Structuring Credit to Manage Real Risks

J.D. Von Pischke

If half the effort that has been spent throwing credit at the frontier [of formal finance] had been devoted to stimulating voluntary savings mobilization, the financial landscape in much of the Third World would probably be more attractive today. (And if the other half had been devoted to managing risk in credit relationships... this financial landscape would be a lush garden.) -- Finance at the Frontier (page 97)

Battered credit projects and institutions litter the rural financial landscape in many countries. Their fate has elements in common with destructive agricultural practices. For example, farmers know the circumstances in which use of heavy machinery destroys the structure of certain types of soils, excessive doses of fertilizer burn crops, overgrazing and overcropping lead to lower carrying capacities and yields, extravagant irrigation causes salinity and bad practices hasten erosion. Excess is also the cause of official credit’s brilliant flashes across the rural financial sky and frequent crash. Too much credit has been issued. More accurately, too much credit has been issued for a particular purpose. This occurs easily when special lending programs are established to direct an artificially inflated supply of credit to officially identified “priority sectors” such as agriculture.

Too Much Credit for a Particular Purpose?

But how could too much credit ever be issued while farm households remain poor, rural children do not get enough to eat, farm women are beasts of burden, men are unemployed and modern agricultural technology can greatly increase crop yields and rural productivity? Is not credit the key to unlocking the solutions to these problems? The answer to this question is complex but not difficult. Its exploration leads along paths to the green pastures and still waters of sustainable rural development and to the flowering of innovative financial architecture.

Credit Does Not Respond Directly to Deprivation

David H. Penny (1968) and Dale W Adams (1992) have pointed out that credit, or from a more useful perspective, debt, does not necessarily respond to the causes of deprivation and poverty. Examples include poverty caused by controls that keep produce prices artificially low, land tenure arrangements that exploit tenants and impede development of a land market, and the high risks of rainfed agriculture. One can also imagine the situation of producers in poor agricultural areas not well-served by infrastructure. Their remoteness keeps the costs of inputs high and the farmgate prices for produce low and inhibits economic production. In these types of situations credit does not address primary constraints. It may not necessarily liberate or effectively compensate target groups because scope for its productive use is limited.

Since these observations were made, interest has developed in micro-enterprise credit for members of households who have little effective access to or occasion to use modern commercial services or taxpayer or donor-financed infrastructure. A few of these small loan programs have been stunningly successful and widely cited by promoters and in the literature. However, prospects for their replicability are less certain, and caution is in order because so few programs that direct credit to specific groups, perceived as disadvantaged, have proved sustainable (Adams and Von Pischke, chapter 9).

Excessive Credit Creates Debt Crises

At the most basic level the observation that too much credit has been issued is tautological. Farmers and other rural borrowers who cannot repay their loans have clearly borrowed too much, creating a sort of barefoot debt crisis. The result is always a reduction in the value of credit outstanding through loan amounts written off, forgiven or otherwise lost.

1. The author is grateful to H.A.J. Moll for helpful comments on an earlier draft.
2. A.H. Ballendux (1974) posed this question. Using a medical analogy he noted that agricultural credit “Administered in too great or too small a quantity, or at the wrong point in time, in the wrong way or under inappropriate circumstances...may do the patient more harm than good and may even endanger his life.”
An upscale example of this effect was illustrated in the United States in the 1980s when farm debt grew several points beyond 20 percent of the nation’s agricultural balance sheet (Johnson and others 1987; Penson 1987; White and Lyu 1988). In other words, farm debt financed more than 20 percent of farm assets. Several related factors fueled this crisis:

During the 1970s boom, farmers as a group enjoyed a massive increase in real wealth, and some farmers borrowed heavily to increase their participation in these gains. In the bust of the 1980s, the entire increase in real wealth disappeared, and many heavily indebted farmers have been unable to repay their debt. Their personal financial crises are being managed through the restructuring of their obligations or are ending in the liquidation of their assets; that is, their “excess debt” is being forgiven or proceeds from sale or foreclosure of their assets are being applied to the indebtedness. In either case, such borrowers have lost their equity and their lenders have lost part of the funds they lent (Melichar 1987a. Quotations added.)

A large portion of the massive growth in farm credit came from the government’s Farmers Home Administration and the government sponsored but privately owned Farm Credit System. Both expanded their market shares of farm debt. Commercial banks also increased their rural lending.

The surge in credit occurred in response to increases in land values associated with high crop prices in the 1970s, to congressional approval of higher levels of financing by the cooperative credit system (loans could exceed 90 percent of the value of land), and to a much smaller extent to public (political) alarm that wealthy aliens from oil-rich and other nations were buying the soil of the American heartland (while foreign-held farms occupy less than one percent of all US farmland).

