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The Impacts of Bank Loans on Economic Development

An Implication for East Asia from an Equilibrium Contract Theory

Shin-ichi Fukuda

4.1 Introduction

In the 1990s, financial liberalization expanded the volume of private capital flows to developing countries. In particular, the miraculous economic success of East Asia attracted a large share of industrialized countries' private capital to the region. As a result, the East Asian economies (e.g., Thailand, Indonesia, and Korea) accumulated significant amounts of unhedged short-term external liabilities before 1997. It is now widely recognized that a large fraction of short-term external liabilities was one of the main reasons why the East Asian countries experienced the serious crisis. A large number of studies have suggested that otherwise solvent East Asian countries might have suffered from a short-run liquidity problem because the available stock of reserves was low relative to the overall burden of external debt service (interest payments plus the renewal of loans coming to maturity).[1] This implies that if a large fraction of external liabilities had longer maturities, the East Asian crisis might not have taken place in the form of a liquidity shortage.

Interestingly, time series evidence suggests that the degree of postcrisis capital mobility in East Asia was quite different in four forms of capital inflows: direct investment, portfolio investment, bank loans, and other investments. For example, table 4.1 reports the quarterly and annual data

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1. See, for example, Corsetti, Pesenti, and Roubini (1998); Radelet and Sachs (1998); Furman and Stiglitz (1998); and Ito (1999).

Table 4.1 **Capital Inflows to the East Asian Economies Before and After the East Asian Crisis, Quarterly Data**

	95.1	95.2	95.3	95.4	96.1	96.2	96.3	96.4	97.1	97.2	97.3	97.4	98.1	98.2	98.3	98.4	99.1
A. Direct Investment (IMF Code = 78bed)																	
Thailand	539	588	304	637	810	453	456	617	645	842	1222	1037	1870	2608	1431	1031	1025
Indonesia	978	765	1344	1259	1990	1024	1640	1540	2342	1267	1392	−324	−502	367	−144	−77	−32
Korea	260	503	414	599	405	680	256	985	624	791	611	819	505	1168	2162	1582	1407
The Philippines	316	293	260	609	531	295	551	140	565	214	295	148	251	198	222	1042	373
B. Portfolio Investment (IMF Code = 78bgd)																	
Thailand	773	1283	1412	615	1407	786	856	537	169	1630	2533	466	210	−92	−307	348	297
Indonesia	375	819	1586	1320	1327	919	630	2129	1009	1103	646	−5390	−3548	1840	−17	−277	−536
Korea	1740	3235	5521	3379	3048	6574	5163	6398	2903	6107	5364	−2086	2592	1734	−3793	−824	1080
The Philippines	292	649	1046	632	424	1612	1205	1885	1205	514	−442	−677	−177	335	−666	232	1996
C. Bank Loans (IMF Code = 78bud)																	
Thailand	3378	5149	2235	2455	456	3016	−1722	1159	2543	245	−3022	−3288	−2216	−1710	−3362	−4094	−2539
Indonesia	854	71	−225	1253	−1133	155	126	94	−244	−99	709	−642	−840	−1064	−204	−362	−1445
Korea	4120	2714	3526	1030	2104	2158	2764	2925	1220	1664	−1179	−11490	−3378	−445	−2230	−181	947
The Philippines	−649	1293	89	915	965	2097	1236	738	1323	2243	−359	−1539	−24	681	−693	−369	−1207
D. Other Investment excluding Bank Loans (IMF Code = 78bid−78bud)																	
Thailand	−2089	2886	2250	3119	4923	2170	512	1362	−820	−6216	−5867	−5757	−5146	−1522	65		−590
Indonesia	−783	882	−34	398	233	21	593	159	880	−20	−940	−2114	−1308	−927	−1931	−1309	2329
Korea	3125	2525	1777	2633	5461	4544	76	4539	2279	2321	−908	−2224	−4711	−1910	−1353	339	−683
The Philippines	670	7	597	118	570	41	709	14	224	285	1317	902	−30	654	273	−636	619

Source: IMF (1997) for data from 95.1 to 95.4; IMF (2000) for data from 96.1 to 99.1.

Note: Unit = millions of U.S. dollars.

Table 4.2 **Capital Inflows to the East Asian Economies Before and After the East Asian Crisis, Annual Data**

	92	93	94	95	96	97	98
			A. Direct Investment (IMF Code = 78bed)				
Thailand	2113	1804	1366	2068	2336	3746	6941
Indonesia	1777	2004	2109	4346	6194	4677	−356
Korea	728	589	810	1776	2326	2844	5415
Malaysia	5183	5006	4342	4178	5078	5106	n.a.
The Philippines	228	1238	1591	1478	1517	1222	1713
China	11156	27515	33787	35849	40180	44236	43751
Singapore	2204	4686	8550	7206	7883	9710	7218
			B. Portfolio Investment (IMF Code = 78bgd)				
Thailand	924	5455	2486	4083	3585	4798	159
Indonesia	−88	1805	3877	4100	5005	−2632	−2002
Korea	4953	10553	8149	13875	21183	12287	−292
Malaysia	−1122	−709	−1649	−436	−268	−248	n.a.
The Philippines	155	897	901	2619	5126	600	−276
China	393	3646	3923	710	2372	7703	97
Singapore	1398	2867	114	410	1672	590	1258
			C. Bank Loans (IMF Code = 78bud)				
Thailand	1758	6589	14295	13218	2909	−3522	−11382
Indonesia	n.a.	1357	527	1953	−758	−276	−2470
Korea	1820	720	7368	11389	9952	−9785	−6233
Malaysia	3150	6282	−3789	468	2974	807	n.a.
The Philippines	1921	−229	1694	1648	5036	1668	−405
China	−786	−415	−5222	−4045	−5959	n.a.	−3151
Singapore	5146	1949	5409	4423	8032	18687	−12787
			D. Other Investment excluding Bank Loans (IMF Code = 78bid−78bud)				
Thailand	4721	150	−4456	6165	8967	−18659	−6017
Indonesia	n.a.	822	−2065	463	1006	−2194	−5475
Korea	3104	−2175	6264	10061	14619	1468	−7635
Malaysia	33	1159	1880	4211	1633	−1933	n.a.
The Philippines	1019	2684	1868	1392	1334	2728	261
China	−3296	−161	3726	9161	7241	n.a.	−5469
Singapore	−45	6375	502	7558	7814	17405	−3076

Source: IMF (1997, 2000).

Note: Unit = millions of U.S. dollars.

series of *International Financial Statistics* (*IFS*) to show how capital inflows to the East Asian economies changed before and after the crisis. Both quarterly and annual data (i.e., tables 4.1 and 4.2) show that before 1997 all forms of net private capital inflows tended to increase among the East Asian countries, including Thailand, Indonesia, and Korea. However, the quarterly data in table 4.1 also indicate that inflows of both bank loans

and portfolio investments turned out to be negative after the crisis in these East Asian countries.[2] In particular, except for in the Philippines, bank loans turned from inflows to large outflows after the crisis and remained until the end of the sample period. This implies that the crisis was accompanied by a significant amount of bank loan withdrawal from the East Asian countries. In contrast, except for Indonesia, inflows of direct investment never declined in the East Asian countries, even after the crisis in table 4.1. Instead, inflows of direct investment steadily increased in Thailand and were quite stable in Korea after the crisis.

The evidence implies that if a large fraction of external liabilities had been financed by direct investment, the East Asian crisis might not have taken place in the form of a liquidity shortage. In other words, a liquidity shortage in the East Asian crisis was attributable to highly mobile forms of capital inflows, particularly by commercial bank debt. It is probably true that liquidity problems emerged in several Asian countries when panicking external creditors became unwilling to roll over existing short-term bank loans in 1997. However, a pure liquidity shortage could have taken place for any short-term forms of external liabilities. Thus, it is not necessarily clear why commercial bank loans played a leading role in causing a liquidity shortage in the East Asian economies.

