

# Creditor Rights and Bank Loan Losses

Amanda Rae Heitz 

*Tulane University Freeman School of Business*  
aheitz@tulane.edu (corresponding author)

Ganapathi Narayanamoorthy

*Tulane University Freeman School of Business*  
gnarayan@tulane.edu

## Abstract

We develop hypotheses regarding the association between two types of creditor rights and bank loan losses. Contrary to prior research conclusions, bank lending risk is negatively associated with both restrictions on reorganization and the secured creditor being paid first. Using accounting disclosures, we develop novel empirical measures of the probability of default (PD) and loss given default (LGD) at the loan-portfolio level. Different types of creditor rights have differential effects pertaining to PD and LGD and exhibit significant intertemporal variation. We corroborate our cross-country findings using the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) shock to creditor rights.

## I. Introduction

State-mandated creditor rights during bankruptcy protect creditor interests in the event of default and ensure the availability of debt capital. Different countries have chosen to implement different ways to protect creditors (La Porta, Lopez-de Silanes, Shleifer, and Vishny (1998), Djankov, McLiesh, and Shleifer (2007)), and as a result, there is considerable cross-country variation in bankruptcy codes. The consequences of creditor rights for economic growth hinge upon their implications for banking (Levine, Loayza, and Beck (2000), Levine (2005)). Notwithstanding the importance of creditor rights to the banking system, there is limited research

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examining the effect different creditor rights have on bank risk taking. One important article examining this issue is Houston, Lin, Lin, and Ma (2010), which concludes that stronger creditor rights can lead banks to make riskier loans, exacerbating the likelihood of financial crises. However, these conclusions regarding lending are not based on a bank-level examination of the loan portfolio but rather on an empirical proxy for overall bank risk ( $z$ -score). In contrast, in this article, we exploit banks' regulatory disclosures to isolate the loan portfolio and directly investigate the effect of creditor rights on bank lending.

Given that creditors do not share in the upside potential of borrowers' investments, the true measure of risk in lending is the loss in the loan portfolios. Conceptually, the expected loss to a bank from its loan portfolio arises from both the probability of default within the loan portfolio (PD) as well as the losses that occur given a default (LGD).<sup>1</sup> By definition, creditor rights provide lenders with greater protection in the event of borrower default. Consequently, enhanced creditor protection will unequivocally decrease LGD

The effect on PD, however, is more complicated. Borrowers' reduction of risk in the face of increased creditor rights (Acharya, Amihud, and Litov (2011a)) will lead to a reduction in PD. Additionally, stricter creditor rights can disincentivize poorer-quality borrowers from seeking loans, once again leading to lower PD. These borrower-side effects, however, need to be balanced against creditor-side effects, where increased creditor protection will incentivize increased lending, which will, in turn, increase PD. Whether the demand- or supply-side effect dominates is a function of the relative strength of the incentives for each specific creditor rights measure. We examine two different types of rights creditors can have during bankruptcy: secured creditor paid first (SECURED) and restrictions on reorganization (REORG).

We note that these two measures are part of a broader creditor rights index first constructed by La Porta et al. (1998) and extended to 129 countries by Djankov et al. (2007). Besides REORG and SECURED, the index includes no automatic stay on assets during reorganization (NO\_AUTO\_STAY) and management removal during reorganization (MANAGES). Because NO\_AUTO\_STAY and MANAGES are provisions that have relevance only during reorganization, their effects should be subordinate to the effect of REORG, and consequently, we do not anticipate these two measures to have unambiguous impacts independent of REORG on our outcome variables. As such, we focus our hypotheses development on only REORG and SECURED.

SECURED offers differential rights for certain claimants over others. In other words, it pertains to creditors fighting over the carcass of a liquidated firm. A borrower is less likely to worry about how the firm's carcass is divided post-demise. As such, we argue that creditor-side effects will dominate under SECURED, leading to an increase in PD. Given the previous arguments, net risk is uncertain for creditors in countries where the secured creditor is paid first and depends on the relative effects of increased PD and decreased LGD.

<sup>1</sup>The Bank of International Settlements' explanatory note on bottom-up credit-risk modeling explicitly advocates a PD times LGD approach to calculating expected losses as a fraction of total loans (see <https://www.bis.org/bcbs/irbriskweight.pdf>).

With respect to REORG, a firm may choose to default and seek refuge under a reorganization if the bankruptcy code permits it (analogous to Chapter 11 in the United States). In other words, a reorganization offers a firm a second chance at life. If the creditor can impose restrictions on that reorganization process, such refuge becomes more costly for firms. Unlike SECURED, we argue that the borrower has significant incentives to take actions that could affect its ability to continue as a firm. Consequently, we hypothesize that restrictions on reorganization (REORG) will make the firm less likely to default, thereby lowering PD. It is possible that, similar to SECURED, lending to a wider pool of borrowers with REORG can raise PD. However, we hypothesize that the direct mechanical effect of lowering PD should dominate the effect of lending to a wider pool of borrowers. Because REORG is expected to lead to both lower PD and lower LGD, we expect it to unambiguously decrease bank risk in lending.

With respect to bank loan losses, we consider both expected losses and realized losses. We employ the loan loss reserve as our measure of expected losses and adopt a 12-month future horizon to accumulate realized losses within the loan portfolio. We are comfortable interpreting expected and realized losses as joint measures of bank risk in lending, so long as they yield consistent results. Using over 8,700 observations from nearly 2,800 banks headquartered in 97 countries, we find that SECURED and REORG have large negative impacts. A unit increase in SECURED (REORG) is associated with a 0.55% (1.05%)<sup>2</sup> decrease in expected losses in the loan portfolio.<sup>3</sup> SECURED and REORG also have negative associations with future realized losses,<sup>4</sup> reinforcing the finding from expected losses that these two forms of creditor protection are associated with less risky lending overall.<sup>5</sup>

Unlike Houston et al. (2010), our measures of loan losses occur at the bank-year level and allow the use of a panel setting. We exploit this setting to conduct intertemporal analyses by partitioning our sample into the precrisis, crisis, and postcrisis periods. Within the United States, the financial crisis has been attributed to indiscriminate secured lending (subprime lending) in the precrisis period (which overlaps with the sample period in Houston et al.). We hypothesize that such egregious lending, leading to increased PD, will be greater in countries where, similar to the United States, the secured creditor is paid first. Consequently, we predict higher credit losses with SECURED in the precrisis periods and lower losses in the postcrisis period. In contrast, REORG, which we hypothesize leads to both lower PD and lower LGD, should not be subject to such a trend. Consistent with our predictions, when the secured creditor is paid first, banks have increased lending

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<sup>2</sup>To address the potential effect of the correlation between creditor rights measures, we examine the incremental effect of each measure relative to the others in a multiple-regression framework and find results that mirror the separate regressions.

<sup>3</sup>Because the United States is disproportionately represented with 5,656 banks and 22,865 bank-year observations, all having the same measure of creditor rights, we conduct our main tests excluding the United States and discuss how the findings predictably change when the United States is included.

<sup>4</sup>As expected, NO\_AUTO\_STAY and MANAGES do not provide consistent results for expected and realized losses. These results are discussed in detail later in the article.

<sup>5</sup>Although we use a 1-year horizon in our measure of realized losses, the results are robust to a 2-year horizon as well.

risk only during the precrisis years. These results for SECURED are consistent with the findings of Houston et al. REORG, on the other hand, does not exhibit such intertemporal differences.

Our results have implications for the way the literature interprets the lessons from the financial crisis. It is widely accepted that egregious subprime lending was a main driver of the financial crisis in the United States. The only form of creditor protection in the United States has been the secured creditor being paid first. From the negative association between the creditor rights index and loan losses, one could erroneously conclude that lower levels of creditor rights overall were associated with an increased likelihood of the financial crisis. In contrast, our findings show that in precrisis years, the increased worldwide lending risk was specifically driven by a high value of SECURED.

Our hypotheses for the differential effects of individual creditor rights measures rely on their differential implications for PD and LGD. We further test the hypotheses by exploiting additional accounting disclosures provided by banks to create relative empirical measures of PD and LGD. In the United States, since 1983, the U.S. Securities and Exchange Commission (SEC) has required banks to supplement their financial statements with disclosures that include nonperforming loans (NPLs) and past net charge-offs (NCOs).<sup>6</sup>

NPL provides a more timely measure of PD than NCO because the criterion for classifying a loan as an NPL is less stringent than the criterion for charging off a loan (Beaver, Eger, Ryan, and Wolfson (1989), Liu and Ryan (1995) Liu and Ryan (2006)). However, the book value of loans classified as NPLs is a noisy indicator of the future losses because unlike NCO, the protection provided by collateral, which affects LGD, is not considered (Beck and Narayanamoorthy (2013)). Additionally, BankScope has created a measure, unreserved impaired losses (UIL), which is the difference between NPL and loan loss reserves. Subtracting loan loss reserves from NPL dilutes the effect of LGD, creating a more powerful measure of PD. We predict that SECURED, which decreases LGD but increases PD, will have a larger positive impact on UIL relative to NCO. In contrast, REORG, which decreases PD mechanically and has a weaker LGD effect than SECURED, is likely to have a stronger effect on UIL than NCO. Our formal empirical findings, employing the Chow test, confirm these predictions.

Our finding of decreased risk in lending appears contradictory to the conclusions of Houston et al. (2010). However, we note that, unlike this article, Houston et al. do not isolate the loan portfolio or examine loan losses. To address the possibility that the increase in overall bank risk is due to risks in nonlending businesses, we decompose bank return on assets (ROA) into three components: returns due to the interest spread between assets and liabilities, changes in loan loss expectations (loan loss provisions), and a third residual measure that captures profits generated from nonlending businesses. When creditor rights are stronger, we find internally consistent results that the loan portfolio is both cheaper and safer, as evidenced by both decreased net interest revenue (NIR) and decreased loan loss

<sup>6</sup>NCO and NPL are, arguably, the two most important metrics for evaluating loan-portfolio risk (Keeton and Morris (1987)).

provisions.<sup>7</sup> However, nonlending profits increase in creditor rights. The finding of increased nonlending profits outlined previously and the finding of a higher standard deviation of gains from trading and derivatives with increased creditor rights together appear to suggest that nonlending risk increases in creditor rights.

Although bankruptcy code overhauls are rare, occasionally countries implement less extreme adjustments targeting specific loan categories. One such example occurred in the United States in 2005 when the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005 (BAPCPA) was introduced to give creditors more rights pertaining to loans to individuals and sole proprietors. We exploit the implementation of the BAPCPA in the United States to bolster the identification of our results attributing lower credit risks to stronger creditor rights.

Similar to REORG, the act instated a “means test” that made it more difficult for individuals to reorganize under Chapter 7. Creditors realized a higher place in the pecking order for student loans and auto liens, analogous to SECURED. Consistent with our cross-country results of lower losses with both SECURED and REORG, we find that banks experienced lower expected and realized losses in the immediate aftermath of BAPCPA. Because BAPCPA primarily focused on individuals and sole proprietors, we expect its effects to be lower for commercial loan losses than for noncommercial loan losses. Using disaggregated loan loss data on commercial loans, we document that losses on noncommercial loans declined more than losses on commercial loans. A trend comparison yields starkly different effects on losses from these two loan types following the BAPCPA shock.

The literature exploring the effect that creditor rights have on bank risk taking is limited. Our contribution to this important research area is both theoretical and methodological while also providing policy implications. Theoretically, we use the  $PD \times LGD$  framework to showcase how different types of creditor rights affect these two channels differently and have differential effects on bottom-line bank loan losses. Our finding of different effects of the different creditor rights measures calls into question the widespread use of an index aggregating these measures.

Methodologically, we extend the  $PD \times LGD$  framework and use accounting disclosures to develop empirical proxies for PD and LGD at the overall bank-loan-portfolio level. Such proxies can be useful for policy makers and researchers alike to answer other questions pertaining to risk taking within the loan portfolio. Drawing inferences from any international study (including every cross-country study on creditor rights) is subject to causality concerns because of potentially omitted variables as well as endogeneity. We bolster identification by exploiting a natural experiment in the United States surrounding the BAPCPA and provide corroborating findings regarding the effect of creditor rights on bank loan losses.

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<sup>7</sup> Additionally, evidence of lower NIR with enhanced creditor protection addresses the concern that by just focusing on loan losses, we ignore other risks in the loan portfolio, such as interest rate risk (Schrand and Unal (1998)).

## II. Background and Hypothesis

In this section, we first outline the important background articles relating to creditor rights. We then outline the basics of loan loss accounting and discuss the additional accounting risk metrics filed by banks with their regulators.

### A. Creditor Rights Literature

Numerous studies have examined the impact that creditor rights have on capital markets. The theoretical literature has shown that lenders are more likely to give loans when they have the ability to seize collateral, force borrowers to repay their debt, or even remove management, as in Townsend (1979), Aghion and Bolton (1992), and Hart and Moore (1994), (1998).

At the country level, La Porta et al. (1998) empirically document cross-country differences in bankruptcy codes and creditor protections by first constructing the widely used creditor rights index, which is an aggregation of the individual creditor-protection measures. Djankov et al. (2007) extend this panel to 129 countries<sup>8</sup> and show that when creditors are better protected, there is greater credit in an economy, validating one of the principal findings within the theoretical literature.

Empirical studies show that enhanced creditor rights enable lenders to influence borrowers even outside of default (Nini, Smith, and Sufi (2009), Nini et al. (2012)) and positively correlate with instances of bankruptcy (Claessens and Klapper (2005)). Other studies employing the measures can be broadly partitioned into those focusing on the lender side of the loan market and those focusing on the borrower side.

Articles focusing on bank-level data have shown that foreign banks extend more loans when creditors are better protected (Haselmann, Pistor, and Vig (2010)), and this effect is most pronounced for creditor-friendly collateral laws. In countries with weaker creditor rights, banks require more collateral and experience reduced loan recovery rates (Davydenko and Franks (2008)), leading to higher LGD. When creditors are better protected, loan maturities are shorter (Bae and Goyal (2009)), and banks transfer funds to markets with fewer regulations (Houston, Lin, and Ma (2012)).

Creditor-protection rights have also been shown to be associated with cheaper debt (Qian and Strahan (2007)). The debt is likely cheaper because it carries less risk for the lender. In contrast, Houston et al. (2010) argue that creditor rights are associated with increased lending risk because increased creditor protection expands credit access to larger sections of the economy, which can, in turn, spur economic growth. Although expanded lending is certainly possible in regimes with enhanced creditor protection, it is counterintuitive how, in equilibrium, bottom-line bank lending risk would increase, especially given the association with cheaper debt (Qian and Strahan (2007)). A likely explanation could be that the increase in a bank's risk comes from its nonlending activities.

Cole and Turk-Ariss (2018) show that creditors make fewer loans when they are better protected, and this supports the borrower-side empirical findings of

<sup>8</sup>Djankov et al. (2007) utilize the same four components of the creditor rights index, although the values differ slightly.

