# Economic Fairness Through Smarter Lending:

Some Factors to Consider on the Eve of Brazilian Credit Reporting Reform



A Center for Competitive Credit White Paper

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# Glossary of Commonly Used Terms

### Negative data:

Adverse payment data on a consumer. It consists of late payments (usually more than 60 days or more commonly 90 days past due), liens, collections and bankruptcies.

### Positive data:

Information on the timeliness of payments, including whether payment was on time, was indeterminately late, or was delinquent. Payment information contains the payment date relative to the due date. Positive information often includes data on account type, lender, date opened, inquiries, debt, and can also include credit utilization rates, credit limit. and account balance. It stands in contrast to negative-only reporting.

### Full-file reporting:

The reporting of both positive payment information and negative information such as delinquencies, collection, bankruptcies, and liens. On time payments are reported. Delinquencies are reported at 30 days (sometimes 15 days) following the due date. Other positive information on an account, such as credit utilization, is also reported.

### Negative-only reporting:

The reporting of only negative information, such as del inquencies, defaults, collection, bankruptcies, and liens. Indeterminate information such as applications (but not approvals or rejections) may be included.

### Segmented reporting:

A system of reporting information, whether full-file or negative-only, in which only data from one sector, e.g., retail or banking, are contained in reports.

### Comprehensive reporting:

A system of in which payment and account information, whether full-file or negative-only, are not restricted by sector, that is, the system contains information from multiple sectors. Such a system is in contrast to segmented reporting, in which information in files is restricted to one sector such as banking or retail.

### Data furnisher:

The supplier of the data, most commonly the supplier of the service to whom a consumer has a payment obligation. The supplier is often a financial service provider, but may be a nonfinancial entity. Non-service providers who report include collection agencies. The collector/supplier of public record information may be a data furnisher if separate from the repository.

### Data user:

The end user of the data, usually but not necessarily a financial firm. In finance, the information is used either manually or in automated computer models to allocate and monitor loans. Other users include central banks, landlords, cell phone providers, and employers.

# **Executive Summary**

Extensive research on variations in the structure of credit reporting has found that the reporting of positive and negative payment data across sectors to a privately owned bureau enjoys superior market and overall economic performance to other variants. We survey and analyze the more comprehensive and systematic of the studies to detail lessons to consider on the eve of credit reporting reform in Brazil. The key findings are that comprehensive and full-file (that is, reporting both positive and negative consumer information) consumer credit reporting result in:

• Greater Private-Sector Lending: Statistical analyses of economies with credit reporting indicate that private, full-file credit bureaus are associated with greater private-sector lending. Studies find that private bureaus can increase lending by more than 21 percent of GDP. Moreover, when the data account for full-file reporting, broad participation by data furnishers in full-file reporting to a privately owned bureau can increase private-sector lending by at least 47.5 percent of GDP.

• **Increased Credit Access**: Full-file and comprehensive credit reporting lead to greater access to mainstream credit. Numerous simulations using millions of credit reports from different economies (Argentina, Brazil, Canada, Colombia, and the United States) find that full-file, comprehensive reporting results in significant access to credit. These simulations find increases in the acceptance rate of 10 percent of the borrower pool for target default rates from 3 percent to 4 percent.

• More Equitable Lending: Full-file and comprehensive credit reporting results in a more equitable distribution of credit. Sharing information helps to bring underserved communities into the financial mainstream. Minorities, low-income groups, women, and the young particularly benefit, and they witness greater increases in their acceptance rates compared with men, higher-income groups, and older individuals. Moreover, relying on behavior-based risk models and greater information, particularly in automated systems, removes human bias and reduces discrimination.

• Smarter Lending: Full-file and comprehensive credit reporting lead to fewer defaults by borrowers and improved loan portfolio performance. Simulations show that more accurate and more expansive lending resulting from the additional payment information translates to fewer high-risk individuals receiving loans and more lowrisk individuals deservingly getting loans. Default rates decline often by more than 0.8 percentage points of loans in most simulations.

• Lower Cost of Credit: Full-file and comprehensive credit reporting reduce the average interest rate and reduce the de facto payment that lower-risk borrowers make by subsidizing higher-risk borrowers. Interest rates decline as the premium paid for higher risk is reduced. Better information also results in greater lending to low-risk borrowers, who faced higher prices relative to the expected return on their uses of credit. The fine-tuning of risk assessments results in interest rates that more accurately reflect the risk of the individual borrowers—higher rates for high-risk borrowers, and lower rates for low-risk borrowers. Since the advent of true full-file, comprehensive reporting, the United States has witnessed a 0.6 percent reduction in the spread or difference in interest rates between 10-year Treasury Bills and a 30-year mortgage.

• **Poverty Alleviation and Asset Formation**: By expanding access to lending, and by increasing private-sector borrowing, full-file and comprehensive credit reporting lessen income inequality, reduce poverty (all else being equal), and increase the growth of the lowest (poorest) quintile's income share.



### **1.Introduction**

During the past 30 years, credit bureaus have assumed a core role in the financial infrastructure of economies around the globe. This development goes hand in hand with the growth of information technology and the formation of competitive global financial markets.

Few disagree that consumer credit and other information allow lenders to make smarter decisions, but this consensus sidesteps additional important questions, including:

- -> What information should be reported?
- -> Which sectors should be encouraged to report?
- -> Who should be able to access the information and for what purposes?
- -> What forms of registry ownership work best?
- -> What, if any, are the trade-offs in different structures?



These questions confront policymakers, financial regulators, and others who use credit data in most economies, yet they are seldom examined systematically in the context of regulatory reform, even though a body of research exists to guide decisions on these issues. As policymakers and regulators in Brazil confront credit-reporting reform, they may benefit from a close examination of this body of research.

# 1.1. Information Sharing and Lending

The answers to the questions posed above depend, in part on the very logic of credit bureaus themselves. Credit bureaus are institutional answers to a ubiquitous problem in lending, that of "information asymmetries." The problem is found in the inherent dilemma of extending a loan. A lender's knowledge of a borrower's likelihood to repay is imprecise; only borrowers know their intention and capacity to repay a loan. The lender, therefore, must infer the risk profile of the borrower from incomplete information.

Incorrect assessments result in two symmetrical problems. Low-risk borrowers are mistaken as high-risk, and high-risk borrowers are mistaken as low-risk. Consequently, low-risk borrowers face high interest rates, which act as subsidies to high-risk borrowers. These rates likely price many low-risk borrowers out of the market. On the other hand, high-risk borrowers are drawn into the market by the rates that are very low in terms of the riskiness associated with them. Average prices rise to reflect the disproportionate presence of high-risk borrowers, and delinquency rates are higher. In response, lenders ration loans. That is, given two individuals with identical risk profiles and preferences, one will receive a loan and another will not.

In presenting information about potential borrowers to a lender, credit-reporting agencies (CRAs) reduce these asymmetries by allowing:

- a. interest rates to be fine-tuned or to reflect the risk of the individual borrower, such as lower rates for lower-risk borrowers;
- b. lower average interest rates;
- c. greater lending through less rationing; and,
- d. lower rates of delinquency and default.

However, the extent to which these results are achieved depends on the structure of credit reporting, bureau ownership, and the information reported. As such, there is no single model for credit reporting, and the differences in the model matter greatly for the scope of lending and the performance of portfolios. It is essential that policymakers and regulators take into account these differences when proceeding with credit reporting reform.

# 1.2. Credit Reporting in Brazil and the Question of Reform

Theory, international experience, and numerous empirical studies all offer answers to these questions as Brazil considers reforming its credit-reporting system. Currently, case law requires that Brazilian consumers provide consent *each time* positive payment data (for instance that a credit account is current, or the amount paid each period) are added to their credit file. Although in principle this provision does not prohibit the collection of positive information, in practice it proves a considerable barrier for the credit repositories. The required notification to consumers each time information is added makes it costly to collect the data, especially positive data and data on mild or ambiguous delinquencies. Data is now "held" until the consumer provides express consent, which would vary considerably. These regulations create a financial disincentive that is strong enough to render credit reporting in Brazil effectively negative-only (that is, including only information on delinquent payments, defaults, bankruptcies).

The administration of President Lula has proposed reform that would allow positive information to be more easily reported. The reform would require consent only once, when the account was opened, rather than each time new data are added to the file. The reform would lower burdens to CRAs and data furnishers and would make the use of positive information commercially feasible, as the consumer would not have to be notified every time positive information is reported.

There is little debate that positive information can enhance the efficiency of a credit reporting system, contribute to a growing economy, lower interest rates, and create wider access to credit. Yet issues remain. Skeptics are unsure whether the growth is significant. Some question whether the effect of interest rates will be nonnegligible. Others have deeper doubts about whether the sharing of information will lead to excessive and, more important, unstable lending.