But trees do not grow to the sky (Kindleberger 1978). Risk keeps the landscape on the ground. Crop prices soon fell, declining land prices wiped $450,000 million off the nation’s farm balance sheet, the oil-rich and others abroad became less interested in American farmland as an investment. Debt service burdens became crushing as farm incomes fell and many farmers who had gone into debt to expand their holdings found themselves in financial difficulty: they had too much debt. Land values were less than the loan amounts they were pledged to support, making it impossible for lenders to recover all amounts due by repossessing and selling land pledged as security.

The impact on the cooperative Farm Credit System was large, as it charged off US$3,755 million in bad loans between 1984 and 1988 (USDA). The Farm Credit System’s 1985 loss of $2,690 million was the largest ever for a US financial institution and led to the restructuring of the system (Collender 1992; Harshbarger and Chite 1987). Other casualties included more than 200 commercial banks that were closed (Melichar 1987b) and the failure of at least 5 percent of American farmers (Wall Street Journal 1985). Melichar made a crude estimate in 1987 after the worst of the crisis that lender losses from 1986 onward would approximate $16,000 million (Melichar 1987a). The government gave new subsidies to farmers to help them out of debt and relaxed regulatory standards to save some weak lenders.

This was the biggest single debt crisis experienced by the US up to that time. But farm credit problems were soon forgotten. They seemed like a tempest in a teapot as the savings and loan and banking crises of the 1980s burgeoned to an estimated $500,000 million mess, a cost spread over a number of years but which approximated the combined GDPs of neighboring Canada and Mexico at the time these troubles were becoming apparent.

Is it reasonable to cite a US example to argue that excessive credit should be avoided in poor countries? Yes, if affordability is considered. Follies of this type are relatively easily handled where agriculture absorbs about 1 percent of the labor force and where computers and industrial smokestacks outnumber farms. In all cases, repayment capacity, not need, is the relevant reference point for designing viable credit projects and nurturing sustainable institutions that can raise funds from depositors and investors.

Excessive Credit Is Difficult to Manage

At a similar tautological level it is clear that too much credit is issued when it goes beyond the capacity of lenders to manage. This may occur in several ways. In some poor countries financial housekeeping is deficient, and lenders on the fast track often get far ahead of their management information systems. They do not know their financial positions -- some have even lost track of their cash and bank balances -- and may not be able to bill borrowers regularly and reliably. Borrowers receive an important signal when they cannot promptly ascertain the lender’s reckoning of the amount they owe. Repayment performance easily declines, causing lenders to lose money.

3. Risk is used here as in non-technical English to denote both risk and uncertainty.
In other cases bookkeeping may be up to date, but rapidly expanding lenders cannot keep in touch with the reality of the market they serve. Visits to clients already in debt may become less frequent as more energy is directed at making new loans. Economic intelligence and technical issues may be discounted or ignored, especially if the lender is expected to help farmers and the economy through economic cycles by lending counter-cyclically.

Pressure to get the money out can lead to the decline and possibly the collapse of the lender’s credit culture: the good questions that probe credit quality are less frequently asked and more frequently left unanswered. Promotions of high-volume lending officers highlight institutional priorities, and when credit quality problems surface several years later there may be few people left who have the stature, willingness or capacity to sort out the debacle. Any political force that stimulated the excessive issue of credit may be refocused on sparing pain for the debtors. The lender ends up much smaller and is often capable of providing only a low level of service to the community. Clearly, viable financial institutions provide better services over the long run than nonviable ones, or than a succession of nonviable lenders could.

**Development Practice and Theory**

Finally, some seasoned development assistance agencies now tend to back away from rural credit projects, implying that they, too, believe that the supply of credit has been excessive. Several major donors, including the World Bank and USAID, have reduced their lending through projects that provide lines of credit to financial intermediaries for on-lending to farmers or other rural activities. But their activities may have been too much too long. “Credit culture” is easily destroyed and takes a long time to reconstruct. Transaction and risk costs are increased for society as a whole (Wall Street Journal 1985) as traditions of default and impaired contract enforcement become more firmly established.

Project analysis offers another but somewhat technical perspective on excessive credit. The theoretically optimum economic project size provides sufficient investment to reduce the project’s marginal rate of return to the level of the opportunity cost of capital. (Few projects are of this magnitude because of budget reasons and institutional limitations.) Larger projects would not be economic because there would be better returns available on alternative projects elsewhere in the economy. Investment beyond the range prescribed by the opportunity cost of capital would be excessive in an economic sense.

This suggests that credit is excessive when many borrowers’ marginal activities yield returns below the opportunity cost of capital. Clearly, positive returns on capital are generally required to support loan repayment, unless borrowers experiencing reverses are willing or can be forced to liquidate assets to satisfy their creditors.

**Banking Ecology**

It is possible to issue too much credit; doing so results in bad debt losses that may overwhelm institutions, destroying confidence and weakening contract enforcement. But are all bad debt losses by financial institutions to be deplored? Do they all defile the landscape? Not necessarily. A large tree may fall with only a small impact on the landscape. In fact, a lender that loses no money is not exploring opportunities for new business and is not behaving competitively. However, losses are a serious threat to all financial systems because these systems use large amounts of debt (such as deposits received from clients) and small amounts of their own capital.

