The credit risk-contingency system of an Asian development bank

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Introduction and summary

During the recent financial and economic crisis in Asia, financial institutions were often found wanting. There is little question that many financial institutions in Asia were mismanaged and poorly regulated prior to the onset of the crisis in the late 1990s. Yet the standards used to make such judgments have been standards appropriate for conventional banks, brought in from the outside, and applied as international best practice more or less uniformly across a variety of local and national institutions. As a result, some institutions have been closed. Alternatively, those same standards have been used to rationalize government intervention in the private sector or greater government subsidies.

Against the backdrop of the Asian financial crisis, we offer an analysis of one financial institution, a government-operated bank in Thailand, the Bank for Agriculture and Agricultural Cooperatives (BAAC). The BAAC offers an example of one of the relatively rare state-owned specialized financial institutions complying with politically mandated lending objectives without recourse to unfettered subsidies, while achieving unprecedented outreach to its target clientele of small-scale farmers. Furthermore, the BAAC has been operating an unconventional and relatively sophisticated risk-contingency system. Indeed, complementary evidence from micro data suggests that this risk-contingency system has had a beneficial impact on the semi-urban and rural Thai households that the bank serves. Unfortunately, the accounts that document the BAAC system, including newly recommended standards from the crisis, are more appropriate for a counterfactual conventional bank, a bank making relatively simple loans with provisions for nonperformance, not for the actual bank, which collects premia from the government if not the households themselves and pays indemnities to households experiencing adverse shocks.

This article ties the actual BAAC operating systems to the theory of an optimal allocation of risk bearing. We recommend accordingly a revised and more appropriate accounting of BAAC operations. That in turn would allow an evaluation of the magnitude of the government subsidy, something that could be compared with the insurance benefit the BAAC offers to Thai farmers, as derived from panel data. The bottom line, and the main policy implication of the article, is a new system for the evaluation of financial institutions, including state development banks which should not be assessed merely on their financial profitability grounds.

Specifically, we proceed as follows. First, we provide a brief review of the theory being used in this type of evaluation of financial institutions and of empirical work in developing and developed economies using that theory. Then, we provide some background information on the BAAC, in the specific context of Thailand. Next, we describe the BAAC risk-contingency system, that is, its actual operating system and how it handles farmers experiencing adverse events. Then, we elaborate via a series of examples on appropriate ways to provision against possible nonpayment, given that underlying risk. We also tie provisioning and accounting standards to the optimal allocation of risk bearing in general equilibrium, inclusive of moral hazard problems. Next, with the costs of insurance well measured, we turn to a more detailed discussion of BAAC accounts and how they might be improved, so as to measure and evaluate better the portion of

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the Thai government subsidy that is effectively the payment of an insurance premium for farmers.

We want to emphasize at the outset that our method of evaluation allows us to attach specific numbers both to the insurance benefit the BAAC may be providing to Thai farmers and to the specific value of the subsidy the government pays to the BAAC. The difference is the bottom-line assessment of the financial institution. In particular, as an illustrative example, Ueda and Townsend (2001) generalize and calibrate a model of growth in which financial institutions provide insurance against idiosyncratic risk, and they estimate the lump sum welfare losses of restrictive financial sector policies that impeded that function at an average of 7 percent of household wealth, up to 10 percent for the middle class. If we take 876,000 baht as the average value of land and agriculture assets for nonbusiness households, thus excluding other sources of wealth and richer households with businesses, and use the lower 7 percent number, the gain would be about 61,000 baht. Thus, a conservative assumption of a compounded interest rate at 4 percent per year and a production lifetime of 40 years, during which such forgone wealth would have to be recovered, gives us a cost recovery factor of 5.05 percent. When applied to the target population of 4.5 million households that benefit from BAAC services, there would be an overall gain of about 13.86 billion baht. This could be used to balance against any subsidy given to a financial institution attempting to facilitate access and improve its policies.[1] The BAAC annual subsidy (explicit and implicit) as calculated under Yaron's *Subsidy Dependency Index* (discussed in detail in a later section) is approximately 4.6 billion baht,[2] so the estimated gain would more than rationalize the BAAC annual subsidy, that is, the gain amounts to almost three times the BAAC annual subsidy. Clearly some nonzero subsidy could be justified. The larger point, again, is that in principle one can evaluate the subsidy based on the estimated welfare-insurance gain.

However, the BAAC accounts as currently constructed do not reflect as well as they could the likelihood of eventual loan recovery and the operation of the bank's (implicit) insurance system. In particular, the costs of provisioning as reflected in the accounts are somewhat ad hoc, and the income transfer that is intended to cover those costs is unclear and commingled with other kinds of government subsidies. These are among the findings we present in this article. However, we do provide constructive suggestions for improvement.

Perhaps political pressures have distorted what might have been otherwise a more conventional system. The government of Thailand is valued for its ability to "bail out" farmers experiencing difficulties, and the BAAC does operate in the context of an agrarian environment with much risk. But we do not argue for going back to any such simpler conventional system, that is, simple loans with provision for default. We do argue for the use of accounting and financial reporting standards appropriate for insurance companies and consistent with the theory of an optimal allocation of risk bearing. By that more appropriate standard, the operation and accounts of the BAAC could be much improved. Again, we include some recommendations here.

Given the pejorative press given to Asian banks, we draw an ironic conclusion: With improvements, the BAAC could serve as a role model for private and public financial institutions in the rest of the world.[3]

The lessons we draw in this article from our analysis of the BAAC are not peculiar to the BAAC and Thailand alone. They apply more generally to institutions in other emerging market economies and in industrialized, developed economies such as the U.S. Overly stringent and ill-conceived regulations of financial institutions that discourage exceptions and contingencies in their otherwise standard loan contracts can have welfare-reducing effects. In earlier work published in this journal, for example, Bond and Townsend (1996) and Huck, Bond, Rhine, and Townsend (1999), we drew the tentative conclusion that lack of flexibility and inappropriate financial instruments may be limiting demand for small business credit in the U.S. More generally, a set of narrow financial institutions with clear accounts and reasonable profit margins may fail nevertheless to provide desirable financial services. Likewise, financial institutions in developing countries that allow exceptions and delayed repayment should not be judged a priori to be inefficient, as was the BAAC, and, hence, closed or bailed out with a government subsidy. Rather, the de facto operating systems of such financial institutions need to be understood and made explicit, then integrated into more appropriate accounting and financial reporting systems and modified regulatory frameworks. In this way, both the costs and benefits of more flexible systems and risk contingencies can be made clear.

Literature review

Recent work on the optimal allocation of risk has stressed the ability of theory to provide a benchmark that can be used to assess the efficiency of a financial system or a particular financial institution. Using household and business data, one can test whether household

or business owner consumption co-moves with village, regional, or national consumption, as a measure of aggregate risk, and does not move with household or business income, as a measure of idiosyncratic risk. This benchmark standard is hard to achieve and tests for full risk sharing do fail. But, we learn something about the risk-bearing capabilities of actual financial systems and about potential barriers to trade. Thus, for example, three villages in India surveyed by International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and 31 villages in Pakistan surveyed by International Food Policy Research Institute (IFPRI) do surprisingly well when taken one at a time (see Townsend, 1994, and Ogaki and Zhang, 2001). The regional and national level systems of Cote D'Ivoire and Thailand display some co-movement in consumption but also an array of surprisingly divergent local shocks that remain "underinsured" (see Deaton, 1990, and Townsend, 1995, respectively). Similarly, Crucini (1999) has measured the extent of risk sharing across states in the U.S., provinces in Canada, and among Organization for Economic Cooperation and Development (OECD) countries. But households in the U.S. seem underinsured against illness or substantial periods of unemployment (see Cochrane, 1991), and wage laborers seem underinsured against occupational-specific economic fluctuations, as shown in Attanasio and Davis (1996) and Shiller (1993).

