

# The Impacts of Information Sharing on Competition in Lending Markets



Michael Turner, Ph.D., Robin Varghese, Ph.D., Patrick Walker, M.A., Sukanya Chaudhuri, Ph.D.

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**PERC**  

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**RESULTS AND SOLUTIONS**



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Ultimately, however, despite the contributions of those referenced above, the views and opinions presented in this study are exclusively those of the authors.

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# Executive Summary

In many markets, lenders have concerns about the introduction of full-file credit information sharing. Lenders often resist the introduction of credit reporting largely out of fears that credit reporting will erode their market position as competitors use the data to take their best customers away.

This paper examines whether the feared downsides of a shift to full-file credit sharing are justified.

The key findings of this study include:

- ▶ Shifts to full-file credit reporting are not associated with meaningful changes in bank concentration/market power. No large or statistically significant changes in bank concentration or market power were found during or following credit-sharing reform for countries that shifted to full-file credit sharing.
- ▶ Consistent with past findings, greater information sharing is associated with increased private sector lending. Analyses show economies with a private credit bureau are associated with higher rates of private sector lending as a share of GDP, by 24 to 40 percentage points. And for economies that shift to full-file sharing, the boost to private sector lending is 16 percentage points from Year 5 following the transition onward. Drivers of this may be improved and more efficient underwriting and risk management made possible with richer data and the opening up of new market segments.

Taken together, these findings suggest that the benefits of full-file credit sharing are much more solid and meaningful than the feared downsides.

There are a number of possible reasons why banking concentration/market power is impacted little by shifts to full-file credit sharing. These include:

- ▶ Credit sharing rules/agreements may exclude prescreening or prospective marketing based on credit report profiles. This helps reduce the possibility of poaching.
- ▶ Credit sharing is a two-way street. A bank can also use the full-file credit information for its own customer acquisition purposes.
- ▶ Lenders may all adapt to the new environment helping keep their relative shares of the market. The transition to full-file data sharing usually takes years (from planning to full implementation with years of data on file). Consequently, there is time to acclimate during the transition and the transition itself may not be as radical as feared by lenders.
- ▶ As consumer credit markets grow, lenders expand their base by lending more to new clients more efficiently.

These potential factors combined with the results of this study suggest that lenders opposed to full-file credit reporting on business grounds should, at the very least, reexamine their cost-benefit calculation. They should take account of the experience of other lending markets, recognize that they can help shape details of their data-sharing agreements, and are able to respond to a changing data environment.



## I. Introduction

In the last decade and a half, a new consensus has emerged on the value of full-file, comprehensive credit information sharing in lending. Credit reporting has been shown to increase lending in the aggregate (Jappelli and Pagano, 2002; Djankov et al., 2007)<sup>1 2</sup> and cross-country analysis further supports that credit reporting improves credit availability (Turner et al, 2007).<sup>3</sup> Credit reporting is correlated with easier access to financing for SMEs (Galindo and Miller, 2001; Love and Mylenko, 2003).<sup>4 5</sup> And studies have shown that credit reporting is associated with lower default rates for any given level of lending (Barron and Staten, 2003; Turner et al 2007;

and IADB 2005).<sup>6 7 8</sup>

Regulators, banking associations, and legislators have come to understand these benefits: Credit reporting helps reduce information asymmetries, substitutes reputational collateral for physical collateral, and promotes efficiency in loan origination, expanding access to finance while promoting safety and soundness.

While the implementation of full-file, comprehensive credit information-sharing systems requires progressively less education of government policymakers, education and outreach efforts have more often found the need to address concerns held by lenders. Increasingly, the source of resistance to credit reporting policy reforms stems from banks' concerns that their market share will erode as a result of increased competition. Sharing information may be a public good and make for a larger and more efficient system, but the concern is that private interests in terms of preserving market position may not align with the public one.

Research by Brown and Zehnder (2010) and Bruhn, Farazi and Kanz (2013) suggests that less competition in the banking sector is associated with a lower likelihood that a voluntary credit information-sharing system

<sup>1</sup> Jappelli, Tullio and Marco Pagano (2002), "Information Sharing, Lending and Defaults: Cross-Country Evidence," *Journal of Banking and Finance*, October, 26(10), 2017-45.

<sup>2</sup> Simeon Djankov, Caralee McLiesh, Andrei Shleifer, "Private Credit in 129 Countries." NBER Working Paper No. 11078 (January 2005). <http://papers.nber.org/papers/w11078>.

<sup>3</sup> Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America*, 2007

<sup>4</sup> Galindo, Arturo, and Margaret J. Miller (2001), "Can Credit Registries Reduce Credit Constraints? Empirical Evidence on the Role of Credit Registries in Firm Investment Decisions." Paper prepared for the Annual Meetings of the Inter-American Development Bank, Santiago, Chile, March.

<sup>5</sup> Love, Inessa, and Nataliya Mylenko (2003), "Credit Reporting and Financing Constraints," World Bank Policy Research Working Paper n. 3142, October.

<sup>6</sup> Barron, John M. and Michael Staten (2003), "The Value of Comprehensive Credit Reports: Lessons from the U.S. Experience", in *Credit Reporting Systems and the International Economy*, Margaret Miller, ed. Cambridge: MIT Press.

<sup>7</sup> Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America*, 2007

<sup>8</sup> 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.

will emerge.<sup>9 10</sup> Bruhn, Farazi and Kanz (2013) find that voluntary credit information-sharing systems emerge where there are considerable barriers to entry in banking.<sup>11</sup> Countries with a higher concentration in banking are less likely to have credit bureaus. They also find that large banks enjoying economies of scale are less likely to want to share information.

This study does not revisit incentives and disincentives among lenders for sharing information. Rather, it assesses whether these concerns and fears are grounded in experience and to what extent are they valid.

The reasons these concerns may be valid are clear to lenders. Larger lenders may lose market share as the costs of switching become lower for a borrower and the costs of acquiring a borrower becomes lower for a lender. As economies of scale obtain for large lenders, goes the hypothesis, any loss in market share involves the increase of cost margins.

Moreover, in economies with low barriers to entry in banking, information sharing may encourage new entrants to the sector as variable costs fall and risk assessment improves.

The reasons these concerns may fail to materialize are based more often on the responses of lenders. Lenders may respond to the market in a manner consistent with the “Red Queen” hypothesis in which agents constantly adapt not merely to gain advantage, but also simply to maintain position against ever-adapting competitors in an ever-changing

market.<sup>12</sup> And credit information-sharing systems do not merely bring credit reports but bureaus that also provide services that assist lenders in making their operations more efficient. In addition, they may also expand the customer base that can be served by large formal lenders (increase the size of the pie).

Studies of the incentive structures behind the voluntary adoption of credit information sharing by lenders, for obvious reasons, dismiss examinations of mandated reporting. Here, we will look at both as we attempt to answer the question: *what has been the effect of full-file, comprehensive credit reporting on banking competition and concentration in practice?* While we will attempt to identify the mechanisms and conditions that may channel information sharing into changes in market structure, our aim is largely an assessment of whether and to what extent fears of poaching, sudden entry by multinationals, or “ruinous competition” are valid.

Pagano and Jappelli (1993) point out that membership in a credit bureau entails both benefits and costs.<sup>13</sup> On the one hand, lenders gain access to better information about potential borrowers. On the other, they also lose *some* informational advantage over their own borrowers. This increases competition among lenders and reduces monopoly rents to information. Pagano and Jappelli develop a model that predicts that the incentive to share information is greater when lenders are

<sup>9</sup> Brown, Martin & Zehnder, Christian, 2010. "The emergence of information sharing in credit markets," *Journal of Financial Intermediation*, Elsevier, vol. 19(2), pages 255-278.

<sup>10</sup> Miriam Bruhn, Subika Farazi, Martin Kanz, (2013) “Competition, Concentration, and Credit Reporting,” The World Bank Development Research Group. Finance and Private Sector Development Team May 2013

<sup>11</sup> Ibid.

<sup>12</sup> The phenomenon's name is derived from a statement that the Red Queen made to Alice in Lewis Carroll's *Through the Looking-Glass* in her explanation of the nature of Wonderland: “*Now, here, you see, it takes all the running you can do, to keep in the same place.*”

<sup>13</sup> Pagano, Marco and Tullio Jappelli (1993), “Information Sharing in Credit Markets,” *The Journal of Finance* 43(5), December, 1693-1718.



protected from competition by barriers to entry. (They cite anecdotal evidence supporting this prediction.) In the US, branching regulation has traditionally limited competition among banks in different states, which may have contributed to voluntary information sharing among lenders as early as the 1920s. In Italy, by contrast, banks compete nationwide and the initiative to create the first credit bureau in 1990 was taken by local lending institutions with national banks joining only later.

Brown and Zehnder (2010) analyze the relationship between competition and the emergence of voluntary information sharing empirically in a laboratory setting where they create an experimental credit market.<sup>14</sup> In the experiment, lenders have to decide whether or not to join a credit bureau under different market conditions, including two different levels of entry costs into the local market. The results show that lenders are more likely to share information when entry barriers are high (i.e. the threat of competition is low), confirming Pagano and Jappelli's theoretical prediction.

To our knowledge, our paper is the first to empirically examine bank competition following the emergence of full-file credit sharing by credit bureaus outside the laboratory setting.

## II. Lending Market and Information Sharing

### Information Sharing

Private consumer credit bureaus first emerged in the late 1800s. Early bureaus were found in the US, Sweden, Austria, Finland, Canada, and Germany.<sup>15 16</sup> These early bureaus were typically cooperatives and nonprofit ventures set up by local retailers to help determine the creditworthiness of consumers and were also used to assist with debt collection. As populations grew more mobile, it became increasingly important for credit bureaus to expand their geographic reach. By 1906 a trade association was established in the US to facilitate the sharing of consumer data across regions.<sup>17</sup>

Today, over 80 countries have a private credit bureau and over 120 have either a private credit bureau or public credit registry. Much of this growth occurred in the last few decades as the importance of information sharing for a nation's financial sector and overall economy became increasingly clear. Credit bureaus and registries are now commonly viewed as being a vital part of a nation's financial infrastructure. Table 1 shows the growth in establishing credit bureaus/registries.

<sup>14</sup> Brown, Martin & Zehnder, Christian, 2010. "The emergence of information sharing in credit markets," *Journal of Financial Intermediation*, Elsevier, vol. 19(2), pages 255-278.

<sup>15</sup> See Marco Pagano and Tullio Jappelli. "Information Sharing, Lending and Defaults: Cross-Country Evidence." The United States and Sweden established their first private credit bureaus in 1890. It is possible that informal information sharing mechanisms among lenders and retailers existed prior to this.

<sup>16</sup> 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).

<sup>17</sup> The organization, the Associated Credit Bureaus, Inc., is the antecessor of the Consumer Data Industry Association (CDIA).

**Table 1: Establishment of Private Credit Bureaus or any Credit Sharing**

	Private Credit Bureau	Private Credit Bureau or Public Credit Registry
Pre 1970	16	35
1970-1979	5	8
1980-1989	8	12
1990-1999	21	36
2000-2009	36	36

Source: GFDR 2013: Credit Reporting Database

The *details* of credit reporting, however, are vital to the actual role and impact of credit reporting on the economy. For instance, a credit-reporting environment in which little information is shared, that covers only a small share of consumers, and exchanges data with questionable accuracy may have little practical impact on lending or an economy. As such, over the last two decades the growth in the establishment of bureaus and registries has also been accompanied by moves to increase coverage, expand the types of data shared, and improve upon data quality.

## Complexities of Examining Lending Markets and Information Sharing

One of the difficulties in examining information sharing is that it is national in nature and it is impacted by the behavior of lenders (data furnishers). Unless data reporting is imposed by government regulations, it arises only with the cooperation of lenders. In short, not only is lending influenced by data sharing, but data sharing itself—and to what extent it takes place—is influenced by lenders. This simultaneity means that if a different lending environment is found among nations in which data sharing occurs, it may not be the data sharing that “caused” this different lending environment but the opposite, that the

different lending environment enabled the data sharing. Or perhaps it is some combination of the two.

Cross-national comparisons can also be complicated by the fact that there are many important factors (e.g. structural differences among nations) for which there are no adequate controls. Many of these factors can be related to both lending and data sharing. For instance, there is a very real possibility that policy reforms and financial liberalization could both enable or promote data sharing *and* alter the lending environment in other important ways.

Other difficulties include the problem that data sharing is not a homogeneous exercise. It varies by:

- share of the population that is covered;
- quality of the data that is shared;
- value-added services available for the data shared;
- type of data shared (negative-only v. full file);
- participation rates of different types of furnishers;
- openness of the financial sector; and
- role played by the Government through regulations.

Again, these aspects of data sharing may be related to the lending environment in terms of causes and effects. For instance, is there little banking competition in country X because country X only shares negative data or does country X only share negative data because there is little competition?

For the purposes of this paper, we will focus specifically on shifts to sharing full-file data (both positive and negative data). There is little evidence that lenders have any concerns with sharing negative information. Furnishing negative data creates a system in which

borrowers have an incentive to pay on time and not default on loans or face restricted future access to credit markets in the form of denied credit or higher interest rates. Attitudes among lenders towards full-file reporting are far more ambiguous, as concerns about losing customers can be viewed by some lenders as outweighing perceived benefits, if not actual ones. Given this, we will examine how full-file data sharing impacts competition in the lending market. To measure impacts on competitiveness within a given nation's lending market, we will focus on how bank concentration (in terms of assets) is impacted by full-file data sharing. Bank concentration will be measured in terms of the combined market share of the three largest banks (C3).

