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# Making Small Business Lending Profitable

## Proceedings from the Global Conference on Credit Scoring April 2–3, 2001 • Washington, D.C.

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# Contents

For more information on the World Bank research work and Financial Sector Learning Program, as well as the conference, consult:

http://www1.worldbank.org/finance/

http://www.worldbank.org/wbi/banking/creditscoring/

# Foreword

Michael Pomerleano, The World Bank
Peer Stein, International Finance Corporation

We are very pleased to make available the proceedings of the Global Conference on Profiting from Small Business Lending jointly hosted in Washington D.C. in April 2001 by the Financial Sector Vice Presidency, the International Finance Corporation and the World Bank Institute. It exemplifies the synergies resulting from the complementary activities of the three affiliates of the World Bank Group. The program brought together international financial sector expertise to exchange complementary perspectives in addressing policy challenges and private sector solutions in micro and small business finance.

The Financial Sector Vice Presidency (FSVP) undertakes policy advice and research to assist client countries. Research work done in the banking sector shows that the current trends might lead to the consolidation of corporate services in the hands of global financial institutions. This suggests that domestic banks should capitalize on their local knowledge and relationships in the retail and small- and medium-sized enterprises (SMEs) markets.

The IFC responded to the needs of its clients in emerging countries by launching the *E-Finance Global Initiative* to help financial institutions target micro and small businesses profitably by capitalizing on proven innovations in financial technologies and lending strategies. The Initiative addresses principal impediments to offer commercially viable financial services for micro and small businesses.

Finally, the World Bank Institute (WBI) as the training arm of the World Bank Group is committed to the development of capacity in client countries. The Institute promotes learning opportunities for policy makers as well as private market participants and other stakeholders. It offers a range of cutting-edge learning activities that complement the operational, policy, and research activities of the World Bank.

The Conference was attended by over 250 participants from 58 countries, representing more than 60 banks, 30 leading microfinance institutions, 10 credit bureaus, several regulators, a number of bilateral and multilateral institutions, and 20 leading technology providers. These proceedings present the key topics on which participants had in-depth discussions. We hope you will find them beneficial.

# Summary

Hany Assaad
International Finance Corporation

The Global Conference on Profiting from Small Business Lending has reaffirmed a concept of enormous economic potential: that expanding credit to underserved communities and businesses around the world can not only promote development but also provide profitable business opportunities for financial institutions. This concept is not in the least far-fetched thanks to modern technology, the growth of credit bureaus, and the advent of credit scoring, all of which help lenders better evaluate risk. With these tools at their disposal, financial institutions need not regard credit for small business with alarm. As one conference participant put it, "If you can measure the risk, you have the opportunity to manage it."

Despite its demonstrated impact on economic growth in places such as the United States, however, in most countries credit to small businesses and to entrepreneurs remains very limited. Financial institutions continue to be uneasy about the risks in offering credit to small businesses. They also fail to see the quality in small portfolios and worry about the transaction costs, two very important drivers for lenders. Another concern is that small businesses, like consumer finance, entails high volumes. Thus the fundamental question for financial institutions today is whether these and other obstacles to small business lending can indeed be surmounted, to the benefit of all concerned. The key to managing risk, conference participants agreed, is better information. But arriving at better information is a complex process. It requires an entire infrastructure—actually two infrastructures, one specifically for the individual financial institution and the other for the entire financial market—to produce the right kind of information and to ensure that it is useful. That is to say, credit information has to be consistent, good, and timely.

How can all this be achieved in economies where information does not yet even exist?

Clearly, it is of utmost importance to establish the respective infrastructures. These consist of the legal and regulatory framework within the country that allows information to flow, and the arrangements within and between financial institutions. Most importantly, it requires a readiness in the business culture: both the internal culture (within the institution) and external culture (within the country) toward credit. And this requires a major investment, not

just in technology but also in people, so that they can learn how to change the credit culture.

But that is just the beginning. The next—and very important—challenge is to collect the data that will enable lenders to assess risk. As mentioned above, the data need to be good, consistent, and up to date. But good data alone will not ward off defaults and losses.

It is essential to know how to analyze the data, and then how to get all this information into decision-making. This is where the credit scoring comes in that makes it possible to move from making decisions to managing decisions on credit, which is a great cultural leap for financial institutions in general.

This conference has brought to light a great deal of information about credit scoring. The central question here is how does one develop a scorecard within a financial institution? Does one buy it off the shelf from somewhere, get an expert to tell the institution how to do it, or develop it in-house? Though every financial institution must find its own way to develop the right system for its clientele, it is impossible to do this all alone. To begin with, the institution will have to buy the expertise from somewhere and then apply the knowledge to its particular situation and build the system from there. At the same time, people within the institution itself who have dealt with risk management must not be omitted from this building process. Unless they are involved, a scorecard simply will not work.

The next step, after the scorecard has been developed, is to test it. This will take quite a while. As numerous conference participants have warned, an institution cannot depend on credit scoring right off the bat. It takes time to implement. Furthermore, it requires constant and consistent monitoring to make sure the system's predictive values are indeed correct. The goal is to develop a scoring system that allows the financial institution to predict how a certain group will perform. It needs to monitor this and see what the actual performance is. To reiterate, credit scoring will not work without consistent management of the entire process. That is one of the keys to its success.

Another word of caution: credit scoring is not a plug-and-play approach, in the sense that one just puts data in a computer and uses the output as its face value. It takes a major investment in time, technology, training, and human resources. And in organization change: Changing the credit culture within an institution is not an easy task.

Furthermore, it is important to recognize that credit scoring and the resulting credit information do not work for all market segments. That is why it is essential for every financial institution to know what it is going to focus on, what markets it is going to go after, and what products it is going to handle. It is not

just everybody, every consumer, every industry. Once all that has been identified, the design of a credit score and a credit system becomes much easier and much more focused.

The next question in the minds of many participants is where does an institution go from there? One step would be to develop the internal credit scoring system mentioned above. Another would be to join up with another institution to share scoring solutions. That works for institutions and countries where either the market is not there yet or no one knows the market or everyone has a small part of the market and needs to share in order to build the volume. Deciding on which way to go is a question best left to the experts. Even then there is no easy answer. Views on this vary across the board, for it depends on the country and on the availability of information. But most important, it depends on the willingness of financial institutions to share information for the benefit of all.

So when people speak about competition in this area, it is not competition regarding information. It is competition regarding the use of information. In other words, the issue is competition versus cooperation. What do institutions cooperate on, and what do they compete on? There are many examples of countries that have already decided how to answer this question. Institutions in Finland, for instance, decided many years ago to cooperate on all aspects of infrastructure, but they compete on the customer relationship side.

These kinds of decisions are made by financial institutions themselves—without the interference of governments. Indeed, there is no need for governments to be involved in this kind of decision.

Yet another issue raised by conference participants concerns credit bureaus. Which models are preferable: private sector or public sector credit bureaus? Private sector ones seem to have the greatest support, according to studies that have investigated them. Within the credit bureaus, it is important to know whether bank secrecy acts, if there are any, affect their function and whether one can provide both positive and negative information or not. It is also essential to know the limitations of positive information—whether a country has property rights that allow institutions to feel secure in their lending, and whether they use collateral or not. This is a subject worth pursuing, because making sure that individuals and the poor have property rights could unleash a huge amount of wealth that is not moving today. A case in point is Egypt, where more than 80 percent of the country's entire investments are in unmovable properties lacking clear property rights arrangements. This is a very large figure.

Some have mentioned that educating consumers is a very important component of credit bureaus. Others are skeptical about whether this is worth the investment. Skepticism regarding this or any other issue is actually a healthy sign. It

keeps us asking and trying to determine whether it is the right thing. In any case, there is a model that works for different organizations in different countries. It just needs to be adopted to the particular circumstances. Perhaps it is not appropriate even to call this a solution; it is an approach. And it is one that has to be properly adapted and properly thought through, both at the institutional and national level.

As mentioned earlier, it will take time to implement whatever credit model is chosen, especially because it represents a change in culture, a change in the traditional way of providing credit. One must be very realistic about that. Furthermore, it is going to require a considerable investment of human resources. Here, the change will require new thinking regarding competition and cooperation, as I hinted earlier. Circumstances of history made it a relatively easy culture change in the United States, whereas the situation might be quite different if it was just starting out today. The fact that banks were not competing directly with one another across the United States together with the mobility of the population made people more willing to share the data voluntarily.

Countries with more concentrated systems or very large lenders may find it more difficult to get things started. In these cases, there will be a need for more active public policy. In the final analysis, however, it is incumbent upon the industry itself or those who represent private credit reporting firms to make sure that an appropriate system develops. Otherwise, someone else will step in to set regulations or create something in the public sector that may not be exactly to the liking of the industry. The answer to problems of this nature is cooperation. In other words, the industry has to be thinking about credit issues proactively.

Although conference participants did not exactly reach a consensus on every issue they discussed, they have come away with a new view of the value of credit information and at least a sense of how this information might be transformed into tools that could improve the decision-making process, risk management, and access to credit. The more this information becomes available, the easier it will be to provide credit to those small businesses that are an excellent risk but about whom credit providers have no clue. It is essential to get that information out to build more vibrant financial markets and businesses, and in the long run, to build more vibrant economies.

# Making Small Business Finance Profitable

Peer Stein
International Finance Corporation

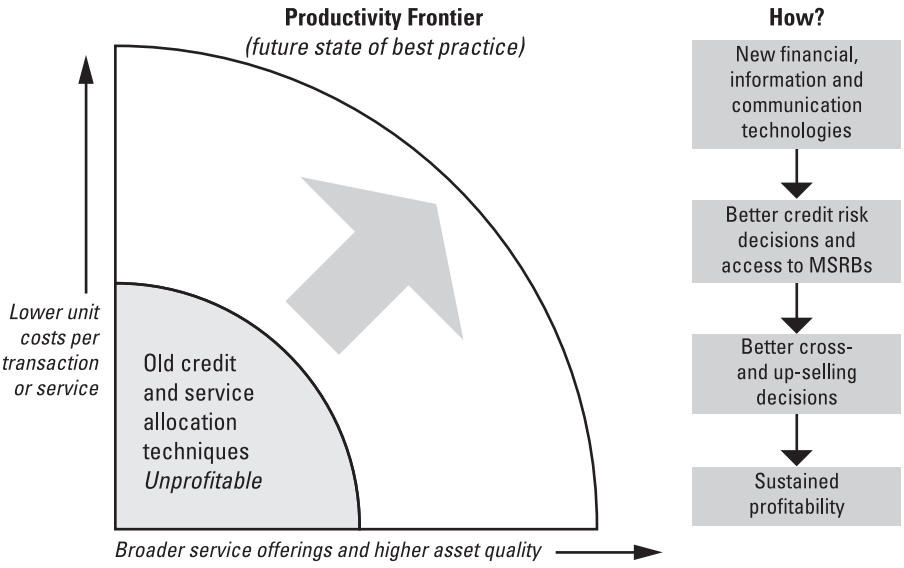
The financial services industry is undergoing dramatic changes caused by recent significant technological advances. The revolution underway can significantly accelerate financial sector development in many countries by reducing costs to consumers of financial services, in particular to small businesses. In recent years, IFC and the World Bank have learned a great deal about small business finance through their investments and work with financial institutions in emerging markets and transition countries. Today, about 40% of IFC's new approvals in equity and debt financing goes to financial institutions, while more than 200 of these institutions in its portfolio are particularly involved in financing small and medium-sized enterprises (SMEs).

Perhaps the first observation to make from this experience is that a large part of the world's population does not have access to financial services, even very simple services like savings and payment services, and certainly not to credit. Formal banking sector penetration in a typical sub-Saharan African country, for example, would be around 1 percent, which is insignificant. Even in a more advanced country such as Brazil, penetration does not exceed 25 percent, whereas in the industrialized nations it is upward of 85 percent.

Second, competition among the mid- and large-cap corporate lenders is increasing. This in turn has been exerting pressure on lenders to go down market and try to tackle the underserved markets of small and micro businesses, which are still largely untapped. The question is, how do they do this in a profitable and sustainable manner?

Clearly, relationship lending or traditional corporate lending is unable to deal profitably with small businesses. It is simply too expensive. The profit from a $5,000 or $50,000 loan cannot even begin to make up for the time spent on evaluating and managing it in a traditional corporate lending approach. It is a non-profitable credit allocation technique for small business lending. At IFC, we believe the answer lies in a mass-customized approach, which advances the productivity frontier for small business finance by using technologies that reduce transaction costs while broadening the service offerings and improving the bottom-line contribution per customer (see Box 1.1, "The Productivity Frontier").

Box 1.1: Shifting the Productivity Frontier




A mass-customized approach will draw on the experiences in consumer finance, particularly the concept of credit scoring and the use of credit information, along with other financial and information technologies that can be used to manage information-intensive flows. These technologies reduce transaction costs while improving portfolio risk management, thus allowing to move away from relationship lending (that is, big business or traditional corporate lending). Broadening the financial services offered to a small business will further aim to capture the whole relationship with the client, including the traditional savings offerings and payment intermediary functions. This in turn allows to make use of the additional captured information to make better business decisions. One interesting approach pioneered by SME Loan Hong Kong is using this kind of payment information on receivables of companies to drive the risk management process in granting credit to small businesses.

