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Systemic Banking Distress: The Need for an Enhanced Monetary Survey

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Abstract

This paper suggests that, in cases of severe banking distress, reliance on the standard monetary survey may be misleading because the classification of monetary aggregates results in an overestimation of both credit to the economy and the availability of deposits. Therefore, whenever feasible, adjustments should be made to help overcome these shortcomings and enhance the operational value of the monetary survey. Such an enhanced monetary survey can also be used to compute standardized indicators of systemic banking distress. The analysis builds on the authors' experience with Mongolia, and is illustrated with quarterly data for that country.

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I. Introduction

This paper suggests that, in cases of severe banking distress, reliance on the standard monetary survey may be misleading because the standard classification of monetary aggregates overestimates both credit to the economy and the availability of deposits. The paper goes on to explain the adjustments that should to be made, whenever feasible, to help overcome these shortcomings and enhance the operational value of the monetary survey. Such an enhanced monetary survey can also be used to compute *standardized indicators of systemic banking distress*. The analysis builds on the authors' experience with Mongolia, which faced acute banking problems while negotiating for use of Fund resources, and is illustrated with quarterly data for that country.

Section II describes the development of monetary aggregates in Mongolia from the perspective of the standard monetary survey. Section III explains why severe systemic banking distress made the interpretation of events based on the standard monetary survey inadequate and misleading. Section IV details the main adjustments required to compile a more accurate enhanced monetary survey. Section V assesses ways in which the enhanced monetary survey could be used to develop standardized indicators of systemic banking distress, and these indicators are more fully described in the Appendix. Section VI concludes by highlighting some implications for the implementation of monetary policy, the design of financial programs, and the monitoring of systemic banking problems.

II. Monetary Developments and the Standard Monetary Survey

The standard monetary survey in Table 1 below, compiled by the authorities, summarizes developments in the main monetary aggregates in Mongolia between end-1995

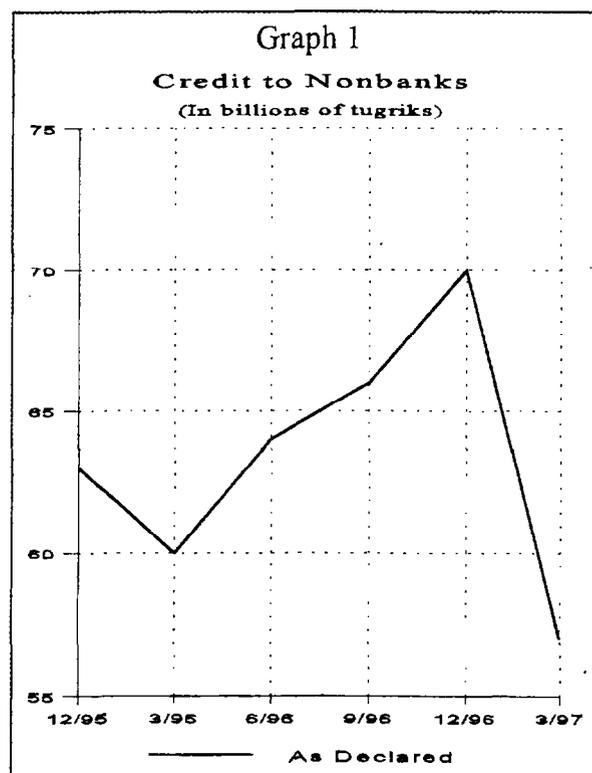
The standard monetary survey in Table 1 below, compiled by the authorities, summarizes developments in the main monetary aggregates in Mongolia between end-1995 and end-March 1997, based on figures reported by deposit money banks, including the central bank. The figures for end-1996 onward incorporate the effects of bank restructuring launched in December 1996, which included the closure of two large insolvent banks, and the issuance of government bonds in place of their nonperforming loans. For our purposes, the two monetary aggregates of interest are credit to the nongovernment nonbank domestic sector and broad money, which represent, respectively, the core of commercial banks' assets and liabilities, i.e. loans and deposits. Credit extended to nonbanks has a large direct impact on the growth rate of output, while the private sector's desire to hold money balances in the banking system (the demand for money) is an important determinant of the rate of inflation.