Acharya et al. (2011a), Acharya, Sundaram, and John (2011b), and Cho, El Ghoul, Guedhami, and Suh (2014), who all show that public firms borrow less when creditors are better protected. These studies suggest that borrowers fear inefficient liquidation and thereby reduce risk. This protection has also been associated with lower innovation (Acharya and Subramanian (2009)) and profitability (Acharya et al. (2011a)). Because there is more credit within economies with greater creditor protection, yet public firms are borrowing less, other studies have shown that private firms borrow more (Brown, Jappelli, and Pagano (2009), Boyd, Hakenes and Heitz (2018)), providing empirical support for the previously mentioned theoretical studies.

Because of the impact that creditor rights have on both bank- and borrower-level risk taking, it is unclear what consequences they will have on losses within the loan portfolio. If creditors increase risks when they are better protected, this can lead to greater losses. However, if the increased creditor-protection measures reduce overall credit risk, it will lead to lower losses in the loan portfolio. The impact of creditor rights on the riskiness of the loan portfolio has not yet been thoroughly examined and is the focus of this article.

We do note that, with few exceptions, most studies focus on the aggregate creditor rights index. The small number of studies that examine components separately also find uniform results across them (Houston et al. (2010), Acharya et al. (2011a), and Cole and Turk-Ariss (2018)). Claessens and Klapper (2005), however, show that not all components of the creditor rights index are uniformly associated with a greater likelihood of bankruptcy. Specifically, one of the measures, no automatic stay on assets (NO\_AUTO\_STAY) behaves differently and is not associated with a higher likelihood of bankruptcy. Although they do not provide a reason for their result, one possible reason could be the increasing tendency for borrowers to transfer collateral to special-purpose vehicles (SPVs) to obtain secured credit. Creditors' interest in the collateral contained within these SPVs is protected from automatic stay during bankruptcy, making NO\_AUTO\_STAY a relatively weaker creditor-protection measure for recent years.<sup>9</sup> We discuss this further in Section IV.G.

## B. Credit-Portfolio Risk and Bank Accounting

In this subsection, we first outline basic loan loss accounting. We then describe the two additional risk metrics that regulators require banks to disclose at the end of each period: nonperforming loans and net charge-offs. We primarily use U.S. regulatory sources to describe these metrics, given our understanding that conceptually, these remain the same across all the countries in our sample.

### 1. Bank Loan Loss Accounting

When a bank makes a loan or a lease, it records an asset called *loan and lease receivable*. At the same time, it also creates a contra-asset called the *allowance for*

<sup>9</sup>Feng, Gramlich, and Gupta (2009) show that within the United States, the percentage of firms using at least one SPV increased from 23% in 1997 to 59% in 2004. Della Groce and Gatti (2014) discuss the existence of a qualitatively similar trend internationally.

*loan and lease losses* (ALLL),<sup>10</sup> which is a reserve it calculates to address the estimated credit risk within the institution's assets. This measure of credit risk represents the charge-offs that will most likely be realized against the bank's operating income over an appropriate future horizon.<sup>11</sup> This reserve (contra-asset) reduces the book value of the bank's asset (loan and lease receivable) to the amount that the institution reasonably expects to collect.

The higher the estimated risk of noncollectable assets in the portfolio, the larger the ALLL reserve should be. ALLL is subject to careful regulatory scrutiny to ensure that the bank has adequate capital to provide a cushion against expected losses. Being a measure of expected losses, any realized loss in a fiscal period depletes this reserve. At the same time, an expense is set aside at the end of each fiscal period as an addition to the allowance. This expense is called the *provision for loan and lease loss* (PLLL)<sup>12</sup> and represents this period's addition to the reserve to cover potential losses from new loans extended during the period, as well as an adjustment for the revised estimate of expected losses for the loans continuing to exist in the loan portfolio.

We employ the loan loss reserve as our measure of expected losses and a 12-month future horizon to accumulate realized losses within the loan portfolio. Both these measures have pros and cons when it comes to proxying for lending risk. Expected losses are a better measure because realized losses can differ from ex ante bank risk as a result of ex post changes in economic conditions.<sup>13</sup> However, it is possible that banks mis-assess risks in lending while estimating loan loss reserves. Additionally, they are subject to the limitations of accounting rules and concerns of willful accounting manipulation (Beatty and Liao (2014)), making them potentially less reliable.

## 2. Loan-Portfolio Risk Metrics<sup>14</sup>

In 1980, the Federal Financial Institutions Examination Council (FFIEC) issued the Uniform Credit Classification and Account Management Policy (UCCAMP), requiring banks to classify retail loans based on risk and report charge-offs and delinquent loans privately to bank regulators. Since 1983, the SEC's Industry Guide has required banks to supplement their financial statements with risk-based disclosures, including NPLs and charge-offs. Keeton and Morris (1987) contend that charge-offs and NPLs are the two most important ex ante risk metrics for evaluating both loan-portfolio risk and the adequacy of loan loss allowances and recommend that the metrics be utilized concurrently.

Both NPL classifications and charge-offs are based primarily on the length of time elapsing since borrowers stopped making payments. The relative informativeness of charge-offs and NPLs as risk metrics involves trade-offs between relevance

<sup>10</sup>This is reported in BankScope as the loan loss reserve.

<sup>11</sup>U.S. regulatory guidance, during the time period of our article, requires banks to consider a loss horizon of at least 12 months.

<sup>12</sup>This is reported in BankScope as loan loss provisions.

<sup>13</sup>Basel II explicitly directs the use of expected loss to calculate credit exposure (see <https://www.bis.org/publ/bcbs107.htm>).

<sup>14</sup>For additional details, see Beck and Narayanamoorthy (2013).



and reliability. Because shorter time periods are typically used in classifying loans as NPLs relative to those used for writing off loans as noncollectable (i.e., recording charge-offs), NPLs can be viewed as a more timely indicator of the PD than charge-offs (Liu and Ryan (1995), Liu and Ryan (2006)). NPL, however, is a noisy indicator of the future loss in that it represents the book value of loans that are deemed to be at risk and, thus, can fail to consider the offsetting loss protection provided by collateral. NCO, on the other hand, reflects the actual realized past losses and explicitly takes LGD into account.

### C. Hypothesis Development

Lenders have an asymmetric payoff from investments whose returns are uncertain. Although they have first access to the assets, unlike the residual claimants (shareholders), they do not get a share of the upside from the investment. Consequently, for a lender, the true measure of ex ante risk from a loan is the expectation of the loss that will arise when the borrowers default on the loan. Consistent with the Bank of International Settlements' explanatory note on bottom-up credit-risk modeling, we model loan losses as a product of the PD and the extent of LGD.<sup>15</sup>

SECURED puts the claims of the secured creditors ahead of those of unsecured creditors, such as employees and the government, and will consequently decrease LGD. Similar to SECURED, REORG should improve the creditors' relative bargaining position and protect them from losses in the event of default, thus lowering LGD.<sup>16</sup> With respect to PD, supply-side (bank) and demand-side (borrower) effects lead to opposite implications. Borrowers have been shown to reduce risk in the face of increased creditor rights (Acharya et al. (2011a)). Such reduction of risk will lead to a reduction in PD. Additionally, stricter creditor rights can disincentivize poorer-quality borrowers from seeking loans, once again leading to lower PD. In contrast to these borrower-side effects, increased creditor protection will incentivize increased lending on the creditor side, which will in turn increase PD (Haselmann et al. (2010)). Whether the demand- or supply-side effect dominates is a function of the relative strength of the incentives for each specific creditor rights measure.

SECURED offers differential rights for some claimants over others in the event of liquidation. In other words, it pertains to creditors fighting over the carcass of a liquidated firm. A borrower is less likely to worry about how the firm's carcass

<sup>15</sup>See <https://www.bis.org/bcbs/irbriskweight.pdf>.

<sup>16</sup>If the stronger creditor rights lead to a riskier pool of borrowers (higher PD), then there is a possibility that this could be associated with a higher level of average impairment in the default states, which in turn could lead to an observed increase in the LGD. We, however, consider any scenario of an LGD increase with creditor protection to be unlikely in equilibrium because the point of creditor protection is to ensure that the creditor is better off in the event of default. Thus, if LGD were to increase with a creditor-protection measure, our maintained hypothesis that we have a creditor-protection measure is violated. That being said, we also note that our empirical tests rely on relative measures of PD and LGD. Even in the unlikely event of lending to a wider pool of borrowers causing an increase in LGD, it is likely to affect PD more than LGD.

is divided post-demise. As such, we argue that creditor-side effects will dominate under SECURED, leading to an increase in PD. Given the previous arguments, the net risk for creditors in countries where the secured creditor is paid first, relative to one without such restrictions, is uncertain and depends on the relative effects of increased PD and decreased LGD.

With respect to REORG, a firm may choose to default and seek refuge under a reorganization if the bankruptcy code permits it (analogous to Chapter 11 in the United States). In other words, a reorganization offers a firm a second chance at life. If the creditor can impose restrictions on that reorganization process, such refuge becomes more costly for firms. In contrast to SECURED, we argue that the borrower has significant incentives to take actions that could impact its ability to continue as a firm. Consequently, we hypothesize that restrictions on reorganization (REORG) will make the firm less likely to default, thereby lowering PD. It is possible that, similar to SECURED, lending to a wider pool of borrowers with REORG can raise PD. However, we hypothesize that the direct mechanical effect of lowering PD should dominate any effect due to lending to a wider pool of borrowers. Because REORG is expected to lead to both lower PD and lower LGD, we expect it to unambiguously decrease bank loan losses.

*Hypothesis 1a (alternative).* Risk in lending portfolios, as reflected in loan losses, is lower for lenders in regimes with restrictions on reorganization.

*Hypothesis 1b (null).* Risk in lending portfolios, as reflected in loan losses, is no different for lenders in regimes with and without the secured creditor being paid first.

The hypothesized effects are depicted as follows:

	Summary of Hypothesized Effects		
	<u>PD</u>	<u>LGD</u>	<u>Loan Losses</u>
REORG	–	–	–
SECURED	+	–	?

In **Hypothesis 1**, we argue that the effect of SECURED on lending risk is ambiguous because of differential effects on PD and LGD. In contrast, REORG has similar negative effects on PD and LGD. We investigate these effects further by partitioning the sample into the precrisis, crisis, and postcrisis periods. Recall that a reason SECURED is expected to increase PD is because SECURED can lead to lending to a wider pool of borrowers.

Unchecked secured lending (subprime lending) in the precrisis period has been widely blamed for the financial crisis in the United States, where the secured creditor is paid first. In other words, during the precrisis period in the United States (where SECURED = 1), PD is known to have been high. We hypothesize that other countries where the secured creditor is paid first will exhibit similar egregious lending (with high PD) in the precrisis period. Stated differently, SECURED should

be associated with riskier lending in the precrisis period and less risky lending in the postcrisis period.<sup>17</sup> Conceptually, REORG does not have a direct effect on secured lending across the periods. Because it is expected to unambiguously decrease both PD and LGD, we hypothesize that there will be no divergence in the effect of REORG.

*Hypothesis 2a (null).* Risk in lending portfolios due to restrictions on reorganization does not vary between precrisis and postcrisis periods.

*Hypothesis 2b (alternative).* Risk in lending portfolios due to the secured creditor being paid first is greater in the precrisis period relative to the postcrisis period.

In Section II, we presented two key risk metrics that banks include in their regulatory reporting: NPLs and NCOs. The conditions for classifying a loan as nonperforming are less stringent than those for writing off (a portion of) the loan as a charge-off. For example, depending on the type of the loan, it can be classified as nonperforming if either interest or principal on the loan is overdue for more than 90 days. However, in order to charge off a loan and decide the amount of the charge-off, due consideration is paid to the overall fortunes of the borrower, the presence of collateral, and other factors. In other words, LGD plays a more important role when it comes to deciding NCO relative to NPL. BankScope has created an additional measure, unreserved impaired loans (UIL), which is the difference between NPL and loan loss reserves. Removing loan loss reserves from NPL creates a purer measure of PD because it represents loans that are impaired (high PD) but without a reserve for losses (LGD = 0). These relative empirical measures allow us to directly test our hypothesis regarding the implications of creditor rights for PD and LGD.

We have argued that LGD is unequivocally reduced by enhancing creditor rights, especially SECURED, which reflects the secured creditor being paid ahead of nonsecured creditors, such as employees and the government, and REORG, which reflects the restrictions on reorganization by the borrower. We have hypothesized that SECURED will be associated with an increase in PD, and REORG will be associated with a decrease in PD. If UIL reflects a relatively greater effect of PD and lower effect of LGD than NCO, we expect UIL to have relatively more positive (negative) associations with SECURED (REORG) than NCO. This brings us to Hypothesis 3.

*Hypothesis 3a (alternate).* Relative to NCO, UIL will be more positively associated with SECURED.

*Hypothesis 3b (alternate).* Relative to net charge-offs (NCO), Unreserved Impaired Loans (UIL) will be more negatively associated with REORG.

<sup>17</sup>Note that LGD was also likely higher during the precrisis and crisis periods, but that is not relevant for this hypothesis because ex ante, we still expect LGD in countries with SECURED = 1 to be less than LGD in countries with SECURED = 0.

### III. Data and Variables of Interest

#### A. Bank-Level Variables

The primary data source for our analysis is the 2015 version of BankScope by Bureau Van Dijk, which contains bank-level financial statement data from 2005 to 2014.<sup>18</sup> This comprehensive database accounts for over 90% of banking assets in each country. Our sample consists of 8,397 commercial, savings, and cooperative banks in 97 countries. Because our sample is dominated by U.S. banks, we report bank-level variables of interest with and without the United States in Panels A and B of Table 1, respectively.

In Table 1, we present summary statistics for bank-level variables of interest for our primary sample of 2,741 banks outside the United States. The descriptive statistics for `LOAN_LOSS_RESERVE`, `NET_CHARGE_OFF`, `NONPERFORMING_LOANS`, and `UNRESER_IMPAIRED_LOANS` are consistent with the numbers in the prior literature.<sup>19</sup> Panel B shows the same variables for the full sample of 8,397 banks, including the 5,656 banks headquartered in the United States. Because data provided for U.S. banks are so complete, more data are available for small banks, which explains the differences in `TOTAL_ASSETS` and `TOTAL_LOANS`. Panel B also indicates that once the United States is added to the sample, `LOAN_LOSS_RESERVE`, `ROA`, and `NONPERFORMING_LOANS` all go down, indicating that banks in the United States anticipate lower losses, are less profitable, and have fewer NPLs.

The primary goal of our article is to understand how creditor rights are associated with risk in the loan portfolio. We examine two types of loan losses: expected and realized. The bank manager's ex ante expectation of losses from the loan portfolio is reported as a loan loss reserve, whereas the realized ex post losses are reported as NCOs. We examine both loan loss reserves and NCOs as a percentage of the loan portfolio. Panel A of Table 1 shows that the average bank loan loss reserve is 4.23% of the loan portfolio, indicating that the average bank expects not to collect 4.23% of its loan receivables. The average bank NCO, or realized loss, is 1.04% of the loan portfolio. Once the United States is added to the sample in Panel B, the average loan loss reserve decreases, whereas NCOs increase.

