

International Evidence on Relationship and Transactional Banks as Delegated Monitors

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As compared to transactional banks, large banks in relationship banking countries have more non-performing loans, yet lower loan loss provisions relative to non-performing loans. These differences are greater for relationship banks that own larger amounts of equity in the companies to which they lend. Banking theory suggests that relationship banks have closer ties to their clients than do transactional banks. These links may provide relationship banks better information about their borrowers; but the links might also create conflicts of interest that change their incentives and make them relatively more reluctant to provision for nonperforming loans. Our results indicate that the incentive effects dominate the information effects.

JEL: G21, G28, G33

Key Words: Loan loss provisions, problem loans, relationship or universal banks

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Abstract:

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Banks exist because in some credit transactions their costs of intermediating between borrowers and lenders are less than the costs of direct financing. These transactions are those in which it is costly for lenders to anticipate and measure borrowers' expected and actual financial performances. Information asymmetries between borrowers and lenders mean that lenders cannot always trust borrowers in direct financing. Diamond (1984) shows conditions in which banks are trustworthy delegated monitors of borrowers. However, subsequent research shows that delegated monitoring raises a conundrum. On the one hand, Boot and Schmeits (2005) suggest that through their originating, pricing, and monitoring of loans, banks develop proprietary information about borrowers' financial conditions, and this facilitates better lending decisions. On the other hand, Boot (2000) argues that a close relationship between a bank and its borrowers can lead to a soft-budget constraint problem in which banks do not enforce loan terms on non-performing borrowers.

This paper reports empirical evidence on whether the closeness of the relationship between banks and their borrowers affects the incidence and treatment of non-performing borrowers. We find that banks in countries that previous researchers identify as relationship bank countries have a greater incidence of non-performing loans, but provision less for a given change in non-performing loans than do banks in transactional countries, which have a weaker association with their borrowers. The results may indicate that the incentive problems of relationship banks exceed their potential informational advantages.

In section I we use banking theory to gain insights into how different information and incentives might affect how transactional and relationship banks treat non-

performing borrowers. In section II we use the theory to develop testable hypotheses of the relative influences of information and incentives on transactional and relationship banks' treatments of their non-performing loans. We present our data in section III. In Section IV we present our empirical results. Section V concludes.

I. IMPLICATIONS OF FINANCIAL THEORY FOR BANKS' NON-PERFORMING LOANS

Allen and Gale (1995) distinguish between transactional and relationship banks. Relationship banks, such as the German Hausbanks, the Japanese main banks, and banks in some other countries provide both debt and equity financing to their clients, have long-lasting ties with them, serve on their boards of directors and in some cases serve as senior managers, and renegotiate debt contracts during periods of financial stress. Transactional banks in the former English colonies primarily provide short-term bank loans but not equity financing, monitor loan covenants, have limited interference in corporate management, and are reluctant for legal reasons to renegotiate loans of distressed firms.

Given a set of borrowers with different random future cash flows, relationship and transactional banks may differ in their estimates of the value of each borrower's cash flows, in their abilities to discern whether a borrower in distress is there because of liquidity or value problems, and in their inclinations to intervene in management and to restructure loans. These potential differences between relationship and transactional banks can reflect differences in the information they have about their borrowers, and in their incentives to act on their information.

A. INFORMATION DIFFERENCES

Bhattacharya and Thakor (1993) show that the assumption of asymmetric information between a bank and its borrowers is an important feature of banking theory. A borrowing firm may have superior knowledge of the risks and returns of its projects, the work ethics of key individuals, and the willingness of management to honor their loan commitments. These asymmetries may lead to adverse selection and moral hazard in the lending process.

Aoki (1994) identifies three monitoring actions that banks take to reduce information asymmetries. Ex ante monitoring consists of credit evaluation and screening to reduce adverse selection and coordination failures across industries with jointly dependent production. Interim monitoring refers to the lender observing and controlling the actions of the borrower after it makes the loan but before the borrower repays it. Ex post monitoring includes verification of the borrower's financial results, punishing poor results, and renegotiating in case of temporary events outside the borrower's control that do not harm its long-run prospects.

The literature suggests that relationship banks have closer ties to their clients than do transactional banks. According to Allen and Gale (1995), Aoki (1994), Aoki, Patrick and Sheard (1994), Hoshi, Kashyap, and Scharfstein (1990), Prowse (1996), and Steinherr and Huveneers (1994), the greater breadth and depth of relationship banks' interactions with their client firms may provide them with information that reduces noise in credit evaluation.

If relationship banks have closer ties to their clients, they may have an informational advantage over transactional banks in originating and monitoring loans. Transactional banks, with noisier information, will be less able to select high-quality

borrowers, and will be less able to identify the cause of distress when it does occur. Relationship banks, on the other hand, may be able to identify and concentrate on high quality borrowers, more effectively monitor them, and correctly specify the reason for distress. They will know which distressed loans they should foreclose and which they should renegotiate. If relationship banks have an informational advantage over transactional banks, then their loan portfolio quality should be higher.¹

B. INCENTIVE DIFFERENCES

Several models suggest that a relationship bank's equity holdings in its client firms may affect its incentives with respect to managing poorly performing borrowers. Dewatripont and Tirole (1994) develop a model in which a firm's performance determines whether control passes to debtors or equity holders. In their model, debtors are more likely to discontinue a poorly performing firm and equity holders are more likely to continue its existence.

Option theory helps distinguish the incentives of debt versus equity. A bank loan may include a short put option on the borrowing company's assets. If the borrower repays the loan, the bank gets the contracted principal and interest. If the borrower does not repay the loan, the bank gets the collateral. The put option's payoff to the bank has a fixed upper limit, but a loss that can increase if the company continues to perform poorly and the value of its collateral goes to zero. Consequently, a lending bank wants to force a

¹ An alternative story is that access to better quality information will enable the relationship banks to focus on riskier borrowers. If true, though, they would also be able to adjust prices accordingly and we would expect higher returns at relationship banks. The data in our sample, though, show significantly lower returns (net interest income and ROA) at relationship banks than at transactional banks. Moreover, we question why the relationship banks would chose the riskier borrowers if they had a superior capability to identify and concentrate on the high quality borrowers.

non-performing company to repay its loan before the loan's collateral loses value. In contrast, equity holders have a long call option on the company's future cash flows. The call has unlimited upside potential, and a limited downside loss. Equity holders want the company to continue operations in hopes it will improve its financial performance.

If a bank has both an equity and debt claim on a company that is in financial distress, Narayanaswamy, et al. (2001) show that the bank's managers will emphasize the equity claim if they view their responsibility as maximizing the value of the bank's equity.

