

Capital Inflows to Emerging Countries and Their Reflux to the United States

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Under the prolonged accommodative financial environment in developed countries, incentives to search for yield have increased among investors. This has prompted capital inflows to emerging countries with high growth prospects (high expected returns) in recent years. In these circumstances, the correlation coefficients of changes in asset prices among emerging countries have reached an unprecedentedly high level, reducing the benefits of internationally diversified investment. Concurrently, many of the emerging countries, faced with a significant amount of capital inflows, appear to be intervening massively in the foreign exchange market to keep their currencies from appreciating sharply. The accumulated foreign reserves resulting from the interventions have tended recently to be invested increasingly in longer-term U.S. Treasuries, and it is possible that this tendency is putting downward pressure on U.S. long-term interest rates. The decline in these rates may cause an acceleration of capital inflows to the emerging countries by further encouraging investors to search for yield. The recent international capital flows suggest that a "feedback loop" is operating between developed and emerging countries, and therefore careful attention should be paid to future developments, including the possibility of a reversal of capital flows.

Introduction

Based on the strong expectation that economic expansion in emerging countries will continue in the future, a massive amount of capital continues to flow into the emerging countries.¹ At the same time, emerging countries receiving capital inflows are faced with problems such as the rising pressure of currency appreciation. To keep their currencies from appreciating sharply, many emerging countries are introducing or strengthening their capital control measures. In addition, they appear to be intervening massively in the foreign exchange market.² Their foreign reserves accumulated through the interventions have tended to reflux to developed countries mainly in the form of investment in U.S. Treasuries.

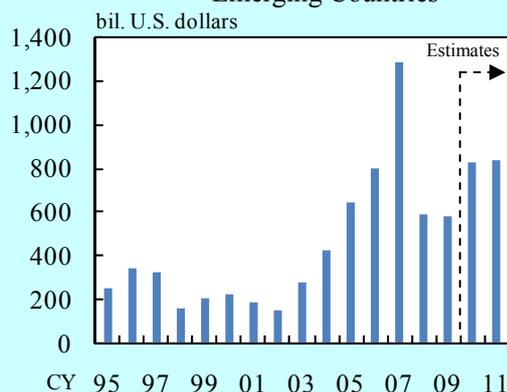
This paper aims to give an overview of the current state of international capital flows by drawing on various data, and to tentatively evaluate whether

there is an indication of accumulated financial imbalances. In what follows, we first provide an overview of the characteristic aspects of recent capital flows from developed to emerging countries, and the policy responses taken by emerging countries that are faced with pressures on capital inflows. We then review the recent reflux of foreign reserves of emerging countries to the U.S. Treasury market and conclude by discussing risks and vulnerabilities pertaining to the recent international capital flows.

Capital Flows from Developed to Emerging Countries

On a gross basis, capital flows from developed to emerging countries have recently been on an increasing trend, after having decreased temporarily due to the Lehman shock (Chart 1). Looking at the net purchases of major emerging market equities by foreign investors to see more detailed movements of

Chart 1: Capital Flows to Emerging Countries



Notes: 1. Chart 1 exhibits the aggregate amount of the capital and financial account on a gross basis of 30 emerging countries. The figures for 2010 and 2011 are estimates by the Institute of International Finance, Inc (the figure for 2010 partially reflects the actual results).
 2. Net purchases in Chart 2 are the sum of the figures of Brazil, India, Indonesia, the Philippines, South Korea, Taiwan, and Thailand. The latest data are as of October 2010.

Sources: Bloomberg; CEIC; The Institute of International Finance, Inc, "Capital Flows to Emerging Market Economies."

Chart 2: Net Purchases of Major Emerging Market Equities by Foreign Investors

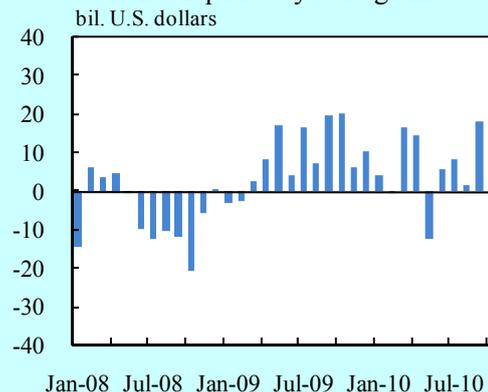
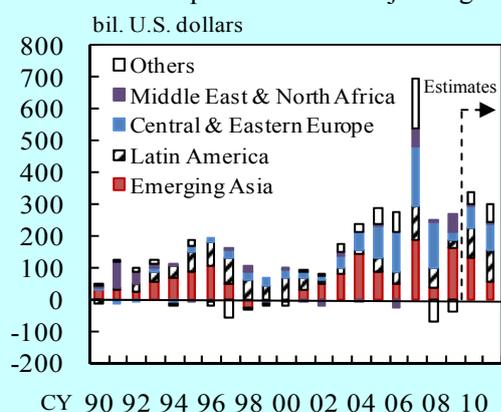


Chart 3: Capital Flows to Major Regions



Note: Sum of the capital and financial account on a net basis of 150 emerging countries. The figures for 2010 and 2011 are estimates by the International Monetary Fund (the figure for 2010 partially reflects the actual results).