Next, we focus our attention on bank profitability. `ROA`, net income scaled by bank assets, is a bank-level measure of profitability, which isn't necessarily driven by the loan portfolio. We decompose `ROA` into three components: returns based on the spread between assets and liabilities (`NET_INTEREST_REVENUE`); changes in loan loss expectations (`LOAN_LOSS_PROVISIONS`); and a third residual measure that reflects profitability from other bank businesses, such as trading and fees (`OTHER_PROFIT`). BankScope reports `NET_INTEREST_REVENUE`

<sup>18</sup>BankScope data are only available for 10 years. Once the 11th year of data is available, Bureau Van Dijk omits the first year of data. Thus, we are confined to the sample period of 2005–2014 for our analysis.

<sup>19</sup>Note that it is not surprising that `UNRESER_IMPAIRED_LOANS` is negative for a quarter of the observations because for these banks, loan loss reserves exceed nonperforming loans. This is not a problem for our article because Hypothesis 3 only seeks to examine PD relative to LGD, not their direct magnitudes.

TABLE 1  
Descriptive Statistics

Table 1 shows the bank-level (Panels A and B), country-year-level (Panel C), and country-level variables (Panel D) for analysis over the period 2005–2014 for 2,741 banks in 96 countries. Panel E contains quarterly variables for U.S. banks contained in the Bank Regulatory Database. Variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B.

Variable	Mean	Std. Dev.	P25	P50	P75	N
<i>Panel A. Bank-Level Variables Excluding U.S. Banks</i>						
TOTAL_ASSETS (\$millions)	37,162	102,131	642	2,670	15,579	8,701
TOTAL_LOANS (\$millions)	19,372	50,055	378	1,566	9,264	8,701
LOANS_TO_ASSETS	0.6046	0.1604	0.4981	0.6220	0.7216	8,701
LOG_TOTAL_ASSETS (\$millions)	8.1524	2.2207	6.4638	7.8898	9.6537	8,701
LOAN_LOSS_RESERVE	0.0423	0.0448	0.0130	0.0264	0.0522	8,701
NET_CHARGE_OFF	0.0104	0.0186	0.0013	0.0036	0.0100	8,701
NONPERFORMING_LOANS	0.0628	0.0802	0.0152	0.0343	0.0719	8,701
UNRESER_IMPAIRED_LOANS	0.0198	0.0481	-0.0027	0.0083	0.0265	8,701
ROA	0.0073	0.0153	0.0025	0.0071	0.0133	8,701
NET_INTEREST_REVENUE	0.0336	0.0231	0.0197	0.0256	0.0402	8,701
LOAN_LOSS_PROVISIONS	0.0081	0.0131	0.0012	0.0036	0.0093	8,701
OTHER_PROFIT	-0.0114	0.0144	-0.0137	-0.0076	-0.0038	8,701
OTHER_GAIN	0.0023	0.0036	0.0000	0.0012	0.0034	3,624
COMMERCIAL_LOANS	0.4786	0.3455	0.1236	0.4856	0.7833	5,643
MORTGAGES	0.3091	0.2204	0.1113	0.2847	0.4864	3,434
<i>Panel B. Bank-Level Variables Including U.S. Banks</i>						
TOTAL_ASSETS (\$ millions)	12,892	59,979	227	544	1,967	31,566
TOTAL_LOANS (\$millions)	6,916	29,847	147	355	1,243	31,566
LOANS_TO_ASSETS	0.6545	0.1401	0.5749	0.6729	0.7556	31,566
LOG_TOTAL_ASSETS (\$millions)	6.7383	1.8894	5.4250	6.2989	7.5843	31,566
LOAN_LOSS_RESERVE	0.0261	0.0283	0.0121	0.0175	0.0282	31,566
NET_CHARGE_OFF	0.0128	0.0165	0.0030	0.0070	0.0153	31,566
NONPERFORMING_LOANS	0.0482	0.0603	0.0120	0.0283	0.0594	31,566
UNRESER_IMPAIRED_LOANS	0.0219	0.0439	-0.0025	0.0092	0.0316	31,566
ROA	0.0035	0.0159	0.0000	0.0061	0.0108	31,566
NET_INTEREST_REVENUE	0.0345	0.0152	0.0269	0.0330	0.0385	31,566
LOAN_LOSS_PROVISIONS	0.0088	0.0119	0.0018	0.0048	0.0107	31,566
OTHER_PROFIT	-0.0164	0.0129	-0.0211	-0.0141	-0.0087	31,566
OTHER_GAIN	0.0006	0.0022	0.0000	0.0000	0.00017	26,478
<i>Panel C. Country-Year Variables</i>						
INFLATION	0.0508	0.0434	0.0210	0.0397	0.0726	819
LOG_GDP_PER_CAPITA	8.9771	1.4483	7.9395	8.9973	10.3727	819
VOICE	0.2651	0.8631	-0.3300	0.1600	1.0300	819
STABILITY	0.0431	0.8766	-0.5800	0.0900	0.8300	819
EFFECTIVENESS	0.3901	0.9148	-0.3900	0.2200	1.1500	819
REGULATION	0.4633	0.8125	-0.2200	0.3700	1.1200	819
LAW	0.2811	0.9585	-0.5000	0.0900	1.0200	819
CORRUPTION	0.2585	1.0380	-0.5700	-0.0200	1.0500	819
<i>Panel D. Country-Level Variables</i>						
CRIGHTS	2.0412	1.0500	1	2	3	97
REORG	0.3711	0.4856	0	0	1	97
NO_AUTO_STAY	0.4536	0.5004	0	0	1	97
SECURED	0.6907	0.4646	0	1	1	97
MANAGES	0.5258	0.5019	0	1	1	97
ENGLISH	0.3093	0.4646	0	0	1	97
FRENCH	0.4124	0.4948	0	0	1	97
GERMAN	0.1546	0.3634	0	0	0	97
SCANDINAVIAN	0.0412	0.1999	0	0	0	97
SOCIALIST	0.0825	0.2765	0	0	0	97
<i>Panel E. Quarterly U.S. Variables from Bank Regulatory Database</i>						
TOTAL_CHARGE_OFF	0.0007	0.0013	0.0001	0.0003	0.0007	1,4345
TOTAL_ALLOWANCE	0.0127	0.0046	0.0102	0.0120	0.0142	1,4345
POST	0.3643	0.4813	0.0000	0.0000	1.0000	1,4345
LOG_QUARTERLY_ASSETS (\$millions)	13.3249	1.3499	12.4262	13.0012	13.7247	1,4345
COMMERCIAL_LOANS	0.1511	0.0834	0.0893	0.1359	0.1972	1,4345
COMMERCIAL_CHARGE_OFF	0.0012	0.0023	0.0000	0.0002	0.0012	1,4345
NONCOMMERCIAL_CHARGE_OFF	0.0005	0.0012	0.0000	0.0002	0.0006	1,4345

and LOAN\_LOSS\_PROVISIONS, along with a bank-level tax measure (BANK\_TAX\_RATE), which allows us to back out the third component of NET\_INCOME for a bank  $b$  in country  $c$  at time  $t$ , as shown in equation (1):

$$(1) \quad \begin{aligned} \text{NET\_INCOME}_{b,c,t} = & \text{NET\_INTEREST\_REVENUE}_{b,c,t} \\ & \times (1 - \text{BANK\_TAX\_RATE}_{b,c,t}) \\ & - \text{LOAN\_LOSS\_PROVISIONS}_{b,c,t} \\ & \times (1 - \text{BANK\_TAX\_RATE}_{b,c,t}) \\ & + \text{OTHER\_PROFIT}_{b,c,t}. \end{aligned}$$

Consequently, we define OTHER\_PROFIT in equation (2):

$$(2) \quad \begin{aligned} \text{OTHER\_PROFIT}_{b,c,t} = & \text{NET\_INCOME}_{b,c,t} \\ & - \text{NET\_INTEREST\_REVENUE}_{b,c,t} \\ & \times (1 - \text{BANK\_TAX\_RATE}_{b,c,t}) \\ & + \text{LOAN\_LOSS\_PROVISIONS}_{b,c,t} \\ & \times (1 - \text{BANK\_TAX\_RATE}_{b,c,t}). \end{aligned}$$

All components of profitability, NET\_INTEREST\_REVENUE, LOAN\_LOSS\_PROVISIONS, and OTHER\_PROFIT, are scaled by TOTAL\_ASSETS, and all bank-level variables are winsorized at 1% in each tail. All three profitability components have comparable means regardless of whether U.S. banks are included in the sample, as shown in Table 1. Houston et al. (2010) examine 2,363 banks from 66 countries, including the United States, over the period 2000–2007. Even though our sample period only overlaps for 2 years, the sample compositions are similar. Panel B shows that the mean bank in our sample, including the United States, has \$12.89 billion in assets and 4.66% NPL, whereas the mean bank in Houston et al. holds \$12.635 million in assets and has 4.82% NPL. However, the banks in our sample have lower loan loss provisions (.88% compared with 2.402%) and have lower ROA (0.0035 compared with 0.019).<sup>20</sup>

## B. Creditor Rights Variables

Our primary variables of interest are different types of protection creditors have during times of bankruptcy. La Porta et al. (1998) examine four distinct types of rights creditors have (or don't have) during bankruptcy and show that these rights vary across countries. The first type is whether the creditor has to approve a bankruptcy petition or a minimum dividend is required for the debtor to be able to file. The dummy variable REORG is equal to 1 if the bankruptcy code favors creditors with respect to restrictions on reorganization, and 0 otherwise. For the Chapter 11 scenario in the United States, REORG is 0 because firms can reorganize

<sup>20</sup>We note that it is impossible to replicate Houston et al. (2010) because data for their time period are no longer commercially available. Bureau Van Dijk lost access to bank-level data from its data provider in 2016 and discontinued selling the BankScope database in 2016. Even upon request, Bureau Van Dijk was unable to distribute earlier years of data or offer support. To the best of Bureau Van Dijk's knowledge, there is no commercially available comparable database.

without the creditor's consent. `NO_AUTO_STAY` takes a value of 1 if creditors have the ability to seize collateral immediately after the approval of the bankruptcy petition, as opposed to an automatic stay on assets being in place, and 0 otherwise. In some countries, secured creditors rank below other creditors, such as the government and employees. If the secured creditor is paid first during the liquidation process, `SECURED` takes a value of 1, and 0 otherwise. The final type of creditor protection examined is whether management is retained during bankruptcy. If either the court or creditors appoint management to run the firm during the reorganization process, `MANAGES` takes a value of 1, and 0 otherwise.<sup>21</sup> The creditor rights index, `CRIGHTS`, ranges from 0 to 4 and is the summation of the 4 dummy variables. Higher values indicate that creditors have more privileges. Because higher values of `REORG` and `SECURED` unambiguously reflect greater levels of creditor protection, we focus our analysis on these two measures, along with the aggregate index, `CRIGHTS`.<sup>22</sup>

Djankov et al. (2007) provide the most recent estimates for types of creditor rights. The authors show that creditor rights are stable over time and largely a function of legal origin.<sup>23</sup> The most recent creditor rights value from Djankov et al. is from 2003, which is used for our article. The mean column in Panel D of [Table 1](#) depicts the proportion of countries within our sample that have each type of creditor right. The creditor rights index value, `CRIGHTS`, has both a mean and a median of 2, although the types of protection vary significantly across countries. For example, the secured creditor is paid first (`SECURED`) for 70% of the 97 countries within our sample, whereas management removal during reorganization (`MANAGES`) is sufficient for just over half of the countries.<sup>24</sup> Dummies for legal origin are also displayed in Panel D of [Table 1](#). The largest proportion of countries within our sample have French legal origin (41%), whereas considerably fewer have Scandinavian (4%) and Socialist (8%) origin.

### C. Additional Macroeconomic Controls

Panel C of [Table 1](#) shows the country-year control variables of interest, including macroeconomic controls (`INFLATION` and `LOG_GDP_PER_`

<sup>21</sup>It is important to note that `NO_AUTO_STAY` and `MANAGES` are functions of the reorganization process and thus likely have relevance only when `REORG` is 0. We will discuss this in depth later in the article.

<sup>22</sup>We note that there is a parallel literature that examines cross-country differences in collateral laws (Calomiris, Larrain, Liberti, and Sturgess (2017), Degryse, Ioannidou, Liberti, and Sturgess (2016)). These collateral laws are based on the World Bank's Strength of Legal Rights Index. We note that this index has significant overlap with our creditor rights measures. For example, the secured creditor being paid first is the key component of this index. Given the overlap, we cannot control for cross-country differences in collateral laws while trying to draw inferences regarding the effect of creditor rights. Notwithstanding the overlap, based on the evidence in this article, we advocate caution in the use of such indexes because their individual components do not behave in a similar fashion. We add that it is not possible to extract nonoverlapping components from the Strength of Legal Rights Index because these are not publicly available.

<sup>23</sup>One of the findings of Djankov et al. (2007) is that creditor rights are not "converging" to a global optimum. Depending on the type of legal origin, creditors have different protections. Thus, within the context of our article, creditor rights are neither "better" nor "worse." They only differ in strength.

<sup>24</sup>The 97 countries within our sample are listed in [Appendix B](#).

CAPITA) to control for overall economic development. Furthermore, because existing literature has shown that enforcement is an important determinant of rules (Bae and Goyal (2009), Bhattacharya and Daouk (2002), Bhattacharya and Daouk (2009)), we use several time-varying measures to control for enforcement within a country and follow Kaufmann, Kraay, and Mastruzzi (2008) to implement these controls. For each country, these variables are measured annually and include control of corruption (CORRUPTION), government effectiveness (EFFECTIVENESS), government regulation (REGULATION), and rule of law (LAW). Together, these variables control for the time-varying differences in enforcement between countries. We also control for the degree of government authoritarianism, which may affect the functioning of the overall banking system, by including a control (VOICE) that quantifies the degree to which citizens can select their government and free media. Further discussion of the construction of all macroeconomic controls, as well as variables from Kaufmann et al., is in Appendix A.

## IV. Empirical Results

### A. Expected and Realized Loan Losses

First, we examine the impact of creditor rights on the expected losses from the loan portfolio. Here, the dependent variable is loan loss reserves, and the independent variables of interest are the creditor rights measures. Loan loss reserves are ex ante expectations reported by bank managers themselves regarding anticipated future losses for the loan portfolio. We use bank- and macro-level controls and cluster our standard errors at the bank and year level. We also include year fixed effects.<sup>25</sup> Our regression analysis takes the following form, and our results are presented in Table 2:

$$(3) \quad \text{LOAN\_LOSS\_RESERVE}_{b,c,t} = \beta'_1 \text{CRIGHTS}_c + \beta'_2 \text{LOG\_TOTAL\_ASSETS}_{b,c,t} + \beta'_3 \text{MACRO\_CONTROLS}_{c,t} + \varepsilon_{b,c,t}.$$

Subscripts  $b$  and  $c$  indicate bank and country, respectively, in year  $t$ . Macroeconomic controls are detailed in Section III and include log real per capita gross domestic product (GDP) (LOG\_GDP\_PER\_CAPITA), inflation, citizens' voice and accountability (VOICE), government effectiveness (EFFECTIVENESS), government regulation (REGULATION), rule of law (LAW), and control of corruption (CORRUPTION), as defined in Appendix A.

Our panel setting, as compared to Houston et al. (2010), is a strength of our analysis because we are able to examine expected (and later realized) losses directly tied to the formation of the loan portfolio.<sup>26</sup> Although our main tests exclude

<sup>25</sup>Country (or bank) fixed effects are not included because the creditor rights variables do not change over time for a particular country (or bank).