In domestic financial markets, banks are known as one of the most prominent means of channeling savings to investments with highest return.[3] Through providing liquidity and permitting the efficient pooling of risk, their activities alter the composition of capital in a way that is potentially favorable to enhanced capital accumulation. As banks have monitoring power delegated by their depositors, they also specialize in gathering information about firms and reduce corporate myopia by overcoming the problems associated with informational asymmetry (e.g., Leland and Pyle 1977 and Diamond 1984). In particular, several previous studies emphasized the special role of banks not only in selecting borrowers but also in monitoring their ex post performance (see, among others, Aoki 1994 and Hoshi, Kashyap, and Scharfstein 1991). If banks could prevent unnecessary liquidation, these monitoring activities would have a positive impact on economic growth. However, efficient ex post monitoring activities also mean that the debt maturity composition becomes shorter. Thus, they could increase the probability of a liquidity shortage in the sense of Diamond and Dybvig (1983) if panicking external creditors became unwilling to roll over existing short-term credits.[4] In particular, without prudential

2. The only exception is portfolio investment in Thailand, which remained positive after the crisis. However, other investments in Thailand took large negative values after the crisis.

3. Noting these roles of banks, classical studies by Patrick (1966), Cameron (1967), Goldsmith (1969), McKinnon (1973), and Shaw (1973) asserted that the extent of financial intermediation in an economy affects rates of economic growth. See also World Bank (1989) and Fry (1995) for their surveys.

4. See also Sachs, Tornell, and Velasco (1996) and Chang and Velasco (1998) in the international market.

regulation or a safety net, the liquidity problems of private bank loans may be intensified in the international capital market.

The purpose of this paper is to present a simple theoretical explanation of why efficient monitoring activities by banks may increase the probability of a liquidity shortage in the competitive international bank loan market.[5] The theoretical model of this paper extends Diamond (1991, 1993), who formulated the choice of a loan's term structure by private firms under asymmetric information.[6] The model contains a liquidity risk because internal funds are not sufficient. When a liquidity shortage develops, borrowers lose the control right, and the project will be liquidated. This indicates that when the manager's control rent is large, long-term debt will be preferred by the firm to eliminate the liquidity risk.[7] However, when asymmetric information exists between lenders and borrowers, short-term debt lowers a good borrower's expected financing costs because of a possible arrival of good information. Thus, when an arrival of new credit information is imminent, borrowers tend to prefer short-term debt (see Flannery 1986).

Note that monitoring activities will be enhanced when an arrival of new information is used. The theory then predicts that efficient monitoring activities by banks tend to make the debt maturity shorter. Unless unnecessary liquidation took place, short-term loans with efficient monitoring would have a positive effect on economic growth. However, when neither prudential regulation nor a safety net is well established, panicky capital outflows may occur with some probability. In such a case, efficient monitoring activities by banks can increase the possibility of having catastrophic liquidity problems by shortening the maturities of bank loans.

The paper proceeds as follows. Before presenting a theoretical model, section 4.2 will show that middle-term and long-term commercial bank loans are less mobile forms of capital flows. It will also show that a large fraction of external bank debt had been financed by short-term loans not only in the East Asian countries but also in a large number of other countries. Section 4.3 will then focus on the role of monitoring in explaining these findings. Section 4.4 will explain a basic structure of our theoretical model, and section 4.5 will define long-term and short-term debt contracts. Section 4.6 will investigate the maturity choices by all borrowers and show that the vulnerable financial structures in developing countries might emerge as a result of efficient monitoring activities by banks. Sections 4.7 and 4.8 will discuss how the main results will change when I alter one of the key assumptions in the model. Section 4.9 will summarize our results and refer to their policy implications.

5. In previous studies, Rodrik and Velasco (1999) made an exceptional attempt to analyze the choice of short-term debt in the international market. However, they did not assume the asymmetric information, which is crucial in this paper.

6. See also Fukuda, Ji, and Nakamura (1998).

7. Another case in which long-term debt may be preferred by borrowers is when borrowers have moral hazard problem. See Rajan (1992).

4.2 Maturity Distribution of Bank Loans Before and After the Crisis

4.2.1 Growth Rates of Bank Loans to East Asia

As we discussed in the introduction, a large fraction of liabilities in highly mobile forms of capital was one of the main reasons for the East Asian crisis in 1997. In particular, the East Asian crisis occurred when foreign lenders suddenly refused to roll over their bank loans in 1997. However, when I look at the time series data of international bank loans based on the Bank for International Settlements (BIS) data, I find that the degree of capital mobility was quite different in different terms to maturity. For example, table 4.3 shows the semiannual growth rates of international bank loans to the East Asian economies before and after the crisis in three different types of maturities: maturities up to one year (short-term loans), maturities over one year and up to two years (medium-term loans), and maturities over two years (long-term loans).[8]

It suggests that until 1997, bank loans to the East Asian economies had steadily increased in almost all terms to maturity. In Thailand from 1994 to 1995, the average semiannual growth rate of short-term loans was close to 20 percent, and those of middle-term and long-term loans were slightly higher than 20 percent. Similarly, both short-term and long-term loans grew on average about 10 percent in Indonesia and about 15 percent in Korea from 1994 to 1996.

In contrast, after the crisis, bank loans declined sharply only for short-term loans. For example, in Korea the semiannual growth rate of short-term loans was −16.12 percent in December 1997 and −44.23 percent in June 1998 (see fig. 4.1). During the same period, however, the semiannual growth rates of middle-term and long-term loans were still significantly positive in Korea (see fig. 4.2 and fig. 4.3). Similarly, almost all of the other East Asian economies experienced significant declines of short-term loans from December 1997 to June 1998. However, except for Thailand in December 1997, they experienced no serious decline in middle-term and long-term loans for the same period. Instead, several East Asian economies experienced significant increases in middle-term and long-term loans during this period (see fig. 4.2 and fig. 4.3).

4.2.2 Shares of Short-Term Loans in East Asia

In general, liquidity problems emerge when panicking external creditors become unwilling to roll over existing credits. Thus, if panicking external creditors could cancel their long-term contracts, liquidity problems might have occurred even when external liabilities were financed by long-term

8. The data sources are BIS (1996) for the data from 94.6 to 95.12, BIS (1998b) for the data from 96.12 to 97.12; and BIS (1998a) for 98.6 data.

Table 4.3 **Semi-Annual Growth Rates of International Bank Loans to the East Asian Economies for Different Terms to Maturity (%)**

	Thailand	Indonesia	Korea	Malaysia	The Philippines	Taiwan	China	Hong Kong	Singapore
					A. Maturities Up To and Including One Year				
94.6	27.03	0.14	18.95	10.94	12.17	7.34	−5.84	10.83	6.51
94.12	14.06	13.12	15.00	−19.80	19.84	11.90	25.13	8.58	1.46
95.6	23.21	18.69	28.14	10.58	7.44	23.87	−4.87	7.16	23.65
95.12	14.29	9.13	5.51	8.52	19.37	−16.72	33.18	−8.13	−12.34
96.6	9.70	7.28	14.84	26.55	46.25	−1.25	6.25	−13.76	−1.96
96.12	−4.46	15.75	8.30	11.88	30.08	−2.76	9.85	−5.05	−0.48
97.6	−0.31	1.22	5.02	45.37	11.41	16.41	12.12	7.19	11.88
97.12	−14.86	2.07	−16.12	−10.06	38.34	−2.57	12.15	−8.32	−8.65
98.6	−28.42	−21.83	−44.23	−23.37	−14.72	−13.14	−8.77	−20.90	−31.64
					B. Maturities Over One Year, Up To and Including Two Years				
94.6	−3.21	8.05	13.96	−20.03	21.46	53.74	4.98	13.39	−39.26
94.12	18.39	16.41	9.43	77.05	−15.55	3.15	5.26	1.11	122.22
95.6	38.91	−9.88	−6.63	61.71	0.00	13.06	8.63	−7.97	40.13
95.12	20.93	2.43	−6.11	−15.66	44.35	59.71	14.94	6.33	−0.93
96.6	15.47	10.01	34.67	−27.29	53.91	−10.00	15.19	4.77	26.61
96.12	18.27	3.34	19.46	−13.55	6.40	−17.44	1.23	2.52	−33.54
97.6	−4.91	−1.31	0.78	−14.70	−42.30	−51.14	−10.74	−15.83	−4.45
97.12	−9.30	4.46	26.17	48.94	31.29	23.31	2.88	32.15	8.90
98.6	2.64	0.68	77.40	7.31	92.29	33.33	0.60	17.23	73.34
					C. Maturities Over Two Years				
94.6	17.51	2.39	−6.13	6.90	−2.21	−1.70	8.40	10.10	21.23
94.12	42.20	12.35	21.95	13.30	12.66	73.73	7.79	11.90	25.52
95.6	13.13	18.53	32.35	−2.81	5.55	−7.49	10.95	5.17	10.17
95.12	25.84	11.97	11.35	21.59	5.26	44.16	−2.47	0.04	11.73
96.6	9.79	14.97	11.70	29.65	7.82	13.33	2.53	−0.58	−11.04
96.12	9.46	8.14	18.24	−1.33	10.81	14.09	9.95	9.72	21.76
97.6	0.89	10.94	3.03	12.57	−2.68	−0.08	−0.62	9.71	4.27
97.12	−16.16	1.77	0.45	14.14	57.34	42.65	7.24	12.00	10.32
98.6	−7.49	−0.41	15.08	−8.75	−7.83	−6.48	−3.96	−6.91	2.33