Successful small business finance operations will take a holistic approach to the operations of a financial institution, embracing both traditional and new distribution channels, products & service offerings. It centers around the three key factors that ensure sustained profitability in small business lending: 1. Operating Efficiency; 2. Asset Quality; and 3. Growth (see Box 1.2, "Reaching Sustained Profitability"). A mass-customized approach requires a minimum volume of business in order to be profitable: Having just a few small business loans will neither

Box 1.2: Reaching Sustained Profitability in Small and Micro Business Financial Services


justify the necessary investment in analytics and systems, nor supply sufficient data to build solid decisioning models. Operating efficiencies are largely driven by technological innovations, and have to address the constraints of small loan sizes, the non-reliability of financial information, the limited access of clients to financial services, and the often non-existing track record of SME clients with financial institutions.

While financial institutions can find individually strategies and solutions to profitably target this market, certain financial infrastructure—like credit bureaus or shared scoring solutions—can prove to provide benefits far in excess of what individual solutions alone could ever achieve (see Box 1.3, "Advancing the frontiers: two levels of intervention"). At IFC, we aim to advance both sides: Working with individual financial institutions to provide profitable financial services to small businesses and investing in financial infrastructure that serves all financial institutions in a given country to do better business.

In particular consumer credit bureaus are an important element of this infrastructure because credit information on the principal of a small business is normally the most predictive measure for a credit decision on the small business itself. Opportunities for shared scoring solutions are important especially for institutions that may not reach a sufficient volume in small business lending to support consistent and robust scoring models. This approach has been successfully developed in the United States. The small business scoring system developed by Fair, Isaac, for instance, is used by about 90 percent of all relevant or significant

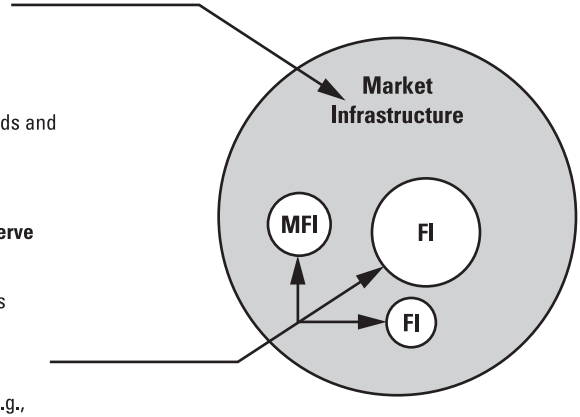
Box 1.3: Advancing the Frontiers: Two Levels of Intervention

**Creating basic information services and infrastructure accessible to IFIs in a country:**

- credit bureaus
- shared credit scoring solutions
- payment systems (e.g., smartcards and mobile payment systems)
- securitizations

**Helping individual IFIS and MFIs to serve small and micro businesses:**

- new risk management processes
- alignment of organization with target market segments
- new distribution channels
- new decisioning technologies (e.g., credit scoring)




small business lenders in the country and has also contributed greatly to making small business lending in the United States one of the most competitive markets in the world.

Market infrastructure can also be strengthened through the introduction of payment systems, particularly non-cash payment systems. These increase information flows by making it possible to capture and gather information on clients that can then be used to make better credit decisions. Once those decisions are made, funding strategies come into play. In the United States and Western Europe, credit scoring helped open new funding strategies, particularly through securitizations.

Despite the fast-changing environment in which IFC operates, its primary mission remains to invest in financial institutions, meaning that it provides debt and equity financing and structured financing as needed to financial institutions. At the same time, its role is evolving into that of a coach helping individual financial institutions that want to implement strategies related to fostering small business finance and the use of new technologies in their financial institutions. In addition, IFC acts as a manager of knowledge in the sense that it shares its global expertise across markets. The Global Conference on Profiting from Small Business Lending is but one expression of this objective.

# The Importance of Credit Information and Credit Scoring for Small Business Lending Decisions

Andrew Jennings, Vice President
Fair, Isaac and Company Inc.

The purpose of this conference is to present and discuss ways in which banks can improve their efficiency, and hence, profitability from small business lending. Efficiency in the context of a lending decision has a number of dimensions. Two of the most important are the percentage of debt that will eventually be written off and the speed with which any individual lending decision is taken.

The proportion of bad debt is measured by the absolute number of non-payers that are accepted and the total number of accepts. Efficiency is improved by better evaluation of future payment performance so that a lender is better able to choose who to accept and who not to accept. In simple economic theory, profit is maximized when the cost of the marginal unit is just equal to the marginal revenue generated from that unit of output. In the context of lending this means that for those applications that just managed to pass the current application screen, the net interest and service income generated from those which repaid is equal to the losses, both by bad debt and operation costs, on those that defaulted. Of course such a determination assumes that the lender both understands and can manage costs and revenues, and can also rank order applications in relation to credit risk.

Speed of underwriting is also related, amongst other things, to a better understanding of credit risk and both, in turn, are related to the use of data. Interpretation of data plays a key part in driving the profitability of any lending portfolio. Of course basic processes need to be efficient; the correct level of underwriting experience should be applied to the appropriate application, inefficiencies such as double capture of data or manual letter production should be eliminated, but above all a lender needs to understand and interpret the data that drives the basic decision making process.

The purpose of my talk today is twofold; firstly, I want to take some time to explain how data can be turned into a reliable and robust tool that can objectively measure credit risk and secondly, I want to touch on some results from data analysis undertaken by Fair, Isaac and then discuss how such tools can be used to improve the efficiency of the lending process and hence increase profitability.

The use of data to objectively evaluate credit risk is commonly known as Credit Scoring and in the context of application evaluation more correctly referred to as 'Application Scoring' Credit scoring has been alive and well in consumer lending for many years. Indeed it has changed the entire face and modus operandi of consumer credit. The vast majority of decisions across the globe are automated and made, to a greater or lesser extent, using a credit score.

Scoring has also been in use for small business lending for many years but on a more limited scale. There are two main reasons for this. There has been a tendency for small business portfolios to be managed alongside and in ways similar to commercial lending. This has maintained the tendency toward manual interpretation of data to make lending decisions. Further, relative to consumer lending the volume of applications for business lending tends to be much smaller and hence there isn't the same extent of data available on which to base an historic evaluation of the efficiency of the lending decisions. In such circumstances lenders have found that there is much to be gained from sharing or 'pooling' data. Pooling of data allows for the creation of a data source that is large enough to undertake historic analysis and enables lenders to benefit from tools that would otherwise not have been available. One classic example is the use of credit bureau data to create pooled risk scores. Outside of credit bureaus perhaps the best example of such a shared small business scoring solution is in the USA where the Small Business Scoring System (SBSS) has been developed by Fair, Isaac using data supplied through the Robert Morris Association. Today, the SBSS comprises a highly developed set of credit risk scoring models which are being used by some 350 lenders and are contributing to approximately 900,000 lending decisions per annum. Small business scoring is also well established across Western Europe and is beginning to become more common in Asia.

The efficiency of any data analysis problem follows three basic steps.

1. Data needs to be collected and assembled in a form that makes it usable. Whilst this is an area that many organizations struggle with I will move over it quickly only noting that it is vital that data are captured in a timely manner, that capture is accurate and that the right data elements are available to describe and address the business problem that the analysis is going to try and solve.

2. Data in and of itself are often of limited value. There is an important distinction between data and information. Information comes from the analysis of the data to extract the pieces that are important to solve the business problem. Often this requires intelligent combinations of different data elements. E.g. a sequence of data fields that show number of payments in arrears are used to generate a value or 'characteristic' such as 'Maximum Delinquency in the last 6 months'. Characteristics can then be used to predict a particular outcome or describe a particular group of customers.

3. Finally the result of the analysis needs to be implemented so that it can impact the business problem. Once implemented new data is produced. Decisions are made differently and the results of those decisions need to be monitored both to understand if they really are more efficient and to repeat the analysis and extract more or new information.

Box 2.1: Sample Scorecard

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Age of Owner | 18-<21 | 21-<25 | 25-<30 | 30-<40 | 40-<50 | 50-High | NI |
| | 6 | 10 | 18 | 26 | 35 | 42 | 10 |
| Marital Status | Single | Married | Divorced | Other | NI | | |
| | 14 | 30 | 5 | 14 | 14 | | |
| No. of Dependents | 0 | 1 | 2 | 3-4 | 4-High | NI | |
| | 14 | 14 | 25 | 10 | 5 | 14 | |
| Residential Status | Own | Rent | Parents | Company | NI | | |
| | 40 | 15 | 20 | 18 | 20 | | |
| Years of Address | <1 | 1-<3 | 3-<6 | 6-<10 | 10-<15 | 15-High | NI |
| | 18 | 20 | 25 | 30 | 33 | 40 | 25 |
| Industry | Prof. Services | I.T. | Other Services | Retail | Catering | Building | |
| | 38 | 35 | 30 | 27 | 20 | 10 | |
| Industry-Continued | Heavy Manuf. | Others | NI | | | | |
| | 8 | 27 | 27 | | | | |
| Years in Business | <.5 | .5-<2.5 | 2.5-<5 | 5-<8 | 8-<15 | NI | |
| | 16 | 20 | 27 | 34 | 38 | 20 | |
| Total Assets | GT 100,000 | LT $100,000 | NI | | | | |
| | 27 | 18 | 10 | | | | |
| Negative File Information | Yes | No | No Investigation | NI | | | |
| | -30 | 15 | 0 | 0 | | | |

Development of a scoring model is no different. The objective is to use a relevant and representative sample (stage 1) to both measure loan performance and then develop characteristics that predict that performance (stage 2). The resulting model is implemented into the decision making process (stage 3) (see Box 2.1).

A scoring model applies different weights to the characteristics used to predict the performance. The weights, or values, measure the influence of that characteristic on the outcome. The weights and the level of influence are determined by statistical analysis. Only those characteristics that exert a 'significant' influence will be included in the final model (see Box 2.1). The outcome, or performance, is the business metric we wish to evaluate in order to improve our decision making

process. E.g. the likelihood that an applicant, if accepted, will reach at least 3 payments in arrears within the first 18 months of the account life. The score allocated to any application is then the sum of the appropriate weights given by the values that the included characteristics take for that application. Any two identical applications will always receive the same score, unlike manual underwriting where there is a) no explicit measure of risk and b) the decision could change from one underwriter to another or change using the same underwriter depending on the interpretation on a given day (see Box 2.2).

Box 2.2 Manual Versus Credit Scoring Underwriting

| Evaluating The Credit Applicant | | |
|---|---|---|
| Characateristic | Judgment | Credit Scoring |
| Age | + | 26 |
| Marital Status | - | 14 |
| No. of Dependents | + | 25 |
| Residential Status | - | 18 |
| Time at Address | + | 25 |
| Industry | - | 20 |
| Time in Business | - | 20 |
| Total Assets | + | 27 |
| Negative File Information | + | 15 |
| OVERALL | + | 190 |
| DECISION | Accept | Accept |
| ODDS OF REPAYMENT | ? | 17.8:1 |

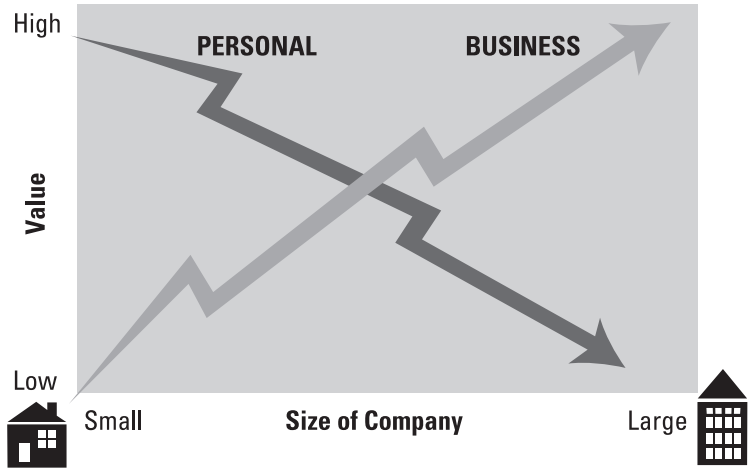
The scoring model helps address the issues of efficiency in a number of ways. All of this stems from the fact that the score relates directly to the performance variable in the model (probability that any loan application will repay) to provide an objective rank ordering of all applicants. Whilst there will always tend to be sufficient doubt around all the values needed to understand the point at which on-going maximization of profit takes place as described above, the very fact that a rank ordering has taken place allows for a much sharper determination of which accounts are likely to make a positive contribution and which groups of accounts will result in losses.

Scoring also leads to process automation. Often it is the case that automation is required simply to ensure the accuracy of the calculated score. However automation will also facilitate many process improvements leading to many by-products such as improved management information, control and consistency.

Developing such models for small business lending raises its own challenges that vary somewhat from those faced in the development of consumer models. For example, what is small? Small is usually measured in terms of turnover and amount of debt outstanding. In the US we have tended to use values of up to $5m and $250,000 respectively. These would vary depending on the country. The break point is still, however, an important decision. Companies vary in size along the dimensions of revenue and credits. The development of a good model requires that small be defined in such a way that it creates a relatively homogeneous group.

It is also the case that the quality of data can vary greatly. At the smaller end of 'small' it is likely that the data, especially the financial data, may be sparse, unreliable or missing. In such situations more emphasis needs to be put on the personal data of the owners. Indeed in such situations the lending decision is very close in nature to that which is taken for a consumer. Generally as the size of the institution increases so does the reliability and importance of the financial data. Consequently its importance in the model increases at the expense of the personal information (see Box 2.3).