Table 1. Monetary Survey - As Declared						
	12/95	3/96	6/96	9/96	12/96	3/97
Net foreign assets	46.5	38.8	34.8	46.0	68.6	79.5
Net domestic assets	55.5	63.2	71.9	69.2	59.8	35.0
Domestic credit	59.7	62.6	73.3	62.4	90.2	82.5
to Government	(2.9)	3.0	9.7	(3.9)	19.9	25.7
to nonbanks	62.6	59.6	63.6	66.3	70.3	56.8
Other items net	(4.2)	0.6	(1.4)	6.8	(30.4)	(47.5)
Broad Money	102.0	102.0	106.7	115.2	128.4	114.5

A. Credit to nonbanks

terms.² In such a presentation, gross credit to nonbanks includes current loans, principal and interest in arrears, capitalized interest, and non-performing loans at face value. Provisions against nonperforming loans are treated as capital and appear in other items net (OIN). When the necessary loan-loss provisions are made, the increase in provisions is offset either by a decline in profits or a reduction in capital, and OIN, credit to nonbanks and NDA remain unchanged.

Graph 1 shows that following an initial moderate reduction, the volume of credit to nonbanks steadily increases until a point of crisis is reached in December 1996 in the form of an acute liquidity shortage as the increase in gross claims reflects the financing of borrowers' accumulated losses rather than the healthy expansion of business activity. As is typical in such cases, the fact that a number of banks carried a high proportion of nonperforming loans in their portfolios was well-known, and



could have been assessed to some extent, long before the crisis arose. Although the correct amount of provisions against nonperforming loans was booked in December, as explained above, this adjustment is not reflected in the standard monetary survey until end-March 1997, when the write-down of bad assets is carried out, assumed by the government, and

²/ IMF, *Draft Manual on Monetary and Financial Statistics*; July 1997; p.5-18.

accordingly incorporated into the monetary survey.³ As a result, the recorded outstanding stock of credit to nonbanks declines sharply to the true underlying level.

Until end-1996 when bank restructuring was launched, the standard monetary survey provides no warning that: (i) a significant proportion of credit growth to nonbanks was artificial, and (ii) new potentially productive credit flows were overestimated. Thus, the standard monetary survey provides no indication of the underlying systemic distress of the banking system.

B. Broad money

In the standard monetary survey, domestic monetary liabilities form the counterpart to the sum of net domestic assets and net foreign assets, and are typically classified according to type of instrument, comprising currency in circulation and liabilities of depository institutions, including foreign currency deposits.

The evolution of broad money in our example is shown in Graph 2. Except for the first quarter of 1996, there is a strong growth until end-1996. The sudden drop in early 1997 reflects the liquidations of two large insolvent banks, which resulted in the partial write-down of some depositors' claims.

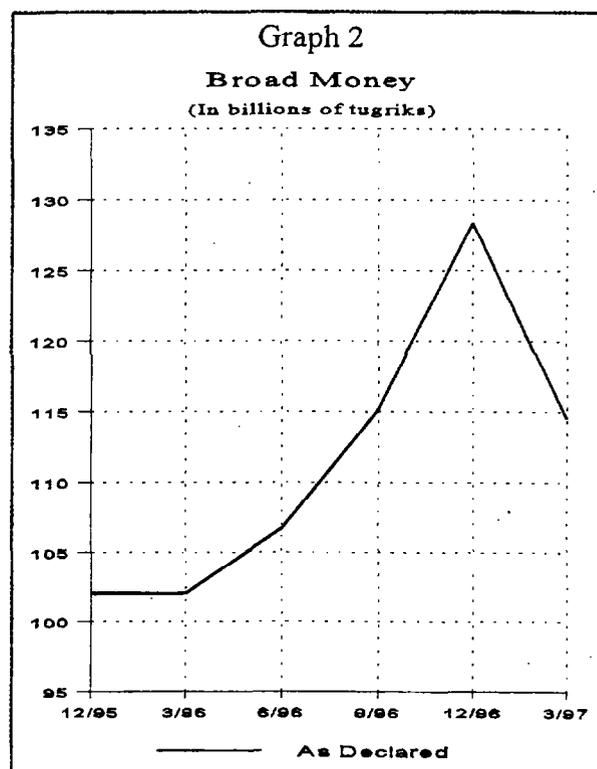
The indication provided by the standard monetary survey is that the accumulation of banking problems did not restrain money growth, while the bank resolution which began at

³/ The stock and flow effects on the standard monetary survey *after* recapitalization and the issuance of government bonds is analyzed in T. Lane, *The First-Round Monetary and Fiscal Impact of Bank Recapitalization in Transition Economies*; IMF, PPAA/96/8 (August 1996); p.16-17.

end-1996 had a strong and sudden restrictive effect on the availability of money, through the partial cancellation of some deposits.