Researchers have examined all of these questions closely, as well as other questions, such as the impact on inequality and poverty of greater lending under full-file payment reporting (reporting both positive and negative information); whether reporting positive information affects the distribution of credit by race-ethnicity, gender, and class; and its impact on the performance of loan portfolios. It is important to keep these answers in mind when contemplating whether the proposed reform is desirable.

We review the research on several of these issues using examples from Argentina, Brazil, Canada, Columbia, and the United States. These studies suggest that Brazil would be best served by private credit bureaus that collect both positive and negative payment information across all credit-extending sectors. This system should result in greater and wider access to credit, including among low-income groups, women, and minorities; better loan portfolio performance; lower interest rates; greater economic growth; increased productivity; lower poverty rates; and greater income equality. The remainder of this paper describes how, why, and to what extent such reporting influences these and other outcomes.

The structure of credit reporting in different economies varies in what information is contained, for how long, and for what uses. Whether the reporting function is fulfilled by public credit registries or by private registries differs as well. Credit reporting may also be comprehensive comprising data from all financial obligations—or segmented by the type of credit (e.g., bank, retail).

The most minimal form of credit reporting is negativeonly information (only serious delinquencies, often more than 90 past due, and defaults). The most extensive form—full-file reporting—contains both negative and positive payment data. A full-file report could contain information on whether the payment was timely or late, and if the latter, how late; how much credit is used; public record data on liens and bankruptcies; and additional information on employment.

Given that these are deliberate choices, it is no surprise that the effects of these variations have been examined extensively. What is more surprising is that only recently have regulators in most countries begun to pay attention to these findings.

The research suggests that:

- a. full-file, comprehensive credit reporting increases lending to the private sector more than other reporting regimes;
- b. private bureaus with comprehensive data increase lending to the private sector; and,
- c. full-file, comprehensive reporting results in better loan performance than segmented and negative-only reporting.

In what follows, we review the evidence of these claims in more depth.



# 2.1. Two Approaches to Measuring Economic Impacts

Researchers have taken two different approaches to confirm and measure the impact of varying credit reporting regimes. The first statistically estimates the impact of different systems of credit reporting worldwide, treating individual economies as observations and controlling for other factors that can affect lending. Although many factors affect the extent of private-sector lending in an economy, the legal system (particularly rights in collateral and bankruptcy), property rights, and wealth are the central factors that researchers typically control.

The second approach, pioneered by John Barron and Michael Staten, is more ambitious and uses microlevel data to compare the effects of different reporting systems.<sup>1</sup> This approach uses individual credit files from an economy that engages in full-file reporting. Some elements of the credit file are kept while others are purged, thereby mimicking the information content from more restricted cases. The researchers then apply decision models to the two (or more) sets of files (the restricted and nonrestricted files). Thus for a simulation of negative-only reporting, positive information is purged. The scores produced are predictions of the likelihood of serious delinquency, bankruptcies, and other outcomes. The predictions are then compared with actual outcomes in the "observation" period, the year or years following the timing of the score. That is, the files are rank-ordered by score, from highest to lowest. Each file thus has, for example, an observation of whether the consumer was delinquent on a trade line.

This approach produces two methods of evaluating the performance of the different reporting systems. For both methods, borrowers are ordered from least risky, as measured by the model, to most risky. In the first method, a market size (say 40 percent of potential borrowers) is targeted, by selecting the top 40 percent of borrowers, and associated serious loan delinquency (default) rates during the observation period are measured. In the second, an acceptable performance level is selected (for example, a 3 percent delinquency rate), by selecting the least risky borrowers until the aggregate default rate equals the default target, and the associated acceptance level is measured. In effect, the simulations measure the capacity of lending systems to accurately identify good and bad risks.

The least accurate scenarios produce higher default rates for a target market size and lower acceptance rates for a target delinquency rate. Thus, for a given credit reporting structure, analysts can gauge trade-offs between loan performance and credit access, and measure which system offers the smallest trade-off between the two.

The results from the two simulations are compared along dimensions of credit access, default, and delinquency, and the predictive efficacy of models. All other factors are effectively held constant. Regression analyses further round out the analysis and provide a complete picture of the economic and social impacts of differing consumer credit reporting regimes.





# 2.2. Theory and Evidence on How to Structure Credit Payment Data

Research on the sharing of consumer payment information has identified factors that significantly affect lending to the private sector and loan performance. The results offer insights into the above questions on the impact of full-file reporting on inequality and poverty, its effect on the distribution of credit across different populations, and its impact on loan portfolios. The analyses not only points to which reporting system works best, but also to estimated measures of the differences in loan performance and market size. Moreover, researchers have explored the reasons and causes for these differences.

Before examining these differences, it is important to understand the logic behind the results and to keep in mind the mechanisms that operate in different credit-reporting systems. Here, we elaborate on the dynamics at play in three salient features:

- whether the data in the files include timely payments (full-file) or contain only delinquencies (negative-only);
- whether the files contain information across all sectors (comprehensive) or are restricted to a single sector in which the consumer has a credit line (segmented); and,
- 3. whether the bureau is owned by public agencies such as the central bank or banking superintendent (public) or is owned privately.

The impact of each of these three variables is considered below.

# 2.2.1. Full-file payment information versus negative-only data

A common assumption is that lenders only need to know of any serious delinquencies on an applicant's other accounts to make an effective credit decision. The limitations of such assumptions, however, may be considerable.

First, this approach does not capture many moderately late payments (30+ or 60+ days past due) that are considered insignificant. Yet, these late payments, although short of an industry-defined level of default, are often telling indicators that a borrower may be seriously late with future payments. That is, minor delinquencies are often predictive of major ones, and their inclusion can improve the accuracy of the loan decision.

Second, negative-only reporting overlooks positive information, which offers a low-cost method of gathering data on applicants who have paid in a timely fashion, and it provides information on those who may be deliberately shut out of the market, such as lower-income borrowers, women, racial minorities, and the young. Reporting positive information not only expands access, but it also creates fairer access to credit simply because more information allows lenders to make more informed decisions and not ration credit. Evidence also suggests that full-file reporting deters discrimination because loan denial to qualified applicants who are members of underserved communities becomes more difficult to justify

Third, full-file reporting allows creditors to determine how many lines of credit a potential borrower already has and, in many cases, the associated balances and credit limits. This enables the creditor to better gauge the potential borrower's credit capacity and true level of indebtedness, thereby reducing the chances of extending too much credit, resulting in overindebtedness. Therefore, broader information reporting is an important protection against credit overextension or overindebtedness. Moreover, greater information allows lenders to speed loans along, especially if lenders use automated decision systems, such as statistical scoring models. More information also lowers the costs of issuing a loan. Automated mortgage underwriting, enabled by full-file information, saved American consumers more than \$18 billion in 2002.<sup>2</sup> In competitive credit markets, these savings are passed along directly to borrowers.

Each of these operating logics means that more information leads to:

- a. better predictions confirmed by better performance;
- b. wider lending validated by larger acceptance rates; and,
- c. fairer lending in the sense that the composition of borrowers begins to more closely reflect the general population.







# 2.2.2. Comprehensive reporting versus segmented reporting

In many ways, the issue of comprehensive reporting versus segmented reporting is akin to that of full-file versus negative-only reporting. Although few explicit arguments for a segmented system exist publicly, defenders suggest that only bank loan payment history is truly relevant for bank loans. Other payment information may provide some additional grounds for predictions, but its contribution is either small or redundant.

Of course, the issue is ultimately an empirical one, as demonstrated below. Nonetheless, counterarguments can be made. The first is whether and to what extent the addition of retail credit data contributes to risk assessment on a bank loan over and above bank-only data. The extent of its effect depends on the amount of historic bank loan data available. A "thicker history" is more helpful, especially when the file is "thin" in the number of trade lines. In addition, many consumers will have little or no borrowing history within a particular sector. As a result, some may be denied crucial forms of credit, such as loans from a bank for a mortgage or small business, even though extensive retail information shows them to be low risk.

As in the case of full-file versus negative-only reporting, more information assists lenders in making better decisions. Recall also that credit rationing arises largely because of a lack of information. By definition, segmented systems offer less information than comprehensive systems. We would therefore expect, as with full-file systems, that a comprehensive system would yield both better predictions confirmed by better performance, and less rationing, verified by larger acceptance rates.





# 2.2.3. Evidence: The impact of wider access to information on access to credit

Several studies have examined the impact of informationsharing on access to credit. Analysts have used aggregate data on increased lending as a share of gross domestic product (GDP) as a proxy. This approach is described below in an examination of ownership structure (public/private) and its consequences. Here, we restrict the discussion to the findings of simulations using anonymous credit files from several different economies. This approach allows us to consider access in terms of the number of individuals who are approved for credit and not the aggregate value of the loans. (Evidence in terms of the aggregate value of the loans also is provided below.)

To summarize, we analyze two (or more) sets of files at time t with statistical risk models and score the results. Payment performance by the consumer over the period from t through t+n serves as the observation period. Files are rank-ordered by score. The ranking provides a market size (acceptance rate) for any given loan performance target. A comparison of the rates shows the value of different reporting regimes, holding all other factors constant.