Less work has been done to determine the actual mechanism that is used in the provision of insurance, limited though it may be. Self-insurance strategies include migration and remittances, as studied by Paulson (1994); savings of grain and money as buffers, as studied by Deaton and Paxon (1994); and sales of real capital assets and livestock, as studied by Rosenzweig and Wolpin (1993), for example. Lim and Townsend (1998) find more communal, collective mechanisms at work as well, but in this there is some stratification by wealth—the relatively rich use grain and credit, while the relatively poor use currency. Murdoch (1993) finds that these poorer, credit-constrained households are more likely to work fragmented land in traditional varieties and less likely to engage in high-yield, high-risk activities. Asdrubali, Sorensen, and Yosha (1996) use gross domestic product (GDP) data to decompose the difference between GDP and consumption; they conclude for states in the U.S. that credit markets smooth about 24 percent of fluctuations.

Even less work has been done to integrate these tests of risk bearing and possible response mechanisms with an empirical assessment of a particular financial institution. Commonly used standards for the evaluation of financial institutions include profitability, capital adequacy ratios, or administrative costs as a percent of assets or loan portfolio. Typically, these are stand-alone metrics, and the evaluation of a particular financial institution is not done with socioeconomic data that support a full cost–benefit analysis. Indeed, the requisite socioeconomic data are frequently not available. But researchers can take some steps.

Building on the premise that financial institutions (credit and savings) exist to smooth the idiosyncratic shocks of participants and that those outside financial institutions must smooth on their own, one can try to explain aggregated data—for example, the growth of income with increasing inequality and uneven financial deepening we have seen in data from Thailand. Growth is higher for those in the system because more of available savings can be put into risky, high-yield assets, and information on diverse projects can be pooled. Fixed costs and transaction fees can endogenously impede entry to the financial system for low-wealth households and businesses. But in Thailand, the political economy of segmentation and regulation appears to have impeded entry exogenously. As noted in the introduction, Ueda and Townsend (2001) generalize and calibrate this model of growth and estimate the lump sum welfare losses of restrictive policies at an average of 7 percent of household wealth, up to 10 percent for the middle class.

There are more direct tests of efficiency with micro data combined with knowledge of the use of particular financial institutions. Combining two data sets from Thailand, household level income and consumption data from the *Socio-Economic Survey* (SES) and village level institutional access data from the Community Development Department (CDD), Chiarawongse (2000) shows that there is some insurance, that is, a negative correlation between access to certain financial institutions—commercial banks, traders, or the BAAC—and the sensitivity of county-level consumption to county-level income shocks. The result for the BAAC seems particularly robust (possibly because the bank's clientele consists mainly of middle- and small-income farmers). The positive role of commercial banks is lessened when joint membership with the BAAC is taken into account. Related, utilizing the Townsend et al. (1997) Thai data financed by the National Institute of Child Health and Human Development, the National Science Foundation, and the Ford Foundation, collected during three years of the recent Thai financial crisis, Townsend (2000) shows that the use of credit accounts at the BAAC has helped smooth shocks to some extent,

in two of four provinces of the survey. In contrast, the use of savings accounts at commercial banks was helpful in only the initial downturn and the use of credit from the informal sector is seemingly perverse—such users achieve less insurance as they seek loans from moneylenders after all else fails. Relative to these financial alternatives, therefore, the BAAC appears to be playing a beneficial societal role, though there remains room for improvement.

BAAC background

The BAAC was established in 1966 as a state-owned specialized agriculture credit institution (SACI) to promote agriculture by extending financial services to farming households. In effect, the BAAC replaced the former Bank for Cooperatives, which suffered from poor outreach and low loan repayment. The BAAC operates currently under the supervision of the Ministry of Finance, though it is soon to be transferred to the central bank, and is governed by a board of directors with 11 members appointed by the Council of Ministers.

The BAAC provides loans at relatively low interest rates to farmers, agricultural cooperatives, and farmers associations. The BAAC also lends to farmers for agriculturally related activities, for example, cottage industries, and more recently for nonagricultural activities, subject to not exceeding 20 percent of its total lending and provided that the borrowers are farming households. The BAAC is also engaged in supporting a number of government "development" projects through lending operations. The mobilization of savings has also become an important BAAC activity in recent years, and such saving has become the fastest growing category in the BAAC balance sheet.

Performance

The BAAC's performance in lending to low-income farmers has been spectacular in terms of outreach to the target clientele in the past few years. The BAAC's customer base has grown from 2.81 million household accounts in 1989 to 4.88 million in 1998, an increase of 2 million accounts. The BAAC claims that it currently serves more than 80 percent of Thailand's farming households, a share that is unprecedented in the developing world. The bulk of BAAC lending goes to individual farmers (88 percent) and follows a deliberate policy of reducing the share of lending to cooperatives because of repayment problems. Interest rates are 1 percent to 2 percent below commercial bank rates. The BAAC practiced a cross-subsidization interest rate policy until 1999, under which higher interest rates were charged on larger loans, subsidizing low lending rates to small farmers. This resulted in meager or negative profitability for small loans and created incentives that subsequently reduced the share of small loans in BAAC's total loan portfolio. This cross-subsidization policy was changed in 1999 and differential lending interest rates reflecting past collection performance of borrowers were introduced, in a range of 9 percent to 12 percent, with an additional 3 percent penalty rate if loans are willingly defaulted.

Overall, the Subsidy Dependence Index (SDI)—a measure of the BAAC's financial sustainability—was 35.4 percent in 1995. (Calculation of the SDI is explained in box 1.) This means that raising lending interest rates by 35 percent in 1995, from 11.0 percent to about 14.89 percent, would have allowed the full elimination of all subsidies, if such an increase did not increase loan losses or reduce the demand for loans. More specifically, the SDI is a ratio that calculates the percentage increase in the annual yield on the loan portfolio that is required to compensate the financial institution for the full elimination of subsidies in a given year, while keeping its return on equity (ROE) close to the approximate nonconcessional borrowing cost. In 1995, the BAAC's average yield on its loan portfolio was 11.0 percent and the SDI was 35.4 percent. This means that the BAAC could have eliminated subsidies if it had obtained a yield of 14.89 percent on its portfolio. The total value of the subsidy in 1995 amounted therefore to about 4.6 billion baht.[4]

The SDI computation of the BAAC's subsidy dependence over the past decade reveals an interesting pattern: The SDI rose when the level of inflation rose (see figure 1). The SDI also moved in the opposite direction to the ROE. A plausible explanation for this outcome is that the BAAC, as a price taker, has had to pay competitive interest rates on deposits when inflation has risen, but it has been unable to adjust its lending interest rates sufficiently upward, due mainly to political pressures to maintain unchanged nominal interest rates on agricultural loans. In contrast, when inflation rates have declined, BAAC operating margins have improved because the agricultural lobby focused on nominal interest rates rather than on real ones. The "money illusion" created by this asymmetry has enabled the BAAC to cover a larger share of its costs and to achieve a smaller dependence on subsidies, as well as increasing its ROE when inflation decreases.

Over the period 1985–95, the BAAC's SDI oscillated within a modest range of 10 percent to 55 percent. There is no declining trend in the BAAC's subsidy independence, but it is evident that the BAAC has displayed a lower level SDI than most other SACIs.[5] Evidently, it is possible to run a government

BOX 1

The Subsidy Dependence Index (SDI)

The SDI is a user-friendly tool designed to assess the subsidy dependence of a specialized agriculture credit institution (SACI). The objective of the SDI methodology is to provide a comprehensive method of measuring the total financial costs of operating a development financial institution and of quantifying its subsidy dependence. The SDI can offer a clearer picture of a financial institution's true financial position and reliance on subsidy than is revealed by standard financial analysis (Yaron, 1992).

