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The Economic Consequences of Consumer Credit Information Sharing: Efficiency, Inclusion, and Privacy

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GLOSSARY OF COMMONLY USED TERMS

Comprehensive Reporting: A system wherein payment and account information, whether full-file or negative-only, is not restricted by sector (i.e., it contains information from multiple sectors). It contrasts segmented reporting, wherein information in files is restricted to one sector such as banking or retail. Colombia, Guatemala, and Canada are examples countries with comprehensive reporting systems.

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 non-financial 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 data users may include central banks, landlords, cell phone providers, or employers, depending on the society.

Full-file Reporting: The reporting of positive payment information (such as on-time payments and credit utilization) *and* negative information (such as delinquencies, collection, bankruptcies, and liens). Delinquencies are reported at 30 days (sometimes 15 days) following the due date. The U.S. system is the model of full-file reporting, including the full range of permissible purposes for the use of credit file data.

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

Negative-only Reporting: The reporting of only negative information such as delinquencies, defaults, collection, bankruptcies, and liens. Indeterminate information such as credit applications (but not approvals or rejections) may be included. Australia, New Zealand, and France are examples countries with of negative-only reporting systems.

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

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, is contained in reports. In some instances, limited sharing arrangements between lending sectors may exist, but this usually involves incomplete or negative-only data. Japan is an example of a country with a segmented reporting system.

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1. INTRODUCTION: INFORMATION SHARING FOR FINANCIAL SERVICES—THE CHALLENGE OF SQUARING EFFICIENCY, INCLUSION, AND PRIVACY

The sharing of financial data within the financial sector has a long history. The first credit registry dates to at early as the mid-19th century in the United States. R. G. Dun and Co. exchanged information regarding wholesalers, importers, banks and insurance companies for an estimated subscriber base of 40,000.[1] These credit bureaus collected information that was less systematic and less idiosyncratic by today's lights; "Good moral character" was a field to be evaluated. For all their lack of systematicity and subjective quality of their assessments, these registries were born of the same logic that drives modern credit bureaus, overcoming "information asymmetries" in lending.

In lending, the problem of asymmetric information stems from the fact that a lender's knowledge of a borrower's likelihood to repay (their "risk profile") is imprecise and must be inferred based upon available information. The lender cannot solely rely on information provided by the applicant but must verify the information. The assessment of risk is crucial as loans involve an agreement to pay in the future. Borrowers have incentives to misrepresent their risk profile, but even when borrowers are truthful, a lender must still evaluate their claims. One common result of information asymmetries is the misallocation of credit, as risk profiles are incorrectly assessed in both directions—with high-risk borrowers confused for low-risk ones and vice versa.

For all the deceptive simplicity of overcoming information asymmetries, it should not be overlooked that, in addition to efficiency in lending, credit information sharing has profound consequences for privacy and for financial inclusion. As will be discussed below, credit information sharing systems vary considerably across economies in terms of the data captured, the sectors that participate, the way ownership is structured, the regulations that govern data collection, storage, and access, and the rights of consumers to access, challenge, and correct data. The impact of these variationswill be the subject of this white paper. These variations have considerable consequences for the efficient allocation of credit and also necessarily implicate the distribution of credit. If the scope and content of information is distributed unevenly across social segments (income, race, gender) then variations in the way that credit information is gathered shape access to credit.

This paper will examine how variations in the sharing of personal data affect the efficiency of financial markets and the distribution of credit across different social segments. It will also examine how the collection, storage, access, and correction of this data is governed, discussing the implications for both consumer rights and market

[1] Rowena Olegario, "Credit Reporting Agencies: A Historical Perspective," pp. 115-157 in Margaret Miller ed., *Credit Reporting Systems and the International Economy*. (Cambridge, MA: MIT Press, 2002). See pp. 118-131.

efficiency. Finally, the paper will investigate possible macro-consequences of variations in personal information sharing for financial markets.

2. Financial Data Sharing: Theory, Practice and Evidence

2.1. Theory

While there are several notable studies in economic theory examining the implications of asymmetric information for financial markets, George Akerlof's work is among the earliest and best known.[2] According to Akerlof, when only the average quality of the good can be assumed in markets with a good of indeterminate quality, over time goods of above-average quality will be driven out and will threaten the viability of the market for the good. In the case of consumer credit markets, the riskiness of a borrower can be thought of as the "good" that the lender "purchases."

Joseph Stiglitz and Andrew Weiss extended these insights in their examination of the consequences of information asymmetries in lending. They suggested that even in a competitive equilibrium, credit markets can witness rationing owing to insufficient information.[3] Given information asymmetries,[4] banks rely on a combination of pricing (interest rates) and rationing to maximize returns. However, higher interest rates, while covering the risk of borrower default, are also likely to result in *adverse selection*. That is, higher interest rates attract borrowers seeking to make risky investments with the potential for high rates of return.

Stiglitz and Weiss further argue that the price mechanism alone might not clear loan markets because as interest rates increase to compensate for rising risk, riskier applicants are attracted. Moreover, some borrowers will have an incentive to make riskier investments to cover the price of credit. Furthermore, once a loan is made, some borrowers may have incentives not to pay because without information sharing, they can still obtain loans from other lenders (collection on loans involves costs that may vary with the rights of creditors in a given economy). Faced with this "moral hazard" (the relative lack of penalty for non-payment) and with the problem of adverse selection

[2] George Akerlof. "The Market for Lemons." *Quarterly Journal of Economics*. 1970. 84 (3): 488-500.
[3] Joseph Stiglitz and Andrew Weiss. "Credit Rationing in Markets with Imperfect Information," 1981.
[4] That is, borrowers are more aware of their true capacity and willingness to repay than lenders. In the absence of information about the borrower except what the borrower provides, lenders face the problem of accurately judging the quality or credit-worthiness of a borrower when the loan is made and will only discover it over time after credit is extended.

(higher interest rates attract riskier borrowers, or make borrowers take more risks) that stem from asymmetric information, lenders will ration credit.[5] That is, given two individuals with identical risk profiles and preferences, one will receive a loan and another will not.

Credit bureaus are an institutional solution to the problems of information asymmetries and moral hazard in credit markets. Shared information allows a lender to better assess the risk profile of a potential borrower and introduce incentives to have a borrower pay on time in the form limiting a borrower's future ability to access credit from other credit suppliers. In presenting information about potential borrowers to a lender, credit-reporting agencies (CRAs) reduce these asymmetries and moral hazards, allowing:

(i) interest rates that are fine-tuned, or that reflect the risk of the individual borrower such as lower rates for lower-risk borrowers;
(ii) a lower average interest rate;
(iii) greater lending through reduced rationing; and,
(iv) lower rates of delinquency and default.

However, given that the structure of credit reporting can vary in terms of what data is shared and which sectors participate, the extent to which these outcomes are achieved depends upon the structure of credit reporting and the kinds of 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. In what follows, the consequences of these differences in the structure of reporting are examined.

2.2. Practice

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

- What types of information should be reported? and
- Which sectors should be encouraged to report?[6]

[5] Marco Pagano and Tullio Japelli. "Information Sharing in Credit Markets." *Journal of Finance*. December, 1993: 1693-1718.

