Weathering the Asian Crisis:
The Role of China*

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Abstract
During the Asian crisis, China's healthy reserves and low debt made possible the avoidance of a "country run". Nonetheless, it did experience an apparently autonomous rise in private savings and a rise in capital outflow. This paper employs global general equilibrium analysis to examine the relative contributions of external and internal shocks in China during the crisis. The savings rise appears to have been dominant domestically and, by coincidence of timing, it was a significant contributor to the international effects of the crisis. The successful defence of fixed US$ parity, however, has made the combined shocks more contractionary in China than would have been the case had it been possible to retain a flexible exchange rate regime.

1. Introduction

The heretofore spectacular growth of the East and Southeast Asian economies stalled in 1997 following a combined financial and currency crisis.[1] Several economies that had earlier been major contributors to both Asian growth and commodity imports experienced very substantial contractions associated with a surge of insolvencies following capital flight and unexpectedly large currency depreciations.[2] The government of China chose to hold fast to its US dollar parity, however. Its comparatively large official foreign reserves and its history of capital controls restricting short-term capital inflow meant less risk of a serious "country run" than in the most affected crisis countries. Nonetheless, the external crisis appears to have combined with domestic reforms and changes in macroeconomic policy to retard overall economic growth and increase unemployment.[3]

The primary effects of the crisis in China were a real appreciation against most trading partners and a rise in the risk premium demanded by investors in China.[4] Taken alone, given the fixed exchange rate regime, these had to be contractionary. But the crisis came at a time when the proportion of total employment in China's relatively secure state sector had begun to decline[5]. Perceiving increased risk from this source, and possibly also from the crisis elsewhere in Asia, Chinese households appear to have chosen an autonomous substitution of savings for consumption. Other things equal, this shock would have tended to

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[1] Subsequent but associated "crises" in Latin America, Eastern Europe and in Russia followed. We focus on the effects of the Asian shocks only.
[2] See McLeod and Garnaut (1998), Goldstein (1998) and Wong (1998).
[3] See Meng (1999).
[4] See Fernald and Babson (1999).
[5] See Meng (1998).

offset the real exchange rate effect of the crisis. Nonetheless, both it and the external crisis acted to reduce the price level and retard output growth. The magnitude of these contractionary effects depends on the proportion of the increased saving channelled abroad and on the response of the Chinese government and central bank. The available evidence suggests that the outflow has been considerable, offset only partially by a virtual cessation of the previously rapid accumulation of official foreign reserves. Over and above the continuing domestic structural reforms, the immediate macroeconomic policy responses have been the fixing of parity with the US dollar and a substantial fiscal expansion, described in combination as a "hard currency, soft budget" policy.

In this paper we review what information is available about China's aggregate performance during and since the crisis, examine the implications of both the external and internal shocks using elemental macroeconomic analysis and quantify some of the real effects using a global general equilibrium model. The use of global general equilibrium is important because one of the reasons the Asian crisis led to so deep a regional recession was that East and Southeast Asia have a lot of intra-regional trade. The effects were therefore transmitted, at least in part, through trade flows.[6] In what may have been an accident of timing, the rise in private savings in China accelerated capital outflow at the same time as capital was fleeing the crisis countries. The changes in the Chinese economy tended, therefore, to enlarge the flow of capital to the north, and particularly to the United States. We also examine the implications of this.

In simulating the crisis, we make no attempt to reproduce its short run dynamics.[7] Instead, our analysis is comparative static, taking as our starting point the real shocks that emerged in its wake. In the short run, these included a severe contraction of domestic investment in affected countries (as home savings fled abroad and foreign savings in Asia were withdrawn). The contractionary effects of this were exacerbated by the temporary unemployment of capital as many Asian firms foundered under the escalated cost of foreign borrowings and the credit crunch that followed. Recent evidence suggests that a considerable

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[6] Earlier applications of this basic approach to the crisis include those by Adams (1998), Noland et al. (1998), Liu et al. (1998) and Yang and Tyers (1999).
[7] Although the events that precipitated the crisis are now fairly well understood (Chang and Velasco, 1998; Krugman, 1999), the best dynamic global macroeconomic models to date still do not fully endogenise the capital flight of 1997 (McKibbin, 1998a, b).

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number of firms in the most affected countries were rendered insolvent, and a larger number illiquid,[8] and that this explains the bulk of the initial contractions in output.

In Section 2 a brief review of the crisis is offered. Section 3 then examines the simultaneous changes in China. Section 4 presents an elemental comparative static macroeconomic analysis of China's response and current policy options. The general equilibrium analysis is then introduced in Section 5, where a summary of the model's structure and behaviour is provided. Our construction of the crisis and policy shocks is described in Section 6 and the simulation results are presented in Section 7. Section 8 offers conclusions.