The SDI can be expressed as follows:

$$\text{SDI} = \frac{\text{Total annual subsidies rec}}{\text{Average annual interest incc}}$$

$$= \frac{A(m-c)+[(E*m)-P]+K}{(LP*i)}$$

A = annual average outstanding loans received;

m = interest rate the SACI would probably pay for borrowed funds if access to concessionally borrowed funds were to be eliminated. This is generally the market reference deposit interest rate, adjusted for reserve requirements and the administrative costs associated with mobilizing and servicing additional deposits;

c = weighted average annual concessional rate of interest actually paid by SACI on its average annual outstanding concessionally borrowed funds;

E = average annual equity;

P = reported annual profit before tax (adjusted for appropriate loan loss provision, inflation, and so on);

K = sum of all other annual subsidies received by SACI (such as partial or complete coverage of the SACI's operational costs by the state);

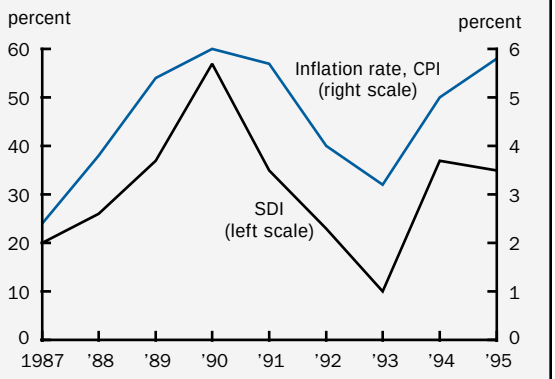
LP = average annual outstanding loan portfolio of the SACI; and

i = weighted average on lending interest rate of the SACI's loan portfolio.

Source: Yaron, Benjamin, and Pipreck (1997).

FIGURE 1

Subsidy Dependence Index of BAAC and inflation rates in Thailand, 1987–95



bank without recourse to enormous subsidies. Thailand has thus far resisted political pressures that have led to the eventual collapse of SACIs in Latin America and elsewhere.

Source of funds

The BAAC's sources of funds have shifted over the past few years. Deposits from the general public (private individuals and public sector entities) accounted for more than 60 percent of operating funds in 1998. Bond issues represented 14 percent of total funds in 1998. The BAAC can issue bonds without a mandated government guarantee. Commercial bank deposit accounts with the BAAC have been declining as its outreach and lending to farmers have increased.

The BAAC had an asset base of 265.29 billion baht ($6.4 billion) in 1998, and its outreach has been remarkable. Between 1989 and 1998, its outstanding loan portfolio increased from $1.22 billion to $4.86 billion. Its loan portfolio measured in baht grew at an average annual rate of 18 percent between 1994 and 1998. The BAAC reaches primarily small farmers, many of whom have no access to other formal credit. The bank's average loan size was $1,100 in 1995, nine times lower than the average commercial bank loan to the agricultural sector.

Since mid-1997, the financial and economic crisis in Thailand has been an issue of concern. However, the BAAC has been much less affected by the Asian crisis than commercial banks and finance companies. The BAAC's loan recovery has declined; by 1998 the outstanding value of overdue loans had increased to about 13 percent of its portfolio. This figure is still lower than in the rest of the banking sector, where bad loans are estimated to have reached 40 percent to 50 percent of the total loan portfolio. Furthermore,

deposits from individuals continued to grow at the BAAC even in 1997 and 1998. To some extent, the BAAC seems to have benefited from the shift of depositors out of private banks, offering a legal comparative advantage as a safer, government-owned institution, as discussed in Fitchett (1999).

The BAAC risk-contingency system—Lending procedures

We begin with a schematic display of BAAC operating procedures. Figure 2 describes the contingent repayment system. It reads from top to bottom as a time line or sequence of events. First, at the top is the amount scheduled to be paid. The loan may then be repaid on time, as the chain of events on the far left of the figure indicates. But, if a client borrower does not repay on time, this triggers a procedure and decision by the branch. A credit officer goes into the field to verify the actual situation of the borrower. (Occasionally that situation would have been communicated in advance of the due date). The credit officer draws a conclusion as to whether the nonrepayment is justified, writing into the client loan history one of numerous possible causes (for example, flood, pest, drought, or human illness). At this point, the loan can be restructured, for example, extended for another cycle. Otherwise, if, as on the far right of figure 2, it is judged that there has been a willful default, a penalty rate of 3 percent per annum can be imposed—an increase of about 30 percent of the original lending interest rate. The exact terms for restructuring depend on the underlying situation, in particular on whether the adverse shock is large and regional in character, for example, a flood or plant disease. In such situations, clients may be given exceptions in terms of the amount eventually due, from deferred noncompounded interest to partial relief of principal, and the BAAC receives a compensating transfer from the Government of Thailand (GOT). Because individual and regional episodes are decided on a case-by-case basis, we are left to scrutinize the balance-sheet and income accounts for the impact of these episodes and the resulting orders of magnitude.

The amount not repaid can be divided into two categories: first, justified nonrepayment, that is, according to the BAAC's assessment, the client could not pay due to *force majeur*; and second, non-justified nonrepayment or willful default. Category one is usually *rescheduled,* principal and/or interest, and may be restructured up to three times. Category two entails an interest penalty of 3 percent. Still, any shortfall of income in either category requires an explicit income line, either from BAAC operations or from the GOT.