Source: International Monetary Fund, "World Economic Outlook."

capital, we see that the trend of a large net long position has continued with fluctuations since the second quarter of 2009, after a huge decrease caused by the Lehman shock (Chart 2). Next, examining capital flows on a net basis by region, it can be seen that in 2010 a massive amount of capital continued to flow mainly into emerging Asian and Latin American countries with high economic growth (Chart 3). As for Central and Eastern European countries, capital inflows remained at a high level before the Lehman shock, but their pace of increase decelerated from 2009.

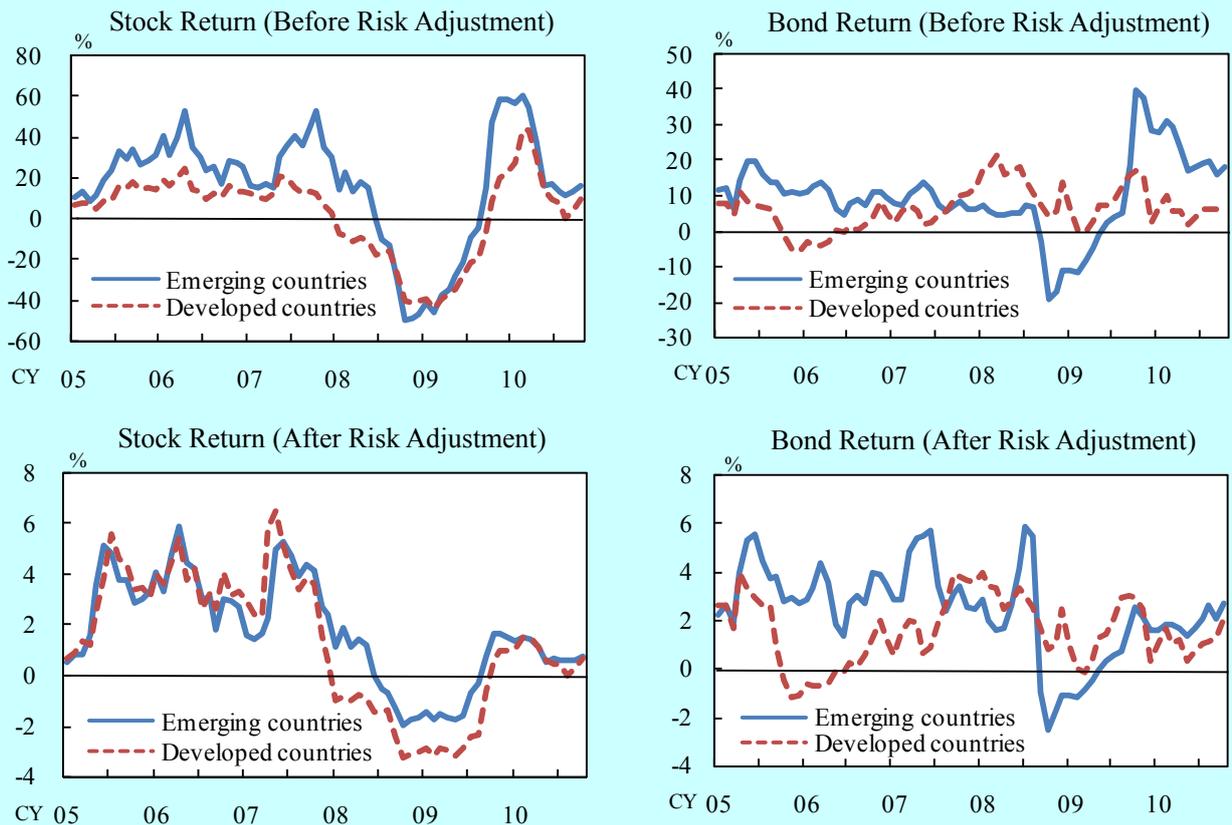
(Search for Yield by Investors in Developed Countries)

The increase in capital inflows to emerging countries

stems basically from (1) their good fundamentals and (2) investors' more intensive search for yield due to the prolonged accommodative financial environment in developed countries. A comparison of returns (1-year rolling returns) on stocks and bonds in developed and emerging countries indicates that stock returns in emerging countries have exceeded those in developed countries for the past several years (Chart 4). Although bond returns in emerging countries temporarily plummeted immediately after the Lehman shock, they surged from the second half of 2009 and have recently exceeded those in developed countries. Financial assets of emerging countries that showed high investment returns have attracted investors in developed countries who are increasingly searching for as high a yield as possible under the prolonged accommodative financial environment in their countries. As a matter of course, risks of financial assets should be taken into consideration when evaluating the investment returns. In this regard, the difference in returns between emerging and developed countries is significantly smaller on a risk-adjusted basis, reflecting the higher volatility of investment returns in emerging markets (risk-adjusted returns are returns divided by the standard deviation of returns). It should also be noted, however, that investment returns on emerging market assets may be heightened by considering the exchange rate fluctuations.