Sources: BIS (1996) for data from 94.6 to 95.12; BIS (1998b) for data from 96.12 to 97.12; BIS (1998a) for 98.6 data.

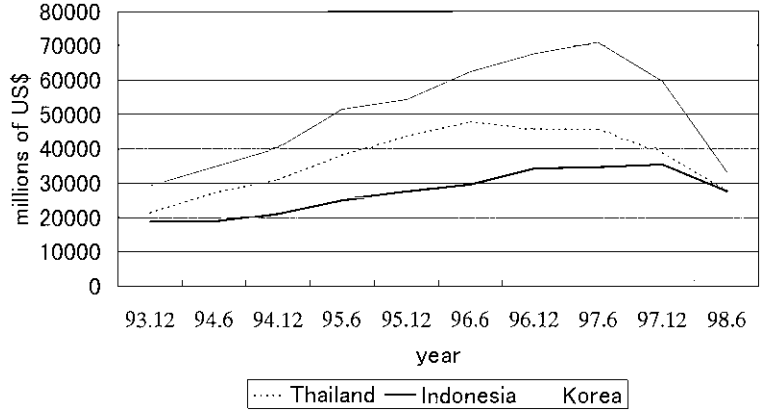

Fig. 4.1 Short-term loans before and after the East Asian crisis

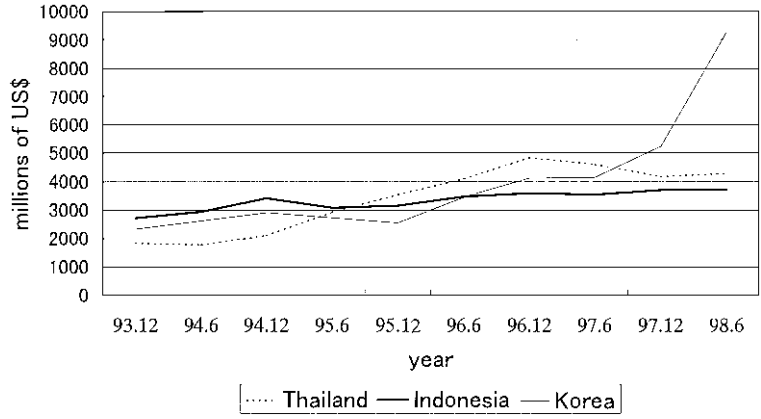

Fig. 4.2 Medium-term loans before and after the East Asian crisis

loans. However, the evidence in the East Asian economies suggests that like direct investment, long-term commercial loans were less mobile forms of capital flows. This may imply that if a large fraction of international commercial bank debt took the form of long-term loans, the East Asian crisis might not have taken place—at least not as a liquidity shortage.

In reality, a large fraction of international commercial bank debt was financed by short-term loans in the East Asian economies. Table 4.4, based on the BIS data, shows how the maturity of international bank loans was distributed before and after the crisis for three different types of maturities. Among the East Asian economies, Taiwan, Hong Kong, and Singapore had remarkably high shares of short-term loans. Needless to say, these data are not enough to capture general situations in East Asia before

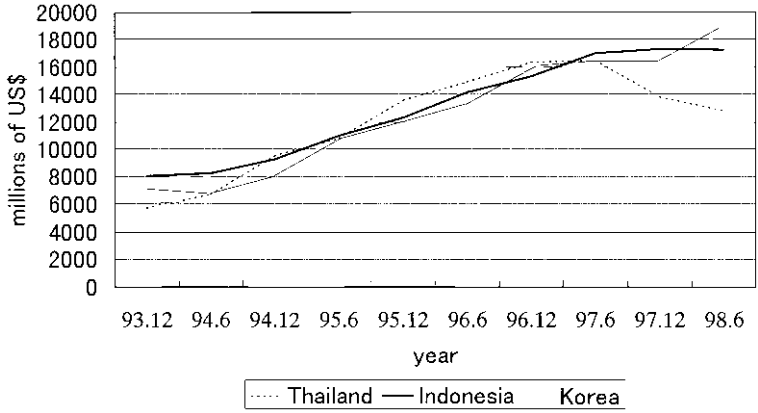

Fig. 4.3 Long-term loans before and after the East Asian crisis

the crisis because Taiwan has been a net creditor, whereas Hong Kong and Singapore are large international financial and intermediation centers. However, even in the other East Asian economies, shares of short-term loans were relatively high in the early 1990s (e.g., 72.0 percent in Thailand, 70.6 percent in Korea in December 1993, etc.).

Because bank loans steadily expanded in almost all terms to maturity, the shares of short-term loans in these East Asian economies slightly declined before the crisis. However, even just before the crisis, these East Asian economies still had relatively high shares of short-term loans, which made their financial structure vulnerable to a liquidity shortage. The crisis in 1997 caused a significant decline only in short-term loans. As a result, the shares of short-term loans in these East Asian economies dropped to nearly 50 percent in 1998.

4.2.3 Shares of Short-Term Loans in the International Market

BIS provides detailed data on the maturity distribution of cross-border loans from BIS reporting banks. Based on this data set, table 4.5 decomposes the cross-border bank loans by region and generates average shares of short-term loans for many emerging countries as well as developed countries. It indicates that even the world average share of short-term loans was above 50 percent throughout the 1990s. Among the different regions, Eastern Europe had lower shares of short-term loans, whereas offshore banking centers had very large shares of short-term loans in general. Compared to developed countries, developing countries had relatively larger shares of short-term loans. Because liquidity problems emerge when external creditors become unwilling to roll over existing short-term credits, the evidence implies that many developing countries could have had liquidity problems.