Government projects

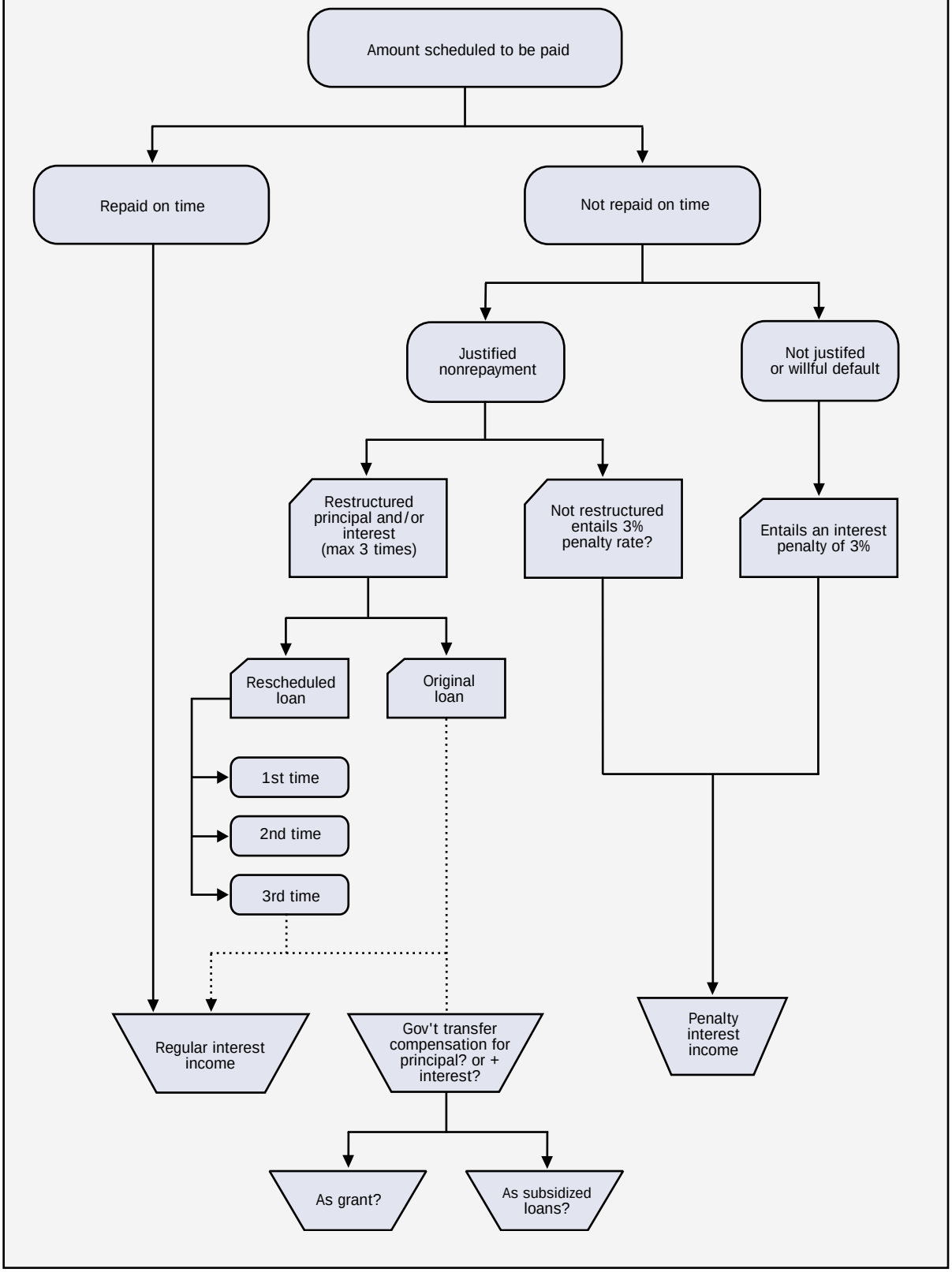
Further clouding the picture in the bank's accounts is its role as an implementing agency for "government projects" (usually, socially oriented long gestation, and often low-yield, loans and projects), obtaining fees in the extreme cases where the GOT is supposed to fully cover the cost involved in implementation. Indeed, to the BAAC's credit, details on the magnitude, nature, and repayment of these projects are in the annual reports. Low repayment rates are listed. Full disclosure of the actual costs and income associated with these government special "developmental programs" carried out by the BAAC are important for the bank's financial sustainability and efficiency (Muraki, Webster, and Yaron, 1998). But, at present, these projects are not transparent, and there is no clear way to verify what the costs are and to what extent they are covered by the GOT. Moreover, in several cases the negotiations between the BAAC and the GOT on how these costs are to be shared between the two entities take place only after the project is launched. This also might introduce disincentives with respect to efficiency and cost savings, in addition to having an adverse impact on the clarity of the bank's real annual profitability. Reported profitability plays a role in the negotiations. More generally, there is no way to assess cross-subsidization, either ex ante or ex post, between projects financed with the full discretion of the BAAC, using the creditworthiness of its clients under the framework of the risk-contingency system, and projects financed because of a GOT decision, reflecting a likely reliance on subsidies.

Head office versus branch accounts

A "transfer price" is an interest rate decided upon by BAAC management to calculate the cost and income on the amount of funds transferred between the branches and head office. This rate enables the branches to price their products in a way that conforms to the overall pursuit of cost minimization (and also to prepare a more complete profit and loss statement). The BAAC uses the tentative results from the measured operational performance in terms of profit (loss) of the branches for better financial management during the year and for evaluation of the branches' performance at the end of the year. Formerly, the calculation of the transfer price was done ex post at the end of the fiscal year, and the rate was announced to branch management, as applicable for the following fiscal year. With the onset of the financial and economic crisis in late 1997, the method was adjusted to an ex ante one in 1998, using as a basis the interest rate offered on 12-month fixed deposits plus a margin or markup for the BAAC.

FIGURE 2

BAAC operating procedures



To gain some insight into branch operations, we visited several branches and interviewed BAAC staff. One branch had experienced the 1995 flood. The staff of the branch had gone out into the local tambons (subcounties), not all of which were badly affected, to assess the damage. The staff reported that there were false or unjustified claims of damage in only four out of 1,200 cases. Those with false reports were not penalized, but they were not given relief.[6]

The BAAC's normal policy on loans is to lend up to 60 percent of expected future crop income, reflecting costs of inputs to be utilized, based on a Ministry of Agriculture formula. In this case, the BAAC made an exception and increased the amount up to 80 percent. This amount included all previous debts due and additions. The branch reported the total outlay to the head office, and the government said it would pay for the farmers in the interim. The process of assessment took two to three months.

Does the head office, relative to the branch, have an explicit ex ante or implicit ex post transfer system? In this case, the branch staff felt that the process was more one of ex post negotiation with a somewhat uncertain outcome. The branch also claimed that head office had not yet paid for 1995, and that the branch was borrowing from the head office to cover its costs at the transfer price.

Typically, if a farmer's loan is rescheduled or extended, it is assigned a code and entered into the client history and the computer. Data in the BAAC system supposedly includes information on how much was paid, how much was extended, and any new interest rate. However, based on the data we have received from the BAAC system, it appears that the ability to track past due loans is somewhat limited, and nonperforming loans may be treated as new loans. That is not like an insurance company that carefully tracks its policies.

Provisioning is decided at the head office and the branch is obliged to go along. According to the branch in our case study, the amount they had to provide for eventual loan losses was higher than necessary; that is, according to the branch staff only 4 percent was necessary, not the amount that the head office required and certainly less than under the new BAAC system.[7] There is, of course, a great danger in assuming that late loans are more likely to default than is actually the case. Provisioning would be excessive, raising costs, thus understating profitability, and so making it appear that the BAAC is more reliant on GOT's transfer that it actually is. Alternatively, excess provisioning and the search for compensating revenue may force more timely repayment in case of *force majeur*, and this would be a cost in the form of loss of insurance to farmers, limiting the social value of contingent contracts. The branch in the case study expected to get the lion's share of arrears paid belatedly, based on past experience.

How to provision—Some examples and the general theory of risk bearing

Our purpose in this section is to examine the risk of unpaid loans, how to account for them properly, what to enter as a cost in the accounts, where to look for compensating income from within the institution itself, and otherwise how to assess properly the magnitude of any government subsidies. We do this by tracing through a series of simple to increasingly complicated scenarios, starting with full repayment with interest rates to cover the cost of funds and other operating costs, then with anticipated partial default of one customer, or more realistically, of a fraction of customers, requiring increased interest rates or premia to cover credit guarantees. Indeed, the fraction of borrowers experiencing repayment difficulties may be random, a function of the aggregate, economy-wide state, and if that loss is to be provisioned properly and covered with interest or premia, then the appropriate, economy-wide event-contingent prices are required. It is more expensive to buy insurance for events that hit many borrowers.

In addition, later in this section, we place financial institutions like the BAAC in the context of a general equilibrium model in which there are borrowers and savers, and then allow for a government making transfers from taxpayers to specified groups, namely farmers at risk of experiencing losses. In that context, we can review the connection between the optimality of a laissez-faire competitive equilibrium, one without government intervention, and the welfare theorem that other optimal allocations can be attained through appropriate (lump-sum) government transfers.[8] Most familiar is the imagined world with complete ex ante markets for financial contracts, that is, with risk contingencies and perfect insurance, but that is not required—we extend the analysis to allow for limited insurance, moral hazard, and other impediments to trade.

Now, suppose a financial institution is to make a conventional loan of $100. It has to acquire these funds, either compensating shareholders or external lenders at the end of the loan cycle, at a cost of $12. Suppose in addition, there are within-period administrative costs associated with servicing the loan (without provision for losses) at a cost of $3. Therefore, the financial institution should get back $115 at the

end of the period. If there is no uncertainty regarding full repayment, this loan at an interest rate of 15 percent would cover its costs and there would be no necessity to provide against loan losses. No provisioning would be necessary here.