[6] It should be noted that the issue of the ownership structure of a bureau, i.e., whether it is publicly or privately owned, has been thoroughly examined in the literature (Pagano, Japelli, M. Miller et. al.). The research suggests that private bureaus and public registries do appear to play complementary roles and are not substitutes for each other. Ownership structure has been shown to be critically important in the evolution of credit bureaus. See Marco Pagano and Tullio Japelli, "Information Sharing in Credit Markets," and Margaret Miller, "Credit Reporting Systems around the Globe: The State of the Art in Public Credit Registries and Private Credit Reporting" in *Credit Reporting Systems and the*

This section focuses on the effect of three variations in the structure of credit reporting:

(i) **Full-File vs. Negative-Only:** Systems that only report serious delinquencies only (ones that are "negative only") do not capture many moderately late payments (30 to 60 days past due) that are often indicative of a borrower's risk. In addition, they do not include positive credit information (including on-time payments) which provides information that a person may be a good risk, as the lack of negative information could either mean that ____ or simply that the person has no payment or credit experience. Negative-only systems generally do not include data that allow creditors to measure a borrower's capacity to carry a loan and prevent overextension by revealing the individual's existing lines of credit, associated balances, and credit limits. "Full-file" systems do include such data.

   a. Negative only reporting usually comprises:
      i. Applications (in some economies, e.g., Australia, New Zealand)
      ii. Bankruptcies
      iii. Defaults
      iv. Delinquencies (60+ days, sometimes 90+ days only)

   b. Full-file reporting commonly comprises:
      i. All negative data, but also
      ii. Account balance
      iii. Account type
      iv. Average age of account
      v. Credit limit
      vi. Debt ratios (e.g., revolving to total debt)
      vii. Delinquencies (30+ but sometimes less such as 15+)
      viii. Inquiries
      ix. Installments remaining
      x. Lender
      xi. Portion of accounts repossessed / written off
      xii. Other public record data

(ii) **Comprehensive vs. Segmented Across Financial Sectors:** In systems that are "segmented" information sharing is largely limited to one sector. Banks share and use credit information from other banks. Retailers share and use retail credit data. Non-bank finance companies share and use data from other non-bank finance companies. "Comprehensive" systems, by contrast, allow a more complete credit profile of a consumer to be drawn. For small businesses, it also includes trade credit data and leasing arrangements.

International Economy, ed. Margaret M. Miller, 273-310 (Cambridge, MA: MIT Press, 2003). Also see footnote 10.

(iii) **Comprehensive across Obligations vs. Restricted to Financial Sectors Only:** Given how credit reporting systems have developed in many economies, the practice of full-file reporting of non-financial services is relatively uncommon. This near-exclusion of non-financial payment data can be viewed as a special case of segmented reporting, in which payment information from the non-financial segments are not reported. These non-financial services, such as utility and telephone services, are usually more common than are financial payment data, particularly in less developed markets, where, for example, the number of cell phone users may far outstrip the number of credit card users. The use of non-financial data in credit files offers the promise of extending reasonably-priced credit to those who have not previously accessed formal credit. Individuals are thus able to build their credit without first going into debt.

The specificities of structure of credit reporting shapes whether, and to what extent, the macroeconomic effects noted above are realized. The research suggests that (a) full-file, comprehensive credit reporting increases lending to the private sector more than other reporting regimes; (b) full-file, comprehensive reporting results in better loan performance than segmented and negative-only reporting; and (c) the inclusion of non-financial data increases access and improves performance relative to a system in which information sharing is restricted to the financial sector. The evidence for these three claims is extensive.

2.3. Evidence

There have thus far been two approaches to measuring the socio-economic impacts of variations credit reporting. The first approach statistically estimates the impact of different systems of credit reporting worldwide, controlling for factors such as wealth and the legal system (particularly rights in collateral, bankruptcy, and property rights). These estimations examine consequences of variations in credit reporting for measure the impact on lending to the private sector and to a lesser extent on loan portfolio performance.

The second approach uses individual credit files from an economy that engages in full-file reporting. Data fields from these files are removed to simulate more restrictive credit reporting systems.[7] The approach allows all factors, save the information available to lenders for risk decisioning, to remain constant. A lending decision using a scoring model is made for borrowers in each of the set, but with the decision period short of the full length of the data in the credit file, e.g., the last year for which data is reported. The remaining final year serves as an "observation period" in which the predictions of the

[7] 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).

scoring model are confirmed.

The consequences of variations in the information share can then be measured in terms of economic trade-offs between extending credit and worsening loan performance. This measurement is made by rank ordering borrower from least to most risky, according to the predictions of the scoring models developed for each set of data, representing different reporting systems.

Actual default rates are derived for the observation period for each borrower and corresponding predicted risk level. In this way, it becomes possible to compare the accuracy of predictions based on one data set with that of the other. If a lender wishes to lend to 60% of the market, one can compare the associated default rates for the decisions based on different data sets and thereby compare the performance of loan portfolios based on different data for decisions.

Similarly, if a lender has a specific risk appetite, e.g., 3% default, one can measure the maximum number of viable borrowers based on the ranking of the applicant in terms of riskiness using the associated acceptance rate for the default target. By taking the acceptance rate measure for all the data sets being compared, one can measure the differences that variations in data make for acceptance level.

These simulations allow for the derivation an associated trade-off curve between acceptance rates and loan portfolio performance for each data set. Smaller trade-offs are to the benefit of all. The consequences of variations in information sharing have been measured for full-file vs. negative-only, comprehensive vs. segmented, and comprehensive vs. financial-only.

2.3.1. Evidence 1: Statistically Estimating the Impact on Access to Credit

PERC conducted a multi-country statistical estimate of the impact of information sharing on private sector lending as a share of Gross Domestic Product (GDP) as part of a study of credit reporting in Latin America. Controls include the legal rights of creditors[8] and

[8] Legal rights of creditors consist of the following variables: (i) creditors can seize their collateral when a debtor enters reorganization; (ii) creditors are paid first from liquidated assets; (iii) an administrator, rather than management, is responsible for and has effective authority during reorganization; (iv) collateral agreements allow a general description of assets; (v) collateral agreements allow a general description of debt; (vi) 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; (vii) there is a unified registry that includes charges over movable property operates; (viii) secured creditors have priority outside of bankruptcy; (ix) enforcement procedures can be specified in contracts; and (x) out-of-court seizure and sale of collateral by creditors is permitted

credit information.[9] PERC measured the impact of full-file and negative-only, modifying for whether the bureau is privately-or publicly-owned.[10] Ownership structure matters considerably, as private sector bureaus are primarily oriented towards assisting banks in making more effective lending decisions whereas publicly-owned registries specialize in facilitating bank supervision by regulators. In this study, PERC used variables that account for coverage—or what portion of the adult population has files in a specified bureau—as coverage of the population by definition relates to the extent to credit bureau allows a lender to assess the risk profile of a borrower. PERC thus measured the impact on lending of:

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

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[9] The index of credit information is based on six variables, namely whether: (i) full-file information (both positives and negatives) are distributed; (ii) financial and non-financial credit information (such as from retailers) is available; (iii) more than two years of information is distributed; (iv) reports contain information on loans above 1% of income per capita; (v) borrowers can access their data; and (vi) information on both firms and individuals is available

[10] Simeon Djankov, Caralee McLiesh, and Andrei Shleifer examine private credit and credit reporting in 129 countries. They found that two factors significantly increased lending to the private sector: the rights of creditors in collateral and bankruptcy, which creates incentives to lend, and information sharing in an economy. In Djankov, McLiesh, and Shleifer's estimates, private bureaus consistently increased lending far greater than public bureaus, which in the estimates had an ambiguous impact. (In some estimates, public bureaus decreased lending, though these were not statistically significant.) In estimations that examined all countries, private bureaus increased lending by 21% (vs. 7% for public bureaus, though the latter was not statistically significant). In estimations that restricted the data to poorer economies, private bureaus increased lending by 14.5%, compared to 10.3% for public bureaus. (Both coefficients are significant.) Simeon Djankov, Caralee McLiesh, Andrei Shleifer, "Private Credit in 129 Countries." NBER Working Paper No. 11078 (January 2005). http://papers.nber.org/papers/w11078. Another study conducted by the Inter-American Development Bank, 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 in order to measure the impact of private and public bureaus on loan performance. It found that banks which loaned primarily to consumers and small businesses and used private bureau data had non-performance rates that were *7.75 percentage points lower* than ones which did not. No such effect of any magnitude could be found for the impact of public bureaus. IADB, *IPES 2005: Unlocking Credit: The Quest for Deep and Stable Bank Lending.* (Washington, DC: IADB, 2004) p. 178. http://www.iadb.org/res/ipes/2005/index.cfm. p. 178.