**The Banker’s Problem**

Commercial banks in OECD countries and elsewhere are increasingly being forced to maintain a risk-adjusted capital-to-assets ratio of 8 percent, as prescribed by the Basle guidelines. This ratio stipulates that every guilder of (risk-adjusted) total assets must be supported by 8 cents of their own capital. Own capital consists primarily of funds subscribed by shareholders and profits retained in the business. Risk adjustment weights assets according to arbitrary probabilities of loss: cash and short-term government securities issued in

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4. Credit culture has several meanings. It usually denotes the environment in which credit decisions are made in a financial institution. Strong credit cultures produce good loans, weak ones lead to low quality loan portfolios and bad debt losses. However, the term is increasingly applied to the attitudes, performance and expectations of borrowers or of a society at large with respect to the sanctity of loan contracts. In this usage the term is a PC (politically current) substitute for financial discipline or the older form, credit morality. Bouman uses *bishi* culture and ROSCA culture even more expansively to denote the dynamics of the operations of these two informal financial institutions (Bouman 1989: 66-69).
the currency in which the bank keeps its accounts are assumed to bear no risk, for example, and hence require no capital to support them. Loans outstanding to private borrowers are assumed to require an 8 percent capital base. The Basle guidelines were agreed under the sponsorship of the Bank for International Settlements in 1988 (Basle Committee). They were adopted in response to pressure on banks worldwide because of Third World and other doubtful debt, and because bankers from countries where relatively high capital-to-asset ratios (e.g., 8 percent) are the norm wanted to diminish competition from bankers in countries where lower ratios are traditional.

In commercial banking an annual return on total assets (ROA) of 1 percent constitutes good financial performance. This return is small compared to that of most other industries, but it still represents a reasonable return on banks’ capital because there is so little of it. A 1 percent ROA for a bank with an 8 percent capital-to-assets ratio represents a 12.5 percent return on capital. These relationships demonstrate that finance has fine tolerances, or little margin for error.

Fine tolerances mean that the banker or financial analyst may view the financial landscape quite differently from the way the economist, agriculturist or sociologist sees it. Consider, for example, a team appraising a credit project that is expected to promote a new crop. The agriculturalist may be doing an excellent job by predicting within plus or minus 25 percent the average yield to be obtained from a new crop, and the rural sociologist may be doing an excellent job by predicting within plus or minus 50 percent the extent of target group adoption of the crop in any given year. The agricultural economist may be doing well by predicting within plus or minus 10 percent the average price that growers of the new crop will receive for their produce in the free market. The banker or financial analyst has a much smaller margin of error, in the order of 1 percent of average loan size, in predicting interest income, loan administration costs, collection rates and bad debt losses. In other words, the risk of error is great for the banker or financial analyst.

These close tolerances give bankers a peculiar point of view that enables them to bring constructive pessimism to bear in any situation. A project can do well as a narrowly economic, agricultural or sociological intervention, yet be a disaster financially for the institution making loans to participants and bearing the associated credit risk. Credit is really quite vulnerable, not the robust cutting edge of development so often portrayed.

**Levels of Losses**

Losses associated with debt crises lead to a reduction in confidence in financial markets (Kindleberger 1978). Reductions in confidence can increase the cost of funds to affected institutions, which must pay higher rates of interest on deposits or other funds to attract clients who prefer their untarnished competitors. Widespread confidence problems have a social cost, because they increase the costs of intermediation for clients as institutions seek to recapitalize themselves from profits. They may also have short-run dislocation or transaction costs if they result in the bankruptcy and closure of poorly performing intermediaries. (There may be long-run social benefits if this weeding out does not diminish the overall competitiveness of financial markets.) Because confidence is so critical in finance, risk receives great attention in financial markets and even from government regulators.

Three degrees of losses may be identified. The first is within an affordable creative margin of innovation, which is part of the natural evolution and regeneration of the landscape. These financial losses do not diminish confidence in financial markets. Their causes are easily corrected and their impact easily absorbed by lenders’ capital, and the greater the capital relative to assets the greater the base of innovation. These losses provide important information that can be acted upon by the would-be innovator and by competitors, redirecting energy toward more sustainable behavior. Hence, these losses cannot really be attributed to excessive credit creation.

The second level is a larger degree of failure that credit institutions and financial markets or institutions can accommodate in unusual circumstances without collapse. Bad loans that accompany this type of failure bring no more than temporary disruption to these markets. While some confidence is lost for a time, a level of confidence is confirmed by the market or institution’s continued operation and eventual recovery. The landscape grows over and around the problem.

Finally, a higher level of failure causes long-term damage to the ability of credit markets and institutions to grow and perform efficiently. This degree of failure overwhelms normal operations and risk management. The landscape is degraded and forever altered. Credit has been excessive.