Chemmanur and Fulghieri (1994) argue that because banks are always providing funds to businesses, they have an incentive to develop a reputation for skillful treatment of borrowers in financial distress. The crux of their argument is that just as lenders look for sound borrowers, so borrowers look for sound lenders. While they do not distinguish between relationship and transactional banks, their model suggests that banks may attempt to differentiate themselves from each other by their renegotiation activities.

Berlin, John and Saunders (1996) and Berlin (2000) argue that borrowers are better off if their lending banks do not own any of their equity. Borrowers want their banks to enforce hard budget constraints because outside creditors, who trust the bank to act prudently, will lend to the bank's borrowers at rates that reflect the bank's assumed superior information.

According to Chemmanur and Fulghieri (1994), when a borrower enters financial distress, the bank wants to signal to other potential borrowers that it is able to distinguish between borrowers whose loans should be renegotiated and those whose loans should be liquidated. According to Berlin (2000), the borrower wants the bank's signal to be

credible so that if the bank renegotiates, the outside creditors will also renegotiate. The bank's credibility is enhanced if it does not have a conflict of interest introduced by an equity holding and is instead a senior, collateralized lender. These arguments suggest that relationship banks are more likely to renegotiate loans to protect the value of their equity, while transactional banks are more likely to foreclose loans to protect the value of their loan.²

To summarize the incentive story, transactional banks may have greater incentives to foreclose questionable loans, while relationship banks may have greater incentives to originate, rollover, renegotiate, or restructure questionable loans.

II. TESTABLE DIFFERENCES BETWEEN RELATIONSHIP AND TRANSACTIONAL BANKS' TREATMENTS OF NON-PERFORMING LOANS

Both the information and incentive stories suggest that relationship and transactional banks' non-performing loans and loan loss provisions may differ. In this section, we develop hypotheses for the behavior of the two types of banks under both the information and incentive stories.

A. NON-PERFORMING LOANS

² An equity investment is not a necessary condition for this behavior. Wilner (2000) shows that a trade creditor that has an enduring, profitable relationship with a trade debtor grants more concessions to a customer in financial distress than would a competitive credit market lender.

In the normal course of business, some bank loans will become non-performing.³ B.I.S. (1988) guidelines require an international bank to establish a loan loss allowance account, a contra asset account, with a sufficient balance to absorb estimated credit losses from the loan portfolio. A bank identifies specific loans or a collectively assessed group of loans that are non-performing. If the bank's estimated credit losses from its non-performing loans exceed the balance in its loan loss allowance account, the bank must increase its allowances through a charge, called loan loss provisions, against its income. If the non-performing loans continue not to perform, the bank may be required to write them off through a charge against its loan loss allowance and a reduction in the carrying value of loans.

If relationship banks have better information about their borrowers' future cash flows than transactional banks have about theirs, they may make fewer ill-advised loans, be more likely to prevent their borrowers from making bad business decisions after the loans are made, and be better at renegotiating loans if they fall into arrears. If these conditions hold, relative to loans, non-performing loans should be smaller at relationship banks.

Incentives may exacerbate a bank's non-performing loans. A bank's equity investment in a borrower may influence its behavior toward the borrower at all three stages of the lending process. To protect the option value of its claim to revenue from the borrower, a bank with an equity investment may be more likely to grant a loan, and be

³ Bank loans require borrowers to repay principal and interest according to a schedule of payment dates and amounts. When borrowers do not repay their loans according to the schedule, banks may declare the loans to be non-performing. While there is no universal definition of non-performing loans across countries, Cortavarria et al (2000) report that in most G-10 countries, loans are considered non-performing if (a) principal or interest is due and unpaid for 90 days or more; or (b) interest payments equal to 90-day interest or more have been capitalized, refinanced, or rolled over.

less strict in monitoring it than a bank without an equity investment. Thus, relative to loans, a relationship bank's non-performing loans (NPL) may be higher.

This leads to the following hypotheses about the ratio of non-performing loans to loans:

H_{1n} Null hypothesis: Conditional on non-incentive and non-information variables, mean non-performing loan ratios are equal for transactional and relationship banks.

H_{1a} Information hypothesis: Mean non-performing loan ratios are smaller for relationship banks.

H_{1b} Incentive hypothesis: Mean non-performing loan ratios are higher for relationship banks.

B. LOAN LOSS PROVISIONS

Following Beatty, et al. (1995), Beaver and Engel (1996), and Wall and Koch (2000), we divide loan loss provisions into non-discretionary and discretionary components. The BIS directive relates a bank's non-discretionary loan loss provisions, $NLLP$, to the change in its non-performing loans, ΔNPL , and to the difference between the target amount of loan loss allowances, LLA^T , it should have to absorb its estimated credit losses less the amount of loan loss allowances that it actually has, LLA_{t-1} .⁴

$$\frac{NLLP_t}{L_t} = \frac{\Delta NPL_t}{L_t} + \frac{(LLA_t^T - LLA_{t-1})}{L_t}. \quad (1.)$$

Beatty et al. (1995), Collins et al. (1995), Beaver and Engel (1996) and Ahmed et al. (1999) using data for U.S. banks find that discretionary loan loss provisions ($DLLP$)

⁴ We divide all variables by the book value of loans to reduce heteroskedasticity.

depend on K_{t-1}/A_{t-1} the beginning-of-year ratio of a bank's capital to its assets, and I_t/L_t the ratio of its pre-loan provision income to assets.

Banks do not separately report their discretionary and non-discretionary loan loss provisions. Instead, they report data that are the sum of discretionary and non-discretionary provisions. Combining the above-discussed discretionary and non-discretionary components of loan loss provisions into one regression equation gives:

$$\frac{LLP_t}{L_t} = \phi_0 + \phi_1 \frac{\Delta NPL_t}{L_t} + \phi_2 \frac{(LLA_t^T - LLA_{t-1})}{L_t} + \phi_3 \frac{K_{t-1}}{A_{t-1}} + \phi_4 \frac{I_t}{L_t} + \varepsilon_t \quad (2.)$$

This equation says that a bank's loan loss provisions increase with the change in its non-performing loans, the difference between the level of loan loss allowances that is sufficient to absorb expected write-offs and lagged loan loss allowances, its lagged capital ratio, and its operating income.