## Relationship Between Lending Markets and Credit Information Sharing

As discussed previously, the voluntary participation in credit sharing by lenders is a business decision where lenders are not compelled by regulators to share data but choose to share data. And there is evidence that the contours of the lending market (the nature of competition, degree of competition, and barriers to entry) influence this decision to credit report.

Credit bureaus often incent lenders to report by restricting access to their database to those lenders that contribute to it. So the perceived and actual benefits for a lender from a credit-reporting system can therefore depend heavily on their decision to share their own data. That is, they cannot simply benefit from the information shared by others if they do not

share, too. Hence, they must make a cost/benefit analysis regarding credit reporting, including the impacts of both furnishing and receiving data.

Bruhn, Farazi, and Kanz (2013) find that both banking concentration and the potential for competition reduces the likelihood of a private credit bureau developing voluntarily. By contrast, no such relationship was found between those same two factors and the establishment of public credit registries.<sup>18</sup> Banking concentration was measured as the combined asset share held by the three largest banks. We use this definition as well. They found that moving from the 25th percentile of bank concentration (combined asset share = 60% of assets) to the 75th percentile (combined asset share = 93% of assets) was associated with a 17.6 percentage point decrease in the likelihood of having a credit bureau. In addition, they found that bank concentration was associated with less information reported to credit bureaus. As a measure of potential for competition, they used the log of the minimum capital requirement and found that moving from the 25<sup>th</sup> to the 75<sup>th</sup> percentile of (the log) minimum capital requirement was associated with a rise in the probability of having a credit bureau by 15 percentage points. Again, no such relationship was observed with the establishment of public credit registries.

Taken together, these results are consistent with the general hypothesis that in economies with a greater potential for competition and with greater lending market concentration, information sharing is less likely to arise voluntarily, and when it does, such economies tend to share less information.

<sup>18</sup> Miriam Bruhn, Subika Farazi, Martin Kanz, (2013) "Competition, Concentration, and Credit Reporting," The World Bank Development Research Group. Finance and Private Sector Development Team May 2013



## How Information Sharing Impacts Lending

All the ways in which full-file information sharing impacts credit markets must be considered when assessing the impact of credit reporting on banking competition. For example, a lender may lose 2% market share on average, but if the lending market grows considerably, e.g. a 45% growth in the market, it can offset the costs of the shift in *relative* position. While the decision to credit report and credit report positive data from lenders appears to be a business decision based to some degree on the structure of the lending market, the structure of credit data sharing also impacts lending.

The impact of data sharing on lending has been examined via two main empirical routes: a cross-country/cross-bank analysis or lending simulations within countries. The former plays off of differences across countries in credit reporting, lending and other factors or differences across banks in terms of use of

credit bureaus and lending (rates and default outcomes). The latter uses credit scores based on different sets of data for the same portfolio of consumer for which a lending outcome is known (such as good v. bad or default v. no default). So a credit score based on all the information in the consumer files is created and compared to one based on only the negative information in the consumer files (or other subset of data). Then the performance of the credit scores in predicting the outcomes is compared. The differences in these credit model performances and the resulting impact on portfolio performances is then attributed to the differences in the underlying data. The first type of analysis (cross-country) is most useful in comparing the impact of a bureau versus no bureau since this case would involve either a simulation using manual underwriting or the creation of a credit score in an environment with no bureau. Broad data differences, such as negative-only versus full-file, can be compared using either method while the impact of very specific data differences are best evaluated with simulations (e.g. assessing the impact of including credit inquires over one year old).

Simeon Djankov, Caralee McLiesh, and Andrei Shliefer examined private credit and credit reporting in 129 countries.<sup>19</sup> 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 their estimates, private bureaus consistently increased lending far greater than public registries, which in the estimates had an ambiguous impact. (It is noteworthy that in some estimates public registries decreased lending, though these were not statistically significant). In estimations that examined all

<sup>19</sup> Simeon Djankov, Caralee McLiesh, Andrei Shliefer, "Private Credit in 129 Countries." NBER Working Paper No. 11078 (January 2005). <http://papers.nber.org/papers/w11078>.

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 registries. (Both coefficients were significant.)

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.<sup>20</sup> Controls include the legal rights of creditors and credit information. PERC measured the impact of full-file and negative-only sharing, modifying for whether the bureau is privately or publicly-owned.<sup>21</sup>

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

Another study conducted by the Inter-American Development Bank (IDB), measured the impact of information sharing on loan performance.<sup>22</sup> The IDB 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 statistically significant effect (of any magnitude) could be found for the impact of public registries.

The methodology behind credit file simulations is designed, in large part, to hold all other factors constant so that researchers 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 US 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.<sup>23</sup> 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% default target (that is, when a lender aims to have a nonperformance level that is no more than 3%).<sup>24</sup> In their calculations, a negative-only reporting system would accept 39.8% of the applicant pool, whereas a full-file system would accept 74.8%. The difference in the

<sup>20</sup> Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America*, PERC, 2007

<sup>21</sup> As found in other studies, a substantial degree of variance in lending is accounted for by extensive rights for creditors. 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.)

Simeon Djankov, Caralee McLiesh, Andrei Shleifer, "Private Credit in 129 Countries." NBER Working Paper No. 11078 (January 2005). <http://papers.nber.org/papers/w11078>.

<sup>22</sup> 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.

<sup>23</sup> Barron, John M. and Michael Staten (2003), "The Value of Comprehensive Credit Reports: Lessons from the U.S. Experience", in *Credit Reporting Systems and the International Economy*, Margaret Miller, ed. Cambridge: MIT Press.

<sup>24</sup> Ibid.

number of borrowers is equal to 35% of the applicant pool, which represents an increase of 87.9%. Simply, these changes 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. Several studies have verified this general trade-off and measured its magnitude in different economies. Simulations have used credit file data from Argentina, Brazil, Colombia, and the US.<sup>25</sup>

In summary, taking the “Macro” cross-country or cross-bank analysis together with the “Micro” credit file simulation analysis suggests the following:

- Credit reporting, and reporting to a private credit bureau in particular, are associated with increased private sector lending.
- Richer data shared (full-file vs. negative-only *or* high coverage vs. low coverage) is associated with increased lending to the private sector.
- Lending decisions using credit files improve when more data is available (full-file vs. negative-only, comprehensive vs. segmented, or traditional-only vs. traditional and alternative data).

The third bullet that lending decisions improve with the use of richer data helps explain the second bullet, that lending is expanded with the sharing of richer data. Richer data allows increased lending without increasing defaults. Segmentation analysis examining which groups of consumers benefit from the richer data sharing finds that they tend to be groups underserved by the status quo lending environment. For instance, the beneficiaries are disproportionately younger borrowers in Australian analysis, younger borrowers and female borrowers in Colombian analysis, and lower-income borrowers, younger borrowers, and ethnic minority borrowers in US analysis. These works suggest that the credit market is expanding by “bringing in” the traditionally underserved/excluded segments.

## Fears of Credit Reporting

Interactions with lenders and credit bureaus have revealed that lenders hold common business fears regarding a possible shift to full-file credit reporting, either from no credit reporting or a negative-only regime. First, lenders fear that by sharing information on their good customers with other banks, they will lose some of their best customers from marketing efforts based on credit bureau data. This is the fear of poaching. While a legitimate possibility, this fear may be addressed by

<sup>25</sup> 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, 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. 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; Michael Turner and Robin Varghese, “Economic Impacts of Payment Reporting Participation in Latin America.” May 2007. PERC; and Michael Turner, et al. “The Fair Credit Reporting Act: Access, Efficiency and Opportunity, The Economic Importance of Fair Credit Reauthorization.” June 2003. Information Policy Institute.

limiting the permissible purposes for which certain credit bureau data can be used. For instance not allowing a credit bureau customer to purchase a list of their competitors' customers for marketing purposes.

Second, lenders fear that even if customers are not directly marketed to by their competitors, they will still face increased competition since their customers would be better able to seek out credit offers from competitors. This is due to their competitors being able to use a customer's credit experience with any lender. There are several reasons why this fear may be exaggerated.

- In economies with full-file reporting ways other than having a complete monopoly on a bank's relationship with a customer are used to build customer loyalty. In these economies, customers are still fairly "sticky" in banking.
- Even with full-file reporting, much customer information is not shared. Applications and customer communications and interactions can be used to gather additional (non-shared) information. Such communications and private data can be used for up- and cross-selling.
- Customers who want to shop around in an economy without a full-file credit bureau can still present their own documentation of their financial relationships.
- Credit sharing is a two-way street. A bank can also use the full-file credit information for its own customer acquisition purposes.

Third, some local banks fear that large foreign banks with greater knowledge of using full-file credit data will enter (or expand in) their market. The advantage large foreign banks may have is also likely exaggerated. One reason why is that shifts in reporting typically take years and there is not a sudden, overnight, radical

expansion of data available to lenders. This should provide ample time for lenders with less experience in a full-file environment to acclimate. Initially, reforms need to occur and then data needs to be collected. The collection of the data takes time to build up. So, initially, the shift is known and no data is available, only then after some time does data come on line and begin to build up. This transition will be gradual. And the very fact that there may not be much data initially means that lenders with experience working in a data rich environment (such as the US) will be little advantaged. In addition, analytic solutions built for one economy may not translate well to another. It may be the case that all lenders (whether domestic or foreign) will be on equal footing as the reporting environment shifts. Yet another reason is that the home market advantage, a much stronger knowledge of working in the domestic market, may overwhelm any incremental benefit foreign banks may gain from their experience with data sharing. It should also be noted (as previously mentioned) that experience with reporting is also a two-way street. To whatever extent it better enables a lender to move in to other markets where full-file reporting is practiced, then lenders in a country that shifts to full-file reporting will also have such opportunities opened up to them.

Finally, there is general fear of entering uncharted territory and changing from traditional lending methodology. This can manifest itself in a resistance to change based on the notion that lending will be *less* sound when underwriting is more and more based on credit scores and new data and less and less on traditional underwriting. This is a fear that the expansion of lending discussed above will result in over-lending and an expansion of credit to those who can't handle it. This is a fear that the new data and tools will be misused (since more information in the context of lending should result in improved lending outcomes). The fact

that new data may enable risk based pricing and may enable increased access to credit to higher risk individuals (as well as lower risk individuals) does not mean that full-file data reduces the quality of individual lending decisions. Jappelli and Pagano (2005) note that credit information sharing can certainly increase credit access for higher risk individuals otherwise excluded.<sup>26</sup>

When contemplating a shift to full-file reporting, lenders must weigh the feared downside of increased competition described above against the very real benefits and opportunities of full-file reporting: increased lending, an increased customer base, potentially safer and sounder lending, and decreased underwriting costs. Ultimately, evidence from both theoretical and empirical economic literature demonstrates that even if the fears of increased competition do materialize to some degree, the benefits associated with full-file reporting are very real and may overwhelm any downsides or costs. Exploring the cost/downsides relative to benefits is one of the aims of this research.



### III. Data and Methodology- Cross Country Comparisons

#### Data

In assembling our dataset, we relied on four data sources.

#### *Doing Business*

The Doing Business project of the International Finance Corporation (IFC) of the World Bank Group has been tracking several metrics concerning the efficiency and strength of laws, regulations, and institutions that affect the performance and environment of domestic small and medium-sized enterprises.<sup>27</sup> It is a comprehensive dataset across several economies over the decade since 2004, when it was first issued. Since 2004, among the aspects of doing business it has covered, the dataset has surveyed the ease of getting credit.

The data collected under the rubric of “Getting Credit” fall into two:

- 1) Legal rights of borrowers and lenders in secured transactions and bankruptcy laws.
- 2) Credit information registries or bureaus.

Data on credit information registries and bureaus, from which we drew in assembling our dataset, covers the following six features on

<sup>26</sup> Jappelli, T. and M. Pagano, (2005). “Role and Effects of Credit Information Sharing”, CSEF Working Paper No: 136.

<sup>27</sup> Doing Business. Measuring Business Regulations. Available at: <http://www.doingbusiness.org/>



the depth of information in the public credit registry or private credit bureau (or both):

- Whether data on both firms and individuals are distributed.
- Whether both positive credit information (e.g. outstanding loan amounts and pattern of on-time repayments) and negative information (e.g. late payments and the number and amount of defaults and bankruptcies) are distributed.
- Whether data from retailers and utility companies as well as financial institutions is distributed.
- Whether more than two years of historical data are distributed. Credit registries and bureaus that erase data on defaults as soon as they are repaid obtain a score of 0 for this indicator.
- Whether data on loan amounts below 1% of income per capita are distributed. Note that a credit registry or bureau must have a minimum coverage of 1% of the adult population to score a 1 on this indicator.
- Whether borrowers have the legal right to access their data in the largest credit registry or bureau in the economy.<sup>28</sup>

The dataset also gathers information on the coverage of the public credit registry and/or coverage of the private credit bureau. That is, for each, the share of the total credit eligible population contained in the database. In the case of consumer credit information, it is measured as a percentage of the adult population (age 15 and above). Given that the data is collected annually, the dataset also contains information on when credit bureaus are established (if after 2003) and when they may have switched to positive reporting (again, after 2003). The data is collected via a survey of different experts and practitioners, e.g., the credit registries themselves, in the economy.<sup>29</sup>

#### *Global Financial Development Database (GFDD)*

The Global Financial Development Database (GFDD) contains information on the characteristics of the financial system of 203 economies. The data covers the period from 1960 through 2011, as of April 2013. The GFDD measures financial systems (institutions such as banks and insurance companies and financial markets such as stock and bond markets) in terms of their: (1) depth, (2) access, (3) efficiency, and (4) stability.