<sup>26</sup>Houston et al. (2010) use one observation per bank by averaging the bank's available annual observations. We, however, note that some banks have observations in the earlier years in our sample, and others have observations in the later years. Thus, averaging the observations for each bank leads to confounding time effects, which can be especially severe because the sample includes the financial crisis years. We explicitly control for such time variation by treating each bank-year observation separately and



TABLE 2  
 Creditor Rights and Loan Loss Reserves

Table 2 reports the ordinary least squares (OLS) regression results where the dependent variable is bank loan loss reserve (LOAN\_LOSS\_RESERVE), defined as the ratio of bank loan loss reserves to total bank loans. Standard errors, in parentheses, are adjusted for cluster effects at the bank and year levels, and year effects are included. The sample contains 2,741 banks in 96 countries, not including the United States, over the period 2005–2014. The creditor rights index (CRIGHTS) is the summation of the dummy variables indicating whether creditors have power over restrictions on reorganization (REORG), there is no automatic stay of assets (NO\_AUTO\_STAY), the secured creditor is paid first (SECURED), or management can be removed during times of bankruptcy (MANAGES). Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Loan Loss Reserves			
	1	2	3	4
CRIGHTS	-0.00181*** (0.000481)			
REORG		-0.0105*** (0.00101)		-0.0100*** (0.00104)
SECURED			-0.00549*** (0.00129)	-0.00424*** (0.00132)
LOG_TOTAL_ASSETS	-0.00198*** (0.000199)	-0.00204*** (0.000198)	-0.00201*** (0.000199)	-0.00207*** (0.000198)
INFLATION	-0.0173 (0.0226)	0.00787 (0.0227)	-0.0354 (0.0225)	0.00164 (0.0229)
LOG_GDP_PER_CAPITA	0.00953*** (0.000781)	0.0125*** (0.000846)	0.00828*** (0.000858)	0.0113*** (0.000963)
VOICE	0.00157 (0.00109)	-0.000686 (0.00106)	0.00239** (0.00102)	-0.000549 (0.00104)
STABILITY	-0.000477 (0.00109)	-0.000416 (0.00108)	-0.000163 (0.00109)	-0.000356 (0.00109)
EFFECTIVENESS	-0.0134*** (0.00262)	-0.0126*** (0.00258)	-0.00911*** (0.00271)	-0.0100*** (0.00269)
REGULATION	-0.00628*** (0.00238)	-0.00809*** (0.00217)	-0.00994*** (0.00221)	-0.00910*** (0.00218)
LAW	0.00822*** (0.00277)	0.0103*** (0.00273)	0.00726*** (0.00273)	0.0102*** (0.00272)
CORRUPTION	-0.0174*** (0.00220)	-0.0205*** (0.00221)	-0.0166*** (0.00219)	-0.0200*** (0.00221)
Year fixed effects	Yes	Yes	Yes	Yes
No. of obs.	8,701	8,701	8,701	8,701
R <sup>2</sup>	0.200	0.207	0.200	0.209

U.S. banks, we discuss robustness to the inclusion of these banks later in the article. Column 1 of Table 2 shows the effect of the aggregate creditor rights measure, CRIGHTS, and columns 2–3 show the effect of REORG and SECURED. Column 4 demonstrates the incremental effect of SECURED and REORG relative to each other.<sup>27</sup>

Columns 2 and 3 of Table 2 indicate that when restrictions on reorganization (REORG) are in place or the secured creditor is paid first (SECURED), this leads to lower loan loss reserves. According to Table 1, the average bank in the sample has loan loss reserves of 4.23%, and when restrictions on reorganization are present, loan loss reserves are decreased by 1%, which is a decrease in loan loss reserves of

including year fixed effects. In robustness tests, we also control for the possibility that our results are driven by countries that have a greater number of banks by removing all countries with more than 100 banks (Germany, France, Norway, and the Russian Federation, in addition to the United States).

<sup>27</sup>Having 97 countries with varying creditor rights measures is sufficient to identify each measure uniquely. The results are unchanged even when we add NO\_AUTO\_STAY and MANAGES in the same regression as REORG and SECURED.

approximately 24%. When the secured creditor is paid first, loan loss reserves decrease by 0.55%, which represents a 13% decrease from the average level of loan loss reserves. This result is both statistically and economically meaningful.

Next, we examine the impact of creditor protection on ex post realized losses in the form of future charge-offs. Because charge-offs are realized losses to the loan portfolio, they are less susceptible to the bank manager's manipulation. Liu and Ryan (2006) argue that there can be some manipulation in charge-offs as well. By using NCOs (charge-offs adjusted for recoveries), we mitigate this manipulation concern. Our analysis takes the form shown in equation (4), and future NCOs are measured over a 1-year horizon, which is the recommended horizon to measure future charge-offs (Altamuro and Beatty (2010), Beck and Narayanamoorthy (2013)). One year is also the period used in current definitions of ALLL provided by the FDIC and is central to the impairment recognition currently favored by the International Accounting Standards Board (IASB). Although our results are robust to using a 24-month horizon instead of a 12-month horizon, we note that longer horizons introduce significant measurement problems because of loan turnover and changing macroeconomic conditions (Harris, Khan, and Nissim (2018)).

$$(4) \quad \text{NET\_CHARGE\_OFF}_{b,c,t+1} = \gamma'_1 \text{CRIGHTS}_c \\ + \gamma'_2 \text{LOG\_TOTAL\_ASSETS}_{b,c,t} \\ + \gamma'_3 \text{MACRO\_CONTROLS}_{c,t} + v_{b,c,t}.$$

Our panel setting is particularly valuable within this regression framework. We can use this time-series variation to examine how the characteristics of the loan portfolio at time  $t$  directly affect future realized losses at time  $t + 1$ . Because we are examining future charge-offs, the number of observations we have for this test is reduced. Here, all 3 creditor rights variables are negative. Similar to Table 2, REORG leads to a 17% decline in future charge-offs, again showing that losses are lower when creditors are better protected. We observe a similar effect when the secured creditor is paid first.

Table 4 shows the results within Tables 2 and 3 for the full BankScope sample, including U.S. banks, which dominate the sample. Similar to Tables 2 and 3, the results suggest that stronger creditor protection, especially when creditors are given restrictions over reorganization (REORG) or paid first (SECURED), leads to lower expected and realized losses. The full BankScope sample has an average loan loss reserve of 2.61% and an NCO of 1.28%. The results in Table 4 show that a 1-unit increase in aggregate CRIGHTS is associated with a 6% increase in loan loss reserves and an 11% decrease in future NCOs. Individually, however, SECURED has the largest impact at 0.77%, which translates to a 30% decrease in realized losses. Similarly, REORG translates to an 8% decrease in future NCOs. Thus, both REORG and SECURED have large impacts that are opposite in sign to the aggregate index.

The future losses presented in columns 5–8 of Table 4 are quantitatively similar to the results presented in Table 3 without U.S. banks. However, there are differences with respect to loan loss reserves. In Table 2, the aggregate creditor rights index showed that enhanced creditor protection was associated with lower losses. However, the opposite is true in column 1 of Table 4. Because the results are

TABLE 3  
Creditor Rights and Realized Losses

Table 3 reports the ordinary least squares (OLS) regression results where the dependent variable is future net charge-off (NET\_CHARGE\_OFF), defined as the ratio of net charge-offs to total bank loans for the next year. Standard errors, in parentheses, are adjusted for cluster effects at the bank and year levels, and year fixed effects are included. The sample contains 2,741 banks in 96 countries, not including the United States, over the period 2005–2014. The creditor rights index (CRIGHTS) is the summation of the dummy variables indicating whether creditors have power over restrictions on reorganization (REORG), there is no automatic stay of assets (NO\_AUTO\_STAY), the secured creditor is paid first (SECURED), or management can be removed during times of bankruptcy (MANAGES). Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Future Net Charge-Offs			
	1	2	3	4
CRIGHTS	-0.000774*** (0.000277)			
REORG		-0.00181*** (0.000570)		-0.00123** (0.000560)
SECURED			-0.00474*** (0.000765)	-0.00455*** (0.000760)
LOG_TOTAL_ASSETS	-0.000988*** (0.000125)	-0.00100*** (0.000124)	-0.00102*** (0.000124)	-0.00102*** (0.000124)
INFLATION	-0.0280** (0.0119)	-0.0260** (0.0121)	-0.0380*** (0.0117)	-0.0326*** (0.0122)
LOG_GDP_PER_CAPITA	0.00114** (0.000442)	0.00167*** (0.000475)	-0.00000318 (0.000487)	0.000323 (0.000521)
VOICE	0.00412*** (0.000512)	0.00393*** (0.000513)	0.00447*** (0.000501)	0.00407*** (0.000510)
STABILITY	0.00108** (0.000480)	0.00113** (0.000479)	0.00138*** (0.000482)	0.00134*** (0.000483)
EFFECTIVENESS	-0.0109*** (0.00153)	-0.0103*** (0.00153)	-0.00748*** (0.00163)	-0.00749*** (0.00163)
REGULATION	0.00867*** (0.00129)	0.00770*** (0.00118)	0.00650*** (0.00119)	0.00658*** (0.00119)
LAW	-0.0144*** (0.00174)	-0.0143*** (0.00175)	-0.0143*** (0.00177)	-0.0140*** (0.00173)
CORRUPTION	0.00647*** (0.00132)	0.00609*** (0.00129)	0.00642*** (0.00132)	0.00605*** (0.00129)
Year fixed effects	Yes	Yes	Yes	Yes
No. of obs.	5,275	5,275	5,275	5,275
R <sup>2</sup>	0.130	0.131	0.137	0.138

similar for SECURED and REORG, the differences are driven by the other measures in the index, management removal (MANAGES) and no automatic stay of assets (NO\_AUTO\_STAY). Having a disproportionately large U.S. sample leads to significant differences in the results for the creditor rights index when the U.S. banks are either included or excluded. These differences suggest caution in using the aggregate creditor rights index. Later in the article, we present results for the other creditor rights measures, which indicate that MANAGES is positively associated with loan loss reserves.

For the sample including U.S. banks, the United States dominates, with 70% of observations. In the United States, the secured creditor is paid first (SECURED has a high value of 1), and the creditor rights index has a low value of 1. Although the results for SECURED within this sample are consistent with our predictions, the overweighting of the U.S. sample, which has relatively low creditor rights compared with other countries, causes the creditor rights index to flip. We highlight this finding for two reasons. First, it cautions against using the aggregate creditor rights index because the United States has a relatively low creditor rights measure, despite

TABLE 4

## Full-Sample Results for Bank Expected and Realized Losses

Table 4 reports the ordinary least squares (OLS) regression results where the dependent variable is bank loan loss reserve (LOAN\_LOSS\_RESERVE), defined as the ratio of bank loan loss reserves to total bank loans in columns 1–6. The dependent variable in columns 7 and 8 is future net charge-off (NET\_CHARGE\_OFF), defined as the ratio of net charge-offs to TOTAL\_ASSETS for the next year. Standard errors, in parentheses, are adjusted for cluster effects at the bank and year levels, and year fixed effects are included. The sample contains 8,397 banks in 97 countries, including the United States, over the period 2005–2014. The creditor rights index (CRIGHTS) is the summation of the dummy variables indicating whether creditors have power over restrictions on reorganization (REORG), there is no automatic stay of assets (NO\_AUTO\_STAY), the secured creditor is paid first (SECURED), or management can be removed during times of bankruptcy (MANAGES). Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Loan Loss Reserves				Future Net Charge-Offs			
	Including U.S.				Including U.S.			
	1	2	3	4	5	6	7	8
CRIGHTS	0.00159*** (0.000395)				-0.00147*** (0.000255)			
REORG		-0.00205** (0.000924)		-0.00209** (0.000920)		-0.00349*** (0.000561)		-0.00338*** (0.000558)
SECURED			-0.00768*** (0.00124)	-0.00770*** (0.00124)			-0.00336*** (0.000746)	-0.00319*** (0.000742)
LOG_TOTAL_ASSETS	-0.000653*** (0.0000959)	-0.000507*** (0.0000924)	-0.000674*** (0.0000956)	-0.000626*** (0.0000952)	-0.00163*** (0.0000727)	-0.00164*** (0.0000717)	-0.00177*** (0.0000722)	-0.00168*** (0.0000730)
INFLATION	-0.0305 (0.0215)	-0.0180 (0.0217)	-0.0296 (0.0216)	-0.0238 (0.0219)	-0.0582*** (0.0113)	-0.0535*** (0.0115)	-0.0686*** (0.0112)	-0.0561*** (0.0115)
LOG_GDP_PER_CAPITA	0.00725*** (0.000768)	0.00719*** (0.000784)	0.00489*** (0.000812)	0.00530*** (0.000857)	0.000989** (0.000450)	0.00203*** (0.000479)	0.000658 (0.000494)	0.00122** (0.000517)
VOICE	0.00494*** (0.00101)	0.00405*** (0.000992)	0.00427*** (0.000975)	0.00381*** (0.000976)	0.00217*** (0.000500)	0.00177*** (0.000506)	0.00266*** (0.000498)	0.00171*** (0.000504)
STABILITY	0.00265*** (0.000964)	0.00329*** (0.000964)	0.00248*** (0.000955)	0.00276*** (0.000966)	0.0000325 (0.000446)	0.0000717 (0.000447)	-0.000355 (0.000446)	-0.0000261 (0.000448)
EFFECTIVENESS	-0.0152*** (0.00258)	-0.0170*** (0.00251)	-0.0118*** (0.00262)	-0.0121*** (0.00261)	-0.00998*** (0.00154)	-0.00896*** (0.00154)	-0.00647*** (0.00164)	-0.00690*** (0.00164)
REGULATION	-0.00383* (0.00210)	-0.00121 (0.00195)	-0.00290 (0.00197)	-0.00267 (0.00195)	0.00979*** (0.00121)	0.00805*** (0.00114)	0.00727*** (0.00113)	0.00750*** (0.00113)
LAW	-0.0157*** (0.00220)	-0.0185*** (0.00224)	-0.0157*** (0.00217)	-0.0165*** (0.00227)	-0.00685*** (0.00151)	-0.00674*** (0.00150)	-0.00457*** (0.00143)	-0.00574*** (0.00149)
CORRUPTION	-0.00103 (0.00165)	0.00129 (0.00159)	-0.0000443 (0.00152)	0.000398 (0.00159)	0.000627 (0.00102)	-0.0000877 (0.000984)	-0.00170* (0.000934)	-0.000765 (0.000990)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	31,566	31,566	31,566	31,566	20,663	20,663	20,663	20,663
R <sup>2</sup>	0.252	0.251	0.254	0.254	0.113	0.113	0.112	0.114

the fact that this finding is driven by high levels of SECURED. Second, because the United States comprises 70% of our sample, it is necessary to understand the effects of creditor rights in the absence of this single country.

## B. Bank Profitability

If creditor rights cause banks to expect and realize lower losses on the loan portfolio, the natural question is whether this reduced risk within the loan portfolio is priced. If banks are indeed taking on less risk, we expect this to be reflected within the loan portfolio in decreased NIR and fewer loan loss provisions.