Relationship and transactional banks may respond differently to their borrowers' non-performing loans.⁵ We show this using the standard econometric analysis of measurement errors. We imagine that a bank's reported change in its non-performing loans, $\Delta NPL_t/L_t$, equals the true, but unobserved, value of the change, $\Delta NPL_t^T/L_t$, plus a random measurement error, u_t .

$$\Delta NPL_t/L_t = \Delta NPL_t^T/L_t + u_t. \quad (3.)$$

The financial conditions of some non-performing borrowers may recover and the bank will reclassify their loans as performing. Other borrowers may not recover and the bank will provision for and write off their loans. Let β be the fraction of true non-performing loans that a well-informed bank would provision for and write off. Let b be the estimated

⁵ In the loan loss provision equation, the coefficient ϕ_1 may differ between relationship and transactional banks.

regression coefficient between loan loss provisions and the observed change in non-performing loans. Using σ_T^2 as the variance of the true change in non-performing loans, and σ_u^2 as the variance of the noise, the coefficients are related by the equation (Johnston and DiNardo, 1997):

$$\text{plimb} = \beta \left(\frac{\sigma_T^2}{\sigma_T^2 + \sigma_u^2} \right) \quad (4.)$$

If a relationship bank has superior information and monitoring of its borrowers compared to a transactional bank, its noise variance is smaller. If so, the estimated regression coefficient between loan loss provisions and the change in non-performing loans will be larger for relationship banks than for transactional banks. A relationship bank will make fewer loans that become non-performing, and when a loan does become non-performing the bank will know if it is recoverable. As a result there will be a close connection between changes in non-performing loans and loan loss provisions. Meanwhile, if a transactional bank has relatively poor information about the true financial condition of its non-performing borrowers, it may wait for more information before provisioning for and writing off bad loans. If so, the coefficient on the change in non-performing loans will be greater for relationship than for transactional banks.

On the other hand, if a relationship bank has an incentive to sustain poorly performing borrowers, it will be reluctant to provision for and write off its non-performing loans. In this case, there will be a smaller coefficient between the change in non-performing loans and loan loss provisions. If a transactional bank's information about its borrowers equals that of a relationship bank, and it has a greater incentive to foreclose non-performing loans, it will have a larger coefficient linking loan loss provisions to the change in non-performing loans.

These arguments give us our loan loss provision hypotheses:

H_{2n} Null hypothesis: Controlling for other factors, a given change in non-performing loans has an equal effect on loan loss provisions for transactional and relationship banks.

H_{2a} Information hypothesis: Controlling for other factors, a given change in non-performing loans has a larger effect on loan loss provisions for relationship than for transactional banks.

H_{2b} Incentive hypothesis: Controlling for other factors, a given change in non-performing loans has a smaller effect on loan loss provisions for relationship than for transactional banks.

To examine further the information and incentive effects, we look across the banks to see if the banks with the deepest relationships (those that have more information or stronger incentives to delay write-offs) behave differently. Based on Dewatripont and Tirole (1994) and option theory, we use the book value of a relationship bank's equity investments in its borrowers to proxy the depth or value of the bank's relationship. Higher equity investment is associated with deeper, more valuable relationships.⁶

⁶ More equity holdings should be associated with more access and influence at the client firm.

DATA DESCRIPTION

All bank data come from the BankScope data set. The sample period covers the 8 years 1994 - 2001. In order to assure that we are comparing relations for similar banks, we only include banks in our sample that satisfy the following criteria:

- The bank is in an OECD developed country.
- Bank Scope⁷ identifies the bank as a commercial bank. We do not include banks identified as savings institutions, real estate and mortgage banks, cooperative banks, or bank holding companies (US only).
- The bank has at least one subsidiary outside the home country.⁸
- All non-local corporate owners hold less than 10 percent of total equity, or are from a country with a similar banking system (e.g.: institutional investor in one relationship country invests in a bank in another relationship country).
- Available bank data include at least non-performing loans, loan loss reserves, and loan loss provisions.

These criteria leave us with a sample of 47 banks from 9 countries: Australia (5 banks), Canada (6), Denmark (3), France (5), Germany (4), Spain (5), Sweden (3), United Kingdom (6), and United States (10)⁹. See Appendix A for a list of the banks.

One obvious omission from the sample is Japan. We exclude Japan from this study because it experienced a severe banking crisis in the middle of our sample period.¹⁰

⁷ Bureau van Dijk compiles and distributes Bank Scope data.

⁸ The opening sentence of the Basle Committee on Banking Supervisions' July 1988 report reads "This report presents the outcome of the Committees' work over several years to secure international convergence of supervisory regulations governing the capital adequacy of *international banks*." (italics added). Given the close links between LLP and the capital ratio, it is important to have a sample where all banks are subject to the same capital regulations, i.e. the Basel Accord.

⁹ One of the US banks, State Street Bank and Trust, is considered by some not to be a typical commercial bank. If we conduct the tests that follow excluding State Street all of the results of interest remain unchanged. The only difference is that all banks tend to show a stronger positive relation between operating income and both loan loss provisions and write-offs.

Banking crises could alter the results by leading to the inclusion of years with unusually low income, unusually high loan losses, or significant regulatory interference that could include temporary or permanent regulatory changes or capital infusions. All of these actions could affect our coefficient estimates.

We rely on Steinherr and Huveneers (1994) and Berlin (2000) to classify our sample countries as transactional or relationship. We split the sample banks into relationship banks (20 banks from Denmark, France, Germany, Spain, and Sweden) and transactional banks (27 banks from Australia, Canada¹¹, United Kingdom, and United States).

Unfortunately, banks from most of the relationship banking countries do not report write offs (Denmark, France and Sweden, almost 60 percent of our relationship bank sample). We estimated derived write-offs for these banks but they have many missing observations and the derived write-offs are highly erratic compared to write-offs at banks that report them. We are dubious of any results that rely on the derived write-offs. As a result, we focus our analysis on non-performing loans and loan loss provisions.

III. EMPIRICAL RESULTS

A. SUMMARY STATISTICS

¹⁰ Sweden and France both had crises in the early 90s, but they were over by the beginning of our period and banks that were subject to the most severe regulatory interference are not included in our sample. The one exception to this is a bank in France that was nationalized, Credit Lyonnais. We conduct robustness tests to confirm this experience does not affect the results. In general, the distinction between the two sets of banks is slightly weaker in the LLP equation and slightly stronger in the WO equation when Credit Lyonnais is removed.

¹¹ Prowse (1990). Barth, et al. (1997) report that Canadian banks share some characteristics with relationship banks such as the ability to hold equity in non-financial firms. Buckley (1997) argues that Canadian banks are more like Japanese banks than they are like U.S. banks because of Canadian bankruptcy laws. Given their historical tradition as a former English colony, we classify Canadian banks *a priori* with transactional banks. Our results support our classification.

Table 1 provides descriptive statistics for our sample banks. For each type of bank, transactional or relationship, the table reports the mean, median and standard deviation calculated from annual observations over the years 1994-2001. The bottom two rows report test statistics for differences between the transactional and relationship banks' means and medians.