Table 4.4 **The Percentage Distribution of International Bank Loans to the East Asian Economies**

	Thailand	Indonesia	Korea	Malaysia	The Philippines	Taiwan	China	Hong Kong	Singapore
				A. Maturities Up To and Including One Year					
93.12	72.0	61.7	70.6	56.8	40.4	92.9	45.5	88.0	96.0
94.6	74.3	60.9	72.5	59.1	44.2	92.7	41.1	88.1	95.9
94.12	70.6	60.9	70.9	48.8	46.4	90.4	44.0	87.6	94.5
95.6	71.2	62.5	72.0	49.4	46.3	92.3	40.2	88.1	94.9
95.12	69.4	61.9	70.0	47.0	48.8	87.2	47.6	86.6	93.3
96.6	68.9	60.0	70.8	49.7	55.1	86.4	48.4	85.1	93.1
96.12	65.2	61.7	67.5	50.3	58.2	84.4	48.9	82.5	92.6
97.6	65.7	59.0	68.1	56.4	59.7	87.3	52.0	82.4	93.1
97.12	65.9	60.6	63.1	53.1	60.4	81.7	53.5	79.2	91.9
98.6	59.3	55.0	45.8	48.6	57.1	80.1	52.0	76.0	87.6
				B. Maturities Over One Year Up To Two Years					
93.12	6.2	8.9	5.6	4.6	4.0	1.3	7.7	2.2	0.7
94.6	4.9	9.5	5.5	3.4	4.7	1.9	7.7	2.2	0.4
94.12	4.8	9.8	5.1	6.2	3.5	1.7	7.0	2.1	0.9
95.6	5.5	7.6	3.8	9.2	3.2	1.6	7.3	1.8	1.0

95.12	5.6	7.1	3.3	6.8	4.1	2.9	7.4	2.0	1.1
96.6	5.9	7.0	3.9	4.1	4.9	2.6	8.2	2.4	1.4
96.12	6.9	6.5	4.1	3.2	4.3	2.2	7.6	2.5	1.0
97.6	6.6	6.0	4.0	2.1	2.3	0.9	6.5	2.0	0.8
97.12	7.1	6.3	5.5	3.3	2.2	1.1	6.1	2.8	1.0
98.6	9.1	7.4	12.8	4.3	4.6	1.7	6.5	3.9	2.3
				C. Maturities Over Two Years					
93.12	19.3	26.5	17.2	30.7	48.1	5.2	40.5	8.1	2.9
94.6	18.4	26.8	13.9	30.8	45.9	4.7	42.1	8.0	3.3
94.12	21.8	26.6	14.4	35.9	45.3	7.2	38.8	8.2	4.0
95.6	20.2	27.3	15.1	32.0	44.4	5.5	41.3	8.1	3.6
95.12	21.6	27.7	15.5	34.1	41.3	8.9	35.8	8.7	4.5
96.6	21.5	28.8	15.3	36.9	34.4	10.1	35.1	9.8	4.1
96.12	23.3	27.6	15.9	32.9	30.9	11.6	35.5	11.0	5.0
97.6	23.8	29.0	15.7	28.6	27.7	10.3	33.5	11.2	4.7
97.12	23.5	29.6	17.5	34.2	31.9	14.1	32.9	13.2	5.6
98.6	27.3	34.3	26.1	37.3	32.6	14.9	33.7	14.9	7.9

Sources: BIS (1995) for 93.12 data; BIS (1996) for data from 94.6 to 95.12; BIS (1998b) for data from 96.12 to 97.12; BIS (1998a) for 98.6 data.

Table 4.5 **Percentages of Short-Term Loans Whose Maturities are Less Than or Equal to One Year**

	93.12	94.6	94.12	95.6	95.12	96.6	96.12	97.6	97.12
All countries	53.04	53.67	53.59	55.53	55.29	55.53	55.1	56.28	54.88
Developed countries	53.21	53.62	52.79	55.98	53.6	52.21	53.22	53.98	53.51
Eastern Europe	37.15	36.45	35.19	39.65	39.08	41.85	44.19	50.68	43.4
Developing countries	55.93	56.69	57.05	58.69	58.41	58.8	57.66	58.18	58.1
Latin America	48.83	50.07	51.27	52.86	52.25	53.08	53.67	52.51	54.76
Middle East	66.6	62.16	59.61	58.7	59.13	60.15	56.71	62.14	59.94
Africa	45.82	47.57	50.24	52.52	53.11	52.12	49.75	50.93	56.26
Asia	63.02	63.82	62.86	64.07	63.45	63.32	61.5	62.31	60.6
East Asia excluding Hong Kong and Singapore									
Thailand	72.03	74.29	70.58	71.18	69.42	68.92	65.15	65.67	65.91
Indonesia	61.65	60.91	60.88	62.53	61.93	60.01	61.68	59.02	60.6
Korea	70.63	72.53	70.93	72.01	70.01	70.81	67.54	68.07	63.12
Malaysia	56.76	59.12	48.76	49.42	47.05	49.71	50.27	56.42	53.08
The Philippines	40.38	44.17	46.43	46.31	48.84	55.1	58.22	59.69	60.43
Taiwan	92.91	92.71	90.41	92.33	87.2	86.36	84.38	87.29	81.71
China	45.53	41.09	43.97	40.2	47.59	48.37	48.87	52.03	53.45
Offshore banking centers	82.29	82.41	81.9	81.68	80.41	75.54	74.26	73.84	72.05
Hong Kong	88.01	88.15	87.59	88.08	86.59	85.11	82.45	82.37	79.2
Singapore	96.01	95.87	94.51	94.91	93.3	93.07	92.6	93.07	91.86
Bahamas	85.80	82.76	84.11	83.79	84.11	87.08	87.08	86.64	85.97
Bahrain	83.04	82.49	77.81	79.57	77.81	71.19	71.19	73.91	73.77

Notes: Asia does not include banking centers such as Hong Kong and Singapore. Unallocated loans are included in total loans.

In the table, average shares of short-term loans in Asia were above 60 percent throughout the periods.[9] This implies that a typical country in the East Asian region had a more vulnerable composition of external debt than did other developing countries. However, even compared to the world standard, shares of short-term loans in the East Asian economies were not necessarily outliers except for Taiwan, Hong Kong, and Singapore. Figure 4.4 is a histogram of short-term loan shares in 180 countries that received the BIS reporting banks' loans in December 1996. It shows that short-term loan shares are greater than 70 percent in a large number of countries in the world. Among the East Asian economies, Taiwan, Hong Kong, and Singapore are three of the outliers that are included in the range over 80 percent. However, except for these economies, Korea is the only East Asian economy included in the range over 70 percent. This implies that shares of short-term loans in the East Asian economies before the crisis were not remarkable outliers even in the world standard.

4.3 Previous Discussions on the Role of Monitoring

In the last section, I showed that middle-term and long-term commercial bank loans were less mobile capital flows in the sense that they never declined, even when panicking external creditors became unwilling to roll over existing short-term credits. However, we also showed that a large fraction of external bank debt had been financed by short-term loans not only in the East Asian countries but also in a large number of countries, which might have made several developing countries vulnerable to liquidity problems. The result may partly be influenced by regulatory factors such as domestic government regulations, the BIS risk-weighted capital adequacy regulation, and so on. However, the world-wide evidence cannot be explained solely by the regulatory factors.

The purpose of the following sections is to present a simple theoretical model in which financial structures in developing countries may become vulnerable as a result of efficient monitoring by competitive foreign banks. In general, it is important for the suppliers of funds (or their agents) to monitor borrowers in order to ensure that funds are used appropriately. In particular, in order to reduce information costs and the costs of duplicate monitoring, the monitoring is usually delegated to financial intermediaries rather than performed by individual investors. In the literature, banks are typical financial intermediaries of such delegated monitors (see Diamond 1984).

In many cases, outside investors are not as well informed beforehand regarding the profitability and risk potential of proposed projects. The monitoring is thus considered economically valuable because it can reduce

9. For example, in December 1996, the share of short-term loans in Bangladesh was 70.4 percent, whereas those of Cambodia, Fiji, and Laos were 86.7 percent.