This analysis is very closely related to that of Qian and Strahan (2007), who use Dealscan syndicated loan-level data and merge it with Compustat data to acquire borrower-level characteristics. Their analysis indicates that enhanced creditor rights are associated with cheaper debt, supporting the idea that public borrowers are reducing risk, as noted by Acharya et al. (2011a).<sup>28</sup> However, the sample's merged set of large syndicated business loans is only a fraction of a bank's portfolio and do not include loans to individuals or private businesses, large or small, which are the majority of businesses within an economy and have been shown to behave differently from public firms (Giannetti (2003)). At the bank level, if creditor rights do encourage lending and banks increase PD more than LGD, it is possible to find evidence of more expensive debt, driven by loans within the loan portfolio that are not attributed to these public businesses. However, if PD either decreases or doesn't increase as much as LGD, we would expect to find cheaper debt.

In Panel A of Table 5, we find that creditor rights have a negative impact on NIR, indicating that debt is cheaper. A 1-unit increase in CRIGHTS is associated with a 5.7% decrease in net interest revenue for the non-U.S. sample and a 15% decrease for the sample including the United States. NIR, being the spread between revenues and expenses, is a good measure of pricing because it directly controls for intertemporal variations in the interest rate. However, the use of NIR is problematic because it captures both the price charged to borrowers and the cost of funds to the bank. It is possible that if the risk of the portfolio increases, then the cost of funds would also rise, and the net interest margin would decrease. In such a scenario, a decrease in the net interest margin does not mean that the debt is cheaper. To alleviate this concern, we examine total interest revenue separately. In equally robust (untabulated) results, we find that creditor rights are negatively associated with the bank's total interest revenue.

In this article, we have primarily focused on default risk as our primary measure of risk within the loan portfolio. We acknowledge that it is possible that

<sup>28</sup>To the extent that other loan characteristics (e.g., covenants) change across countries, it is possible that lower interest rates are associated with increased risk taking. In such a case, the finding of Houston et al. (2010) of increased risk taking and the finding of Qian and Strahan (2007) of a lower interest spread can potentially coexist. However, we note that the outcome variables in our article and, more importantly, in that by Houston et al. are bottom-line losses/risk. To the extent that covenants protect banks and allow them to take on more risk and charge lower interest rates, such protection should be reflected in lower risk/credit losses. Thus, it is more logical that lower interest spreads in higher-creditor rights regimes (Qian and Strahan) go hand in hand with our finding of lower credit risk. We thank the referee for making this nuanced point.

TABLE 5  
Components of Bank Profitability

Table 5 reports the ordinary least squares (OLS) regression results for three components of profitability: net interest revenue (NIR), loan loss provisions, and other profit. The dependent variable in Panel A is NET\_INTEREST\_REVENUE, defined as NIR scaled by total bank assets. The dependent variable in Panel B is LOAN\_LOSS\_PROVISIONS, defined as loan loss provisions scaled by total bank assets. The dependent variable in Panel C is OTHER\_PROFIT, defined as NET\_INCOME – NET\_INTEREST\_REVENUE × (1 – BANK\_TAX\_RATE) + LOAN\_LOSS\_PROVISIONS × (1 – BANK\_TAX\_RATE), scaled by total bank assets. Columns 1–6 show the results for the sample containing 2,741 banks in 96 countries, not including the United States, over the period 2005–2014. Columns 7 and 8 show the results for the full sample of 8,397 banks in 97 countries, including the United States, over the period 2005–2014. The creditor rights index (CRIGHTS) is the summation of the dummy variables indicating whether creditors have power over restrictions on reorganization (REORG), there is no automatic stay of assets (NO\_AUTO\_STAY), the secured creditor is paid first (SECURED), or management can be removed during times of bankruptcy (MANAGES). Bank- and macro-level controls are unreported but identical to those in Table 2. Standard errors, in parentheses, are adjusted for cluster effects at the bank and year levels, and year fixed effects are included. Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Excluding U.S.				Including U.S.			
	1	2	3	4	5	6	7	8
<i>Panel A. Net Interest Revenue</i>								
CRIGHTS	-0.00191*** (0.000222)				-0.00519*** (0.000195)			
REORG		-0.00499*** (0.000432)		-0.00418*** (0.000420)		-0.0116*** (0.000402)		-0.0116*** (0.000402)
SECURED			-0.00851*** (0.000586)	-0.00799*** (0.000576)			-0.00344*** (0.000593)	-0.00353*** (0.000594)
<i>Panel B. Loan Loss Provisions</i>								
CRIGHTS	-0.000870*** (0.000148)				-0.000992*** (0.000129)			
REORG		-0.00238*** (0.000301)		-0.00219*** (0.000304)		-0.00271*** (0.000283)		-0.00271*** (0.000283)
SECURED			-0.00215*** (0.000399)	-0.00188*** (0.000401)			-0.00132*** (0.000383)	-0.00134*** (0.000381)
<i>Panel C. Other Profit</i>								
CRIGHTS	0.000676*** (0.000154)				0.00198*** (0.000135)			
REORG		0.00305*** (0.000315)		0.00280*** (0.000313)		0.00548*** (0.000298)		0.00549*** (0.000298)
SECURED			0.00282*** (0.000445)	0.00247*** (0.000444)			0.00143*** (0.000426)	0.00147*** (0.000426)
Bank-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	8,701	8,701	8,701	8,701	31,566	31,566	31,566	31,566

the loan portfolio contains other risks that are not directly related to default, such as interest rate risk (Schrand and Unal (1998)). Our finding of both a lower NIR and a lower total interest revenue with enhanced creditor protection directly alleviates this concern because a bank will need to be compensated for both default and nondefault risk, which should be reflected in loan pricing.

Next, in Panel B of Table 5, we examine loan loss provisions, which reflect the period-specific reserve that banks put aside for uncollected loans and loan payments. For all of the creditor rights measures, we find that enhanced protection is associated with decreased loan loss provisions, indicating that banks anticipate lower losses directly from the loan portfolio. For both the sample including the United States and that excluding the United States, a 1-unit increase in CRIGHTS is associated with a 10% decrease in loan loss provisions. This result is robust to both individual creditor rights measures and samples including and excluding the United States.<sup>29</sup>

Taken together, the results presented in Panels A and B of Table 5 are consistent with the results presented in Tables 2–4, suggesting that when creditor rights are stronger, the overall loan portfolio is safer. This is reflected in cheaper debt as well as fewer loan loss provisions set aside. Finally, in Panel C of Table 5, we examine the third part of profitability that is attributable to other fees, trading activity, derivatives, investment, and ventures. Here, for the sample excluding the United States, more creditor rights are associated with greater returns from other business areas outside the loan portfolio. In fact, a 1-unit increase in CRIGHTS is associated with a 6% increase in profit from other ventures. The magnitude is doubled for the sample including the United States.

### C. Risk Outside the Loan Portfolio

Our results, on the face of it, appear to call into question the conclusion of Houston et al. (2010) that enhanced creditor rights are associated with increased lending risk. However, we note that the primary tests in Houston et al. deal with overall bank risk. Such risk comes from both inside and outside the loan portfolio, and modern banks, aside from lending, have both fee- and trading-based business that can contribute to overall bank risk. In fact, the average loan-to-asset ratio is close to 60%, suggesting that up to 40% of the bank assets may be unrelated to lending. Although we are able to isolate the loan portfolio and show that it is not the driver of increased bank-level risk, it is possible that banks could be increasing their risk in other areas. We attempt to explicitly investigate the effect of creditor rights on risk outside the loan portfolio by examining banks' gains and losses from trading activities.

We define another variable, OTHER\_GAIN, that is the sum of bank-reported gains from trading derivatives and gains from other securities subsequently normalized by TOTAL\_ASSETS. Unlike the loan portfolio, which has an asymmetric payoff, banks can realize the upside reward from their trading patterns. Therefore, in order to analyze the risk derived from nonlending activities, we focus on the standard deviation of this measure,  $\sigma(\text{OTHER\_GAIN})$ . For this test, we collapse

<sup>29</sup>Houston et al. (2010) report positive associations of enhanced creditor rights with loan loss provisions. We are, however, unable to replicate the same, likely because Houston et al. aggregate over both time and banks to arrive at country-level provisions.

our panel down to a cross-sectional setting where each bank is a single observation, following Houston et al. (2010). In order to calculate  $\sigma(\text{OTHER\_GAIN})$ , we require a bank to be present for at least 5 years of our sample period.<sup>30</sup> Because banks do not uniformly report gains from trading derivatives or other securities, these data are not available for a portion of our sample.

Furthermore, we average all of the macro controls from Table 6. Because the data are averaged over time, year fixed effects are not included. The results are presented in Table 1. The creditor rights index shows a significantly positive association with risk outside the loan portfolio when, similar to Houston et al. (2010), the U.S. banks are included, as shown in column 5. These results are driven primarily by REORG and SECURED. Once the U.S. banks are excluded, our sample size is dramatically reduced. We still observe the positive association between the index and risk outside the loan portfolio, although the effect has attenuated and is no longer statistically significant. However, columns 3 and 7 show that when the secured creditor is paid first, this positively relates to risk outside the loan portfolio in samples both including and excluding the United States, suggesting the possibility that the finding of Houston et al. of higher bank risk may be driven by risks outside the loan portfolio.

#### D. Intertemporal Variation and Crisis Analysis

In Hypothesis 2, we examine intertemporal variation in the effect of enhanced creditor protection on risk in lending. We partition the 2005–2014 period into three subperiods, precrisis (2005–2006), crisis (2007–2009), and postcrisis (2010–2014), and reexamine Hypothesis 1 within these subperiods. To our knowledge, this is the first article to examine the effect of creditor rights during the recovery period after the financial crisis, where economic growth is a key policy concern. Specifically, within the United States, where the secured creditor is paid first, banks indulged in riskier secured lending during the precrisis period by utilizing subprime loans. In Hypothesis 2, we examine whether banks in other countries where the secured creditor is paid first behave in a manner similar to their U.S. counterparts precrisis. Hypothesis 2 predicts that lending risk will be increasing in SECURED. Additionally, Hypothesis 2 predicts no such differences for REORG.

We present the results in Table 7. There is no intercept in this estimation because we include a separate dummy variable for each of the three periods. The variable  $\text{REORG} \times \text{PRECRISIS}$  captures the effect of REORG on bank losses for the precrisis period. Other interactive variables are similarly descriptive. We find the coefficient on REORG to be negative and significant in each of the subperiods. In contrast, as predicted by Hypothesis 2, SECURED is significantly positive in the precrisis period in the  $\text{LOAN\_LOSS\_RESERVE}$  regression and remains positive, although not significant, in the  $\text{FUTURE\_CHARGE\_OFF}$  regression.<sup>31</sup> Again, consistent with Hypothesis 2, in the postcrisis period, the effect of SECURED is significantly negative uniformly. In contrast to SECURED, CRIGHTS is negative

<sup>30</sup>Results are also robust to using 3 years of data.

<sup>31</sup>There has been a criticism that banks were not reserving sufficiently for losses on their subprime lending during the precrisis period (Huizinga and Laeven (2012)). This is not a concern for our article because it biases against a positive coefficient for SECURED.



TABLE 6  
 Creditor Rights and Risk Outside the Loan Portfolio

Table 6 reports the ordinary least squares (OLS) regression results examining the effect creditor rights have outside the loan portfolio. The dependent variable is  $\sigma(\text{OTHER\_GAIN})$ , defined as the standard deviation of bank-reported gains from trading derivatives and gains from other securities subsequently normalized by TOTAL\_ASSETS. Columns 1–4 show the results for the sample excluding the United States. Columns 5–8 show the results for the full sample, including the United States, over the period 2005–2014. The creditor rights index (CRIGHTS) is the summation of the dummy variables indicating whether creditors have power over restrictions on reorganization (REORG), there is no automatic stay of assets (NO\_AUTO\_STAY), the secured creditor is paid first (SECURED), or management can be removed during times of bankruptcy (MANAGES). Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	$\sigma(\text{OTHER\_GAINS})$				$\sigma(\text{OTHER\_GAINS})$			
	Excluding U.S.				Including U.S.			
	1	2	3	4	5	6	7	8
CRIGHTS	0.000122 (0.000101)				0.000250*** (0.0000810)			
REORG		0.000111 (0.000234)		0.0000376 (0.000237)		0.000529*** (0.000174)		0.000530*** (0.000173)
SECURED			0.000691*** (0.000218)	0.000687*** (0.000222)			0.000524** (0.000215)	0.000527** (0.000216)
AVERAGE_ASSETS	0.0000342 (0.0000391)	0.0000425 (0.0000396)	0.0000517 (0.0000388)	0.0000527 (0.0000397)	0.000123*** (0.0000183)	0.000130*** (0.0000178)	0.000147*** (0.0000177)	0.000137*** (0.0000180)
AVERAGE_INFLATION	0.0288*** (0.00661)	0.0306*** (0.00689)	0.0292*** (0.00649)	0.0288*** (0.00674)	0.0247*** (0.00546)	0.0237*** (0.00562)	0.0261*** (0.00544)	0.0215*** (0.00551)
AVERAGE_GDP_PER_CAPITA	-0.0000714 (0.000175)	-0.000129 (0.000199)	0.000172 (0.000195)	0.000159 (0.000222)	-0.000136 (0.000173)	-0.000334* (0.000182)	-0.0000182 (0.000191)	-0.000135 (0.000199)
AVERAGE_VOICE	0.0000355 (0.000177)	0.0000215 (0.000177)	-0.0000316 (0.000176)	-0.0000218 (0.000187)	0.000118 (0.000173)	0.000149 (0.000166)	-0.00000522 (0.000166)	0.000129 (0.000173)
AVERAGE_STABILITY	0.0000473 (0.000170)	0.0000472 (0.000173)	-0.0000495 (0.000176)	-0.0000513 (0.000177)	0.000182 (0.000153)	0.000167 (0.000162)	0.000229 (0.000158)	0.000104 (0.000165)
AVERAGE_EFFECTIVENESS	0.00214*** (0.000603)	0.00218*** (0.000619)	0.00155** (0.000616)	0.00154** (0.000629)	0.00186*** (0.000562)	0.00181*** (0.000560)	0.00129** (0.000572)	0.00125** (0.000587)
AVERAGE_REGULATION	-0.000959** (0.000469)	-0.000824* (0.000450)	-0.000591 (0.000459)	-0.000597 (0.000452)	-0.00108*** (0.000384)	-0.000888** (0.000364)	-0.000611 (0.000371)	-0.000681* (0.000372)
AVERAGE_LAW	0.00130** (0.000546)	0.00131** (0.000551)	0.00116** (0.000545)	0.00115** (0.000555)	0.000546 (0.000457)	0.000570 (0.000462)	0.00000419 (0.000469)	0.000317 (0.000479)
AVERAGE_CORRUPTION	-0.00209*** (0.000393)	-0.00211*** (0.000425)	-0.00198*** (0.000389)	-0.00196*** (0.000427)	-0.00140*** (0.000281)	-0.00133*** (0.000270)	-0.000934*** (0.000289)	-0.00110*** (0.000287)
Constant	0.000414 (0.00170)	0.000908 (0.00190)	-0.00208 (0.00193)	-0.00195 (0.00216)	0.000346 (0.00166)	0.00236 (0.00172)	-0.000793 (0.00185)	0.000407 (0.00192)
No. of obs.	429	429	429	429	2,621	2,621	2,621	2,621
R <sup>2</sup>	0.210	0.208	0.225	0.225	0.123	0.122	0.120	0.126