The intuition behind testing this set of variables is that the *content* and *scope* of credit reports also must matter for lending. Table 1 shows the results of some of these regressions.[11]

Table 1: Participation Rate Impacts on Private Sector Lending

VARIABLE	I	II	III	IV
Constant	-142.40***	-139.48***	-133.97***	-130.80***
	(35.31)	(35.49)	(35.41)	(32.20)
Log of GDP per capita (adjusted for PPP)	20.31***	18.37***	17.38***	16.85***
	(4.65)	(4.45)	(4.41)	(3.87)
Avg. change in GDP (1995-2004)	-1.20*	-0.82		
	(0.70)	(0.64)		
Legal rights of creditors (from 0 to 10)	4.55**	4.99**	4.68**	4.80**
	(2.07)	(2.06)	(2.06)	(1.97)
Credit information (from 0 to 6)	-3.87			
	(2.88)			
Private full-file coverage (0 to 100, as percentage of adults)	0.72***	0.60**	0.66***	0.67***
	(0.20)	(0.18)	(0.17)	(0.16)
Private negative-only coverage (0 to 100, as percentage of adults)	-0.02	-0.13	-0.06	
	(0.86)	(0.46)	(0.46)	
Public full-file coverage (0 to 100, as percentage of adults)	-0.11	-0.26	-0.17	
	(0.41)	(0.40)	(0.39)	
Public negative-only coverage (0 to 100, as percentage of adults)	0.16	-0.01	-0.09	
	(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
N	65	65	65	65

Errors in parentheses; * p < 0.1; ** p < 0.05; *** p < 0.01

On the face of it, the most startling result is the absence of any real impact of the credit information variable. The inclusion of the aggregated "credit information" variable, the one that comprises whether the information reported is full-file or negative-only,

[11] From Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America,* Table 3, p. 18. In the estimations, two outliers that had experienced recent financial crises, Argentina and Uruguay, were excluded. Sources: 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.

comprehensive or segmented, added nothing to the estimation. The chief reason is that the elements that comprise "credit information" are captured in private and public "full-file" bureaus. Moreover, private bureau coverage and credit information are substantially correlated (0.568).

As found in other studies, a substantial degree of variance in lending is accounted for by extensive rights for creditors.[12] Lenders are more willing to lend if the chances of recouping the principal is greater in the event of a default. (The expected difference between an economy in which there are none of the rights identified by the World Bank and one in which all ten rights are present is nearly 45 percentage points.)

The estimates show that 100% coverage of credit eligible adults by a full-file private bureau can be expected to increase private sector lending by more than 60 percentage points of GDP (all else being equal). Even when outliers on the high side, notably the United States and the United Kingdom, were removed, 100% coverage in a full-file private bureau could be expected to increase private sector lending by 47.5%.

2.3.2. Evidence 2: Credit File Simulations to Estimate the Impact on Access to Credit

Above, we described the methodology behind credit file simulations and noted that it is designed, in large part, to hold all other factors in effect content so that we can measure the impact of varying data fields in a credit file.

Anonymized credit files from many different economies have been used to gauge the impact on credit of wider access to information. John Barron and Michael Staten first used U.S. files to simulate the impact of a system in which only negative information is provided and, separately, a system in which only retail payment information (i.e., segmented reporting) is provided.[13]

Barron and Staten's approach allowed them to measure, for example, the differences in acceptance rates that would be enabled by different data sets for a 3 percent default target (that is, when a lender aims to have a nonperformance level that is no more than 3 percent). In their calculations, a negative-only reporting system would accept 39.8 percent of the applicant pool, whereas a full-file system would accept 74.8 percent. The difference in the number of borrowers is equal to 35 percent of the applicant pool (see Table 2, col. 1), an increase of 87.9 percent, as also shown in Table 2. Simply, these changes are enabled fewer "good" risks be mistaken for "bad" ones, the most common lending error. This shift results in an increase in lending without any commensurate decrease in portfolio performance.

[12] Simeon Djankov, Caralee McLiesh, Andrei Shleifer, "Private Credit in 129 Countries."
[13] Ibid. p. 298.

Several studies have verified this trade-off and measured the change in different economies. Table 2, columns 1 to 5, detail the results of five measures of change in access to credit as the reporting shifts from negative-only to a full-file system (i.e., as positive data is included). The simulations use credit files data from the Argentina, Brazil, Colombia[14], and the United States[15]. All of these studies assume that negative-only data excludes 30+ day and 60+ day delinquencies, with accounts reported only when they are 90 or more days past due.

The most modest improvements in lending is for the Colombia case; for the 3%default rate, would find an additional 7% of the applicant pool accepted. The second most modest increase, again at the 3% default target, is for the second US case (Turner et. al. column 2), with a measure increase of 9.2% of the applicant pool. These are both significant improvements. At higher default targets, the increases in acceptance become more modest. This convergence can be understood using the limiting cases in which 0% and 100% acceptance of the applicant pool will result in the same default rate for the full-file and the negative only scenarios. The data makes a difference when lenders are seeking to discriminate high-risk borrowers from lower-risk ones. More data allows better and more accurate identifications.

[14] For the Brazilian and Argentine simulations, see 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 http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2004/12/17/000.160016_20041217171024/Rendered/PDF/WPS3443.pdf. For the other two studies see Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America* (Chapel Hill, NC: Political and Economic Research Council, May 2007).

[15] Michael Turner, *The Fair Credit Reporting Act: Access, Efficiency, and Opportunity*. (Washington, DC: The National Chamber Foundation, June 2003), Table 11, p. 50. Scenario C results. Available also online at http://infopolicy.org/pdf/fcra_report.pdf.

Table 2: Percentage Point Change in the Acceptance Rate by Shift in Reporting Regime (percentage change shown in parentheses)									
Scenario	Full-file vs. Negative Only					Comprehensive vs. Segmented Across Financial Sectors		Comprehensive across Obligations vs. Restricted to Financial Sectors Only	
Direction of Change in Simulation	Negative-only to Full-file					Segmented to Comprehensive Reporting		Inclusion of Utility Data	Inclusion of Telecom Data
Simulation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Default Rate	Barron and Staten, U.S. files	Turner et al., U.S. files	Turner and Varghese, Colombian files	Majnoni et al., Argentinean files	Majnoni et al., Brazilian Files	Barron and Staten, U.S. files	Turner, Canadian files	Turner, Lee et al., U.S. files	Turner, Lee et al., U.S. files
0.5%							16.5 (52.7%)		
1%							8.2 (13.1%)		
2%		13.4 (47.0%)			15.9 (32.3%)		7 (8.8%)	5.2 (11.0%)	4.6 (11.9%)
3%	35 (87.9%)	9.2 (23.0%)	7.4 (290.6%)	10.7 (21.7%)	26.4 (47.3%)	8.0 (10.6%)	9.1 (10.9%)	5.5 (10.0%)	4.1 (9.1%)
4%	9.5 (12.9%)	8.4 (17.8%)			6.7 (7.9%)	10.0 (12.4%)		5.8 (9.7%)	4.2 (8.7%)
5%	4.3 (5.1%)	4.9 (8.8%)	36.2 (702.9%)	0.6 (0.1%)	1.9 (2.0%)	2.2 (2.3%)		6.0 (9.5%)	4.3 (8.4%)
6%	2.3 (2.5%)	3.3 (5.5%)						6.3 (9.6%)	4.1 (7.7%)
7%	0.5 (0.5%)	2.3 (3.6%)	45.2 (332.5%)	1.76 (2.1%)				6.6 (9.7%)	4.4 (8.0%)