Box 2.3: Value of Data

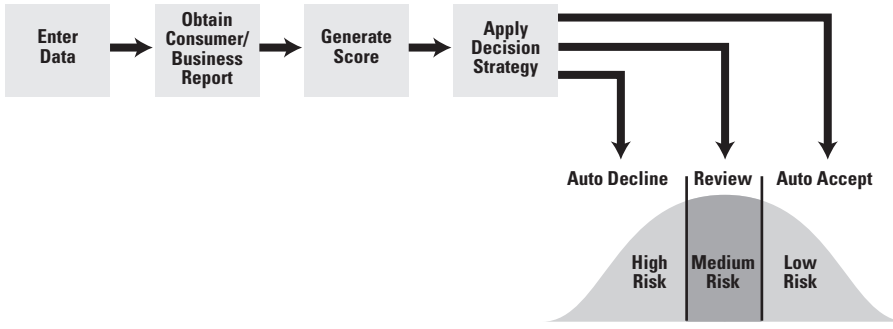



Understanding the inefficiencies of the manual underwriting process leads to a wide range of strategies that can improve profitability. Actions can be taken to boost revenue by accepting more applicants or to reduce costs through a reduc-

tion of the percent of bad payers. In practice lenders usually choose some combination of both.

The decision making process can also be enhanced by using a score to better direct a particular application through the process. This comes back to exploiting the score to decide what level of manual review is required and by whom. A very common business strategy once a score is available is to use it to auto decline all the cases with a score below a certain value i.e. unacceptable risk on non-payment, and auto accept all those with score above a given value. This restricts manual review to those cases in the middle. As confidence grows it is possible to reduce this group so increasing the amount of automated decision-making. For many banks this increased control over the workflow of the underwriting process has been one of the major benefits from the use of scoring (see Box 2.4).

Box 2.4: Efficiency Gains in Credit Scoring Underwriting




To understand the scale of potential benefit it is instructive to refer to some benchmark results from work carried out by Fair, Isaac on US data. As I have tried to explain, scoring allows the lender to trade-off, in an explicit manner. Higher accept rates agains higher risk and vice versa. In a sample of data analyzed, trade-off was at the point of 2.3% of accepts reaching 3+ payments delinquent for an accept rate of 57%. Using the data to develop a scoring model allowed the 57% accept rate to equate to a default rate of 1.2% (down 48%) or the 2.3% default rate to equate to an accept rate of 89% (up 56%). Of course intermediate positions are also possible where the benefit can be taken both in high accept rate and lower default rate from the original position; for example, accept rate of 75% and default rate or 1.7%. This simple but powerful illustration demonstrates how the scorecard opens up a menu of choices that are simply not available in a normal underwriting environment.

In summary, using credit scoring to improve underwriting decisions can deliver great benefits for lenders. Efficiency can be improved from the development of empirical strategies to target lower risk cases leading to better management of debt and return on capital. Further major reductions in staffing can occur as human expertise can be applied to those applications needing expert review. Costs are reduced and service levels increased as a result of faster through-put.

In situations where a given lender does not have enough data to reap such benefits individually, the strategy of pooling data has proven that it can work to the advantage of all those lenders involved, outweighing any fear of loss of competitive edge. As with most things in business and life, access to the best tools does not automatically result in the same benefits for all. It is how the tool is applied in any given situation that really counts. There is no substitute for business savvy. Just as I can buy the best tennis racket in the world it will not make me play like Andre Agassi!

# Introducing Scoring to Micro and Small Business Lending

John Coffman
Partner, C&T International

Of the numerous definitions of scoring, perhaps the following one best captures the importance of focusing on risk: Scoring is the mathematical (statistical) process of converting data about a prospect, applicant, or customer into a quantifiable, objective forecast of some aspect of a consumer's or small business's behavior. The whole concept of scoring depends on the fact that historical performance can be used to predict future performance (see Box 3.1).

Box 3.1: Past Behavior Predicts Future Behavior


In some ways, however, this has become something of an Achilles heel. In an environment that is constantly changing, a lender who is trying to implement scoring is going to have problems because in fact the history of the past and the link of data to performance may not predict in the future the same way it did in the past. That is why it is essential to have a relatively stable environment in which to implement scoring. Without that consistency, it will be more difficult to accurately forecast the risk.

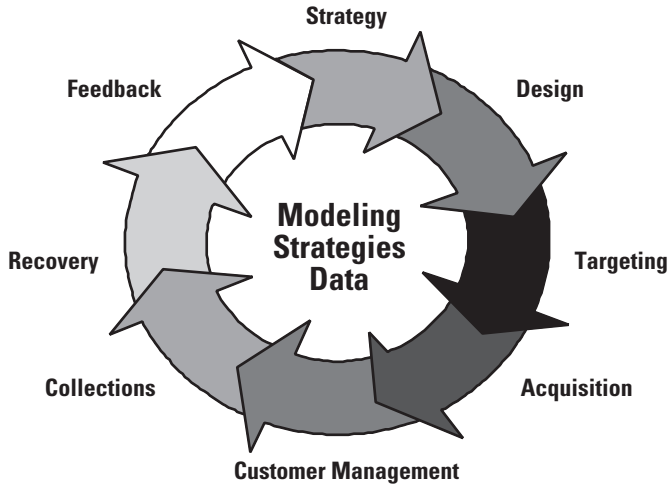
Another objective of scoring besides forecasting risk is to help create a more efficient decision process. The level of efficiency will depend to a great extent on the so-called handling rate of a system, in other words, how many decisions are made by the system versus how many decisions have to be made judgmentally in the end.

Also important, scoring allows for the ongoing verification and validation of credit criteria. If a scoring system is properly tracked and monitored and performance is assessed on the basis of a score and other criteria, then it is possible to verify that our criteria are correct. That is a key ingredient of the success of credit scoring.

Yet another objective of scoring is to facilitate management's control over business strategies. It is much easier to control volume and losses if one has a numerical, quantifiable measure that allows one to predict what is going to happen. If a cutoff score is set at a certain place and one knows that it is going to give a 50 percent approval volume, then that can be used in planning strategies. By contrast, if lenders are simply told to tighten up or loosen up, they really do not know what that means. To reiterate, it is hard to control processes without quantifiable measures.

Actually, scoring affects every aspect of the credit cycle, from strategy to acquisition, collections, and feedback (see Box 3.2).

Box 3.2: Supporting the Credit Cycle




Scoring models can be applied in areas of targeting, acquisition, customer management, collections, and recovery. The key point to remember is that scoring produces accurate feedback for strategy setting. Feedback is a key component of any scoring system.

Now, what do we have to do to be successful in scoring? Following are five basic requirements:

- Culture
- Data

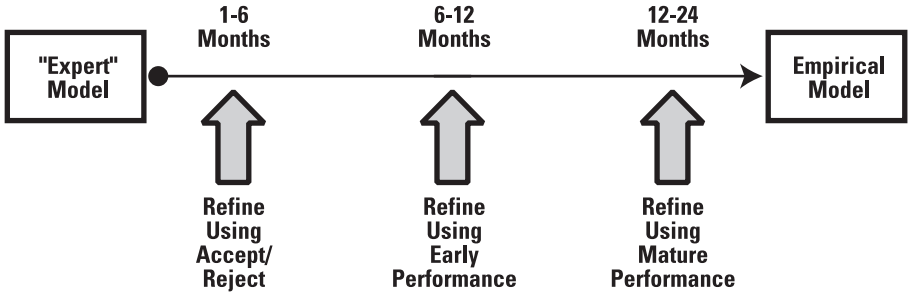
- Implementation system
- Feedback
- Strategy management.

Note that the culture of a scoring operation is quite different from the culture of a judgmental operation. Judgmental underwriting is a culture of "making decisions", while credit scoring requires a culture of "managing decisions". Scoring cannot succeed without the proper business culture, otherwise it will run into a lot of problems.

As for data, scoring cannot exist without data on the applicant or customer. Data are obtained in part from independent external sources: credit reporting agencies, the public record, and direct investigation of references. Data are also obtained from internal customer files. Though historical data are necessary to develop an empirical scorecard, collecting and securing future data are critical to scoring.

When we first introduced small business scoring in Canada back in the early 1980s, we were working with a company that had no data. Its credit files were almost nonexistent. Yet we succeeded in introducing scoring into that environment, and today that same company uses scoring for virtually 100 percent of its decisions under a certain dollar level. Although it took time, we were still able to create an automated "expert" system. To our surprise, we were not only able to make more consistent decisions across a multibranch operation, but because of that, we actually improved on loan losses and improved on volume at the same time simply by making more consistent decisions and tracking what happened as a result of those decisions. Over time, the system was then empirically updated with data gathered over 24 months (see Box 3.3). So it allowed management to have better control over policy and operations.

Box 3.3: Moving from an Expert to and Empirical Model



It is also important for scoring to be an automated process. Although automation can incur substantial costs, its benefits are enormous. To get around these costs, a lot of small business systems in the United States and Canada have piggybacked on consumer systems that already exist. Of course, "automated" does not necessarily mean complicated or even extremely expensive. It does mean an effective system of tracking, monitoring, and saving data for future development. Otherwise it will be impossible to have management control over the process.

Another important concept in small business lending is controlled flexibility. This consists of some automatic approvals, some automatic declines, and then a review. Reviewing is necessary in small business, particularly in microfinance, because the data will be less complete and a lot less reliable, certainly, than consumer data, for example. Hence it is not going to be possible to score all information about a pending deal. Because of the variability of information sources and the variability of the information itself, often it is not practical to score everything, either on the financials or the application. So the manual review is where the system cannot make an automatic approval or decline. However, additional information available to the lending officer, though not really scored data, can add to the value of the score.

Manual review is not recommended for high- and low-scoring accounts. For one thing, if the handling rate goes outside the midrange, then the more we review the scoring decisions the lower our handling rate becomes and the lower the efficiency. After all, the ability to cut costs is a major selling point for scoring in small and microbusiness. This is where judgmental policies can be used to modify a decision. An incomplete application, for instance, may be a good reason to decline, or a strong deposit relationship with the borrower or prospective borrower may be a good reason to approve. One does not just subjectively reevaluate the score, but needs to incorporate it into the credit and decision process and procedures.

Nor should one automatically set a loan amount on the basis of a score. Remember that a score is based on past experience and it is going to represent average risk. So other factors need to be taken into account to decide what the loan amount or limit should be, not just a score.

Above all, a scoring system cannot succeed if lenders do not know how well it is doing. They will find it impossible to manage the decision process without feedback. Again, feedback is also a reason to have automation. Even business payback-without which scoring is bound to fail-depends on feedback. That is what makes it possible to save on costs, to control losses better, get a higher approval rate, or improve customer service through faster turnaround.

The hardest part will be moving scoring into a new environment. It will be necessary to fight from the beginning to justify scoring, to justify the implementa-

tion cost, to justify the data cost, and to prove the business payback. Above all, it will require a change in culture: Moving away from a culture of "making decisions" towards a culture of "managing decisions."

# Credit Scoring in Microfinance

Maria Otero and César López
ACCION International

The microfinance industry still has a long way to go to meet the needs of the developing world. It resembles the consumer credit history of the 1960s, when only a small group of banks were providing credit to high- and middle-income customers and the majority of banking sector products focused on meeting corporate or investment needs. Yet more than 80% of the population in the developing world has no access to credit, in many cases not even through loan sharks or families, let alone financial institutions. When small businesses do obtain credit, quite often they pay very high interest rates-the daily rate may be as high as 10% in some countries.

The need for credit is clear from the number of microenterprises in operation in developing countries. About 6 million are found in Latin America alone. At present, there are only three major players serving the microfinance market:

1. A few nongovernmental institutions that are being transformed into formal financial institutions such as EPYMES in Peru, SOFOLS in Mexico, and FFP in Bolivia.

2. Boutique banks that specialize in microfinancing, such as MIBANCO in Peru, Banco Solidario in Ecuador, and Bangente in Venezuela.

3. Commercial banks, notably Banco del Estado in Chile, Banco del Pichincha in Ecuador, Sogebank in Haiti, and Banco del Nordeste in Brazil.

Many difficulties lie in the path of the development of the microfinance industry. To begin with, little information is available about small businesses, so there is not much of a database to work with. The only way to address this issue in most countries is to have credit officers visit clients and collect the necessary data.

Another question they face is how to build a long-term relationship with clients. The first credits are usually small and short-term loans. To enter the market competitively, lenders need to establish special arrangements for repayment that will provide clients higher amounts if they do fulfill the terms of the loans. This will lead to longer terms and lower rates in future loans and thus give clients the incentive to remain with the institution.

It is also crucial for lenders to focus on collateral, on the guarantees that will ensure loans are based on the client's capability to repay as well as performance in business. Even when default rates are very low, however, operational costs will remain a persistent problem. Our bank has one of the lowest rates of delay in payment—only 1.8%, whereas the average is more like 11%—yet are constantly concerned about operational costs. It is the same everywhere. To be profitable, even with a very low loss rate, lenders must find ways to reduce operational costs as well as to reduce losses incurred by businesses.

This is where credit scoring comes into play. It can help not only in the initial selection of potential microfinance clients, but also in the identification of the best clients for new types of services, such as lines of credit. Scoring also makes it possible to price risk according to the different risk profiles of clients and to improve collection on delinquent portfolios.

Credit scoring can achieve these ends because of its many potential benefits:

- Standardize various aspects of the lending process and allow better access to financial markets such as securitization and credit ratings.
- Reduce operational costs and time spent in credit committees.
- Reduce the time required to answer an application.
- Improve marketing, risk control, and pricing.