### 2.2.3.1. Full-file vs. negative-only

The first of these simulations, conducted by the pioneers of this method, Barron and Staten, used U.S. files to simulate the effect of a system using only negative information and one using only retail payment information on acceptance rates and default rates.<sup>3</sup> They compared the findings with a full-file, comprehensive system. Table 1 reports the results.

Acceptance rates between the two systems converge as the default target nears the societal default rate. For lenders, however, the key piece of information is that for lower default targets, full-file, comprehensive reporting allows for higher acceptance rates. At a 3 percent default target, that is, if a lender aims to have a non-performance level that is no more than 3%, a negative-only reporting system would accept 39.8% of the applicant pool, whereas a full-file system would accept 74.8% of the applicant pool. The difference in the number of borrowers is equal to 35 percent of the applicant pool. The reason is that with more information, fewer good risks are likely to be mistake to be bad ones, the most common error that takes places in lending. The spread in acceptance rates narrows as the default rate rises.

The gap shows that with less information, more good risks are thought to be bad ones. At lower default targets, fewer cases are judged as good risk (although for this acceptance level, mistakes will be greater in a negative-only reporting than in the full-file reporting, as shown below). Several studies have verified these results, including those that use data from Latin American countries. Three of these studies are notable. The first, by PERC's Information Policy Institute, uses U.S. files with commercially deployed scoring models. The second and third use Latin American files—one by Majnoni, Miller, Mylenko, and Powell using Brazilian and Argentine files, and the other, again by the Information Policy Institute, using Colombian files.<sup>4</sup>



#### TABLE 1:

Acceptance Rates for a Targeted Performance Level using Full-File versus Negative-Only Reporting

Target default rate (%)	Full-file, comprehensive reporting (%)	Negative-only reporting (%)	
3%	74.8%	39.8%	
4	83.2	73.7	
5	88.9	84.6	
6	93.1	90.8	
7	95.5	95.0	

Source: John M. Barron and Michael Staten, "The Value of Comprehensive Credit Reports: Lessons from the U.S. Experience," in Margaret M. Miller ed., *Credit Reporting Systems and the International Economy*, 273-310 (Cambridge, MA: MIT Press. 2003).

Table 2 shows the results of the first study by the Information Policy Institute using U.S. data. It includes one negative-only simulation, in which payment data less than 90 days past due were excluded.<sup>5</sup>

At a 3 percent targeted default rate, nearly 10 percent more of the applicant pool can be accepted when fullfile information in available than when using negativeonly information. Of the various simulations, the results of this simulation are most modest. Yet, even here, lending increases by more than 22 percent.

The second study by Majnoni et al. is notable for its use of varying levels of non-negative information, which confirms the value of positive data reporting. The authors use public registry files from Argentina, Mexico, and Brazil for both supervision and credit to simulate decisions using negative-only and full-file or fuller file information.<sup>6</sup>

Brazilian credit files on bank loans above (US)\$2,000 contain some positive payment data, or timelines of payment, as noted above. Majnoni et al. conducted simulations on large loans, those in excess of (US)\$300,000. For simulations using Argentinean credit files, they used a lower cut-off, (US)\$21,000. Argentinean files report loans by trade line, not as aggregated data. Brazil collects borrower loan information at an aggregate level for each bank rather than by trade line. Most important for our purposes is that these files contain information on days past due—from 15 to 60 days, from 61 to 180 days, from 181 to 360 days, and more than 360 days. Argentinean files simply collect whether they are 90 or more days past due. Although the intervals used in Brazilian files are less nuanced than those found in American, Colombian, or Canadian systems, they provide a record of timeliness. Argentinean files, unlike Brazilian files, contain information on interest rates and maturities of loans. Otherwise, its elements are similar, including credit outstanding.





#### TABLE 2:

Acceptance Rates by Targeted Performance Level with Full-File versus Negative-Only Reporting (U.S. Commercial Scoring Models)

Target default rate (%)	Full-file, comprehensive reporting (%)	Negative-only reporting (%)
2%	41.9%	28.5%
3	49.2	40.0
4	55.6	47.2
5	60.4	55.5
6	63.7	60.4
7	66.4	64.1

Source: Michael Turner et al., *The Fair Credit Reporting Act: Access, Efficiency, and Opportunity* (Washington, DC: The National Chamber Foundation, June 2003).

The simulations conducted on these files test the degree to which more information is better than less information. In the context of Brazil, it is a test of whether positive information can significantly assist loan performance and credit access. As Tables 3 and 4 show, positive information considerably increases access to credit, given a performance target. The fact that these simulations were restricted to loans (US) \$300,000 and greater should not take away from the larger lesson. In fact, experience elsewhere suggests that effect of positive information does not vary by loan size.

With a 3 percent default target, the Argentinean model increases acceptance rates by 22 percent over the negative-only scenario when full-file information is used. For the Brazilian model, acceptances rates increased by more than 47 percent of the pool of potential applicants. This finding is in keeping with Barron and Staten's results (Table 1) with U.S. data (an increase in acceptances by

nearly 35 percent of the potential applicant pool). Indeed, no studies find contrary results or suggest there is no improvement when full-file information is used rather than negative-only information.

Although limited by loan size to a much smaller pool than would be found nationwide in Brazil, the simulations using Brazilian credit files demonstrate the value of including positive information for credit decisions and confirm an extensive body of literature.

The third study, again by the Information Policy Institute, uses 5 million anonymous Colombian credit files and a commercial grade generic scoring model ACIERTA<sup>TM</sup>, developed by TransData LLC.<sup>7</sup> As is Brazil, Colombia is a descendant of the same French legal code and has similar rights of creditors. The simulations, therefore, assume a similar institutional backdrop.

#### TABLE 3:

Acceptance Rates by Targeted Performance Level with Full-File versus Negative-Only Reporting (Argentinean Loans in Excess of US\$21,000)

Target default rate (%)	Full-file model (%)	Negative-only model (%)
3%	60.22%	49.50%
5	76.37	75.76
7	86.02	84.26
9	92.76	91.95
10	95.24	94.71
11	97.50	97.10
12	99.59	99.55
	·	-

Source: Giovanni Majnoni, Margaret Miller, Nataliya Mylenko and Andrew Powell, "Improving Credit Information, Bank Regulation and Supervision." World Bank Policy Research Working Paper Series, No. 3443 (Washington, DC: World Bank, November 2004)

#### TABLE 4:

Acceptance Rates by Targeted Performance Level with Full-File versus Negative-Only Reporting (Brazilian Loans in Excess of US\$300,000)

Target default rate (%)	Full-file model (%)	Negative-only model (%)
2%	65.08%	49.20%
3	82.27	55.84
4	91.53	84.81
5	96.23	94.36

Source: Giovanni Majnoni, Margaret Miller, Nataliya Mylenko and Andrew Powell, "Improving Credit Information, Bank Regulation and Supervision." World Bank Policy Research Working Paper Series, No. 3443 (Washington, DC: World Bank, November 2004).

Colombian files include a considerable degree of nonfinancial payment information, such as rental and utility payment data. As such, the default rates (defined as more than 90 days past due) comprise many nonfinancial accounts. The results are reported in the Table 5.

The differences in this scenario are greater than the other models because of the nonfinancial data, but the logic and nature of the findings remain. Here again, more extensive information on past payment patterns and current credit obligations (that is, full-file reporting) better predict future payment outcomes.



TABLE 5: Acceptance Rates
by Targeted Performance
Level with Full-File versus
Negative-Only Reporting Using
Columbian Data

Target default rate	Full-file, comprehensive reporting	Negative-only reporting
3%	10.00%	2.56%
5	41.35	5.15
7	58.82	13.60
10	73.06	54.97
12	77.80	72.26

Source: Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America* (Chapel Hill, NC: Political and Economic Research Council, May 2007), Table 5.

# 2.2.3.2. Comprehensive vs. segmented reporting

One common structure for credit reporting is the model of a consortium by a class of lenders. By this framework, banks, nonbank financial institutions, or retailers collect positive and negative information from lenders in their sector. Often this information is made available only to the sector from which it is collected. Decisions are thus made with positive and negative data, but the trade lines are restricted to particular sectors. Two studies have compared the impact of sector segmentation. The first, by Barron and Staten, found considerable increases in acceptance rates when switching from retail-only information to full-file in simulations using U.S. data, as Table 6 shows.<sup>8</sup>

#### TABLE 6:

Effects of Sector Segmentation in U.S. Markets

Target default rate	Comprehensive model	Retail-only model	Percentage change in acceptance in switch to full-file
3%	83.4%	75.4%	+10.61%
4	90.6	80.6	+12.41
5	96.3	94.1	+2.34

Source: John M. Barron and Michael Staten, "The Value of Comprehensive Credit Reports: Lessons from the U.S. Experience," in Margaret M. Miller ed., *Credit Reporting Systems and the International Economy*ë 273-310 (Cambridge, MA: MIT Press. 2003).