**Sustainability or Green Finance**

Losses from excessive credit issue jeopardize the eventual quality of services available to those who receive excessive credit. This occurs because money-losing lenders rarely create robust capacity. At some point these lenders lose their credibility and the support of the parties that made it possible for them to sustain losses for
long periods. Government priorities may change, donor fads alter. This often occurs just when the continued supply of funds is most important, such as in the midst of a downturn in the economy or in a period of structural change. Because of the larger factors that cause credit problems, old priorities are abandoned or downgraded. These often include subsidized programs and unprofitable state-owned ventures.

Because of the inevitability of adversity, financial institutions’ capacity to survive is best served by building strong balance sheets and high-quality earnings. This is most likely to occur in competitive situations and when financial intermediaries create strong links with their clients and have sufficient capital to enable them to innovate in providing financial services. Institutions that are not competitive are unlikely to have the incentives required to ensure their survival over the long run, regardless of the economic power they exert in the short run. Because their monopoly shields them from market forces, they may not adjust to changing conditions. They tend to become brittle, often collapsing relatively quickly at a point when they have clearly outlived their mandate. Monopoly may appear to be the most stable form of economic organization, but because it is not attuned to developments in changing markets and societies it proves to be especially vulnerable.

In summary, excessive credit arises from an overestimation of what credit can accomplish, from an unrealistic view of borrowers’ repayment commitment or capacity, from inattention to the requirements for effective loan administration by lenders, and from lack of appreciation of the damage to financial institutions and to society caused by bad debt losses beyond the rather small limit that is easily absorbed by lenders’ capital and public confidence.

Risk and Risk Management

The general failure to build sustainable financial systems and institutions with development dollars or generous guilders suggests that a new strategy and role are required for financial interventions made in an effort to develop economies and to empower people and institutions. The new strategy and role proposed here shifts the emphasis from concern for the quantity of directed credit to its quality. The ingredients for this revision are inherent in finance and develop naturally when financial markets are not gagged with regulations or force-fed with ill-conceived credit projects. Respect for what might be called “financial values” can improve financial landscapes.

Risk is the essential element of finance that offers developers their greatest opportunity in using financial markets. This is paradoxical, because it is risk that unseats systems, institutions and projects that issue excessive credit. Beyond some dynamic but sustainable equilibrium, risk translates otherwise rational behavior into forces that depreciate credit contracts and destroy credit institutions. Debtors are unable to repay, creditors are unable to collect, or both. But risk is the blessing as well as the curse of finance. Developers and landscape architects using finance as their garden should be inordinately concerned with and profoundly fascinated by risk.

Dimensions of Risk

The most visible dimension of banking is the intermediation of funds or dealing in money. Deposits provided by some are transformed into loans for others. This process is a very powerful one that all governments and many other organizations and people seek to control. It is also often regarded as the financial sector’s greatest contribution to a market economy and to development.

Beneath the surface of dealing in money is an equally important or, in the long run, possibly more important process: the intermediation of risk. Risk may be defined simply as variability of returns, or as failure to achieve financial objectives or expectations. Intermediation between depositors and borrowers cannot occur without a simultaneous intermediation of risk.

In the transformation of a deposit into a loan, the transformation of risk is subtle and complex. To illustrate this point, assume that the depositor is a private individual and that the borrower is a business. The depositor expects that the deposit is less risky than holding cash at home or in a secret place. The depositor believes that money in the bank is safe from theft, that there is less risk that it will be spent on impulse because it is not instantly available, and that the existence of the deposit will be kept in confidence by the banker except as may otherwise be required by the state.

The banker knows that there is risk in lending. Risk motivates bankers’ efforts to remain liquid so that payments can be made on demand and to remain solvent by using profits to build capital. The banker’s risk includes the possibility that the purpose for which credit is provided may not be remunerative, leaving the borrower with insufficient funds with which to repay, and also the possibility that the borrower may attempt to avoid repayment in spite of having funds available.

But there is also another element of risk transformation. Owners of a business invest their own funds in their enterprise, and these are at risk. If the business fails the owners lose some or all of these funds. As long as the
business is financed only by the owners’ funds, the owners’ risk on this investment is identical to the risk facing
the business. When the owners borrow for the business, their risk increases because their returns are subject to
greater variability. They are willing to take this risk because they believe the returns from using credit are
greater than the costs of doing so.

This occurs because a loan creates a hierarchy of claims: the lender expects and has a legal right to a steady
or fixed return in the form of payment of interest and repayment of principal, while the owners take a residual
position that receives variable returns. Debt service obligations diminish the owners’ returns from the business
disproportionately in bad times when flows are small, while providing the opportunity for disproportionately
larger gains in good times when the returns obtained from using credit are much greater than the cost of credit.

Hence, borrowing increases the owners’ risk, as their returns are more variable than those of the business. In
addition, lenders often place conditions on their loans. Compliance may increase borrowers’ costs and risks,
including the cost of reporting and the loss of flexibility in managing the business. Obviously they borrow in
the expectation that bearing larger risks, up to some subjective point, generates larger returns.