III. Limitations of the Standard Monetary Survey in Case of Systemic Banking Distress

In normal circumstances, the standard monetary survey represents an accurate account of monetary and credit developments. However, in cases of banking distress, experience has shown, in Mongolia and elsewhere, that regardless of the legal reporting requirements, problem banks conceal and mis-report their true financial condition, often for long periods of time. This applies across all types of economies, regardless of their stage of



development. Even in cases where the supervisory authority has some knowledge of this, the information is rarely acted upon, through on-site inspections and/or portfolio audits, and therefore not correctly reflected in the monetary aggregates of broad money, net domestic credit, and other items net. As a result, the standard monetary survey becomes increasingly distorted and ceases to be a useful analytical and policy tool which accurately reflects the underlying reality of monetary developments.

A. Causes of inaccurate reporting by distressed banks

Banks have strong incentives to conceal any deterioration in their financial condition. As confidence plays a major role in banking, there is a natural tendency for banks to conceal

emerging difficulties, while trying to reverse their deteriorating financial position. In all countries, credit risk and non-performing loans are still the principal cause of bank problems. However, even experienced supervisory authorities find it difficult to accurately determine when a bank loan ceases to be a revenue generating asset and becomes nonperforming. As a result, it becomes increasingly difficult to ascertain whether the increase in gross claims reflects a healthy expansion of business activity or the financing of the borrowers' accumulating losses. Moreover, whereas other businesses generally need to generate a net income to remain liquid, banks can remain liquid even when they make losses and become insolvent, as long as they attract new deposits.⁴ In fact, in most cases, insolvency precedes illiquidity, and banks are able to remain apparently healthy and liquid for protracted periods of time, sometimes years, after they have fallen into insolvency.⁵

B. Consequences of inaccurate reporting by distressed banks

In countries in which a high proportion of insolvent banks remain in operation, often owing to central bank credit, most, if not all, insolvent banks have an incentive not to adequately classify nonperforming loans and make loan-loss provisions as required.⁶ As mentioned above, the bulk of increases in loans typically represents concealed loan losses and capitalized or accrued (unpaid) interest. Banks in such a situation often continue to book

⁴/ Banks in distress also tend to offer higher deposit rates in a desperate plea to attract new depositors. See '*Bank Soundness and Macroeconomic Policy*'; IMF (1996).

⁵/ An insolvent institution is defined as one having a negative net worth; that is to say, when liabilities less capital exceed assets. For an analysis of this issue, see '*Bank Soundness and Macroeconomic Policy*'; IMF (1996); Part I, Chapter 3.

⁶/ Assuming that requirements are set at the appropriate level. In many cases, the requirements themselves may be inadequate.

accrued interest on nonperforming loans as income, thereby artificially inflating their profits and capital in addition to their loan portfolios.⁷ High stocks of nonperforming loans have at least two adverse effects on real economic growth. First, they invariably result in wider interest rate spreads as banks attempt to recoup some of their losses from nonperforming assets, which discourages investment and leads to a lower output path. Second, they crowd-out new borrowers as banks are stuck with their preferred or related customers, which are usually the ones that have defaulted on previous loans, in order to mask the underlying state of insolvency.⁸ To the extent that only new (i.e. potentially more productive) credit flows to nonbanks are a reliable indicator of future economic activity and/or inflation, such an all-inclusive measurement of gross credit in a typical financial program will tend to overestimate total available credit and the growth rate of economic activity, while the actual (lower) amount of new credit extended may not be consistent with the targeted growth or projected inflation paths. Also, any ceiling on domestic credit contained in a financial program would be set too high.⁹

On the liabilities side, the growth in deposits is likely to include increasing amounts of accrued interest on existing deposits. As the root causes of the problems remain unaddressed, losses continue to accumulate silently for extended periods of time until the underlying

^{7/} However, not all nonperforming loans will be in default; some will (eventually) be repaid.

^{8/} In countries with systemic banking distress, real sector activity is also adversely affected by a host of other factors, including perverse risk incentives, an inefficient payments system, and weak governance. See *'Bank Soundness and Macroeconomic Policy'*, Part II, Chapter 5, pp.58-63.

^{9/} While the use of an NDA ceiling would correct this shortcoming, credit to non-government is often an important consideration in the formulation of a financial program.

disequilibrium between money supply and demand becomes so severe that the net cash flow from deposits is no longer sufficient to cover interest payments and operating costs.¹⁰ By then, typically, the interbank market has dried up, liquidity problems accumulate, and the central bank is pressured to provide credit. If such credit slows or stops, banks may become paralyzed by illiquidity and may be unable to meet the demand for withdrawals of deposits.

Two cases can be distinguished. First, when, as was the case in Mongolia, the authorities postpone their intervention in the problem banks, requests by customers for transfers and withdrawals are increasingly delayed and turned down by the banks, a backlog builds up, and deposits lose a large part of their *moneyness*¹¹ as depositors find themselves unable to withdraw their deposits at will.¹² If a significant portion of the banking system is concerned, over time economic entities find it increasingly difficult to pay their suppliers, employees' wages and taxes, domestic arrears in general are likely to rise, and economic activity as a whole is depressed as a result. Yet the standard monetary survey measures deposit liabilities *as if they are available in their entirety at any given point in time*.

