buying do not coincide. In addition, since most of the securities issued by governments and firms in the emerging economies are denominated in the dollar terms, investors can invest in any country's asset by converting the dollar-denominated liquid assets at hand into dollar deposits. A growing external debt also increases international liquidity demand. International borrowers must periodically pay interest in a foreign currency terms, most in the dollar terms, but the currency composition of their cash flow does not always match that of their external debt. So, to avoid shortage of liquid asset in the debt-contracting currency terms, international borrowers may be eager to hold liquid assets in the dollar terms.

In sum, demand for dollar as an international liquidity may have increased not only by a growth of international goods and service trade but also by a growth of international financial trade. Then, we can suspect that there exists some optimal level of international liquidity for each country, which is an increasing function of the volumes of her external goods and financial trades, and of the degree of uncertainty about future cash flow and about accessibility to refinance from abroad as discussed in the previous section.

Related concepts have been presented by several researchers. Lane and Milesi-Feretti (2002) proposed a hypothesis that there exists a long-run equilibrium net external asset to GDP ratio for every country. They inferred that this long-run net external asset position depends positively on output per capita and the ratio of young generation to retired generation, and negatively on the government budget deficit. Using an error correction model, they showed that the half life of the convergence on which the economy will approach to the new long-run equilibrium through a current account surplus (deficit) is about 5 years, after some shock pushes up (pulls down) the long-run equilibrium external asset position. Christopher Carroll proposes in his consecutive papers that consumers have a target wealth to permanent labor income ratio and save (or dissave) if their wealth is below (or above) it (Carroll, 1992, 1997)[6]. Though his discussion is based on a closed-economy model, it can be extended to an open-economy environment: if one country's wealth to GDP ratio is below its target level, this country saves more and a part of the saving results in a current account surplus[7].

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[6] The wealth in Carroll's model is the sum of financial asset and current labor income. Based on his buffer stock saving theory, the target wealth to permanent labor income ratio becomes an increasing function of income uncertainty.

[7] Ben S. Bernanke expresses a similar idea in his comment on Blanchard et al.(2005).

3.2. Analytical framework

To consider valuation effects accompanying with changes in international liquidity demand, we will use a bit complicated notations for external investment positions: X_{t+1}^{t} denotes the value of the corresponding asset category X at the end of period t, while X_{t+1}^{t+1} expresses the ex-post value of the same asset at the beginning of period $t+1$.

The net external asset position F is defined as the difference between external asset position A and external debt position D, where all variables are evaluated in the key currency terms: i.e., in the dollar terms. At the end of period t, the following relationship holds.

$$F_{t+1}^{t} \equiv A_{t+1}^{t} - D_{t+1} \tag{1}$$

For an analytical convenience, we ignore valuation changes in the external debt. The net increase in the net external asset equals the current account surplus cum capital gain accruing to the gross position of the external assets and liabilities at the beginning of the period, i.e.,

$$\Delta F_t \equiv F_{t+1}^{t} - F_t^{t-1} = CA_t + KG_t . \tag{2}$$

CA_t denotes the current account balance during period t (a positive sign means a surplus) and KG_t denotes capital gain accruing to the gross external asset and debt positions accumulated through period $t-1$ at the beginning of period t. Using equation (1), we can rewrite equation (2) as follows.

$$\Delta A_t \equiv A_{t+1}^{t} - A_t^{t-1} = CA_t + KG_t + \Delta D_t \tag{3}$$

Here, $\Delta D_t \equiv D_{t+1} - D_t$.

Home agents (institutional investors and firms) hold a part of their external assets as internationally liquid assets denominated in the U.S. dollar. So, we can divide external asset position in a following way.

$$A_{t+1}^{t} = L_{t+1} + NL_{t+1}^{t} \tag{4}$$

Here, L_{t+1} denotes the nominal amount of international liquidity at the beginning of period $t+1$ which is accumulated through period t, and NL_{t+1}^{t} denotes the dollar

value of the illiquid external assets at the end of period t. We assume that the liquid asset pays zero coupon and its price is constant, or unity; thus, the upper lowercase letter is not needed for L.