In general, investment returns may be increased by (1) making use of leverage, (2) extending the maturity mismatch (taking on liquidity risk), and

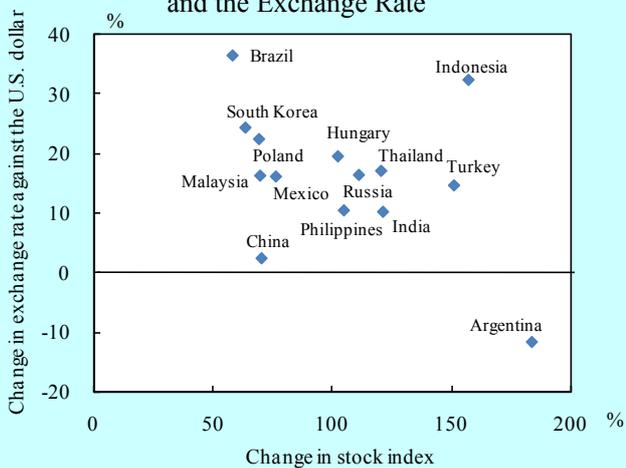
Chart 4: Investment Returns on Stocks and Bonds



Note: Returns are calculated as 1-year rolling returns. Risk-adjusted returns are returns divided by the 1-year rolling standard deviation of returns. The latest data are as of the end of October 2010.

Sources: MSCI for stock data; JPMorgan's EMBI (emerging countries) and GBI-Global (developed countries) for bond data.

Chart 5: Relationship between Stock Returns and the Exchange Rate

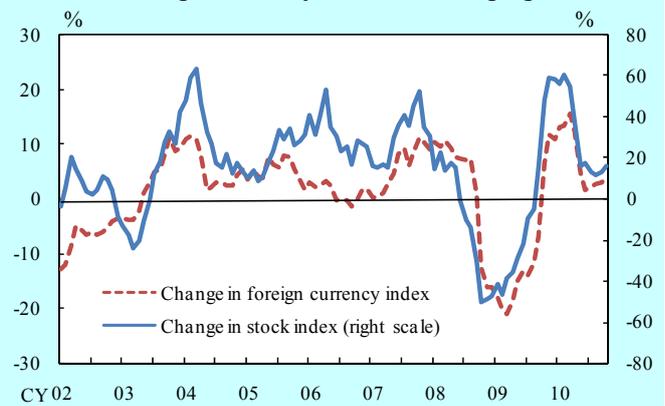


Notes: 1. Chart 5 exhibits the rate of change in the stock index (denominated in local currencies) and the exchange rate against the U.S. dollar from January 2009 to October 2010.

2. Chart 6 exhibits the rate of 1-year rolling change in the stock index and the currency index against the U.S. dollar of emerging countries.

Sources: Bloomberg; MSCI.

Chart 6: Relationship between Stock Index and Foreign Currency Index of Emerging Countries

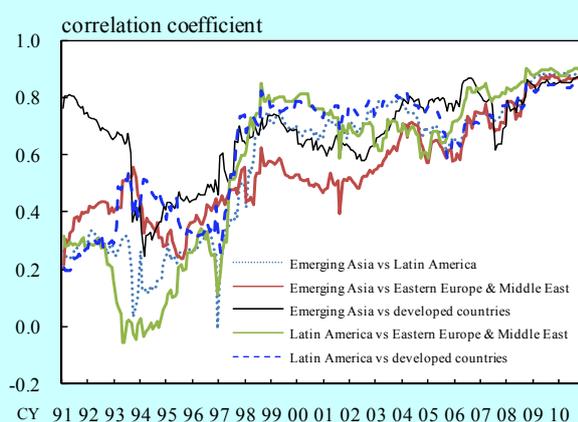


(3) adding other risk factors to the underlying risks. Of these methods, the first two are difficult for financial institutions to apply, due to a trend in which tightened financial regulations require them to decrease leverage and hold ample liquidity buffers

following the Lehman shock. Consequently, the relative appeal of the third method (adding other risk factors to the underlying risks) has been rising. For example, in the case where the underlying risk is the price fluctuation risk of equities or bonds, the addition

Chart 7: Correlations between Asset Prices of Major Countries/Regions

(1) Correlations of Stock Prices between Regions



(2) Correlations of Stock Prices between Countries

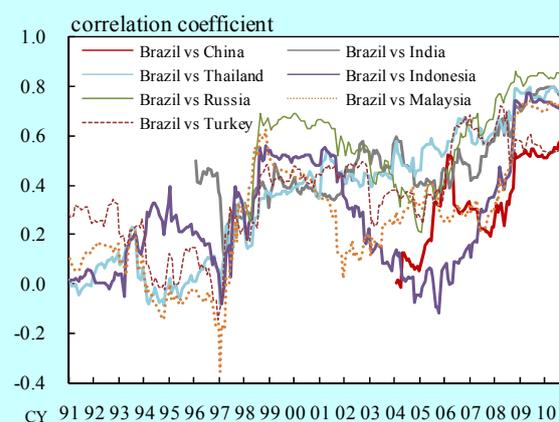
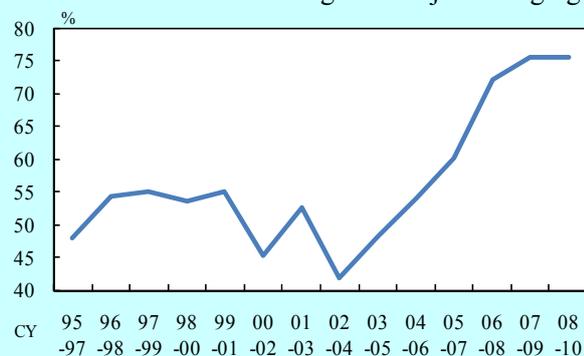