Eventually, the failed banks are closed, and depositors lose part of their claims. Only then is broad money adjusted downward to reflect the write-down of deposits, whereas in reality the

^{10/} The more depositors believe that the authorities will not allow banks to fail, and so continue to meet the banks' liabilities, the longer depositors will invest their funds at ever increasing yields. While this behavior delays a state of illiquidity, it also increases the ultimate cost to the taxpayer.

^{11/} See *Draft Manual*, page 6-10, for a definition of the key characteristics of money.

^{12/} In most banking systems, there would most likely be a run on deposits rather than a loss of moneyness, as defined, and either the problem banks would be forced to close or the monetary authority would be compelled to provide lender-of-last-resort credit to honor the moneyness of the deposits.

availability of deposits has been declining for some time. Second, even when explicit government guarantees or deposit insurance schemes exist, deposits in failed banks lose some of their moneyness as guarantees or deposit insurance schemes may only be partial and are rarely honored immediately. Either way, the actual loss of moneyness, even if temporary, is not reflected in the monetary survey although it does have a dampening wealth effect on economic activity.¹³

The above analysis, which is based on our country example, has the following implications for the implementation of monetary policy and the design of financial programs in countries facing systemic banking distress. First, the provision of new, potentially-productive credit was never as high as suggested in the standard monetary survey, nor was the amount of such credit increasing until bank restructuring began. As a result, to the extent that the authorities use the amount of new credit in the economy as an indication of future growth and inflationary pressures, up until end-December 1996, the standard monetary survey would overestimate the amount of credit required and projected real growth and/or inflation. In these circumstances, a tightening of monetary policy before end-1996, for example to counteract a build-up in inflationary pressures, would in fact have been more restrictive than necessary as the actual decline in credit would have been exacerbated (see section IV.A below).¹⁴ Second,

^{13/} The counterpart to the illusory credit to the private sector when interest is capitalized on nonperforming loans of an insolvent bank is either an increase in the implicit claim on government (in the case where deposits are fully guaranteed), or a reduction in the true value of depositors' claims (in the case where there is no government guarantee), or a combination of both (in the case where deposits are only partially guaranteed).

^{14/} In a recent study on the effects of banking crises on monetary aggregates and policy in the Baltic countries, Garcia-Herrero (1997) found that credit to the private sector was

(continued...)

actual broad money, while rising, was constrained throughout the period up until the liquidation of banks and the write-down of deposits. From that point on, however, the standard monetary survey indicated that money demand was falling whereas in fact it was increasing, as measured by the improved availability of deposits (see section IV.B below). A tightening of monetary policy based on the belief that money demand was falling would have inappropriately rationed the availability of credit at a time when the demand for money was in fact increasing. Third, as a direct consequence of the first two points, any financial program based on projections of monetary aggregates and estimates of money demand from a standard monetary survey at any point in time prior to March 1997 would be fundamentally flawed.¹⁵

IV. Compilation of an Enhanced Monetary Survey

Whenever feasible, the standard monetary survey should be adjusted before bank restructuring is initiated and while insolvent banks are still operating, so that an enhanced monetary survey can be used as an additional instrument for economic analysis and policy formulation. In practice, in many cases, supervisory authorities have some knowledge of which banks are likely to be concealing underlying problems, and it may be necessary for them to conduct on-site inspections of problem banks, at least for the largest ones, to compile more accurate balance sheet data. Admittedly, even with on-site inspections, the practical difficulty in obtaining estimates of the true amount of nonperforming loans and available deposits *before*

¹⁴(...continued)

overestimated owing to the large share of nonperforming loans.

¹⁵/ On this point, see also Garcia-Herrero (1997); p.55; and '*Bank Soundness and Macroeconomic Policy*', Appendix III (Financial Programming When the Banking System is Unsound), Executive Board Paper, SM/96/40; February 12, 1996.

the outbreak of a crisis should not be underestimated and on-site inspections may not always be feasible in practice as such inspections take time.¹⁶ However, the important point is that such adjustments, if feasible, should be made even if they are based only on partial or crude estimates of the true underlying condition of banks, to be in a better position to monitor and analyze the macroeconomic consequences of systemic banking distress more accurately.¹⁷ Specifically, adjustments are suggested in the compilation of at least two principal monetary aggregates: credit to nonbanks (private sector and public enterprises) and broad money. The following section details the adjustments that were made to the monetary aggregates in Mongolia.