The first column shows that transactional banks hold essentially no equity whereas relationship banks have about 1.3 percent of their total assets in equity investments.¹² Equity investments range from 9.47 to 0.08 percent across the relationship banks and 0.46 to 0.00 percent for the transactional banks. Higher equity investments at relationship banks are consistent with the notion that their financial ties to their borrowers are more extensive than at transactional banks. The second column shows that transactional banks hold 59 percent of their assets as loans compared to 52 percent for relationship banks. The difference is significant at the one percent level for both means and medians. Combining loans and equity, relationship banks hold 54 percent of their assets as loans and equity. This is smaller than transactional banks' holdings of loans. Transactional banks appear to have a larger portion of their assets at risk than do relationship banks.¹³

Relationship banks have about twice the level of non-performing loans as a fraction of loans than do transactional banks, 3.4 percent compared to 1.8 percent.

¹² The Equity Investment data include listed and unlisted shares, holdings, investments and participations in affiliated, associated, unaffiliated, Group, and other companies. They do not include shares in subsidiaries, investments in equity accounted affiliated firms, or long term insurance. For transactional banks, the EqInv data most likely relate to either equity holdings in failed borrowers acquired via debt-equity swaps following bankruptcy, or equity holdings of a related but not consolidated investment-banking arm.

¹³ A comparison of the asset side of the balance sheet shows that the relatively lower level of loans at the relationship banks is offset with a relatively higher share of assets classified as Other Earning Assets, which comprise an average of 37.6% at the relationship banks compared to 29.7% at the transactional banks. Other earning assets consist of deposits at banks, short-term investments, other investments, equity investments, and insurance company investments.

Relationship banks make relatively fewer loans and the loans they make perform relatively worse. In addition, over the sample period both types of banks, on average, reduced their reported non-performing loans.¹⁴ The means of the changes in non-performing loans at relationship and transactional banks are not significantly different, but the medians are.

Transactional banks have smaller ratios of loan loss provisions to loans than relationship banks, 0.45 percent versus 0.62 percent. This is because they have relatively fewer non-performing loans. When divided by non-performing loans, in an average year transactional banks provision for 41 percent of their non-performing loans compared to 25 percent for relationship banks. These ratios are significantly different with a Median test, but not with a means test.¹⁵

Transactional banks have sufficient loan loss reserves to write off all of their bad loans. Relationship banks' reserves are 85 percent of their non-performing loans. For both types of banks, the implied provisioning periods seem unduly long. Dividing loan loss reserves by provisions shows that transactional banks have reserves sufficient to support 4.0 years of average provisions. The comparable number for relationship banks is 4.6 years. This difference is significant at the 5 percent level with a means t-test and at the 1 percent level for a Median test.

The last four columns report descriptive statistics for additional explanatory variables that we use in the analyses. Operating income is significantly higher at the transactional banks (0.9 vs. 0.6 percent of loans), while the capital ratios are

¹⁴ The far right column of Table 1 shows that GDP in each economy increased during the sample period. In a growing economy fewer borrowers should default.

¹⁵ The average ratio of LLP to NPL for transactional banks excludes one observation for a bank year with very low NPL. If this observation is included, the transactional bank ratio is even higher than those reported here.

indistinguishable with the means test, but significantly different with the Median test (10.99 vs. 10.80).¹⁶ The last two columns provide statistics on the two variables that proxy for regulatory differences and macroeconomic conditions, respectively, across countries. Our proxy for regulatory regimes, Heritage, is the Index for Banking and Finance from the Heritage Foundation's Index of Economic Freedom series. The index considers government ownership of banks, restrictions on the ability of foreign banks to open branches, government influence over the allocation of credit, government regulations, and freedom to offer any and all types of financial services. The variable ranges from 1 to 5, with higher numbers indicating more government interference. The sample country averages range from 1 for Australia to 3 for France. The average across the transactional countries is 1.5; the average across relationship countries is 2.4. These averages are significantly different from each other at the 1 percent level for both types of tests.

Our proxy for macroeconomic conditions is the annual percentage change in nominal GDP. For the sample period, GDP growth ranges from 2.9 percent for Germany to 6.9 percent for Spain. The averages, significantly different from each other at the 1 percent level for both types of tests, are 4.7 percent across relationship countries and 5.5 percent across transactional countries.

In summary, the univariate tests provide evidence that transactional and relationship banks differ along several dimensions. Relationship banks hold more equity and fewer loans than transactional banks; they declare more of their loans non-performing, yet they provide for smaller amounts of their non-performing loans. These

¹⁶ When we conduct the tests that follow with two alternative measures for income, pre-provision income or net interest income, the results of interest do not vary.

findings are consistent with relationship banks having greater incentives to forbear non-performing loans, and inconsistent with them having better information about their borrowers and a hard budget constraint.

B. REGRESSIONS TESTS: CHANGES IN NON-PERFORMING LOANS

According to BIS guidelines, banks are to provision based on changes in their non-performing loans. We first ask whether relationship and transactional banks differ in their tendencies to declare loans non-performing.

Table 2 reports regressions of the first differences of non-performing loans on five regressors: each bank's inherited capital ratio; a binary variable indicating whether the bank's capital ratio is in the lowest third of its peer group; the bank's inherited loan loss reserves; the Heritage index; and GDP growth. The Heritage and GDP variables control for cross country differences in regulation and growth, respectively. Theory does not predict the sign of the relation between the regulation proxy and changes in non-performing loans. Higher GDP growth rates should be associated with smaller increments to non-performing loans as most companies perform better in business expansions. Higher initial levels of capital and loan loss reserves should give banks more leeway to declare new non-performing loans, while the lowest capital banks should be constrained in their ability to declare (and then provision for) new non-performing loans. We estimate pooled, fixed effect regressions (47 banks with 8 years of data), with cross section weights and White heteroskedasticity consistent covariances. We report the adjusted R^2 , however because the regressions have bank specific fixed effects rather than a common intercept, the adjusted R^2 statistic is ill defined.

We include variables to allow the regression coefficients to differ between relationship and transactional banks (column 1), among banks based on their equity investments (column 2), or both (column 3). The regressor REL has the value one for relationship banks and zero for transactional banks. The regressor EI is the ratio of equity investments to loans. It has positive values for all relationship banks and zero values for most transactional banks.

Our main purpose for estimating the non-performing loan regressions is to test whether the mean change in non-performing loans differs between relationship and transactional banks, controlling for other factors. Theory says that banks with better information about their borrowers will make fewer loans that become non-performing, and that banks with incentives to forebear instead of foreclose bad loans will end up with greater amounts of non-performing loans. If the two types of banks have equal incentives and information, the mean fixed-effect intercepts for each type of bank should be equal. If relationship banks have greater incentives to forebear, their mean change in non-performing loans will exceed that of transactional banks. If relationship banks have better information about their borrowers, they should have smaller increases in non-performing loans.