However, commercial banks and other financial institutions face default risk. They lend with a clear perception that some of the loans will not be repaid. So, to begin with an extreme example, suppose the financial institution lends $100 as above but, based on past experience, it knows that only $90 will be repaid; in addition, the $10 of default on principal repayment entails nonpayment of interest of (15 percent × 10) = $1.50. In this case, it requires that the financial institution should, at the beginning of the period, provision $10, reflecting the cost to the entity of not being able to collect sufficient principal (and interest), ensuring that profits of the entity are realistic. A commercial banker would normally try to cover this cost through its price structure, that is, an increased interest rate to 27.8 percent on the loan portfolio would obtain the 15 percent desired overall return (adjusted to nonrepayment of 10 percent of principal and related interest[9]). Alternatively, state-owned banks may benefit from credit guarantee indemnity or crop insurance schemes (from a separate institution) or may benefit from an ad hoc direct bailout from the state. Usually, but not always, state-owned banks are loss-making institutions. The more subtle point is that the $10 of uncollected principal, plus $1.50 unearned interest, represents an expenditure to the entity, but not necessarily to the economy—it could be considered as a transfer or part of an income redistribution scheme.

In the above example, there is no uncertainty regarding the lender's clientele, based on long-term past performance. We can reinterpret the situation as one where the lender has many customers who may experience a loss or adverse idiosyncratic shocks. Imagine, based on past performance, that the financial institution knows with certainty that 90 percent of customers will repay their loans fully, including the interest charge. But 10 percent will pay neither interest nor principal. Neither the bank nor the customers know a priori who will fall into the 10 percent group. Overall, though, the return on the $100 loan is certain and is equal to $103.50.[10] The difference between $115 and $103.50 is $11.50. Hence, the bank should provision the $10 of nonpayment of principal as a cost and not accrue interest on these nonperforming loans (NPL). If it did already accrue interest, then the bank should reverse the accrual by reducing the interest earned both in the income statement and in the accrued interest line of the balance sheet. To ensure that the return on initial resources amounts to $15 at the end of the period, the bank can build into the interest structure a factor that compensates for the risk it assumes, charging an interest rate of 27.8 percent. This covers its administrative costs, finance costs, and the risk of default, and thus it breaks even in the end. The $10 provision made and the increase in the lending interest rate from 15 percent to 27.8 percent[11] both reflect the compensation that is needed for the lender to remain "as well as" it was at the start of the period, including the required 15 percent return on assets. From the clients' point of view, the increase in lending rate from the original 15 percent to 27.8 percent represents an insurance premium for the "indemnity" of nonpayment (reflecting probability of failure) that the financial institution has factored into the lending formula. Again, the apparent increase in gross revenue is balanced on the cost side by provisioning against loan losses and the loss of interest earned on NPL.

Suppose now that there is, in addition to the given financial institution, a second entity that ensures loan repayment, for example, a credit guarantee scheme (CGS). The CGS guarantees to the bank 100 percent of the value of loans with interest. In turn, the CGS charges a premium. That is, the CGS pays the bank an indemnity for the full amount of principal and interest for any default, as in the example $10 in principal and $1.50 in interest. The premium charged for this nonstochastic certainty example should thus be $11.50 (which can be converted to a percent of loans outstanding at the beginning of the period). The premium enters, of course, as an expense.

However, suppose that the bank does not build in higher rates to compensate for costs and there is no CGS. The financial institution still needs to provision against loan losses so as to reflect realistically the collection performance. Suppose it does this properly. But now the important if obvious point is that with an added cost and no corresponding revenue, the financial institution shows a loss. How does it cover the loss? Many state-owned development finance institutions are subsidized routinely by governments and also are bailed out frequently in cases of nonrepayment by their clients. Or they benefit from subsidies granted to a CGS and, hence, are (indirectly) subsidy dependent. That is, the loss is paid by the state and, hence, by the taxpayer. This then becomes the compensating income. The overall picture requires an analysis of the consolidated financial statements of the SACI and the CGS. The picture is not necessarily inconsistent with a *Pareto optimal allocation* of resources (see note 8, page 46, for a definition), as if the government were administering an income transfer scheme to bank customers.

Now, suppose, in addition, that the financial institution is not certain about the fraction of its clients who will not be able to repay. Let's say there are two *aggregate* states—one under which 90 percent will repay as above and a second under which only 50 percent will repay. A banker who needs to buy insurance from a CGS would have to pay a yet larger premium than above. Basically, the bank is buying claims to be paid in two states of the world; in one of these there are fewer resources because there is a relatively poor return on economy-wide investment. Logically, the price of this insurance is relatively high. This analysis thus assumes that nonpayments are due to idiosyncratic and aggregate events in nature associated with project failure, and that risk contingencies can be priced as if in complete markets. This analysis does preclude the possibility of willful default, but that too can be priced if it is constant or varies systematically with idiosyncratic and aggregate states.

Despite this modification, the accounting principles remain intact. If the financial institution operates independently, it must both add to costs by provisioning against losses and get revenue. If there is a CGS, then the bank does not have extra costs beyond premium costs. Still, we are assuming the CGS does the insurance exactly as the bank would have to do it if it were on its own and that the CGS needs to remain solvent, recovering from fees the costs of its resources and its risk. (We are however, for expository purposes, abstracting from additional administrative cost of the CGS.) Without a CGS, the financial institution needs additional revenue for its accounts to balance. Certainly, it may gain additional revenue in its interest rate structure. Otherwise, it could show a loss, the order of magnitude of which is exactly the subsidy.

In the more formal language of Arrow (1964), Debreu (1959), and McKenzie (1959), any risk in the economy is priced in equilibrium. A financial institution maximizes return to capital (that is, the present value, risk-adjusted profit, the valuation in units of account at an initial date of the contract it has entered into) subject to constraints (that is, financial and legal obligations to honor all its liabilities). One group contracting with the bank would be the client borrowers we have been discussing. A second group would be a set of investors (or taxpayers). Each group would maximize its expected utility subject to budget constraints expressed in units of account, that net expenditure be nonnegative. In a competitive equilibrium with many potential intermediaries, the risk-adjusted net present value for an intermediary would be zero, and the distribution of resources between clients and investors or taxpayers would be Pareto optimal.

We could, however, imagine ex ante transfers of resources to client borrowers from investors or taxpayers directly. Any Pareto optimum can be supported with such lump-sum grants, as in the second welfare theorem as mentioned earlier. Or again, the transfers could take place indirectly through the intermediaries. That is, client borrowers would begin, even before engaging in financial transactions, with a positive net present value budget and the intermediary would begin with an equivalent negative one. If this were so, then the intermediary would need to gain that missing revenue from taxpayers or investors.

In practice in actual economies, this concept is more difficult to achieve. In particular, not everything is contracted for unit of account prices at the initial period. Rather, the allocation of resources is achieved through a blend of contracts and spot market trades. Related, an income statement has revenue from previously contracted loans balanced with provision for future loan losses. Thus, ex ante profit maximization as in the theory seems to be replaced by period maximization, and profits are measured to a large extent as a residual item in the income statement itself. Finally, more generally, there is a danger that transfers are targeted to those actually experiencing losses, whereas the goal is the provision of *ex ante* insurance and, if necessary, a lump-sum transfer. The danger is that the likelihood of *ex post* transfers would lower the ex ante interest rate, causing a price distortion on the margin.

Still, the basic principles would carry over. Insurance is desirable, but risk assessment requires provisions to be made against doubtful accounts, at appropriate ex ante prices, and entered as an explicit cost, funded with fees or some ex ante revenue or income transfer.

The reader may note that we assume in the above examples that all financial transactions go through primary financial institutions or through the CGS. In an Arrow–Debreu world, households or businesses can enter into the market on their own, do their own insurance, and hence, fulfill their more narrow obligations (paying off noncontingent loans). This does not change the arithmetic; the marginal cost of loans applies as well at the individual level. But, in many economies, markets are incomplete and the ability to access insurance on one's own may be limited. Insurance is precisely one of the obvious services offered through intermediaries.