A. Credit

On the credit side, three enhancements are suggested. First, credit to non banks should be split between performing and nonperforming loans. Second, provisions for non-performing loans should be extracted from other items net and deducted from the gross amount of credit. The first two steps only involve reclassifications and do not call for any adjustment yet to the figures reported by the banks. However, as shown in Graph 3, the profile of the credit curve net of provisions is already significantly altered. During the first two quarters of 1996, the gross and net credit curves remain parallel, as the problem banks are not provisioning their nonperforming loans. The two begin to diverge during the third quarter, as banks begin to

^{16/} As an illustration of the practical difficulties involved, the adjustments to the monetary survey in Mongolia were made only *after* the outbreak of the banking crisis. It would have been difficult, *although not impossible*, to make adjustments prior to the onset of the crisis because the central bank did not have the necessary legal authority to write-down assets and deposits by as much as it would have wanted to.

^{17/} This underscores the importance of effective banking supervision.

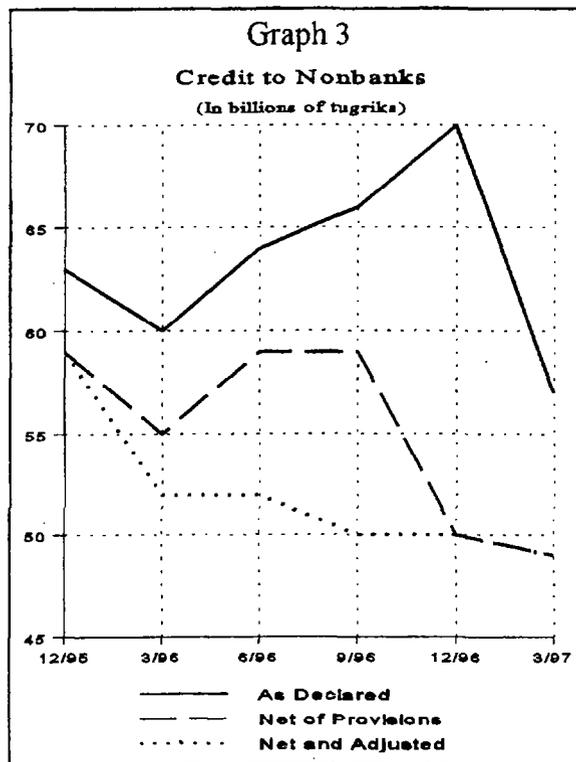
partially provision. Indeed, credit net of provisions remains flat. At the end of the year, as the banks are taken over by the authorities and the newly appointed liquidators book all needed provisions, there is a sharp drop in credit, a quarter earlier than for gross credit.

The third enhancement is the most significant but is likely to be difficult and arbitrary, and may prove impossible. It consists in substituting, for each insolvent

bank, estimates of the true or underlying amount of nonperforming loans and resulting necessary provisions in addition to the figures declared by the banks. In our example, the "net and adjusted" curve shows a continuous trend toward a reduction of credit throughout the period, completely at variance with the pattern shown by the standard monetary survey.

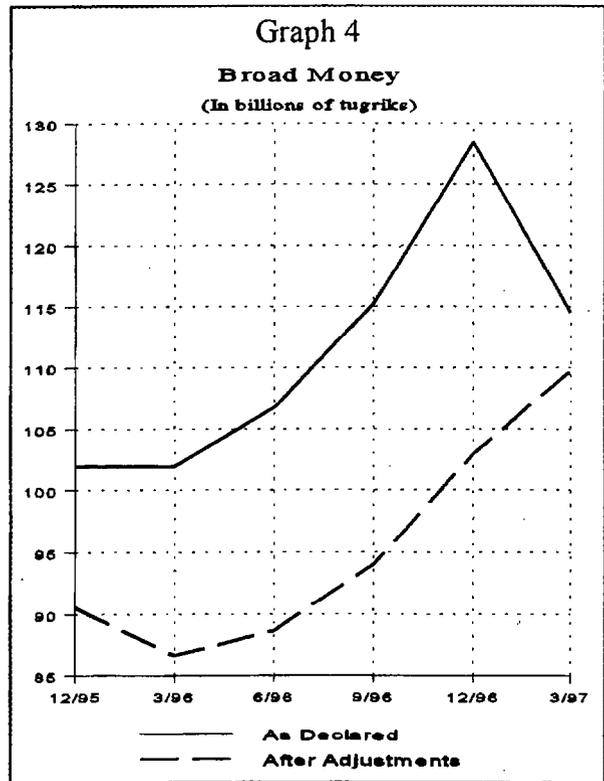
B. Money

On the deposit side, a single adjustment consists in recalculating banking system deposits to reflect their true availability, by weighting deposits by their degree of "moneyness". In our example, which is admittedly unusually straightforward, the degree of moneyness is derived from the degree of insolvency of each bank, which has progressively deteriorated over time. For instance, one of the problem banks became insolvent during 1995 and continued to deteriorate until, at the time of its liquidation, its assets represented only 53