The second study, by the Information Policy Institute, examines Japanese credit reporting using Canadian files to simulate Japanese reporting practices and a commercial grade generic scoring model in order to compare them to a full-file scenario. (Canadian credit markets, specifically their levels of indebtedness and default rates, resemble Japan's.) The results are similar to the U.S. model (see Table 7).9 Default rates in Japan are dramatically lower, on average, than those in other advanced economies, mainly because of credit rationing. Retail credit markets in Japan are severely underdeveloped and relatively unprofitable. In addition, a large black market for credit exists, owing to the substantial unmet demand for credit in Japan. The Information Policy Institute study attributed the underdeveloped retail banking sector in large part to Japan's segmented, generally negativeonly credit reporting system.

Each of these studies that examine comprehensive and segmented reporting affirms that more information enables lenders to make more accurate decisions. Acceptance rates rise (without hurting performance) as lenders realize that those they believed to be bad risks were not. The magnitude of the increase varies, of course, with the underlying population and the models used. Yet, files from the United States, Canada, and Brazil all suggest that at default target rates ranging between 2 percent and 5 percent (a range that reflects practical default targets), acceptance rates can be commonly expected to increase by between 10 and 12 percentage points, and often more. (Here, we exclude Majnoni et al.'s results for Brazil.)

Next we compare loan performance rates in a full-file context with such performance under negative-only and segmented scenarios. In these comparisons, we more easily see the potential to improve loan performance with full-file information. Specifically, lenders come to see those identified as good risks to be, in fact, bad risks.



#### TABLE 7:

Target default rate	Full-file model	Non-bank financial institutions only model	Percentage change in acceptance in switch to full-file
0.5%	47.81%	31.32%	+52.65%
1	70.90	62.70	+13.08
2	86.34	79.34	+8.82
3	92.38	83.29	+10.91

Effects of Sector Segmentation using Canadian Data

Source: Michael Turner, Robin Varghese, and Patrick Walker, On The Impact of Credit Payment Reporting on the Finance Sector and Overall Economic Performance in Japan (Chapel Hill, NC: Information Policy Institute, March 2007), Table 5.



# 2.2.3.3. Impacts on the distribution of credit

The aggregate figures of increasing acceptance rates detailed above hide a significant change. As Brazil considers reform, it should consider that what holds for those in Brazil who can afford loans in excess of (US) \$300,000 may also hold for lower amounts. In fact, two studies have examined how different systems of reporting affect the distribution of credit. The first study uses U.S. credit files and the second Colombian files.



The first study, by the Information Policy Institute, examines the consequences of data restrictions for the distribution of credit.<sup>10</sup> The files were appended with anonymous sociodemographic information on race-ethnicity, age, gender, and household income. Differences in acceptances rates between full-file and negative-only systems thus can be examined by these categories. Table 8 shows the results.<sup>11</sup> (The negative-only acceptance rate is indexed to 100 for each segment. Acceptance rates for the full-file scenario are expressed in terms of this index.)

#### TABLE 8:

Effects on Acceptance Rates for a 3 Percent Targeted Default Rate between Full-file Reporting and Negative-only Reporting, by Demographic Characteristics

Source: Michael Turner et al., *The Fair Credit Reporting Act: Access, Efficiency, and Opportunity* (Washington, DC: The National Chamber Foundation, June 2003).

	Negative-only (indexed to 100)	Full-file (change in terms of the negative-only index of 100)
Race-Ethnicity		
Caucasian, Non-Hispanic	100	121.8
African American	100	127.9
Latinos	100	136.8
All Minority	100	135.5
Gender		
Female	100	121.8
Male	100	123.0
Age		
<36	100	147.1
36-45	100	121.8
46-55	100	121.2
56-65	100	119.8
66-75	100	117.9
76+	100	119.9
Household Income (US\$)		
< 15,000	100	135.9
15,000-29,000	100	129.7
30,000-49,000	100	124.2
50,000-99,000	100	120.6
>100,000	100	117.8

Three results are notable. Ethnic minorities in the United States experience greater increases in acceptance rates with full-file information. Acceptance rates for African Americans increase by 6 percentage points more than the increase for whites, and for Latinos, acceptance rates increased by 15 percentage points more than they did for whites. The acceptance rate increased by a greater degree for younger individuals than older. Those younger than age 35 saw growth that was nearly 30 percentage points greater than the growth for those aged 66 to 75. Finally, low-income households (those with incomes less than \$15,000 annually) saw a greater increase in acceptance rates than households reporting more than \$100,000 annually—by nearly 18 percent.

Notably, the increase in acceptance rates for women do not differ significantly from that of men. This finding may not hold for other settings. The Information Policy Institute's study of Latin America found an increase in the share of women among the pool of borrowers when switching to a full-file system, as shown Figure 1 below.<sup>12</sup>



Source: Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America* (Chapel Hill, NC: Political and Economic Research Council, May 2007)

Individuals in underserved social segments are the most likely to benefit from expanded information sharing. Positive information is more likely to "thicken" their files, given their histories of difficult access to credit, than those of others. A system of loan decisions based on payment information also can help mitigate human biases against the young, women, low-income groups, and minorities and counter the belief that they are more irresponsible in meeting financial obligations. Behavioral predictions can be based on observed behavior rather than on descriptive features. Moreover, once automated systems are introduced, many of these factors will not even enter the decision process, consciously or unconsciously.





#### Figure 1:

Acceptance Rates in Columbia by Gender Under Full-File and Negative-only, as a Share of Total Borrowers

# 2.2.4. Evidence: The impact on loan performance

The counterpart to greater acceptance rates at a given default rate is lower default rates at a given acceptance rate. Table 9 reports the percentage point and percentage changes in the default rate for five simulations.<sup>13</sup>

As noted above, Colombian simulations included delinquencies on nonfinancial trade lines such as rent and utilities and are not, therefore, strictly comparable, although the direction of change shown in Table 9 is. The other four simulations show the default rate increasing by as little as 0.3 percentage points (or a 10 percent increase), which is still a considerable degradation of portfolio performance, to as much as 1.84 percentage points (a 170 percent increase) in cases restricted to financial accounts only. Majnoni et al.'s

**TABLE 9:** Percentage PointChange in the Default Ratein Switch from Full-file toNegative-Only (percentagechange shown in parentheses)

Source: John M. Barron and Michael Staten, "The Value of Comprehensive Credit Reports: Lessons from the U.S. Experience," in Margaret M. Miller ed., Credit Reporting Systems and the International Economyë 273-310 (Cambridge, MA: MIT Press. 2003). Michael Turner et al., The Fair Credit Reporting Act: Access, Efficiency, and Opportunity (Washington, DC: The National Chamber Foundation, June 2003). Michael Turner and Robin Varghese, The Economic Impacts of Payment Reporting in Latin America (Chapel Hill, NC: Political and Economic Research Council, May 2007). Giovanni Majnoni, Margaret Miller, Nataliya Mylenko, and Andrew Powell, "Improving Credit Information, Bank Regulation and Supervision." World Bank Policy Research Working Paper Series, No. 3443 (Washington, DC: World Bank, November 2004).

simulation using Brazilian files revealed that even at an extremely high acceptance target (of 80 percent), the default rate increases by 0.86 percentage points (or 30 percent). At a 60 percent acceptance target, the default rate nearly doubles (an 83 percent increase) under negative-only reporting compared with full-file reporting. These effects are significant for a lender and, moreover, as aggregated they can have a significant effect on an economy's financial stability and growth (for more information, see Section 3).



Acceptance Rate	Barron and Staten, using U.S. files	Turner et al., using U.S. files	Turner and Varghese, using Colombian files (includes non- financial trade lines)	Majnoni et al., using Argentinean files	Majnoni et al., using Brazilian files
20%			4.94 (140%)		
30%		0.8 (62%)	4.94 (120%)		
40%	1.84 (170%)	0.6 (33%)	8.96 (183%)	0.92 (60%)	1.48 (114%)
50%		0.3 (10%)	8.54 (146%)		
60%	1.45 (76%)	0.4 (8%)	8.1 (113%)	0.83 (28%)	1.53 (83%)
70%		0 (0%)			
75%	1.03 (34%)				
80%				0.96 (19%)	0.86 (30%)
100%	0 (0%)	0 (0%)		0 (0%)	0 (0%)

Table 10 reports the differences in default rates between a segmented reporting system and a full-file reporting system.<sup>14</sup> Comparisons show a similar shift in performance to the shift from full-file to negative-only. The more modest shifts show an in increase in the default rate by 30 percent to 40 percent, a considerable deterioration in performance.