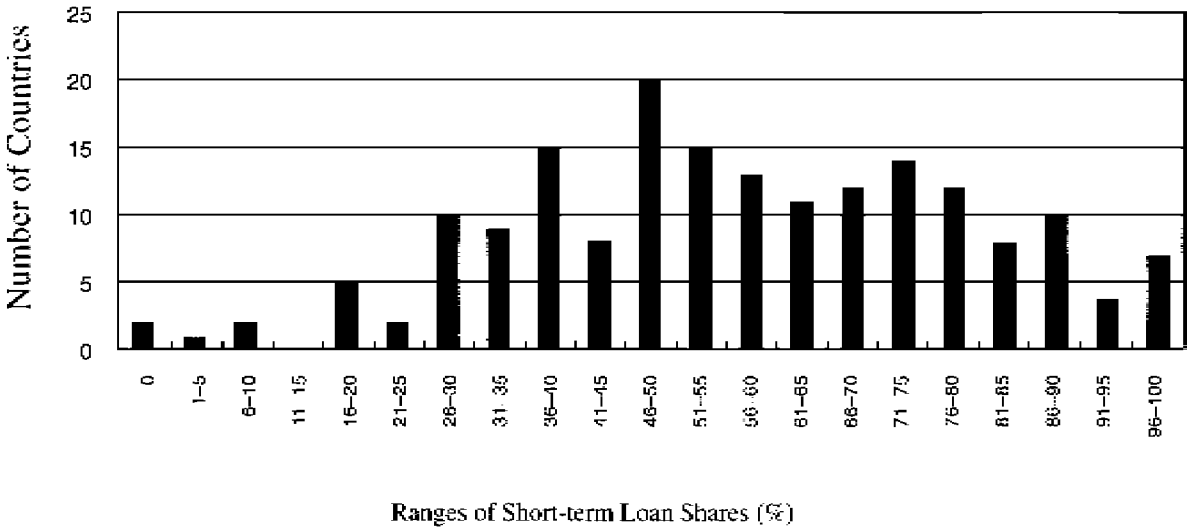

Fig. 4.4 A histogram of short-term loan shares

the degree of the adverse selection problem. It may also be a necessary response to the problem of moral hazard arising from informational asymmetry. In some cases, ex ante monitoring may be performed by investment banks acting as underwriters, by venture capital firms, and so on. Interim monitoring may also be provided by rating companies in that they keep track of the changing financial state of the firm. However, directly placed debt (commercial paper) is usually a contract with terms (covenants). Thus, investors need to base their decisions only on public information, including the borrower's track record. In contrast, the contract of a bank loan uses not only public information but also information from costly monitoring of borrower's actions. Consequently, monitoring of private information can be delegated to banks more efficiently than it can be collected by other financial institutions or many individual investors.

In the following model, we consider the choice of bank loan maturity in an international financial market. In particular, we investigate how the efficiency of banks' monitoring can affect the choice of bank loan maturity. Without the possibility of liquidity shortage due to herd behavior, the choice of bank loan maturity in the international market is similar to that in the domestic market. However, because neither prudential regulation nor a safety net (e.g., deposit insurance) tends to be established well in the emerging market, a liquidity shortage is more likely to occur in the competitive international financial market as the bank loan maturity becomes shorter.

4.4 The Model

We consider a small open economy model that modifies Diamond's (1991, 1993) closed-economy model. In the small open economy, domestic borrowers (that is, domestic firms or domestic financial institutions) need to fund their indivisible investment projects from foreign banks. As in McKinnon and Pill (1996) and Krugman (1998), I assume that domestic borrowers directly own capital and engage in investment projects. Strictly speaking, the assumption may be too restrictive for domestic financial institutions because they generally lend money instead of buying capital assets outright. However, lending to a very highly leveraged firm that engages in risky projects is very much like buying the capital directly. Thus, the assumption holds approximately true for a large number of domestic financial institutions in developing countries.[10]

10. In fact, the data seem to show that the maturity distributions of international loans indicate no significant difference depending on the fact that most domestic borrowers are domestic firms or domestic financial institutions. For example, in Indonesia a large number of domestic firms directly borrowed from foreign banks before the crisis. However, I could not find evidence that the maturity distributions in Indonesia were significantly different from those of other East Asian countries in table 4.4.

In the model are three dates: 0, 1, and 2. All projects require the fixed amount of K in capital at date 0 and produce cash flows only at date 2 (none at date 1). At date 0, each borrower has no internal (domestic) fund or outside equity. Thus, at date 0, a borrower needs to fund external debt of K from foreign banks for the project.

Both domestic borrowers and foreign lenders (that is, foreign banks) are risk neutral. Foreign banks consume only at date 2 and have a constant returns-to-scale investment technology that returns R per unit invested per period. One unit invested at date 0 produces returns of R units at date 1; and if this is invested until date 2, the terminal value will be R^2. There are many potential foreign banks that all observe the same information. Thus, borrowers face a competitive international loan market at each date and can borrow as long as lenders receive an expected return of R per period per unit loaned.

Borrowers' technological environments are summarized in figure 4.5. When successful, each borrower's project yields a cash flow of X. It also produces a nonassignable control rent of C if the management has control right at date 2. Examples of the nonassignable control rent might be the

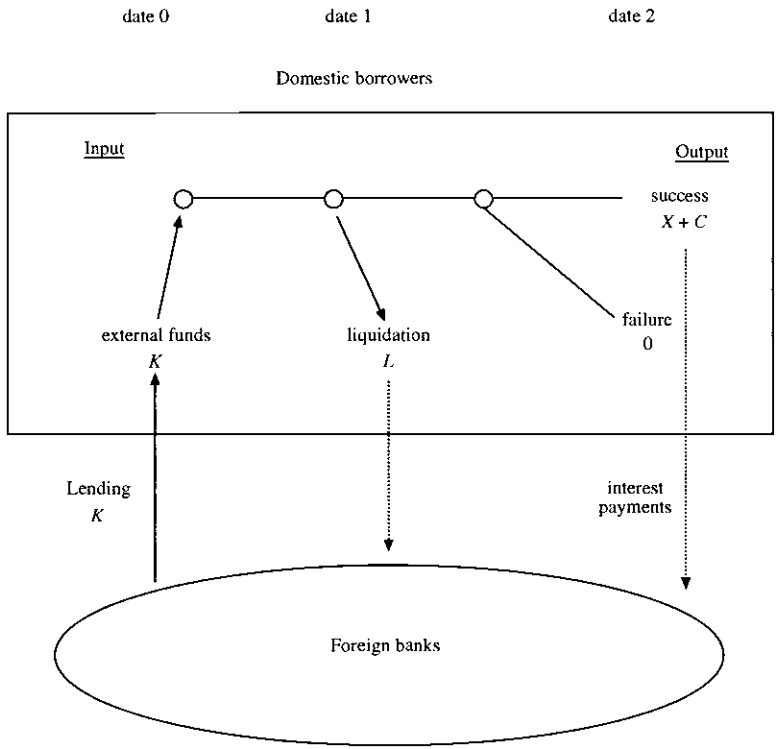

Fig. 4.5 Technological environments of borrowers

manager's desire to keep his business going, the manager's consumption of perquisites, or the manager's disutility from dismissing long-standing employees. I assume that $X > R^2K$ and $C > 0$.

The project can be liquidated at date 1 for a liquidation value of L. Because $C > 0$, no borrowers have an incentive to liquidate their projects by themselves. However, foreign banks liquidate their borrower's project at date 1 either when its expected present value is less than L or when a financial panic occurs against the borrower. If a project is liquidated, it produces no cash flows nor control rents at date 2. In addition, the liquidation value of L is assumed to be less than RK. This implies that a successful project always yields a higher cash flow when not liquidated.

There are two types of borrowers. The two types of borrowers differ only in the probability that their projects are successful at date 2. The types of borrowers are characterized as follows.

Type G borrower: The project succeeds for sure at date 2.
Type B borrower: The project returns succeed with probability q but fail with probability $1 - q$, where $qX < R^2K$.

Because the control rent of C is positive, borrowers never liquidate their projects when they have the control right to force the liquidation. However, since $X > R^2K > qX$, the type B borrower's project has a negative net present value in terms of cash flows. Thus, when foreign banks find out that the borrower is type B, the type B borrower cannot raise funds.

The key assumption in this model is that a project's ex ante prospects are private information observed only by the domestic borrower. No one but the borrower knows his own type. Each foreign bank's information set on borrowers' type, which is summarized in figure 4.6, is as follows.

At date 0 (the initial period), a foreign bank only knows that its domestic borrower is type G with probability f and type B with probability $1 - f$. I assume that

$$R^2K \leq [f + (1 - f)q]X. \tag{1}$$

This assumption implies that on average the project has a positive net present value in terms of cash flows. The assumption is realistic for developing countries with high growth rates such as the East Asian economies before the crisis. It is, however, restrictive for stagnated developing countries or countries in crisis because the average project has low net present value in these countries. In section 4.8 I will discuss how the main results change when the assumption does not hold.