The theoretical framework we emphasize is one of full insurance, but that framework can be extended. There can be moral hazard on the part of potential borrowers when effort and the capital input may not be observed. Each borrower would choose a financial

contract that implicitly recommends effort and a mix of capital (financial) inputs and stipulates the amount of repayment contingent on observed output. Each contract is incentive compatible, in the sense that its provisions for repayment and insurance induce the recommended effort and input use. Each contract carries a price in units of account, and the collection of contracts the intermediary buys net of any it sells must have valuation zero in equilibrium. That is, an intermediary can buy and sell contracts in such a way as to maximize profits subject to a clearing constraint, that it takes in enough resources so as to honor all beginning- and end-of-period claims. Competition among intermediaries will ensure that claims are priced in equilibrium at their actuarial fair value, as before (Prescott and Townsend, 2000).

In extensions to costly verification of project returns, the lender may at some expense verify the actual adverse situation of the borrower; see Townsend (1979), Gale and Hellwig (1984), and Bernanke and Gertler (1989). With interim communication of privately observed states, borrowers file claims about their underlying situation, triggering the resulting contingencies; see Prescott (2001). Ex ante observable diversity among clients changes the nature of incentive-compatible contracts and the mechanism of implementation but changes nothing essential as regards the accounting. Essentially, different clients are charged different interest rates or select from a different array of contingencies. Conceivably, certain groups could be subsidized ex ante and others not. Extensions to adverse selection where individual risk characteristics are not known a priori are less trivial and can cause a divergence between the outcomes of *competitive* markets and those achieved with intermediaries; see Rothschild and Stiglitz (1976) and Prescott and Townsend (1984). Bisin and Gottardi (2000) describe a possible decentralization, but we do not pursue this last difficult topic here.

BAAC accounts in practice and how they might be improved

As we have learned in the previous sections, we need to look at the BAAC accounts in search of provisioning against nonpayment, how that is done in practice, and possible government transfers or other income being used to cover provisioning and insurance costs.

In the asset–liability statement, we see in the balance sheet shown in table 1 that loans outstanding are by far the biggest BAAC asset, and deposits plus borrowing are the biggest liability. Loan loss provision reflects the integrals of all past provisions against doubtful accounts, net of write-offs. There is also a nontrivial and increasing capitalization from the Ministry of Finance to prevent the deterioration of the equity–asset ratio. Otherwise, capital provisioning would be inadequate. The SDI, however, computes the opportunity cost of the BAAC capital (net worth) as a cost from which annual profit (or loss) is subtracted (or added). Both reserves and government capitalization are symptomatic of potential and actual loan losses.

In the income statement, table 2, note the "other income" line in revenue. This includes transfers from the GOT to cover loan losses, deferred interest, and the costs of provisions among other things—a revenue item that shapes the final profitability picture. We note in particular, from note 2.20 in the 1998 BAAC audited financial statements annual report, that of other income reported there, 55 percent represents income from recompense-services. Similarly, an amount of 423 million baht is included as income from recompense-cost of funds.

The issue at stake is a material one, as demonstrated by the fact that the GOT income transfer to the BAAC oscillated around 1 billion baht in 1997 and 1.1 billion baht in 1998, or 5.3 percent and 5.6 percent of gross revenue in these years, respectively. These assessed, arbitrarily negotiated GOT transfers to the BAAC, which were recorded as part of "other income" in the bank's financial statements, exceeded its profits in both 1997 and 1998. (This is true when reported profit is adjusted to include among the costs, as required by accounting standards, the bonuses to employees and directors, in contrast to the BAAC's practice, which presents such bonuses as appropriations of earnings and not as expenditures. This practice was changed in 1999). We did acquire from the BAAC some further information on GOT transfers during fiscal year 1995 through fiscal year 1997. Transfers intended as compensation for interest income payable to the bank on behalf of its clients were as follows for these fiscal years: in 1995, 896 million baht; in 1996, 995 million baht; and in 1997, 1.08 billion baht.

Note that these GOT transfers constitute the bulk of "other income" in the profit and loss statement. We also infer, however, that the residual in the other income line item is for something else.

In response to our questions, the BAAC informed us that even the interest income part of the transfer could be broken down differently in the following two cases:

- Case 1—The farmers participated in a government-directed project to promote and develop certain types of agriculture. The farmers received an incentive for participating, namely, lower interest

TABLE 1

BAAC balance sheet

	March 31, 1999		March 31, 1998		March 31, 1997	
	baht	%	baht	%	baht	%
Assets						
Cash and deposits at banks	4,026	1.46	9,890	3.73	3,414	1.45
Investment in securities						
Government bonds	30,580	11.05	32,300	12.18	25,430	10.80
Other securities	113	0.04	123	0.05	125	0.05
Net loans	225,962	81.67	204,509	77.09	185,812	78.93
Net accrued interest receivable (not yet paid)	9,279	3.35	10,578	3.99	8,404	3.57
Properties foreclosed	—	—	—	—	5	—
Net land, buildings, and equipment	4,977	1.80	5,205	1.96	5,429	2.31
Other assets	1,743	0.63	2,684	1.01	6,792	2.89
Total assets	276,680	100.00	265,290	100.00	235,411	100.00
Liabilities and shareholders' equity						
Deposits	180,564	65.26	165,007	62.20	131,841	56.00
Interest-bearing interbank accounts	—		45	0.02	3,611	1.53
Borrowing	60,283	21.79	67,157	25.31	79,614	33.82
Other liabilities	15,279	5.52	15,369	5.79	13,354	5.67
Total liabilities	**256,126**	**92.57**	**247,578**	**93.32**	**228,720**	**97.16**
Shareholders' equity						
Capital fund						
Authorized share capital						
200,000,000 shares of 100 baht per share	30,000		20,000		20,000	
Issued and paid-up share capital						
93,815,098 shares of 100 baht per share					9,382	3.99
111,721,440 shares of 100 baht per share	22,761	8.23	11,172	4.21		
Surpluses						
Increase in capital from government	34	0.01	10,034	3.78	1,034	0.44
Surplus from donation	1,036	0.37	1,030	0.39	1,015	0.43
Deferred gains (losses) due to						
Exchange rate fluctuations	–6,918	–2.50	7,954	3.00	–9,003	–3.82
Retained earnings						
Reserves	735	0.27	693	0.26	622	0.26
Unappropriated retained earnings	2,900	1.05	2,737	1.03	3,641	1.55
Total shareholders' equity	**20,555**	**7.43**	**17,712**	**6.68**	**6,691**	**2.84**
Total liabilities and shareholders' equity	**276,680**	**100.00**	**265,290**	**100.00**	**235,411**	**100.00**

Note: Amounts are bahts in millions. Tentative figures prior to certification by the Office of the Auditor General of Thailand. Columns may not total due to rounding.
Source: Bank for Agriculture and Agricultural Cooperatives (1999).

rates. The GOT compensates for the difference between the rates charged on the farmers' loans and the normal BAAC lending rates.

- Case 2—When there is a natural calamity covering large areas and a large number of farmers are affected, then the GOT assists them. Such assistance is given to enable them to immediately rehabilitate their agricultural production. A lower interest rate is offered. The GOT compensates for the differences in the interest rates similar to case 1.

We could not identify or obtain a breakdown for the two cases in the "other income" amounts. A basic question then is whether the GOT transfer is not to a large extent compensation for the BAAC's administrative handling of "state projects."