To examine an effect of a growth of international balance sheet on demand for international liquidity and on the current account balance, it is useful to describe the home demand for international liquidity as a proportion to the sum of its gross external assets and liabilities.

$$L_{t+1} = \beta_t (A^t_{t+1} + D_{t+1}) \tag{5}$$

Equation (5) can be interpreted as an identity, because we can always choose β_t such that L_{t+1} and $A^t_{t+1} + D_{t+1}$ satisfy the equation. For an analytical purpose, however, we think of equation (5) as a demand function of international liquidity, and assume that β_t and $A^t_{t+1} + D_{t+1}$ are independently determined. This is the first critical assumption of our analysis.

We assume β is variable and satisfies the condition of $0 < \beta < 1$. This means that international liquidity demand increases by two factors: an expansion of gross external asset and debt positions (an increase in $A^t_{t+1} + D_{t+1}$) and an increase in the propensity to hoard internationally liquid assets (an increase in β). For a descriptive motive, let γ_t denote the time-varying ratio of the net foreign asset position to the gross external asset position; i.e., $\gamma_t \equiv F^t_{t+1} / A^t_{t+1} = (A^t_{t+1} - D_{t+1}) / A^t_{t+1}$. Utilizing γ_t, we can rewrite the liquidity demand function as a function of the gross external asset position.

$$L_{t+1} = \beta_t (2 - \gamma_t) A^t_{t+1} \equiv \alpha_t A^t_{t+1} \tag{6}$$

Let us assume that an illiquid external asset pays non-zero coupon and its price is variable. Then, the overall value of the non-liquidity assets can be expressed as the product of the period t dollar price of the asset (q^f_t) and the volume of the asset at the end of period t (B^*_{t+1}), i.e.,

$$NL^t_{t+1} = q^f_t B^*_{t+1}. \tag{7}$$

If we apply equation (7) to an expression of the market value of external equity investments or direct investments, q_t^f corresponds to the dollar price of the foreign share home agents invest, while B_{t+1}^* means the number of the shares. If we apply equation (7) to an expression of the market value of external bond holdings, q_t^f corresponds to the dollar market value of the foreign bonds, the face values of which are 1 unit of the issuer country's currency, while B_{t+1}^* means the number of the bonds home agents hold. An important point is that q_t^f changes not only by a fluctuation of the security price itself but also by an exchange rate movement vis-à-vis the U.S. dollar.

The second critical assumption of this paper is that the period t dollar price of the non-liquidity foreign asset q_t^f depends negatively on the period t ratio of the international liquidity to the overall external asset α_t, i.e., $q^f(\alpha_t)$ and $q^{f'}(\alpha_t) < 0$. Since α means home demand for international liquidity as a fraction of the overall external assets, an increase in α reduces home demand for the illiquid foreign assets and for currencies other than the key currency; thus, it decreases q^f both through a drop in the security price itself and through a depreciation of the currency of the issuer's country.

As discussed in the previous section, each country is supposed to have a long-run target level of the net foreign asset position relative to GDP. To make a discussion assuming the country has such a target net external wealth, equations (1) ~ (7) should be rewritten in terms of a fraction of GDP. By multiplying the both sides of equations (1) ~ (7) by S_t/P_tY_t, we can rewrite them in terms of a ratio to GDP (S, P, and Y denote the nominal value of the U.S. dollar in terms of home currency, price of home goods, and real output of home goods, respectively)[8].

$$f_{t+1}^t \equiv a_{t+1}^t - d_{t+1} \tag{1'}$$

$$a_{t+1}^t - a_t^{t-1} \approx ca_t + kg_t + (d_{t+1} - d_t) - \left[\frac{\pi_t + g_t - \varepsilon_t}{(1+\pi_t)(1+g_t)}\right] f_t^{t-1} \tag{3'}$$

[8] The rearranged version of equation (2) is omitted because it is basically same as (3').

$$a_{t+1}^{t} = l_{t+1} + nl_{t+1}^{t} \tag{4'}$$

$$l_{t+1} = \beta_t (a_{t+1}^{t} + d_{t+1}) \tag{5'}$$

$$l_{t+1} = \beta_t (2 - \gamma_t) a_{t+1}^{t} \equiv \alpha_t a_{t+1}^{t} \tag{6'}$$

$$nl_{t+1}^{t} = q_t^f b_{t+1}^{*}. \tag{7'}$$

Here, small letters mean the ratios to GDP of the corresponding capital letters. π, g, and ε denote the inflation rate of home goods (the growth rate of GDP deflator), the growth rate of home GDP, and the rate of nominal depreciation of home currency vis-à-vis the dollar, respectively. We derive equations (3') by assuming the product πg is trivial and can be ignored.