At date 1, each foreign bank's monitoring partially reveals types of domestic borrowers. That is, the monitoring identifies some type G and type B borrowers, but it cannot identify all type G and type B borrowers. Define e as the probability that the monitoring identifies the type among type G borrowers at date 1 and m as the probability that the monitoring identifies the type among type B borrowers at date 1. Then, given the previous

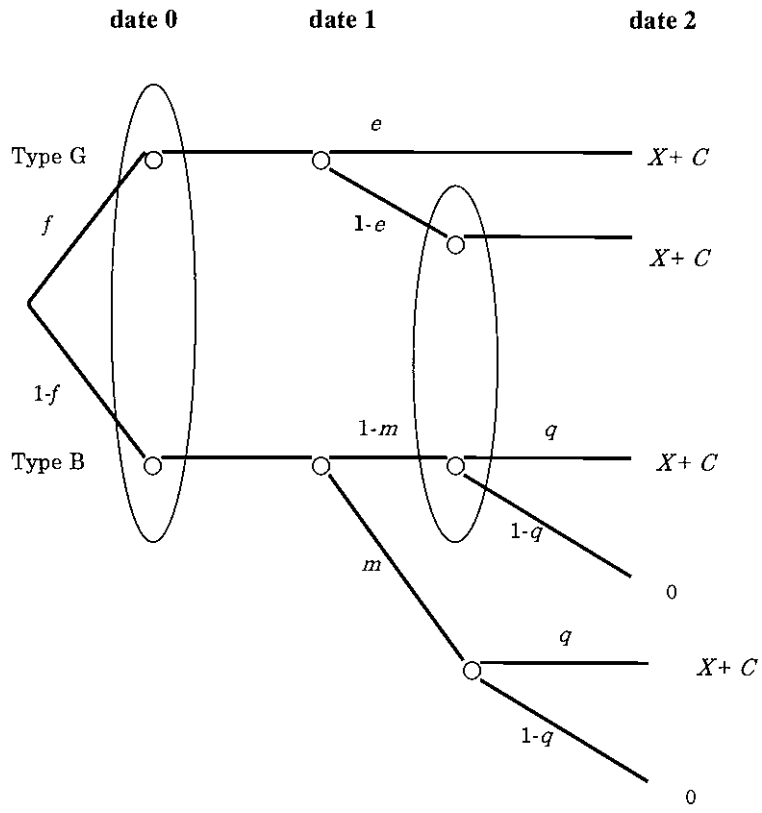

Fig. 4.6 Information structure of foreign banks

assumptions, Bayes law implies that a borrower whose type was not identified at date 1 is type G with probability $(1-e)f/[(1-e)f+(1-m)(1-f)]$ and type B with probability $(1-m)(1-f)/[(1-e)f+(1-m)(1-f)]$.

It is easy to see that the larger e and m are, the more efficient the foreign bank's monitoring is. However, the revealed information at date 1 is not verifiable, so contracts contingent on it are not enforceable in the international capital market. Thus, only when a short-term loan is chosen, refinancing at date 1 will depend on what foreign banks can find out about types of borrowers.

4.5 Loan Contracts

4.5.1 Long-Term Loan

A *long-term loan* is bank debt floated at date 0 that matures at date 2, with no refinancing at date 1. The face value r^L of this debt is set so that

foreign banks can obtain the expected return of R^2 per unit invested. Under the assumption that $qX < R^2K \leq [f + (1 - f)q]X$, we can verify that the equilibrium with long-term loans is a pooling equilibrium, realizing that debt is repaid with probability $f + (1 - f)q$. Thus, as long as $r^L \leq X$, the face value of a long-term loan is given by[11]

$$r^L = R^2K/[f + (1 - f)q]. \tag{2}$$

The lower f is, the higher is the promised interest r^L, owing to the higher default rate of type B borrowers. In other words, reflecting a risk premium, the long-term interest rate becomes higher as the proportion of type B borrowers becomes larger.

Recall that at date 1, each foreign bank's monitoring might reveal information about some type G and type B borrowers. However, the information does not influence the face value of long-term loan and does not lead to liquidation because long-term lenders have no such rights.[12] Therefore, the payoff of a type G borrower with a long-term loan is equal to

$$\begin{aligned} \Pi_g^L &= X + C - r^L \\ &= X + C - R^2K/[f + (1 - f)q], \end{aligned} \tag{3}$$

which is independent of e and m (i.e., the degree of foreign banks' monitoring efficiency).

On the other hand, the expected payoff of a type B borrower with long-term loan is equal to

$$\begin{aligned} \Pi_b^L &= q(X + C - r^L) \\ &= q(X + C) - qR^2K/[f + (1 - f)q]. \end{aligned} \tag{4}$$

Because $[f + (1 - f)q]X > qR^2K$ and $C > 0$, it always holds that $\Pi_g^L > \Pi_b^L > 0$.

4.5.2 Short-Term Loan

A *short-term loan* is bank debt financed at date 0, maturing at date 1 with face value r^1. At date 1, the short-term loan can be either refinanced or repaid, at least partially, by liquidation of the project. If the short-term loan is rolled over at date 1, the refinanced short-term loan matures at date 2. The refinanced short-term loan at date 1 has different face values depending on the realization of date 1 information. Each face value of the short-term loan issued at date 1 is set so that foreign banks at date 1 get

11. If $r^L > X$, borrowers cannot issue long-term debt because they cannot provide lenders with an expected return of R^2K. Because $R^2K \leq [f + (1 - f)q]X$, we can rule out this possibility in the following analysis.

12. When C is small, renegotiation between lenders and borrowers may be possible. However, assuming that C is large enough rules out this possibility.

an expected return of R per unit invested, given the information about a borrower at that date.

Short-term borrowers who were identified as type G at date 1 will succeed the project with a probability of 1. Thus, unless a financial panic occurs, each of them can always refinance to pay the full face value of the debt r^1 at date 0. Noting that a new short-term loan maturing at date 2 is repaid with probability 1, the face value of this short-term loan issued at date 1, which is denoted by r^B, satisfies

$$r^B = r^1 R. \tag{5}$$

However, the determination of the face value of a short-term loan issued at date 1 is more complicated for borrowers whose type was not identified, because even if no financial panic occurs, the borrowers might not be able to refinance to pay the full face value of their date 0 debt. In the following sections (up to section 4.8), I consider the case in which foreign banks always choose liquidation when their monitoring cannot identify the type of borrowers at date 1.[13] In this case, foreign banks liquidate their borrower's project at date 1 either when their monitoring cannot identify the borrower's type, when their monitoring identifies the borrower as type B, or when a financial panic occurs in this lending market. I assume that even if the borrower was identified as type G, a financial panic occurs for him with probability $1 - \theta$.

Because lenders can identify type G borrowers out of all borrowers with the probability fe at date 1, the expected rate return for a date 0 short-term lender is $\theta fe\, r^1 + (1 - \theta fe)L$, where L is a liquidation value of the project. Equating this to the one-period riskless return RK leads to

$$r^1 = [RK - (1 - \theta fe)L]/(\theta fe), \tag{6}$$

so that equations (5) and (6) lead to

$$r^B = [RK - (1 - \theta fe)L]R/(\theta fe). \tag{7}$$

Because $RK \geq L$, both r^1 and r^B are decreasing in f. Thus, the short-term interest rates also become higher as the proportion of type B borrowers becomes larger, due to a risk premium.[14]

The payoff of a type G borrower with a short-term loan is

(8a) $X + C - r^B$ when the project is not liquidated at date 1,

13. This case is more likely when the bank's monitoring reveals more type G borrowers than type B borrowers. I think that the case is realistic because type G borrowers have an incentive to reveal their type, but type B borrowers do not.

14. Because X is the maximum amount that type G borrowers can repay for the banks, r^B needs to be less than X for the short-term loans to be supplied. In the following analysis, I implicitly guarantee this condition assuming that $R^2K \leq (1 - \theta fe)RL + \theta feX$.

and

(8b) 0 when the project is liquidated at date 1.