Potential improvements

An accounting and financial reporting procedure that separates the accounts to reflect the outcome of government-project operations would help to display the real cost of these government projects and, thereby, disclose the full extent of the cross-subsidization. This, in turn, when the full benefits are estimated, would facilitate a better assessment of whether these government projects are socially warranted. The SDI could and should be computed separately for the GOT projects. This would also separate those projects and

TABLE 2

BAAC profit and loss statement

	March 31, 1999		March 31, 1998		March 31, 1997	
	baht	%	baht	%	baht	%
Revenues						
Interest earned on loans to client farmers	19,768	82.33	21,187	86.98	19,704	79.88
Interest on loans to farmers' institutions	1,497	6.23	1,723	6.34	1,191	4.83
Interest on deposits with other banks	32	0.13	143	0.53	124	0.50
Interest on government bonds and promissory notes	542	2.26	2,266	8.34	2,040	8.27
Other income[a]	2,173	9.05	1,850	6.81	1,607	6.52
Total revenues	**24,011**	**100.00**	**27,170**	**100.00**	**24,665**	**100.00**
Expenses						
Salaries, wages, and fringe benefits	3,291	13.87	3,123	11.58	3,177	13.64
Interest paid on deposits	6,055	25.52	10,035	37.21	9,325	40.04
Interest on commercial bank deposits	—	—	261	0.97	280	1.20
Interest on borrowing and promissory notes	3,987	16.80	5,321	19.73	5,221	22.42
Loan expenses	31	0.13	27	0.10	163	0.70
Travel and per diem expenses	126	0.53	120	0.44	133	0.57
Provision for doubtful accounts	5,665	23.87	4,833	17.92	2,751	11.81
Bad debts written off	7	0.03	9	0.03	27	0.12
Other expenses	1,179	4.97	1,287	4.77	1,054	4.52
Depreciation on assets and leasehold amortization	592	2.50	616	2.29	600	2.57
Losses due to exchange rate fluctuation	1,983	8.36	550	2.04	557	2.39
Total expenses	**23,731**	**100.00**	**26,967**	**100.00**	**23,289**	**100.00**
Net profit	**280**		**203**		**1,377**	

[a]Other income includes government transfers among other items.
Note: Amounts are bahts in millions. Columns may not total due to rounding.
Source: Bank for Agriculture and Agricultural Cooperatives (1999).

that assessment from the assessment of the risk-contingent income transfers on the bank's regular loan operations that is the focus of this article.

More specifically, the accounts need to clarify whether the transfer from the GOT reflects administrative costs that the BAAC incurs in implementing the government projects; or the difference between the lending interest rates paid by the beneficiaries of such projects and the BAAC's opportunity cost in lending to other clients when the loans are from the bank's own resources; or compensation for low repayment rates on these special projects; or, as we focus on in this study, compensation for ex post loan losses generated by normal operations. The point is that at present all these types of transfers are commingled.

The income statement does not provide separate information on "regular" interest income and penalty interest income. This distinction would be necessary to handle separately BAAC income that is generated directly from clients in various ways versus "indirect" income from the GOT. In response to our questions, the BAAC reports that penalty interest income cannot be easily subtracted from the regular interest income presented, because the BAAC's policy does not emphasize imposing the penalty rate on nonrepaid loans. That is, the BAAC emphasizes assistance to clients affected by *force majeur* factors. The income from these penalties is minimal in any event. However, the condition of entailing a penalty rate is stated in the loan document and can be audited in the individual client's loan account.

We also need clarification with respect to loans that were recognized as "justified nonrepayment" but for which the borrower refused to sign a new "restructured" loan agreement (or has not yet signed it). How is this loan balance classified? How are belated repayments of such a loan to be classified? Will such belated repayments require payment of the penalty interest rate?

Furthermore, in tables of arrears, we see a related version of the risk-contingency story—litigation debt is a small part of annual arrears, for example, 3.1 percent in 1997 and 3.5 percent in 1998. Apparently, then, the bulk of arrears fell under the well-established risk-contingency system and, hence, these clients were not subject to ex post litigation. However, it would be useful to know how much of the nonrepayment amount each year belongs to category one versus category two, that is, justified or non-justified delay. Furthermore, data on nonrepayment could include a breakdown of how much belongs to loans already rescheduled (one, two, or up to three times).

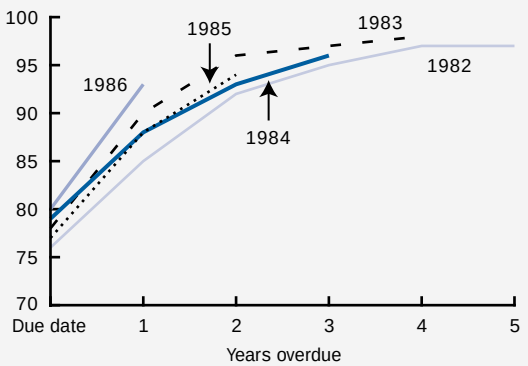
Ideally, data on repayments of loans that fell in arrears but were repaid belatedly should be reported as well, with appropriate reference to the original loan's maturity, so as to verify, over time, the state of loans that result in eventual loss. This information is essential to allow the bank to make appropriate annual provisions for loan losses and realistic cash flow projections.

To its credit, the BAAC reports an analysis of arrears by age related to their original maturity dates in its audited financial statements (see figure 3, for example). This type of information is only seldom disclosed by other financial institutions. Notwithstanding the availability of such data, the BAAC is now provisioning for loan losses more conservatively (see table 3), based on new guidelines, noted in the BAAC annual reports. Previously, provisioning for loan losses was made against the original total, spreading it evenly over ten years (10 percent per annum). Ideally, however, provisions should not be based on some conventional formula but rather on the analysis of arrears by age, adjusted for the likelihood of macroeconomic shocks and, of course, any estimated changes in future repayment stemming from altered policy and assessment of changes in the capacity of borrowers to repay.

The 1998 annual report provides further information by subitems on doubtful accounts as of the end-of-the-accounting periods for 1997 and 1998, as well as the amount provisioned against these subitems in those years. We note, in particular, the explicit mention of natural disaster victim accounts, that is, the magnitude of doubtful accounts associated with southern storms in 1989 and the floods of 1995 (as in the earlier branch example) and 1996. While the 1989 southern storm doubtful accounts are apparently expensed in 1997 and 1998, the 1995 and 1996 flood accounts are associated with positive income in 1997 and 1998. It is not clear if this latter income is associated with overprovisioning in earlier years or if it is a GOT transfer. More generally, the text of the 1998 annual report notes that 350,200 farmers have had debts postponed as victims of natural disasters, permitting one year free of interest. It does seem that interest is not accrued on these accounts, though as argued earlier, other income seems to compensate for loss of interest, as for transfers from the GOT. However, the point remains that the GOT transfers to compensate for loss of interest and the provisioning of the principal of doubtful accounts from the 1989 storm and the 1995–96 flood are not readily apparent in the income accounts themselves.

FIGURE 3

Percentage of original loan amount paid on time and belatedly against original maturity



Source: Yaron, Benjamin, and Piprek (1997).

TABLE 3

BAAC provisioning for loan losses

Age of principal overdue	Loan loss provision rate (%)
< 1 year	10
> 1–2 years	30
> 2–3 years	50
> 3–4 years	70
> 4 years	100

Source: Data from Bank for Agriculture and Agricultural Cooperatives.

Table 4 presents more recent information that reflects the financial crisis. Of the amount of one-year arrears in 1997, 4.49 billion baht, about 41 percent, of that was repaid by 1998, leaving 2.67 billion baht; 25 percent of that (two years in arrears) was repaid by 1999, leaving a little over 2 billion baht. Other rows in table 4, for example, two years arrears in 1997, illustrate similar geometric patterns, with the percentage of the residual repaid positive and declining. Linear rules are potentially too conservative in early years. A comparison of 1997 and 1998, that is, columns 3 and 5 of table 4, shows that the repayment rate on many age categories deteriorated between the two years. Also, total arrears increased for most age categories, and overall by 53 percent. This reflects the impact of the macroeconomic and financial crisis on the Thai economy. These and other shocks need to be factored into expectations in setting future provisioning rates.