percent of its liabilities after the assets of shareholders and creditors had been written-down.¹⁸ The moneyness of its deposits was therefore adjusted in each quarter between end-1995 and March 1997, to reflect an estimated (linear) evolution of that particular bank's insolvency. It must be reiterated that in most other cases, an adjustment of this type is likely to be more difficult, and may in fact not be possible at all.

Graph 4 compares broad money as declared and as adjusted by applying the above mentioned method to weight insolvent banks' deposits. During the first quarter of 1997, when the failed banks' liquidation is completed, the adjusted figure shows an increase in money, completely at variance with the declared figures, which show a sharp decrease. In reality, following the write-down of deposits, the overall liquidity of commercial banks improved as depositors were able to



access the remaining share of their deposits which had not been written down. As a result, a considerable backlog of long-delayed payments were immediately effected.¹⁹

^{18/} In general, depositors would not know that the moneyness of their claims may have deteriorated, especially in cases where deposit insurance schemes or explicit government guarantees exist.

^{19/} The fact that deposits tend to be well protected in most countries complicates the determination of the amount of the actual loss in moneyness and the extent of the necessary

(continued...)

Once the reported data from each problem bank have been adjusted with the best available estimates of the actual situation on both assets and liabilities, an enhanced monetary survey can be compiled.²⁰ Graphs 5 and 6 show that the level and evolution of credit to nonbanks and broad money in the enhanced monetary survey turn out to be quite different from those indicated by the original standard monetary survey. In particular, while the quarterly path of credit and monetary aggregates is sensitive to the particular assumptions regarding the pattern of adjustments, far from rising throughout the period until liquidation occurs, credit to nonbanks actually declines, while broad money rises steadily throughout the period (from a lower level), after an initial small decline, and does not revert downward when the failed banks are actually liquidated. Also, in the standard monetary survey, credit and money follow a parallel evolution. In contrast, in the enhanced monetary survey, their paths diverge, partly reflecting the increasing insolvency of banks (shrinking assets and growing liabilities).

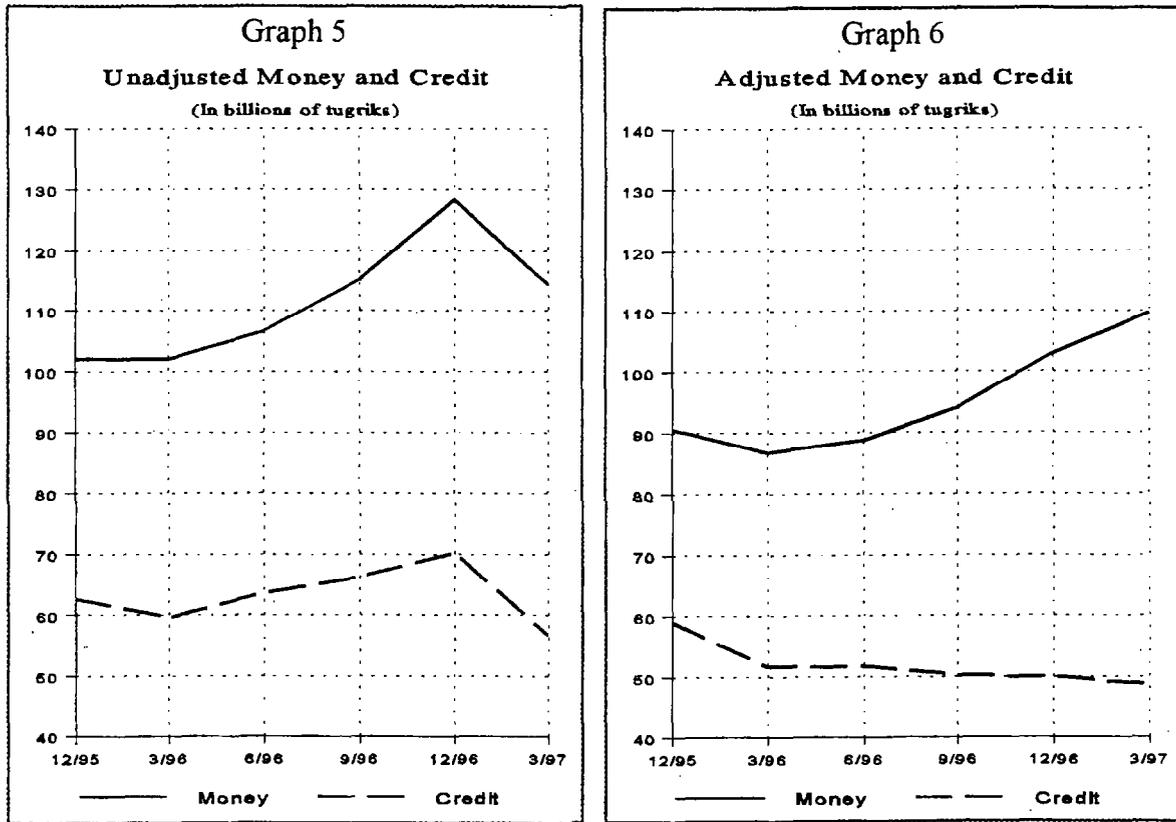
V. Additional Benefits of an Enhanced Monetary Survey