Accion has had experience with three types of scorecards in assessing microenterprises. The first is the traditional application scorecard, which is used to select potential clients asking for a first-time loan. The second scorecard looks at the possibility of renewal, at whether those who are asking for a new loan could be renewed automatically or would be rejected on the basis of their past performance. Third, we have a scorecard for portfolio operations and collections. Its purpose is to improve efficiency in portfolio performance as well as help in the collection of delinquent portfolios. This allows us to reduce operation costs without pushing up loss rates.

In applying credit scoring to microenterprises, however, lenders need to recognize that the issues they face are quite different from those faced by consumer banks. Our experience shows, for example, that scoring needs to consist of two phases when we work with microenterprises. The first step is to obtain basic information that allows us to determine whether we can move forward in the process. The necessary information is simply not available from credit bureaus in many of the countries where we operate because most of our clients there do not have access to traditional financial services.

Using that basic information, we may reject the application of this stage. If we determine that the risks are too high, we have to turn it down.

If an application has not been rejected at this stage, we move further and visit potential clients, primarily the lower-risk clients, and obtain most of the information that would be required for the second phase of the scoring process.

The credit officer visits the clients in order to glean not only information for the scorecard but also financial information that allows our credit committee to determine the repayment capabilities of the potential client and decide whether to go forward. In most cases the scoring process is centralized. In a commercial bank, the scoring may be done in several agencies, and each agency may follow different criteria. It is important to remember, however, that credit officers are not simply collectors of information, but must analyze the credit data where required.

Since behavior variables are important, we have also selected appropriate data that allow us to standardize much of the financial information that in the past was seldom kept anywhere. This is now tabulated and included in the decision making process. We can also use this information in the statistics employed to build price quoting. One piece of financial information we look for is whether clients have made investments in their own business in the last year. Do they have records, even informal records, on their sales?

Unlike consumer banks, however, we are not as worried about whether information is available in a credit bureau from past loans. Some scorecards would greatly put a client at a disadvantage if no credit report could be available on this person. In our case, this would not be relevant. We have found that most of the clients for which such information is not available are our best clients because they do not have access to other sources of financing.

We are more concerned with the repayment capability of the microenterprises. That is why an application that finally becomes a loan goes through two processes, both the scoring process and a financial analysis that allows us to determine repayment capability.

This approach is necessary because most microenterprises do not have relevant financial or external information. Therefore, we still need to amass that information. We do this through visits by the credit officers and information from credit scoring, all of which is used to carry out financial ratings. This also makes it possible to be more flexible in providing loans and to take into account the fact that each client has its own unique risk profile.

We think the process we use is highly efficient because we do not always visit the client. Indeed, that decision is a first step-whether we are going to visit the client or not. So we have an initial savings there because not all of the applicants are visited, only those that we suspect are going to be lower-risk clients.

After this visit, we construct another scorecard that enables us to reject some of the previous applications without going to the credit committee and approving some of those. This process is producing a lot of information on microfinance, in some cases on as many as 150 variables.

After the credit scoring, we can reduce the number to only those that are statistically relevant for the decision of the credit committee. The main points covered by our risk analysis are the accumulative portfolio risk, capital adequacy, bankruptcy risk and risk pricing.

All in all, credit scoring is an important tool for the microfinance industry. I would like to close with a reminder, however, that institutions will be unable to implement credit scoring successfully without the following elements:

- A clear and stable credit process.
- A minimum volume of operations.
- A minimum degree of macroeconomic stability.
- An information system in place.

# Requirements for the Successful Use of Credit Information

Barry Connelly
Associated Credit Bureaus, Inc.

In the United States, we take for granted the whole concept of sharing consumer credit data. Thus it may be a challenge to explain the value of credit information and the impact it has on the lending process. To begin, one must recognize that credit reporting is really a very simple process. Its structure is simple, but its results are dramatic.

The first precursor to the modern credit bureau was a cooperative venture operated by a group of English tailors in London back at the turn of the nineteenth century. These tailors had discovered something that all lenders discover at one point or another: that a few individuals who use their services do not pay for them. They do not pay what is owed. Instead, these people would purchase as suit from one tailor and not pay that tailor, then would do the same thing to the next one down the street, or on another street, and then go to a third one.

So in 1803 the tailors formed the Mutual Communication Society of London to share data on their bad debts-on people who had defaulted. One can almost see them meeting at a pub in London, making lists and telling each other who did not pay for his suit. The name of this group, the Mutual Communication Society of London, defines what credit reporting is all about even today: mutual communication.

The sharing of information among a group of businesses was recognized for the value and the profitability that it brought not just to one, but to all. That is still the fundamental reason why we do it today. These tailors happened to be among the first to understand the leverage that they could bring to a market by sharing information. They figured it would not only reduce future losses, but would create an incentive for customers to pay their bills. Moreover, a person's willingness to repay his debts might make him a profitable customer for even more sales, for additional services. If they had confirmation that the customer who had no bad debt history was now buying suits from them, maybe he was good for two suits-perhaps two suits and three shirts. Here we have marketing.

The confidence that they could have because of credit history provided these London tailors with the same reasons for marketing that it does today.

In the United States, which began primarily as an agrarian society in the late 1800s, credit became important at an early stage of its development. Farmers planted their crops in the spring and would sell them after harvest time in the fall, at which point they would be in a position to pay off whatever debt that they had accumulated. That was also the time when they could purchase those goods and services that they did not have cash for during the rest of the year.

Then along came an entrepreneur named Richard Sears. He decided to offer farmers goods through a catalog. These same farmers, he said, could repay him later, after the crops had come in, when they had the cash. That microbusiness, which became Sears Roebuck, marked the birth of the consumer credit market in the United States. Subsequently, credit granting matured from solely and economic tool for business survival, as it was for the London tailors, to one that met the immediate needs of consumers. Some would argue that Americans have taken the principle to the extreme through their desire for immediate gratification. One effective way to satisfy this desire is to go out and buy the services or the goods that one wants.

Yet the fact that consumer purchasing power has made the United States what it is today should not be trivialized. Consumer spending drives two-thirds of its economy. When the chairman of the Federal Reserve talks about the U.S. economy, he is talking about what is the consumer doing. Outstanding consumer credit at the end of 2000 amount to US$1.5 trillion. Add to that another US$4.7 trillion in mortgage lending and one can see what happened to Richard Sears' idea of granting a little bit of credit. It also helps explain why economists pay so much attention to consumer confidence when predicting the economic future of the United States: $6.2 trillion is a lot of consumer confidence.

This confidence begs the question: If consumers have confidence in the economy, who has confidence in consumers? And why do they have confidence in consumers? The answer is consumer credit information, which derives from the consumer credit reporting system. Credit reporting is the infrastructure that has enabled this economic credit machine to go forward.

Credit reporting brings the willing buyer and the willing seller together. Credit reporting provides the information needed by those who want to sell their products on credit to a consumer that they have never heard of, perhaps have never even seen. They do not know anything about the individual, except through his credit history. It brings a level playing field.

Without a credit report, businesses are granting credit without the use of a proven risk system. Credit can be granted for political reasons, it can be granted

for reasons of friendship, or family. But none of those reasons can match the record of determining risk based on previous payment history.

Worldwide interest in consumer credit reporting has become tremendous, especially over the past 10 years. Organizations in countries ranging from Jordan, Bosnia, and Israel to China, Thailand, Mongolia, and Russia now wish to import some type of consumer credit history system. In some cases, these organizations have been motivated by a banking or financial crisis that served to highlight the lack of a credit-granting infrastructure in their country.

My international association, the Associated Credit Bureaus, counts as members consumer reporting agencies in Asia and Central and South America, Europe and Africa. In 1998, the Associated Credit Bureaus and Europe's association, the Association of Consumer Credit Information Suppliers, joined forces to hold the first world consumer credit reporting conference in Rome. They repeated it for the second time in San Francisco in October 2000. Credit registries from 35 countries met to share information about their experience of forming and creating consumer credit information systems.

Consumer credit payment data are of enormous value for small business borrowers, and even small lenders, of course. Though some might say their local market customer base is too small to develop a credit reporting system or that microbusinesses do not have a credit history, small can be good. The United States has millions of small businesses or sole proprietorships that are using credit. In 1969 there were 2,250 local credit bureaus in the United States, mostly in small towns, serving the needs of individual local businesses. All credit was local in those days. Today, credit history information is an indispensable underwriting tool. The inescapable truth is that an individual consumer's personal credit history is predictive of his or her microbusiness' ability to repay credit.

The central question for all those countries hoping to establish credit reporting systems is what goes into a successful system? The consumer's credit history on an account is the beginning. Past payment performance is the best indicator of future payment performance. Second, all types of credit should be considered, not only credit issued by banks. Retailers are also excellent sources of credit history information. A third principle is that more information is better than less.

In the United States, we sometimes have too much information. Contrary to what many think, however, we also have privacy laws that regulate the dissemination of information, although the Fair Credit Reporting Act does not actually dictate what information can or cannot be included in credit report. Even so, one cannot just put anything in a credit report. The market determines the relevance of the information to the risk being considered.

Factors such as highest credit granted, the current balance, how much the borrower pays each month, does he or she pay it on time are included in a credit report. What a borrower bought, his or her religion, politics, or race are not included. Those factors are all irrelevant.

The credit reporting system in the United States also includes both positive and negative data in the credit history section of the reports. This has been done voluntarily since the very beginning of credit reporting in the country. There is no privacy reason to justify the prohibition of the reporting of positive data. At least, there is no privacy reason that makes any sense.

In fact, banking regulators in the United States view the occasional failure of an institution to report positive credit history as unfair-unfair to consumers and potentially dangerous to the safety and soundness of the banking system, because a new lender would not have the complete picture of the applicant. The real reason that any country prohibits the reporting of positive data is to protect the business of its established banking institutions. In a word, it's anticompetitive. They fear that the sharing of positive information will let other competitors find out the names of their good customers and steal them away.

In the U.S. view, credit history belongs to the customer. If consumers can get a better deal because of their favorable credit history, they deserve it. And the bank does not deserve to keep that customer hostage. In some cases, it is lucrative predatory lending. American regulators care about that. Business must compete. Artificial barriers, like not reporting positive data, only serve to protect market's share unfairly. That not only harms consumers, but it also retards the country's economic success.

Needless to say, there have been industry-specific adverse databases in the United States, such as heating oil exchanges and small loan exchanges. They collected only negative data and would share information as an exchange. But in the end they were unable to compete with the more comprehensive databases of the credit reporting industry. When they got to the point of doing risk scoring, such a limited database was not as effective as a complete one. Participants in these exchanges quickly realized that they could make a better credit decision with a full file of credit history.

Three important elements of the U.S. credit reporting system merit special attention. First, participation by lenders is voluntary. There is no law stating that all of these organizations must report. Second, the system is private. And third, it is competitive. The three largest members of our organization-TransUnion, Equifax, Experian are competing constantly, every day, for the same customers.

The system is an outgrowth of groups of merchants and bankers who recognized the business value of an independent third party doing the work of collect-

ing, collating, and disseminating this information. It was never encumbered by central bank ownership, or oversight. The idea was to eliminate potential conflicts of interest as much as possible.

One by-product of this system has been a change in the various uses of the information as a result of recent technological developments. Credit reports and credit scores were first used as a primary tool for accepting or rejecting the credit application. Today, the score has become an account management tool. Credit history therefore has become an account management tool.

As a result, the credit relationship between the consumer and the lender is constantly being reviewed and updated. Some lenders are obtaining a report from the credit bureau each month on existing, active accounts, to increase or decrease credit limits, to adjust interest rates, or simply to get a reading on the current status of the consumer's credit picture. What better way to manage risk?

Lending to microbusinesses is not much different from lending to consumers. The same underwriting factors probably come into play, above all the ability and the willingness to repay the debt. Microbusiness loans are personal guarantee loans. Like consumer loans, they are best made on the basis of the borrower's previous payment history. Used properly, and with respect, a healthy consumer credit system will bring an improved standard of living and an economy that can compete in the rest of the world. This is not to say that the U.S. system is right for every culture. The important point is to examine it and to accept or reject whatever is best for one's own country. It is the principle of credit information that counts.

# The Value of Comprehensive Credit Reports: Lessons from the U.S. Experience

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Credit bureau data on consumer borrowing and payment behavior has become the cornerstone of the underwriting decision for consumer loans in the United States. Armed with the most comprehensive consumer payment histories in the world, U.S. creditors apply statistical scoring models to estimate an individual's repayment risk with remarkable accuracy. Reliance on risk scoring has fundamentally improved the efficiency of U.S. credit markets. Credit bureau data has brought consumers both lower prices and more equitable treatment, and has made a wide range of credit products available to millions of households who would have been turned down as too risky just a generation ago. In addition, the U.S. credit reporting system has made consumers (and workers) more mobile by reducing the cost of severing established financial relationships and seeking better opportunities elsewhere.

The full benefits of comprehensive credit reporting have yet to be realized in most other countries, because the amount of personal credit history available to lenders for assessing risk is typically limited by custom or law. Historically, credit reporting in most countries began with the sharing of so-called "negative" information (delinquencies, charge offs, bankruptcies, etc.) on borrowers. Only gradually and recently has information about the successful handling of accounts (prior and current) been contributed to the data repository. However, in the interest of protecting consumer privacy, some countries in the European Union and elsewhere continue to ban the reporting of data such as account balance and credit limit.