Information Is Required to Manage Risk

Procedures used to intermediate funds in highly developed financial centers are rather easily copied in less
developed ones, but processes used to manage risk are much more difficult to transplant. Because financial
intermediation transfers funds and risk simultaneously, failure to cope with risk undermines attempts to inter-
mediate funds successfully. This occurs because bad loans destroy the confidence on which intermediation is
based. Hence, risk should receive special attention in all efforts to use finance to stimulate development.

Information is the most important ingredient in risk management. The greater the amount of relevant, valid
and timely data about the affairs of a loan applicant and the markets in which the applicant operates, the more
refined the rational credit or investment decision. With good information, the operations of an enterprise can
be better understood. In countries with highly developed financial markets, accounting and disclosure
standards have developed to facilitate the flow of information to investors and creditors. Projections of a firm’s
financial performance can be made more skillfully, yielding a higher probability of accuracy. These reduce
transaction costs and promote wider access to credit and equity capital.

Information is used to create confidence in financial markets. Confidence is extremely important because
finance is always risky. Risk arises because the future is unknown and because financial markets trade cash in
the present for promises of returns in the future. Confidence is a judgment, a state of mind, an emotion, an
impression, even if backed by complex and profound analyses, making information especially important.

Information, Risk and the Lending Decision

Organization of information increases its power. Table 1 illustrates conventional information organization
and use in agricultural or rural credit projects. This table portrays a very simplified example of farm budgets
used by donors in agricultural credit project design. This budget is for a single season and is driven by the
increase in purchased inputs with the project (line 6). Similar budgets for on-farm investments with a longer
life cover correspondingly longer periods.

The Conventional Approach

Budgets of this sort are intended to be representative of the potential for large numbers of farms or hectares
or of what might be accomplished in specified areas. They are also used to calculate rates of return, especially
the economic rate of return that attempts to indicate that “the economy” would benefit from donor intervention
through investment in an activity. In this context risk may not be viewed as relevant or interesting because the
sequence of good, normal and bad years is impossible to predict and because good and bad years offset each
other to some extent.

“Sensitivity analysis” provides an indication of a farm budget’s resilience by arbitrarily adjusting the rate of
return to reflect larger-than-expected costs (e.g. more than 10 percent) and lower-than-expected revenues (e.g.
less than 20 percent). The discounted cost stream and the discounted benefit stream may even be graphed to
illustrate their slopes at the cross-over point at which they meet to yield the rate of return. If their slopes are
steep a change in either, denoted by a parallel shift, will produce a smaller impact on the rate of return than if
their slopes are more nearly horizontal. This gives a perspective on risk, but few if any projects or support for
specific farm enterprises (crops) were ever redesigned or abandoned as a result of sensitivity analysis.

However, the format used in Table 1 makes no explicit allowance for risk. This is not to say that risk has been
entirely ignored: the agronomist who recommended the crop to be planted (“produce” on line 1 in this
example) may have had a good nose for risk, reflected in the projected yield and recommended inputs. The
Table 1: Hypothetical Farm Budget

<table>
<thead>
<tr>
<th>Category</th>
<th>Without Project</th>
<th>With Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Produce (tons)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2. Consumed on farm (tons)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3. Marketed produce (tons)</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4. Farmgate price per ton ($)</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>5. Total farm cash receipts ($)</td>
<td>1200</td>
<td>3200</td>
</tr>
<tr>
<td>6. Purchased inputs ($)</td>
<td>200</td>
<td>1000</td>
</tr>
<tr>
<td>7. Net benefit before financing ($)</td>
<td>1000</td>
<td>2200</td>
</tr>
</tbody>
</table>

Agricultural economist may likewise have researched farmgate prices and input costs very carefully (lines 4 and 6 in Table 1).

A problem -- a big problem -- arises when the format used in Table 1 is also used to determine loan size, as has customarily been the case. In this example the incremental inputs required, which cost $800, double outputs, from 5 tons to 10 tons. This budget would customarily be used to justify a loan of $640, $720, $760 or $800. Why these amounts? Simply because donors usually use rules of thumb, or formula lending approaches: loan size equals 80 percent, 90 percent, 95 percent or 100 percent of incremental input or investment costs. There seems to be no particular conceptual basis for selecting any one of these high percentages, but there is probably a bias toward the high end of the range when potential borrowers are viewed as poor.

These high levels of financing almost inevitably run into problems when bad years occur. These problems may be avoided or minimized when the loan finances only a small portion of the economic activities of a borrower who has a good relationship with a lender, and when methods of handling bad years are thought out in advance by the lender. These precautions appear to be the exception in donor-supported credit projects.

High levels of debt create large debt servicing requirements that may be difficult for borrowers to meet or which discourage them from repaying out of a diminished supply of funds available to support their normal consumption levels (beyond the 2 tons of produce consumed on the farm) and their customary social obligations. The budget approach illustrated in Table 1 virtually guarantees that loans will be excessively large.