2. Events in the crisis countries:

We focus here on the real shocks associated with the crisis, rather than its financial origins. For the most affected Asian economies, the primary real shocks were of two types. First, as savings fled domestic investment declined. In Japan, where the process was more gradual, investment fell by about a tenth in the two years from late 1997.[9] In the most affected economies of developing Asia, however, the initial panic of 1997 was so great that domestic investment declined by as much as half. Domestic capital goods and construction demand collapsed and private consumption demand also fell, driven by the associated wealth effects of asset price declines. Imports therefore fell dramatically.

The second of the real shocks was a further short run decline in domestic production in the affected economies. Because the credit squeeze was greatly exacerbated by an associated currency crisis and hence a blowing out of dollar denominated debt service costs, there was a high incidence of illiquidity and insolvency. This was the more so in developing Asia because of the rapid expansion of private sector credit there during the early 1990s. It was therefore inevitable that the substantial rise in debt service costs would drive more than the usual proportion of firms in the most affected economies into insolvency.[10] This was the principal cause of the contractions in output experienced in developing Asia in the first year following the onset of the crisis.

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[8] See World Bank (1999).
[9] According to IMF(1998), Table 3, gross fixed capital formation in Japan declined by 3.5 per cent in 1997 and was forecast to decline by 7.2 per cent in 1998.
[10] This is borne out in a recent World Bank survey of 3,700 companies in the worst affected economies (World Bank, 1999) as reported in *Asiaweek*, 16 April 1999.

3. Events in China:

Both economic and social change has been comparatively rapid in China during the last two decades. Underlying it has been the gradual but continuous transfer of economic activity from the public to the private sector and the expanded reliance on markets in the allocation process. In spite of this background of continuous change, there appears to have been an acceleration just prior to, and during, the crisis. From an external perspective, the most notable changes were an increase in outflows on the capital account, the government's adherence to fixed parity with the US dollar and the resulting rise in China's real exchange rate relative to its Asian neighbours. We consider, below, evidence suggesting that these changes were not directly related to the surrounding crisis but rather that they stemmed from the evolution of China's economic policy regime and would have occurred even in its absence.

Following unification in 1994 key policy objective had been to "get the exchange rate right" and a "real targets" approach was adopted whereby the nominal rate was set in relation to the cost of earning a unit of foreign exchange through exports.[11] In effect this ensured the stabilisation of the real exchange rate.[12] With the advent of the crisis in 1997 the government fixed nominal parity with the US dollar. Although this was initially in defence of Hong Kong and its currency board, the Chinese government held to its commitment beyond the Hong Kong financial crisis. That this brought a departure from the real targets approach is evident from the ensuing effects on China's real exchange rate, which are summarised in Figure 1. Nominal parity with an appreciating US dollar in a period of low inflation ensured real appreciations against almost all of China's trading partners. Deflation in China has, however, ensured that a real depreciation has been enjoyed relative to the US and, more recently, against Europe. In spite of the reduced competitiveness of Chinese exports relative to those from crisis affected countries, the value of Chinese exports continued to grow through early 1998, only beginning to fall off later that year. Exports to other Asian countries fell first and most dramatically while the growth of those to the US and Europe had virtually ceased by the end of the year.[13]

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[11] This view is put by Zhang (1999) and borne out in the form of a policy reaction function estimated by L.L. Song (1999).
[12] This accorded with the strategy advocated by Corden (1993).
[13] See Fernald and Babson (1999) and Hu (1999).

China's capital controls notwithstanding, capital outflows appear to have accelerated markedly in 1997 and 1998, as indicated in Table 1. Estimates of unsanctioned outflows include both private flows on the capital account and, on the current account, the effects of under-invoicing of exports on the one hand and over-invoicing of imports on the other. Taken together, these appear to have more than doubled, to about six per cent of China's GDP. Between 1996 and 1998, for example, the change represents a reversal of private flows on the capital account, from a net inflow of about US$30 billion to a net outflow of almost equal magnitude. These were offset by a decline in the rate of accumulation of reserves by about US$30 billion. In magnitude, the corresponding change in the current account is about a fifth of that experienced collectively by the crisis affected countries (principally Indonesia, Malaysia, Thailand and Korea). It is smaller than the Korean change but larger than the contribution of any other affected country. As a proportion of GDP it is about half the collective change in those countries.

This substantial increase in outflows appears to be fuelled by a rise in the rate of private saving, some evidence for which is presented in Table 2. There are many changes within China that could be contributing to this but the most likely causes are twofold. First, liberalisation of the housing market began in the mid-1990s and private ownership sanctioned in urban areas. Since then, there has been a rapid increase in the proportion of accommodations that are privately owned and an obvious incentive to raise private savings to achieve private ownership. Second, the trend of transferring production activity from the state to the private sector has accelerated.[14] The proportion of workers enjoying "cradle to grave" welfare services in the state sector has declined from about 60% in the mid-1990s to less than half, with substantial and comparatively prominent lay-offs taking place in 1997. Thus, the perceived probability of obtaining or retaining state employment has declined and the need for savings to finance health, education and retirement has increased. All this suggests that the rise in savings and the associated increase in the true capital account deficit are largely autonomous and related to the crisis in other Asian countries mainly through an accident of timing.