Table 2 depicts a similar shift in trade-offs for the two other types of scenarios discussed above: (i) Comprehensive vs. Segmented Across Financial Sectors (columns 6 and 7) and (ii) Comprehensive across Obligations vs. Restricted to Financial Sectors Only (columns 8 and 9). Barron and Staten found, for a 3% default target, a 10.6% increases in acceptance rates when switching from retail-only information to full-file using U.S. data (column 6).[16] Comprehensive vs. segmented reporting across financial sectors scenarios were also simulated in PERC's study of credit reporting in Japan. PERC used Canadian files to simulate Japan's segmented reporting practices and a commercial-grade generic scoring model to compare them with a full-file scenario (column 7) as levels of indebtedness and default rates in Canadian credit markets resemble those in Japan. The results are similar to the U.S. credit file based scenario: for a 3% default target, a comprehensive reporting system accepts an additional 9.1% of the applicants than does a segmented system.[17]

As suggested above, the logic extends not simply to credit-issuing sectors but also to those goods and services for which consumers make regular payments to a supplier for goods or services. Both PERC and the Brookings Institution have examined the effects of using utility and telecommunications payment data in credit reporting[18].

As shown in table 2 (columns 8 and 9), including non-financial data significantly increases access to credit. For a 3% default target, the inclusion of utility payment data appears to enable lenders to extent credit to an addition 5.5% of the applicant pool and inclusion of telecom data extends credit to 4.1%. There is little reason to believe that this dynamic would not hold true with other types of non-financial payment data. What makes these results interesting, however, is that much of the increase in acceptance rates is not from simply better gauging risk with more information, but due to including many potential borrowers not previously in the mainstream financial system (see below on the distribution of credit). It should be noted that significant non-financial payment data are reported in Colombia. PERC's Information Policy Institute analysis of credit files and score performance in Colombia also examined how different levels of full-file information (relative to negative-only) from non-financial data providers affect the trade-off between default rates and acceptance rates. The findings are consistent with U.S. results; namely that full-file reporting of non-financial data improves the ability of lenders to gauge risk.

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[16] John Barron and Michael Staten, "The Value of Comprehensive Credit Reports," Table 8.6, p. 303.

[17] 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.

[18] Michael Turner et al., *Give Credit Where Credit Is Due* (Washington, DC: Brookings Institution, December 2006).

2.3.3. Evidence 3: Credit File Simulations to Estimate the Impact on Loan Portfolio Performance

Higher acceptance rates at a given default rate are countered by lower default rates at those acceptance rates. Table 3 reports the changes in the default rate for the nine simulations discussed above.[19]

[19] John Barron and Michael Staten, "The Value of Comprehensive Credit Reports," Table 8.2, p. 297, and Table 8.5, p. 302. Michael Turner et al., *The Fair Credit Reporting Act,* Table 10, p. 49; Michael Turner and Robin Varghese, *The Economic Impacts,* Table 6, p. 31; Giovanni Majnoni et al., "Improving Credit Information," Table 4, Panel A.; Michael Turner et al., *On The Impact of Credit Payment Reporting*, Table 6, p. 44. Michael Turner, et al., *Give Credit Where Credit Is Due*.

Table 3: Percentage Point Change in the Default Rate in Reporting Regime Switch (percentage change shown in parentheses)									
Scenario	Full-file vs. Negative Only					Comprehensive vs. Segmented Across Financial Sectors		Comprehensive across Obligations vs. Restricted to Financial Sectors Only	
Direction of Change in Simulation	Change from Full-file to Negative Only					Change from Comprehensive to Segmented Reporting		Removal of Utility Data	Removal of Telecom Data
Simulation	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Acceptance Rate	Barron and Staten, using U.S. files	Turner et al., using U.S. files	Turner and Varghese, using Colombian files	Majnoni et al. using Argentinean files	Majnoni et al., using Brazilian Files	Barron and Staten, using U.S. files	Turner, using Canadian files	Turner, Lee et al., using U.S. files	Turner, Lee et al., using U.S. files
20%			4.94 (140%)						
30%		0.8 (62%)	4.94 (120%)					0.2 (22%)	0.2 (18%)
40%	1.84 (170%)	0.6 (33%)	8.96 (183%)	0.92 (60 %)	1.48 (114%)	0.57 (108%)	0.18 (43%)	0.3 (25%)	0.5 (29%)
50%		0.3 (10%)	8.54 (146%)				0.19 (36%)	0.5 (28%)	1.3 (39%)
60%	1.45 (76%)	0.4 (8%)	8.1 (113%)	0.83 (28 %)	1.53 (83%)	0.72 (61%)	0.24 (35%)	1.2 (40%)	2.7 (36%)
70%		0 (0%)					0.26 (27%)	2.7 (50%)	3.8 (31%)
75%	1.03 (34%)					0.84 (39%)			
80%				0.96 (19 %)	0.86 (30%)		0.68 (47%)	4.3 (45%)	5 (31%)
90%							2.83 (114%)	3.9 (28%)	3.4 (19%)

The table shows the *percentage point change in the default rate* as data is removed:

- as positive data is removed from credit files (columns 1 to 5);
- as non-bank financial sectors are removed (columns 6 and 7); and
- as non-financial, specifically utility payment data (column 8) and telecom

payment data (column 9), are removed.

It should be noted that Colombian simulations included delinquencies on non-financial trade lines such as rent, telecoms, and utilities and are not, therefore, strictly comparable, although the direction of changes shown in Table 3 is comparable. The other four negative-only to full-file simulations show, for a 60% acceptance target, the default rate increasing by as 0.4 percentage points on the low side, which is still a considerable degradation of portfolio performance, to as much as 1.53 percentage points, a near doubling of the loan non-performance rate.

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

Comparisons using segmented and comprehensive files show similar shifts in performance (as were evident in the shift from full-file to negative-only). The more modest shifts show an in increase in the default rate of 30% to 40%, a considerable deterioration in performance. Both simulations use US credit files. The noticeable differences in change in performance are attributable to (i) the different periods in which the simulations were conducted and (ii) the fact that Barron and Staten used a scoring model developed for research and educational purposes whereas Turner, et. al., used market scoring models Finally, the exclusion of non-financial data produces a similar result: a deterioration of loan portfolio performance. At a 60% acceptance target, the default rate increases by 1.2 percentage points when utility payment data is excluded and by 2.7 percentage points when telecom payment data is excluded.

2.3.4. Evidence 4: The Impact on the Distribution of Credit Access

Three of the studies by PERC also examine how different systems of reporting affect the *distribution* of credit by various among different groups. Two use U.S. credit files: to assess the value of full-file reporting and to evaluate the impact of reporting non-financial data. The third uses Colombian files to assess the consequences of greater participation in the full-file reporting system by data furnishers. Columns 1 and 2 of table 4 show the distributional effects of adding utility and telecommunications payment information. Column 3 presents the distributional effects of switching from negative-only to full-file.[20] The presented results use a 3% target default rate. The last column in table 4 shows results for a negative-only vs. full-file simulation using Colombian files, with a 7% target

[20] Michael Turner et al., *The Fair Credit Reporting Act;* Turner et al., *Give Credit Where Credit is Due*.

default rate.[21]

Above we explicated how the inclusion of greater information results in greater credit access in terms of a larger share of the applicant pool are deemed (rightly) to be lower-risk than previously imagined. By symmetry, the removal of data leads to a contraction in access to credit as more applicants are (wrongly) evaluated as higher risk. The question that remains open is whether those to whom credit is newly extended under full-file reporting, i.e., those for whom credit is withdrawn under negative reporting, differ in any way in terms of salient socio-demographic characteristics. To measure whether they do or do not vary, PERC tagged the credit files used in simulations with socio-demographic variables, specifically income, age, race/ethnicity, and gender. For the simulations using Columbian files the results are presented only for gender, as other socio-demographic variables were not available.