Because the ex ante probability that the project is liquidated at date 1 is θe at date 0, the expected payoff of a type G borrower with a short-term loan S at date 0 is

$$\Pi_g^S = \theta e(X + C - r^B) = \theta e(X + C - RL) - (1/f)R(RK - L). \tag{9}$$

Because all type G borrowers are identical at date 0, Π_g^S is common for all type G borrowers. It is easy to see that Π_g^S is increasing in e (i.e., the degree of foreign banks' efficiency to sort out type G borrowers). However, it is independent of m (i.e., the degree of foreign banks' efficiency to sort out type B borrowers).

4.6 The Maturity Choice by Borrowers

In our model, domestic borrowers choose the maturity of their external loans at date 0 in order to maximize their expected payoffs. However, because $qX < R^2K$, choosing a maturity that only type B borrowers would prefer would reveal that the borrower was type B, and no loan would be made to him. Therefore, as long as the expected payoff rate of a type B borrower is positive, the maturity of a bank loan that is chosen by type G borrowers is also chosen by type B borrowers. Assuming the existence of such a pooling equilibrium, this indicates that all borrowers choose short-term loans if $\Pi_g^L < \Pi_g^S$ but choose long-term loans otherwise.

Subtracting equation (9) from equation (3) leads to

$$\Pi_g^L = \Pi_g^S = (1 - \theta e)(X + C) - (1/f)R(1 - \theta fe)L + \frac{(1 - f)q}{[f + (1 - f)q]f} R^2K. \tag{10}$$

Thus, in this international financial market all domestic borrowers choose short-term loans if and only if

$$(1 - \theta e)(X + C - RL) + \frac{(1 - f)q}{[f + (1 - f)q]f} R^2K < \left[\frac{(1 - f)}{f}\right]RL. \tag{11}$$

Equation (11) has two noteworthy implications for the terms to maturity in international bank loans. The first is that given other parameters, an increase in θ makes equation (11) more probable. Because θ denotes the probability that a financial panic will not occur, this implies that foreign banks tend to choose short-term loans when they are optimistic about the

borrowers' financial conditions. The intuition behind this result is that when lenders perceive that liquidity risk is small, long-term contracts appear less attractive for lenders.

Because foreign lenders were optimistic about the precrisis East Asian economies, the result can explain why the East Asian economies had comparatively higher shares of short-term loans in the world standard before the crisis.[15] It may also imply that some optimistic confidence made the precrisis East Asian economies vulnerable to the crisis not only through increasing the total amount of external liabilities but also through making their terms to maturity shorter.

The second noteworthy implication is that given other parameters, an increase in e makes equation (11) more probable. Because the value of e is a proxy for the degree of monitoring efficiency, this implies that borrowers tend to choose short-term loans when monitoring can make use of new information arrival efficiently. In general, short-term debt can lower a good borrower's expected financing cost because of a possible arrival of good information. Thus, when lenders can make use of additional credit information arrival more efficiently by ex post monitoring, short-term debt will be preferred in debt contracts.

The latter implication is important in considering the choice of bank loan maturity because banks usually have better monitoring abilities than do other financial intermediaries. The result generally predicts that efficient monitoring activities by banks tend to make the debt maturity composition shorter. Without the possibility of unnecessary liquidation, the efficient monitoring might have a positive effect on economic welfare. However, without prudential regulation or a safety net in the international financial market, the efficiency of banks' monitoring can increase the possibility that an otherwise solvent country may suffer a short-run liquidity problem. The negative consequence is particularly likely when the available stock of reserves is low relative to the overall burden of external debt service.

This theoretical result is consistent with the empirical fact that a large fraction of external bank debt had been financed by short-term loans in a large number of countries, which might make several developing countries vulnerable to liquidity problems. In particular, because the East Asian crisis took the form of a pure liquidity shortage in private bank loans, the experience of several Asian countries in 1997 may provide striking examples of such negative consequences of efficient bank monitoring.

15. In table 4.4, one finds remarkably high shares of short-term loans in Taiwan. This finding may be consistent with our result because large amounts of foreign reserves made a financial panic least likely in Taiwan.

4.7 Discussions

I have discussed how the maturity of bank loans is determined in the competitive international financial market. The results are, however, based on several assumptions that may not be relevant for some developing countries. For example, my simple theoretical model did not take into account several regulatory factors in the international loan market. In reality, the maturity structure of international bank loans may have been influenced not only by the government policy to regulate long-term capital inflows but also by the regulations on foreign banks such as the BIS risk-weighted capital regulation, which favors short-term loans. In terms of this theoretical analysis, these regulatory factors can be modeled as taxes on long-term loans. Thus, if these factors exist, short-term loans would be chosen even under relatively milder conditions in our model.

In addition, this model assumed that borrowers face a competitive international loan market. The assumption may be justified when a large number of potential foreign lenders are in the international loan market. In particular, the assumption may be realistic for the East Asian economies before the crisis, during which time many foreign banks competed with others in the loan market under the lending boom. However, in several developing countries, private loans from foreign banks took the form of syndicated loans. Under such circumstances, borrowers in developing countries did not necessarily face a competitive international loan market.

Without rigorous analyses, it is not clear how the main results will change when foreign banks have some monopolistic power in the international loan market. However, even when the international loan market is not competitive, it is always true that efficient monitoring activities can make use of new information arrival more efficiently under asymmetric information between lenders and borrowers. Thus, I conjecture that under some mild conditions, monopolistic foreign banks can still have an incentive to choose short-term loans when they have better monitoring abilities.

Finally, our model assumed equation (1), under which the average project in the economy has a positive net present value. In general, however, we cannot rule out the case in which equation (1) does not hold. In fact, equation (1) does not hold when the average project in the economy has a negative net present value in terms of cash flows, i.e., when $R^2K > [f + (1 - f)q]X$. I think that the case is unrealistic for the East Asian economies before the crisis because their expected growth rates were very high. However, it may hold true for several stagnant developing countries where the percentage of bad quality borrowers in the economy is large.

When $R^2K > [f + (1 - f)q]X$ holds in the model, a long-term loan is never supplied by foreign banks at date 0 because foreign banks cannot get the expected rate return of R^2. However, as long as $R^2K \leq (1 - \theta fe)RL$

$+ \theta feX$ holds, short-term loan can be supplied by foreign banks at date 0. This implies that when the average project in the economy has a negative net present value, foreign banks provide only short-term loans to the economy.

Although the analysis focused on international bank lending, the result may be extended to explain several noteworthy events in the international bond market for some stagnant developing countries.[16] For example, in 1994 foreign investors refused to purchase long-term Mexican government bonds because of the likelihood of a devaluation of the Mexican peso. As a result, in Mexico the term structure of government bonds shifted to the shortend before the eventual crisis in December 1994.[17] Similarly, in 1998 foreign investors became skeptical about the sustainability of fiscal deficits in Russia. As a result, they shifted their investment to short-term Russian bonds before the eventual devaluation of the ruble.[18] Although these events happened in the bond market rather than in the loan market, they are consistent with the previous discussions, which allowed for the case that $R^2K > [f + (1 - f)q]X$ in our model.