TABLE 7  
 Creditor Rights and the Financial Crisis

Table 7 reports the ordinary least squares (OLS) regression results for loan loss reserves and future charge-offs scaled by total assets. LOAN\_LOSS\_RESERVE is defined as loan loss reserves scaled by total bank loans. FUTURE\_CHARGE\_OFF is defined as the ratio of net charge-offs to total bank loans for the next year. The creditor rights index (CRIGHTS) is the summation of the dummy variables indicating whether creditors have power over restrictions on reorganization REORG, there is no automatic stay of assets (NO\_AUTO\_STAY), the secured creditor is paid first (SECURED), or management can be removed during times of bankruptcy (MANAGES). Bank- and macro-level controls are unreported but identical to those in Table 2. PRECRISIS is a dummy variable that has a value of 1 if the observation is from 2005 or 2006, and 0 otherwise. CRISIS is a dummy variable that has a value of 1 if the observation is from 2007, 2008, or 2009, and 0 otherwise. POSTCRISIS is a dummy variable that is equal to 1 if the observation is from 2010 or after, and 0 otherwise. Standard errors, in parentheses, are adjusted for cluster effects at the bank and year levels, and year fixed effects are included. Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Loan Loss Reserves			Future Net Charge-Offs		
	1	2	3	4	5	6
CRIGHTS × PRECRISIS	-0.00329*** (0.00122)			-0.00165** (0.000668)		
CRIGHTS × CRISIS	0.000107 (0.000825)			-0.00108* (0.000555)		
CRIGHTS × POSTCRISIS	-0.00305*** (0.000614)			-0.000690* (0.000366)		
REORG × PRECRISIS		-0.0177*** (0.00237)			-0.00470*** (0.00160)	
REORG × CRISIS		-0.00836*** (0.00187)			-0.00251** (0.00102)	
REORG × POSTCRISIS		-0.0112*** (0.00137)			-0.00133* (0.000775)	
SECURED × PRECRISIS			0.00685*** (0.00246)			0.000797 (0.00159)
SECURED × CRISIS			-0.00233 (0.00200)			-0.00309*** (0.00118)
SECURED × POSTCRISIS			-0.00929*** (0.00162)			-0.00753*** (0.00102)
PRECRISIS, CRISIS, POSTCRISIS indicators	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes
Macro controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	8,701	8,701	8,701	5,275	5,275	5,275
R <sup>2</sup>	0.200	0.208	0.203	0.131	0.131	0.141
F-statistic for difference in coefficients PRECRISIS vs. POSTCRISIS	0.04	5.62	34.00	1.61	3.72	20.30
p-value	0.8492	0.0177	<0.0001	0.2044	0.0537	<0.0001

and significant in both the precrisis and postcrisis periods. This result suggests that, consistent with our hypothesis, the egregious lending during the precrisis period when the secured creditor was paid first is not occurring during the crisis and postcrisis periods.

We note that although the United States is high on the SECURED measure, it is actually very low on the CRIGHTS measure (having a value of 1 relative to a worldwide average of more than 2). Formal statistical tests ( $F$ -statistics) confirm that loan losses are higher with SECURED in the precrisis period compared with the postcrisis period. Note that although the  $F$ -statistic also shows significant differences between the periods for REORG, the direction is opposite to SECURED. Thus, the worldwide evidence appears to be consistent with the significant lending risk in the precrisis period being primarily driven by SECURED and not the other creditor-protection measures.

## E. Loan Losses: PD versus LGD

Given our finding that creditor rights lead to lower overall loan losses, there are two possible explanations. In [Section II.B](#), we argue that losses are a function of both PD and LGD. In [Hypothesis 1](#), we predicted a negative (ambiguous) association of REORG (SECURED) with loan losses as a result of a decrease (increase) in PD. To directly test our hypothesis, we need measures of PD and LGD, which have not appeared in the literature to date. However, we exploit additional accounting disclosures regarding risk metrics in the loan portfolio to indirectly get at PD and LGD. We argued in [Section III](#) that UILs could represent a greater share of PD, whereas NCOs would incorporate more LGD. Thus, if PD goes up, we expect to see a relatively greater positive effect of creditor rights on UIL compared with NCO. Our regressions take the form shown in [equations \(5\) and \(6\)](#):

$$(5) \quad \text{UNRESER\_IMPAIRED\_LOANS}_{b,c,t+1} = \zeta'_1 \text{CRIGHTS}_c \\ + \zeta'_2 \text{LOG\_TOTAL\_ASSETS}_{b,c,t} \\ + \zeta'_3 \text{MACRO\_CONTROLS}_{c,t} \\ + \tau_{b,c,t},$$

$$(6) \quad \text{NET\_CHARGE\_OFF}_{b,c,t+1} = \eta'_1 \text{CRIGHTS}_c \\ + \eta'_2 \text{LOG\_TOTAL\_ASSETS}_{sb,c,t} \\ + \eta'_3 \text{MACRO\_CONTROLS}_{c,t} + \nu_{b,c,t}.$$

The results presented in [Table 8](#) show that for the non-U.S. sample, both SECURED and REORG have negative associations with NCO, whereas only REORG has a negative association with UIL. SECURED, in contrast, has a positive association with UIL. A 1-unit increase in CRIGHTS is associated with a 17% increase in UIL but an 8.4% decrease in NCO. We have argued that mechanically, restrictions on reorganization (REORG) should be associated with less default. Therefore, it is not surprising that REORG goes the opposite direction. These results suggest that PD can increase with enhanced creditor protection, but the decrease in LGD dominates any increase in PD. However, having restrictions on reorganization does not lead to an increased likelihood of default.

Per [Hypothesis 3](#), SECURED (REORG) affects UIL more positively (negatively) than NCO. Although we want to compare the influence of creditor rights on UIL relative to NCO, we cannot directly compare the regression coefficients in [equations \(5\) and \(6\)](#). With different dependent variables, a direct comparison of the coefficients on the independent variables cannot indicate the importance of creditor rights on UIL relative to NCO, which is the primary goal of this analysis. Instead, Chow (1960) gives us a framework to directly test [Hypothesis 3](#). We implement the Chow test as follows: First, we start with our original data set consisting of 8,701 observations. Then, we append a second identical set of data to the first set, creating a single data set with 17,406 observations. In order to determine the source of the observation, we define the variable `SECOND_SET_DUM`, which takes a value of 0 if the observation comes from the original data set and 1 if it is from the second (appended) data set.

From there, we create our dependent variable of interest, `MODIFIED_NCO`, which is equal to `NET_CHARGE_OFF` if `SECOND_SET_DUM = 0` and

TABLE 8  
Creditor Rights, Unreserved Impaired Losses, and Net Charge-Offs

Table 8 reports the ordinary least squares (OLS) regression results for unreserved impaired losses and net charge-offs. The dependent variable in Panel A is UNRESER\_IMPAIRED\_LOANS, defined as the difference between nonperforming loans and loan loss reserves scaled by total bank loans. The dependent variable in Panel B is NET\_CHARGE\_OFF, defined as net charge-offs scaled by total bank assets. Columns 1–6 show the results for the sample containing 2,741 banks in 96 countries, not including the United States, over the period 2005–2014. Columns 7 and 8 show the results for the full sample of 8,397 banks in 97 countries, including the United States, over the period 2005–2014. The creditor rights index (CRIGHTS) is the summation of the dummy variables indicating whether creditors have power over restrictions on reorganization (REORG), there is no automatic stay of assets (NO\_AUTO\_STAY), the secured creditor is paid first (SECURED), or management can be removed during times of bankruptcy (MANAGES). Bank- and macro-level controls are unreported but identical to those in Tables 2 and 3. Standard errors, in parentheses, are clustered at the bank and year level, and year fixed effects are included. Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Excluding U.S.				Including U.S.			
	1	2	3	4	5	6	7	8
<i>Panel A. Unreserved Impaired Loans</i>								
CRIGHTS	0.00335*** (0.000493)				0.00475*** (0.000412)			
REORG		-0.00456*** (0.00110)		-0.00503*** (0.00117)		0.000831 (0.00104)		0.000831 (0.00103)
SECURED			0.00396*** (0.00153)	0.00458*** (0.00160)			-0.0000186 (0.00148)	-0.0000121 (0.00148)
<i>Panel B. Net Charge-Off</i>								
CRIGHTS	-0.000878*** (0.000227)				-0.00133*** (0.000208)			
REORG		-0.00192*** (0.000459)		-0.00170*** (0.000456)		-0.00301*** (0.000442)		-0.00303*** (0.000441)
SECURED			-0.00442*** (0.000601)	-0.00534*** (0.000595)			-0.00368*** (0.000567)	-0.00370*** (0.000567)
Bank-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	8,701	8,701	8,701	8,701	31,566	31,566	31,566	31,566

TABLE 9  
Unreserved Impaired Losses and Net Charge-Offs Chow Test

Table 9 tests the hypothesis that creditor rights affect unreserved impaired losses (UNRESER\_IMPAIRED\_LOANS) more positively than net charge-offs (NET\_CHARGE\_OFF) by implementing a specialized case of the Chow test (Chow, 1960). The dependent variable is MODIFIED\_NET\_CHARGE\_OFF. The creditor rights index (CRIGHTS) is the summation of the dummy variables indicating whether creditors have power over restrictions on reorganization (REORG), there is no automatic stay of assets (NO\_AUTO\_STAY), the secured creditor is paid first (SECURED), or management can be removed during times of bankruptcy (MANAGES). The variable SECOND\_SET\_DUM indicates whether the observation came from the first or second data set. Bank- and macro-level controls are unreported but identical to those in Tables 2 and 3. Standard errors, in parentheses, are clustered at the bank and year level, and year fixed effects are included. Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	1	2	3
CRIGHTS	-0.0406*** (0.00766)		
REORG		-0.000896 (0.0142)	
SECURED			-0.0785*** (0.0177)
SECOND_SET_DUM	-0.345*** (0.0195)	-0.253*** (0.00935)	-0.315*** (0.0152)
CRIGHTS × SECOND_SET_DUM	0.0445*** (0.00801)		
REORG × SECOND_SET_DUM		-0.00405 (0.0149)	
SECURED × SECOND_SET_DUM			0.0909*** (0.0171)
Bank-level controls	Yes	Yes	Yes
Macro controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of obs.	13,973	13,973	13,973
R <sup>2</sup>	0.166	0.161	0.165

UNRESER\_IMPAIRED\_LOANS if SECOND\_SET\_DUM = 1. We then use our pooled data set to formally implement the procedure from Chow (1960), presented as follows:

$$\begin{aligned}
 (7) \quad \text{MODIFIED\_NCO}_{b,c,t} = & \delta'_1 \text{CRIGHTS}_c + \delta'_2 \text{SECOND\_SET\_DUM} \\
 & + \delta'_3 \text{CRIGHTS}_c \times \text{SECOND\_SET\_DUM} \\
 & + \delta'_4 \text{LOG\_TOTAL\_ASSETS}_{b,c,t} \\
 & + \delta'_5 \text{MACRO\_CONTROLS}_{c,t} + \zeta_{b,c,t}
 \end{aligned}$$

Within the regression framework, the variable SECOND\_SET\_DUM absorbs the variation between NCO and UIL unrelated to creditor rights. If creditor rights affect UIL more positively than NCO, this would indicate that  $\delta'_3 > 0$ . The variable  $\delta'_2$  captures the difference between UIL and NCO unrelated to creditor rights. To avoid a correlated omitted-variable bias, it is important to also include this un-interacted dummy variable in the regression.<sup>32</sup> As shown in Table 9, consistent with Hypothesis 3,  $\delta'_3 > 0$  for SECURED, and the opposite is true for REORG.<sup>33</sup>

<sup>32</sup>Our procedure of pooling the data, fitting the fully interacted model, and then testing the second-set coefficients against 0 is equivalent to the Chow test (see <https://www.stata.com/support/faqs/statistics/computing-chow-statistic/>).

<sup>33</sup>In Table 9, we also present results including U.S. banks, and the results are predictably different. As outlined earlier, the United States had significantly higher bank losses while simultaneously having a

We also consider the effect of REORG and SECURED on the ratio of NCOs to NPLs (NCO/NPL). NCO is expected to decrease with SECURED, and NPL is expected to increase, leading to a clear prediction that NCO/NPL decreases in SECURED. REORG, on the other hand, lowers both NCO and NPL, leading to the lack of a clear prediction. In untabulated empirical tests, we find a significant negative relation for NCO/NPL with SECURED and no statistically significant relation with REORG, confirming our predictions.

## F. Bankruptcy Abuse Prevention and Consumer Protection Act of 2005

Any international study, including every prior cross-country study on creditor rights (Djankov et al. (2007), Acharya et al. (2011a), and Houston et al. (2010)), is subject to concerns that the findings can be a function of uncontrolled, region-specific variables or arise as a result of endogeneity. To bolster identification, we exploit a natural experiment surrounding the implementation of the BAPCPA in the United States. The act was passed on Apr. 14, 2005, and signed into law on Apr. 20, 2005. Most provisions became effective to cases applied after Oct. 17, 2005. Although a number of changes occurred under BAPCPA, two specific sets of changes enhanced creditor rights along the lines of REORG and SECURED for individuals and sole proprietors.

The first set pertained to Chapter 7 and Chapter 13 filings. Within the United States, an individual may file for Chapter 7 bankruptcy, and a sole proprietor may file for Chapter 13. Post-BAPCPA, the time between Chapter 7 filings was extended from 6 to 8 years. Additionally, a means test was instated, under which if the debtor's income is greater than the state's median income, he or she may not be eligible for Chapter 7. Thus, for loans to individuals and sole proprietors, this test restricts the ability of borrowers to reorganize, similar to REORG. Second, the legal change enhanced the rights of secured creditors with respect to both student and auto loans. In addition to government student loans, student loans to for-profit and nongovernmental agencies are no longer able to be discharged. Within Chapter 14 bankruptcy, when the creditor holds a security interest in a motor vehicle purchased within 910 days of the filing, the secured creditor can retain its lien on the vehicle until receiving payment of the entire debt, not just the secured portion. Both of these enhancements of the rights of secured creditors are analogous to SECURED.

In Section IV.A, we found that when creditors had more protection in the form of REORG and SECURED, they had lower realized and expected losses overall. Consequently, we anticipate expected and realized losses to decrease in the immediate aftermath of BAPCPA. Because BAPCPA was primarily designed to target lending to individuals and sole proprietors, we expect this section of the loan portfolio to be affected significantly more than the commercial sector. The act's differential implications across loan types allow for a direct comparison of the effect of strengthening creditor rights on loan losses.

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low (high) value of CRIGHTS and REORG (SECURED). Having the sample dominated by U.S. banks leads to opposite coefficients for SECURED and CRIGHTS. These results, again, suggest caution in including U.S. banks in a cross-country comparison.