<sup>28</sup> See IFC, “Getting Credit Methodology.” <http://www.doingbusiness.org/methodology/getting-credit>

<sup>29</sup> See the following for the survey instruments: IFC, “Getting Credit-Legal Rights Survey –Economy.” [http://www.doingbusiness.org/~media/GIAWB/Doing%20Business/Documents/Methodology/Survey-Instruments/DB2013/Credit\\_legal\\_survey\\_en.pdf](http://www.doingbusiness.org/~media/GIAWB/Doing%20Business/Documents/Methodology/Survey-Instruments/DB2013/Credit_legal_survey_en.pdf); IFC, “Getting Credit- Private Credit Bureau Survey – Economy.” [http://www.doingbusiness.org/~media/GIAWB/Doing%20Business/Documents/Methodology/Survey-Instruments/DB2013/Credit\\_private\\_survey\\_en.pdf](http://www.doingbusiness.org/~media/GIAWB/Doing%20Business/Documents/Methodology/Survey-Instruments/DB2013/Credit_private_survey_en.pdf). And IFC, “Getting Credit- Private Credit Bureau Survey – Economy.” [http://www.doingbusiness.org/~media/GIAWB/Doing%20Business/Documents/Methodology/Survey-Instruments/DB2013/Credit\\_public\\_survey\\_en.pdf](http://www.doingbusiness.org/~media/GIAWB/Doing%20Business/Documents/Methodology/Survey-Instruments/DB2013/Credit_public_survey_en.pdf). Also see, Simeon Djankov, Caralee McLiesh, and Andrei Shleifer, “Private Credit in 129 Countries.” From which the methodology is drawn. <http://www.doingbusiness.org/methodology/~media/GIAWB/Doing%20Business/Documents/Methodology/Supporting-Papers/DB-Methodology-Private-Credit-in-129-Countries.pdf>

Of special relevance for our study is the fact that the GFDD measures concentration and competition in the banking sector. The GFDD contains the data collected for the “Database on Financial Development and Structure.”<sup>30</sup>

#### *Credit Reporting Database*

The Credit Reporting Database contains information on credit bureaus and credit registries in 195 countries.<sup>31</sup> It builds on the Doing Business database. The database provides an overview on the state of public and private credit reporting around the world, this database presents data on the ownership structure and extent of information collected by credit bureaus and registries.

#### *Bankscope*

Bankscope contains comprehensive information on individual banks across the world. It maintains up to 16 years of bank-level information including financials, interim data, and many other attributes including ratings and stock data.

Data for bank concentration and competition used in this report were derived from Bankscope data. These were C3 (share of assets held by the largest three banks), C5 (share of assets held by the largest five banks), and the Lerner Index (a measure of market power in the banking market).

#### *World Development Indicators (WDI)*

The World Development Indicators (WDI) database is the primary World Bank collection of development indicators, containing the most current and accurate global development data at the national, regional and global level. The WDI includes all external debt and financial flows data.<sup>32</sup>

#### *Levine-Barth-Caprio Dataset on Bank Supervision and Regulation in 180 Countries, 1999-2011*

Finally, we also use an extensive database on bank regulation and supervision assembled by Ross Levine, James Barth and Gerard Caprio.<sup>33</sup> The data set is compiled mostly from four surveys conducted by the World Bank. The

<sup>30</sup> IFC, “Global Financial Development Database,” <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTGLOBALFINREPORT/0,,contentMDK:23269602~pagePK:64168182~piPK:64168060~theSitePK:8816097,00.html>. For more on the GFDD, see chapter 1 of the 2013 *Global Financial Development Report*, and also Cihák, Martin, Asli Demirgüç-Kunt, Erik Feyen, and Ross Levine. 2012. “Benchmarking Financial Systems around the World.” Policy Research Working Paper 6175, World Bank, Washington, DC.

<sup>31</sup> IFC, “Credit Reporting Database,” ” <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTGLOBALFINREPORT/0,,contentMDK:23269620~pagePK:64168182~piPK:64168060~theSitePK:8816097,00.html>

<sup>32</sup> World Development Indicators. Available at: <http://data.worldbank.org/data-catalog/world-development-indicators>

<sup>33</sup> See Ross Levine, James Barth and Gerard Caprio, "Bank Regulation and Supervision in 180 Countries from 1999 to 2011" *Journal of Financial Economic Policy*, *Journal of Financial Economic Policy*, 2013, 5(2), 111-220 for a full discussion of the dataset. Also available at: [http://faculty.haas.berkeley.edu/ross\\_levine/Papers/Bank\\_Regulation\\_and\\_Supervision\\_Around\\_the\\_World\\_15JAN2013.pdf](http://faculty.haas.berkeley.edu/ross_levine/Papers/Bank_Regulation_and_Supervision_Around_the_World_15JAN2013.pdf). The dataset itself can be downloaded at [http://faculty.haas.berkeley.edu/ross\\_levine/Papers/Copy%20of%20BCL\\_Sup\\_Reg\\_Data\\_13JAN2013.xls](http://faculty.haas.berkeley.edu/ross_levine/Papers/Copy%20of%20BCL_Sup_Reg_Data_13JAN2013.xls)

surveys ask about a wide array of bank regulatory and supervisory policies, including,

entry into commercial banking, ownership of bank restrictions, capital standards, allowable activities for banks, external auditing requirements, governance of banks, liquidity and diversification requirements, deposit protection schemes, asset classification and provisioning practices, accounting and information disclosure requirements, supervisory powers associated for dealing with banks in financial duress, and the structure, mandate, staffing, and procedures of supervisory agencies.<sup>34</sup>

The dataset also contains information on the characteristics of banking, notably concentration and competition over time.

## Methodology

Forty-five countries were identified as having undergone a shift from either negative reporting to full-file reporting or from having no credit bureau to a full information sharing credit bureau.<sup>35</sup>

The way these were identified was as follows.

- 1) PERC examined all countries in Doing Business that currently share positive information and went through shift in credit reporting to include positive data since 2004.
- 2) To this list, we added countries from GFDD where a bureau was either established on or after 1999 and which shared positive information.

We identified the year of change also using both databases. For example, the credit bureau in China was established in 2005, and Doing Business states that in 2006 China started using full-file reporting. Thus, we have 2006 as the year of change for China. On the other hand, for Ghana the credit bureau was established in 2010 and it was a full information-sharing bureau. Therefore, the year of change for Ghana is 2010. Based on the year of change, we created a number of variables to identify the impact over time. These variables were indicators for one year after the change, two years after the change etc.

The following table provides a brief description of the variables and the sources:

<sup>34</sup> See Ross Levine, James Barth and Gerard Caprio, "Bank Regulation and Supervision in 180 Countries from 1999 to 2011" *Journal of Financial Economic Policy*, *Journal of Financial Economic Policy*, 2013, 5(2), 111-220 for a full discussion of the dataset. Also available at:

[http://faculty.haas.berkeley.edu/ross\\_levine/Papers/Bank\\_Regulation\\_and\\_Supervision\\_Around\\_the\\_World\\_15JAN2013.pdf](http://faculty.haas.berkeley.edu/ross_levine/Papers/Bank_Regulation_and_Supervision_Around_the_World_15JAN2013.pdf). The dataset itself can be downloaded at

[http://faculty.haas.berkeley.edu/ross\\_levine/Papers/Copy%20of%20BCL\\_Sup\\_Reg\\_Data\\_13JAN2013.xls](http://faculty.haas.berkeley.edu/ross_levine/Papers/Copy%20of%20BCL_Sup_Reg_Data_13JAN2013.xls)

<sup>35</sup> Albania, Armenia, Bahrain, Belarus, Bolivia, Bosnia and Herzegovina, Bulgaria, China, Croatia, Czech, Republic, Ecuador, Egypt Arab Rep., Georgia, Ghana, Honduras, Hong, Kong, SAR, China, India, Iran, Kazakhstan, Kosovo, Kuwait, Latvia, Lithuania, Macedonia, FYR, Morocco, Netherlands, Nigeria, Pakistan, Panama, Qatar, Romania, Russian, Federation, Rwanda, Saudi, Arabia, Serbia, Singapore, Slovak, Republic, Sri, Lanka, Thailand, Trinidad, and, Tobago, Tunisia, Uganda, United, Arab, Emirates, Uzbekistan, and Zambia

Variable	Description	Source
Shift Indicator	Indicates which countries underwent a change in credit reporting	Doing Business, GFR Credit Variables
Year of Change (Years before and after change are based on this)	Indicates the year the country shifted from negative only to full-file reporting or from no credit bureau to a full-file credit bureau	Doing Business, GFR Credit Variables
Private Credit to GDP	Private credit by deposit money banks and other financial institutions	GFDD
Private Credit Bureau Coverage	Reports the number of individuals or firms listed on a private credit bureau with information on repayment history, outstanding debt etc. The number is expressed as a percentage of adult population	WDI
Public Credit Registry Coverage	Reports the number of individuals or firms listed on a public credit registry with information on repayment history, outstanding debt etc. The number is expressed as a percentage of adult population	WDI
Private Credit Bureau present	An indicator variable we created for countries where private credit bureau coverage was greater than 0	WDI
Public Registry Present	An indicator variable we created for countries where public credit registry coverage was greater than 0	WDI
GDP	GDP was converted to international dollars using purchasing power parity rates. Data are in constant 2005 international dollars	WDI
Legal Rights	Measures how lending is facilitated by collateral and bankruptcy laws protecting the rights of borrowers and lenders. The index ranges from 0 to 10 with higher numbers indicating better access to credit	WDI
Inflation (Consumer Prices)	Reflects the annual percentage change in the cost of acquiring a fixed basket of goods and services.	WDI
Per Capita Income	GDP per capita based on purchasing power parity. The data is in constant 2005 international dollar	WDI
Dummy Entry Barrier	This dummy was based on the variable that measured whether various types of legal submissions are required to obtain a banking license. The index runs from 0 to 8 and higher values indicate greater stringency. Our dummy was 1 for countries that had 8 for all years it was surveyed and 0 otherwise.	Levin, Berth and Caprio dataset

Dummy Foreign Banks	This dummy was based on the variable that measured whether foreign banks may own domestic banks and whether foreign banks may enter a country's banking industry. The index runs from 0 to 4 and lower values indicate greater stringency. Our dummy was 1 for countries that had 4 for all years it was surveyed and 0 otherwise.	Levin, Berth and Caprio dataset
C3	Assets of three largest commercial banks as a share of total commercial banking assets. Total assets include total earning assets, cash and due from banks, foreclosed real estate, fixed assets, goodwill, other intangibles, current tax assets, deferred tax, discontinued operations, and other assets.	Bankscope
C5	Assets of five largest banks as a share of total commercial banking assets. Total assets include total earning assets, cash and due from banks, foreclosed real estate, fixed assets, goodwill, other intangibles, current tax assets, deferred tax, discontinued operations, and other assets.	Bankscope
Lerner Index	A measure of market power in the banking market. It compares output pricing and marginal costs (that is, markup). An increase in the Lerner index indicates a deterioration of the competitive conduct of financial intermediaries.	Bankscope

## IV. Results

### Private Credit and Information Sharing

As noted previously, 45 economies switched to full-file reporting in the period between 1999 and 2011.<sup>36</sup> In this section we will examine the changes in market structure for these countries from the eve of the implementation of full-file reporting through the following years. Our examination of market structure will focus on changes in concentration/competition and on changes in the size of lending to the private sector.

First, however, we utilize basic regression analysis to check whether the same relationships found in past research between information sharing and private lending in an economy (in terms of the ratio of private lending to GDP) continue to persist. Table 2 shows results from five regressions that use the same dependent variable as Djankov, McLiesh, and Shleifer (2007) and Turner and Varghese (2007), the ratio of private credit to GDP.<sup>37 38</sup> Where Djankov, McLiesh, and Shleifer (2007) average the private credit to GDP ratio over the five-year period 1999-2003, this analysis uses the average over the five-year period 2007-2011.

In Regression I, not controlling for any other

factors, the presence of a private credit bureau increases the private credit as a share of GDP by about 39 percentage points. This is highly statistically significant. The presence of a public credit registry, on the other hand, is associated with reduced private lending (and this relationship is only marginally statistically significant).

Regressions IV and V are similar to that found in Djankov, McLiesh, and Shleifer (2007) in that other variables are controlled for, such as inflation, size of the economy (GDP), and legal rights. In these regressions the coefficient on the presence of a private credit bureau drops to 24 percentage points (in Regression V).<sup>39</sup> This, in fact, is close to the estimate of 21 percentage points found in Djankov, McLiesh, and Shleifer (2007).<sup>40</sup> In both studies, the coefficient on the presence for a public credit registry is not significant.

From these results it appears that the relationship identified by Djankov, McLiesh, and Shleifer (2007) remains, *that the presence of a private credit bureau is associated with increased lending in an economy*.<sup>41</sup> It should also be noted that the broad consistency between these results occurs despite the fact that different time periods are examined, different (though similar) control variables are used, and mostly similar but different sets of countries are examined.

<sup>36</sup> Albania, Armenia, Bahrain, Belarus, Bolivia, Bosnia and Herzegovina, Bulgaria, China, Croatia, Czech, Republic, Ecuador, Egypt Arab Rep., Georgia, Ghana, Honduras, Hong, Kong, SAR, China, India, Iran, Kazakhstan, Kosovo, Kuwait, Latvia, Lithuania, Macedonia, FYR, Morocco, Netherlands, Nigeria, Pakistan, Panama, Qatar, Romania, Russian, Federation, Rwanda, Saudi, Arabia, Serbia, Singapore, Slovak, Republic, Sri, Lanka, Thailand, Trinidad, and, Tobago, Tunisia, Uganda, United, Arab, Emirates, Uzbekistan, and Zambia

<sup>37</sup> Simeon Djankov, Caralee McLiesh, Andrei Shleifer, "Private Credit in 129 Countries." NBER Working Paper No. 11078 (January 2005). <http://papers.nber.org/papers/w11078>.