Chart 8: Contribution Ratio of the First Principal Component for Stock Price Changes in Major Emerging Asian Countries



Notes: 1. Chart 7 (1) and (2) exhibit linear correlation coefficients of the monthly return over the past two years calculated based on MSCI indices of each country/region. The latest data are as of the end of October 2010.

2. Chart 8 exhibits the contribution ratio of the first principal component for the comovements of seven major emerging Asian countries (China, India, Indonesia, Malaysia, the Philippines, South Korea, and Thailand). Principal component analysis is conducted for each 3-year interval by using the MSCI index of each country.

Source: MSCI.

of exchange rate risk is considered as a kind of "carry trade" in a broad sense, and this kind of investment may have increased recently. In fact, as the stock prices and the value of currencies against the U.S. dollar have risen simultaneously in many emerging markets during the recovery process following the Lehman shock, investment in emerging market stocks has performed remarkably well for those holding U.S. dollars (Chart 5). It should be noted, however, that a highly positive correlation between the change in stock returns and exchange rates in emerging markets has been observed from a historical perspective (Chart 6). This fact suggests that careful attention should be paid to the possibility of a reversal process in which the unwinding of carry trade positions accompanies a simultaneous decline in stock prices and exchange rates.³

(Increased Correlation among Countries /Regions)

A characteristic feature of recent asset price fluctuations in emerging countries is that correlation

coefficients between emerging countries or regions have increased remarkably. For example, looking at the historical movements of correlation coefficients of stock returns between (1) major emerging regions and (2) a specific country and another emerging country (with Brazil chosen as the specific country in this paper), we see that the degree of comovements has shown an upward trend irrespective of the combination and recently reached a historically high level (Chart 7). As an alternative method, principal component analysis was conducted for stock price changes in seven major emerging Asian countries, and the result shows that the contribution ratio of the first principal component, which implies the degree of comovements, has increased significantly for the past several years (Chart 8). This fact suggests a growing tendency in which stock prices of each country are driven not by idiosyncratic factors but by common factors among countries. As for the background of heightened comovements of recent emerging market stock prices, one may consider that the influence of foreign investors tracking an index for the entire

Chart 9: Foreign Reserves of Emerging Countries

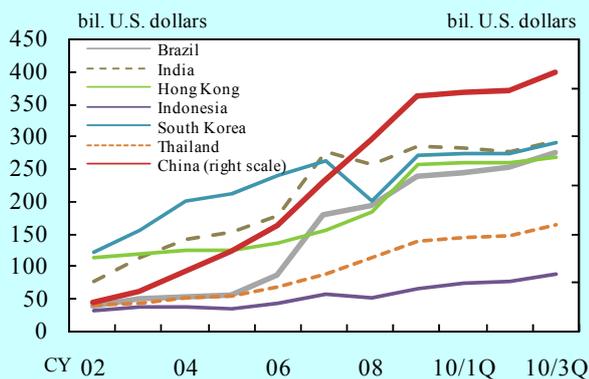
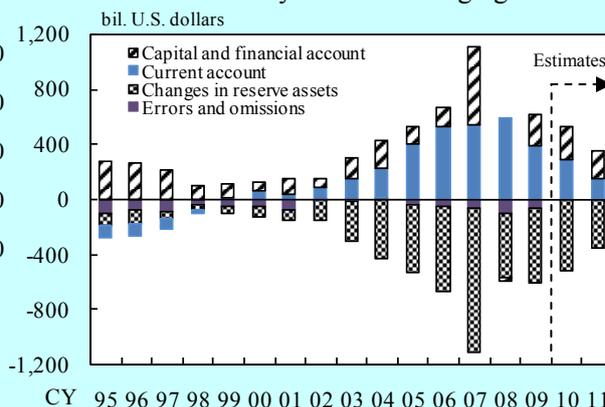


Chart 10: Balance of Payments of Emerging Countries



Note: Chart 10 exhibits the sum of 30 emerging countries. The figures for 2010 and 2011 are estimates by the Institute of International Finance, Inc (the figure for 2010 partially reflects the actual results). The balance of payments is constructed according to the principles of double-entry bookkeeping and the equation "current account + capital and financial account + changes in reserve assets + errors and omissions = 0" is maintained. The increase in foreign reserves means the outflows and is expressed as a negative figure.
Sources: CEIC; The Institute of International Finance, Inc, "Capital Flows to Emerging Market Economies"; web site of each central bank.

emerging market with high expected returns is increasing, as well as that convergence of indices referred to as a benchmark is proceeding. Among other factors, it is possible that increased correlations among commodity prices have led to stronger comovements of stock prices of countries that produce different types of commodities. In any case, as the increase in comovements among asset prices in emerging countries reduces the benefits of internationally diversified investment that were originally expected from the indexing investment approach,⁴ the probability of entering a phase of simultaneous adjustment of, for example, stock prices has also been increasing.