3.3. International liquidity demand and the Current Account

We are now ready to proceed a theoretical experimentation. What we are interested in is the relationship between international financial integration, demand for international liquidity, and the current account. Under the assumption of equation (5) and (5'), growth of international financial integration affects international liquidity demand through two channels: indirect effect through changes in β_t and direct effect by changes in $a_{t+1}^{t} + d_{t+1}$. So, we will examine first how will the economy adjust if, at the beginning of period t, a positive shock on demand for international liquidity happens, i.e., β_t increases, and how the depth of international financial integration affects the way of the adjustment. Second, we will examine how an increase in $a_{t+1}^{t} + d_{t+1}$ affects the current account through its direct effect on demand for international liquidity.

3.3.1 Exogenous increase in international liquidity demand

Demand for international liquidity may surge when a currency crisis or a sudden stop of capital inflow worsens prospect for future cash flow evaluated in the international currency terms. It may also increase as the import to GDP ratio grows. We can think of the effects of these factors as those of changes in β, in our analytical framework. What should happen when β_t abruptly increases at the beginning of period t with a and d constant, i.e., with $a_{t+1}^{t} = a_t^{t-1}$ and $d_{t+1} = d_t$?

For a descriptive motive, let us first assume that the gross level of external assets and liabilities, A and D, remains constant (thus, nominal GDP in the dollar terms is also assumed to be constant). In the familiar model where only real bond is traded and changes in security prices is not considered, if the condition of $\Delta A_t = \Delta D_t = 0$ holds, the current account must be zero. Even if the net income payment balance is surplus, the corresponding trade balance deficit brings zero current account balance. However, this proposition does not hold once we consider variable security prices, because capital gains or losses induced by changes in security price affect the value of the external asset.

The value of the external asset accumulated through period $t-1$ at the beginning of period t is

$$A_t^t = \alpha_{t-1} A_t^{t-1} + q^f(\alpha_t) B_t^*,$$

while the value of it at the end of period $t-1$ is

$$A_t^{t-1} = \alpha_{t-1} A_t^{t-1} + q^f(\alpha_{t-1}) B_t^*.$$

From these equations, the capital gain (or loss) on the external asset between $t-1$ and t can be calculated as

$$KG_t = A_t^t - A_t^{t-1} = \left(q^f(\alpha_t) - q^f(\alpha_{t-1})\right) B_t^*. \tag{8}$$

From equation (8), we can easily see that if β_t, thus α_t, abruptly increase, home country suffer a capital loss on her existing external asset at the beginning of period t. This means that, to keep the nominal value of the net external asset constant, a surplus in the current account will be needed (See equation (2)).

A parallel discussion can be applied to the case of the terms of a ratio to GDP. By multiplying the both sides of equation (8) by $S_t / P_t Y_t$ and rearranging it, we can rewrite it in terms of a ratio to GDP.

$$a_t^t - a_t^{t-1} \approx \left(q^f(\alpha_t) - q^f(\alpha_{t-1})\right) b_t^* - \left[\frac{\pi_t + g_t - \varepsilon_t}{(1+\pi_t)(1+g_t)}\right] a_t^{t-1} \tag{9}$$

Equation (9) shows that the change in the value of external asset accumulated through period $t-1$ relative to GDP depends on a valuation effect or capital gain (the first term of the right hand side of (9)) and a growth effect (the second term of it). If $\alpha_t > \alpha_{t-1}$, the valuation effect becomes negative because of a capital loss which comes from the assumption of $q^{f\prime}(\alpha_t) < 0$.

By substituting $\Delta a_t = \Delta d_t = 0$ into equation (3') and rearranging it, the following relationship is attained.

$$ca_t \approx -kg_t + \left[\frac{\pi_t + g_t - \varepsilon_t}{(1+\pi_t)(1+g_t)}\right] f_t^{t-1} \qquad (10)$$

Note that $kg_t = \left(q^f(\alpha_t) - q^f(\alpha_{t-1})\right) b_t^*$ holds. Considering $kg_t < 0$, from equation (10), we can classify the effect of an exogenous increase in international liquidity demand on the current account as follows.

(i) if $f_t^{t-1} > 0$ and $\pi_t + g_t \geq \varepsilon_t$, then $ca_t > 0$.