Research commissioned by the World Bank developed a series of simulations that show how credit availability is hindered when the amount of information in personal credit histories is restricted. The results are encouraging for those countries attempting to stimulate economic development by building the legal and technical underpinnings for a vibrant consumer credit market. More generally, the simulation results have special relevance for the ongoing debate in the U.S. and globally over the cost of increasing privacy protections. Privacy legislation that

would curtail the collection and use of factual credit history data has a direct cost in terms of higher prices and restricted access to credit.

## Broader Access to Credit in the United States

For the past 35 years, federal policy in the U.S. has encouraged the credit industry to make credit and other financial services available to a broader segment of the U.S. population. The result of these public policies has been a dramatic increase in credit availability to all segments of the U.S. population, particularly those toward the bottom of the socio-economic spectrum. As of the end of 2000 mortgage credit owed by consumers in the U.S. totaled about $5.1 trillion, including both first and second mortgages and the increasingly popular home equity lines of credit. Non-mortgage consumer credit (including credit cards, auto loans and other personal installment loans) totaled an additional $1.6 trillion.

Over the past two generations, millions of Americans have gained access to credit to enable them to make such investments and raise their standard of living. In 1956 about 20% of households (11 million) had an automobile loan. By 1998 this proportion had increased to 31% (32 million households). A similar pattern is evident for mortgage credit. In 1956 24% of U.S. households (13 million) had mortgage debt. By 1998 43% of households (44 million) had home mortgage loans. In the case of both products, credit markets enable consumers to purchase and finance durable goods which provide a valuable stream of services to their owners over time. A similar story has unfolded for credit card products, but even more dramatically given the shorter time frame. The percent of U.S. households which owned at least one general purpose credit card (e.g., Visa, MasterCard, Discover) rose dramatically between 1983 and 1998 in virtually every income category. By 1998 over 25 million more households had access to bank credit cards than was the case in the early 1980s.

## Credit Bureau Data Provided the Foundation

In the U.S. the combination of technological advances and flexible public policy toward data collection have fostered an explosion in consumer credit availability. In the U.S. computerized credit files have made it possible to store and instantaneously retrieve many years of payment history for over 200 million adult residents. Over 2 million credit reports are sold by the three major national credit bureaus every day. Broader access to credit products is widely recognized as the consequence of four simultaneous and interdependent factors:

- Legal rules which permit the collection and distribution of detailed personal credit data to those with an authorized purpose for requesting the information
- The development of statistical scoring techniques for predicting borrower risk,
- The repeal of legislated interest rate ceilings which had limited the ability of creditors to price their loan products according to risk.
- The ability to tap credit bureau data to pre-screen consumers in order to identify creditworthy individuals and target solicitations for new credit products.

The expansion of credit during the past two decades corresponded to the advent of credit scoring, and its eventual widespread use by credit card issuers (in the late 1980s), automobile lenders in launching risk-based pricing (led by companies such as General Motors Acceptance Corp. in 1989-1990) and mortgage lenders in the early to mid-1990s. By 1998, credit scoring models were being developed and applied to guide small business lending. Personal loans, credit cards and debit card products are available to the vast majority of the adult population. Moreover the time between application for credit and the decision to make the loan has fallen precipitously: approval for many auto loans is available in less than 10 minutes. Many retailers advertise "instant credit" available at the point of sale, and can deliver approval for a new account in less than 2 minutes.

The dramatic increases in the proportion of the population using credit have come without equally dramatic increases in defaults. The percent of accounts which are delinquent at any point in time varies between 2 and 6 percent nationwide, depending upon the product. Viewed in a slightly different way, the percent of borrowers nationwide who were delinquent 30 days or more on any account as of March, 2000 was 2.8% for mortgage holders, 6.2% for closed-end installment loan borrowers, and 4.6% of credit card borrowers. The credit reporting environment in the U.S. is the foundation for this remarkable combination of widespread availability and low default rates.

## The Impact of Restricting Positive Information in Credit Files

The scope and depth of U.S. credit bureau files make them a useful analytical tool for simulating the impact of creditors constrained to making lending decisions in more restricted environments. In one simulation, we built credit scoring models that compare a lender's ability to measure borrower risk under the U.S. Fair Credit Reporting Act and under the more-restrictive Australian rules that were adopted with the passage of Australia's Commonwealth Privacy Act of 1988. The simulation compares the accuracy of risk scoring models for a large group of consumers under each set of rules and determines the impact on the percent of customers who would receive loans.

Australia has a "negative-only" reporting environment in which only derogatory information and inquiry information can be used in determining a credit score. No variables are permitted on the number of open lines, age of lines, balances or credit limits. Although explicitly the result of government intervention in Australia, the negative-only scenario is typical of many countries with reporting systems that evolved as a means of sharing bad experience with borrowers. To simulate the effects of a negative-only system vs. the more comprehensive U.S. reporting system we built a "full-model" which used all the information available in U.S. credit reports, including "negative" data (delinquencies, charge offs, bankruptcy, collection judgments, tax liens, etc) and "positive" data (information on all of the consumer's accounts, including account type, account age, current balance, credit limit, etc). The "negative-only" model used only the nega-

tive information, omitting all variables describing positive information. The dependent variable was constructed as equal to one if a new account became 90 or more days delinquent within two years, and equal to zero otherwise. In each case a profit model was used to estimate the probability of serious delinquency for a random sample of 312,484 new accounts opened at the start of the observation period.

The resulting models were used to calculate individual credit scores for each consumer in the sample. For each model, individuals were ranked according to their "credit score". We then picked various "approval rates" (e.g., 60%) and compared the "bad" rates (percent of loans 90 or more days delinquent within two years) for the full model to that of the restricted model. At a targeted approval rate of 60%, the negative-only model produced a 3.35% default rate among accepted applicants, as compared to a 1.9% default rate for the full model. Put another way, at a 60% approval rate, the default rate using the negative-only model was 76.3% higher than if the full model were used on the same set of borrowers.(see Box 7.1)

Box 7.1: Effects of Negative-only Credit Information on Default Rates

| Target Approval Rate (%) | Default Rates | | |
|---|---|---|---|
| | Full Model (%) | Negative-only Model (%) | Percent Increase In Default Rate on Loan with Negative-only Model (%) |
| 40 | 1.08 | 2.92 | 170.4 |
| 60 | 1.90 | 3.35 | 76.3 |
| 75 | 3.04 | 4.07 | 33.9 |
| 100 | 9.31 | 9.31 | 0.0 |

Alternatively, suppose the economics of a lender's operation dictate an optimal default rate of 4%. The full model approved 83.2% of consumers for a loan, while the negative-only model approved only 73.7% of consumers, an 11.4% reduction in loans made. In other words, at a default rate of 4%, for every 100,000 applicants, the use of the negative-only model would yield 11,000 fewer consumer loans. Put another way, the simulation showed that, while maintaining delinquency rates similar to those experienced in many U.S. consumer credit markets (e.g., 4% ), creditors who are constrained to use the sharply limited credit bureau data present under Australian rules would extend new credit to 11,000 fewer consumers for every 100,000 applicants than would be the case if they were allowed to use the more complete data available under U.S. law. (see Box 7.2)

Box 7.2: Effects of Negative-only Credit Information on Credit Availability

| Target Default Rate (%) | Approval Rates | | |
|---|---|---|---|
| | Full Model (%) | Negative-only Model (%) | Percent Decrease in Consumers Who Obtain a Loan with Negative-only Model (%) |
| 3 | 74.8 | 39.8 | 46.8 |
| 4 | 83.2 | 73.7 | 11.4 |
| 5 | 88.9 | 84.6 | 4.8 |
| 6 | 93.1 | 90.8 | 2.5 |
| 7 | 95.5 | 95.0 | 0.5 |
| Mean | 100.0 | 100.0 | 0.0 |

These simulations show that an environment which restricts lenders to using the negative-only model produces significant changes in either the likelihood a loan is repaid (and thus, the cost of a loan) or the availability of credit. The results highlight the distinct tradeoff between 1) limiting the collection and use of personal credit histories and 2) making credit available to consumers at reasonable prices.

## The Impact of Bureau Data Restricted by Type of Lender

Credit reporting in many countries has historically been driven by commercial banking consortiums. Positive data is more likely to appear for accounts reported and shared within the bank consortium, but is typically not available to institutions outside the consortium. Information on loans not held by consortium members has tended to be negative, when it appears at all. In some countries (e.g., Argentina, Mexico, Japan) retailers and finance companies have attempted to form their own reporting consortiums to improve the quality and scope of data available on consumers to whom they would like to lend. If the U.S. experience is any indicator, as the consumer finance industry grows in a domestic economy, an increasing portion of consumer credit outstandings will likely be held outside the domestic commercial banking system. For example, in the U.S. at the end of December, 1999, approximately 40–45% of non-mortgage credit outstanding ($560–$640 billion) was originated by non-banking financial institutions including finance companies, credit unions and retailers. A reporting system that provides a credit profile on a consumer's credit experience with either the bank or the non-bank sector, but not both, leaves a substantial gap in the overall profile for a given borrower.

We conducted a restricted-sector simulation to determine the impact of a retail creditor having access to information only on loans held by retailers, as though

the retailer could access credit histories only from a retailer consortium. Thus, in making a loan decision a retailer would be able to draw on its own experience with a customer (if any) as well as the experience of other retailers in the consortium with the same customer. Specifically, the simulation used a probit model to estimate the probability of serious delinquency (90+days) within two years among a random sample of 67,130 new retail accounts opened in May, 1997. The full-information model employed both positive and negative data on all of the borrower's accounts. The restricted, retail-information-only model used only those variables that described retail account experience.

As in the negative-only simulation, both the full and restricted models were used to estimate credit scores for each individual in the sample and rank them according to their scores. At a target approval rate of 60%, the default rate in the full model was 1.18% while the default rate using the restricted model would jump to 1.9%, a 61% increase (see Box 7.3).

Box 7.3: Effects of Retail-only Credit Information on Default Rates

| Target Approval Rate (%) | Default Rates | | |
|---|---|---|---|
| | Full Model (%) | Retail-only Model (%) | Percent Increase In Default Rate on Loan with Retail-only Model (%) |
| 40 | 0.53 | 1.10 | 107.5 |
| 60 | 1.18 | 1.90 | 61.0 |
| 75 | 2.13 | 2.97 | 39.4 |
| 100 | 6.03 | 6.03 | 0.0 |

Alternatively, for a given target default rate of 3%, the full model approves 83.4% of customers while the restricted model approves only 75.4% of customers, a decline of 9.6%. Put another way, among the pool of borrowers that could be served and still achieve the creditor's target default rate, for every 100,000 applicants, 9,600 deserving borrowers would not receive loans if only the restricted, retail-only model were available (see Box 7.4).

## Implications

These simulations collectively yield the following implications regarding the benefits of more comprehensive reporting. The implications also serve as a warning of what might be lost as a consequence of privacy regulations that would erode the depth and breadth of personal credit information available in credit files.

Box 7.4: Effects of Retail-only Credit Information on Credit Availability

| Target Default Rate (%) | Approval Rates | | |
|---|---|---|---|
| | Full Model (%) | Retail-only Model (%) | Percent Decrease in Consumers Who Obtain a Loan with Retail-only Model (%) |
| 3 | 83.4 | 75.4 | 9.6 |
| 4 | 90.6 | 80.6 | 11.0 |
| 5 | 96.3 | 94.1 | 2.3 |
| Mean | 100.0 | 100.0 | 0.0 |

1. Consumer credit will be less available where credit reporting omits categories of variables that would provide a more complete picture of a consumer's borrowing and payment history. The impact of reduced availability is greatest for those consumers who are young, have short time on the job or at their residence, have lower incomes, and are more financially vulnerable.

2. For a given amount of consumer borrowing activity per capita, credit losses will be higher if creditors are constrained to using restricted credit histories, relative to lending in the same market with access to more comprehensive credit reports.

3. As the amount of credit made available per capita increases in countries that lack comprehensive credit reporting, prices will escalate more sharply. Consumer loans will likely be more costly in terms of finance charge and fees, as well as more restrictive in terms of down payment and convenience of access.

4. The ability of creditors to conduct ongoing account monitoring and take preventive action if a consumer shows signs of overextension will be limited or impossible in countries with more restrictive rules on the reporting of account data.

# Requirements for the Successful Use of Credit Information

Fabrizio Fraboni
CRIF Group

In view of the importance of credit information in small business lending, two questions of wide interest are how can credit bureaus best serve small and micro business, and what new functions should they perform to this end?

In the past, credit bureaus were primarily suppliers of data. However, as markets develop, it is no longer enough simply to have data available in order to meet market needs. That is why the credit bureau must move beyond that point to become a supplier of tools and of decision solutions as well (see Box 8.1).