**TABLE 10:** Percentage PointChange in the Default Rate inSwitch from Comprehensiveto Segmented Reporting(percentage change shown inparentheses)

Acceptance Rate	Barron and Staten using U.S. files	Turner, using Canadian files
40%	0.57 (108%)	0.18 (43%)
50%		0.19 (36%)
60%	0.72 (61%)	0.24 (35%)
70%		0.26 (27%)
75%	0.84 (39%)	
80%		0.68 (47%)
90%		2.83 (114%)

Source: John M. Barron and Michael Staten, "The Value of Comprehensive Credit Reports: Lessons from the U.S. Experience," in Margaret M. Miller ed., *Credit Reporting Systems and the International Economy*ë 273-310 (Cambridge, MA: MIT Press. 2003).

### 2.2.5. Summary

The reasons for these results underscore the logic of credit reporting. With less information, two factors reduce lending and worsen performance. The first concerns acceptance, that is, the size of the market for lending. In the absence of sufficient information to assess risk, lenders will ration, or not extend, loans to some worthy consumers while lending to others with the same risk profile. Second, without the ability to more accurately assess who is a good risk and who is not, lenders will find themselves with smaller pools for a default target, as more risky borrowers are included in the pool. Loss of the ability to assess risk accurately, which leads to rising default rates and worsening acceptance rates, occurs because less information leads to more mistakes.

One method of showing the rising frequency of mistakes measures "model fit"—the ability of a scoring model to differentiate between good and bad risk borrowers as gauged by the Kolmogrov-Smirnoff (K-S) statistic associated with each scenario. The K-S measures the maximal distance between the cumulative distributions of bad "events" over the score range (or curve of delinquencies) and good (or curve of on-time payments), with a maximum of 100. That is, this method allows one to measure the ability to tell good risk from bad.

For convenience, Table 11 reports the increase in the K-S in the shift from negative-only to full-file in terms of the percentage increase, as found in three studies. That is, Table 11 reports a direct measure of the degree to which assessments of borrowers' risk profiles improve with more information.



#### TABLE 11: Change in

Predictive Power of Models Resulting due to a Shift from Negative-Only to Full-File Reporting, as Measured by K-S Statistics

	Share of furnishers providing positive and negative information (with the remainder providing only negative information)						
Scenario	Turner et al., using U.S. files	Turner et al., using U.S. files U.S. files U.S. files U.S. files					
Total	7.76%	15.23%	8.15%				

K-S = Kolmogrov-Smirnoff statistic.

Source: Michael Turner et al., *The Fair Credit Reporting Act: Access, Efficiency, and Opportunity* (Washington, DC: The National Chamber Foundation, June 2003). Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America* (Chapel Hill, NC: Political and Economic Research Council, May 2007).

The increases shown in Table 11 are significant and underscore the process by which acceptance rates increase *and* default rates fall in the simulations above.

### 2.3. The Issue of Ownership Structure: Public v. Private, and Type of Private Bureau

The third aspect of a credit reporting system—in addition to full-file to negative-only and comprehensive vs. segmented reporting—has only recently begun to gain attention. In the past, analysts and others believed that whether a credit bureau was publicly or privately owned was immaterial to the performance of the financial sector. Public bureaus were thought to be equal in performance to private bureaus. Recent research has suggested otherwise. Of course, for Brazil this is not an issue confronting policymakers and regulators, but its dynamics are worth noting because they illuminate some of the important functions of credit reporting, which are not always realized as a result of variations in ownership structure.



Although there is no theoretical reason why a public bureau cannot behave like a private one, there are practical reasons. Public bureaus have been set up largely and primarily for supervisory purposes. That is, the accounts of loan performance kept by public bureaus are collected as a way for the state to monitor the safety and soundness of the financial sector and determine whether reserves are sufficient, if interest rate policy is encouraging excessive and unstable lending. Unlike private bureaus, they are not established primarily to facilitate greater and *sustainable* lending. Private bureaus, by contrast, are set up to ease lending. That is, the reasoning behind the data collection by private bureaus lies primarily in reducing information asymmetries and to improve risk assessment in lending. By this account, private bureaus are complements to public bureaus. Each fulfills a different set of functions, and jointly, these functions enhance the health of the financial sector.

In different economies, this focus by private-sector bureaus on lending generates incentives for several changes. Some of these changes are unrecognized and tend to flow from the needs of collecting and storing data. First, for example, data accuracy improves. Private bureaus have incentives to provide more accurate data because more accurate data greatly improve risk assessment, and hence, increase the value of their product. Second, private bureaus spearhead the standardization of payment data collection and storage. Standardization often brings its own efficiencies. Third, as database specialists, private bureaus help to enhance data security for a given volume of data.

The most significant changes relate directly to lending. Private bureaus open new sources of data. That is, they have incentives to collect information from sectors where credit is issued but often not reported, notably nonbank sources of finance. In so doing, they help risk management in these sectors, and help to extend more stable lending by providing information for those who may otherwise have little data on which to base risk assessments. They often also provide services in fraud detection and identity verification, both of which reduce lending risk.

Private bureaus also act to distribute the data more widely. Public bureau data are more likely to be used solely by the larger players in an economy, and the bureaus have less incentive to encourage the use of credit data in loan decision making than their private-sector counterparts.

Finally, private bureaus are key actors in developing analytic services that speed and ease lending. Standardization and regular collection of data from multiple sources allow a product to be deployed in automated algorithms for lending, instruments commonly referred to as "credit scores." These statistical models are based on a representative body of available payment data. Modelers use this information to develop statistical algorithms that best calculate risk. On the whole, these statistical models are considerably better at predicting risk than human judgment. Fannie Mae, the American, government-backed private mortgage lender and guarantor, found in its switch to automated underwriting, that using a scoring model was vastly superior to manual underwriting in predicting the likelihood of 90+ day delinquencies. Moreover, these predictions are less subject to human bias, especially





in relation to ethnicity, income, and gender. Rather than relying on personal descriptions, these methods rely instead on behavioral patterns found in payment histories for loan decisions.<sup>15</sup>

Once scoring becomes available, lending is greatly The efficiency of processing loans is rationalized. greatly improved. As a result, the costs of originating a loan—that is, the costs of initially evaluating an applicant and approving a loan-decline significantly. Automated mortgage scoring models deployed by Fannie Mae reduce loan-processing costs by (US)\$1,500 per mortgage over manual underwriting. They also increase decision speed from days to minutes.<sup>16</sup> The less time loan officers must spend on loan applications from standard consumers, the more time they can dedicate to those with special circumstances. That is, automated decision making also makes manual underwriting more efficient. Lowering origination costs also should significantly lower costs on smaller loans and microlending in general, as such costs would represent a relatively large share compared with the loan value.

Over time, decision models are developed for specific credit instruments—mortgages, auto loans, revolving credit, etc. However, the generic scoring models allow for faster development of new financial products by lowering the costs of processing and limiting rationing.

Empirically, statistical estimates have shown that private bureau data considerably increase lending and reduce delinquencies, phenomena either not statistically evident or evident to a much smaller extent within public bureaus. Results from three different studies are of note.

Djankov, McLiesh, and Shleifer examined private credit and credit reporting in 129 countries.<sup>17</sup> They found two factors that significantly increased lending in the private sector: the rights of creditors in collateral and bankruptcy, which create incentives to lend, and information-sharing in an economy. In the authors' estimates, private bureaus increased lending far more greatly than public bureaus, which in the estimates had an ambiguous impact. (In some estimates, public bureaus decreased lending, though these declines were not statistically significant.) In estimations that examined all countries, private bureaus increased lending by 21 percent (vs. 7 percent for public bureaus, although the latter was not a statistically significant increase). In estimations that restricted the data to poorer economies, private bureaus increased lending by 14.5 percent compared with 10.3 percent for public bureaus. Both coefficients are statistically significant.