(ii) if $f_t^{t-1} > 0$ and $\pi_t + g_t < \varepsilon_t$, then the sign of ca_t is undetermined.

(iii) if $f_t^{t-1} < 0$ and $\pi_t + g_t \geq \varepsilon_t$, then the sign of ca_t is undetermined.

(iv) if $f_t^{t-1} < 0$ and $\pi_t + g_t < \varepsilon_t$, then $ca_t > 0$.

(v) if either $f_t^{t-1} = 0$ or $\pi_t + g_t = \varepsilon_t$, then $ca_t > 0$.

Though it is difficult to draw a general conclusion about the direction of the current account movements from the results above, the relationship of $kg_t = \left(q^f(\alpha_t) - q^f(\alpha_{t-1})\right) b_t^*$ indicates an important point about the magnitude of the capital loss on the (net) external asset to GDP ratio. International financial integration intensifies the magnitude of the capital loss. We can see this by the term b_t^*. A growth of international financial integration expands the gross external asset holdings of one country, or makes b_t^* larger, which intensifies the negative value of Δq_t^f when $\Delta\alpha_t > 0$. Though Lane and Milesi-Feretti (2004) correctly pointed out the magnifying effect of international financial integration on the valuation effect, our finding here differs from theirs in connecting it with international liquidity demand and the current account movement. By this additional effect of growing international balance sheet, the capital loss may be so much enlarged that it would outweigh the growth effect and produce a current account surplus even in case (ii) and (iii).

Case (iv) states that an abrupt surge in demand for international liquidity in a

net debtor country always brings a current account surplus if the nominal depreciation of her currency vis-à-vis the dollar exceeds the nominal GDP growth rate, and if the gross external asset and liability positions are constant relative to GDP. Most of the East Asian countries have experienced a turnaround of their current account into a large surplus relative to GDP after the Asian Crises, with a sharp fall of the value of their currency vis-à-vis that of the U.S. dollar and a painful drop of their domestic production. A part of this current account reversal may be ascribed to an unexpected growth of demand for international liquidity which was caused by a discouraging prospect for future cash flow and for accessibility to refinancing from abroad.

3.3.2 Direct effect of international financial integration

Growth of $a^t_{t+1} + d_{t+1}$, our proxy for international financial integration, increases demand for international liquidity by assumption. However, its effect on the current account is not so straightforward as that of an increase in β. The reason is that the effect on α, the ratio of international liquidity to the overall external asset, is not unique, depending on whether d/a stays constant or increases or decreases when both a and d increase. If d/a stays constant, i.e., a and d grow proportionately, the valuation effect is nil, or α remains constant, because γ is constant. If d/a increases, i.e., the growth rate of a is exceeded by that of d, α increases and home investors suffer a capital loss because γ decreases. If d/a decreases, the counter argument applies. Furthermore, in each three cases, the effect on the current account depends both on whether home country is net creditor or net debtor, and on whether the growth rate of nominal GDP exceeds the rate of nominal depreciation of home currency vis-à-vis the dollar. Since we have to distinguish all these cases, it is not easy to draw a clear-cut implication about the effect of an increase in $a^t_{t+1} + d_{t+1}$ on the current account, to our regret.

To see this, it is suggestive to rearrange equation (3') as follows.

$$ca_t \approx -kg_t + (\Delta a_t - \Delta d_t) + \left[\frac{\pi_t + g_t - \varepsilon_t}{(1+\pi_t)(1+g_t)}\right] f_t^{t-1} \qquad (11)$$

The first term on the right hand side of (11) can be zero or positive or negative depending on the pattern of the movement of d/a. The signs of the second and third term are also indeterminate. Thus, the sign of ca_t depends on the several factors and is undetermined.

Nevertheless, it is worthwhile to examine the case in which international financial integration proceeds with the net external asset position kept on the long-run target level, i.e., $\Delta a_t = \Delta d_t$. In this case, the effects of international financial integration on the current account can be classified in a similar (but a little different) fashion as in the preceding subsection.

(vi) if $f_t^{t-1} > 0$ and $\pi_t + g_t \geq \varepsilon_t$, then $ca_t > 0$.

(vii) if $f_t^{t-1} > 0$ and $\pi_t + g_t < \varepsilon_t$, then the sign of ca_t is undetermined.

(viii) if $f_t^{t-1} < 0$ and $\pi_t + g_t \geq \varepsilon_t$, then $ca_t < 0$.