Risk Adjustment

One dimension of organization of information in finance is the testing of data regarding variances from the norm or expected outcome. Variance-centered analysis is important because of risk, which deflects results from the normal or expected outcome. Because of the narrow margins for error in credit markets, skillful loan providers have a good feel for risk.

What would a risk-adjusted budget look like? Table 2 offers another highly simplified example. Risk adjustment, properly done, provides opportunities for protecting the lender from lending too much, for protecting the borrower from taking on too much debt, and of greatest importance, for examining real risks that borrowers are exposed to and searching for ways of reducing or managing real risk. Whereas farm budgets have customarily been directed at deriving a representative return on an investment, risk adjustment focuses primarily on the size of loan that is sustainable for an on-farm investment.

Table 2: Hypothetical Risk-Adjusted Farm Budget

<table>
<thead>
<tr>
<th>Category</th>
<th>Without Project</th>
<th>With Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal Year</td>
<td>Bad Year</td>
</tr>
<tr>
<td>A. Produce (tons)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>B. Consumed on farm (tons)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>C. Marketed produce (tons)</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>D. Farmgate price per ton ($)</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>E. Total farm cash receipt ($)</td>
<td>1200</td>
<td>3200</td>
</tr>
<tr>
<td>F. Purchased inputs ($)</td>
<td>200</td>
<td>1000</td>
</tr>
<tr>
<td>G. Net benefit before financing ($)</td>
<td>1000</td>
<td>2200</td>
</tr>
<tr>
<td>H. Senior claims ($)</td>
<td>500</td>
<td>600</td>
</tr>
<tr>
<td>I. Repayment capacity ($) = uncommitted cash flow</td>
<td>500</td>
<td>1600</td>
</tr>
<tr>
<td>J. Loan received ($)</td>
<td>0</td>
<td>1333</td>
</tr>
<tr>
<td>K. Debt service ($) (principal + 20% interest)</td>
<td>0</td>
<td>1600</td>
</tr>
</tbody>
</table>
The starting point for risk adjustment is identification of what is most likely to go wrong. Risk manifests itself in real hazards and events, such as the death of a cow or failure of a crop or a machine, not in mechanical assumptions such as a 10 percent cost increase and a 20 percent decline in revenues. Hence, risk adjustment has to go beyond sensitivity analysis.

In other words, material risks should be identified and their likely impact explored and quantified. Once the question about what is most likely to go wrong is answered, the next question is, “What else is likely to go wrong?” Lines A through G in Table 2 provide a simple format that incorporates risk, defined as a “bad year” or season. In this hypothetical example, a reduction in output (line A) is partially offset by an increase in prices (line G), on the assumption that the yield shortfall is generalized, yet total farm cash receipts (line E) fall by almost half.

It would be easy to cook up risk-adjusted models like Table 2, based on hypothetical situations without identifying what the real risk is that would create a “bad year”. Is it realistic to assume that sufficient information would be available to permit risk adjustment based on real underlying factors? If it is possible to predict yields and prices it is also possible to predict risk. In other words, evaluation of risk is part of any investment decision and may even be included in a gambler’s calculus. Many extension service field staff have an idea of what types of adversity can be expected and the frequency with which they are encountered.

Farmers also have expectations and experience that they are very clear about when they are questioned about bad years, reversals and losses. But they have not been sufficiently consulted in credit project design. Once they are consulted, real risk and measures to deal with real risk, in addition to the possibility of providing more credit, should become apparent and accepted as a priority and objective of development intervention.

In this way developers and lenders’ interest in providing credit can open windows on problems, defined here as risk, facing borrowers and potential borrowers. The result should be more mutually satisfying relationships between lenders and their rural borrowers. A lender or development agency that viewed risk identification and management as a major element in development strategy would accumulate much information and experience. This could provide a powerful platform for helping intended beneficiaries around or over the things that limit their progress and that are within their control or the lender’s control.

**Senior Claims**

Table 2 takes risk analysis further by including senior claims (line H). These are obligations that the borrower considers more important than repaying the lender. They pose a risk to the lender. Senior claims that are not considered when a loan is issued increase the probability that the loan will not be repaid. Senior claims include survival or keeping the farm business operating, paying schools fees and taxes, seizing extraordinary opportunities, and meeting social obligations that cannot be side-stepped except at great cost. They may also include things that borrowers always wanted to do or acquire but felt too poor to do so. Senior claims are expected to increase with the expansion in farm income (line H, versus without project).

Senior claims are not immutable. Sustainable lenders that establish good relationships with their borrowers in effect lever their way up the borrower’s ladder of claims. Informal finance demonstrates this effect: to default on a RoSCA obligation is a very serious matter. Contributions to the periodic hand take precedence over many alternative expenditures that would otherwise occur, indicating that few claims on members are senior to those of the RoSCA. Overall, informal lenders are likely to be repaid before formal lenders, newer lenders after older lenders, lenders close by before distant ones (Shipton 1990). Here again there are mountains of information on senior claims waiting to be mined by bankers and rural developers.