All three changes (inclusion of utility data, inclusion of telecommunications data, and the shift to full-file data) are associated with higher acceptance rates for groups that have been traditionally underserved by the financial mainstream: the young ethnic minorities and those with lower household incomes. These groups benefit the most from including positive and non-financial information in credit files. For example, the switch from negative-only to full-file (U.S. credit files, in column 3) results in an increase in acceptance (or credit access) of 30% or more for households with incomes less than US$30,000 compared to an increase of 18% for households earning more than US$100,000. Similar results obtain when non-financial data such as telecom and utility payment data are included. In fact, the inclusion of non-financial information for credit decisions can help overcome financial exclusion. The addition of this data in credit files helps overcome the challenge that (for those without other forms of collateral) credit history is needed to get credit, but credit is needed to develop a credit history.

While U.S. simulations show little or no impact on the distribution of credit by gender with the inclusion of broader information sets, we see dramatic increases in the Colombian simulations. The acceptance rates for men and women increase substantially, largely owning to the fact that the exclusion of positive payment data leaves very little information for many borrowers, making their risk profiles almost invisible. The inclusion of positive data increases the rate at which women can access credit, and does so at a rate of two times that of men: 1239% of negative-only systems vs. 591% of a negative-only system. Younger borrowers also see dramatic increases in their access to credit relative to older borrowers.

Several reasons explain these differences. First, as a disproportionate share of minorities, women, the very young, and lower-income segments are excluded, the addition of more

[21] Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America,* Figure 3, p. 34.

data that can allow this risk to be assessed means that a larger share of the excluded are brought in. Second, while not strictly measured in these simulations, privileged segments have greater recourse to assets that serve as collateral enabling credit access. With information sharing, "reputational collateral," or one's history of obligations and payments, substitutes for physical assets. As such, those who have few assets can better enter the credit system.

Table 4: Change in the Acceptance Rate with Reporting Regime Change

	US, with Utility Data (without = 1.00) [1]	US, with Telecom Data (without = 1.00) [2]	US Full-File (Neg.-Only = 1.00) [3]	Colombia Full-File (Neg.-Only = 1.00) [4]
Ethnicity				
Asian	1.14	1.08		
Black	1.21	1.11	1.28	
Hispanic	1.22	1.17	1.37	
Other	1.11	1.11		
White	1.08	1.08	1.22	
Age				
18-25	1.14	1.1	1.47	18.31 (c)
26-35	1.06	1.06		
36-45	1.05	1.06	1.22	6.48 (d)
46-55	1.06	1.06	1.21	4.54 (e)
56-65	1.06	1.06	1.20	3.85 (f)
>65	1.14	1.13	1.19	
HH Income (000)				
<20	1.26	1.22	1.36 (a)	
20-29	1.15	1.14	1.3 (b)	
30-49	1.1	1.08	1.24	
50-99	1.06	1.05	1.21	
>99	1.03	1.03	1.18	
Gender				
Female	1.09	1.08		12.39
Male	1.08	1.08		5.91

(a) Actual Range is <15,000; (b) Actual Range is 15,000-29,000; (c) Actual Range is 18-32; (d) Actual Range is 32-42, (e) Actual Range is 42-50; (f) Actual Range is > 57.

The switch to full-file credit files from negative-only files and the inclusion of non-financial data notably improves acceptance rates to a much greater extent for groups traditionally underserved: lower income segments, younger borrowers, much older borrowers, racial/ethnic minorities, and women. Those least likely to be in the credit

mainstream, lacking multiple credit accounts in the past, are those most likely to benefit from including non-financial and positive data in credit files. Including such data can lead to a more equitable distribution of credit and a generally improved macroeconomic performance.

3. MACRO EFFECTS ON DEVELOPMENT AND FINANCE

As the credit reporting system has a significant effect on the allocation of credit, variations in information sharing have implications for the price of credit directly, economic growth, income distribution and safety and soundness. That is, it has consequences for economic efficiency and on economic distribution, as the financial system has significant consequences for efficiency and distribution.

The economic impact of a stronger financial structure is a well-explored topic. Theoretically, finance mobilizes savings, or moves savings to sites where it can develop productive capacity through investment and assist consumption. At the level of the individual, it has been also thought to smooth consumption over a person's life cycle. In the aggregate, it is thought to stabilize consumption and thereby decreases the swings of the business cycle. Moreover, at a social level, the results of the simulations on the distribution of credit suggest that *widening* access to finance should result in positive consequences for income equality and poverty alleviation, as access to credit shapes income to the extent that credit access helps in asset formation. Three spheres of economic life are strongly shaped, directly and indirectly, by the structure of credit reporting: (i) economic growth and stability; (ii) the price of credit; and (iii) income distribution, as it relates to both poverty and equality.

3.1. Greater Economic Growth and Stability

The research on finance and growth is extensive. The research strongly supports the proposition that economies with larger financial sectors (under various measurements) have higher rates of growth, greater productivity increases, and faster growing capital stock.[22] The causal chains are theorized to be direct (allocation of capital to productive

[22] Walter Bagehot believed that England beat out its competitors not because it had more capital that its competitors but because it could mobilize it better. Also see R. G. King and and Ross Levine, "Finance, Entrepreneurship, and Growth: Theory and Evidence," *Journal of Monetary Economics*. Vol. 32 (1993). pp. 513-542; R. Levine and S. Zervos, "Stock Markets, Banks, and Economic Growth", *American Economic Review*, Vol. 88 (1998) pp. 537-558; Ross Levine, "Financial Development and Economic Growth: Views and Agenda" *Journal of Economic Literature,* Vol. 25(June 1997), pp. 688–726; Jose De Gregorio and Pablo Guidotti, "Financial Development and Economic Growth." *World Development*, Vol. 23, No. 3, (March 1995) pp. 433-448; J. Greenwood and B. Jovanovic

investments) and indirect (facilitating exchange, permitting greater corporate control over managers). The consumer credit reporting system is only one component 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.

In cross-country estimations, Ross Levine found that an increase in private sector lending by 30% of GDP can be expected to witness an increase in GDP growth by 1% per annum, and increases in productivity and capital stock growth by 0.75% per annum.[23] This is a conservative estimate and should be considered in the context of our findings concerning the impact of higher participation rates in private full-file credit bureaus upon growth in private sector lending as a ratio of GDP.

Above we suggested that 100% coverage by a private, full-file reporting system would conservatively increase lending to the private sector by 45% of GDP. To see what this could mean, we use the example of Brazil. Were the estimated 55% of Brazilians now covered in a private bureau to have positive information also reported, we would expect an increase in private sector lending by 25%. In turn, if measures of the private sector mobilization of finance are accurate, we would expect to witness an increase in Brazil's GDP growth rate by 0.83% than would otherwise obtain, as well as 0.63% increase in productivity and the capital stock.

The micro simulations above also offer a reason why greater lending as enabled by full-file, comprehensive reporting can be expected to be stable. 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 (by creating incentives to pay on time). It can also reduce moral hazard problems by helping to reduce interest rates. (See below.)