In addition to providing an additional tool with which to analyze monetary developments and formulate policy, an enhanced monetary survey could also be used as a

¹⁹(...continued)

adjustment. A potential rule of thumb would be to limit the amount of deposit write-down to the magnitude of the credit adjustment.

²⁰/ Though the adjustments outlined in this paper refer to their impact on the monetary survey, a similar exercise could be performed at a more disaggregated level. For example, at the level of the balance sheet of the monetary authorities, large reserve deficiencies of problem banks could be masked by excess liquidity conditions of healthy banks. The bifurcation would provide the monetary authorities useful information for the purposes of liquidity management.



framework from which a set of standard indicators could be derived to typify each occurrence of a systemic banking crisis, measure its scope and depth, and monitor its evolution and resolution. Using our example, this section describes the main features of such a framework and a number of possible indicators are suggested in the Appendix.

A. Framework

The following framework reflects the enhanced monetary survey at end-September 1996, the last reporting date before the authorities intervened in the failing banks (Table 2).

Table 2. Monetary Survey as of September 30, 1996						
(billions of tugriks)						
	As declared			Adj.	After adjustments	
	Global	Good banks	Problem banks		Problem banks	Global
	1=2+3	2	3	4	5=3+4	6=2+5
NET FOREIGN ASSETS	46.0	40.4	5.6	-	5.6	46.0
NET DOMESTIC ASSETS	69.2	15.4	53.8	(21.3)	32.5	47.9
DOMESTIC CREDIT	55.5	14.2	41.3	(9.1)	32.2	46.4
to Government	(3.9)	0.9	(4.8)	-	(4.8)	(3.9)
to nonbanks, of which:	59.4	13.3	46.1	(9.1)	37.0	50.3
* gross nonperforming loans	12.6	3.0	9.6	7.9	17.5	20.5
* provisions	(6.9)	(2.9)	(4.0)	(9.1)	(13.1)	(16.0)
* net nonperforming loans	5.7	0.1	5.6	(1.2)	4.4	4.5
* other loans (performing)	53.7	13.2	40.5	(7.9)	32.6	45.8
OTHER ITEMS NET	13.7	1.2	12.5	(12.2)	0.3	1.5
* equity (minus if positive)	(21.2)	(13.4)	(7.8)		(7.8)	(21.2)
* profit (-) or loss (+)	(2.8)	(9.7)	6.9	9.1	16.0	6.3
* all other items net	37.7	24.3	13.4	(21.3)	(7.9)	16.4
BROAD MONEY	115.2	55.8	59.4	(21.3)	38.1	93.9

Compared to the standard monetary survey of Table 1 (p.2), the enhanced version incorporates the following adjustments:

(i) In the first column, provisions for nonperforming loans (6.9) are taken out of OIN (which thus increases from 6.8 to 13.7) and included in credit to nonbanks (which decreases from 66.3 to 59.4). NDA remains unchanged as compared with Table 1;

(ii) OIN are broken down to explicitly show equity (capital, reserves, and other items which are undisputably part of the shareholders' equity), profits or losses, and other items;

(iii) The global position is split (column 2 and 3) to separate positions of performing banks (including the central bank) and problem banks;

(iv) For each problem bank, individual financial data are adjusted to reflect as accurately as possible the true underlying condition. In our example, the following three adjustments were made (bold figures in column 4):

a) part of the loans reported as performing were reduced to nonperforming for an amount of 7.9;

b) additional provisions against existing and newly recognized nonperforming loans of 9.1 were made. The balancing item (in italic) is a loss; and

c) broad money was reduced by 21.3 to reflect the fact that customers of the insolvent banks could not withdraw their deposits, with a balancing item in OIN.