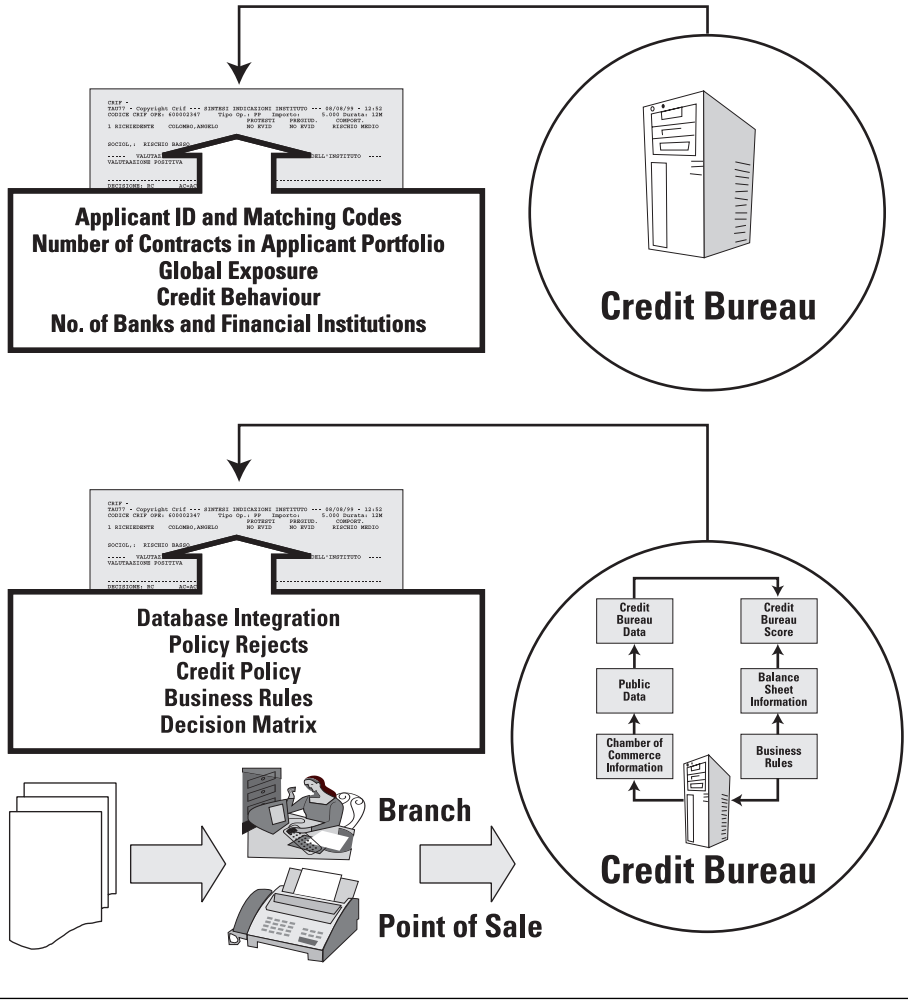
A lender's basic concern is to prevent portfolio risk and to limit the asymmetry of information characteristic of the credit market. As emphasized throughout this conference, credit bureau information is essential at an early stage of the credit analysis to guarantee the completeness of information regarding the credit behaviour of the applicant in the market.

Statistical analysis of data stored in the credit bureau is the first "logical" step forward, together with the distribution of other available public information. With the development of the credit market and increasing competition, new business needs must be met-such as consistent underwriting and administration of loans, quicker decisions on applications, and improved customer satisfaction-all of which impose new tasks on the bureau and call for major changes in the loan delivery process itself.

At the same time, it is essential to keep an eye on the costs of the underwriting and portfolio management processes and to find ways of reducing them (through the standardization of policies and procedures, the use of credit scoring, the automation of decisionmaking, and strict monitoring of the portfolio, not just individual loans). Furthermore, financial institutions will want to increase the volume of loans while maintaining portfolio quality.

In other words, today's credit bureau is evolving from a distributor of data to a supplier of value added services and a manager of the decision process. Hence its credit reports must now include details on applicant or customer behavior toward

Box 8.1: The Evolution of a Credit Bureau From the Delivery of Credit Reports to the Management of Decision Processes




the credit market stored in the bureau (information contained in the credit report consists of number of existing contracts, global exposure, patterns of payments, and the like). These kinds of changes have been taking place in Italy, for instance, where the credit bureau is no longer perceived only as a database containing credit information but also a solution provider that can help control credit risk through quick and sound decisions based on the early identification of pre-problem loans once they are part of a bank's portfolio, automated decision systems (which speed up the decision process without draining internal resources), standard or custom scores, and portfolio-based policies.

Indeed, the goal of the credit bureau should not be to replace the credit professional, but to streamline the decisionmaking process. Its function should be to identify the high-risk or very low-risk transaction, leaving the "grey area" accounts to the expertise of the credit professionals. The credit bureau then becomes a provider of complete support systems. That is to say, it integrates different information sources and maintains the specific features of each bank's credit policies. Italy's main credit bureau, for example, manages 150 decision support systems, each tailored to the specific needs of the bank or finance institution using it.

A word of caution is in order here, however: the process of small business lending should draw not only on the information from the credit bureau, but also on that from the chamber of commerce, the application form, the balance sheet, and specific business rules of the institution granting credit. With all these different sources of information on credit risk, it becomes possible to rationalize and speed up the decision process.

Another factor critical to the success of a credit bureau is the investment in the training of its employees and in keeping up to date on market needs. The fact is that the structure and services of a credit bureau must be in tune with the specific features of the credit market. Hence the bureau must guarantee that it will provide its users with the skilled analysis, advice, and services of a skilled group of credit experts who tailor the complexity of the credit processes to the specific needs of its associates and who guarantee updated information and state-of-the-art technology.

To reiterate, the credit bureau offers clients not only credit information but also solutions to risk control for the entire credit life cycle. These solutions consist in part of an automated credit process (as a result of a consistent, objective, and efficient system of assessment), of reporting activities that uniformly monitor the different assessment systems implemented for the bank, and a system of scoring expected risk among the small business clientele (the resulting risk score could also be the input to internal rating systems).

On one hand, these solutions will help improve credit underwriting by determining the risk of new clientele, helping to define a homogeneous credit policy, and facilitating application information analysis (e.g., by facilitating decisions on first credit approval). On the other hand, they will be a boon to portfolio management since the use of tools such as behaviour scoring, roll rates, line increase/decrease matrices, and post-campaign analysis will make it possible to control the quality of the portfolio and to define the appropriate strategies for each segment of clientele.

Strategies are the means by which complex information is transformed into action. They make it possible to differentiate actions based on the construction of

business rules, decision trees, judgmental criteria, and the like. In this way, it is possible to apply targeted decision policies that ensure the lending institution will achieve its own business goals. The objectives of such strategies may be to reduce the cases in which the expert appraisal of real estate is needed, limit the impact of external data retrieval, and take advantage of cross-selling opportunities at application time (for instance, while evaluating a credit line request, or to determine if the customer might also be eligible for a company credit card).

Even when strategies are successfully implemented, long-term success cannot be achieved unless the financial institution "whatever its size" monitors risk and its portfolios in order to provide directors and senior management with a clear understanding of its position and risk exposures. Because of the increasing complexity of banking, it is essential to continue evaluating, directing, and monitoring the business risks of the institution. Management will be unable to make informed decisions without accurate, timely information relating to the institution's performance and management of its resources.

Monitoring activities cannot be emphasized enough. They are as critical as the design of the decisionmaking strategies, in that they will allow the bank to constantly control the decisionmaking system and the trend of portfolio indexes.

Usually, the type of analysis (down to the branch level) required in monitoring focuses on:

- portfolio quality (to keep an eye on the level of risk for the specific customer segment or for the specific finance product),
- decision rules (to evaluate whether the decision structure is aligned with the existing decisionmaking process), and
- performance (to compare the effect of the decision rules on the performance of the clientele).

A final point to note is that lending errors are more often that not a result of a bank's failure to obtain and properly evaluate credit information, namely, adequate and comparative financial statements, income statements, cash flow statements, and other pertinent statistical support. The purpose of the borrowing, the intended plan of repayment and intended sources, progress reports, and inspection schedules are also essential details that should be kept in the bank's credit files. Without proper attention to credit files, it is difficult if not impossible to make sound credit judgments.

# Credit Reporting Systems around the Globe

Margaret Miller
The World Bank

Credit information and credit scoring technologies are at the heart of a sound and stable financial system. That is one reason why we at the World Bank are interested in applying these technologies to the less fortunate in the countries that we work with, to those living on the margins of their societies. Such people include not only poor consumers but also small businesses and microenterprises on the margins of the financial system. Credit information technologies enable us to provide credit to those who have not had it before and therefore help to make the distribution of income and opportunities in society more equal.

Few such people have the necessary collateral—few own or have a clear title to real estate-to gain access to credit. Credit information provides a different kind of collateral, known as reputation collateral. This collateral can establish a good payment history and thus be taken to a bank.

Such collateral can be used in credit scoring, especially for small businesses and for microenterprises. So far, however, little credit scoring is being used in developing countries to make credit decisions on small businesses or microenterprises in an automated way on the basis of information from external credit registries. Only in Latin America have people reported that they are using data from these external registries. That shows work needs to be done in terms of accessing the data, creating the kinds of databases that can be used in credit decisions for small enterprises, and resolving the legal issues surrounding the development of credit scoring.

To better explain these needs, I discuss some "quantitative" issues based on the results of a survey that the World Bank did in 1999 and 2000 of public credit registries and also a survey of financial institutions. I then turn to some qualitative questions regarding good practice. First, I briefly discuss the broad elements of a credit reporting system. Here, I am referring not only to public credit registries—which may be run by a bank supervisor or the central bank—or private credit registries. I am also referring to the legal framework for credit reporting, which includes means of redress if consumers have a concern, the judicial registries that are available in a country, the way in which credit information is used by financial intermediaries, and even more broadly, the cultural context that exists for

credit reporting. How do people feel about sharing credit information? Is there a history of it in the country? What should it include or omit?

It is widely agreed that credit reports should not include sensitive information such as sexual orientation or political or religious affiliation, but excluding certain other information may have unintended consequences. Reports in the United States, for instance, are not allowed to include the gender of the person as part of a credit scoring application. This policy was established because 20 or 30 years ago women were discriminated against and often had to have a husband's signature to get a loan. The trouble is that women are now subsidizing men's defaults because gender cannot be taken into account; yet women are less likely to default than men. Other problems such as wide-scale tax evasion, still widespread in many countries, also affect the willingness of people to share their data and thus complicate the issues involved in establishing a credit reporting system.

The Bank survey, which looked at both public and private credit registries, began with a focus on Latin America and then was expanded to Africa, Eastern and Western Europe, and, to a lesser extent, the Asia/Pacific region. Briefly, what we found is that credit reporting is an industry in transition, with many new entrants. The median age of the private registries in our survey sample was only 10 years, and 30% had been established only since 1995. Of the 29 private registries from Latin America, close to half had been established in the past seven years. And, from survey results so far, it appears that Latin America led all other regions in the 1990s.

In addition, a good number of countries have a public credit registry run by their central bank, though many people are not even aware of this fact. Public registries exist in virtually all of Latin America and are becoming a more common sight in Africa, Asia, and Eastern Europe as more and more supervisors recognize that information is crucial to building a viable, modern economy. Nevertheless, many obstacles exist to information sharing.

The difference between public and private registries is demonstrated in the following table:

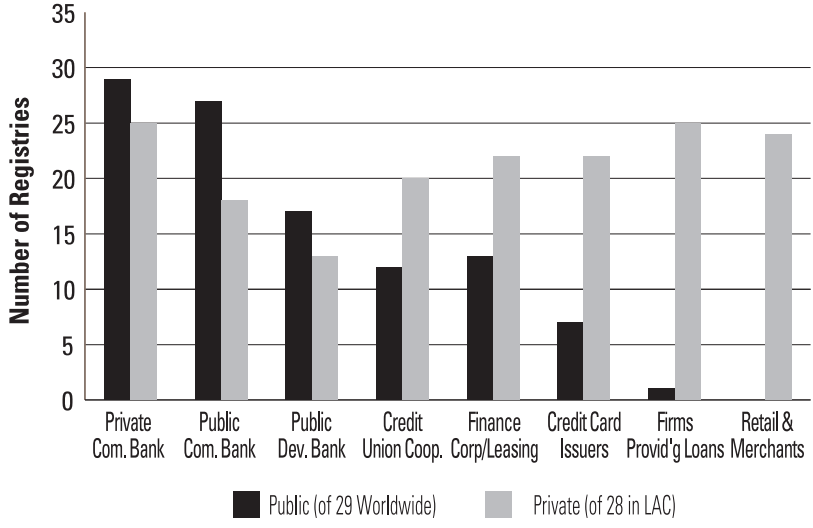
Box 9.1: Public vs. Private Registries

| Features | Public | Private |
|---|---|---|
| Source of information | Supervised institutions | Varied sources |
| Participation mandatory | Yes | No |
| Positive information | Yes | In some cases |
| Borrowers assigned a rating | Yes | No |
| Minimum loan size | In some countries | No |
| Fee for service | No charge or minimal charge | Yes |

To give an example of loan sizes, public registries in Germany list loans above DM 3 million (US$1.5 million), while those in Brazil list loans of 50,000 reals and up (about US$20 to $25,000). But other countries have no minimum loan size; they list every single loan that is outstanding, and typically there is no fee for service in the public registry, or it is very small.

In a private registry, the information is provided voluntarily, but it usually comes from a much broader variety of sources, though the information is generally less positive (see Box 9.2).

Box 9.2: Who submits information to public and private registries?




Whereas the rating may or may not be given in a private registry, the public registry often requires loans to be rated, typically on a scale of 1 to 5. And private registries do charge a fee for their service.