(1990), "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy.* Vol. 98 (1990) pp. 1076-1107; J. H. Boyd and E. C. Prescott (1986), "Financial Intermediary-Coalitions", *Journal of Economics Theory.* Vol. 38 (1986) pp. 211-232; F. Allen, "The Market for Information and the Origin of Financial Intermediaries", *Journal of Financial Intermediation*, Vol. 1 (1990) pp. 3-30.. R. T. S. Ramakrishnan and A. Thakor, "Information Reliability and a Theory of Financial Intermediation", *Review of Economic Studies*, Vol. 51 (19854) pp. 415-432.

[23] Ross Levine, "Financial Development and Economic Growth: Views and Agenda." p. 706. R. G. King and Ross Levine, "Finance, Entrepreneurship, and Growth: Theory and Evidence" find similar outcomes.

3.2. Lowers Average Interest Rates

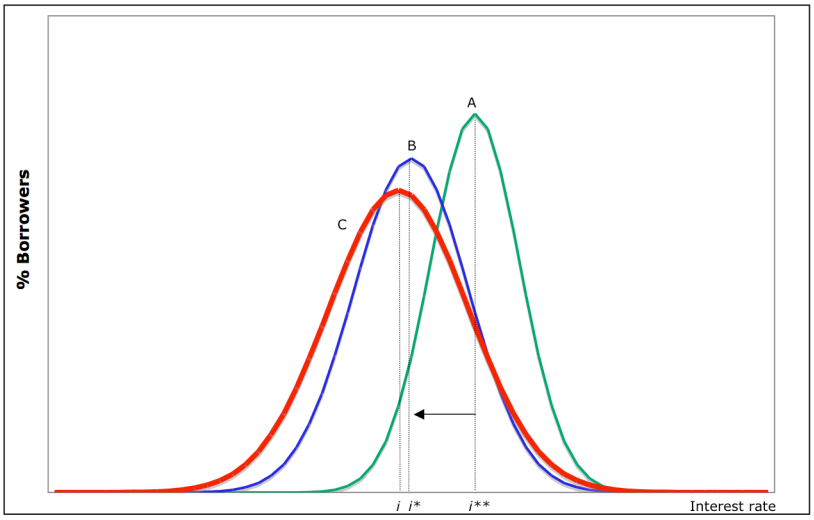
Credit information sharing can lower average interest rates. The consequences for information sharing on interest rates has been extensively explored in the theoretical literature, beginning with George Akerlof's 1970 paper on the market for "lemons" (or poor-quality goods) and Joseph Stiglitz and Andrew Weiss's path-breaking 1981 paper on asymmetric information and credit rationing.[24] When lenders cannot assess the risk profile of a borrower or if they do so poorly, the interest rate they charge, based on average loan performance, can *itself* affect the overall risk of their portfolio. The logic is as follows. The first reason stems from the dynamics illustrated above. Without information on borrowers' risk profiles, a lender will mistake good risks for bad ones and vice versa. For low-risk borrowers, credit is expensive relative to its uses, as they are called on to subsidize high-risk borrowers. For high-risk borrowers, credit is cheap, as it is subsidized. Lower-risk borrowers are driven from the market and higher-risk ones are brought in by cheap credit. Interest rates adjust to reflect more risky loan portfolios leading to higher rates. Higher rates also create incentives to take on riskier projects, as less risky 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.

When information is shared, lenders are able to better discern an individual's risk profile, and by being able to screen away more risky borrowers, they can improve the performance of the portfolio and extend lower rates to less risky borrowers who would not have borrowed otherwise. Moreover, with more accurate discernment, lenders are able to price loans more at the individuals risk profile and less so at the portfolio average.

The three figures below illustrate the dynamic. The first represents a case hypothetically, in order to illustrate the dynamics by which interests rates can decline with information sharing. The second illustrates the empirical example of the distribution of credit card interest rates in the United States, as information sharing spread. The third depicts the spread between prevailing 30-year mortgage rates and the prevailing rate on US 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.)

[24] George A. Akerlof, "The Market for "Lemons": Quality Uncertainty and the Market Mechanism." *The Quarterly Journal of Economics*, Vol. 84, No. 3 (Aug., 1970), pp. 488-500; and Joseph E. Stiglitz, Andrew Weiss, "Credit Rationing in Markets with Imperfect Information." *The American Economic Review*, Vol. 71, No. 3 (Jun., 1981), pp. 393-410

Figure 1: The Distribution of Borrowers by Interest Rates Under Information Sharing Regimes



Curve A represents a distribution of consumers in a market for loans with limited information sharing by interest rates. Curve C represents the distribution of all potential borrowers according to the interest rates that would obtain under full information about their risk profiles. i represents the mean interest rate that would obtain 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 find the loans relatively cheap, and low-risk borrowers find them too expensive for their risk profiles. The latter leave the market and more of the former enter. The second is a problem of moral hazard, where some borrowers will engage in high-risk investments in order to obtain a reasonable return given the high cost of capital. In either case, the curve shifts rightward. Moreover, without sufficient information on consumers, each are charged interest rates closer to the average, thereby leading the lower-risk consumers to subsidize the higher-risk ones. 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.

The following figure illustrates the distribution of credit card interest rates in the US in 1990, before the advent of truly extensive information sharing systems as enabled by the information revolution, and after the revolution in 2002.

Figure 2: Distribution of US Credit Card Interest Rates, 1990 and 2002[25]

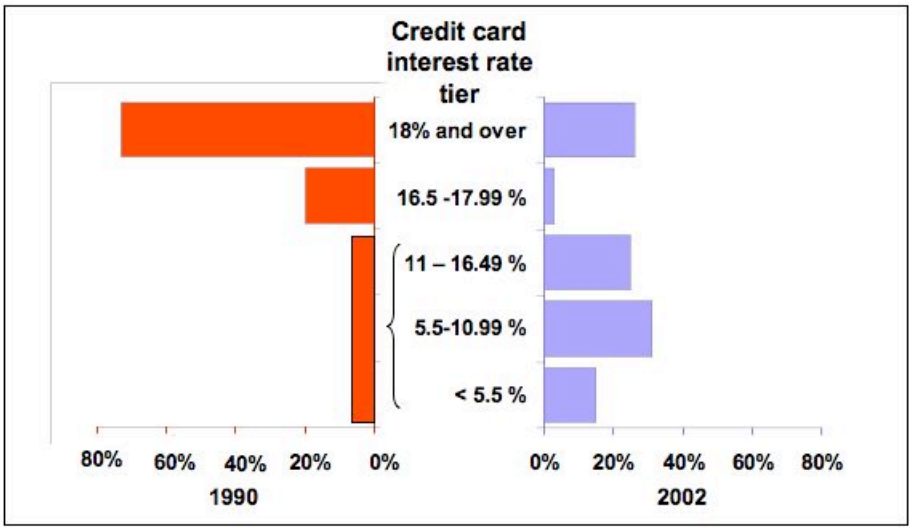


Figure 2 shows a radical shift in the way interest rates on credit cards have come to be distributed. Although over the period shown the prime rate in the US fell from 10% to 4.75%, there appears to be an even greater reduction and spreading out of interest rates. Risk-based pricing, based on consumers' risk profiles as determined from credit reports, altered the price of credit for many Americans, allowing for more nuanced pricing, according to narrower risk profiles.

3.3. Lowers Poverty and Improves the Distribution of Income

The above suggests that a well-functioning financial system that efficiently allocates savings toward investment can facilitate growth. Perhaps the more interesting inference is the question of the distributional consequences of greater lending. Above it was also shown that lending as enabled by full-file reporting disproportionately increases access the credit among women, minorities and low-income groups. While the macro-effect of credit reporting on poverty and income distribution have not been directly measured, the effects of greater lending on these aspects of economic life have.

[25] Michael Turner et al., *The Fair Credit Reporting Act: Access, Efficiency & Opportunity.* Table 6. p. 30.