<sup>38</sup> Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America*, 2007

<sup>39</sup> Simeon Djankov, Caralee McLiesh, Andrei Shleifer, "Private Credit in 129 Countries." NBER Working Paper No. 11078 (January 2005). <http://papers.nber.org/papers/w11078>.

<sup>40</sup> Ibid.

<sup>41</sup> Ibid

**Table 2: Linear regression: Dependent Variable: average (Private credit to GDP) from 2007-2011**

Variables:	I	II	III	IV	V
Intercept	42.58 *** (5.77)	35.51 *** (4.19)	40.42 *** (5.51)	4.55 * (9.25)	22.46 * (11.01)
Private Credit Bureau Present in 2007	39.32 *** (7.03)		33.75 *** (6.80)	25.04 ** (6.65)	23.68 ** (6.58)
Public Registry Present in 2007	-15.55 * (7.04)		-14.58 (6.68)	-3.19 (6.73)	-7.53 (6.76)
Private Bureau coverage in 2007		0.76 *** (0.11)		6.67 *** (1.43)	
Public Registry Coverage in 2007		0.63 * (0.34)			
GDP in 2007			1.24E-11 *** (2.65E-12)	1.10E-11 *** (2.50E-12)	1.04E-11 *** (2.45E-12)
Legal Rights in 2007					5.984 *** (1.43)
Inflation in 2007 (consumer prices)					-2.11 ** (0.67)
R-Square	0.19	0.26	0.29	0.38	0.439
Adjusted R-Square	0.18	0.25	0.28	0.36	0.419
F-State (P-Value)	19.17 ( $<.0001$ )	27.48 ( $<.0001$ )	21.88 ( $<.0001$ )	24.05 ( $<.0001$ )	22.41 ( $<.0001$ )

Standard errors in parentheses unless otherwise noted, \*\*\* represents a 99% confidence level, \*\* represents a 95% confidence level, \* represents a 90% confidence level.

Regression II in Table 2 examines the impact of coverage for private credit bureaus and private credit registries. The results indicate that coverage of a population is significantly associated with private credit. Whereas the relationship between coverage at a private bureau and the extension of private credit (loans to the private sector) is strongly significant, the relationship between the extension of private credit and coverage at a

public credit registry is only weakly significant. The coefficient of 0.76 on private bureau coverage indicates that 100% coverage in a private bureau is associated with a 76 percentage-point increase in the private credit (relative to GDP). In Table 3 of Turner and Varghese (2007), the coefficient on private bureau coverage ranges between 0.60 and 0.72, depending on model specification.<sup>42</sup> In that work, public credit registry was not found to be

<sup>42</sup> Michael Turner and Robin Varghese, *The Economic Impacts of Payment Reporting in Latin America*, 2007

significant. The relationship between private credit bureau coverage and extension of private credit relative to GDP appears robust and to have persisted.

In Table 3, regression results examine the relationship between the extension of private credit relative to GDP following a change to full-file credit reporting. In that table, in Regression I, we see that five or more years following the change, private credit is higher by 27 percentage points relative to GDP. In Regression II, a dummy for private credit registry and public registry is also included. Since an economy switching to full-file sharing also has either a credit bureau or registry, we see in Regression II that the switch to full-file represent an increase of 16 percentage points above simply having a bureau or registry. While Djankov, McLiesh, and Shleifer (2007) did not examine this specifically, it did find that private credit grows an average of roughly 20 percentage points three years following the introduction of a private credit bureau.<sup>43</sup>

The results in Tables 2 and 3 are consistent with past research (using cross-country, cross-bank, and credit file simulations) that sharing full-file credit information across lenders, the presence of private credit bureaus, broad credit bureaus coverage of a population, and the sharing of more credit information (full-file/comprehensive) are associated with sustained increases in lending. And these observed increases are significant.

**Table 3: Panel regression: Private credit to GDP**

Variables	I	II
One year after change	8.61 *** (2.96)	2.78 (2.34)
Two Years after change	10.12 *** (3.13)	5.38 * (2.42)
Three Years after change	12.37 *** (3.35)	5.93 ** (2.53)
Four Years after change	13.21 *** (4.22)	7.20 ** (3.15)
Five or more Years after change	27.40 *** (3.89)	16.09*** (3.57)
Private Credit Bureau Present		8.85 *** (2.00)
Public registry Present		4.82 ** ( 2.33)
R-Squared	0.025	0.06
Adjusted R-squared	0.023	0.05
F-stat p-value	1.43 (0.21)	8.56 (3.29e-10)

Standard errors in parentheses unless otherwise noted, \*\*\* represents a 99% confidence level, \*\* represents a 95% confidence level, \* represents a 90% confidence level.

<sup>43</sup> Simeon Djankov, Caralee McLiesh, Andrei Shleifer, “Private Credit in 129 Countries.” NBER Working Paper No. 11078 (January 2005). <http://papers.nber.org/papers/w11078>.



## Changes in Concentration Over Time for Economies New to Full-File

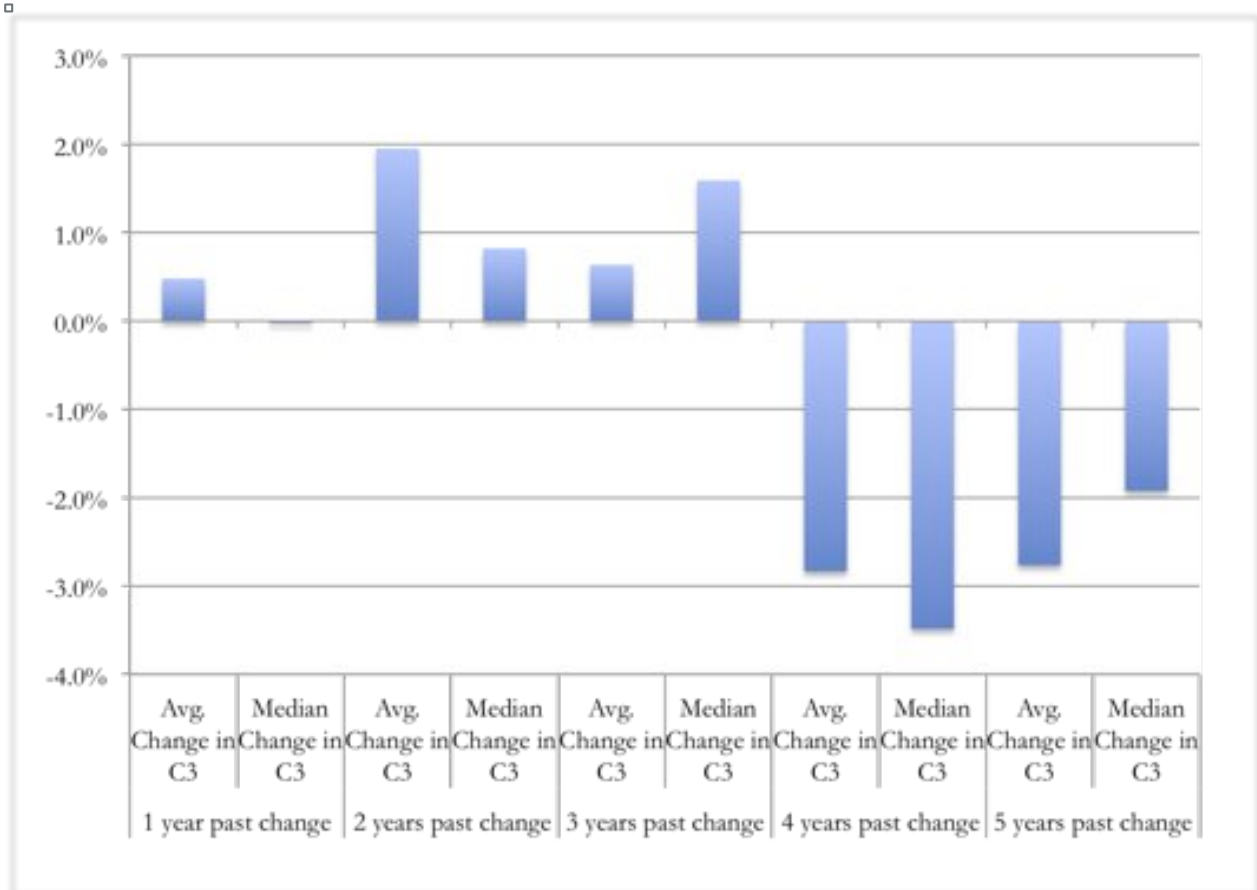
Figure 1 shows changes in banking sector concentration over a five year period, measured by the C3, or share of the market (assets) controlled by the three largest lenders, relative to market share in the year of implementation.

As seen in Figure 1, there is no discernible trend in changes in concentration; Years 2 and 3 after implementation of positive data sharing see rising concentration, only to be followed by

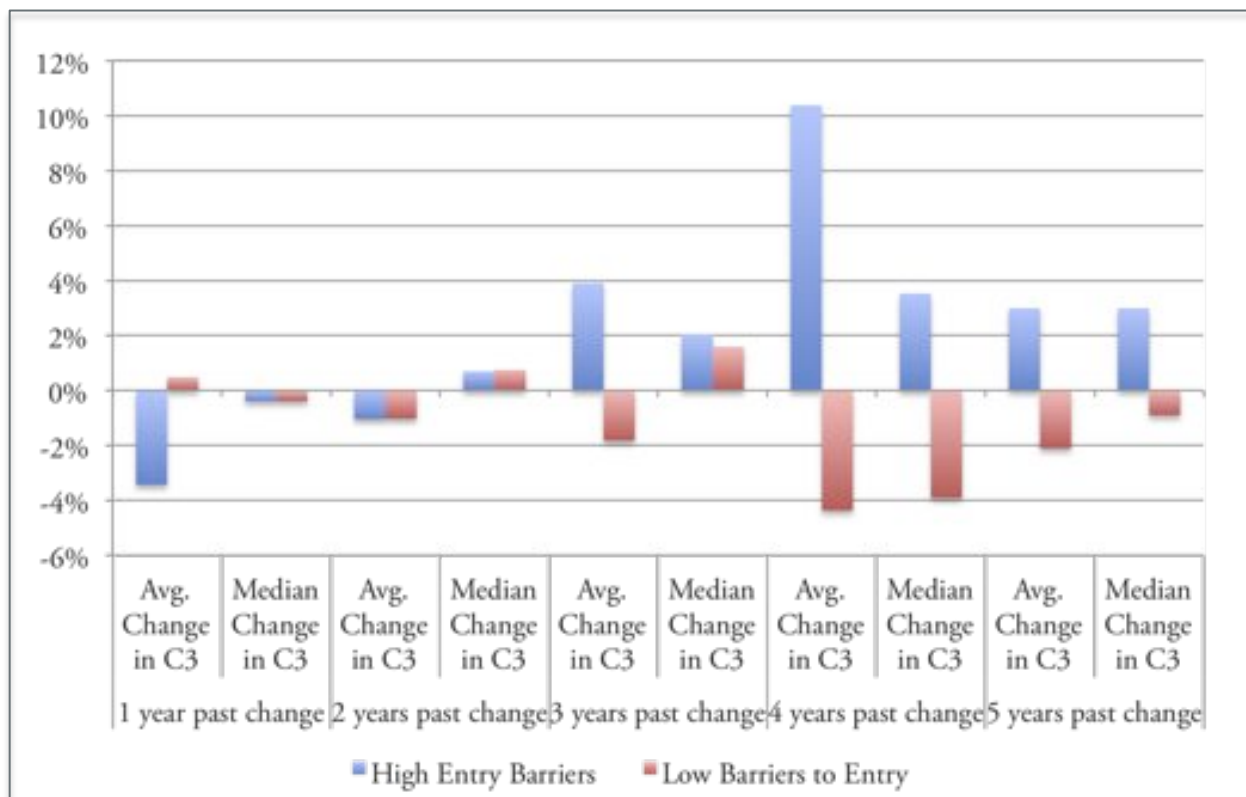
rising competition in Years 4 and 5 after implementation. The magnitude of changes in market structure remains modest, ranging from +1.95% to -3.48% relative to the implementation year.

Of course, not all economies are the same. To nuance the analysis better, we segmented the sample according to whether the economies had high barriers to entry or whether barriers to entry were low. Our operating assumption for this segmentation is that how credit reporting affects market structure depends in part on how difficult it is for a lender to enter the market.