Private registries take various forms. Some consist of private firms with no bank ownership, such as Experia or TransUnion in the United States. Others are firms with a bank ownership, as can be seen in a number of developing countries. In some instances, bank associations act as hosts for credit bureaus, as do chambers of commerce and commercial and credit insurance firms. One of the main concerns about lenders being owners of the system, especially if it is a closed lending group such as only banks can create, is that preferential access will allow the owners to use the data in a specific way. Public credit registries, on the other

hand, obtain data primarily from commercial banks and different kinds of development banks. They get very little from retail merchants, firms that provide loans, or credit card issuers.

Thus it stands to reason that the kind of data collected by public and private registries also differs. Sometimes the differences can be very important. Take the address of the individual. That is not typically collected by public registries because one of their main objectives is supervision. That is to say, they are interested in aggregate amounts, not in a specific borrower. Even information that is crucial to making a loan decision, such as the identification number and tax code of the borrower, is not always collected by public registries. Furthermore, public registries are less likely to share data with a broader segment of people who could be interested. For example, they usually only provide the data to the banks that gave them data, whereas private registries are more likely to provide data to banks that did not participate.

Because of the reciprocity requirement, public registries are less likely to provide access than private agencies. In addition, private agencies are more consumer oriented, in terms of providing consumers with access to their own data, or offering protocols for taking complaints or for placing a comment on the record. As these databases grow, however, there are going to be some errors. Hence people need to be able to make comments and correct errors.

In sum, our research has clearly shown that public and private credit agencies are not substitutes. They serve different purposes. Above all, public registries are more narrowly targeted and do not include the broader scope of information that has empirical value in making credit decisions.

Interestingly, we also found that 84 percent of the banks surveyed were consulting an external credit registry for their consumer loans, while 93 percent said they were consulting an external credit registry for small business loans. When banks were asked which was more important, information from a credit registry or collateral, more than 2 to 1 said they would rather have good data from a credit registry. The reason seems clear: in many of the countries that we work with, that is not an easy proposition. Even lenders in the United States would prefer to have good data to screen out and identify good borrowers beforehand, than have to do the collection. Financial standing of the borrower and the borrower's history with the bank were also viewed as less important by institutions than was access to credit registry data.

Turning now to qualitative issues, a fundamental concern is what kinds of public policies are needed to support credit reporting? This is an area of perpetual concern at the Bank, for we are involved in trying to identify the elements of good practice in credit reporting systems. The legal framework plays a critical role here.

It should encourage information sharing among lenders. That sharing can be seriously hampered by bank secrecy laws, in particular. Public credit registries are being established in some countries because there is a legal impediment to a private sector solution. We at the Bank would say it is better to fix the law than try to create something in the government just because of a legal problem. That is the best way to give the private sector the opportunity to come up with a solution.

Another legal issue concerns privacy. The laws protecting privacy may be so restrictive that they impede the sharing of data. Some environments may be so strict that they constrict investment because it is virtually impossible to enforce their regulations. The kind of system that works best is one that allows people to address problems in the data. This will make it possible to strengthen and enrich the database.

The early credit bureaus in the United Sates, for example, were quite reluctant to let people see the data and makes changes because of errors. However, they quickly found that the process had to accommodate corrections if the database was going to be substantial enough to support the system. Furthermore, a system that limits access to information to a small group of lenders might well have an adverse effect on competition. That is why policies adopted by lenders and by society more broadly should treat information as a critical strategic asset of the country, something that promotes competition, rather than restricts it.

Apart from the legal and regulatory framework, some other elements of "good practice" are as follows:

- A credit reporting system should be an open, not closed, network. Ownership by a limited group of lenders or bank association will, as already mentioned, weaken the database.
- It should collect both positive and negative information.
- Data should be maintained for a minimum of five years. Data on nonpayments should not be deleted when the debt is repaid.
- Integrity and transparency are paramount. Special standing of any group, including the owners or the government, will discourage participation.
- Access to detailed information is preferable.
- Supervisors should include the financial institution's use of credit information as part of inspections.
- Publicly owned financial institutions should be required to provide data to legitimate credit reporting firms and associations.
- All financial institutions should be encouraged to participate in credit reporting.
- Public credit registries should have clear objectives. Furthermore, they should complement, not compete with, private firms.

- Public registries should focus on larger loan sizes and should provide customer service if data are distributed to the financial system.
- Borrowers should have access to their own data. Consumer-friendly procedures should be in place to challenge erroneous information in a reasonable time frame.
- Who has accessed data should be part of the credit report.
- A clear privacy policy should be established.

Though credit registries are becoming an increasingly important part of modern financial systems, public policy is not keeping pace with the changes brought on by new technologies in this industry. It is therefore essential above all at this early stage to develop appropriate legal and regulatory frameworks, through consultative processes between government, civil society, and the private sector.

# Small Business Lending and the New Basel Capital Accord

Mark Carey
U.S. Federal Reserve Board

My remarks today are my own opinions and not necessarily those of the Federal Reserve Board, other members of its staff, or the Federal Reserve System.

On January 16 of this year the Bank for International Settlements' Basel Committee on Banking Supervision released a new proposal that would make major changes to the way regulatory minimum capital requirements are determined for major commercial banks around the world and that would make other changes to the prudential supervision and regulation of banks. The Committee is still working on the proposal and a final version is not expected before the end of this year at the earliest. It is possible that the final version will differ in important ways from the January 16 document, but in my remarks today I will assume that the final proposal will be generally similar. If that is the case, I expect the new Basel Accord to provide both challenges and opportunities to those banks and individuals that are pursuing approaches to small business lending that rely heavily on credit scoring models. In my remarks today I will summarize some of the major challenges and opportunities.

First some background. One of the innovations of the Basel proposal is that it goes beyond capital regulation by focusing on "three pillars" that are meant to support banking system safety and soundness. The first pillar is capital regulation, which will potentially be much more sensitive to individual banks' risk postures than under the existing 1988 Basel Accord. The second is prudential supervision. For the first time, it appears that the Accord will require that national supervisory agencies engage in at least somewhat active supervisory review of banks. Today such supervisory review is suggested but not required, and the intensity of supervision varies quite a bit across nations. The new proposal instructs supervisors to do a number of things, such as checking whether banks make their own internal assessments of how much capital they need to ensure they remain solvent; requiring a bank to hold more than the regulatory minimum amount of capital where the bank's risk posture makes that appropriate; and early intervention by supervisors to try to correct the management of troubled banks. The third pillar is disclosure. Most banks will be expected to disclose to the public more than they do today about their capital and their risk posture.

Focusing on changes to capital regulation, the new proposal offers banks a choice among three approaches to setting capital requirements for credit risk: 1) A revised standardized approach that resembles the current Accord but that, among other things, sets higher requirements for nonperforming or other very risky loans; 2) A Foundation Internal Ratings Based or "IRB" approach that for the first time would make capital requirements for a borrower's loans depend on the bank's own internal assessment of the chance that the borrower will default; and 3) An Advanced IRB approach that would make capital depend on internal assessments of recovery rates and exposure at default, and of many other aspects of portfolio risk as well. The proposal also covers risks other than credit. Overall, the proposal is intended not as the ultimate approach to capital regulation but as a transition regime (albeit one expected to endure for many years) along the way to approaches that would rely mainly on banks' internal risk models, much like the current Market Risk Amendment relies on internal models to set capital requirements for market risk.

At most banks, credit risk is the main risk associated with small business lending, and so in the remainder of this talk I will focus on credit. Moreover, I will focus only on the IRB approaches to capital regulation, because I expect both market pressures and self-interest eventually will motivate most major banks to use one of the IRB options. To understand the challenges that small business lenders will face, it is helpful to understand the basic structure of IRB capital requirements. These will be set using a formula that for each loan requires as inputs a probability of default, a loss given default, an amount of exposure at default, and a remaining maturity of the loan. The Foundation IRB approach only gives a bank discretion to set values of Probability of Defaults (PDs). The other variables are specified by regulators to be values that are the same for all loans. The Advanced approach permits a bank to set values for all variables, and these are expected to vary across loans. To summarize, in order to use the IRB approaches, a bank must have systems that can provide at least PDs and maybe values of all the other variables in the formula. Moreover, the systems must be validated by the bank's national supervisor as meeting the requirements specified in the Basel proposal.

An open question at the moment is the classification of small business loans that are made and managed using credit scoring models. The January 16 proposal appears to require that such loans be treated as "corporate" loans, under rules similar to those for loans to large businesses, banks, and sovereigns. However, many banks manage credit-scored small business loans in a manner more like consumer or "retail" loans, and the Basel proposal's treatment of retail loans is somewhat different from that of corporates. In particular, if scored small business loans are ultimately treated like consumer loans, banks will be expected to allocate each loan to a risk segment, based on characteristics like the product type (is it a loan or a lease, for example), on an estimate of the risk of loss on the particu-

lar loan that would probably be based on the credit score, on when the loan was originated, and on the payment status of the loan. All loans in a given risk segment would be treated as identical for purposes of specifying the variables that go into the Basel formula, and the parameters of the retail formula may differ from those of the corporate formula even if the form is similar.

The first challenge to small business lenders that rely heavily on credit scoring models is to convert the scores into the variables that the Basel formula requires. Although most credit scoring models are designed to tell the lender something about the chance that each borrower will default, the primary goal of these models is not to estimate an actual probability of default but rather to provide a score that is useful for separating a pool of borrowers into "goods" and "bads." The level of the score's value is often arbitrary. For example, we could add 1000 to all the scores coming out of a given model and do no harm to the model's ability to separate good and bad borrowers. However, the Basel formula, and more generally any capital allocation model, requires PDs for which both the relative values and the levels are reasonably accurate estimates of risk. To make credit scores usable in capital allocation, model builders must develop ways of converting their scores into reasonable PD values.

A number of tricky issues complicate that conversion. Where a scoring model is estimated for a particular risk segment, say small business loans less than $50,000 to borrowers in a given geographic region with no history of default, the exact details of how the segment is defined can have a big effect on PDs. For example, if a bank splits all its small business loans into ten segments instead of five, if it is not careful it can end up with a different overall estimate of the risk posed by the whole small business book. Also, the data used to estimate the scoring model's parameters matters. In particular, if the data do not cover a period of general economic recession, the model may be able to do a reasonable job of discriminating good and bad borrowers, but when scores are converted into PDs using the non-recession data the levels of the PDs are likely to be too low to be representative of a whole business cycle.

Another challenge is that the Basel proposal requires IRB banks to save or "warehouse" data about their loss experience. That means keeping track of each loan on the books, of each credit score value that was ever generated for the loan, of whether the loan ever went bad, and if so how much the bank was able to recover. For banks that plan to depend on central credit registers for their data and credit scores and repayment history, it would appear that the central register would have to meet the Basel proposal's requirements in order for the bank to qualify for the IRB approach. Many central credit registers may need to make changes to conform to the requirements, and such changes take time, so it would be desirable to begin discussing the details soon. For banks that intend to use internal data warehouses, experience in the U.S. suggests that building and maintaining such databases is an expensive and tricky task.

One of the requirements associated with Pillar 2 of the Basel proposal is that banks produce their own independent estimates of how much capital they need to preserve their own solvency given the risks they are taking. As a practical matter, many national supervisors are likely to interpret this as a requirement that banks maintain and use internal models of portfolio credit risk. Many banks in the G10 nations and elsewhere have been experimenting with such models, but most have focused on the corporate lending book, and few banks even in the U.S. have been taking the models very seriously in making decisions about their capital structure. Portfolio credit risk modeling technology is still in early stages for retail lines of business.

Another challenge appears to be for the bank supervisory agencies in each nation but really will affect banks as well. The supervisors have to develop the capability to implement the new Pillar 2 requirements and to validate the internal systems of banks wishing to use the IRB approaches. Certainly here in the U.S. the supervisory agencies feel they have a lot to learn. As a practical matter, we plan to work closely with banks in developing the necessary procedures and technical capabilities and standards, and I expect regulators in other countries will do so as well. This means that both regulators and banks must try to maintain good, constructive relationships throughout what will be a very challenging task.

I have focused on the challenges the new Basel proposal will pose for bankers involved in small business lending, but I want to emphasize that the proposal also offers important potential benefits. It is not just that regulatory capital requirements will become more rationally related to asset quality. More importantly, I expect the proposal to provide a big push to the development and use of modern credit risk management techniques at banks around the world. Although such development might appear to involve a lot of costs, there are hints from recent U.S. experience that implementing the modern techniques might save money in the long run by reducing credit losses. As you may have noticed, economic growth has slowed recently in the U.S. and loan losses in the banking industry have been increasing. However, and this is purely a rough impression based on no formal analysis, it is my impression that those U.S. banks that have made the most progress in integrating good internal credit rating systems and portfolio credit risk models into their businesses are currently experiencing much smaller losses than banks that are less far along. If future experience confirms my impression, the upfront costs of implementing good modern risk management may be well rewarded in the long run.

# Using Internet to Make Small Business Loans

Ming Siu
SMEloan

Credit scoring systems are now widely recognized as an effective way of allowing financial institutions to make lending decisions to small businesses. This lending model requires a certain amount of data in order to allow it to predict the default probability of borrowers or recommended credit limit of borrowers. With the arrival of the Internet, which can be used to obtain data from small businesses, SMEloan has been able to develop a small business-lending model that allows financial institutions to reduce loan-servicing costs and minimize credit losses.

## How the Internet Promotes Good Lending Principles

In commercial lending, the best practice of lending has been to focus on individual borrowers' financial and cash-flow performance and to make lending decisions accordingly. Following are some of the good lending principles:

- Financial institutions should not make loans simply because they are comfortable with losing a maximum amount per borrower.
- Financial institutions should not stop making lending decisions after a loan is approved. They should proactively manage the credit risk, not when a borrower is delinquent in their repayment.
- Financial institutions should allow borrowers to increase their borrowing when they grow.

