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Introduction

Financial Fragilities in Developing Countries

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Some developing countries have experienced banking and currency crises in recent years. Tables 1-(a) and 1-(b) show currency and banking crises in five developing countries from 1994 to 2002. According to table1-(a), which shows the five developing countries' nominal exchange rates against the US dollar, they experienced large currency depreciations; Indonesia and Thailand (1998), Argentina (2002), Mexico (1995), and Turkey (2001). Table 1-(b) shows occurrences of systemic banking crises in these countries: Indonesia and Thailand (1997-2002), Argentina (1995, 2001-02), Mexico (1994-2000), Turkey (2000-02). From both tables, we can observe that in the years in which these countries experienced large currency depreciations, they also experienced systemic banking crises. Table-1(c) shows foreign-currency share of total debt. The foreign-currency shares of total debt in the previous year of the years of the large currency depreciations were high; Indonesia (46.7%), Thailand (35.2%), Argentina (58.9%), Mexico(26.8%), and Turkey (31.4%). According to Table-1(d), which shows GDP growth rates, theses countries experienced output decline in the years of large currency depreciations; Indonesia (-13.1%), Thailand (-10.5%), Argentina (-10.9%), Mexico(-6.2%), and Turkey(-7.3%).

The fractional reserve banking system under which creditors and debtors are subject to asymmetric information is potentially fragile to shocks and changes in expectations, and sometimes suffers systemic banking crises. The debt denominated in foreign currency adds fragility to the economy because of the increase, in domestic currency terms, of the value of debt, in the case of domestic currency depreciations. On the other hand, currency crises pose challenges to central banks in developing countries with regard to their balance sheet management. This report intends to contribute to understandings of situations, typically represented in the above five developing countries: banking and currency crises in the countries with high share of debt denominated in foreign currencies. Chapters from one to four are of theoretical nature, while chapter five conducts a case study on banking and currency crises in Indonesia.

Chapter 1: Models of Banking Crises: Explaining Associations with Output Decline and Financial Liberalization (Hisayuki Mitsuo). Banking crises

which occurred frequently in developing countries for the past quarter century are sometimes associated with output decline and interest rates liberalization. This paper introduces representative models which explain how banking crises are associated with output decline and interest rates liberalization.

Chapter 2: Understanding Krugman's "Third-Generation" Model of Currency and Financial Crises（Hidehiko Ishihara）. This paper presents a simplified but complete version of Krugman's "third-generation" model and derives a closed-form solution. In the model, workers provide labor, receive wage, and consume home goods and imported goods. Entrepreneurs maximize discounted sum of utility obtained from consumption from first period to infinite period. Entrepreneurs borrow in foreign currency, consume imported goods and make investments in home goods. Entrepreneurs can hide part of income from creditors and are subject to borrowing constraint. Another assumption on borrowing is that defaulted entrepreneurs can get no new fund. Production technology exhibits positive externality (spillover) and marginal productivity of capital is constant. In the model, two types of equilibria are shown to exist; a crisis equilibrium in which real exchange rate depreciates, firms with foreign currency debt becomes insolvent and can not obtain new loan, and investment is zero, and a steady-growth equilibrium in which real exchange rate is constant and capital stock grows at a constant rate. The economic structure in which the crisis equilibrium tends to exist is low propensity to import, low propensity to consume, low world interest rate, moderate borrowing constraint of private sector, restrictive financial market with high entry barrier, low price elasticity of export, and low wage elasticity of labor supply.

Chapter 3: Foreign Currency Debt as a Barrier to Price Adjustment in a Financially Constrained Economy (Kaku Furuya). A monopolistically competitive firm has debts denominated in foreign currency. The firm owes a fixed amount of debt repayment. The foreign currency debts are assumed to be unable to be refinanced or repudiated, and if the firm's net profits including debt repayment with foreign currency debt are assumed not to be negative. In the model, if a negative shock to export demand hits the economy, and non-negative net profits condition is binding, the firm will limit employment and stop lowering price of output. In this way, the foreign currency debt can impose a constraint on firm's behavior, and can make the economy to attain only a low-employment equilibrium.

Chapter 4: Monetary Policy, International Liquidity and Central Bank Balance Sheet in Emerging Market Economies (Masanaga Kumakura). Due to currency crises, the importance of balance sheet management of central banks in emerging markets is rising. The central bank is assumed to target a ratio of capital to currency. From a simplified balance sheet identity that net foreign asset is equal

to the sum of currency, net interest-bearing debt, and capital, the lower bound of the sustainable target ratio of capital to currency is derived.

