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Business cycle accounting East and West: Asian finance and the investment wedge ☆

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ABSTRACT

While a large literature studies the causes of financial crises, little is known about the mechanisms by which crises lead to output drops. We perform an exploratory analysis of output drops by applying the Business Cycle Accounting (BCA) methodology developed by Chari et al. (2007) to a sample of 23 crises. The BCA procedure estimates the wedges, and thus the kinds of distortions, that are most relevant in explaining output movements in each episode. Our results make a case for separating East Asian crises, which are mostly driven by the efficiency and investment wedges, from crises elsewhere, which are mostly driven by the efficiency and labor wedges. These findings are consistent and complementary with studies of Asian financial systems, which highlight the influence of Japanese institutions and practices, including relationship-based as opposed to market-based lending, and reluctance to impose bankruptcy.

1. Introduction

Over the last three decades, international financial crises have struck in countries as diverse as Argentina, Korea, Turkey and Finland. Typical symptoms of crises have been large real depreciations, current account reversals (or sudden stops), difficulties in the banking sector and, in some cases, sovereign default. Most importantly, financial crises have also typically led to sharp drops in output, and it is for this reason that they are a topic of perennial interest for academic economists and policymakers alike.

Recurrent waves of financial disasters have led to the development of three generations of models examining the causes of crises. Latin American crises in the 1970s and 1980s motivated first generation models (e.g., Krugman, 1979; Flood and Garber, 1984), highlighting the incompatibility of fixed exchange rates with monetized fiscal deficits. The European ERM crisis of 1992/93 and Mexico's 1994/95 episode led to second generation theories (e.g., Obstfeld, 1994; Cole and Kehoe, 1996, 2000), emphasizing multiple equilibria and self-fulfilling prophecies. And after the crises of the second half of the 1990s, third generation models (e.g., Burnside et al., 2001; Schneider and Tornell, 2004) tended to stress the role of government guarantees and currency mismatches in private sector balance sheets. However, as noted by Calvo (2000),

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while all three generations have provided valuable insights into how and when crises are possible, they have had less to say about the mechanisms through which crises lead to output drops. In all three generations, typically, the objective is to determine conditions under which markets can force governments to abandon currency pegs and/or default, *assuming* that the abandonment/default has adverse real effects. This assumption is often made because it is difficult to generate output drops endogenously. In fact, in many environments, crises may raise output, as real depreciations improve net exports.

The literature seeking to identify mechanisms by which crises lead to output drops is relatively more recent and less extensive. Regarding output drops in specific episodes, to our knowledge, the cases that have been most extensively studied are Mexico in 1994/95 and Korea in 1997/98. In the context of the "Tequila" crisis, Meza (2008) finds that changes in fiscal policy account for about 20 percent of the output drop in Mexico in 1995, while Kehoe and Ruhl (2009) find that reallocation from nontradable to tradable sectors explains the evolution of the real exchange rate and trade flows, but not the drop in output and total factor productivity (TFP). In the case of Korea's 1997/1998 crisis, Benjamin and Meza (2009) develop a model of sectoral reallocation which takes into account the effect of high interest rates on firms' working capital, and show that the model accounts for about half of the decline in GDP and TFP.

In this paper, instead of studying the role of specific frictions in a given episode, our approach is to perform an exploratory analysis of output drops throughout a sample of crises. We employ the Business Cycle Accounting (BCA) methodology developed by Chari et al. (2007) (CKM henceforth). BCA decomposes output fluctuations into fluctuations due to changes in an efficiency wedge, a labor wedge, an investment wedge and a government consumption wedge. The efficiency wedge captures shocks to TFP. The labor and investment wedges capture frictions distorting the intratemporal choice between consumption and leisure and the intertemporal Euler equation, respectively. Finally, the government consumption wedge captures government purchases plus net exports. After estimating the processes governing all wedges, we use simulations where some wedges vary and others are held constant to discern which kinds of distortions play the most important role accounting for observed fluctuations. Thus, BCA provides a priori guidance for economists seeking to explicitly model frictions. One important question that this analysis will help us answer is to what extent crises are alike. If a similar combination of wedges accounts well for the data in all (or most) episodes, it may be possible to develop a single model with general applicability. On the other hand, if different crises, or clusters of crises, are driven by different sets of distortions, it may be preferable to develop multiple models tailored to the different varieties.

To construct our sample, we start from the list of episodes compiled by Kaminsky (2006). After dropping some cases due to data limitations, we are left with the following 23 episodes, involving 13 countries: Argentina (1981, 1985, 1989, 1994, 2001), Brazil (1987, 1991, 1999), Chile (1982, 1998), Finland (1991), Indonesia (1997), Israel (1983), Korea (1997), Malaysia (1997), Mexico (1982, 1994), Philippines (1983, 1997), Sweden (1992), Thailand (1997), and Turkey (1994, 2000). The sample offers variation along several potentially interesting dimensions, such as size of the output drop, time of the crisis, inflation, severity of banking problems, etc. Moreover, the countries in the sample are spread across different regions of the world with markedly different histories and institutions.

After applying the BCA methodology to all cases, the dominance of the efficiency wedge becomes immediately apparent. It is the most important wedge in virtually all cases, explaining on average about 60 percent of the output drop in the crisis year. The labor wedge comes second, accounting on average for 20 percent of the drop, and the investment wedge third, accounting for an average of 14 percent. Regarding recoveries, we find that in the three years after the crisis year, the order of importance of the wedges remains the same. The efficiency wedge comes first, the labor wedge second, and the investment wedge third. The government consumption wedge plays a negligible role in both drops and recoveries.

In light of previous studies, these average contributions are unsurprising. What is new in our paper is the finding that, behind these averages, there is substantial variation between cases. The variation is systematic enough to suggest that crises in Asia—meaning Indonesia, Korea, Malaysia, the Philippines, and Thailand—share characteristics which set them apart from crises in other regions. Specifically, Asian crises in our sample are significantly deeper and more investment-driven than crises elsewhere. Regarding severity, the drop in (detrended) output in the crisis year is significantly larger in Asian crises than in the rest of the sample. Moreover, this output loss persists, as growth in the recovery years fails to narrow the gap with the pre-crisis trendline. Moreover, in Asian crises, the investment wedge plays a much more important role than the labor wedge, whereas the opposite holds in European and Latin American crises. The investment wedge explains roughly 35 percent of the output drop in East Asia, a significantly higher percentage than the 6 percent average in non-Asian crises.

Given that Asian crises are comparatively deeper, more investment-driven, and less labor-driven than non-Asian crises, it is not surprising that crisis severity correlates positively with the importance of the efficiency and investment wedges and negatively with the labor wedge. These correlations, however, are only statistically significant within the Asian subsample, and not in the overall sample. Regarding the dynamic properties of wedges, the labor wedge is more mean-reverting than the efficiency and investment wedges. That is, in crises where the labor wedge has a sizable contribution to the drop, it also has a significantly higher contribution to the recovery. By contrast, for the efficiency and investment wedges, the contributions to the drop and to the recovery are not significantly correlated. When we examine the roles of the different wedges in the three years after the crisis, we find that post-crisis growth is significantly faster the greater the contribution of the efficiency wedge to the recovery and the greater the contribution of the investment wedge to the recovery. For all results, we verify that the coefficients and significance levels obtained via plain correlations/regressions are not too different from those obtained by means of an outlier correction method, which reduces or eliminates the weight of influential observations. We find that our results do not appear to be driven by outliers.