(v) Incorporating the adjustments, a new sub-set of the monetary survey for problem banks is put together (column 5), and an enhanced monetary survey is derived (column 6), by adding columns (2) and (5).

VI. Conclusions

As illustrated in the case of Mongolia, in cases of severe banking system distress, reliance on the standard monetary survey can result in an inaccurate interpretation of monetary developments and lead to erroneous policy prescriptions and the setting of inappropriate financial targets. First, domestic credit may be overestimated and incompatible with the targeted growth rate of economic activity and/or projected inflation. Second, the available deposit base may be lower than indicated, and monetary targets are likely to be set based on an inaccurate pattern of money demand.

While acknowledging the practical difficulties involved, which are likely to be considerable in most cases, it is argued that, if at all possible, some attempt must be made to construct an enhanced monetary survey before actual bank restructuring. Specifically, credit to nonbanks should be split between performing and nonperforming loans; provisions for nonperforming loans should be extracted from OIN and deducted from gross credit; estimates of the true amount of nonperforming loans should be derived in addition to those reported by banks; and banking system deposits should be calculated, as far as possible, according to their actual availability. Such an enhanced monetary survey could also be used as a framework from which to derive a standard set of indicators to measure the depth and scope of a banking crisis, as well as monitor its evolution and resolution.

The above analysis is based on the experience of only one country and is therefore legitimately subject to all the usual caveats and criticisms associated with attempts to draw general inferences from a single sample, especially in deriving indicators of systemic banking

distress. An obvious extension of the analysis undertaken in this paper would be to test the robustness of the proposed enhanced monetary survey and indicators in other countries.

Indicators of Systemic Banking Distress

The framework described in Section V.A could be relied upon to develop standardized indicators to (i) measure the scope and depth of systemic banking distress, and (ii) monitor its evolution until resolution. Moreover, such standardized indicators would facilitate international comparisons of banking crises.

a. Measuring the scope and depth of banking distress

The **scope** of the systemic banking distress could be measured through three indicators:

(i) the share of deposits (broad money, before adjustments) held by the problem banks. In our example, 59.4 out of 115.2, or 52%, indicating a particularly wide scope for distress;

(ii) the share of loans (domestic credit to nonbanks) held by the problem banks; 46.1 out of 59.4, or 78% in our example; and

(iii) the system wide proportion of gross nonperforming loans (adjusted); in our example, 20.5 out of 66.3 (20.5 + 45.8), or 31%, confirming the distress.

The **depth** of the distress could be assessed on the basis of another set of indicators focussing on the adjusted data for the problem banks:

(i) the proportion of the problem bank's loan portfolio which is nonperforming as an indicator of the degree of contamination; in our example, 17.5 out of 50.1 (17.5 + 32.6), or 35%.

(ii) the average provisioning rate deemed necessary to account for the nonperforming loans as an indicator of the degree of deterioration in impaired assets; in our example 13.1 out of 17.5, or 75%; and

(iii) the loss of moneyness of deposits, based on the average rate of insolvency of the problem banks; in our example, 21.3 out of 53.8, or 40%.

b. Monitoring the evolution and resolution of banking distress

Typically, a banking crisis consists of three phases. During the first phase, the problems build up in the form of a marked increase in the volume of nonperforming loans, until a peak is reached and the problem is acknowledged by the concerned banks. During the second phase, sufficient provisions are progressively set apart, either by the bank's own management or by a temporary administration imposed by the authorities, until all losses are made apparent, reducing equity. In the third phase, the losses are allocated among stake-holders, either through a liquidation or a recapitalization.

The build up of problems could be monitored by following the evolution of the indicators of scope and depth.

Acknowledgment of the problems, which is a prerequisite to any resolution, could be made by comparing problem banks' declared and adjusted figures for:

(i) gross nonperforming loans (in our example, the declared figure, i.e. 9.6 out of 17.5, is only 55% of the adjusted one, indicating that the acknowledgment phase is far from completed);

(ii) provisions (in our example, 4.0 instead of 13.1, or 31%, confirming the indication of the previous ratio);

(iii) losses (in our example, 6.9 instead of 16.0, or 43%).

Progress in the allocation of the losses, which represents the final resolution of the crisis when all losses have been made apparent and allocated, and nonliquidated banks have been restored to an appropriate level of solvency, could be measured by expressing the combined

negative net worth of the problem banks (in our example, 8.2, i.e. the difference between a declared equity of 7.8 and losses of 16.0) as a percentage of GDP. Alternatively, an indicator of equity deficiency could be used which would show the amount of additional equity needed for problem banks to comply with internationally accepted capital adequacy norms.

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