(Responses by Emerging Countries)

Due to the massive amount of capital inflows, most emerging countries are faced with upward pressure on their local currencies. They are also concerned about the "trilemma of international finance," that is, the quandary that it is impossible to achieve (1) stabilization of the foreign exchange rate, (2) independent monetary policy, and (3) free capital mobility at the same time.

In reality, several emerging countries appear to be intervening massively in the foreign exchange market to keep their currencies from appreciating, as well as introducing or strengthening capital control measures in succession⁵ (Chart 9). As a result, the balance of payments of emerging countries shows that the current account surplus and the capital and

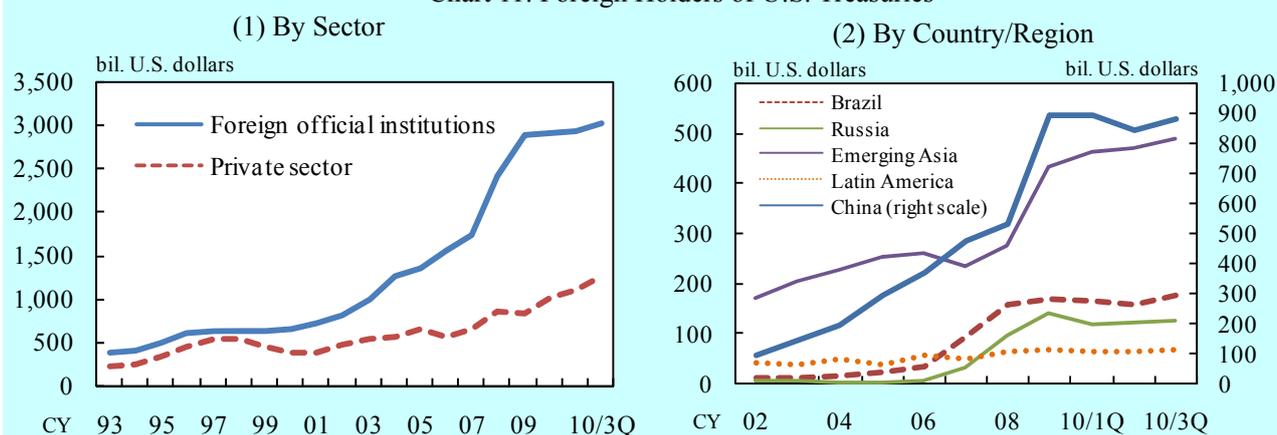
financial account surplus earned are mirrored by reverse flows abroad in the form of a significant increase in foreign reserve assets due to the interventions (Chart 10).

Reflux of Capital from Emerging to Developed Countries

(Purchases of U.S. Treasuries by Emerging Countries)

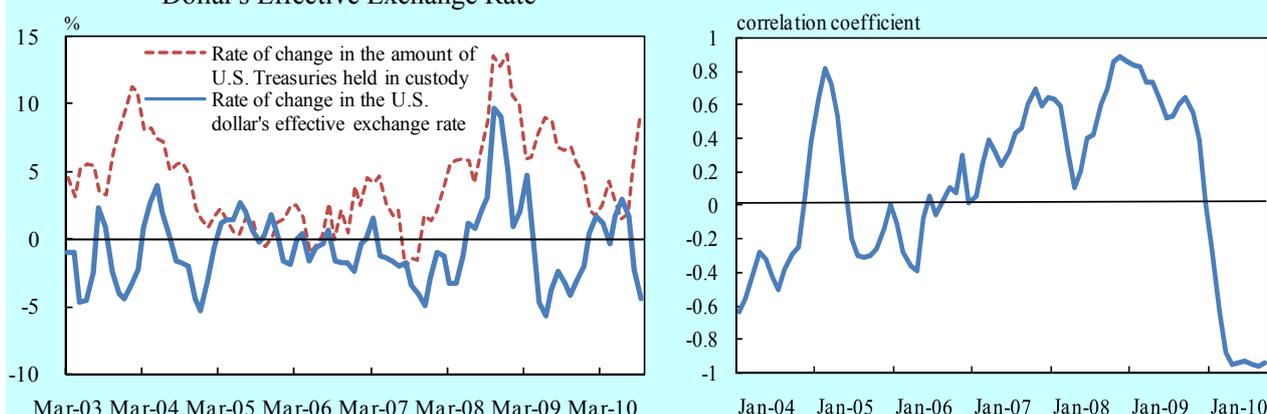
In general, foreign reserves are invested in safe and liquid assets (typically U.S. Treasuries), as they are also regarded as reserves for claims. Most of the foreign reserves accumulated through the interventions by the emerging countries are also considered to flow back into the U.S. government bond market. In this regard, by checking the recent developments in U.S. Treasury holdings by foreign investors, we can see (1) a remarkable increase in purchases of U.S. Treasuries by foreign official institutions, and (2) by country and region, an increase in purchases by Brazil and emerging Asian countries such as China (Chart 11). We can also see a strong negative correlation between the rate of change in holdings of U.S. Treasuries by foreign official institutions and that in the U.S. dollar's effective exchange rate for about one year (Chart 12). (Here, as a proxy for the amount of U.S. Treasuries held by foreign official institutions, the amount held in custody at the Federal Reserve Bank of New York is used.) This chart could imply that emerging countries have been increasing their holdings of U.S. Treasuries