Our estimates of the impact of information-sharing in 65 economies found similar results.<sup>18</sup> The tests we conducted examined the effects of the same factors on private-sector lending as a share of GDP. We modified the estimates to account for both full-file and negative-only reporting. We also used variables that posit coverage—or what portion of the adult population has files in a specified bureau—by a combination of private or public, and full-file or negative-only registries. Controls include the legal rights of creditors<sup>19</sup> and credit information.<sup>20</sup> That is, we measure the extent of coverage of the credit-eligible population by:

- 1. Public bureaus that contain negative-only data
- 2. Public bureaus that contain positive and negative data
- 3. Private bureaus that contain negative-only data
- 4. Private bureaus that contain positive and negative data





The logic of testing these four variables is that the *content* of credit reports also must matter for lending. Table 12 shows the results of these regression analyses.<sup>21</sup>

**TABLE 12:** Participation in CreditReporting Systems and Private SectorLending

	MODELS				
VARIABLE	1	2	3 <sup>22</sup>	4	
Constant	-142.40***	-139.48***	-133.97***	-130.80***	
	(35.31)	(35.49)	(35.41)	(32.20)	
Log of GDP per capita	20.31***	18.37***	17.38***	16.85***	
(adjusted for PPP)	(4.65)	(4.45)	(4.41)	(3.87)	
Avg. change in GDP (1995-2004)	-1.20* (0.70)	-0.82 (0.64)			
Legal rights of creditors	4.55**	4.99**	4.68**	4.80**	
(from 0 to 10)	(2.07)	(2.06)	(2.06)	(1.97)	
Credit information (from 0 to 6)	-3.87 (2.88)				
Private full-file coverage	0.72***	0.60**	0.66***	0.67***	
(0 to 100, as percentage of adults)	(0.20)	(0.18)	(0.17)	(0.16)	
Private negative-only coverage	-0.02	-0.13	-0.06		
(0 to 100, as percentage of adults)	(0.86)	(0.46)	(0.46)		
Public full-file coverage	-0.11	-0.26	-0.17		
(0 to 100, as percentage of adults)	(0.41)	(0.40)	(0.39)		
Public negative-only coverage	0.16	-0.01	-0.09		
(0 to 100, as percentage of adults)	(0.46)	(0.86)	(0.86)		
R squared	0.7075	0.698	0.6895	0.6883	
F-stat	16.93	18.82	21.46	44.9	
(p value)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	
Residual standard error	29.45	29.65	29.81	29.12	
Ν	65	65	65	65	

Standard errors in parentheses; \* p < 0.1; \*\* p < 0.05; \*\*\* p < 0.01

As in Djankov, McLeish and Shleifer's study, extensive rights for creditors account for a large degree of the variance in lending in the private sector, for obvious reasons; lenders are more willing to lend if the chances of recouping the principal in a default are greater. (The expected difference between an economy with none of the rights identified by the World Bank and one with all 10 rights is nearly 45 percentage.)

The most startling result is the absence of any real impact of credit information (that is, whether full-file or negative-only files). The inclusion of the aggregated "credit information" variable added nothing to the estimation. The chief reason seems to be that the factors making up credit information are attributes that can be found in the practices of private bureaus. (Private bureau coverage and credit information are substantially correlated, at 0.568.) The direction of the effect is likely complicated, given that the ability to gather wider credit information allows a private bureau to better perform its main function of serving lenders. The presence of private bureaus encourages the collection of more information and better information practices. Private bureaus are more likle to store information for longer periods and collect information that comprises wider aspects of the payment universe (such as utilities). They do so given that their focus is assisting lenders and not merely or primarily regulators interested in reserve requirements. (Below, this effect is controlled for in the simulations.)

However, what is quite telling is the implication that 100 percent coverage of credit-eligible adults by a fullfile private bureau can be expected to increase privatesector lending by more than 60 percent of GDP (all else being equal). This figure is substantially larger than that found by Djankov, McLeish, and Shliefer. One likely reason is that they estimated the impact of credit information sharing by a private bureau without accounting for variations in coverage. In our estimates, removing observations with very high levels of privatesector lending, notably the United States and the United Kingdom, resulted in a coefficient of 0.475, which was still significant at the 1 percent level. In other words, removing these observations increased lending by 47.5 percent of GDP. (Coefficients on the other variables remained roughly the same.)

The third study was by the Inter-American Development Bank (IADB).<sup>23</sup> Unlike Djankov, McLeish, and Shliefer or our study, the IADB's statistical estimations measured the impact of information-sharing on loan performance. The IADB examined data from 170 banks in Bolivia, Brazil, Chile, Colombia, Costa Rica, El Salvador, and Peru to measure the impact of private and public bureaus on loan performance. It found that banks that loaned primarily to consumers and small businesses and that used private bureau data had nonperformance rates that were 7.75 percentage points lower than banks that did not. The authors found no such effect of any magnitude for the impact of public bureaus.

As with microsimulations using credit files, studies have consistently found that privately owned bureaus expand access as evident in increased private-sector borrowing, and they improve performance, as demonstrated in lower loan nonperformance rates, at least when banks serve the data subjects of the credit files.

### 2.4. Implications of micro-logics

As shown above, a wide body of empirical research using different methodologies suggests that full-file, comprehensive, privately owned credit bureaus are more successful at expanding access to credit and improving loan performance than their counterparts. Crucially, they also appear to assist in expanding credit access in ways that disproportionately benefit underserved consumers women, ethnic and racial minorities, the young, and lowincome groups. As such, they offer the promise of less uneven development. Questions of course remain about some macro-consequences of increased lending, questions to which we now turn.







# 3. Macro Effects on Development and Finance

Given that a credit reporting system exists, the question of its structure retains a deep importance for a country's economic performance for many reasons. If the structure of the credit reporting system—whether the information reported includes positive data; whether it integrates information from many sectors; if the registry is privately owned—affects the scope of lending and the performance of loans, then the issue turns on the effects of greater lending and a healthier financial sector for the well-being of an economy.

The economic impact of a stronger financial structure is well explored. Theoretically, a strong financial sectors is thought to "mobilize savings," or to move savings to uses that can assist consumption or develop productive capacity through investment. For individuals, a strong financial structure can theoretically smooth consumption over a person's life. In the aggregate, it is thought to stabilize consumption and thereby limit the swings of the business cycle. Moreover, wider access to finances may have positive consequences for economic fairness (both leveling income inequality and lowering poverty) as access to credit helps families develop assets.

These theoretical claims have been empirically examined. Three spheres of economic life are strongly shaped, directly and indirectly, by the structure of credit reporting: 1) economic growth and stability; 2) the price of credit; and 3) income distribution, as it relates to both poverty and equality. These macro effects are achieved most commonly through a sustainable expansion of lending that comes with better risk assessment. Each is examined in turn below.

# 3.1. Greater Economic Growth and Stability

The research on finance and growth is extensive.<sup>24</sup> Multicountry estimates show that economies with larger financial sectors (under various measurements) have higher rates of growth, greater productivity increases, and faster growing capital stock. The links are theorized to be direct (allocation of capital to productive investments) and indirect (facilitating exchange, permitting greater corporate control over managers). The consumer credit reporting system is clearly only one part of the system, relating as it does to risk assessment and credit allocation among consumers and small businesses, whose finances are quite often coincidental with the personal finances of their principals. Other factors, such as the stock and bond markets, also are significant.

In cross-country estimations, Levine statistically estimated that an increase in private-sector lending by 30 percent of GDP should lead to an increase in GDP growth by 1 percent per annum, and an increase in productivity and capital stock by 0.75 percent per annum.<sup>25</sup> This is a conservative estimate and should be considered in the context of our findings on the impact of greater participation of private full-file credit bureaus on growth in private-sector lending as a share of GDP.

Recall that 100 percent coverage by a private, full-file reporting system can conservatively increase lending to the private sector by 45 percent of GDP.<sup>26</sup> Were the estimated 55 percent of Brazilians now covered in a private bureau to have positive information also

reported, we could expect an increase in privatesector lending of 25 percent. In turn, Brazil's GDP would grow by 0.83 percent more than would otherwise occur, and productivity and capital stock would grow by 0.63 percent.

There are, of course, many examples of periods of increased lending that led to economic growth for brief moments, but then left debt crises in their wake. Latin America has been particularly prone to economic crises. Between 1974 and 2003, Latin America averaged 1.25 crises per country, a higher rate of financial crises than any other region in the world. Approximately one-third of countries in the region have suffered recurrent crises.<sup>27</sup> By comparison, the second most crisis-prone regions during that time period, Eastern Europe and Central Asia, experienced an average of 0.89 crises per country, with 11 percent of countries in the region suffering recurrent crises.

The micro-simulations above show how greater lending, as enabled by full-file, comprehensive reporting, can help stabilize the lending environment. To the extent that lending is matched with capacities to carry the loan and willingness to pay, as demonstrated above, full-file reporting can contribute to stability by reducing problems of asymmetric information (by revealing more accurate risk profiles) and moral hazards, or the chance that the borrower will not pay on time given the incentive structure. It does so by creating incentives to pay on time, and by helping to reduce interest rates.





### 3.2. Lowers Average Interest Rates

Information-sharing can lower average interest rates in several ways. These dynamics have been borne out both theoretically and empirically. Many researchers have theoreized about the consequences of informationsharing for interest rates, beginning with Akerlof's 1970 paper on the market for "lemons" (or poor quality goods) and Stiglitz and Weiss's groundbreaking 1981 paper on asymmetric information and credit rationing.<sup>28</sup> When lenders cannot accurately assess the risk profile, the interest rate they charge, based on average loan performance, can itself affect the overall risk of their portfolio. The logic is laid out below.

First, without information on borrowers' risk profiles, a lender will mistake good risks for bad, and vice versa. The portfolio, therefore, will consist of more risky loans and, over time, as interest rates adjust to reflect loan performance, higher rates. Second, higher rates create incentives to engage in riskier projects, as lower risk projects will not yield the return to compensate for the costs of the loan. Risky projects come to account for a larger share of the portfolio, thereby driving up the average rate.