4.8 Some Extensions

In previous sections, I have considered the case in which foreign banks always choose liquidation when their monitoring cannot identify the type of borrowers at date 1. However, when the bank's monitoring reveals more type B borrowers than it does type G borrowers, this case becomes less likely because the percentage of type G borrowers becomes larger among unidentified borrowers. In this section, I discuss how our main results would change if foreign banks never liquidate the projects of unidentified borrowers at date 1.[19]

For analytical simplicity, we assume that the probability of a financial panic is 0 (i.e., $\theta = 1$). Then, when the projects of unidentified borrowers are never liquidated, foreign banks liquidate the borrower's project at date 1 if and only if the monitoring identifies the borrower as type B. Because the percentage of identified type B borrowers among all borrowers is $m(1 - f)$ at date 1, this implies that the expected rate of return for a date 0 short-term lender is equal to $[1 - m(1 - f)]r^1 + m(1 - f)L$, where r^1 is the face value of short-term loan issued at date at date 0, maturing at date 1. Equating this to the one-period riskless return RK leads to

16. The following arguments were suggested by Takatoshi Ito.
17. The Mexican government also had to issue dollar-linked government bonds.
18. However, investors were to be surprised at eventual de facto default of the bonds.
19. However, I do not think that the case where the bank's monitoring reveals type B borrowers more than it does type G borrowers is realistic in many countries because type G borrowers have an incentive to reveal their type, but type B borrowers do not.

$$r^1 = [RK - m(1 - f)L]/[1 - m(1 - f)]. \tag{12}$$

Recall that at date 1 unidentified borrowers are type G with probability $(1 - e)f/[(1 - e)f + (1 - m)(1 - f)]$ and type B with probability $(1 - m)(1 - f)/[(1 - e)f + (1 - m)(1 - f)]$. Recall also that type G borrowers succeed for sure and that type B borrowers succeed with probability q at date 2. Then, when a new short-term loan is supplied to them at date 1, the new short-term loan maturing at date 2 is repaid with probability $[(1 - e)f + (1 - m)(1 - f)q]/[(1 - e)f + (1 - m)(1 - f)]$. This implies that the face value of a short-term loan issued for unidentified borrowers at date 1, which is denoted by r^C, needs to satisfy

$$\frac{(1 - e)f + (1 - m)(1 - f)q}{(1 - e)f + (1 - m)(1 - f)} r^C = r^1 R. \tag{13}$$

For borrowers who were identified as type G, the face value of a short-term loan issued at date 1, r^B, is determined by equation (5), that is, $r^B = r^1 R$. Therefore, equations (5), (12), and (13) lead to

$$r^B = \frac{RK - m(1 - f)LR}{1 - m(1 - f)}, \tag{14}$$

$$r^C = r^B \frac{(1 - e)f + (1 - m)(1 - f)}{(1 - e)f + (1 - m)(1 - f)q} > r^B. \tag{15}$$

When the project of unidentified borrowers is never liquidated, the payoff of a type G borrower with short-term loan is written as

$$X + C - r^B \quad \text{when the type is identified at date 1,} \tag{16a}$$

and

$$X + C - r^C \quad \text{when the type is not identified at date 1.} \tag{16b}$$

Because a type G borrower is identified at date 1 with probability e, the expected payoff of a type G borrower with a short-term loan at date 0 can be calculated as

$$\begin{aligned} \Pi_g^S &= e(X + C - r^B) + (1 - e)(X + C - r^C) \\ &= X + C - r^B \frac{(1 - e)f + (1 - m)(1 - f)[1 - (1 - q)e]}{(1 - e)f + (1 - m)(1 - f)q}. \end{aligned} \tag{17}$$

As was Π_g^S in equation (9), Π_g^S in equation (17) depends on the parameter e. However, contrary to Π_g^S in equation (9), Π_g^S in equation (17) also depends on the parameter m, i.e., the degree of foreign banks' efficiency to sort out type B borrowers.

Subtracting equation (17) from equation (3) leads to

$$(18)\quad \Pi_g^L - \Pi_g^S = -r^L + er^B + (1-e)r^C$$
$$= r^B \frac{(1-e)f + (1-m)(1-f)[1-(1-q)e]}{(1-e)f + (1-m)(1-f)q} - \frac{R^2K}{f + (1-f)}.$$

That all borrowers choose short-term loans if and only if $\Pi_g^L < \Pi_g^S$ implies that all domestic borrowers choose short-term loans if and only if $r^L > e r^B + (1-e)r^C$, or equivalently,

$$(19)\quad r^B \frac{(1-e)f + (1-m)(1-f)[1-(1-q)e]}{(1-e)f + (1-m)(1-f)q} < \frac{R^2K}{f + (1-f)}.$$

After some tedious calculation, I can verify that given other parameters, an increase in e makes the inequality in equation (19) more probable. Thus, even in cases in which unidentified borrowers are never liquidated, foreign banks that have the better monitoring ability to sort out type G borrowers will tend to choose short-term loans.

In contrast, the effect of the parameter m on equation (19) is not clear in general. In particular, when L is small enough, an increase in m makes the inequality in equation (19) less probable. Thus, under some circumstances foreign banks with better monitoring ability to sort out type B borrowers may choose long-term loans. However, when L is close to RK, an increase in m makes the inequality in equation (19) more probable. Thus, at least when a liquidation value is large, foreign banks with better monitoring ability to sort out type B borrowers can tend to choose short-term loans even when unidentified borrowers are never liquidated.

4.9 Concluding Remarks

In this paper, I first demonstrated that middle-term and long-term commercial bank loans are less mobile forms of external liabilities. I also showed that a large fraction of external bank debt had been financed by short-term loans not only in the East Asian countries but also in a large number of other countries. I then presented a simple theoretical model in which the financial structure may become vulnerable as a result of banks' efficient monitoring activities.

In the literature of corporate finance, a large number of studies stressed the positive role of banks as delegated monitors that specialize in gathering information about borrowers. It is probably true that when government regulations are established well in the financial market, the efficient role of banks as delegated monitors unambiguously improves economic welfare. For example, in Japan during the 1950s and 1960s, nearly 90 percent of loans supplied by the city and local banks were short-term funds whose

Table 4.6 **Percentage Distribution of Outstanding Loans and Discounts by Maturity: The Case of Japan during High Growth Period**

End of Year	3 months and less	3 months–1 year	More than 1 year	Overdrafts
City banks				
1955	76.2	17.7	5.1	0.9
1960	70.0	22.4	6.4	1.2
1965	53.7	35.2	10.0	1.1
1970	53.0	32.2	13.7	1.1
1975	40.4	28.8	29.3	1.5
Local banks				
1955	78.5	12.7	7.6	1.2
1960	68.6	22.2	8.4	0.8
1965	53.5	34.8	11.1	0.6
1970	45.6	35.3	18.5	0.5
1975	36.3	31.2	31.7	0.8

Sources: Bank of Japan, Economic Statistics Annual, various issues.

terms to maturity was less than one year (see table 4.6). If a financial panic was likely, the financial structure in Japan would have been vulnerable to a liquidity shortage. However, under strict administrative regulations, a financial panic never occurred in Japan during the 1950s and 1960s. As a result, short-term loans made a significant contribution for remarkable economic growth in postwar Japan under the regulated financial market.

Unfortunately, we can expect neither satisfactory government regulation nor a safety net (say, deposit insurance) in the current international financial market. Given the circumstances, efficient monitoring activities by competitive banks are not necessarily desirable. In other words, international bank lending may have an ironic consequence that an improvement of bank's monitoring ability can increase the possibility of an unnecessary liquidity shortage and may have a negative effect on economic growth.

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Comment Takatoshi Ito

I have two kinds of comments on Fukuda's paper. First, I will examine the plausibility of the basic assumptions on information asymmetry and their implications; second, I will comment on the data interpretation.

Basic Assumptions

This paper sets up a theoretical model of asymmetric information on bank lending, motivated by recent problems in international bank lending to Asian countries (as shown by the author, citing statistics collected by the Bank for International Settlements [BIS]). Given how important international bank lending has been in Asian economies, both positively (before the crisis) and negatively (during the crisis), a contribution on understanding banks' lending behavior is welcome.

In Fukuda's model, borrowers know that they are of either good type (higher probability to succeed) or bad type (lower probability to succeed). Lenders cannot distinguish between them when making bank loans, unless they behave differently. Lending can be made for either one period or two periods; bank monitoring reveals some of the good borrowers after one period. Knowing this monitoring activity, good-type borrowers have incentive to borrow short (one-period loans) in the hope that they may be identified as being of good type. The tradeoff for going short is that, after one period, there may be a bank run, and even good-type borrowers would not have a rollover of bank loans. Without a rollover, only a fraction of a project is recovered in the process of liquidation. If good-type borrowers choose to borrow short, then bad-type borrowers must also borrow short in order to avoid being identified as bad. Comparative statics shows that if the proportion of the good-type borrower is higher, then good-type borrowers tend to borrow short. If monitoring to identify good-type borrowers after one period becomes more accurate, good-borrowers tend to borrow short.

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