Chart 11: Foreign Holders of U.S. Treasuries



Notes: 1. In Chart 11 (1), figures up to 2009 are based on the annual data of the Bureau of Economic Analysis. Figures for 2010 onward are calculated by summing up the quarterly Treasury International Capital (TIC) data.
 2. In Chart 11 (2), figures for emerging Asia are the sum of Hong Kong, India, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand. Figures for Latin America are the sum of Chile, Colombia, and Mexico. Figures for emerging Asia and Latin America exclude China and Brazil, respectively.
 Sources: Bureau of Economic Analysis, "International Investment Position"; U.S. Department of the Treasury, "Treasury International Capital System."

Chart 12: Relationship between Holdings of U.S. Treasuries by Foreign Official Institutions and the U.S. Dollar's Effective Exchange Rate



Notes: 1. The left-hand chart exhibits the 3-month rate of change in the U.S. dollar's effective exchange rate and the 3-month rate of change in the amount of U.S. Treasuries held by foreign government and international organizations in custody at the Federal Reserve Bank of New York. The latest data are as of the end of September 2010.
 2. The right-hand chart exhibits the 12-month rolling correlation coefficient between the "rate of change in the U.S. dollar's effective exchange rate" and the "rate of change in the amount of U.S. Treasuries held in custody."
 Sources: Bank for International Settlements, "Effective Exchange Rate Index"; Federal Reserve Bank of New York, "Factors Affecting Reserve Balance."

as a result of massive interventions in response to the depreciation of the U.S. dollar against their currencies.

(Purchases of U.S. Treasuries by Foreign Official Institutions and Downward Pressure on the Term Premium)

It is possible that the purchases of U.S. Treasuries by foreign official institutions have exerted downward pressure on U.S. long-term interest rates, as holding periods of foreign official institutions typically following a buy-and-hold strategy tend to be longer than those of the private sector. A breakdown by

maturity of U.S. Treasuries held by foreign official institutions (Chart 13) shows that their holdings of longer-term bonds have recently been increasing remarkably, while those of short-term bonds have remained more or less unchanged. Looking at the share of indirect bidders (which are purchasers other than primary dealers in the U.S. market and composed mainly of foreign official institutions) at U.S. Treasury auctions by maturity (Chart 14), we see that the share of medium- and longer-term bonds held by indirect bidders has been increasing. The share of 10-year bonds held by them reached around 40 percent

Chart 13: U.S. Treasuries Held by Foreign Official Institutions by Maturity

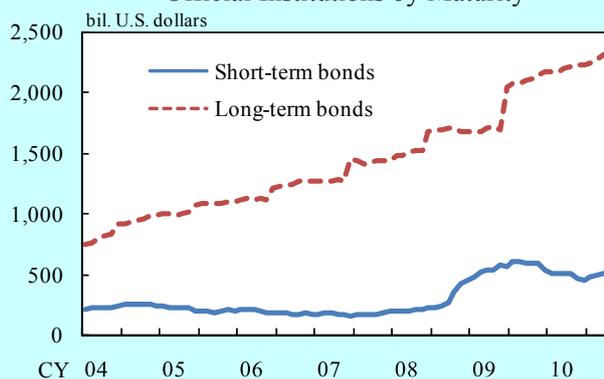


Chart 14: Shares of Indirect Bidders at U.S. Treasury Auctions

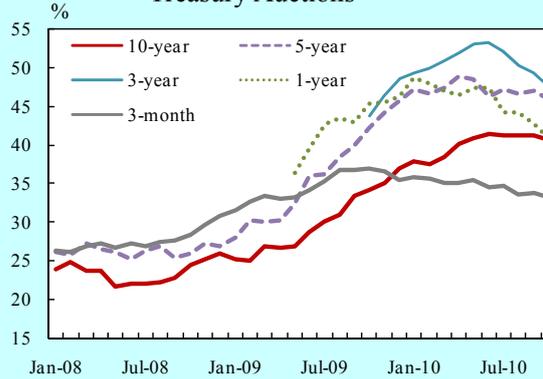
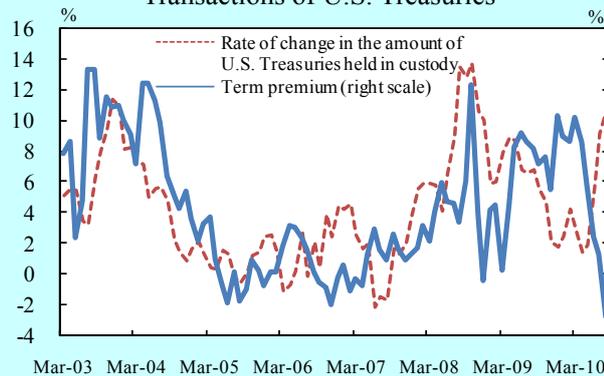