**Figure 1: Changes in Average and Median Competition (C3) 1 to 5 Years After Full-file Implementations, Relative to Competition at Implementation**



**Figure 2: Change in Banking Competition Relative to Year of Full-file Implementation, 1 to 5 Years After Shift for High and Low Barriers to Competition**

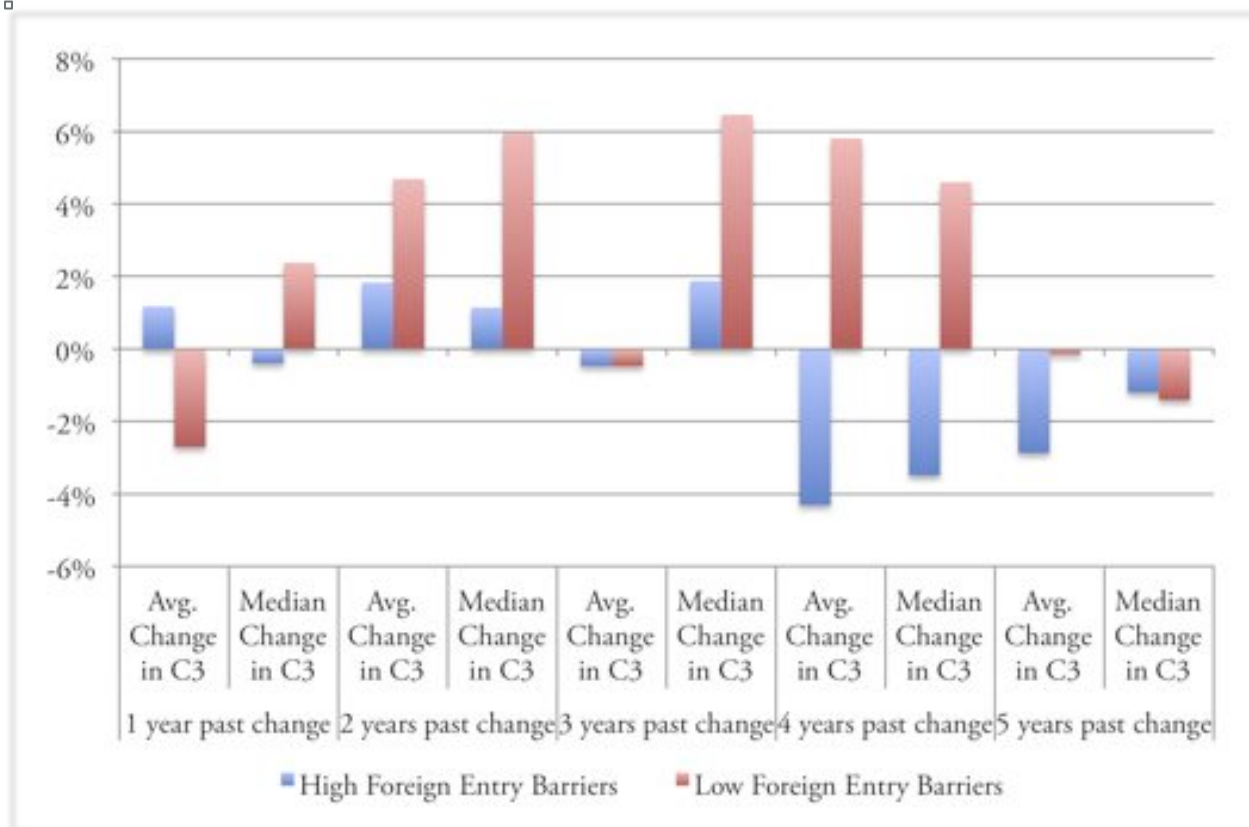


On the face of it, the data indicates that economies with high barriers to entry in credit markets witness increases in concentration a few years after implementation, whereas those with low barriers to entry see more competition. This result is the product of some extreme outliers. During the four years after implementation, the top three banks in economies with high entry barriers experience a sharp increase in the average market share, but a much more modest gain for the median case. This same trend seems to slow over time for economies with high barriers, as five years after implementation we see an increase in the market share of the top three lenders by only 2.5 percentage points.

For countries with low entry barriers, we see almost the inverse. Four years after implementation, there was a four percentage point decline in the share of the market for the top three firms (a degree of change also seen for the median economy), but the top three lenders on average capture half of that loss back in year five. For the years more proximate to implementation, changes for both sets (high and low barrier economies), are very modest and lack a definite direction.

We see a similar set of results when we segment by barriers to foreign entry. Figure 3 shows the results for changes in C3 for economies with high barriers to foreign entry and low barriers to foreign entry.

Figure 3: Change in Banking Concentration Relative to Year of Full-file Implementation, 1 to 5 Years After Shift for High and Low Barriers to Foreign Competition



In Figure 3 we see even less of a discernible pattern for economies with high barriers to entry for foreign banks. By the end of the period, the C3 had changed by 1.4 percentage points from the year of implementation. The C3 for economies with low barriers to foreign entry also witness a small increase in competition (it declines by 0.9 percentage points). However, these economies do see a 6 percentage point rise and then fall in the C3 over the five-year period.

These descriptive statistics suggest that *the direct impact of credit reporting reform on market structure is negligible to none*. Importantly, they do not speak at all of changes in the size of the lending market. If credit reporting increases lending to the private sector, and there is considerable evidence that it does, then it may be that the modest changes in market share do

not stem from poaching but instead from new customers. It is also important to note that none of the five years out changes seen in Figures 1, 2, and 3 are statistically significant. As such, comparing means of the various groups, one would conclude no long-term impacts on C3 banking competition following the shift to positive data sharing.

Next we compare the change in banking concentration over the entire 1997 to 2011 period between countries that did and did not shift to positive data sharing during that period. This comparison is done in regression analysis.

Table 4 presents the results from regression analysis examining the change in C3 over the period 1997 to 2011. The coefficient “Change to Full-file Indicator” is 1 if the country transitioned to full-file credit reporting between 1999 and 2011 and 0 otherwise. In Regression I this coefficient is -7, but only marginally significant. This indicates that of the countries that shifted to full-file credit reporting between 1999 and 2011, on average, bank concentration declined by 7 percentage points over the period 1997 to 2011. However, as seen in Regression II, with the addition of a handful of control variables, this coefficient drops to about -2 and is no longer significant.

Similar results are found when using C5, the market share of the *five* largest banks, instead of C3. See table A1 in the appendix for these results.

One of the shortcomings of the regressions in Table 4 (or Table A1) is that change in concentration may not have been related to the change to full-file credit sharing and may have occurred prior to the shift to full-file sharing. For instance, banking concentration for an economy may have fallen between 1997 and 2005. Credit information sharing reforms may have occurred in 2005 in this economy and then from 2005 to 2011 banking concentration may have stayed unchanged. So, clearly, no change in banking concentration occurred after the credit sharing reform, but there would have been both a reform noted and a decline in banking concentration noted over the whole 1997-2011 period.

To account for this timing issue of the reform and the subsequent change in banking concentration we employ a panel regression framework in which we explicitly explore changes in banking concentration *after* credit reporting reforms.

**Table 4: Linear Regression of Change in Banking Concentration from 1997 to 2011**

Variable	I	II
Intercept	0.56 (2.42)	-38.43 *** 12.86
Change to Full-file Indicator	-6.86 * (4.13)	-2.21 (4.64)
Per Capita Income in 1997		4.34 *** (1.44)
Change in Per Capita Income		-10.86 (8.63)
Dummy Entry Barrier		-0.06 (4.19)
Dummy Foreign Banks Barrier		7.43 (4.67)
Multiple R-Squared	0.02	0.22
Adjusted R-squared	0.01	0.18
F-stat (p-value)	2.76 (0.10)	5.25 (0.0003)
Residual Standard Error	21.13	19.5

Standard errors in parentheses unless otherwise noted, \*\*\* represents a 99% confidence level, \*\* represents a 95% confidence level, \* represents a 90% confidence level.

We next examine the change in bank concentration in a panel regression framework in which the change in C3 is measured in Year 1, 2, 3, 4, and 5+. Table 5 shows the results of these regressions and it should be noted that country fixed effect were employed.

Virtually none of the coefficients on One Year after change, Two Years after change, ..., Five or more Years after change are statistically significant. Only the coefficient Four Years after change is mildly significant in Panel Regression I. But this coefficient is no longer significant in panel Regressions II and III when the variables included in the regression are altered. In fact, these coefficients for changes to banking concentration *after* shifts to positive data sharing actually change signs from Regressions I to II and III. Likewise, the coefficients on changes in banking concentration *prior* to credit sharing reforms are also not significant.

Similar results are found when using C5, the market share of the *five* largest banks, indicating the particular definition of banking concentration is not likely important here. See table A2 in the appendix for these results. Table A3 in the appendix shows panel regression results using another dependent variable, the Lerner Index (World Bank calculations). This measures the degree of market power in the banking sector. It compares prices to marginal costs to measure the degree of markup. This is created by estimating marginal cost using a translog cost function and prices are produced using total bank revenue divided by assets. The functional form is  $(P-MC)/P$ . The index ranges between 0 (no market power) and 1 (maximum market power). Hence, the Lerner Index results speak beyond simply market concentration and more to profitability and overall market power. Here again, no meaningful, statistically significant impact on the Lerner index is found in the

years following the shift to full-file credit sharing for those countries that went through such a transition (and no impact prior to the change).

Therefore, the results indicate no significant change in concentration or market power before or after the change to full-file reporting. This is the case whether or not variables for credit coverage or per capita income are included and controlled for. *We therefore conclude that no statistically significant evidence of a decline in banking concentration or market power is found following a country's shift to sharing full-file credit information.* In fact, the relevant coefficients are also not practically significant (large). Looking over Figures 1, 2 and 3 and Tables 4 and 5 one finds little to suggest that banking concentration declines to any significant degree given a shift to full-file credit sharing. Figures on individual country-level changes found in the appendix show no clear pattern of changes in banking concentration before of after shifts to full-file credit sharing.



**Table 5: Panel Regression of Banking Concentration (country Fixed Effects)**

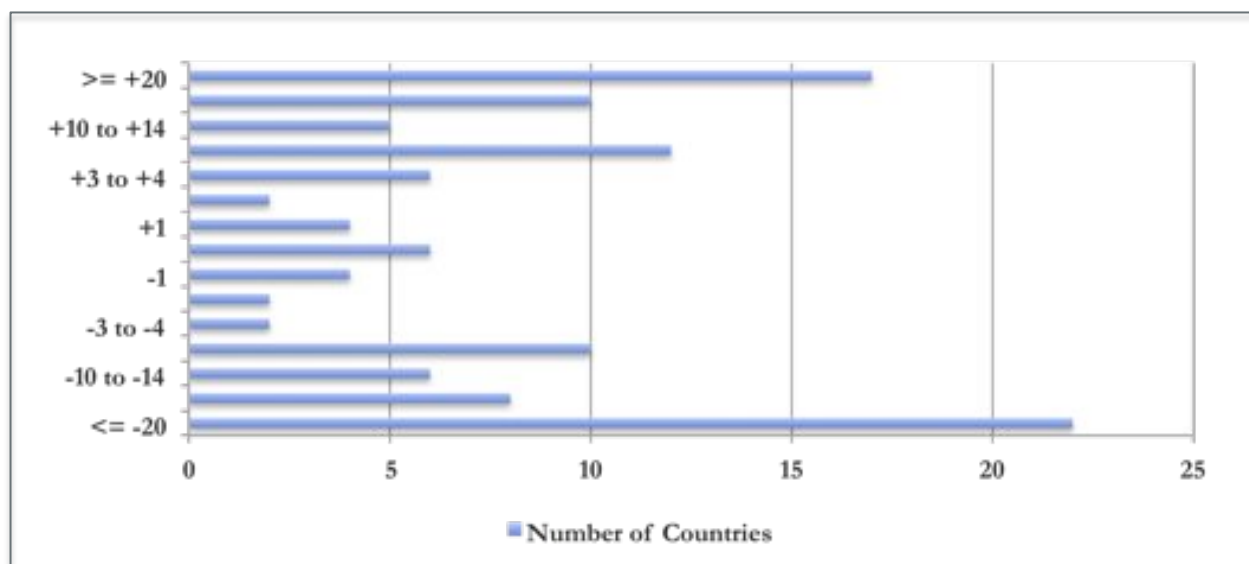
Variables	I	II	III
Five or more years before change		2.04 (2.31)	-1.60 (1.90)
Four years before change		-1.86 (2.13)	-0.01 (1.59)
Three years before change		-2.02 (1.89)	-0.60 (1.43)
Two years before change		-2.21 (1.76)	-1.44 (1.31)
One year before change		-2.17 (1.68)	-1.18 (1.25)
One year after change	-2.72 (1.68)	0.12 (1.70)	-0.02 (1.27)
Two years after change	-1.54 (1.80)	1.59 (1.75)	0.88 (1.33)
Three years after change	-2.13 (1.95)	2.73 (1.83)	1.59 (1.39)
Four years after change	-4.05 * (2.38)	1.79 (2.15)	0.08 (1.62)
Five or more years after change	-2.91 (2.00)	2.35 (2.31)	0.52 (1.76)
Year 2005			-1.32 (0.78)

Variables	I	II	III
Year 2006			-1.05 (0.81)
Year 2007			-0.32 (0.87)
Year 2008			-0.02 (0.92)
Year 2009			-0.84 (0.92)
Year 2010			-0.51 (0.98)
Year 2011			2.22 (1.07)
Private Credit Bureau Coverage		0.00 (0.02)	-0.02 (0.02)
Public registry coverage		-0.03 (0.04)	-0.02 (0.03)
Log of Per Capita GDP		-19.75 (2.99)	-13.13 (2.82)
R-Squared	<0.01	0.07	0.06
Adjusted R-squared	<0.01	0.05	0.05
F-stat	1.42 (0.21)	4.74 (0.00)	2.60 (0.00)

Standard errors in parentheses unless otherwise noted, \*\*\* represents a 99% confidence level, \*\* represents a 95% confidence level, \* represents a 90% confidence level.