In all three regressions reported in Table 2, changes in non-performing loans at relationship banks significantly exceed those at transactional banks. The average fixed effects coefficient estimates, reported at the bottom of the table, are 0.0161 at relationship banks and 0.008 at transactional banks when we include both REL and EI regressors. These results are consistent with relationship banks' incentives to maintain the values of

their long call options, which are implicit in their loans, dominating any possible informational advantages they might have over transactional banks.

We next examine the remaining coefficients to glean insights into why the two types of banks differ from each other. If banks and regulators in different countries have similar rules for estimating and recording non-performing loans, and if the regressions do not omit any regressors that are correlated with included regressors, the regression coefficients should be the same for transactional and relationship banks. They are not. The coefficients differ between transactional and relationship banks, and they differ based on the banks' equity investments.¹⁷ These banks behave differently from each other.

We focus our comments on column 3 where we allow the regressors to differ between transactional and relationship banks (REL), and by the amounts of equity the banks hold (EI). First, equity investments add information above that given by knowing whether a bank is in a relationship country.¹⁸ Second, the two types of banks differ in how their capital ratios affect their declarations of non-performing loans. Transactional banks with greater capital ratios tend to declare more of their loans to be non-performing. In contrast, relationship banks and banks with greater equity holdings declare smaller amounts of their loans to be non-performing as their capital ratios increase. Third, the capital ratio effect is non-linear as low capital banks declare significantly smaller changes in non-performing loans. Fourth, transactional banks with greater beginning loan loss reserves declare fewer loans to be non-performing, and this effect is smaller at relationship and equity-holding banks. Fifth, at transactional banks new non-performing

¹⁷ The F-statistics in Table 2 test whether the category coefficients are significant as a group.

¹⁸ See the F-tests in column (3) of Table 2.

loans are not related to GDP growth whereas relationship banks' bad loans decrease as their economies grow. Sixth, transactional and relationship banks in countries with high Heritage scores, indicating more government intervention in banking, declare smaller amounts of non-performing loans. This effect is smaller at banks with higher equity investments.

We have two main findings from our analysis of changes in non-performing loans: changes in non-performing loans conditional on the other regressors are greater at relationship banks and at banks with greater equity investments; regression coefficients linking changes in non-performing loans to the conditioning regressors differ between transactional banks and relationship banks and they differ based on banks' equity investments. In short, these banks' non-performing loans differ along every dimension we investigated.

C. REGRESSION RESULTS: LOAN LOSS PROVISIONS

Table 3 reports pooled, fixed-effect regressions for loan loss provisions across all 47 banks using annual data from 1994-2001. The regressors, based on equation (2) developed above, include each bank's current and previous year's change in non-performing loans,¹⁹ loan loss reserve and capital ratio at the end of the previous year,²⁰ operating income, a binary variable that designates the banks with capital ratios in the lowest third of their type of bank (lagged), the product of the low capital ratio variable and the change in non-performing loans, and the country's Heritage Index and growth

¹⁹ We include the previous year's change in non-performing loans because the results in Table 1 show that banks appear to take several years to adjust provisions to changes in non-performing loans.

²⁰ We follow the convention in the literature and do not include a proxy for the target level of loan loss reserves that the bank should have to absorb estimated credit losses.

rate of GDP. We test for differences between banks by allowing the coefficients for every explanatory variable to differ between transactional and relationship banks (column 1), among banks based on the level of their equity investments (column 2), and both (column 3).

We are most interested in the coefficients on ΔNPL , the change in non-performing loans. The information hypothesis developed above (H_{2a}) suggests that relationship banks should provision relatively more than transactional banks for a given change in non-performing loans (relationship banks have less measurement error), while the incentive hypothesis (H_{2b}) suggests they should provision relatively less (relationship banks are less willing to foreclose non-performing borrowers).

Our main finding is that in all three regressions, transactional banks increase their loan loss provisions with their non-performing loans whereas relationship banks do not. Over a two-year period, transactional banks change their provisions by about 20 cents for every dollar change in non-performing loans. In contrast, relationship banks' loan loss provisions are not related to changes in their non-performing loans.²¹ These results are consistent with transactional banks having stronger incentives to foreclose (H_{2b}). It is not consistent with relationship banks having better information about their borrowers (H_{2a}).

The coefficients of the control variables provide additional evidence that these two types of banks behave differently. Banks' capital ratios affect their loan loss provisions through three channels with different effects between the two types of banks.

²¹ In the REL regression, the sum of the direct and cross product coefficients of the change in non-performing loans is not different from zero with a p-value of 0.58. Testing the significance of the EI banks' ΔNPL coefficients requires two steps: First, multiply the cross-product coefficients times the average change in non-performing loans (0.025). Second, test whether the sum of the products plus the transactional banks' coefficients equal zero. Not one of these sums differs from zero. Thus, relationship banks do not adjust their provisions in response to changes in their non-performing loans.

First, the general level of the capital ratio does not affect transactional banks' loan loss provisions. Across relationship banks, however, banks with higher capital have higher provisions, but this effect decreases at banks with higher levels of equity investments.

Second, the link between provisions and capital is nonlinear. Low-capital transactional banks have systematically smaller provisions. The relationship banks with the lowest capital have higher provisions, with the effect strengthening at banks with more equity. This suggests that the weakest banks with the strongest incentive effects have the poorest quality loan portfolios.

Third, transactional banks with low capital have smaller responses of loan loss provisions to changes in current non-performing loans as seen by the significantly negative coefficient on the low-capital times change in non-performing loan regressor. Loan loss provisions reduce the amount of income that can be kept as retained earnings and added to capital. Transactional banks with low capital may be reluctant to provision for non-performing loans because doing so may leave them with insufficient capital to meet their capital requirements. In contrast, among low capital relationship banks, the sensitivity of loan loss provisions to changes in non-performing loans increases with their equity investments.

Transactional and relationship banks have dissimilar links to their country's Heritage Index values. Among the transactional countries, banks in countries with higher index values, indicating more government intervention, have smaller provisions. Relationship banks have no link between regulatory interference and the level of loan loss provisions.

Provisions in both types of countries are smaller in years with greater GDP growth with the effect in relationship countries being five times that of transactional countries.

With one exception, the regression coefficients are relatively stable across the three regressions. The loan loss reserve regression coefficients are much different in column (2) where we compare transactional banks to banks with equity investments. When we control for only the level of equity investments, transactional banks increase loan loss provisions if they enter the period with higher loan loss reserves. As a bank's level of equity investments rise, this relation diminishes by two-thirds.

Relationship banks with low equity investments decrease their loan loss provisions as their operating income increases. This relation diminishes as the level of equity investments rise.