Chart 15: Relationship between the Term Premium and Transactions of U.S. Treasuries



Notes: 1. In Chart 13, short-term bonds mean T-bills, and long-term bonds mean T-bonds and notes. The latest data are as of the end of September 2010.
 2. In Chart 14, 12-month moving average data are used because the raw data of shares of indirect bidders are volatile. The latest data are as of October 2010.
 3. The rate of change in the amount of U.S. Treasuries held in custody in Chart 15 is same as that of Chart 12. As for the definition of the term premium, see Footnote 6.
 Sources: Bloomberg; Federal Reserve Bank of New York, "Factors Affecting Reserve Balance"; U.S. Department of the Treasury, "Treasury International Capital System."

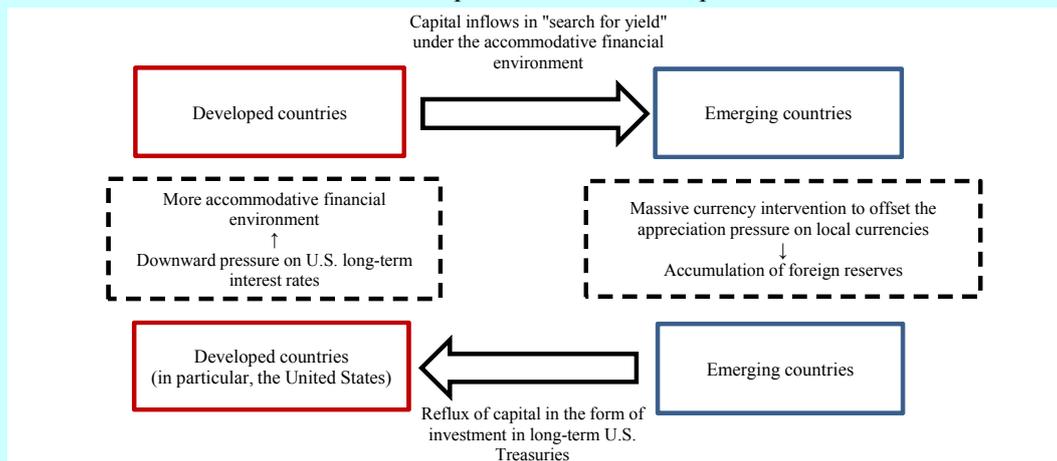
recently, though it used to be low compared with other maturities in the past. Thus, foreign official institutions in emerging countries have tended to lengthen the duration of U.S. Treasury holdings, because -- like private investors in developed countries -- they are compelled to search for yield under the prolonged accommodative financial environment in developed countries.

Finally, turning to the relationship between the rate of change in the holding amount of U.S. Treasuries by foreign official institutions and estimates of the term premium of U.S. long-term interest rates, we can see negative correlations in the last several months (Chart 15).⁶ Considering that these two variables have generally showed positive correlations from a historical viewpoint, the recent negative correlations suggest that an increase in purchases of U.S. Treasuries by foreign official institutions and a decline in the term premium are occurring simultaneously. It should be borne in mind that estimation of the term premium is based on only one method and that other factors may be affecting the term premium, such as the Treasury purchases by the

Federal Reserve. Yet, foreign official institutions -- which in the past tended to become less willing to invest in U.S. Treasuries when the term premium (U.S. long-term interest rates) declined -- have recently increased investment in U.S. long-term bonds due to the recent rise in foreign reserves. As a consequence, their activities might have exerted downward pressure on U.S. long-term interest rates to some extent. Indeed, recent research shows that purchases of U.S. Treasuries by foreign official institutions are more likely to bring about a decline in long-term bond yields compared with those by private investors.⁷

If the reflux of capital from emerging countries to the United States leads to a decline in U.S. long-term interest rates, this relationship has a significant implication for international capital flows as a whole. Namely, as mentioned earlier, one of the important driving forces of recent capital flows to emerging countries is the prolonged accommodative financial environment in developed countries. Under such an environment, investors have been accelerating their search for yield and become more eager to invest in assets of emerging countries that are expected to

Chart 16: "Feedback Loop" of International Capital Flows



produce high returns based on growth prospects. As the above analysis implies, if the accumulated foreign reserves of emerging countries have contributed to a decline in U.S. long-term interest rates, this will create a more accommodative financial environment in the United States. Thus, the recent international capital flows suggest the operation of a "feedback loop," in which the intensified search for yield among investors further increases capital inflows to emerging countries (Chart 16).