While the evolution of China's domestic and macroeconomic policy regimes has continued, two policy changes standing out as having significance for macroeconomic circumstances in the crisis period. First, as indicated above, the retention of the fixed US

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[14] See Meng (1999).

dollar parity tends to tie up monetary policy, which has been tight. In spite of the increase in the supply of domestic savings, the real interest rate facing the relatively privileged customers of the state banking system is estimated to have risen from –4.8% in 1995, to 1.8% in 1996, 5.8% in 1997 and 7.2% in 1998.[15] Second, a "soft budget" policy has been maintained since the mid-1990s. Official estimates of fiscal deficits ranged in the vicinity of 0.8 per cent of GDP until 1998, when there was a rise to 1.1 per cent. Government spending had been below 12 per cent of GDP in the two years prior to the crisis but rose to 13 per cent in 1998.[16]

The combination of the real appreciation, which reduced export growth, restrictive monetary policy and the autonomous switch to private savings appears to have contracted overall domestic demand, causing deflation. Growth in the CPI, which had exceeded 24 per cent in 1994, has since declined each year, reaching –0.8 per cent in 1998. Estimated GDP growth does appear to have slowed as a consequence, from the 10 per cent achieved in the mid 1990s to an official 7.8 per cent in 1998. The 1998 target of eight per cent apparently influenced provincial estimates, leading to some controversy and a slight downward revision. The official rate for 1998 is widely believed to be an overestimate, however. Moreover, an unusually large part of expenditure on GDP in 1998 was investment by state owned enterprises and this included inventory investment.[17] Nonetheless, total investment as a share of GDP has risen slightly and productive capacity continues to be transferred from the state sector to the presumably more productive private sector, all of which suggests the slowdown is not the result of slower productivity growth. We therefore look for nominal wages that are sticky downward, excessive real wage growth and rising unemployment.

Wage rigidities are not unexpected in China, where the labour market is more highly regulated than in other developing countries. The evidence presented in Table 3 suggests that the deflation in 1998 was indeed associated with a spurt in real wage levels. Again, however, the data on which this is based ignore non-wage and over-contract (bonus) payments.[18] The former are large in state-owned enterprises while the latter are comparatively important in the private sector. The evidence on unemployment is also mixed. The principal source of lay-

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[15] The real interest rate is here estimated as the concurrent difference between the state bank lending rate and the rise in the CPI. The source for both is IMF, *International Financial Statistics*, October 1999.
[16] Here, also the source is IMF, *International Financial Statistics*, October 1999. These government spending statistics apparently ignore subsidies to state-owned enterprises. Such subsidies are large, though they probably take the form of transfers rather than spending on goods or services or public investment.
[17] See the discussion by Fernald and Babson (1999), p 6.
[18] Although the data in Table 3 for 1998 are drawn from the indicated sources without adjustment, they do look out of line by more than we would expect and we regard them as questionable at best.

offs has been the state sector. Yet workers laid off by the state sector are not included in the unemployment statistics. The official unemployment rate is therefore an underestimate considering that more than a tenth of the nation's workers have moved out of the state sector in recent years.[19]. In addition, there is anecdotal evidence that millions of rural migrants have returned to the countryside because of reduced opportunities in urban employment (Macro Team of CASS ,1999). On balance, we conclude that there has been a slowdown in output growth associated with a rise in unemployment.

In sum, then, we think of macroeconomic events in China during the crisis period as comprising three important shocks and two key policy changes. The shocks are the crisis-driven external price decline, the rise in the interest premium on investments in China, and the spontaneous substitution of private saving for private consumption in the home economy. The policy changes are the adoption of a fixed nominal exchange rate and the fiscal expansion. Before turning to our global general equilibrium analysis of these events, we work through them in the context of an elemental macroeconomic model, employing a primarily graphical exposition.

4. An Elemental Macroeconomic Analysis

4.1 The model

To foster intuition about Chinese policy, we begin with an elemental macroeconomic model of a small open economy. "Smallness" keeps the foreign real interest rate, r^*, and price level, P^*, exogenous.[20] The model emphasises the short run, or at least a length of run within the average gestation period of investment. The productive capital stock is therefore constant and unaffected by the level of investment. And the model is comparative static, so that expectations and their implications are not endogenous and there is no continuous inflation to separate the real from the nominal rate of interest. Flows on the capital account are motivated by real interest rate divergences.

The demand side of the model has equilibrium in the markets for money and "loanable funds". Money market equilibrium equates real money demand, m_D, with real

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[19] The extent of underestimation is moderated, however, by the disguised employment amongst these workers. Because they retain generous allowances and payments in kind, which are denied to workers who take new jobs, when new employment is attained these workers rarely concede it to officialdom. See Meng (1999).
[20] That China is not "small" has been emphasised by others, including Dornbusch (1999). Our subsequent global general equilibrium analysis corrects for this. Even there, however, the 1995 database has China contributing only 2.5% of global output.