In order to conduct this analysis, we use the Bank Regulatory Database to obtain quarterly data for banks headquartered in the United States. We define 4 quarterly variables corresponding to bank losses: `TOTAL_CHARGE_OFF`, `TOTAL_ALLOWANCE`, `COMMERCIAL_CHARGE_OFF`, and `NONCOMMERCIAL_CHARGE_OFF`. Total charge-offs and total allowances are both scaled by total loans, whereas commercial charge-offs are scaled by total commercial loans. We calculate noncommercial charge-offs by isolating the portion of the bank's charge-offs that are not attributable to commercial loans,  $TOTAL\_CHARGE\_OFF - COMMERCIAL\_CHARGE\_OFF$ , and we scale by noncommercial loans, calculated by  $TOTAL\_LOANS - COMMERCIAL\_LOANS$ . `NONCOMMERCIAL_CHARGE_OFF` and `NONCOMMERCIAL_LOANS` are our best proxy for loans made to individuals and sole proprietors. All summary statistics are presented in [Table 1](#) and further described in [Appendix A](#).

Unlike the cross-country setting, we have data available at a quarterly level that allows us to conduct a finer test of the effects of the BAPCPA shock. We focus our analysis on the 4 quarters before the act's passage and the 4 quarters afterward, restricting our sample to 2004:Q4 through 2006:Q3. We control for bank size (`LOG_QUARTERLY_ASSETS`) and define an indicator variable, `POST`, that takes a value of 1 if the data are from after 2005:Q3, and 0 otherwise. Data availability for loan composition for U.S. banks allows us to explicitly compare across loan types. We also add a control, `COMMERCIAL_LOANS`, which is the ratio of commercial loans to total loans.

Quarterly loan losses, both expected and realized, are subject to seasonality (Liu, Ryan, and Wahlen (1997)). To address the seasonality concern, we compare bank losses the quarter just after the act's passage, 2005:Q4, to the fourth quarter just before, 2004:Q4. Columns 1 and 2 of Panel A in [Table 10](#) indicate that post-BAPCPA, banks realized fewer overall loan charge-offs and allowances. Total charge-offs were 0.0158% less in 2005:Q4 relative to 2004:Q4. Similarly, total allowances were 0.04% less. The results for both charge-offs and allowances are consistent for the next 3 quarters post-BAPCPA, as shown by columns 3–8, indicating that strengthening creditor protection led to lower losses.

Next, we separately examine losses from commercial loans and other loans within the loan portfolio. We only have disaggregated data on charge-offs and not loan loss reserves. Because BAPCPA strengthened creditor rights primarily for individual loans, we would expect to see the act have the greatest effect on this section of the loan portfolio. In columns 1–4 of Panel B in [Table 10](#), we examine noncommercial loans. Because data pertaining to allowances are unavailable at a disaggregated level in 2005, we can only examine noncommercial versus commercial charge-offs.

Note that we have scaled the charge-offs for commercial and noncommercial loans by their respective outstanding loan amounts. Consequently, we are measuring the change in charge-offs per unit of loans made. This choice of scaling controls for any change in loan composition across quarters. Additionally, we cannot compare the magnitude of the coefficients to infer which loan type had a greater impact because, by definition, different loan types have different charge-off characteristics. As such, we only use statistical significance or its absence to infer relative impacts across loan types.

TABLE 10  
BAPCPA and Realized Losses

Table 10 compares quarterly realized losses in the aggregate loan portfolio, commercial loans, and noncommercial loans in relation to the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) for U.S. banks. The variable POST is an indicator variable that takes a value of 1 if the data are from after 2005:Q3, and 0 otherwise. In Panel A, the dependent variable is either TOTAL\_CHARGE\_OFF, which is computed by taking the ratio of total charge-offs to total loans in a given quarter, or TOTAL\_ALLOWANCE, computed by taking the ratio of total allowances to total loans in a given quarter. In Panel B, the dependent variable is either COMMERCIAL\_CHARGE\_OFF, which is computed by taking the ratio of commercial charge-offs to commercial loans, or NONCOMMERCIAL\_CHARGE\_OFF, computed as (TOTAL\_CHARGE\_OFF – COMMERCIAL\_CHARGE\_OFF) scaled by (TOTAL\_LOANS – COMMERCIAL\_LOANS). Standard errors, in parentheses, are clustered at the bank level. Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Effect of BAPCPA on Total Loan Portfolio Realized Losses

	2004 vs. 2005 Q4		2005 vs. 2006 Q1		2005 vs. 2006 Q2		2005 vs. 2006 Q3	
	TOTAL_CHARGE_OFF	TOTAL_ALLOWANCE	TOTAL_CHARGE_OFF	TOTAL_ALLOWANCE	TOTAL_CHARGE_OFF	TOTAL_ALLOWANCE	TOTAL_CHARGE_OFF	TOTAL_ALLOWANCE
	1	2	3	4	5	6	7	8
POST	-0.000158*** (0.0000364)	-0.000403*** (0.0000547)	-0.000214*** (0.0000377)	-0.000573*** (0.000127)	-0.000140*** (0.0000449)	-0.000531*** (0.000118)	-0.000235*** (0.0000422)	-0.000459*** (0.000125)
LOG_TOTAL_ASSETS	0.000109*** (0.0000351)	0.0000908 (0.0000929)	0.000148*** (0.0000289)	-0.0000178 (0.0000881)	0.000111*** (0.0000279)	-0.0000700 (0.0000846)	0.000132*** (0.0000300)	-0.0000703 (0.0000931)
COMMERCIAL_LOANS	0.000918** (0.000394)	0.00624*** (0.00130)	0.000307 (0.000322)	0.00598*** (0.00122)	0.000413 (0.000270)	0.00566*** (0.00120)	0.000302 (0.000290)	0.00590*** (0.00121)
No. of Obs.	4,516	4,516	3,294	3,294	3,262	3,262	3,273	3,273
R <sup>2</sup>	0.013	0.014	0.032	0.015	0.017	0.015	0.023	0.015

Panel B. Effect of BAPCPA on Noncommercial and Commercial Realized Losses

	NONCOMMERCIAL_CHARGE_OFF				COMMERCIAL_CHARGE_OFF			
	2004 vs. 2005 Q4	2005 vs. 2006 Q1	2005 vs. 2006 Q2	2005 vs. 2006 Q3	2004 vs. 2005 Q4	2005 vs. 2006 Q1	2005 vs. 2006 Q2	2005 vs. 2006 Q3
	1	2	3	4	5	6	7	8
POST	-0.000118*** (0.0000298)	-0.000210*** (0.0000360)	-0.000152*** (0.0000423)	-0.000227*** (0.0000415)	-0.000246*** (0.0000727)	-0.000127* (0.0000685)	-0.0000523 (0.0000753)	-0.000191*** (0.0000724)
LOG_TOTAL_ASSETS	0.000144*** (0.0000353)	0.000170*** (0.0000301)	0.000130*** (0.0000288)	0.000154*** (0.0000315)	0.0000450 (0.0000301)	0.0000492** (0.0000228)	0.0000522** (0.0000232)	0.0000540** (0.0000236)
No. of Obs.	4,516	3,294	3,262	3,273	4,516	3,294	3,262	3,273
R <sup>2</sup>	0.018	0.048	0.028	0.033	0.002	0.001	0.001	0.002

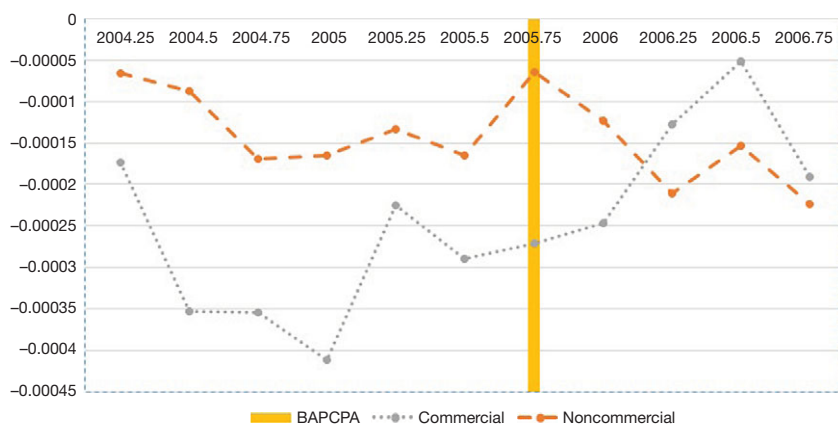


When we compare each of the 4 quarters post-BAPCPA to the corresponding fiscal quarter before the act passed, we can see that the coefficient on POST is positive and significant, indicating that post-BAPCPA, banks realized lower losses from noncommercial loans. We isolate commercial loans from the aggregate lending portfolio and conduct a separate analysis, as shown in columns 5–8 of Panel B in Table 10. For all 4 quarters analyzed, losses in commercial loans are lower post-BAPCPA, although the results are only significant for two comparisons: 2004:Q4 versus 2005:Q4, and 2005:Q3 versus 2006:Q3. Coupled with our findings that charge-offs decreased significantly in each quarter for noncommercial loans, this indicates that noncommercial loans experienced a greater impact compared with commercial loans.

Disaggregated analysis by loan type also facilitates a trends comparison of the effects of the BAPCPA shock. The seasonally adjusted realized losses for commercial and noncommercial loans are plotted in Figure 1. In addition to doing the pre-BAPCPA and post-BAPCPA comparison in Table 10, we extend the analysis back to 2003:Q4. As in Table 10, the plotted value for seasonally adjusted losses is derived as the coefficient on the POST variable from a regression that controls for size and loan composition as well. These seasonal-change coefficients for both commercial and noncommercial loans are negative, suggesting a decline in overall realized losses during the period from 2003–2006. Prior to BAPCPA, a significant increase (decrease) in the POST coefficient for noncommercial loans is typically accompanied by a corresponding increase (decrease) in the POST coefficient for commercial loans. Such a parallel trend is consistent with a change in realized losses for both kinds of loans being driven by common macroeconomic indicators. However, in the immediate aftermath of BAPCPA (2005:Q4 and 2006:Q1), we note that there is a significant increase in the coefficient for commercial loans, but it is accompanied by a significant decrease in the noncommercial coefficient.

FIGURE 1  
BAPCPA Trends Seasonally Adjusted Realized Losses

Figure 1 compares quarterly seasonally adjusted realized losses in commercial loans and noncommercial loans in relation to the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) for U.S. banks. The values plotted on this graph are analogous to the coefficient on POST in Table 10. The BAPCPA went into effect in 2005:Q3, as indicated by the vertical line.



## G. Discussion of Other Creditor Rights Measures

Thus far, we have focused our attention on REORG and SECURED because our hypotheses are relatively clean compared with the other two creditor rights measures, NO\_AUTO\_STAY and MANAGES. As previously discussed, we have no hypotheses for the effect of NO\_AUTO\_STAY and MANAGES independent of the reorganization process reflected in REORG, and it is possible to contract around NO\_AUTO\_STAY by use of SPVs. Furthermore, if MANAGES = 1, this could mean that either the creditor or the court could effect change in management to run the firm. The court could either appoint management favoring the creditor, enhancing creditor protection, or management favoring the borrower, which would not indicate greater creditor protection. The ambiguity of these two measures does not allow us to provide precise predictions for their effect on bank losses or our profitability decomposition.

Table 11 presents the results of our analysis when examining either NO\_AUTO\_STAY or MANAGES, as reflected in Panels A and B, respectively. As anticipated, the effect of NO\_AUTO\_STAY and MANAGES on our dependent variables is not always consistent with what we find pertaining to REORG, SECURED, and the creditor rights index. In fact, NO\_AUTO\_STAY has a statistically significant positive relationship with future charge-offs, profitability, and NIR, contrary to the results we find with the other creditor rights components. Its effect on loan loss reserves and loan loss provisions is not statistically significant.

Furthermore, the relationship between MANAGES and future charge-offs, ROA, NIR, loan loss provisions, and other profit is both statistically significant and in the same direction as SECURED, although it is associated with greater loan loss reserves. Taken together, these results highlight the richness of the creditor rights index and suggest caution in using the aggregate index.

## H. Robustness

Our findings are robust to a battery of additional tests. In this section, we give a brief overview of the primary robustness tests that we conduct, and in the Supplementary Material, we provide more detail and present select tables. First, we control for a number of potentially omitted variables, including bank loan composition and differences in international bank accounting standards, following the methodology of Bushman and Williams (2012). Second, we show that our results are robust to alternate empirical specifications. We perform a matched-sample test utilizing the peer groups defined within BankScope and follow Houston et al. (2010) in implementing an instrumental-variable framework using legal origin as an instrument for creditor rights. Our conclusions are robust, and we present the results in Tables OA1–OA4 in the Supplementary Material.

In unreported tests, we perform asset-weighted regressions where we weigh each observation by bank assets, drop the largest 10% of banks in our sample that may engage in cross-border lending, and exclude countries with more than 100 banks (Germany, Italy, Norway, and the Russian Federation), and we find results consistent with those reported in Tables 2–5.

TABLE 11  
Other Types of Creditor Rights

Table 11 reports the ordinary least squares (OLS) regression results for loan loss reserves, future charge-offs, return on assets (ROA), net interest revenue, loan loss provisions, and other profit using an instrumental-variables analysis. Results are reported for the sample containing 96 countries, not including the United States, over the period 2005–2014. LOAN\_LOSS\_RESERVE is defined as loan loss reserves scaled by total bank loans. FUTURE\_CHARGE\_OFF is defined as the ratio of net charge-offs to total bank loans for the next year. Bank ROA is the ratio of bank net income to bank assets. NET\_INTEREST\_REVENUE is net interest revenue scaled by total bank assets, and LOAN\_LOSS\_PROVISIONS is loan loss provisions scaled by total bank assets. OTHER\_PROFIT is defined as  $\text{NET\_INCOME} - \text{NET\_INTEREST\_REVENUE} \times (1 - \text{BANK\_TAX\_RATE}) + \text{LOAN\_LOSS\_PROVISIONS} \times (1 - \text{BANK\_TAX\_RATE})$ , scaled by total bank assets. (NO\_AUTO\_STAY) is a dummy variable indicating whether or not there is no automatic stay of assets, and (MANAGES) is a dummy variable indicating if management is removed during times of bankruptcy. Bank- and macro-level controls are unreported but identical to those in Table 2. Standard errors, in parentheses, are adjusted for cluster effects at the bank and year levels, and year fixed effects are included. Other variables are defined in Appendix A, and a breakdown of banks per country is presented in Appendix B. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Loan Loss Reserves	Future Net Charge-Offs	ROA	Net Interest Revenue	Loan Loss Provisions	Other Profit
	1	2	3	4	5	6
<i>Panel A. NO_AUTO_STAY</i>						
NO_AUTO_STAY	-0.000659 (0.000987)	0.00326*** (0.000460)	0.000903** (0.000375)	0.00624*** (0.000475)	0.000390 (0.000314)	-0.00396*** (0.000344)
<i>Panel B. MANAGES</i>						
MANAGES	0.00449*** (0.00102)	-0.00282*** (0.000449)	-0.00248*** (0.000377)	-0.00355*** (0.000426)	-0.00107*** (0.000319)	0.00225*** (0.000328)
Bank-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Macro controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	8,701	8,701	8,701	8,701	8,701	8,701

## V. Conclusion

Given the significant differences in creditor rights protection across countries and their lack of convergence, the implications of these varying creditor rights for bank lending are of considerable interest. We develop theory on how two measures of enhanced creditor protection, the secured creditor being paid first (SECURED) and restrictions on reorganization (REORG), will affect bank lending risk. With asymmetric payoffs to lenders, the logical measure of risk for a lender is the loss associated with the loan. We find robust evidence that both expected and realized future losses decrease with REORG and SECURED. Corroborating results surrounding the shock to creditor rights as a result of BAPCPA serve to alleviate identification concerns. Our finding of a decrease in overall lending risk with enhanced creditor rights is directly opposite to the conclusion in prior research (Houston et al. (2010)). Whereas Houston et al. study overall bank risk, we isolate and directly examine the loan portfolio and loan losses.