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, particularly in early stages of economic development when *only* the rich can truly afford credit. The other suggests that it 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.

There is a thorough statistical examination of the impacts of greater private sector borrowing on (i) income inequality; (ii) relative poverty; and (iii) absolute poverty conducted by Thorsten Beck, Asli Demirgüç-Kunt, and Ross Levine.[26] To do so, they measure the effect of greater private sector lending on (i) the Gini coefficient[27], (ii) the income share of the poorest quintile to total national income, and (iii) the share of the population that lives on less than US$1 per day.

Controlling for factors such as education, inflation, and trade, Beck and his co-authors found that greater private sector lending:

- *lowers* the growth of the Gini coefficient.
- *lowers* the growth of the percentage of the population living under $1 per day.
- *increases* the growth of the lowest (poorest) quintile's income share.

To understand the magnitudes of the effects suggested by the estimations, Beck, Demirgüç-Kunt, and Levine offer a comparison of Brazil and Canada. Brazil had a private sector lending level of 33% of GDP for the observation period compared to Canada's 63%.

> "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% every year rather than the actual 0.6%, which would have resulted in an income share of

[26] Thorsten Beck, Asli Demirgüç-Kunt, and Ross Levine, "Finance, Inequality and the Poor." NBER Working Paper No. 10979. National Bureau of Economic Research. December 2004, updated January 2007. Available at www.econ.brown.edu/fac/Ross_Levine/Publication/Forthcoming/Forth_3RL_Fin%20Inequalily%20Poverty.pdf

[27] The Gini, which is a ratio that takes values between 0 and 1, or 0 and 100 when indexed, measures income distribution with higher values indicating greater inequality.

3% for the lowest income quintile rather than the actual 2.4% in 2000."[28]

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

Beck, Demirgüç-Kunt, and Levine provide reasons to believe that much of the unequal distribution is accounted for by an unequal access to credit. The research into credit reporting suggests that there are strong reasons to believe that unequal access to credit is shaped by variations in credit reporting. The simulations using US credit files showed that low-income groups witness disproportionately greater increases in access to credit than other income groups. Full-file, comprehensive credit reporting appears in several measures to result in a more equal access to credit through the removal of information barriers, and thereby promises to improve inequality and the distribution of income through the efficient allocation of credit.

4. Implications For Regulation and Policy Frameworks

Consumer financial information sharing implicates issues concerning the efficiency of credit markets, financial inclusion, and personal privacy. As such, variations in the structure consumer financial information sharing *and* the role of consumers in the system are of great concern for regulators. Moreover, the regulation of each of these issues has consequences for the operations of the other spheres of impact. It is for this reason that these three issue areas cannot be easily separated.

While there is no "one size fits all" approach to regulation—factors such as the structure of the banking system, regulatory enforcement capacity, social norms regarding privacy, the shape of the contracting regime all must be taken into account—there are common concerns and some common lessons. While various legislative considerations must be taken into account according to the country in which the credit bureau is operating, certain aspects of regulatory framework are essential, such as provisions for equal treatment of all data providers, as well as stipulations for data expiration. Regulation must address consumer protection, privacy, data protection, and credit granting and consumer credit regulations. The basic principles outlined in the OECD's Guidelines on the Protection of Privacy and Transborder Flows of Personal Data have provided the framework for these regulation.[29]

[28] Thorsten Beck, Asli Demirgüç-Kunt, and Ross Levine, "Finance, Inequality and the Poor." pp. 18-19.
[29] OECD, "Guidelines on the Protection of Privacy and Transborder Flows of Personal Data." 1980.

The set of laws that regulate credit bureaus is shaped in large part by the economic environment of each specific country. What defines the operational space for credit bureaus, how consumers are protected, how the lending industries are safeguarded, and how these laws are enforced will vary considerably according to norms, the prevailing network of contracts, and the regulatory and enforcement capacity of a state. With that said, there are two basic strategies that have been successful in regulating consumer financial information sharing. Some countries, such as several EU member states, have opted to use all-encompassing data protection laws to define credit bureau operation. These laws oversee not only the parameters of operation for credit bureaus, but also for broad categories of data management and information sharing. Other countries opt to specify regulatory laws uniquely for credit bureaus and for the sharing of consumer financial information for credit decisioning and other limited purposes. Both legislative approaches address the following:

- equal treatment of financial and non-financial industries that report;
- protection of consumer rights, ensuring that the data that is collected is not abused, and that data and information is shared through a regulated process;
- maintenance of integrity of information privacy, including limited and regulated access to consumer information;
- management of information sharing, which may include incorporating a regulation that requires the borrower to consent to both information collecting and access to credit reports;
- data expiration regulation;
- provisions for the sharing of both positive and negative information;
- consumer protection, including individual rights to access personal information, and a system that addresses and rectifies consumer disputes; and
- inclusion of financial, governance, and security standards for credit bureaus.

How each of these operational factors is addressed will vary by economy, but these factors must be addressed in legal and regulatory frameworks. The frameworks must address three dimensions of the system: (i) the rules by which data is collected stored and shared; (ii) the rights of consumers to review, dispute and correct their data; and (iii) the ownership of the data itself. Each of these policy issues implicates efficiency in lending, financial inclusion, and privacy.

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http://www.oecd.org/document/18/0,3343,en_2649_34255_1815186_1_1_1_1,00.html#part2

4.1. Information Collection, Storage and Sharing Rules

The collection of information should be standardized across financial and non-financial institutions such that all information is collected and processed without prejudice of its source. The U.S. Fair Credit Reporting Act, for example, stipulates the categories of data that may be collected and shared, requirements for the quality of data that is collected, statutes for fair and equal treatment of consumers, and the institutions that may provide data. Information that is used for credit decisioning and maintenance purposes must be treated in the same manner, whether it comes from a financial or non-financial institution.[30] Treating all information sources equally allows for the equal treatment of consumer populations.

Legislation must stipulate data expiration regulations. A major function of the credit bureau is to provide a historical picture of a consumer's likely financial behavior such that a potential lender may assess consumer risk. Given this function, the credit bureau must maintain data that appropriately discloses the information needed to assess this risk. Equally, it is important not to expunge data prematurely. Data must describe the current financial behavior of a consumer. If, for example, information is expunged from a consumer's record immediately upon repayment of a loan, the financial habits of this consumer are not exposed to new potential lenders. Any adverse information regarding the repayment of the loan is lost. Storing the information after the debt has been repaid is valuable to potential lenders as it allows for a more accurate prediction of a consumer's behavior.

Information sharing must be regulated from two fronts. First, the sharing of information must protect the privacy of consumers. Specific institutions will be authorized within the legal framework to access consumer information. If strict regulation of this standard is not enforced, consumers will not trust the credit bureau system and the credit bureau will fail. It is the onus of the bureau to prove to consumers and institutions that they can provide appropriate information security. Legal frameworks should require borrower consent for institutions to access their credit information. Second, the sharing of both positive and negative information must be regulated and restricted to very narrow purposes. Failure to specify the limits of this use cannot only violate privacy, but can also distort the market for lending.

Every credit system has its own set of laws that define data subject rights, and the afforded rights differ depending on political situation and framework of the existing credit system. (For a list of these rights, see the Appendix.)

[30] The Fair Credit Reporting Act represents the first comprehensive regulation of credit information sharing to be based on OECD Fair Information Principles anywhere in the world.