**Figure 4: Percentage Point Change in Banking Concentration between 1997 and 2011 for 116 Countries**



Finally, Figure 4 presents a distribution of changes in the share of assets held by the top three banks (C3) across 116 countries over the period 1997 and 2011. As opposed to the small *average* changes in C3 associated with a shift to full-file sharing seen thus far, C3 actually witnesses large changes in general. About a third of countries saw a 20 percentage point or greater increase or decrease in concentration. Approximately, half saw a 15 percentage point or greater increase or decrease, and over three-quarters saw a change of 5 percentage points or greater. Thus, large changes in C3 do occur, but this is due to factors other than shifts to full-file credit reporting. And, so, even if there was a small shift (of a few percentage points) relating to a shift to full-file credit sharing, this would be drowned out by these other, apparently dominating, factors. Figure 4 also demonstrates that that change in the structure of the lending market is likely to occur regardless of shifts to full-file credit sharing. That is, change appears to be difficult to avoid.



## V. Case Study: Hong Kong

Hong Kong presents an interesting case study: as credit reporting was implemented, the banking sector became very concentrated. Moreover, barriers to entry were low in Hong Kong. That is, Hong Kong implemented credit-reporting reform in a lending environment not favorable to doing so voluntarily. Moreover, in terms of sequence, Hong Kong represents the case where competition increased significantly following the introduction of full-file reporting, which is not to imply that there is a causal relationship. But as it is a case that conforms to common banking sector fears of full-file reporting, a closer examination is warranted.

Full-file reporting was introduced into Hong Kong in 2004 on the heels of credit card default crisis. The banking sector had undergone considerable consolidation in the years before, with the largest three banks going from accounting for 48.1% of the consumer credit market in 1997 to 86.6% in 2003, on the eve of credit reporting reform. (The C5 likewise increased from 73.8% to 90.1% in the same period.)

Credit reporting reform in Hong Kong, while not mandated by law, was nonetheless encouraged by regulators. After the Asian financial crisis, weak corporate loan demand and loose monetary policy designed to stimulate the economy resulted in high liquidity in the banking system in much of the region. Loans as a share of deposits fell sharply, and banks were under pressure to tap previously untapped consumer credit markets.<sup>44</sup>

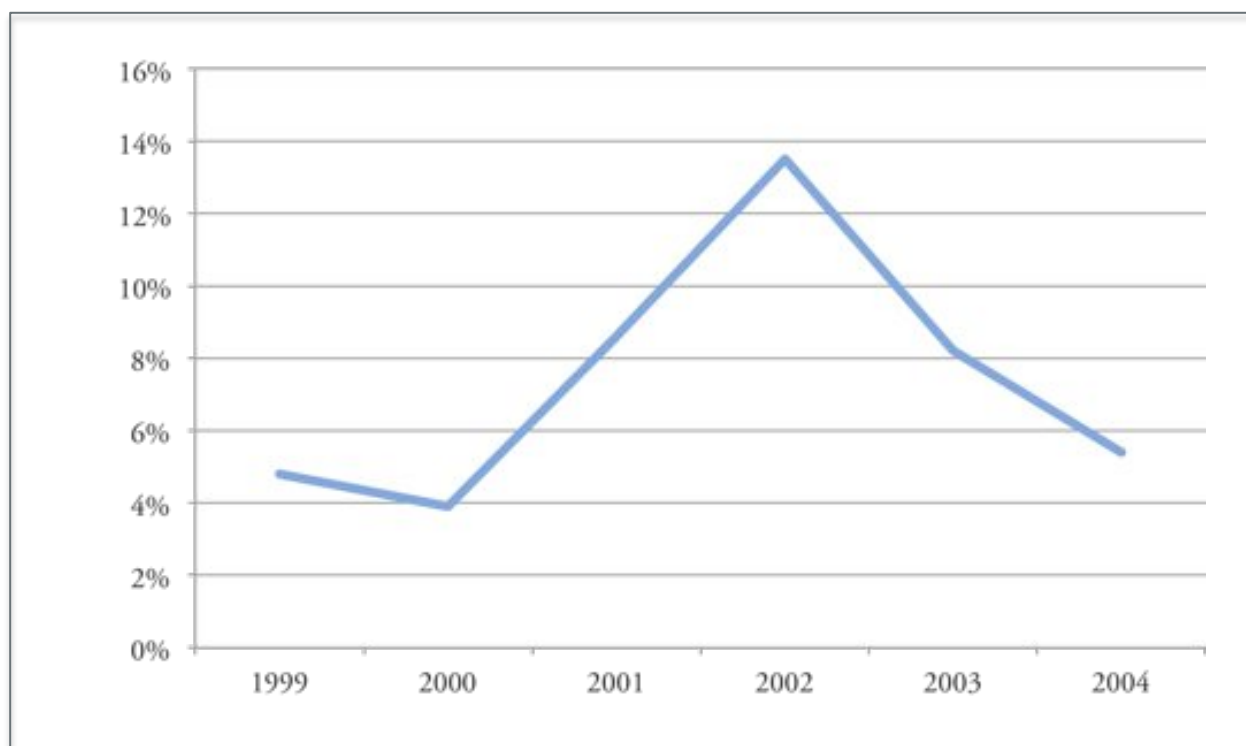
<sup>44</sup> Tae Soo Kang and Guonan Ma. "Recent episodes of credit card distress in Asia." BIS Quarterly Review, 2007, [http://www.bis.org/publ/qtrpdf/r\\_qt0706g.pdf](http://www.bis.org/publ/qtrpdf/r_qt0706g.pdf)

A boom in credit card lending and the availability of revolving credit led to a rapid growth in credit card debt. Advances on credit cards grew at a rate of 16% per annum between 1998 and 2001.<sup>45</sup> The number of credit cards in circulation grew by approximately 60%.<sup>46</sup> A handful of foreign issuers entered the credit card market through direct marketing, exacerbating the dilemma.

The credit card crisis was attributed in large part by regulators and observers alike to rising liquidity, new entrants, and also in part to a

limited credit-reporting infrastructure. Credit reporting was limited both in terms of coverage and the types of data collected. Given the combination of an economic environment with low corporate demand, high liquidity, and poor information sharing, the development of an unstable credit boom fueled by poor underwriting was predictable and rising delinquencies followed. Impaired card assets accounted for approximately 14% of the portfolio in 2002, remaining high until 2004.<sup>47</sup>

Figure 5: Credit Card Charge off Ratio, Hong Kong, 199-2004<sup>48</sup>



<sup>45</sup> Ibid

<sup>46</sup> Ibid

<sup>47</sup> He, D, E Yao and K Li (2005): “The growth of consumer credit in Asia,” Hong Kong Monetary Authority Quarterly Bulletin, March, pp 13–21. Table 8, p. 17; <http://www.hkma.gov.hk/media/eng/publication-and-research/quarterly-bulletin/qb200503/fa2.pdf>

<sup>48</sup> Tae Soo Kang and Guonan Ma. “Recent episodes of credit card distress in Asia.” BIS Quarterly Review, 2007, [http://www.bis.org/publ/qtrpdf/r\\_qt0706g.pdf](http://www.bis.org/publ/qtrpdf/r_qt0706g.pdf) p. 20



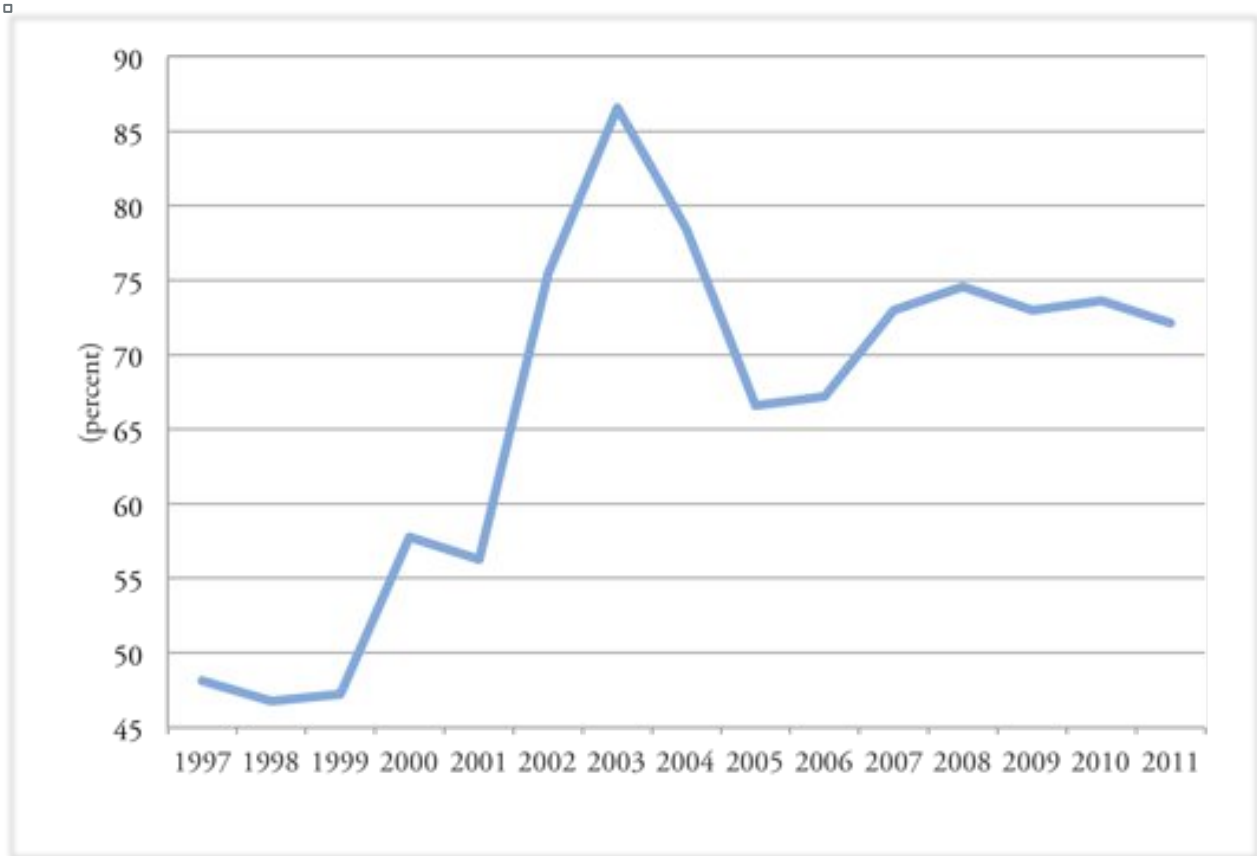
Regulators enacted a series of reforms including full-file reporting, as the sharp rise in credit card delinquencies and defaults in 2001 and 2002 underscored the importance of positive credit data in credit reports. The push came not simply from regulators but many other stakeholders—the Hong Kong Association of Banks, the Deposit Taking Companies Association, the Licensed Money Lenders Association, and the Finance Houses Association—submitted a proposal for full-file reporting. It is worth noting that, consistent

with the hypotheses given a highly concentrated sector, the proposal submitted by the lending industry excluded mortgage information sharing.

Credit card delinquencies and defaults stabilized after 2005.

It is in this context that we should evaluate banking sector competition and the impact of credit reporting on the market. The following chart shows the C3 for the period 1997-2011.<sup>49</sup>

**Figure 6: Bank Concentration for Hong Kong**



<sup>49</sup> Federal Reserve Economic Data, “Bank Concentration for Hong Kong (DDOI01HKA156NWDB).” <http://research.stlouisfed.org/fred2/series/DDOI01HKA156NWDB>

Against the backdrop of this trend, we see how some observers draw a correlation between banking competition and credit reporting. However, the timing is off. Banking competition increases drastically (with nearly a 10 percentage point fall in the C3) before the implementation of full-file reporting.

Prior to the crisis, the Hong Kong Monetary Authority (HKMA) worried that the banking sector was among the most concentrated in developed markets. The top three banks accounted for over 50% of customer deposits in almost half of domestic loans. While there were many banks in Hong Kong, a medium-sized local bank accounted for on average less than 3% of total customer deposits or less.<sup>50</sup>

After 1998, the HKMA, concerned about concentration in the market, began a reform agenda designed to increase competition. The years following did witness increased concentration as a wave of mergers took place, which explains the sharp rise in banking concentration between 2001 and 2003.<sup>51</sup> Despite consolidation in the industry, a number of other reforms increased competition in the market.<sup>52</sup>

In particular, several measures of market liberalization were implemented. Interest Rate Rules were deregulated in 2001, making deposit rates determined by competitive forces. Restricted license banks were given access to the Real Time Gross Settlement System in 1999, branch restrictions for foreign banks was removed in 2001. Market entry criteria were also relaxed in 2002 to attract more providers.

The spate of mergers distorted the trend line for market competition, presenting an image of increased competition following the merger peak. What is interesting to note is that from 1998—that is from before the advent of full-file reporting and the advent of greater liberalization in market entry rules—to the present, the C3 increased until stabilizing around 72% (the C5 stabilized around 81%).