#### 3.Macro Effects on Development and Finance

When information is shared, lenders are better able to discern an individual's risk profile. The ability to screen out more risky borrowers can improve the performance of the portfolio and allow lenders to offer lower rates to lessrisky borrowers who would not have borrowed otherwise. Moreover, with more accurate information, lenders are able to price loans tailored to individuals risk profile and less at the portfolio average.

Figures 2–4 illustrate this dynamic. Figure 2 represents a hypothetical case illustrating the dynamics by which interests rates can fall when information is shared. Figure 3 illustrates the empirical example of the distribution of credit card interest rates in the United States as information sharing spread between 1990 and 2002. Figure 4 depicts the spread between prevailing 30-year mortgage rates and the prevailing rate on U.S. Treasury bills. (To the extent that the spread is accounted for in part by a risk premium, changes in the spread imply changes in the riskiness of the loan.) Curve A in Figure 2 represents a distribution of consumers by interest rates in a market with limited information-sharing. Curve C represents the distribution of all potential borrowers according to the interest rates that would occur if full information were available on their risk profiles. i represents the mean interest rate that would occur in a lending market with no information asymmetries. In such a market, a lender can charge a consumer an interest rate that best reflects the risk involved in lending to that specific consumer.

Curve A, the actual market in our hypothetical example, has an associated mean interest rate of  $i^{**} > i$ . The distribution of borrowers is skewed relative to that of the potential market for two reasons. The first is a problem of "adverse selection," where high-risk borrowers view the loans as relatively cheap, and low-risk borrowers view them as too expensive for their risk profiles. The latter leaves the market, while more of the former enters. The second reason for the skewed distribution is a problem of moral hazard, where some borrowers will engage in high-risk investments to obtain a reasonable return, given the high cost of capital. In either case, the curve shifts to the right.

formationms and on of Interest

Interest Rate

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FIGURE 2: Information-Sharing Systems and the Distribution of Borrowers by Interest Rates Moreover, without sufficient information on consumers, each is charged interest rates nearer the average, thereby leading the lower-risk consumers to subsidize the higherrisk consumers. Curve B represents what happens with more information. The curve "flattens" with the distribution of interest rates, increasingly resembling the distribution of risk in a society. Lower-risk borrowers are brought into the market and many higher-risk ones are priced out. The average interest rate falls ( $i^*$ ).

These dynamics are not purely theoretical. To the extent that interest rate decisions reflect the risk associated with lending, the simulations above provide strong empirical reasons to believe that rates will fall. If there are sufficient competitive pressures, interest rates will be driven down (controlling for a lender's risk appetite and target market share) as default rates are driven down.

Figure 3 illustrates the distribution of credit card interest rates in the United States in 1990, before the advent of truly extensive information-sharing systems as enabled by the information revolution.

Figure 3 shows a radical shift in the distribution of interest rates on credit cards. Although the U.S. prime rate fell from 10 percent to 4.75 percent during the time period, there appears to be an even greater reduction and spreading out of interest rates. Risk-based pricing, based on consumers' risk profiles, as determined from credit reports altered the price of credit for many Americans, allowing for more nuanced pricing. More important, it extended cheaper credit to millions while extending more credit overall.

Another indicator is the spread between the 30-year fixed mortgage rate and the interest rate on the extremely low-risk 10-year U.S. Treasury bill. The spread suggests a considerable decline in the risk premium. In the United States, it worked to extend home ownership to millions.<sup>30</sup>

To the extent there is sufficient competitive pressure, credit pricing will increasingly reflect the default rate. To this extent, there is a simple mechanism that translates better risk assessment to the desired macroeconomic outcome of lower rates.



**FIGURE 3:** Distribution of U.S. Credit Card Interest Rates as Information-Sharing Expanded between 1990 and 2002<sup>29</sup>



**FIGURE 4:** Spread between the 30-Year Fixed Effective Mortgage Rate and 10-Year U.S. Treasury Bill Interest Rate<sup>31</sup>



#### 3.Macro Effects on Development and Finance



# 3.3. Lowers Poverty and Improves the Distribution of Income

Theory and experience strongly suggest that a well-functioning financial system can facilitate growth when it efficiently allocates savings toward investment. In conjunction with results demonstrating that full-file credit reporting results in more stable lending, financial expansion via a well-structured reporting system can likely help consumers build as sets and wealth.

Perhaps more interesting is the question of the distributional consequences of greater lending. Lending as enabled by full-file reporting disproportionately increases access to credit among women, minorities, and low-income groups. Although the macro-effects of credit reporting on poverty and income distribution have not been directly measured, the effects of greater lending on economic indicators have.

There are two competing theories of the consequences of greater lending on income inequality. One suggests that the financial sector will disproportionately benefit the rich, as they are in a better position to access credit. This will be particularly true, according to these theories, in early stages of economic development, when only the rich can truly afford credit. The other theory suggests that greater lending will disproportionately benefit the poor to the extent that information and transaction costs are sufficiently low. Constraints in the allocation of credit, as witnessed in situations of poor credit information, hurt the poor relatively more and increase inequality by hindering the flow of capital to those poor individuals who are likely to have investments with high expected returns. By reducing credit constraints, credit reporting can be expected to reduce relative and absolute poverty *and* reduce income inequality, according to these frameworks.

Beck, Demirgüç-Kunt, and Levine have thoroughly examined the impacts of greater private-sector borrowing on income inequality, relative poverty, and absolute poverty.<sup>32</sup> They measured the effect of greater private-sector lending on the Gini coefficient (a standard measure of income inequality), the income share of the poorest quintile to total national income, and the share of the population that lives on less than US \$1 per day, a commonly used threshold for poverty worldwide. (Higher values in the Gini indicated greater inequality.)





Controlling for factors such as education, inflation, and trade, Beck and colleagues found that greater privatesector lending lowers the growth of the Gini coefficient; lowers the growth of the percentage of the population living under \$1 per day; and increases the growth of the lowest (poorest) quintile's income share. To shed light on these findings, Beck and colleagues compare Brazil and Canada. Brazil had a private-sector lending level of 33 percent of GDP for the observation period while Canada's rate was 63 percent. As the authors explain:

Had Brazil had the same level of Private Credit [measured as the logarithm of private sector claims in banks] as Canada over the period 1961 to 2000, the income share of the lowest income quintile would have fallen only by 0.1 percent every year rather than the actual 0.6 percent, which would have resulted in an income share of 3 percent for the lowest income quintile rather than the actual 2.4 percent in 2000.<sup>33</sup>

That is, the income share of the bottom quintile may have been 25 percent greater with such increased levels of private credit. If overall economic growth were positively affected by increased private credit, then the actual income for this quintile would have been more than 25 percent greater.

Previously discussed simulations using U.S. credit files showed that low-income groups benefit more from greater access to credit than other income groups. Our simulations using Colombian data did not permit analysis by income group. However, there are reasons to believe that gender may be a proxy for income to the extent that income and gender covary in Colombia. To that extent, the Columbian results may be consistent with the proposition that increased information available to lenders leads to a more equitable distribution of credit. Certainly, treating gender on its own terms, greater information sharing leads to more equitable lending among the sexes.

Credit reporting promises not only to alleviate poverty but also, by providing more equal access to credit by removing information barriers, to reduce inequality and improve the distribution of income through a more efficient allocation of credit. The Brazilian distribution of income is among the world's least egalitarian. A 2004 survey of household income found a Gini coefficient of 54 (using an index of 0 to 100) according to United Nations' estimates (and 59.7 by U.S. Central Intelligence Agency estimates). Beck and colleagues provide reason to believe that much of this distribution is accounted for by an unequal access to credit. Full-file credit reporting may provide a solution that at the same time improves the efficiency of financial markets.





# 4. Conclusion: What Is at Stake for Brazil?

Findings are consistent across a wide body of research examining information-sharing and related finance and growth, as well as finance and equality. Information-sharing expands access to credit overall and disproportionately expands access among the underserved. Information-sharing improves loan performance by reducing delinquency rates for any given target. Both are achieved by accurately identifying good credit risks that otherwise would have been misidentified as bad risks and, therefore, would have been denied credit.

At the same time, bad risks, offered credit because they were thought to be good risks, now have credit denied to them or are no longer subsidized by lowerrisk individuals. In the aggregate, lending is increased, leading to greater economic growth, rising productivity, and greater capital stocks. Average interest rates decrease. Poverty and income inequality are alleviated. This is especially true of full-file, comprehensive reporting to private bureaus as they increase private sector lending more than any other system of credit reporting and do so significantly.

As Brazil considers credit reporting reform, policymakers and regulators should keep in mind that the structure of reporting has considerable consequences for several economic outcomes, including economic growth, stability, poverty alleviation, and equality. The sprevailing practice of requiring consumer notice for every report of positive information generates a barrier to practices that have been shown to directly and indirectly improve economic conditions. At stake are issues no less important than prosperity and fairness for Brazilian consumers.