The above principles are difficult to follow unless financial information from borrowers is available on a regular basis and financial institutions are able to achieve significant efficiency in servicing small business loans. The Internet has made all this possible.

SMEloan, which was established in Hong Kong one and a half years ago, is building a new small business lending model that makes use of the Internet in gathering data and interacting with small business borrowers. The SMEloan model effectively allocates capital to small businesses now and when they grow. This new risk model also enables financial institutions to practice the above sound lending principles while achieving efficiency and scalability.

We believe companies fail because they have no business, no cash flow, and their customers are of substandard quality. Thus, instead of focusing on values and the quality of collateral, which is the traditional lending approach, SMEloan focuses on "knowing" the small business, its cash flow, and its business trend. This information makes it possible to pro-actively manage the risks before it is too late.

SMEloan is using the Internet to collect critical business information from small businesses when loan applications are processed and after the applicants become customers. Hence the process of information gathering is divided into two steps.

## Two-Step Approach

The two steps consist of a pre-approval process and a post-approval process.

**Pre-approval process.** The pre-approval process is a web-based scoring model that obtains a snapshot of the overall financial condition of a company at the time of loan approval. Companies with ideal profiles will be approved. In this process, SMEloan focuses on

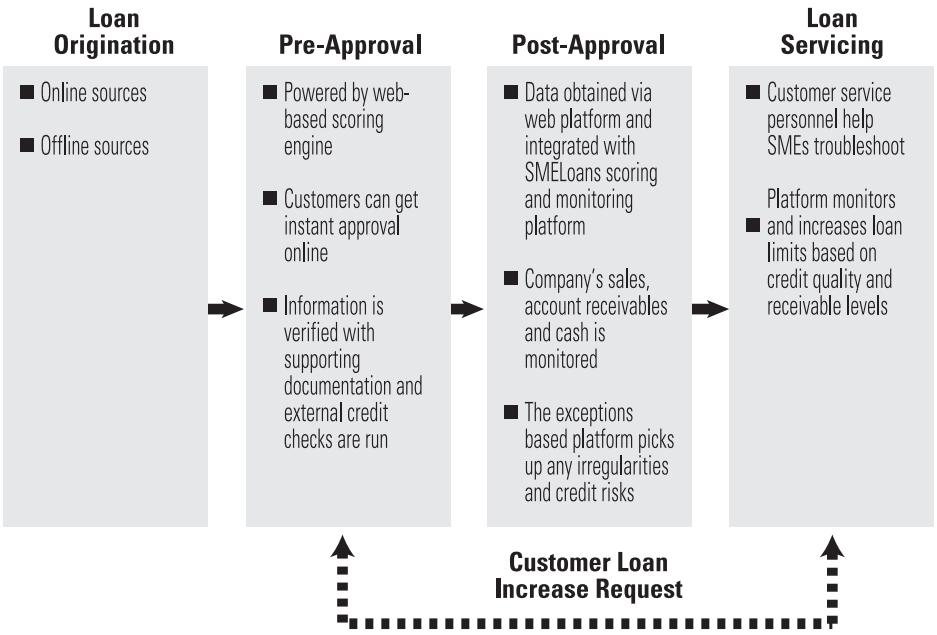
- Industry the company is in
- Length of time established
- Background of the company's owners
- Amount and number of financial obligations
- Banking transaction history
- Existing bank credit support
- Recent financial history
- Recent financial performance
- Amount of commitment owners have put into the company
- Debtor profiles of borrowers

This web engine, together with our highly efficient and standardized credit process, allows us to valuate each loan application objectively and quantitatively. Approval turnaround time for each transaction is fast, and staffing costs are low because the process and standards simplify credit analysis, and we do not require highly experienced and compensated credit professionals to perform such tasks.

**Post-approval process.** Once a loan is approved and disbursed, it enters into a post-approval process, which employs an Exception Based Risk Management (EBRM) Model. The EBRM is a cash-flow lending model that uses the Internet to enhance its access to information on SME borrowers. This lending methodology combines access to real-time cash-flow information on its clients with Internet-sourced information on its clients' sales and account receivables ("A/R"). A proprietary diagnostic risk management system, the EBRM model manages and ana-

lyzes dynamic credit information on a large number of small business borrowers. By contrast, traditional risk management models utilize static and historical financial information. Instead of having to look at every borrower all the time in the traditional relationship-lending model, the EBRM allows financial institutions to focus only on those borrowers identified as having exceptions. This will efficiently and effectively allocate appropriate resources to borrowers of higher risk.

Box 11.1: The SMEloan Process




## Integrated Customer Acquisition, Risk Management, and Customer Service Flow

The above diagram illustrates the complete SMEloan lending cycle that begins with loan applications. All loan applications go through a web-scoring engine and standardized loan review process. After applicants become customers, they submit their business information (i.e., sales, cash-flow, and accounts receivable data) via the Internet. Such data will then go through the proprietary risk management system that will identify borrowers who are displaying unusual cash-flow and business trends. A risk management team will then take action to engage customers in resolving such exceptions. If exceptions are not corrected within a set period of time, the risk management team will either reduce the loan exposure or the credit limit of the customer.

Once SMEloan has begun collecting business information on customers, they are able to apply for a line increase when they need it. Such applications are run through the scoring engine and the credit decision is made automatically.

With the above integrated process, SMEloan is able to follow the good lending principles of not lending only the amount that it is prepared to lose. It is able to retain customers longer because customers are now able to receive continuous support from the firm.

## Conclusion

Introduced and tested in Hong Kong, the SMEloan Model is demonstrating that Internet is an effective tool for communicating with small businesses and collecting real-time business information from them. Together with the business process and the exception risk management model, this new way of making cash flow loans to small business could improve the way in which capital is allocated to small businesses. This will inevitably result in win-win situations for small business and for financial institutions in other parts of the world.

# Chip Cards in Global Small Business Lending

Theodore Iacobuzio
TowerGroup

After a flurry of activity in 1996–98, interest seems to have subsided in the utilization of chip cards, or "chip," as an enhanced transaction medium for small-business lending and payments. In a way, this is puzzling, since chip addresses many of the concerns small business lenders face globally, especially in developing economies. These concerns are, most notably, security and control, both of which may be difficult in certain network environments.

Part of this has to do with how chip has developed over the years. It began in the European Union, most notably in France, as a way to circumvent high telecom costs as well as to reduce the high merchant fraud rates. At the same time, there have been very successful European country-specific purse programs, such as GeldKarte in Germany. Unfortunately, this has for the most part meant that the schemes have remained anchored to their individual countries.

The possibilities for single-country "closed-loop" proprietary lending schemes are by no means nugatory, however. Nevertheless, the category will most likely remain spotty at best until global standards can be attained.

There are four entities currently powerful enough together to mandate global standards: Visa International, MasterCard International, American Express Co., and Europay (of which MasterCard is a shareholder). These global payment schemes have, beyond certain baseline standards such as EMV (which is by no means universal in its application), been unable to attain the standards necessary to roll out chip worldwide.

This could change, because there are signs that the rollout of chip as an authentication medium replacing magnetic stripe is about to begin in the United States. If this is indeed the case, global standards could be based on the U.S. model, and small business lending could follow afterward.

## A False Start?

During the period 1996–98, when there was a flurry of interest in the success of European countrywide chip schemes-mostly for the facilitation of purse-there was also a great deal of interest in using chip in small business applications.

These implementations included:

- Overnight deposits at a bank in St. Petersburg, Russia
- Merchant-to-bank "cash" transfers from pubs in South Africa
- A large-value purse scheme in Nigeria for home and auto purchase

Though implementations such as these achieved varying degrees of success, interest was not long-term or widespread because of the industry's fixation on purse, rather than on the traditional transaction processing and management function, which would include, of course, lending as well as the direct disbursement of value.

At the same time, it has become evident that chip offers a variety of enhancements to magnetic stripe as a medium for small-business lending, since the extra memory and security on the chip allow for greater control over transactions and usage, as well as greater control from an expense management point of view.

It is unlikely, however, that chip will gain acceptance as a medium for small business transaction management—and hence as an enhancement for the small business lending function—until worldwide standards have been achieved. This seemed a daunting task until it became apparent that the United States is finally beginning its own chip rollout with products such as Blue from American Express Co. and Smart Visa from Visa USA. When the United States comes on board for chip, it will not be much longer before worldwide standards are at least a possibility.

Before considering the prospects for such standards, it is necessary to examine how chip enhances the transaction capability of plastic payment cards as compared with the current magnetic stripe infrastructure.

## What Chip Provides

The chips contained on smart cards are integrated circuits (IC) capable of holding vastly greater amounts of data than magnetic stripes (mag stripes). The most sophisticated smart cards are actually capable of microprocessing. Today's smart cards can hold 32K or 64K of memory, and there is nothing technically to forbid applications needing in the aggregate even greater amounts of memory.

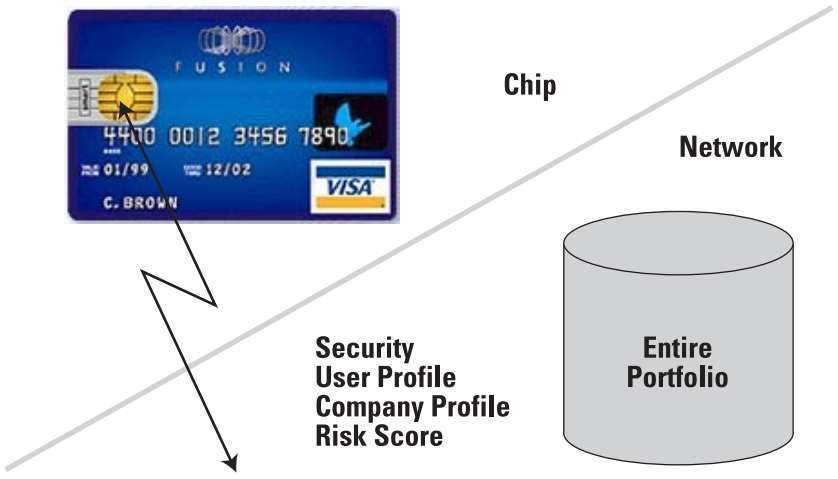
This capacity means, first of all, that the chips are much more secure than mag stripes, which are in fact not secure at all. (Though many mag stripe cards cannot work without the addition of a personal identification number, or PIN, that PIN is easily extracted from the mag stripe itself.) The security would allow the exchange of a digital certificate between the card user and the merchant, allowing for positive identification of the user in an online or physical environment.

Outside of security, the cards' ability to hold more information enhances the transaction function by allowing much tighter control over card use in terms of appropriate merchants, purchase size, and general usage considerations.

In addition, the cards have enough "space" on their chips for the ever-present purse function, which would allow for the direct transfer of value from one card to another, or from card to central processing unit (CPU). This could be an attractive addition to basic lending functions.

In the United States, credit scoring as a function of portfolio management, whether from a credit risk or fraud risk point of view, always takes place on the network: that is to say, the performance of the borrower is gauged online at the portfolio level, at the time of purchase, rather than at the point of purchase through the medium of the chip. While it is unlikely that there is no application for small business lending using the chip in the United States, the most obvious example of environments that the chip could benefit would be those where network and physical security are difficult or porous and where lender control of the transaction function is paramount (see Box 12.1).

Box 12.1: Chip-Based Versus Network Based Small-Business Loan Scoring




Before such applications become at all widespread, the standards issue must be resolved. The entitites noted above-the global card schemes-that are capable of addressing this issue have yet to arrive at a workable modus vivendi. Until they

do, small business lending using the chip will likely remain stalled. That is because the chip at the merchant level must be as transparent to the user and to the merchant as is the magnetic stripe today. Just as today the merchant swipes the magnetic stripe through one counter-top terminal little caring if it is Visa, MasterCard, or American Express, so in the future merchants must regard the chips of varying schemes. Such interoperability is not available today.

Until such time, then, it is very likely that developing markets may again examine countrywide or "closed-loop" lending schemes using only a few merchants for special needs. But the cost of implementation of such schemes would most likely render them isolated. Universal merchant acceptance is the key.

## The Merchant in the Center

Universal merchant acceptance is important if for nothing else than because merchants must bear the brunt of any smart-card rollout, in any country, at any time. That is one of the reasons that the United States has been such a laggard in implementing smart card technology, even on a countrywide basis: since the U.S. economy is not top-down in nature, there is no central bank authority to mandate that retailers accept chip as the transaction authorization medium. A business case had to be built first.

This translates into three guidelines for global implementation of small business loan utilization of chip cards:

- Technology standards
- Universal merchant acceptance
- Consumer adoption

Without the latter, large-scale small business lending cannot happen on chip. If these points are read in reverse order, until consumer acceptance creates scale, there will not be the necessary merchant infrastructure for handling the volume of transactions such acceptance will mandate. And the merchants will not come on line until they can be convinced that the chip is a globally accepted payment instrument.

## Conclusion

The key to launching global chip-based small business lending is to make contact with the relevant scheme sponsors early in order to capitalize on advances in technology. Again, it is important to remember that these advances will only come from the consumer side, because initially the consumer market is the only one that can provide merchants the kind of scale they need to sustain a rollout.

At the same time, the possibilities of localizing the scoring and transaction function, rather than depending upon networks, make the chip a natural transaction medium for a variety of small business lending projects.