4.2. Rules on Dispute/Verification

Consumer disputes systems are a key component of data quality, as consumers are one key interface in the identification of data errors. It should be noted that data errors have a substantial negative effect on the prediction of models and scorecards for obvious reasons. Systems that have data quality improvements see significant improvements in the predictive power of scoring models. It is more or less obvious that accurate data leads to better predictions, and incorrect data leads to inaccurate predictions: the associated phrase "garbage in, garbage out" is telling. The relevance of the connection is that consumer rights strongly implicate the efficiency of the lending system. The better a system of consumer access, dispute, and redress, the more efficient the lending system. While there are no systematic studies of how much a model's performance can improve with data quality improvements (as the value would vary from place to place, model to model, and quality metric to quality metric), interviews with modelers and credit bureaus suggest that the improvements are significant when data quality problems are significant.

Rules for dispute and verification of consumer data files are based on the data subject right to personal data, whereby a consumer has the right to know the personal information that an institution maintains, as well as the right to know with whom that information has been shared. As previously discussed, data subject rights must also include the right of grievance: a consumer may contest the information in their credit file and be provided with an appropriate venue for correction. Additionally, the legislative framework must provide for authentication of information. The legislative framework should provide for four basic phases of grievance resolution:

- Personal Information: A consumer requests documentation of the data about them held by an institution (right to personal data).
    - Credit bureaus must be structured such that they can immediately release information to consumers.
    - All information in the consumer file must be released, including the stored information and a list of those that have been provided with the consumer's information.
- Receipt of Grievance: A consumer contests the information in their file (right of grievance).
    - Credit bureaus should have a streamlined system to receive complaints and consumers must have easy access to customer service.
    - Each consumer complaint should be assigned a case and framework for the resolution of each case should be in place.
- Authentication of Grievance: The credit bureau must have a system to verify the authenticity of the dispute.
- Grievance Resolution: Credit bureaus must respond to each consumer case.
    - Credit bureaus must contact consumers individually to notify them of the result of their case.

- Credit bureaus may provide for a system of appeals in the case that the consumer refutes the resolution.

Regulatory oversight is essential for the operation of a credit bureau. Enforcement of the credit bureau framework and function allows the bureau to earn the trust of institutions and consumers such that they participate in the credit system and thus the bureau can provide the lenders the information needed to assess risk. Two basic strategies of enforcement have emerged: (1) self-regulation; and (2) regulation by supervisory body. In the case of self-regulation, the credit bureau legislative framework will provide for regulation. This provides regulation limited to processing complaints, issuing clarifying statements, and filing suits.

4.3. The Ownership of Data

While there have been extensive examinations of the impact of public bureaus in comparison to private bureaus on lending and loan performance, there has been little attention paid to variations in the ownership of the data. Whether the data is owned by the data furnishers (from who the data is managed by the credit bureau) or whether the data is owned by the bureau makes a difference in how the data is used.

It should be noted that the ownership of the data is usually not clarified in regulation but rather in contracts between the data manager or data cooperative and the data furnisher. For understandable reasons, data providers will place restrictions on the use of their data. Reciprocity—meaning that a user of data must also provide data—is a common condition to prevent free riding (when a lender/data source gets data from others without giving data or participating in the system).

Data ownership by bureaus practically means that all uses of the data that are not prohibited by law or contract are allowed. Data ownership by data users means that all uses of the data that are permitted by law but not specified in contract are not permitted until the permission of data providers is secured.

The ownership structure of the bureau often dictates the extent to which it is a closed network or an open one. It was noted above that information sharing systems for credit data give rise to network externalities and that networks can be associated with anti-competitive behavior. The question is whether the ownership structure and operating rules allows equal access to data and does not disallow legal uses that would assist competition. For example, it is not simply that lenders can access data for risk assessment on a client, but that new legal uses are not hindered.

5. CONCLUSION:

In summary, the research paints a fairly consistent set of lessons.

- The sharing of positive data significantly increases credit access while reducing the share of non-performing loans in a portfolio.
- The addition of positive data significantly increases access to credit by underprivileged social segments such as lower income households, racial/ethnic minorities, women, and the young.
- The broadening of the base of data furnishers to financial institutions beyond banks also significantly increases credit access while reducing the share of non-performing loans in a portfolio.
- The broadening of the base of data furnishers to comprise other service providers to whom consumers have regular obligations (i.e., utility, telecom, rental) also significantly increases credit access, especially for financial excluded segments, while reducing the share of non-performing loans in a portfolio.

A wide body of scholarly literature that examines information sharing, finance and growth, and finance and equality is consistent in these conclusions. Efficiency and equity in access to credit are brought about when "good risks," who are denied credit because they were thought to be "bad risks," are extended credit. Concomitantly, bad risks, who are given credit because they were thought to be good risks, are denied credit or are no longer subsidized by lower-risk individuals. In the aggregate, lending is increased, leading to greater economic growth, rising productivity and greater stocks of capital. Average interest rates drop. Poverty and income inequality are alleviated.

The consistent results do provide policy makers a guide for understanding what may be the costs of certain consumer data regulations, but also provide guides for considering how consumer data protections should be structured so that economic value need not be lost.

As these results have held across many studies and in the experience many economies, there are efforts to promoted credit information sharing standards in a few forums. The International Finance Corporation is leading efforts in association with the Bank for International Settlements to develop financial information sharing standards. PERC is working with APEC to develop regional standards for credit reporting. Given the difference that a well-structured financial information sharing system can make in the well-being of the lives of consumers, the development, reform, and implementation of full-file, comprehensive reporting systems has become a key component of a well-developed financial infrastructure.

PERC
RESULTS AND SOLUTIONS

APPENDIX: DATA SUBJECT RIGHTS

Regulations must cover the following data subject rights:

- Right to personal data: Consumers have the right to knowledge of all personal data maintained by an institution, as well as to whom the information in their file has been disclosed (UK, US, EU, Japan);
- Right to Third Party Notification: Consumers have the right to be notified of all third parties who have received subject data information, including information about rectification, deletion, or blocking of data (EU);
    - This right does not apply if it is a disproportionate effort for the data controller;
- Right to data controllers: Consumers should have the right to have their file examined by a data controller, such that any final decisions made about their file is not an entirely automated decision, but is also monitored by a data controller (UK);
- A consumer is entitled to a free credit report if (US):
    - Adverse action is taken against the consumer based on information in the consumer's credit report;
    - A consumer is the victim of identity theft;
    - A consumer's file contains false information due to fraud;
    - A consumer is benefiting from public assistance;
    - A consumer is unemployed, but expects to be gainfully employed within 60 days
- Right to Object: Consumers have the right to object to the processing of their personal data (some exceptions exist) (EU);
- Right to Opt-out: Consumers have the right to limit or control the collection of personal information, data controllers must describe the intended use and handling of personal information (Japan)
- Right to protected processing: Consumers have the right to have their data protected from any adverse processes and be protected from use for direct marketing (UK, EU), or, consumers may limit the number of prescreened offers of credit or insurance and all prescreened applications must be accompanied with toll free numbers by which the consumer may cancel their participation (US);
- Right to compensation: Consumers have the right to compensation should the use of their data by a data controller cause them damage (UK), or, consumers have the right to seek damages if federal law (specifically the FCRA) is violated during the handling of consumer information (US);
- Right of grievance: Consumers have the right to examine the information in their file, and have the right to a system that helps them to correct inaccurate data (UK, US, EU, Japan);
- Right to correction of inaccurate data: A credit bureau is responsible for correcting information in a consumer credit file that has been proven to be false

(UK, US, EU);

- Right to oversight: Consumers have the right to request oversight of the data subject to ensure that the legislation is appropriately implemented and followed.
- Data expiration rights: Credit bureaus may not report outdated negative information (US);
- Right to Erasure: A consumer has the right to have personal data erased in cases of unlawful processing of data (EU);
- Additional rights for identity theft victim and active duty military personnel: consumers who fall into this category are subject to additional data subject rights such as the right to “freeze" their file, and prevent access by anyone until the freeze is removed at the request of the data subject (US).