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The cyclical properties of capital inflows in emerging market economies☆

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ABSTRACT

This article empirically investigates the cyclical characteristics of capital inflows in 12 emerging economies from the perspectives of their durations, amplitudes and speeds. Among emerging economies, the duration of capital inflows is shown to be on average the longest in Europe while the amplitude of inflows the biggest and the speed of those the fastest in Asia. Furthermore, the threshold effects of cyclical factors on capital inflows are examined. According to a panel smooth transition regression model, there exist the thresholds of cyclical factors such as (excess) global liquidity growth, the change in U.S. long-term interest rate, the change in the VIX and the US dollar index growth, beyond which the impacts on capital inflows change significantly.

1. Introduction

Capital inflows are known to play positive roles by boosting economic growth and financial development of emerging market economies (EMEs), which face capital shortages. During the 2008 global financial crisis, however, the negative aspects of capital liberalization were highlighted as sudden stops in capital inflows occurred in most emerging countries simultaneously (IMF, 2011). Accordingly, EMEs have started to introduce policies to regulate excessive capital inflows, and active discussions have been proceeding in global level meetings on trying to reduce the volatility of capital inflows. Future policies related to capital inflows should also be implemented flexibly, in consideration of changes in the environment.

Before discussing the pros and cons of capital inflows, an in-depth analysis of the stylized facts of capital inflows to emerging countries is first needed. Capital inflows generally tend to expand before crises, and shrink during crises. As examples, surges in capital inflows ended up reversing during the Asian foreign exchange crisis and the global financial crisis. With capital inflows to EMEs rising consistently, three episodes of surges in inflows have occurred since the 1990s (IMF, 2011). The first episode was from 1996:Q2 through 1998:Q2. During this period Asian countries saw increases in capital inflows and direct inflows that accounted for 40% of total capital inflows to all EMEs. The second episode (2006:Q2∼2008:Q2) was characterized by the fact that the percentage of bank loans rose to 40%, from 20% during the first episode, even though direct inflows still accounted for the highest portion of total capital inflows. More capital found its way into Asia, Emerging Europe and CIS (Commonwealth of Independent States) countries than to other emerging economies. During the third episode (2009:Q3∼2010:Q4), portfolio inflows made up half of the total capital inflows, and capital inflows to Asia and Latin America accelerated.

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In this sense, several papers have analyzed the patterns of capital flows. Reinhart and Reinhart (2008) find that capital inflow bonanzas are related to higher incidences of economic crisis. As shown in Contessi, Pace, and Francis (2013), capital inflows to most countries have been pro-cyclical, expanding during booms and contracting during busts. Thus, while capital inflows will not increase at the same time in different countries, they often come to an end at the same time. The IMF (2011) defines capital inflows as surges, episodes (prolonged surges), and waves (large numbers of country episodes occurring at the same time). Their analysis, using the quarterly data of 48 emerging economies between 1990Q1 and 2010Q2, identified 718 surges, 125 episodes, and three waves of capital inflows. Forbes and Warnock (2012) identified episodes of "surge", "stop", "flight" and "retrenchment" using the quarterly data of 50 countries from 1980 to 2009.[1] Their empirical results showed that there were 170 episodes of surges, 220 of stops, 198 of flight, and 212 of retrenchment during the sample period. In terms of the average length of each type of episode, surges lasted the longest (4.5 quarters) and retrenchment the shortest (3.9 quarters).

Unlike the aforementioned papers, which analyze the cyclical characteristics of capital inflows to emerging countries (or advanced countries) as a whole, this paper investigates the cyclical properties of those to individual emerging countries, broken down by types of inflow. Given the higher volatility of capital inflows, it is important to closely observe the inflows of different types of capital. As far as I know, this is the first study to analyze the characteristics of capital inflows using the business cycle algorithm. This paper focuses on the following questions in order to comprehensively identify the characteristics of capital inflows to emerging countries: Are there differences in the persistence and volatility of capital inflows by type, country and region? Are there threshold effects of cyclical factors on capital inflows?

In this regard, this paper shows the cyclical characteristics of capital inflows in terms of their durations, amplitudes and speeds (the amplitudes for each quarter), in order to investigate the persistence and volatility of capital inflows to emerging markets. Also, the thresholds of cyclical factors such as (excess) global liquidity growth, the change in U.S. long-term interest rate, the change in the VIX and the US dollar index growth, beyond which the impacts on capital inflows change significantly, are investigated by estimating a panel smooth transition regression model.

The rest of this paper proceeds as follows. Section 2 examines the cyclical characteristics of capital inflows to emerging countries, in terms of their persistence and their volatility. Section 3 investigates the threshold effects of cyclical factors on capital inflows through a panel smooth transition regression model. Section 4 then summarizes the results of analysis.

2. Cyclical characteristics of capital inflows

2.1. Measures of cyclical characteristics

In this section, the persistence and volatility of capital inflows to emerging markets are investigated. As we all know, capital inflows increased in the 1990s up until just before the Asian currency crisis, and decreased thereafter until the end of 1999. In contrast, increases and decreases of capital inflows have occurred repeatedly several times in the 2000s, indicating that capital inflows have become less persistent in the 2000s. Regarding the volatility of capital inflows, the difference between the size of inflows during the 1990s until right before the Asian currency crisis, when capital inflows were at their peak, and the size of capital inflows at the following trough is smaller than what was witnessed during the global financial crisis in the 2000s. Capital inflow volatility may thus have increased in the 2000s. If the difference between the peak and the trough of capital inflows is large, the shock to the foreign exchange and financial markets will become relatively greater.

Considering all of this, more detailed analysis of the cyclical characteristics of capital inflows are needed. And to this end I address the cyclical process of capital inflows in light of their duration, amplitude and speed.

First, I define a cycle as meaning the total duration of the expansionary period in which capital inflows increase, plus the contractionary period in which they decline or even become negative, as shown in Fig. 1. I use the BBQ (Bry-Boschan Quarterly) algorithm, which is frequently used in analysis of the business cycle, for identification of the trough and the peak to indicate the starts of the expansionary and the contractionary periods. This duration is useful for analyzing the persistence of capital inflows. In the algorithm the peak (trough) is the local maximum (minimum) value of the time series data, the expansionary and contractionary periods continue for at least two quarters, and the length of one cycle is at least five quarters (Harding & Pagan, 2002; Igan, Kabundi, Simone, Pinheiro, & Tamirisa, 2011).

Amplitude indicates the difference between the sizes of capital inflows at their peak and their trough. The amplitude during the expansionary period is accordingly the difference between the trough and the peak, and that during the contractionary period the difference between the peak and the next trough. The amplitudes of the expansionary and the contractionary periods have different signs, and I therefore compute the absolute values of the different volumes of capital inflows. The bigger the amplitude, the higher the volatility of capital inflows.

Lastly, the speed is obtained by dividing the amplitude by the duration, and indicates the amplitude for one unit of the duration period. In general, the amplitude becomes bigger as the duration period becomes longer. In consideration of such differences, speed can therefore be a more precise indicator for identifying the volatility of capital inflows.

I use quarterly data for the practical analysis, and divide the amount of quarterly capital inflows by that of quarterly nominal GDP in order to control for the effect of a GDP increase on capital inflows. For the sample period of 2000:Q1-2014:Q4, the processes of capital

[1] "Surges" and "stops" are related to capital inflows brought in by foreign investors, while "flight" and "retrenchment" are associated with capital outflows by domestic investors.