Overall, the loan loss provision regressions confirm the univariate results; these two types of banks differ from each other. Of special note, for a given increase in non-performing loans, transactional banks increase their loan loss provisions, but relationship banks do not. This result defies BIS recommendations, and the normal sequence of accounting for non-performing loans in which a bank first declares some loans to be non-performing and then provisions for them.

D. ALTERNATIVE INTERPRETATIONS

We conduct robustness checks to reduce the chance that our results are spurious due to the effects of omitted variables. It is possible that some other, as yet unidentified, factor is responsible for the differences between these two types of banks. One likely

candidate is legal regimes: all of the transactional banks come from common law countries while all of the relationship banks come from civil law countries (France and Spain from French-origin, Germany from German-origin, Denmark and Sweden from Scandinavian-origin).²² If legal regimes matter we expect intercepts for banks in transactional countries, i.e. common law countries, to be equal. To check this possibility we estimated the non-performing loan and loan loss provision regressions with country intercepts instead of fixed effects. We find that the transactional bank intercept terms are not equal to each other. This suggests that the common law countries differ significantly from each other.

To look across the civil law countries, we estimated the regressions using legal origin binary variables instead of country binary variables (common, French, German, Scandinavian). We reject that the civil law (French, German, and Scandinavian) intercepts are equal. Instead, we find that the results of interest still hold. We think it is unlikely that legal origin, broadly defined, is responsible for the different behaviors of the relationship and transactional banks.

Taxes may be another possible explanation for the different behavior of these two types of banks. Because loan loss provisions affect pre-tax income, relatively higher average provisions in the relationship countries might be due to higher tax rates in those countries. However, average tax rates across the 2 sets of banks (calculated over years of positive income) are 34.6 percent for the transactional banks and 28.5 percent for the relationship banks. This difference is significant at the 1 percent level with both a mean and median test. In addition, the correlation for tax rates and loan loss provisions across

²² Dewenter and Hess (1998) provide evidence of a relation between banks' equity betas and returns and their legal regimes.

the transactional banks is -0.050, and across the relationship banks is 0.136. When we include taxes in the loan loss provision equations, the transactional banks show a negative relation between taxes and loan loss provisions, while the relationship banks show a positive relation. All of the other results are unchanged. We can find no evidence that the different behavior documented in Table 3 is due to taxes.

A third possibility is that our proxy for regulatory differences, the Heritage Index, does not accurately capture relevant regulatory differences.²³ Recently, Barth et al (2001, 2004) collect and analyze data on the regulation and supervision of banks in 107 countries. Beck et al (2005) present four principal components that summarize supervisory practices. These components relate to: the power of supervisors to discipline and monitor banks; the degree to which regulations force banks to disclose accurate transparent information to the public and whether regulations facilitate and encourage private sector monitoring of banks; the efficiency of the legal system; and bureaucratic efficiency. To check whether our results are due to any of these factors we reestimate our loan loss provision regressions using a common intercept and the Beck et al factors. Because of correlations between the Beck factors and our other regressors we are only able to include the factors two at a time.

Table 4 presents salient regression coefficients of our loan loss provision regressions with the Beck factors. These factors are not available for Australia and Denmark. This reduces our sample to 39 banks in 7 countries. Columns (1), (4), and (7) replicate the specifications in Table 3, which used all 47 banks. Columns (2), (5), and (8)

²³ We also experimented with The Fraser Institute's "Economic Freedom Rating, 2003". For our sample of countries a regression of the Heritage Index on the Economic Freedom Rating gave a slope coefficient of -1 and an R^2 of 0.90. The Economic Freedom Rating does not add information to the Heritage Index.

add two regulatory variables, Supervisory Power and Private Monitoring. Columns (3), (6) and (9) add two government variables, Rule of Law and Government Efficiency, to the base regressions.

Our main questions are whether the Beck factors are statistically significant, and if they are if the coefficients of the non-performing loans change when we add the Beck factors. The answers are yes and no, respectively. Greater supervisory power is associated with decreased loan loss provisions in transactional banks but greater loan loss provisions in relationship banks. Private sector monitoring of banks is associated with reduced provisions at both transactional and relationship banks with the effect being five times larger at relationship banks. The rule of law has a weak positive effect at transactional banks and no effect at relationship banks. Government efficiency has a weak negative effect on provisions at transactional banks, but no effect at relationship banks.

Even though the Beck factors have significant links to loan loss provisions, they do not change our main result, which is that transactional banks adjust their provisions in response to changes in their non-performing loans, but relationship banks do not.

In sum, differences in legal regimes, taxes, or regulatory environments cannot explain differences in transactional and relationship banks' loan loss provisions. Different incentives provide a consistent explanation. Loan loss provisions at transactional banks are consistent with a hard budget constraint. Loan loss provisions at relationship banks are consistent with a soft-budget constraint.

IV. CONCLUSIONS

Prior work on relationship banking has studied the effects on borrowers.²⁴ We look at the effects on banks. Our main finding is that transactional and relationship banks differ in their non-performing loans and loan loss provisioning. These differences could be due to differences in the information the banks have about their borrowers, or in their willingness to act on the information. Transactional banks have smaller amounts of non-performing loans relative to loans, greater provisions relative to non-performing loans, and a significant link between changes in non-performing loans and provisions. These results are consistent with BIS guidelines and the notion that a transactional bank has an incentive to provision for a non-performing loan before the borrower's collateral decreases below the value of the loan. In contrast, relationship banks' provisions are unrelated to changes in their non-performing loans. A relationship bank has an incentive to protect the combined values of its loans and equity, both explicit and implicit, in its borrowers. The different behaviors reflected in the data we study are consistent with differences in incentives, not differences in information.

Our results raise a host of questions about relationship banks. How long can relationship banks forebear non-performing loans? Ponzi schemes eventually fail. Do relationship countries have more bank failures, crises, government bailouts, and forced mergers than transactional bank countries? Do relationship banks have relatively larger loan loss reserves because past loan losses have convinced them they need these reserves? What are the costs of these reserves? Do the bid/ask spreads of relationship and transactional banks differ because of their different reserves and provisions? If so, whose

²⁴ See, for example, the review by Boot (2000), in "Relationship banking, what do we know?"

spread is smaller and by how much? How do these reserves affect the efficiency of the banking system? Does one system have more value than another?

Controlling for the credit quality of borrowers and the loan exposures of banks, are the market values of the assets of transactional and relationship banks equally valuable? Or, do relationship banks transfer value to their borrowers by their possibly more lenient loan renegotiation policies? What about other lenders? Do other lenders depend on banks' signaling of borrowers' credit qualities? If so, do companies in relationship countries face higher non-bank borrowing rates than companies that primarily borrow from transactional banks?

