

# China's vulnerability to currency crisis: A KLR signals approach <sup>☆</sup>

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## Abstract

In this paper we use the Kaminsky–Lizondo–Reinhart (KLR) [Kaminsky, G., Lizondo, S., Reinhart, C., 1998. Leading Indicators of Currency Crises. International Monetary Fund Staff Papers 45, 1–48.] approach to conduct an ex-post study of the probabilities of China suffering a currency crisis during the period of January 1991 to December 2004. Two high-probability periods are identified: July 1992–July 1993 and August 1998–May 1999. The first period correctly predicts China's 1994 devaluation. The second period predicts currency devaluation in the aftermath of the Asian crisis, which did not occur. The results of the model indicate that the fundamentals were weak enough for China to experience contagion of the Asian crisis, and raise the question of the possible role of China's institutional arrangements in preventing the crisis. The paper further analyzes the economic fundamentals of China that drive the high probability of crises, and provides some suggestions for further reform.

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## 1. Introduction

China's economic transformation has been one of the major development successes of the end of the twentieth century. Since the start of the economic reforms in 1978, China has outperformed any other country in the world in terms of economic growth, taking 400 billion people out of poverty in the process. China has become one of the top six largest economies in terms of output produced (when output is measured at market exchange rates), the fourth world trader, and the largest recipient of foreign direct investment (Prasad & Rumbaugh, 2004).

Despite all this success, the Chinese economy still has some structural weaknesses that may undermine its potential for future growth. In particular, China's financial system is weak: financial intermediation is mainly dominated by state banks, which have high proportions of non-performing loans in their asset portfolios. Furthermore, the currency is non-convertible, and capital controls substantially restrict the ability of Chinese citizens to invest abroad. This institutional

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structure is in the process of being reformed by the Chinese government, which has expressed its willingness to liberalize its capital account. China is also under pressure from the United States and other economies to reevaluate its currency and potentially liberalize its currency system. Some economists see this move as problematic and fear a reproduction in China of the circumstances that led to the Asian financial crisis of 1997 (Goldstein & Lardy, 2006). Given the strong link between China and other Asian economies, destabilization in China could be readily spread over the region.

The East Asian crisis of 1997 was prompted by Thailand's devaluation of its currency in mid-1997 and it rapidly spread to other East Asian economies, which either had to devalue their currencies or lost important amounts of foreign reserves defending them. Even though the East Asian countries affected by the crisis differed in terms of their economic policies and economic fundamentals, they had some common features that made them vulnerable to a currency crisis. In particular, most economists agree by now that the crisis was the result of a combination of weak financial systems with high exposure to short-term foreign debt (Goldstein, 1998; Lee, 2003; Radelett & Sachs, 1998, among others).

China was one of the few East Asian emerging economies that were spared from contagion of the currency crisis. There has been a lot of speculation on how fragile the Chinese economy was during the Asian Crisis and the possible role that its exchange rate regime may have played at insulating the country from the crisis. Some authors attribute China's ability to resist contagion to its better fundamentals (Lan, 2002); whereas other authors claim that the non-convertibility of the RMB and capital controls had a crucial role in the insulation (see, for instance, Lardy, 2003; Lee, 2003).

In order to analyze the level of vulnerability of a country to currency crisis at any given period, a method is needed that is able to identify a set of leading indicators that present abnormal behavior prior to a currency crisis and that gives a measure of the likelihood of a crisis occurring, given the behavior of those indicators. This is precisely the objective of "early warning system" approaches. Even though these methods are designed as forecasting devices, they are also useful, when applied to a single country, in determining the ex-post likelihood of that country suffering a currency crisis at any given period (Edison, 2003). In this paper we use an early warning system developed by Kaminsky, Lizondo, and Reinhart (1998) (the KLR signals approach) to determine, ex-post, the probabilities of currency crises for China for the period of January 1991 to December 2004. Two periods of high probability of crisis are identified: July 1992–July 1993 and August 1998–May 1999.<sup>1</sup> The first period correctly predicts the exchange rate realignment of 1994, when China unified its official and swap-market exchange rates, resulting in a 50% devaluation of the renminbi (RMB). The second period coincides with the aftermath of the East Asian crisis. Even though no devaluation occurred in China during this period, the high probability of crisis indicates that, according to the KLR method, China's fundamentals during the Asian crisis were weak enough to make the country a candidate for contagion.

The paper further analyzes the economic fundamentals underlying the "crisis signaling" periods. We find that the fundamentals signaling the crisis in both periods are radically different, except for an increase in the M2 multiplier, which appears on both periods. For the 1992–1993 periods the signaling variables are a rise in M2, a decrease in reserves, and an appreciation of the real exchange rate. For the 1998–1999 periods the indicators signaling a crisis are the real interest rate differential, domestic credit relative to GDP, exports, and terms of trade. An analysis of the Chinese economy at that period reveals that the decrease in exports is a direct effect of the recession that the Asian Crisis brought to the region (an important part of Chinese trade at the time was with other East Asian countries). The increase in domestic credit was driven by the government massive investment in infrastructure in order to keep the Chinese growth rate at its target level of 8%. This suggests that the government used expansionary fiscal policy in order to face the challenges posed by the Asian crisis, instead of devaluing the currency.

The objective of this paper is twofold. First, by analyzing the Chinese economy under the KLR method we develop a better understanding of the vulnerabilities of China during the Asian crisis and the reasons why China was able to avoid contagion. Second, we shed some light on the use of the KLR method for countries with non-convertible currencies and capital controls. To the extent that currency inconvertibility and capital controls reduce the possibility of sudden and massive capital flights, weak fundamentals may not necessarily lead to currency devaluation. We argue that for such countries, the KLR method is a useful tool to *detect* structural weaknesses in the economy that would lead to exchange rate pressure in a liberalized economy. Detecting these weaknesses is especially important for economies that

<sup>1</sup> A high probability of crisis in a given period implies that a crisis is likely to occur within 24 months of the signal being received. Therefore, the model identifies a high likelihood of currency crises occurring between July 1992–July 1995 and August 1998–May 2001.

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