Chapter5: Lessons from Financial Deregulation Policy, Financial Development and Crisis – Case of Indonesia – (Masaaki Komatsu). This paper argues about behaviors of Indonesia's state owned banks and business group banks in Indonesia and international capital movements until currency and financial crises in 1997/98. Financial liberalization was made in 1983/84 and in 1988. Interest rates were liberalized, and entry restriction was eased. Capital flowed in rapidly in the early 1990s, because of interest rate differentials, high economic growth rates, stable exchange rates whose paths are predictable. Rapid and massive capital inflows made the Indonesian economy overheating. However, effective monetary and fiscal policy was not implemented; fiscal tightening was not made because of the need for infrastructural investment, and monetary tightening was not effective under *de facto* fixed exchange rate regime and high capital mobility.

Table 1. Banking and Currency Crises in Five Developing Countries

Table 1-(a). Nominal Exchange Rate against the US dollar

	1994	1995	1996	1997	1998	1999	2000	2001	2002
Indonesia	2160.8	2248.6	2342.3	2909.4	10013.6	7855.2	8421.8	10260.9	9311.2
Thailand	25.2	24.9	25.3	31.4	41.4	37.8	40.1	44.4	43.0
Argentina	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3.1
Mexico	3.4	6.4	7.6	7.9	9.1	9.6	9.5	9.3	9.7
Turkey	0.0	0.1	0.1	0.2	0.3	0.4	0.6	1.2	1.5

Table 1-(b). Systemic Banking Crises

	1994	1995	1996	1997	1998	1999	2000	2001	2002
Indonesia				*	*	*	*	*	*
Thailand				*	*	*	*	*	*
Argentina		*						*	*
Mexico	*	*	*	*	*	*	*		
Turkey							*	*	*

Table 1-(c). Foreign-Currency Share of Total Debt (%)

	1994	1995	1996	1997	1998	1999	2000	2001	2002
Indonesia	33.0	32.6	32.9	46.7	42.9	33.1	32.0	28.9	22.5
Thailand	26.4	32.8	32.5	35.2	23.3	18.8	17.9	15.7	12.7
Argentina	32.9	36.4	40.2	41.4	43.2	44.7	46.2	49.2	58.9
Mexico	26.8	39.4	46.3	40.5	44.4	40.1	37.0	33.9	33.8
Turkey	40.6	35.6	33.0	33.5	31.2	31.2	31.4	24.6	22.9

Table 1-(d). GDP Growth Rates (%)

	1994	1995	1996	1997	1998	1999	2000	2001	2002
Indonesia	7.5	8.2	7.8	4.7	-13.1	0.8	4.9	3.8	4.4
Thailand	9.0	9.2	5.9	-1.4	-10.5	4.5	4.7	2.2	5.3
Argentina	5.8	-2.8	5.5	8.1	3.9	-3.4	-0.8	-4.4	-10.9
Mexico	4.4	-6.2	5.2	6.8	5.0	3.8	6.6	0.0	0.8
Turkey	-5.4	7.2	7.0	7.5	3.1	-4.7	7.2	-7.3	7.8

Sources:

Table 1-(a), International Financial Statistics, May 2007.

Table 1-(b), Caprio, Gerard, Daniela Klingebiel, Luc Laeven, and Guillermo Noguera,2005, "Banking Crises Database" in Patrick Honohan and Luc Laeven. eds. *Systemic Financial Crises : Containment and Resolution*. Cambridge, U.K. ; New York, NY : Cambridge University Press.

Table 1-(c), Modified from Table 4.4 in Goldstein, Morris and Philip Turner, 2004, *Controlling Currency Mismatches in Emerging Markets*. Washington D.C.: Institute for International Economics.

Table 1-(d), International Financial Statistics, May 2007.

Notes:

Table 1-(b), ＊denotes an occurrence of systemic banking crisis which means systemic bank insolvency.

Table1-(c). For the construction of table 4.4 of Goldstein and Turner, 2004, foreign-currency share of total debt is defined as

$$\frac{NBKL\$ + BKL\$ + IB\$}{NBKL + BKL + DCP + IB + DB}$$

where $NBKL$: liabilities of nonbanks(cross-border) to BIS reporting banks, in all currencies; BKL : liabilities of banks(cross-border) to BIS reporting banks, in all currencies; DCP :domestic credit to the private sector, IB : international debt securities(bonds) outstanding, in all currencies; DB : domestic debt securities(bonds) outstanding. The suffix "$" signifies debt denominated in foreign currency. Both domestic credit to the private sector and domestic debt securities (bonds) are assumed to be denominated in domestic currency.