### **ENDNOTES**

<sup>1</sup>John M. Barron and Michael Staten, "The Value of Comprehensive Credit Reports: Lessons from the U.S. Experience," in *Credit Reporting Systems and the International Economy*, ed. Margaret M. Miller, 273-310 (Cambridge, MA: MIT Press, 2003).

<sup>2</sup>Michael Turner, *The Fair Credit Reporting Act: Access, Efficiency, and Opportunity* (Washington, DC: The National Chamber Foundation, June 2003), p. 8.

Barron and Staten, "The Value of Comprehensive Credit Reports," p. 298.

<sup>4</sup>Giovanni Majnoni, Margaret Miller, Nataliya Mylenko, and Andrew Powell, "Improving Credit Information, Bank Regulation and Supervision" (World Bank Policy Research Working Paper Series, no. 3443, November 2004). Available at www-wds.worldbank.org/servlet/WDSContentServer/WDSP/ IB/2004/12/17/000; and Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America* (Chapel Hill, NC: Political and Economic Research Council, May 2007).

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<sup>5</sup>Turner et al., *The Fair Credit Reporting Act*, Table 11, p. 50. Scenario C results. Available online at http://infopolicy.org/pdf/ fcra\_report.pdf.

<sup>6</sup> Majnoni, Miller, Mylenko, and Powell, "Improving Credit Information, Bank Regulation and Supervision."

<sup>7</sup> Turner and Varghese, *The Economic Impacts* 

<sup>8</sup>Barron and Staten, "The Value of Comprehensive Credit Reports," Table 8.6, p. 303.

<sup>9</sup>Michael Turner, Robin Varghese, and Patrick Walker, *On The Impact of Credit Payment Reporting on the Finance Sector and Overall Economic Performance in Japan* (Chapel Hill, NC: Information Policy Institute, March 2007), Table 5, p. 43.

<sup>10</sup> Turner et al., *The Fair Credit Reporting Act.* 

<sup>11</sup>Calculated from Turner et al., *The Fair Credit Reporting Ac*, Table 12, p. 52.

<sup>12</sup>Turner and Varghese, *The Economic Impacts*, Figure 3, p. 34.

<sup>13</sup>Barron and Staten, "The Value of Comprehensive Credit Reports," Table 8.2, p. 297; Turner et al., *The Fair Credit Reporting Act*, Table 10, p. 49; Turner and Varghese, *The Economic Impacts*, Table 6, p. 31; Majnoni et al., "Improving Credit Information," Table 4, Panel A.

<sup>14</sup>Barron and Staten, "The Value of Comprehensive Credit Reports," Table 8.5, p. 302; Turner et al., *On the Impact of Credit Payment Reporting*, Table 6, p. 44.

<sup>15</sup>Susan Wharton Gates, Cindy Waldron, and Peter Zorn Freddie Mac, "Automated Underwriting: Friend or Foe to Low-Mod Households and Neighborhoods?" (working paper BABC 04-13, Joint Center for Housing Studies, Harvard University, 2003). Available at www.jchs.harvard.edu/publications/finance/babc/ babc\_04-13\_draft.pdf. <sup>16</sup>Ibid., p. 3.

<sup>17</sup> Simeon Djankov, Caralee McLiesh, Andrei Shleifer, "Private Credit in 129 Countries" (National Bureau of Economic Research working paper no. 11078, January 2005). Available at http://papers.nber.org/papers/w11078.

<sup>18</sup> From Turner and Varghese, *The Economic Impacts*, Table 3, p. 18.

<sup>19</sup>Legal rights of creditors consist of the following 10 variables: (1) creditors can seize their collateral when a debtor enters reorganization; (2) creditors are paid first from liquidated assets; (3) an administrator, rather than management, is responsible for and has effective authority during reorganization; (4) collateral agreements allow a general description of assets; (5) collateral agreements allow a general description of debt; (6) security in the property can be taken or granted by any legal or natural person; that is, there is no constraint on the form of the legal person; (7) there is a unified registry that includes charges over movable property operates; (8) secured creditors have priority outside of bankruptcy; (9) enforcement procedures can be specified in contracts; and (10) out-of-court seizure and sale of collateral by creditors is permitted.

<sup>20</sup>The index of credit information is based on six variables, whether: (1) full-file information (both positives and negatives) are distributed; (2) financial and nonfinancial credit information (such as from retailers) is available; (3) more than two years of information is distributed; (4) reports contain information on loans above 1 percent of income per capita; (5) borrowers can access their data; and (6) information on both firms and individuals is available.

<sup>21</sup>From Turner and Varghese, *The Economic Impacts*, Table 3, p. 18. In the estimations, two outliers that had experienced recent financial crises, Argentina and Uruguay, were excluded. Statistics on private-sector borrowing are drawn from International Monetary Fund, *International Financial Statistics Database*, "Claims on the Private Sector." Line 52D for 2004. Statistics on coverage rates, credit information indices, and legal rights are drawn from the World Bank, *Doing Business Database*. www. doingbusiness.org/ExploreTopics/GettingCredit. Information is for 2005.

<sup>22</sup> There is confusion about how to code Colombia's public credit bureau. Regressions assuming a public bureau coverage rate identical to that of the private bureau were also conducted with no real change to the results.

Constant	Log GDP (PPP)	Legal rights	Priv. full file	Priv. neg. only	Pub. full file	Pub. neg. only
-136.01***	17.84***	4.48**	0.65***	0.09	0.33	0.04

<sup>23</sup> Inter-American Development Bank, *IPES 2005: Unlocking Credit: The Quest for Deep and Stable Bank Lending* (Washington, DC: IADB, 2004), p. 178. Available at www.iadb. org/res/ipes/2005/index.cfm.

<sup>24</sup> Walter Bagehot believed that England beat out its competitors not because it had more capital but because it could mobilize it better. Also see R. G. King and Ross Levine, "Finance, Entrepreneurship, and Growth: Theory and Evidence," Journal of Monetary Economics 32 (1993): 513-542; R. Levine and S. Zervos, "Stock Markets, Banks, and Economic Growth," American Economic Review 88 (1998): 537-558; Ross Levine, "Financial Development and Economic Growth: Views and Agenda" Journal of Economic Literature 25 (June 1997): 688-726; Jose De Gregorio and Pablo Guidotti, "Financial Development and Economic Growth," World Development 23 (3) (March 1995): 433-448; J. Greenwood and B. Jovanovic, "Financial Development, Growth, and the Distribution of Income," Journal of Political Economy 98 (1990): 1076-1107; J. H. Boyd and E. C. Prescott, "Financial Intermediary-Coalitions," Journal of Economics Theory 38 (1986): 211-232; F. Allen, "The Market for Information and the Origin of Financial Intermediaries," Journal of Financial Intermediation 1 (1990): 3-30; R. T. S. Ramakrishnan and A. Thakor, "Information Reliability and a Theory of Financial Intermediation," Review of Economic Studies 51 (1984): 415-432.

<sup>25</sup>Levine, "Financial Development and Economic Growth," p. 706, and King and Levine, "Finance, Entrepreneurship, and Growth," find similar outcomes.

<sup>26</sup> From Turner and Varghese, *The Economic Impacts*, Table 3, p. 18.

<sup>27</sup> IADB, *IPES 2005*, Table 3.1, p. 30.

<sup>28</sup>George A. Akerlof, "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism," *The Quarterly Journal of Economics* 84 (3) (August 1970): 488-500; and Joseph E. Stiglitz and Andrew Weiss, "Credit Rationing in Markets with Imperfect Information," *American Economic Review* 71 (3) (June 1981): 393-410.

<sup>29</sup> Turner et al., *The Fair Credit Reporting Act*, Table 6, p. 30.

<sup>30</sup> It could be argued that information sharing could also assist in preventing overextension, that is lending to those who cannot afford loans. The recent credit crisis in the United States in the subprime market heavily consists of lending to lower income groups, about which there was little information. Many of these borrowers who were good risks "transited" to lower-interest rate loans once they had build a sufficient credit history. Others for whom there was little information (i) could not afford the mortgages at the interest rates charged or (ii) could not afford the mortgages at all. Banks flushed with cash often loaned on the basis of very little information including self-reported incomes, a category which has come to be known as "liar-loans". <sup>31</sup> U.S. Department of Housing and Urban development, *We Open Doors for America's Families: Freddie Mac's Annual Housing Activities Report for 2002* (Washington, DC: HUD, March 17, 2003), Exhibit 12, p. 21.

<sup>32</sup>Thorsten Beck, Asli Demirgb3-Kunt, and Ross Levine, "Finance, Inequality, and the Poor" (National Bureau of Economic Research working paper no. 10979, December January 2007). Available at www.econ.brown.edu/fac/Ross\_Levine/ Publication/Forthcoming/Forth\_3RL\_Fin%20Inequalily%20Pov erty.pdf

<sup>33</sup> Ibid., pp. 18-19.





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