(ix) if $f_t^{t-1} < 0$ and $\pi_t + g_t < \varepsilon_t$, then the sign of ca_t is undetermined.

(x) if either $f_t^{t-1} = 0$ or $\pi_t + g_t = \varepsilon_t$, then $ca_t = 0$.

The major difference is in the case of net debtor country. Contrary to case (iii) and (iv), in case (viii) the current account of net debtor country turns into deficit, while in case (ix) the sign of the current account is undetermined. The reason why for a debtor country a current account deficit is needed when $\pi + g \geq \varepsilon$ is that α decreases as a and d increase by an equal amount. Since conditions of $a_t < d_t$ and $\Delta a_t = \Delta d_t$ means that condition of $(\Delta a_t / a_t) > (\Delta d_t / d_t)$ is hold, an increase in γ_t and a decrease in α_t are resulted. A decrease in α_t makes q_t^f rise and brings a capital gain. In addition, economic growth shrinks the ratio of net external asset to GDP if $\pi + g \geq \varepsilon$ holds. So, to keep the target net external debt position relative to GDP, the country needs a deficit of the current account. The necessary deficit to GDP ratio expands as international financial integration deepens because the integration magnifies the capital gain.

It is interesting that, along the target net external wealth, the ways of the current account adjustment of a net debtor country in response to an increase in demand for international liquidity are asymmetric between the case of exogenous increase in the demand and the case of endogenous increase following international financial integration. In the former case the current account tends to be in surplus as international financial integration deepens, while in the latter case the current account is inclined to be in deficit as the gross position of external assets and liabilities gets larger.

This difference comes from the valuation effect. An exogenous increase in international liquidity demand, which leaves the gross external position constant, raises the ratio of liquidity to the overall external asset and thus brings a capital loss. On the contrary, a growth of external asset and liability position in a net debtor country pulls down the liquidity to external asset ratio, and thus results in a capital gain. Since a deepening of international financial integration intensifies the valuation effect, it also strengthens the asymmetry between the current account implications of the exogenous and endogenous increases in international liquidity demand.

When an exogenous rise in international liquidity demand and a deepening of international financial integration occur simultaneously, the overall effect on the current account of an ex-ante net debtor country depends on which one of the above opposite mechanisms acts more strongly than the other. On the other hand, as to a net creditor country, both the effects must function to take the current account into surplus.

4. Concluding thoughts

This paper examined what an adjustment should occur when international financial integration a la Lane and Milesi-Feretti (2003) deepens and demand for international liquidity is stimulated, by inquiring into the identity of a country balance sheet.

First, we investigated the effects of an exogenous increase in international liquidity demand which is not directly caused by international financial integration. If an increase in the ratio of international liquidity to the overall external asset brings about a capital loss on the existing non-liquidity external asset, a current account surplus is needed after the shock to keep the ratio of net external asset to GDP constant under some condition. Both the probability that a surplus is needed and the extent of the surplus would get larger as international financial integration deepens, or as the sum of gross external asset and debt positions swells.

Second, we examined the effects of an endogenous increase in international liquidity demand brought by international financial integration. Along the target net external asset position, the current account of a net creditor country tends to be in surplus, while that of a net debtor country tends to be in deficit. This asymmetric outcome is caused by the sign of the valuation effect on the existing net external asset. Deepening of international financial integration strengthens the valuation effect, and thus also intensifies the asymmetric movements of the current account.

What can we say by combining these analyses? As for a net creditor country, it is very likely that international financial integration would move the current account

towards in a surplus and enlarge surpluses along an increasing trend of international liquidity demand. As for a net debtor country, it depends on which of the two effects acts more strongly whether the current account moves into surplus or not with a growing integration of the international financial market. Further increases in the current account surplus of the ex-ante net creditor countries since the end of 1990's may reflect the rapid growth of international financial integration. The sharp reversals in the current account of the East Asian economies, most of which have been net debtors, might be partly resulted from an abrupt increase in demand for international liquidity after the Asian Crises.

A lot of work remains to be done. We ignore the existence of the euro. Growing importance of the euro both in the international capital market and in the foreign exchange market may change the result of the analysis above. It may be fruitful to consider the composition of international liquidity between the dollar and the euro. Though we did not analyze the problem in a multi-country framework, a consideration on the global budget constraint may also be important.

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