Conclusion

In this article, we put forward a new integrated method for the evaluation of a financial institution. Specifically, we identify a risk-reduction or insurance

TABLE 4

Changes in arrears by age, BAAC, 1997–99

Years in arrears (age)	Amount in arrears, 1997	Percent change 1997–98	Amount in arrears, 1998	Percent change 1998–99	Amount in arrears, 1999	Average percent change, 1997–99
1	4,488	–40.53	6,272	–49.35	3,938	
2	1,246	–22.95	2,669	–25.03	3,177	
3	509	–22.00	960	–20.10	2,001	–33.23
4	295	–22.71	397	–20.40	767	–21.54
5	224	–20.98	228	–19.74	316	–21.21
6	73	–20.55	177	–17.51	183	–21.24
7	45	–17.78	58	–17.24	146	–19.27
8	29	–17.24	37	–18.92	48	–18.91
9	15	–16.56	24	–17.33	30	–18.35
10	136		126		124	–17.00
Total	7,060	55.07	10,948	–1.99	10,730	23.28
Outstanding from FY 1997	7,060	–33.77	4,676	–22.69	3.615	–28.44
Outstanding from FY 1998	—	—	10,948	–37.96	6,792	—

Note: Amounts are bahts in millions.
Source: Bank for Agriculture and Agricultural Cooperatives (1999).

role for the BAAC in Thailand. Microeconomic data on consumption and income fluctuations and the BAAC's own operating system both suggest potential substantial benefits from a risk-contingency system that is embedded in the operation of an otherwise standard credit-generating bank. However, the costs of operating that risk-contingency system and the magnitude of the subsidy granted by the government of Thailand to this state-operated financial institution are difficult to estimate, given the way that the BAAC is keeping its accounts. Accordingly, we recommend some changes in the operating procedures, accounts, and managerial information system that would improve the BAAC's financial performance. Specifically, when an individual farmer or small business owner experiences an idiosyncratic or aggregate shock, for example, individual-specific losses such as house fire or aggregate losses such as flood or cyclone, the reason for difficulty is identified at some expense by loan officers in the field. In principle, the reason for nonpayment is recorded in the borrower's credit history, but apparently, these are not systematically coded into a data management system, either at the level of the branch or the head office. Doing this would allow an analysis of the frequency of adverse events, providing a clearer, more direct measure of the insurance functions of the bank. Further, these data would allow an assessment of the likelihood of eventual default on extended or rolled over loans, thus allowing improved provisioning and more accurate cost analysis. Indeed, because interest on late payment may not be compounded (that is, interest is not accrued), concessional interest rates are sometimes offered, and even the principal due may be reduced. As for the case of aggregate shocks, there are other direct costs associated with these various adverse events. It is important to identify and record separately all these costs and enter them as line items under expenses in the financial accounts. Provisions based on assessments of future events and eventual repayments should take into account variations in risk by event and by branch and possibly include low covariation across events and branches.

Although the BAAC provides an excellent presentation of the age of arrears, it does not make the best use of these data, apparently, in the determination of current provisioning rates. What might be rationalized as international best practice is in fact not that at all, but rather conventional norms that may be inappropriate for the BAAC, given the data already available. For example, BAAC loans should be broken down by whether they are rescheduled and provisioned accordingly. Related, nontrivial discrepancies between needed provisions and actual provisions would be associated with necessary adjustments to income later on. However, these are hard to find in the accounts.

In turn, any transfer from the GOT that is intended to compensate the BAAC for these various costs should be identified and broken down into subcategories in the "other income" line item. Currently, the "other income" line in the income statement is aggregated over a variety of potential subsidies, including government funding of special projects, something that is potentially quite inefficient and in any event has nothing to do with the risk-contingency system. More generally, it is sometimes difficult to tell if a farmer has repaid a loan or if the government has done so on the farmer's behalf. Likewise, the branch accounts need to keep track of the timing of transfers from the head office and price them appropriately. With these changes, we could estimate that part of the government subsidy that covers the costs of the risk-contingency system. These results could then be compared with the estimates of welfare benefits coming from the micro data.

As the magnitude of the total subsidy seems nontrivial, we would also recommend ways for the BAAC to increase income and recover costs that are not subsidy reliant. The most obvious of these is to charge borrower clients a fee, which would cover the costs of implicit indemnities. Indeed, even if the government is determined to transfer income to farmers and others in rural areas, the more efficient form of the transfer would be a lump sum, for example, provide a given amount to all villagers, then let households decide whether to borrow, and if they do borrow, let them pay the insurance premium if they wish to do so. Otherwise, they would forfeit the future indemnities listed above. Similarly, the premia would be based on actuarial fair values, using the historical data generated under the new system (or as can be surmised from SES survey data). Costs could also be recovered from higher fees charged to households displaying willful default, and this income should be identified as a separate item. Finally, costs could be reduced by less comprehensive, random checks of claimed adverse events, still allowing client borrowers to make verbal or written claims.

NOTES

[1]Ideally, the benefits would be measured as a function of observed characteristics, for example, wealth, and then compared with the cost financed by indirect or direct taxes, again as a function of observed characteristics. A subsidy is not necessarily redistributive.

[2]The annual average yield on the loan portfolio is 118,500 million baht, the yield obtained on a loan portfolio at 11 percent per annum, so with a Subsidy Dependence Index of 35.4 percent, this equals about 4.6 billion baht. For an explanation of the Subsidy Dependence Index (SDI), see box 1, page 35. All data are from 1995.

[3]We are not apologists for all Asian financial institutions. Indeed, by our more appropriate standards, the commercial banks of Thailand do not do so well. As nearly as one can tell from the limited information provided, the nonperforming loans of commercial banks would seem to be genuinely problematic, nor do micro data provide overwhelming evidence for a beneficial role. The larger point is that our methods of evaluation are objective and yet respect the local variation one might suspect would be contained in a country-specific, indigenous system. Such indigenous systems need to be assessed and that requires the appropriate accounts and the integration of those improved accounts with the theory of risk bearing and measurements from micro data.

[4]The value of the subsidy can be calculated by computing the yield rate of the subsidy against the value in baht of the yield on the loan portfolio—(14.89 percent – 11 percent) × 118,500 million baht = about 4.6 billion baht.

[5]Disclosure of BAAC financial data is somewhat limited and the measure of its subsidy dependence therefore may not be fully precise. However, it is more likely to reflect trends in the BAAC's subsidy dependence over time. Data that are required for more accurate computation of the SDI are monthly balances of the major items of the BAAC's financial statements, to compute more accurately than with annual averages, and the specific financial cost of each financial resource, as information often is available only in the aggregate.

[6]One might question the optimality of checking everyone. In lieu of this, one could check randomly as in the costly state-verification framework. Still, the BAAC does have relatively low administrative costs compared with other SACIs.

[7]The new BAAC system introduced in 2000 requires that nonperforming loans be amortized in five years, so there is an even higher requirement to provision in the first year.

[8]An allocation is said to be *Pareto optimal* if no one can be made better off without making someone else worse off. The first fundamental welfare theorem of economics is that under certain assumptions any competitive equilibrium is Pareto optimal. The second welfare theorem is that any Pareto optimal allocation can be supported as a competitive equilibrium with appropriate taxes and transfers.

[9]The calculation $(100 - 10) \times (1 + x) = 100 \times 1.15$ implies $x = 27.8$ percent.

[10]This can be calculated $90 \times 1.15 = 103.50$.

[11]Again, to realize \$115, an interest rate of 27.8 percent is needed as $1.278 \times (100 - 10) = 100 \times 1.15 = 115$.

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