There has been an outpouring of research on the role of financial intermediaries in economic growth. This research has been coupled with and used to evaluate financial systems for emerging countries. Much of that research treats intermediaries around the world as homogeneous. Our research suggests that relationship and transactional banks are heterogeneous in their dealings with borrowers. These micro level effects may have differing macroeconomic effects. Much remains to be done to estimate the relative values of transactional and relationship banking systems.

Appendix A – Sample Banks

TRANSACTIONAL BANKS

Australia

National Australia Bank
Commonwealth Bank of Australia
Westpac Banking Corp
Australia and NZ Banking Group
St. George Bank Ltd.

Canada

Royal Bank of Canada
Canadian Imperial Bank of Commerce CIBC
Toronto Dominion Bank
Bank of Nova Scotia
Bank of Montreal
National Bank of Canada

United Kingdom

Barclays Bank
Royal Bank of Scotland
HSBC Bank
National Westminster Bank
Bank of Scotland
Standard Chartered

United States

Bank of America, NA
JP Morgan Chase
Citibank NA
Wachovia Bank, NA
Fleet National Bank
Bank One, NA
Wells Fargo Bank, NA
Sun Trust Bank
Bank of New York
State Street Bank and Trust Company

RELATIONSHIP BANKS

Denmark

Danske Bank
Jyske Bank
Nordea Bank Danmark

France

BNP Paribas
Societe Generale
Credit Lyonnais
Credit Agricole Indosuez
Credit Ind. et Comm'l CIC

Germany

Deutsche Bank
Bayerische Hypo-und Ver.
Dresdner Bank
Commerzbank

Spain

Santander Central Hispano
Banco Bilbao Vizcaya Argentaria
Banco Esp. de Credito, BANESTO
Banco Popular Espanol
Banco de Sabadell

Sweden

Svensk Handelsbanken
Skandinaviska Enskild Banken AB
Nordea Bank Sweden

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Table 1: Descriptive Statistics

	EqInv/TA	Loans/T A	NPL/L	d(NPL/L)	LLP/L	LLR/L	OpInc/L	Capital Ratio	Heritage	Δ GDP
Transactional Banks										
Mean	0.0004	0.588	0.018	-0.0023	0.0045	0.018	0.089	10.993	1.500	5.537
Median	0.0000	0.599	0.013	-0.0010	0.0042	0.017	0.074	10.950	1.500	5.576
St. Dev.	0.0008	0.139	0.017	0.008	0.004	0.008	0.083	1.775	0.501	1.290
N	200	215	205	178	215	215	215	214	216	216
Relationship Banks										
Mean	0.0127	0.524	0.034	-0.0039	0.0062	0.029	0.058	10.802	2.437	4.722
Median	0.0083	0.513	0.026	-0.0026	0.0059	0.028	0.056	10.410	2.000	4.452
St. Dev.	0.0139	0.106	0.028	0.013	0.004	0.013	0.020	1.459	0.568	1.773
N	147	147	136	115	147	144	147	136	160	160
Trans-Rel Test Statistic										
Means	12.51***	4.64***	6.23***	1.32	4.16***	9.74***	4.57***	1.05	16.93***	5.05***
Median	15.41***	5.61***	6.07***	2.79***	4.16***	8.76***	7.71***	2.85***	11.60***	4.47***

Note: Table reports Mean, Median and Standard Deviation for the variables across the 27 transactional and 20 relationship banks, using annual data over 1994-2001. EqInv = equity investments, TA = total assets, NPL = non-performing loans, L = total loans, LLR = loan loss reserves, LLP = loan loss provisions, OpInc = operating income, Capital Ratio = total capital ratio, Heritage = Heritage Foundation's Index of Economic Freedom country rating, Chg GDP = annual percentage change in gross domestic product. Test for differences: Means is a two-sided t-test for difference in means assuming different variances, and Medians is a Wilcoxon/Mann Whitney test. *, **, and *** Denote significant differences at 1, 5, and 10 percent, respectively.

Table 2 – Pooled Fixed Effect Regressions for Change in Non-Performing Loans

Regressors	(1) REL	(2) EI	(3) REL & EI
Capital Ratio(-1)	-0.0004 (0.000)	-0.0003 (0.000)	0.0001 (0.074)
Capital Ratio(-1)*REL	-0.0004 (0.007)		-0.0005 (0.009)
Capital Ratio(-1)*EI		-0.027 (0.000)	-0.029 (0.000)
Low Capital(-1)	-0.001 (0.000)	-0.0004 (0.004)	-0.0007 (0.000)
Low Capital(-1)*REL	0.000 (0.867)		0.001 (0.229)
Low Capital(-1)*EI		-0.029 (0.000)	-0.046 (0.000)
Loan Loss Reserves(-1)	-0.650 (0.000)	-0.464 (0.000)	-0.539 (0.000)
Loan Loss Reserves(-1)*REL	0.317 (0.000)		0.150 (0.004)
Loan Loss Reserves(-1)*EI		3.967 (0.000)	0.971 (0.290)
Δ GDP	-0.0000 (0.082)	-0.000 (0.848)	0.0000 (0.983)
Δ GDP*REL	-0.0001 (0.423)		-0.0007 (0.000)
Δ GDP*EI		0.007 (0.010)	0.011 (0.067)
Heritage Index	0.000 (0.950)	-0.001 (0.000)	-0.0007 (0.002)
Heritage*REL	-0.0003 (0.533)		0.0005 (0.275)
Heritage*EI		0.090 (0.000)	0.110 (0.000)
F-statistic for category variables	15.7 (0.000)	83.3 (.000)	REL: 33.8 (0.000) EI: 58.5 (0.000)
Adj. R ²	1.00	1.00	1.00
N	283	271	271
Average Fixed Effects			
- Transactional Banks	0.0150	0.0110	0.0080
- Relationship Banks	0.0185	0.0145	0.0161
T-Test	-2.94***	-3.05***	-7.14***

Note: Table reports results of pooled regressions for annual data for 27 transactional and 20 relationship banks over 1994-2001. Specifications are with fixed effects, cross sectional weights and White heteroskedasticity consistent covariances. Heritage = Heritage Foundation's Index for Banking and Finance, REL = binary variable set equal to one

for the 20 relationship country banks, Δ GDP = annual percentage change in GDP, Low Capital = binary variable set equal to one for banks with bottom one-third capital ratio (calculated over transactional and relationship banks separately), EqInv = equity investments/loans. P-values reported below coefficients in parentheses. Test statistic for T-Test is with pooled variances. *** Denotes significance at the 1 percent level for the t-test.