**Sizing Loans to Accommodate Risk**

Table 2 indicates repayment capacity (line I) adjusted for risk and for senior claims. The estimated amount, $150, is quite small compared to the normal year level of $1600. What size loan should be issued? Assuming a 20 percent interest charge a loan could be issued for any amount between $125 and $1333 (line J). How would lenders use these data rationally? The maximum loan would not appear to have to exceed the $800 in incremental input costs (line F, normal year with versus without project). (Occasionally project designers have applied high, arbitrary financing percentages to total costs, not to incremental costs, lending more than is theoretically related to the difference between the with and without project cases.) Many lenders would not issue a loan of $800 in view of the risk suggested by the difference between repayment capacity in a normal and bad year.

A loan of $125 would presumably not exceed the borrower’s capacity to repay every year within the range of adversity and senior claims considered reasonable. But would a loan of $125 make sense? If it were viewed as trivial, it would be less likely to be repaid. Would the borrower be able to undertake the incremental $800 investment in inputs if a loan of only $125 were issued? If not, what would make sense, and most importantly,
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for which type of lender?
While some lenders would refuse to become involved in such situations, others might be willing to accept “interest only” from distressed clients in a bad year. Payment of interest shows goodwill and commitment on the part of the distressed borrower and permits the lender to collect income on the loan. Assuming a 20 percent interest charge and a minimum repayment capacity of $150, a loan of $750 could be issued ($150/x = 0.2/1). The principal amount, $750, could be recouped over normal and good years that could be expected to recur, because good year repayment capacity is $1600. A strategy of this type assumes that lender and borrower maintain a long term relationship.

Within an enduring relationship there are a number of other solutions to the puzzle of deciding how much to lend or borrow. One approach to the problem would be to calculate how long it would take to recover a specified amount in arrears over a sequence of bad, normal and good years, assuming always that new loans will have to be forthcoming each season for the borrower to continue to be productive and in a position to service debt and for the lender to retain a relatively senior claim. New lending in the face of adversity, or following adversity, is especially important in assisting the borrower’s recovery and is one means of risk management. Measures to manage risk that are thought out in advance of its impact have rarely been incorporated in the design of donor-supported credit projects and components.

A lender with no flexibility could not agree to anything less than repayment in full on the due date. A strategy of collecting interest only in an adverse situation or lending new money when old money is in arrears would not be worth considering. In this extreme situation the lender cannot manage risk. The loan is bad and the borrower is abandoned, creating the worst possible real and financial outcomes, assuming limited alternatives available to each.

Yet some degree of risk management is common in finance. The source of a lender’s flexibility is risk management. A very simple example: lenders do not want to run out of cash, to be illiquid, because this destroys confidence. Therefore they keep cash in reserve: commercial banks often have loan-to-deposit ratios as low as 50 or 60 percent. Required reserves kept with the central bank absorb part of the difference, some is kept in the form of vault cash, and balances with other banks and investments in government securities account for most of the remainder. In effect, these provide different levels of insurance against running out of cash. Another simple example is portfolio diversification by type of borrower, geographically, and by loan maturity.

Bangladesh Awash, Grameen Bank Awash with Cash

An example of successful risk management is Grameen Bank’s financial structure at the time of the disastrous 1988 floods in Bangladesh. How should a bank be structured to survive the inundations that cover a third to a half of Bangladesh’s landscape every few years? Half of Grameen’s assets consisted of cash on deposit with other banks in Bangladesh. This raised the eyebrows of some observers from development assistance agencies and NGOs who thought that this money should be loaned to desperately poor people rather than kept in banks.

But while the waters were receding, Grameen Bank’s Yunus gave the following instructions to his staff: (1) go to the villages and tell our members that every day they are not working they are eating their assets, and that is bad because it only makes them poorer, (2) members who have lost their loan-financed assets in the flood can have new loans equal in size to their old loans, (3) all restrictions on the withdrawal of the various forms of savings deposits members hold with the Bank are waived -- anyone can withdraw on demand, and (4) do not mention loan repayment: when members are in a position to repay they will repay. Members took new loans. Very few withdrawals were made from deposit accounts, possibly because members valued these as reserves against another rainy day.

Is it possible for a bank to design a better approach to risk management than this, one that sustains the dignity and aspirations of member-borrowers in such a way that their commitment to Grameen (or the seniority of the Bank’s claim on them) is reinforced rather than weakened by catastrophe, that could be accommodated within normal banking procedures, and that could be undertaken at short notice without having to obtain approvals from any other source such as a donor or government authority? No loans were forgiven, and Grameen lost relatively little from the tragedy.