If we consider the beginning concern of regulators, namely that the sector was too concentrated in the hands of three lenders, neither credit reporting nor, more importantly, easier market entry have altered market shares. In fact, if anything appears to have affected aggregate statistics, it is the spate of mergers, and their share of the market at the peak of

<sup>50</sup> See David Carse, “The banking industry: competition, consolidation and systemic stability: the Hong Kong experience.” 2001, vol. 04, pp 71-74. [Bank for International Settlements. http://www.bis.org/publ/bppdf/bispap04f.pdf](http://www.bis.org/publ/bppdf/bispap04f.pdf)

<sup>51</sup> In 2000, Standard Chartered Bank acquired Chase Manhattan’s credit card and retail bank divisions and the Industrial and Commercial Bank of China purchased Union Bank of Hong Kong. The following year saw the merger of Bank of East Asia and United Chinese Bank. 2001 also saw the merger of the ten member banks of the Bank of China Group: Bank of China, China and South Sea Bank, China State Bank, Hua Chiao Commercial Bank, Kincheng Banking Corporation, Kwangtung Provincial Bank, National Commercial Bank, Po Sang Bank, Sin Hua Bank, and Yien Yieh Commercial Bank. In the same year, Fuji Bank, The Dai-ichi Kangyo Bank and the Industrial Bank of Japan merged, as did the Development Bank of Singapore and Dao Heng Bank. In 2002, Bank of East Asia purchased First Pacific Bank. CITIC Ka Wah Bank also purchased the Hong Kong Chinese Bank. In 2003, DBS Kwong On Bank, Dao Heng Bank and Overseas Trust Bank all merged into DBS Bank (Hong Kong) Ltd. Guorong Jiang, Jim Wong, Nancy Tang and Angela Sze, “Banking Sector Competition In Hong Kong --Measurement And Evolution Over Time.” p. 5. Table 1. Hong Kong Monetary Authority, 30 April 2004. <http://www.hkma.gov.hk/media/eng/publication-and-research/research/working-papers/pre2007/RM04-2004.pdf>

<sup>52</sup> Guorong Jiang, Jim Wong, Nancy Tang and Angela Sze, “Banking Sector Competition In Hong Kong -- Measurement And Evolution Over Time.” p. 2. Hong Kong Monetary Authority, 30 April 2004. <http://www.hkma.gov.hk/media/eng/publication-and-research/research/working-papers/pre2007/RM04-2004.pdf>



concentration itself appears skewed by the lending boom in consumer credit owing to loose monetary policy and sluggish corporate credit demand.

But in this light, these results are at odds with intuition about the determinants of market structure. Easier entry rules should impact market structure as new lenders enter. Of course in reality, if existing players are sufficiently efficient and there are no rents, or if Red Queen (running faster to stay in the same place) effects are in play, we would not necessarily expect changes in market concentration, measured by C3 (or a Lerner Index). Moreover, there is little evidence that incumbents have been dislodged.

Owing to the coincidence of credit reporting reform and market upheaval, Hong Kong is a case that is thought to show how credit reporting disrupts the competitive position of lenders, as opposed to making lending more efficient across the sector. But a closer look shows that this inference is mistaken, and it is instead an instance of the fallacy known as *post hoc ergo propter hoc*—basically the conclusion that since one event *followed* another event, the second event must have been *caused* by the first. Both the details of the Hong Kong experience, and the statistical analysis above, leave plenty of reason to reject that conclusion.

## VI. Conclusion

The main analysis of this paper finds no evidence that banking concentration declines due to a shift to full-file credit reporting. This finding also holds for subsets of countries that vary by the strength of barriers to entry and for subsets that vary by strength of barriers to entry by foreign banks. The small changes in the average or median banking concentration rate that were found following a transition to full-file credit reporting (of a few percentage points) did not survive statistical tests that accounted for other factors and were not statistically significant.

Panel regression results found no meaningful statistically significant decline in banking concentration in the years (1,2,3,4,5+) *following* a shift to full-file credit sharing. The impact five years following the shift is about a 2-percentage point decline in bank concentration, but again this is not statistically significant and many countries even saw increases in concentration.

It appears that changes in banking concentration over the 1997 to 2011 period for countries that transitioned to full-file credit reporting from either no reporting or negative-only reporting may be due to other factors, such as changes in banking sector regulation. Furthermore, this study was unable to assess the impact of information technology, which played a considerable role in reshaping the sector in the period we examined.

It should be stressed that banking concentration does in fact change considerably in this period for both the countries that implemented full-file reporting as well as for the ones that did not. About a third of countries saw a 20 percentage point or greater increase or decrease in concentration. Approximately, half saw a 15 percentage point

or greater increase or decrease, and over three-quarters saw a change of 5 percentage points or greater. Such changes result from a long list of factors. To the extent that full-file credit sharing might be one component in changing bank concentrations, it appears it would be small and overwhelmed by other factors.

Even if we want to keep open the possibility that full-file sharing does in some measure attribute to the average 2 percentage point decline in concentration, evidence strongly suggests that this is offset by an expansion of private sector lending. Analyses also show that private credit bureaus increase private sector lending; economies with a private credit bureau are associated with higher rates of lending, by 24 to 40 percentage points. And for economies that shift to full-file sharing, the boost to private sector lending is 16 percentage points from Year 5 following the transition onward. These results are consistent with past findings regarding credit reporting and private sector lending. Combined, these results also imply that changes in market share *may not stem from the ‘poaching’ of existing borrowers but rather the extension of loans to new, often first time borrowers.*

Taken together, the primary findings are that:

- Shifts to full-file credit reporting are not associated with meaningful declines in bank concentration/market power;
- The landscape of banking markets is such that, generally, large changes in banking concentration are seen over a 14 year period, due to many factors; and
- Shifts to full-file credit reporting, credit bureau coverage, and the presence of private credit bureaus are associated with meaningful increases in private sector lending.

The questions for many will be: *why are the*

*changes in market share negligibly related to full-file information sharing?* After all, intuition and practice would suggest that information should allow lenders to “poach” each other’s clients.

There are three possible reasons why the changes in market share are on average negligibly related to full-file reporting.

- *First*, lenders all adapt to the new environment helping keep their relative shares of the market. The transition to full-file data sharing usually takes years (from planning to full implementation with years of data on file). Consequently, there is time to acclimate during the transition and the transition itself may not be as radical as feared by lenders. Furthermore, value added service providers in the information sector emerge to provide the sector, and not simply one or two lenders, new products and new strategies to remain cutting edge in the market. It is certainly the case that in economies with full-file credit sharing, banks have strategies to retain their profitable customers that can be emulated by banks in markets transitioning to full-file sharing.
- *Second*, almost all transitions to full-file reporting exclude prescreening or prospective marketing based on credit report profiles. Such access to credit report information *to find* customers is necessary for any market strategy based on ‘poaching’ the best customers. Without such access search costs remain essentially what they were in the pre-full-file environment.
- *And third* and perhaps most important, as efficiencies in lending expand, lenders can focus on unmet credit demand in the market instead of reallocating the existing customer base. Both observation and analysis show that these new markets are

larger, and they also suggest that these markets may be more profitable than securing another lender's existing clients.

It should be noted that each of these mitigating features are part and parcel of the full-file information sharing system. Bureaus are the ones eager and ready to help lenders make the most use of the new system. These full-file frameworks (apart from a small number of economies) are also structured to prohibit any use of the data for prospective marketing, usually as a condition of sharing data. And finally, the data actual produces other, larger profit opportunities. In considering the full-file system, lenders largely overlook these countervailing features, the ones that work against 'poaching'. In so doing, they overlook the possibility that the sector as a whole and each lender, as constituent parts, stand to profit more by participating in the full-file system than by not participating.

# Appendix: Additional Results

Table A1: Linear Regression: C5 2011- C5 1997

Variable	I	II
Intercept	4.38 * (2.36 )	-24.24 * (13.47)
Change to Full-file Indicator	-8.02 ** (3.84 )	-2.89 (4.46 )
Per Capita income in 1997		3.17 ** (1.49)
Change in per capita income		-12.50 (8.41)
Dummy Entry Barrier		-0.06 (4.1 )
Dummy Foreign Banks Barrier		5.92 (4.60 )
Multiple R-Squared	0.05	0.19
Adjusted R-squared	0.03	0.14
F-stat (p-value)	4.35 (0.04 )	3.82 (0.004 )
Residual Standard Error	17.96	17.12

Standard errors in parentheses unless otherwise noted, \*\*\* represents a 99% confidence level, \*\* represents a 95% confidence level, \* represents a 90% confidence level.

Table A2: Panel Regression of C5 (country Fixed Effects)

Variables	I	II	III
Five or more years before change		-1.44e+00 (1.89e+00)	-1.60 (1.90)
Four years before change		-5.03e-02 (1.59e+00)	-0.01 (1.59)
Three years before change		-6.58e-01 (1.43e+00)	-0.59 (1.43)
Two years before change		-1.67e+00 (1.32e+00)	1.44 (1.31)
One year before change		-1.34e+00 (1.26e+00)	-1.18 (1.25)
One year after change	-1.78 (1.37)	-1.67e-02 (1.28e+00)	-0.02 (1.27)
Two Years after change	-1.63 (1.49)	8.91e-01 (1.34e+00)	0.88 (1.33)
Three Years after change	-1.85 (1.59)	2.15e+00 (1.39e+00)	1.59 (1.39)
Four Years after change	-3.53 (1.91)	8.26e-01 (1.61e+00)	0.08 (1.62)
Five or more Years after change	-2.29 (1.61)	1.31e+00 (1.74e+00)	0.52 (1.76)
Year 2005			-1.32 * (0.78)
Year 2006			-1.05 (0.81)
Year 2007			-0.32 (0.87)
Year 2008			-0.02 (0.92)
Year 2009			-0.84 (0.92)
Year 2010			-0.51 (0.98)
Year 2011			2.22 ** (1.07)
Private Credit Bureau Coverage		1.37e-04 (1.98e-02)	-0.02 (0.020)
Public registry coverage		5.23e-03 (3.33e-02)	-0.02 (0.03)
Log of Per Capita GDP		-1.04e+01 (2.3e+00)	-13.13 *** (2.82)
R-Squared	0.004	0.03	0.07
Adjusted R-squared	0.004	0.03	0.05
F-stat	1.43	1.97	2.60
p-value	(0.21)	(0.02)	(0.00016)

Standard errors in parentheses unless otherwise noted, \*\*\* represents a 99% confidence level, \*\* represents a 95% confidence level, \* represents a 90% confidence level.

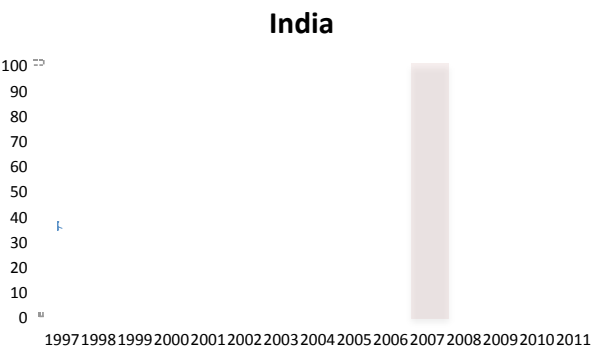
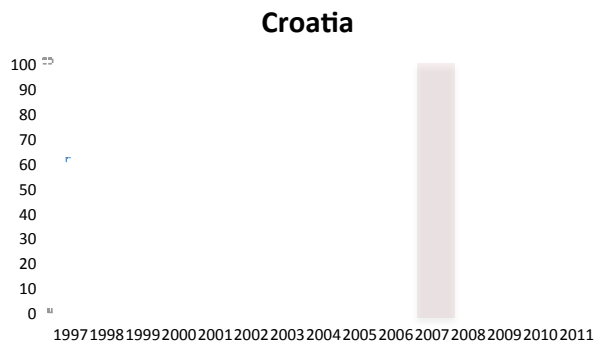
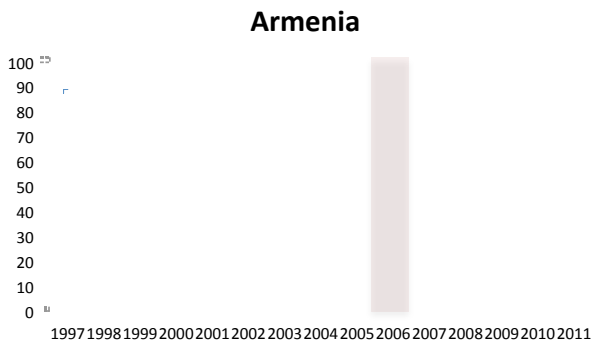
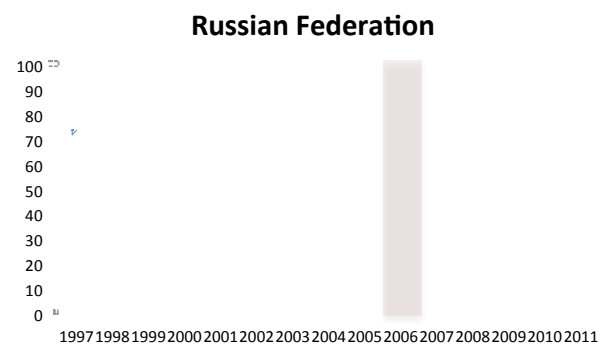
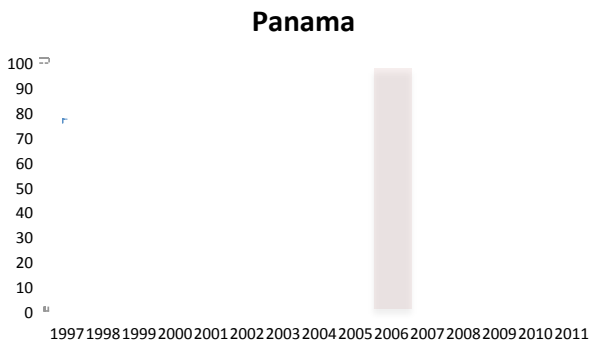
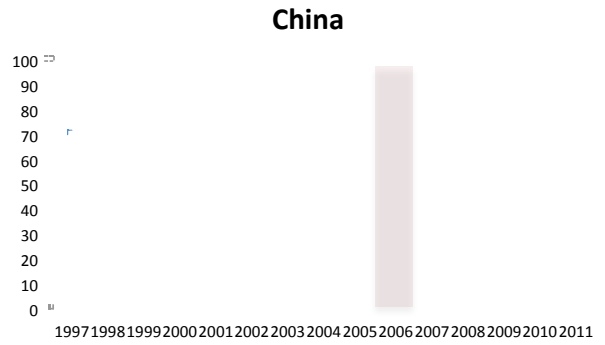
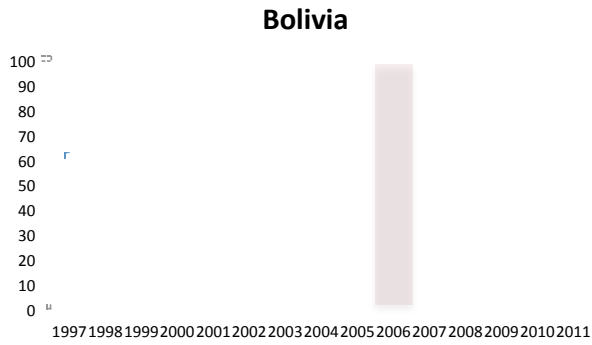
Table A3: Panel Regression of Lerner Index (country Fixed Effects)