Conclusion: Risk Factors for the Outlook

The current international capital flows outlined in this paper entail several risks and vulnerabilities. First, there is a risk that excessive risk-taking activities by investors will create asset price bubbles in emerging countries. History shows that it is difficult to judge whether current situations are bubbles on a real-time basis. Nonetheless, it cannot be assumed that the current situation -- in which investors increasingly take profits on several risk factors at once through the carry trade -- will continue as it stands. Moreover, the experience following the Lehman shock shows clearly that once reversal of the carry trade begins, the situation can take a sudden turn for the worse. In addition, as the recent asset price movements in emerging markets have shown a rapid increase in the degree of comovements, it should be borne in mind that once a phase of adjustment is entered, the possibility of a simultaneous decline in asset prices will also increase.

The second risk concerns a large-scale adjustment in the U.S. Treasury market, due to a

possible sharp decrease in capital inflows to the United States induced, for example, by diversification of foreign reserve management by emerging countries. It may be inferred that emerging countries have a potential need to enlarge the coverage of invested currencies in their foreign reserves from the viewpoint of mitigating foreign exchange losses stemming from one-sided investment in the U.S. dollar. It is also possible that some emerging countries will allow their local currencies to appreciate and be driven to monetary tightening by a large margin if their economic growth accelerates or inflation risk intensifies. In such a case, capital flows from emerging countries to the U.S. bond markets may shrink dramatically.

Fundamentally, the increase in capital flows to emerging countries is considered to be based on structural changes such as the expansion of their economy, market developments, and improvements in market infrastructure. At the same time, we have observed that accompanying investors' herding behavior, capital flows to emerging countries have increased under the unprecedentedly accommodative financial environment in developed countries. Accordingly, careful attention should be paid to the future developments in capital flows, including the accumulation of financial imbalances.

¹ The following issues of *Bank of Japan Review Series* summarize the current developments in and the background of capital inflows to emerging countries and examine their implications for the outlook for emerging economies:

- Bank of Japan, International Department, "Shinkoukoku no Kokusai Shikin Flow to Shisan Kakaku no Hendo (International Capital Flows and Asset Price Changes in Emerging Economies)," Bank of Japan Review Paper No. 2010-J-1, January, 2010 (in Japanese).
- Ookawa, Risa, Yoshihiro Takada, Eiichi Tamura, Satoe Aoki, Masato Higashi, and Yasunari Inamura, "Shinkoukoku wo Meguru Shikin Flow to Keizai Doukou (Flow of Funds and Economic Developments in Emerging Economies)," Bank of Japan Review Paper No. 2010-J-11, International Department, Bank of Japan, July, 2010 (in Japanese).

² Examples of papers referring to the recent currency interventions by emerging countries are as follows:

- Bank for International Settlements, "International Banking and Financial Market Developments," *BIS Quarterly Review*, December, 2010.
- International Monetary Fund, *Global Financial Stability Report*, April, 2010.
- Organisation for Economic Co-operation and Development, *Briefing on Exchange Rate Developments*, October, 2010.

³ For an analysis of the expansion of the carry trade and its sharp reversal, see Hiroyuki Shiozawa, Maiko Koga, and Takeshi Kimura, "Carry Trade to Kawase Rate Hendo -- Kinri Hendo ga Shijo Sankasha no Risk Ninshiki ni Ataeru Eikyo (Carry Trades and Movements in Foreign Exchange Rates: Effects of Movements in Interest Rates on Market Participants' Assessments of Risks)," Bank of Japan Review Paper No. 2009-J-5, Bank of Japan, June, 2009 (in Japanese).

⁴ If the presence of investors who use an indexing strategy ("passive" investors) is small, they enjoy the benefits of internationally diversified investment as price takers. However, if the presence of passive investors increases significantly, their activities may have an impact on the prices (as they become price makers). In this case, a paradoxical result will presumably arise in which they do not enjoy the benefits of internationally diversified investment.

⁵ For example, in October 2010 Thailand removed an exemption from withholding tax for foreigners receiving income from Thai bonds, and Brazil raised the tax on foreign fixed-income inflows. South Korea also expressed a plan to introduce a new measure to curb capital inflows from abroad.

⁶ From the viewpoint of monetary economics, long-term interest rates can be decomposed into (1) the average of expected short-term risk-free rates and (2) the risk premium compensating for long-term bond holdings. The risk premium in this decomposition is called the "term premium." In Chart 15, term premiums are estimated using yield spreads between 10-year and 3-month bonds based on the methodology proposed in Don H. Kim and Jonathan H. Wright, "An Arbitrage-Free Three-Factor Term Structure Model and the Recent Behavior of Long-Term Yields and Distant-Horizon Forward Rate," Federal Reserve Board Financial and Economics Discussion Series, 33, 2005.

⁷ Jesus Sierra, in "International Capital Flows and Bond Risk Premia," Bank of Canada Working Paper, 2010, analyzed the quantitative impact of purchases of U.S. Treasuries by foreign investors on bond prices by means of regression analysis using the instrument variables method. He found that purchases of U.S. Treasuries by foreign official institutions led to a decline in long-term bond yields.

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