Table 3: Pooled Fixed Effect Regressions for Loan Loss Provisions

Regressors	(1) REL	(2) EI	(3) REL & EI
Δ NPL	0.148 (.000)	0.147 (.000)	0.196 (0.000)
Δ NPL*REL	-0.128 (.000)		-0.119 (0.000)
Δ NPL*EI		-6.546 (.000)	-2.510 (0.005)
Δ NPL(-1)	0.053 (0.000)	0.055 (0.000)	0.050 (0.000)
Δ NPL(-1)*REL	-0.020 (0.164)		0.006 (0.719)
Δ NPL(-1)*EI		-1.506 (0.011)	-2.040 (0.000)
LLR(-1)	0.016 (0.632)	0.090 (0.000)	0.042 (0.324)
LLR(-1)*REL	0.033 (0.403)		0.016 (0.744)
LLR(-1)*EI		-2.287 (0.005)	0.274 (0.733)
Operating Income	0.0005 (0.923)	0.0001 (0.978)	0.001 (0.773)
Operating Income*REL	-0.014 (0.378)		-0.081 (0.000)
Operating Income*EI		0.082 (0.916)	1.992 (0.001)
Capital Ratio(-1)	0.0001 (0.059)	0.0004 (.000)	0.000 (0.278)
Capital Ratio(-1)*REL	0.0005 (0.001)		0.001 (0.000)
Capital Ratio(-1)*EI		-0.013 (0.004)	-0.012 (0.001)
Low Capital(-1)	-0.0003 (0.052)	-0.00001 (0.939)	-0.0007 (0.001)
Low Capital(-1)*REL	0.002 (0.000)		0.002 (0.000)
Low Capital(-1)*EI		0.025 (.022)	0.039 (0.001)
LowCapital(-1) * Δ NPL	-0.078 (0.007)	-0.094 (0.000)	-0.152 (0.000)
LowCapital(-1) * Δ NPL*REL	0.071 (0.034)		-0.103 (0.102)
LowCapital(-1) * Δ NPL*EI		3.273 (0.079)	14.445 (0.000)
Heritage	-0.002 (.002)	-0.002 (.000)	-0.002 (0.005)
Heritage*REL	0.003 (0.001)		0.003 (0.001)
Heritage*EI		0.098 (0.000)	0.006 (0.772)

Δ GDP	-0.0002 (0.001)	-0.0003 (0.000)	-0.0002 (0.002)
Δ GDP*Rel	-0.0008 (0.000)		-0.0009 (0.000)
Δ GDP*EI		-0.009 (0.024)	0.002 (0.667)
F statistic (REL or EI =0)	21.9 (0.000)	13.9 (0.000)	REL: 20.9 (0.000) EI: 170.2 (0.000)
Adj. R ²	1.00	1.00	1.00
N	237	228	228

Notes: Table 3 reports results of pooled regressions for annual data for 27 transactional and 20 relationship banks over 1994-2001. Specifications are with fixed effects, cross sectional weights, and White heteroskedasticity consistent covariances. Heritage = Heritage Foundation's Index for Banking and Finance, REL = binary variable set equal either to one for the 20 relationship country banks, EI = equity investments/loans, Δ GDP = annual percentage change in GDP, LLR = loan loss reserves/loans, Operating Income = operating income/loans, Capital Ratio = total capital ratio, Δ NPL = annual percentage change in total reported non-performing loans, Low Capital = binary variable set equal to one for banks with bottom one-third capital ratio (calculated over transactional and relationship banks separately). P-values in parentheses below coefficients.

Table 4. Pooled Regressions for Loan Loss Provisions including the Beck et al Factors

Regressors	REL			EI			REL & EI		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Δ NPL	0.17 (0.00)	0.16 (0.00)	0.16 (0.00)	0.17 (0.00)	0.19 (0.00)	0.18 (0.00)-	0.18 (0.00)	0.14 (0.00)	0.14 (0.00)
Δ NPL*REL	-0.14 (0.00)	-0.13 (0.00)	-0.13 (0.00)				-0.18 (0.01)	-0.12 (0.06)	-0.10 (0.11)
Δ NPL*EI				-8.55 (0.00)	-10.31 (0.00)	-9.59 (0.00)	3.05 (0.28)	0.78 (0.77)	-0.38 (0.89)
Δ NPL(-1)	0.08 (0.01)	0.07 (0.03)	0.09 (0.02)	0.07 (0.00)	0.07 (0.00)	0.07 (0.00)	0.07 (0.13)	0.20 (0.68)	0.03 (0.59)
Δ NPL(-1) *REL	-0.04 (0.22)	-0.03 (0.33)	-0.04 (0.25)				-0.02 (0.74)	0.03 (0.50)	0.02 (0.63)
Δ NPL(-1)*EI				-1.74 (0.21)	-1.92 (0.16)	-1.32 (0.34)	-1.44 (0.25)	-1.14 (0.31)	-0.83 (0.46)
Heritage	-0.0014 (0.00)	-0.003 (0.00)	-0.002 (0.01)	-0.0009 (0.00)	-0.001 (0.04)	-0.001 (0.07)	-0.001 (0.01)	-0.003 (0.00)	-0.002 (0.02)
Heritage*REL	0.0015 (0.04)	0.004 (0.00)	0.003 (0.01)				0.004 (0.00)	0.005 (0.00)	0.004 (0.00)
Heritage*EI				0.07 (0.02)	0.18 (0.00)	0.13 (0.00)	-0.10 (0.01)	-0.07 (0.14)	-0.08 (0.09)
Supervisory Power		-0.0006 (0.00)			-0.0004 (0.01)			-0.0006 (0.00)	
Supervisory Power *REL		0.006 (0.00)						0.008 (0.00)	
Supervisory Power * EI					0.12 (0.00)			-0.03 (0.52)	
Private Monitoring		-0.002 (0.36)			0.002 (0.05)			-0.004 (0.04)	
Private Monitoring *REL		-0.01 (0.00)						-0.02 (0.00)	
Private Monitoring * EI					-0.29 (0.04)			0.22 (0.28)	
Rule of Law			0.03 (0.06)			-0.003 (0.07)			0.03 (0.10)
Rule of Law * REL			-0.04 (0.01)						-0.04 (0.01)
Rule of Law * EI						-0.08 (0.41)			0.13 (0.23)
Government Efficiency			-0.02 (0.08)			0.004 (0.00)			-0.02 (0.11)
Government Efficiency*REL			0.03 (0.04)						0.03 (0.04)
Government Efficiency * EI						-0.01 (0.94)			-0.16 (0.52)
F statistic:									
REL =0	(0.00)	(0.00)	(0.00)				(0.00)	(0.00)	(0.00)
EI =0				(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Adj. R ²	0.62	0.67	0.62	0.70	0.65	0.59	0.67	0.71	0.69