Grameen’s example demonstrates several things. First, it shows that the fortunes of borrowers and lenders are tied, giving both a stake in successful risk management. Second, it shows how risk management by either party can benefit the other. Third, it demonstrates the importance of financial innovation to successful risk management, in this case the highly unconventional level of cash reserves. Periodic massive flooding is entirely predictable in Bangladesh, although the year in which it strikes is not, and Grameen Bank was essentially in a position to reproduce itself when the inevitable adversity struck.

Other devices bankers use to control the risk of illiquidity include back-up lines of credit from other banks and rediscount facilities from the central bank. Most commercial lenders diversify their loan portfolios so that problems in one industry or sector have a relatively small impact on the overall portfolio. Even in Grameen’s
case, some of its borrowers were in higher areas that escaped flooding. Debt renegotiation is another means that gives flexibility to the distressed party. Renegotiation forgiving some or all of the amount due demonstrates partial or complete failure of previous levels of risk management, however.

The Opportunity to Manage Real Risks

Disillusionment has spread regarding the use of credit to stimulate sustainable development. This is the normal denouement of popular speculative indulgences (Kindleberger 1978), such as the incredible seventeenth century fascination with tulips, which have never seemed quite the same since. Now, creditomania, too, has run its course as excessive credit self-destructs and donors’ credit project flows diminish.

But there are exceptions to this disillusionment. First there have always been those who have no intention of building sustainable financial arrangements. They often cry out that, “Something must be done!” in the belief that present need is so great or political imperatives are so overwhelming, (and probably always will be), that nurturing the financial landscape is a secondary, more remote or even unrealistic task. When something has to be done, credit has often been seen as the easiest way to do it, especially when risk is ignored, as it usually has been in fashioning credit terms. This is not to say that people with this view set out to destroy the landscape. If they can build in a little viability along the way they are often willing to do so, as long as the cost to their money-moving agenda is not too great.

Second are those who are not greatly concerned about the consequences of their attempts to stimulate development. Their view is that good intentions are sufficient, that policies and actions should be evaluated on the basis of intentions. This position is under increasing attack as more and more evaluation is done and as more widely-publicized and -debated results divest intentions of their credibility and make developers more accountable.

There is now a special opportunity for the disillusioned, for those who want to turn damaged financial landscapes into lush gardens, and even for some who are willing to build in a little viability here and there in exchange for providing smaller, smarter loans to help their client lenders and ultimate borrowers deal more effectively with risk. Current circumstances present the largest opportunity for innovation since the surge in interest in credit as a vehicle for development assistance at the household and firm level began in the 1960s.

Finance as a Window on Risk

This opportunity is the potential for using finance as a window on risk. This window opens with the realization that financial flows are information flows, that credit inevitably creates risk, and that these features, already combined in loan contracts and credit markets, can also be combined in an enlightening way in developmental interventions. This perspective leads naturally to concern for identifying risks and quantifying their impacts. This is the first step in risk management. From it develop attempts to deal with real risk -- the things likely to go wrong. These can be avoided or managed in ways that reduce their incidence and impact.

Risk management systems can include real measures (e.g., spraying crops) and financial measures (e.g., saving for the rainy day or linking savings and credit). These systems begin with attention to real risk. They reflect this in loan sizing and in credit terms and conditions. They go on to protect financial relationships by structuring institutional responses to risk that go beyond specific transactions. These responses include the lender’s financial structure and mix of services provided to clients.

Risk as a Window on Finance

A risk-embracing approach should move developers toward a broader, more inclusive view of the realms of human experience from which relevant information about risk can be gathered and analyzed. For example, the family, village and culture are surely the institutions that have stood the test of time as means of risk management (Halstead and O’Shea 1989). When this is realized the contributions of sociology and anthropology can be more fully used to balance the stylized concerns of economics, and the hollow view of finance as another name for cash, in defining development problems and what might be done about them.

At the big end of the financial market in major financial centers, many new instruments, techniques and markets have developed during the last 50 years that have created new ways to manage risk by redefining it and by transferring its impact. These include commercial paper, options and futures on many commodities and securities, securitization of debt, application of duration analysis in portfolio management, and numerous others, without even considering the markets for insurance and guarantees. An especially interesting example was the “junk bond” episode in the US in which financiers redefined risks by repackaging them and then took the lead in locating investors and entrepreneurs to bear them. As with farm debt, promotion of high yield bonds involved unsustainable extremes that eventually unraveled part of the market that was created.
Financial measures to manage risk have been barely explored at the small end of the financial market serving households and small businesses, including farms. New attempts to use finance to manage risks at the small end, at the grass roots part of the landscape, have to increase the flexibility of all parties to a credit transaction to react to adversity without breaking their explicit loan contract or their implicit financial relationship.

This requires innovation, which in credit means lengthening term structures so that larger amounts of credit can be repaid over longer periods of time, reducing transaction costs so that more households and firms have access to financial markets, and redefining the valuation processes that create the basis for credit relationships (Von Pischke 1991). Successful financial innovations lower costs and increase debt capacity in a developmentally sustainable manner. This task should occupy and preoccupy developers well into the next century.

References