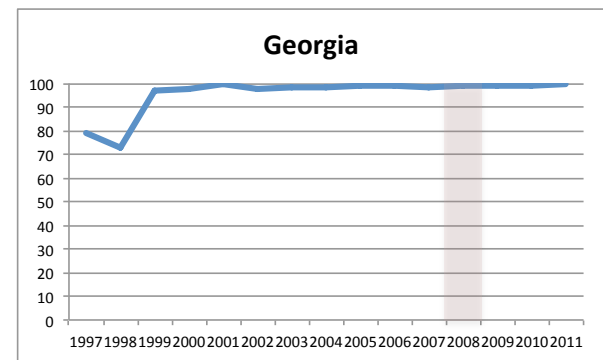
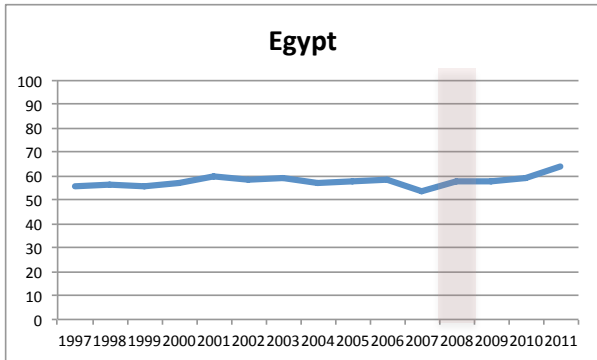
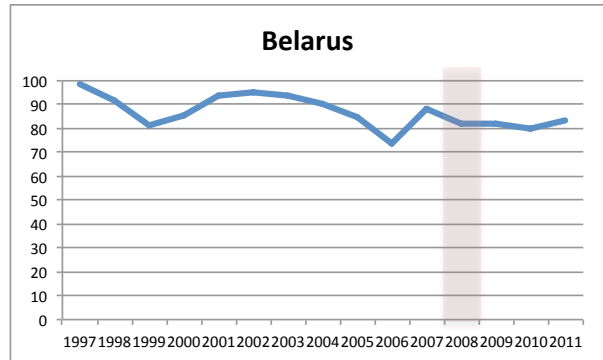
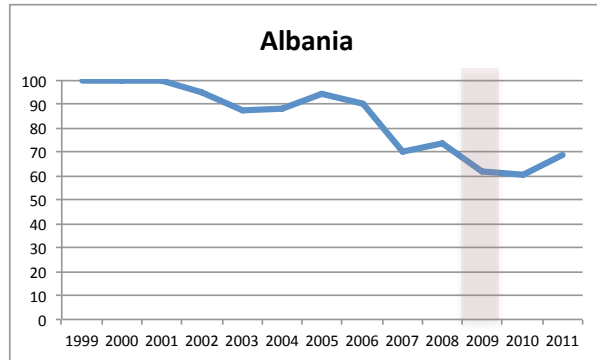
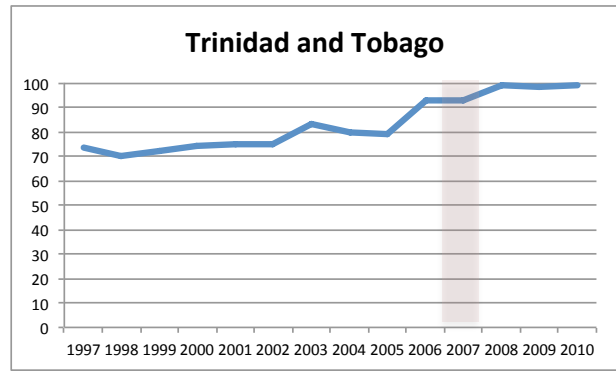
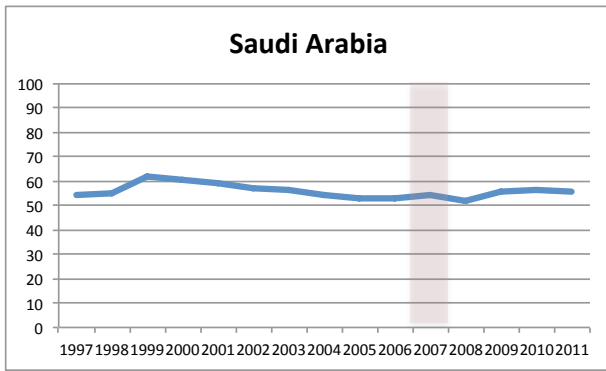
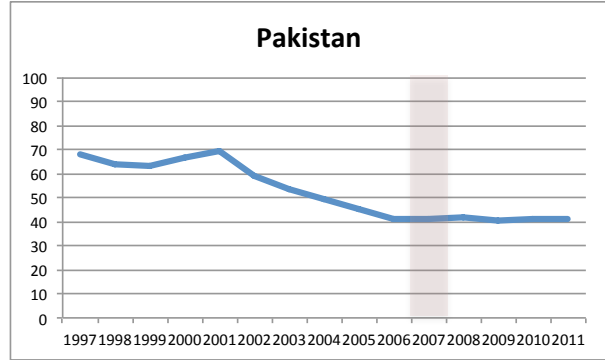
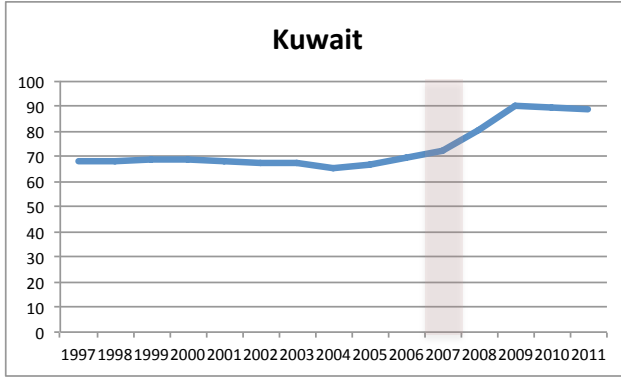
Variables	I	II	III
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Four years before change		0.03 (0.02)	0.02 (0.02)
Three years before change		0.02 (0.02)	0.02 (0.02)
Two years before change		0.02 (0.02)	0.02 (0.01)
One year before change		-0.0001 (0.015)	-0.001 (0.014)
One year after change	0.01 (0.02)	-0.02 (0.016)	-0.015 (0.015)
Two Years after change	0.03 (0.02)	-0.003 (0.02)	-0.005 (0.016)
Three Years after change	0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)
Four Years after change	0.02 (0.03)	-0.03 (0.02)	-0.03 (0.02)
Five or more Years after change	0.06 (0.03)	-0.001 (0.024)	-0.01 (0.02)
Year 2005			0.006 (0.008)
Year 2006			0.007 (0.009)
Year 2007			-0.003 (0.010)
Year 2008			-0.03 *** (0.01)
Year 2009			-0.01 (0.01)
Year 2010			0.004 (0.01)
Year 2011		-0.0003 (0.0003)	-0.0001 (0.0003)
Private Credit Bureau Coverage		0.0003 (0.0005)	0.0002 (0.0005)
Public registry coverage		0.02 (0.02)	0.06 (0.03)
Log of PC GDP	< 0.01	0.03	0.07
R-Squared	< 0.01	0.02	0.06
Adjusted R-squared	1.26 (0.28)	1.34 (0.18)	2.45 (0.0006)
F-stat p-value		0.041 (0.02)	0.03 (0.02)

Standard errors in parentheses unless otherwise noted, \*\*\* represents a 99% confidence level, \*\* represents a 95% confidence level, \* represents a 90% confidence level.

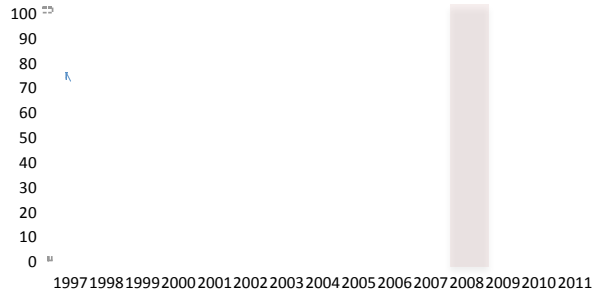


# Three Bank Concentration: Individual Countries

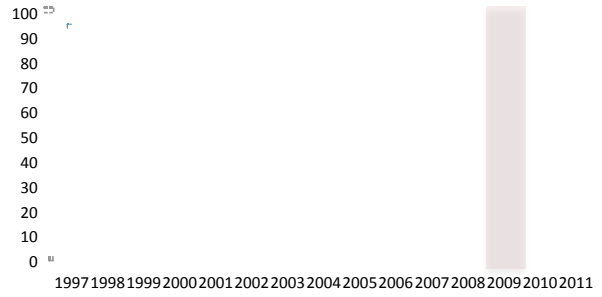




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### Slovak Republic



### Tunisia



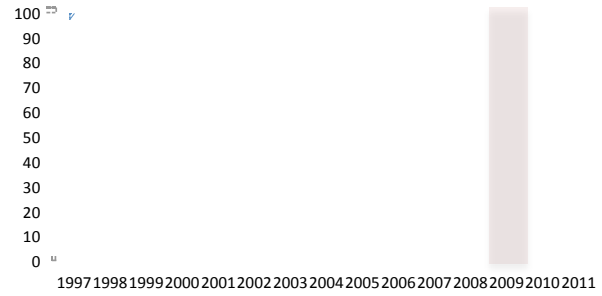
### United Arab Emirates



### Uzbekistan



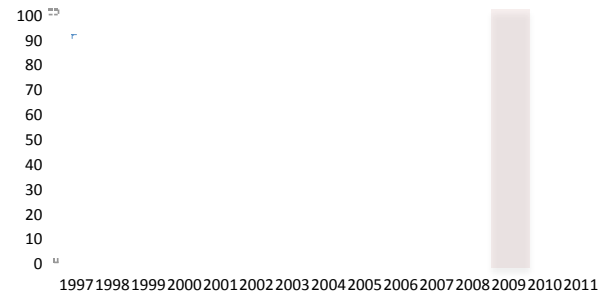
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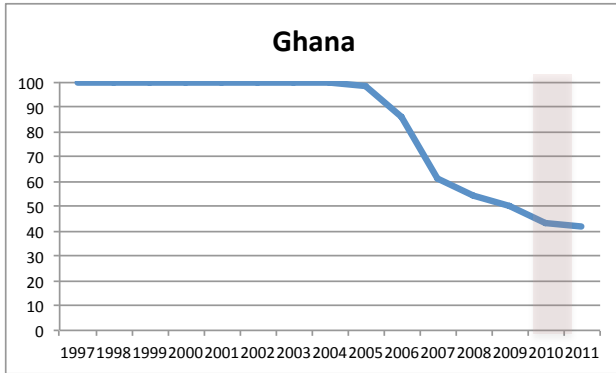
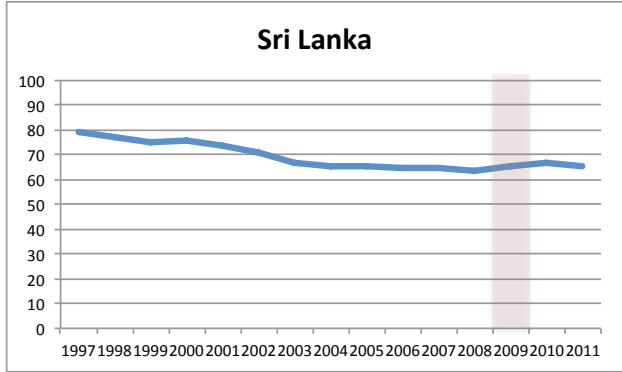
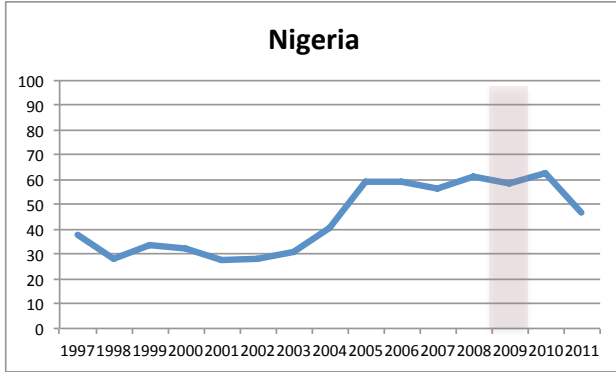
### Latvia



### Morocco



The Impacts of Information Sharing on Competition in Lending Markets





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