Are Capital Controls Effective? Duration of Capital Controls and the Survival of Pegged Exchange Rate Regimes with Special Reference to the People's Republic of China

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November 2007

## Abstract

There is a debate in the literature regarding the effectiveness of controls on movements of financial capital across national boundaries in insulating nations from currency crises or sudden stops. Some studies, mainly dealing with individual country experiences, suggest that capital controls are an important instrument in insulating countries from excess exchange rate volatility. Rodrik (2002), for example, argues that capital controls were an effective means of stemming the financial crisis in Malaysia in 1998, and was a better alternative to conditions that would have been imposed if the country had adopted an IMF program. Other studies, usually based on multi-country panel data sets, suggest that controls are not especially effective in protecting countries from exchange rate instability, especially once a financial crisis is underway (e.g. Edwards, 1999; Glick and Hutchison, 2005; and Glick, Guo and Hutchison, 2006).

In this paper we investigate whether economic forces work to erode the effectiveness of capital account restrictions and that they become weaker over time as investors and markets adjust and find ways to circumvent them, and whether this characteristic leads to misleading inferences from empirical work that do not control for this feature of the institutional arrangements. The greater is the incentive to evade capital controls, if domestic interest rates are less than foreign interest rates for example, then the "erosion" of capital controls may occur faster than otherwise (Gros, 1987).

There is a large literature on the rise of financial innovation and how this process is partly driven over time by the extent of financial market restrictions. The more binding are restrictions, the larger are the economic benefits from circumventing the controls. And the longer the controls are in place, the more likely that financial innovations have developed in a way that allows agents to circumvent them. This paper develops a new and unique "duration adjusted" measure of capital controls, where the measure is linked to the "intensity" of capital controls and the period that controls have been in place. Other things equal—especially foreign and domestic interest differentials-- our duration-adjusted" measure declines with the length of the period that controls have been in place and that the higher initial intensity of the controls dictates the speed at which innovations take place.

We test how the survival of exchange rate regimes is influenced by our duration-adjusted measure of capital control intensity. We hypothesize that capital controls are initially effective in helping to support a pegged exchange rate regime, but that they lose their effectiveness with their duration and initial intensity.

This study is particularly relevant for China in that there are pervasive capital controls that have been in place for a long period of time (Prazad and Wei, 2005a,b). At the same time there has been a rapid development and deepening of financial markets in China, possibly providing channels through which controls may be circumvented.

## Methodology and Data

We use a semi-parametric method to estimate a survival/duration model of exchange rate regime, and test whether adjusted capital control intensity is an important determinant of the probability of exit from a tranquil state into a crisis state. This method allows us to study the effect of capital control intensity and other determinants on the likelihood of a currency crash, and also to model the duration of spells of tranquility and how this varies over time and across countries. Our model goes beyond standard duration models in that we consider multiple-spell data—periods of tranquility interspaced with periods of currency turmoil. (The standard model considers a single spell for each unit where, in our example, a country would be in a tranquil state and then is either observed leaving this state or is censored. But in our case, there are multiple states.) Assuming constancy across time in the process driving currency crises, we use multiple crises to help us in identification, especially since we allow heterogeneity that can be correlated with time-varying covariates.

We employ a panel data set over the 1980-2004 period for 80 countries. Using dynamic panel estimation methods we test whether capital controls lose their effectiveness over time in insulating countries from currency turbulence.

## **Results**

We find strong evidence that our measure of capital controls—taking into account the weakening of controls that take place over time and in response to weak institutional enforcement and higher interest rate differentials-explains the link between "effective" controls and currency stability than other studies employing conventional measures of capital controls. We find that duration adjusted controls do have an positive effective in helping to insulate countries from currency instability, but that this effect diminishes over time unless supplementary measures are put in place to further tighten the restrictiveness of controls. This suggests that capital flow restrictions, even when controlling for recent liberalizations, were more binding in China when originally implemented and that their effectiveness is gradually diminishing. This shows up in the formal statistical model and in gross capital flow measures between China and the rest of the world. Although a body of evidence indicates that Chinese capital controls are effective in partly "decoupling" Chinese financial markets from the U.S., Hong Kong and elsewhere (e.g. Cheung et al., 2006; Ma and McCauley, 2007; and Liu and Otani, 2005), our work suggests that the markets will become increasingly integrated even without formal abolition of capital controls in China.

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