In developing the theory, we employ the  $PD \times LGD$  framework advocated by the Basel Committee. The theory suggests that the two creditor rights measures will have differential effects on PD and LGD. Consistent with the theory, both PD and LGD decline with REORG. In contrast, consistent with the theory, only LGD declines with SECURED, whereas PD has a positive association. Notwithstanding the opposite effects, the overall risk-reduction finding with SECURED appears to be dominated by the reduced LGD effect.

We also document significant intertemporal differences in the association of creditor rights with lending risk. Specifically, in the period before the financial crisis, the secured creditor being paid first appears to be associated with increased lending risk worldwide, likely because of the widespread use of risky secured lending. In the postcrisis period, however, we see a negative association between SECURED and lending risk. There is no such evidence of a drastic intertemporal difference for the other main creditor rights measure, REORG.

Previous articles, including those by Acharya et al. (2011a) and Houston et al. (2010), among others, have frequently employed the index of creditor rights, which assumes that all forms of creditor rights have a uniform impact. Our article shows that these measures actually behave quite differently. Our results thus suggest caution in using the creditor rights index without separately analyzing each creditor rights measure.

## Appendix A. Variable Descriptions

**CRIGHTS:** Creditor rights index. An index aggregating the four components of the creditor rights as originally proposed by La Porta et al. (1998) and extended by Djankov et al. (2007). This index ranges from 0 to 4, where higher values indicate greater levels of investor protection. The four components of the creditor rights index are the variables REORG, NO\_AUTO\_STAY, SECURED, and MANAGES. The value of 2003 from Djankov et al. is used in this article. Source: Djankov et al. (2007).

**COMMERCIAL\_CHARGE\_OFF:** Total bank commercial charge-offs scaled by commercial loans winsorized at 1% in each tail. Source: Bank Regulatory Database.

**CORRUPTION:** Control of corruption. This indicator measures the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests. Higher values indicate more control over corruption. Source: Kaufmann et al. (2008).

**EFFECTIVENESS:** Government effectiveness. This variable indicates the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies. Higher values mean a higher quality of public and civil service. Source: Kaufmann et al. (2008).

**INFLATION:** Inflation as measured by the Consumer Price Index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used, and the data are winsorized at 1% in each tail. Source: World Bank.

**LAW:** Rule of law. This variable measures the extent to which agents abide by and have confidence in the rules of society. In particular, this measure captures the quality of contract enforcement, the police, and the courts, as well as the likelihood of crime and violence. Higher values indicate stronger law and order. Source: Kaufmann et al. (2008).

**LEGAL\_ORIGIN:** Dummy variables for English, German, French, Scandinavian, or Socialist legal origin. Source: Djankov et al. (2007).

**LIQUIDITY:** Bank short-term funding to short-term liabilities scaled by total assets and winsorized at 1% in each tail. Source: BankScope.

**LOAN\_LOSS\_PROVISIONS:** Loan loss provisions scaled by total assets winsorized at 1% in each tail. Source: BankScope.

**LOAN\_LOSS\_RESERVE:** Loan loss reserves scaled by total assets winsorized at 1% in each tail. Source: BankScope.

**LOG\_GDP\_PER\_CAPITA:** Log GDP per capita. Natural logarithm of real per capita GDP. Source: World Bank.

**LOG\_QUARTERLY\_ASSETS:** Logged quarterly U.S. total bank assets in millions of USD winsorized at 1% in each tail. Source: Bank Regulatory Database.

**LOG\_TOTAL\_ASSETS:** Logged total bank assets in millions of USD winsorized at 1% in each tail. Source: BankScope.

**MANAGES:** Management removal. One component of the creditor rights index that takes the value of 1 if, during the reorganization of a business, an official is appointed by the court, or by the creditors, to take responsibility for operating the business. The firm management does not retain administration of its property pending the resolution of reorganization. This variable also takes a value of 1 if the firm does not keep the administration of its property pending

the resolution of the reorganization process. Otherwise, this variable is equal to 0. Source: Djankov et al. (2007).

**NET\_CHARGE\_OFF:** Net charge-offs scaled by total loans and winsorized at 1% in each tail. Source: BankScope.

**NET\_INTEREST\_REVENUE:** Net interest revenue scaled by total assets and winsorized at 1% in each tail. Source: BankScope.

**NO\_AUTO\_STAY:** No automatic stay of assets. One component of the creditor rights index that equals 1 if the reorganization process does not impose an automatic stay on the assets of the firm upon filing the reorganization petition and creditors are able to seize their collateral after the reorganization petition is approved, and 0 otherwise. Source: Djankov et al. (2007).

**NONCOMMERCIAL\_CHARGE\_OFF:** Total bank charge-offs. Commercial charge-offs scaled by total loans minus commercial loans, winsorized at 1% in each tail. Source: Bank Regulatory Database.

**NONPERFORMING\_LOANS:** Nonperforming loans scaled by total loans and winsorized at 1% in each tail. Source: BankScope.

**OTHER\_GAIN:** Bank gains from outside the Loan portfolio. The sum of bank-reported gains from trading derivatives and gains from other securities subsequently normalized by **TOTAL\_ASSETS** and winsorized at 1% in each tail. Source: BankScope.

**OTHER\_PROFIT:** Other bank profit. Profitability from banks' businesses not pertaining to loans or loan spreads, such as trading and fee-based ventures. Calculated as  $\text{NET\_INCOME} - \text{NET\_INTEREST\_REVENUE} \times (1 - \text{BANK\_TAX\_RATE}) + \text{LOAN\_LOSS\_PROVISIONS} \times 1 - \text{BANK\_TAX\_RATE}$ , scaled by **TOTAL\_ASSETS** and winsorized at 1% in each tail. Source: BankScope.

**POST:** Indicator variable that takes a value of 1 if the observation is from post-BAPCPA, which took place in 2005:Q3, and 0 otherwise.

**REGULATION:** Government regulation. This variable represents the ability of the government to formulate and implement sound policies and regulations that permit and promote market competition and private-sector development. Higher values mean a higher quality of regulation. Source: Kaufmann et al. (2008).

**REORG:** Restrictions on reorganization. This component of the creditor rights index has a value of 1 if the reorganization procedure imposes restrictions, such as creditor's consent or minimum dividend for a debtor to be able to file for reorganization, and 0 otherwise. Source: Djankov et al. (2007).

**ROA:** Overall bank profit. Calculated as  $\text{NET\_INCOME}/\text{TOTAL\_ASSETS}$  winsorized at 1% in each tail. Source: BankScope.

**SECURED:** Secured creditors are paid first. One component of the creditor rights index that takes a value of 1 if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm, opposed to other creditors such as employees or government, and 0 otherwise. Source: Djankov et al. (2007).

**STABILITY:** Government stability. This indicator measures the perceptions of the likelihood that the government will be overthrown or destabilized by violent or unconstitutional methods, including violence or terrorism. Higher values mean more stable environments. Source: Kaufmann et al. (2008).

**TOTAL\_ALLOWANCE:** Quarterly bank allowances scaled by total loans winsorized at 1% in each tail. Source: Bank Regulatory Database.

**TOTAL\_ASSETS:** Total bank assets in millions of USD winsorized at 1% in each tail. Source: BankScope.

**TOTAL\_CHARGE\_OFF:** Quarterly bank charge-offs scaled by total loans winsorized at 1% in each tail. Source: Bank Regulatory Database.

**TOTAL\_LOANS:** Total bank loans in millions of USD winsorized at 1% in each tail. Source: BankScope.

**UNRESER\_IMPAIRED\_LOANS:** Unreserved impaired loans. Calculated as  $\text{NONPERFORMING\_LOANS} - \text{LOAN\_LOSS\_RESERVE}$ ) scaled by total loans winsorized at 1% in each tail. Source: BankScope.

**VOICE:** Voice and accountability. Captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and freedom of the media. Source: Kaufmann et al. (2008).

## Appendix B. Sample Construction

TABLE B1  
Detailed Country-Level Variables

Table B1. Panel A of Table B1 reports the number of banks for each of the 97 countries contained within our sample period of 2005–2014, as well as each type of creditor protection. Variables are defined in Appendix A. The creditor rights index (CRIGHTS) is the summation of the dummy variables indicating whether creditors have power over restrictions on reorganization (REORG), there is no automatic stay of assets (NO\_AUTO\_STAY), the secured creditor is paid first (SECURED), or management can be removed during times of bankruptcy (MANAGES). Panel B shows the different bankruptcy code combinations present within the sample, along with the number of countries and banks (including and excluding the United States) within the sample that have each combination. Variables are defined in Appendix A.

### Panel A. Bank Distribution

Country	Banks	CRIGHTS	REORG	NO_AUTO_STAY	SECURED	MANAGES	Country	Banks	CRIGHTS	REORG	NO_AUTO_STAY	SECURED	MANAGES
Albania	5	3	0	1	1	1	Lithuania	6	2	1	0	1	0
Angola	3	3	1	1	1	0	Macedonia, FYR	8	3	0	1	1	1
Armenia	15	2	0	0	1	1	Malawi	4	2	0	1	0	1
Australia	18	3	0	1	1	1	Malaysia	23	3	1	1	1	0
Austria	7	3	1	1	1	0	Mexico	32	0	0	0	0	0
Bangladesh	28	2	0	0	1	1	Moldova	10	2	0	1	1	0
Belgium	5	2	0	0	1	1	Mongolia	3	2	0	0	1	1
Bolivia	3	2	1	0	1	0	Morocco	1	1	0	0	0	1
Bosnia and Herzegovina	9	3	0	1	1	1	Mozambique	6	2	0	1	1	0
Botswana	8	3	0	1	1	1	Nepal	6	2	1	1	0	0
Brazil	72	1	0	1	0	0	Netherlands	12	3	0	1	1	1
Bulgaria	14	2	0	0	1	1	New Zealand	8	4	1	1	1	1
Cambodia	5	2	1	0	1	0	Nicaragua	3	4	1	1	1	1
Canada	37	1	0	0	1	0	Nigeria	18	4	1	1	1	1
Chile	2	2	0	1	1	0	Norway	109	2	1	0	1	0
China	95	2	1	0	1	0	Oman	6	0	0	0	0	0
Colombia	10	0	0	0	0	0	Pakistan	23	1	0	0	1	0
Costa Rica	10	1	0	0	1	0	Panama	22	4	1	1	1	1
Croatia	13	3	0	1	1	1	Papua New Guinea	1	1	0	0	1	0
Czech Republic	12	3	0	1	1	1	Peru	11	0	0	0	0	0
Denmark	46	3	0	1	1	1	Philippines	24	1	0	0	1	0
Dominican Republic	4	2	0	1	1	0	Poland	20	1	0	0	0	1
Ecuador	3	0	0	0	0	0	Portugal	87	1	0	0	1	0
Egypt, Arab Rep.	17	2	1	0	0	1	Russian Federation	110	2	1	0	0	0
El Salvador	6	3	1	1	1	0	Rwanda	3	1	1	0	0	0
Finland	3	1	0	0	1	0	Saudi Arabia	7	3	1	1	1	0
France	61	0	0	0	0	0	Sierra Leone	4	2	1	0	0	1
Georgia	12	2	0	0	1	1	Singapore	7	3	0	1	1	1
Germany	680	3	0	1	1	1	Slovak Republic	9	2	0	1	1	0
Ghana	13	1	0	0	0	1	Slovenia	11	3	0	1	1	1
Greece	15	1	1	0	0	0	South Africa	10	3	1	0	1	1

(continued on next page)



TABLE B1 (continued)  
Detailed Country-Level Variables

Panel A. Bank Distribution (continued)

Country	Banks	CRIGHTS	REORG	NO_AUTO_ STAY	SECURED	MANAGES	Country	Banks	CRIGHTS	REORG	NO_AUTO_ STAY	SECURED	MANAGES
Guatemala	4	1	0	0	1	0	Spain	60	2	0	1	0	1
Honduras	3	2	1	0	0	1	Sri Lanka	11	2	1	0	0	1
Hong Kong Sar, China	20	4	1	1	1	1	Sweden	68	1	0	0	1	0
Hungary	7	1	1	0	0	0	Switzerland	3	1	0	0	1	0
India	42	2	1	0	1	0	Tanzania	22	2	0	1	0	1
Indonesia	52	2	0	0	1	1	Thailand	13	2	0	0	1	1
Ireland	6	1	0	0	1	0	Turkey	19	2	1	1	0	0
Israel	9	3	0	1	1	1	Uganda	16	2	0	1	0	1
Italy	244	2	1	0	0	1	Ukraine	39	2	0	0	1	1
Jamaica	5	2	0	1	1	0	United Arab Emirates	10	2	1	1	0	0
Japan	75	2	0	0	1	1	United Kingdom	47	4	1	1	1	1
Jordan	9	1	0	0	0	1	United States	5,656	1	0	0	1	0
Kazakhstan	25	2	1	0	0	1	Uruguay	6	3	1	1	1	0
Kenya	25	4	1	1	1	1	Venezuela, RB	1	3	0	1	1	1
Kuwait	5	3	1	1	1	0	Vietnam	8	1	0	0	1	0
Kyrgyz Republic	4	3	0	1	1	1	Zambia	10	1	0	0	0	1
Lao Pdr	3	0	0	0	0	0	Total Banks	8,397					
Latvia	15	3	1	0	1	1	Non-U.S. Banks	2,741					
Lebanon	20	4	1	1	1	1							

Panel B. Bankruptcy Code Distribution

CRIGHTS	REORG	NO_AUTO_ STAY	SECURED	MANAGES	Countries	Banks Including U.S.	Banks Excluding U.S.
0	0	0	0	0	7	126	126
1	0	0	0	1	5	53	53
1	0	0	1	0	13	274	5930
2	0	0	1	1	10	256	256
1	0	1	0	0	1	72	72
2	0	1	0	1	4	102	102
2	0	1	1	0	6	36	36
3	0	1	1	1	15	843	843
1	1	0	0	0	3	25	25
2	1	0	0	1	7	414	414
3	1	1	1	0	6	260	260
3	1	0	1	1	2	25	25
2	1	1	0	0	3	35	35
3	1	1	1	0	7	57	57
4	1	1	1	1	8	163	163

## Supplementary Material

To view supplementary material for this article, please visit <http://dx.doi.org/10.1017/S0022109020000678>.

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