Do Solicitations Matter in Bank Credit Ratings? Results from a Study of 72 Countries

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Abstract

Would the credit ratings of unsolicited banks be higher if they were solicited? Alternatively, would the credit ratings of solicited banks would be lower if they were unsolicited? To answer these questions, we use an endogenous regime-switching model and data from 460 commercial banks in 72 countries, excluding the United States, for the period 1998-2003. The answer to both questions is yes. Our results show that the observed differences between solicited and unsolicited ratings can be explained by both the solicitation status and financial profile of the banks. In some cases, the effect of solicitation status on bank ratings is stronger than the effect caused by differences in financial profile. This finding is a new contribution to the literature.

JEL classification: G21; G20

Keywords: Banks, Credit rating, Unsolicited, NRSROs

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1. Introduction

Unsolicited bank credit ratings assigned to banks by Nationally Recognized Statistical Rating Organizations (NRSROs), such as Standard and Poor's Ratings Services (S&P's) and Moody's Investor Service (Moody's), are controversial. Credit ratings that are initiated and paid for by issuers are called "solicited ratings," and credit ratings that are not paid for by the issuing firm are called "unsolicited ratings." The U.S. Department of Justice (DOJ) has recommended that the U.S. Securities and Exchange Commission (SEC) require rating agencies to disclose when credit ratings are unsolicited (Gasparino, 1996a). The DOJ stated that "'unsolicited' ratings may not be as accurate as ratings by retained agencies … When unsolicited ratings are not based on the same type of information as solicited ones, the ratings agency runs the risk that its rating is not accurate" (DOJ, 1998). Based on the survey of Baker and Mansi (2002), there are concerns that unsolicited ratings are less accurate than ratings that are paid for in the traditional manner because the rating agency does not have access to confidential information in the traditional ratings process.

Rating agencies encounter potential conflicts of interest because they serve both issuers and investors (Baker and Mansi, 2002). Investors are the main users of credit ratings, but fees paid by the issuers are the principal source of income of the agencies. For example, about 90 percent of Moody's and Fitch's revenues come from issuer fees (SEC, 2003). Michael Oxley (2004), Chairman of the House Committee on Financial Services, said in hearings about "The Ratings Game" that "Officials from Northern Trust Corporation have stated that the major rating agencies have requested payment for unsolicited ratings and strong-armed the company to pay the fees in return for a good rating. Northern Trust is not the only company to register a

complaint about these practices." The following year, Oxley (2005) also stated in hearings about "Reforming Credit Rating Agencies" that "Given the inherent conflicts and evidence that unsolicited ratings tend to be lower, this practice begs for reform, if not outright prohibitions."

In 2005, Eliot Spitzer, New York State Attorney General, subpoenaed Moody's for documents related to the company's unsolicited credit ratings and other credit-rating practices (Klein, 2005; and Stempel, 2005). James Kaitz, President and Chief Executive Officer of the Association for Financial Professionals, said that issuers often feel compelled to participate in the rating process and pay for the unsolicited rating. He asked the SEC to explore the potential for abuse in unsolicited ratings (McTague, 2005). On the other side of the rating process, Kathleen Corbet, during her tenure as President of S&P's, defended unsolicited ratings on the grounds that they benefit the market and said that the company issued these ratings only if there was meaningful market interest and adequate public disclosure by the issuer (McTague, 2005). Moody's (1999) considers the assignment of unsolicited ratings to be the market's best defense against rating shopping. Rate shopping occurs when issuers shop among various agencies for the highest ratings and to suppress lower conclusions.

Against this background, the main research issues that we examine are whether the credit ratings of unsolicited banks would be higher if they were solicited; and alternatively, whether the credit ratings of solicited banks would be lower if they were unsolicited? These questions are complicated as they must be answered by taking into account: 1) the differences in the financial characteristics of the two groups (the clientele effect), 2) the potential self-selection bias whereby better firms may self-select to be rated and poor-quality firms may not request to be rated, and 3) the differences in the importance of the same factors in determining the ratings of the banks between the two groups. As the next section will show, previous studies in the literature have not addressed these hypothetical questions.

We attempt to take all of the above factors into account by adopting an endogenous regime-switching model and using a relatively simple testing procedure. The two regimes are "solicited banks" and "unsolicited banks". The selection mechanism is endogenous and depends on observable firm characteristics and market performance. Specifically, we use the estimated coefficients in each regime equation of the endogenous regime-switching model. We use the estimated model to obtain the expected credit ratings of the bank in an alternative regime. The expected credit rating of the bank is calculated using the estimated coefficients of the other regime, thus utilizing the bank's own characteristics. These are counterfactual measures that cannot be observed directly. Then, we evaluate several treatment effects in hypothetical situations.

The important point is that we evaluate the hypothetical ratings after controlling for different bank characteristics and endogenous selection bias. Our approach is different from the standard Heckman's selection bias model as we use heterogeneous parameters of the rating determinants in the selection equation. We attempt to control for selection bias based on observable firm characteristics. We cannot account for the unobservable factors if firms with something to hide may select not to be rated. Further discussion of the potential limitation of our analysis is presented in Section 4.4. However, our methodology also allows us to decompose the observed difference in ratings into two different treatment effects using selected counterfactual measures, and in particular, permits us to divide the usual treatment effects into two different sources that are more meaningful in our analysis. We decompose the sources of rating difference into two components: 1) the clientele effects caused by differences in *financial profile*, or *financial characteristics*, holding the solicitation status fixed, and 2) the treatment effects caused by a change in *solicitation status*, holding the financial characteristics fixed. The latter effects constitute the focus of the main questions of this study. Our results show that the observed

differences between the solicited and unsolicited ratings can be explained by both financial profile and solicitation status. In some cases, the effect of solicitation status on bank ratings is stronger than the effect caused by differences in financial profile. This is a new contribution to the literature.

The remainder of the paper is organized as follows. Section 2 provides background information on credit ratings and the relevant literature. Section 3 explains the research design and methodology. Section 4 discusses the results of our tests, and Section 5 presents our conclusions.

2. Background and Research Issues

Large firms that issue publicly held debt believe that credit ratings from NRSROs are indispensable for managing interest costs and attracting investors. The SEC recognizes five NRSROs: A.M. Best Company, Inc., Dominion Bond Rating Service Ltd., Fitch Inc. (Fitch), Moody's, and S&P's (SEC 2005). These firms are also recognized internationally. Moody's began to assign unsolicited credit ratings in 1909 (Moody's Investors Service, 1999). However, Stempel (2005) reported that Moody's discontinued assigning unsolicited credit ratings in 2000.

Other rating agencies continue to assign unsolicited ratings because investors want them. In addition, unsolicited ratings can be used as a strategy for entering new markets, or when there is a new asset class (McTague, 2005). For example, when S&P's entered the Japanese market in recent years, it assigned 176 unsolicited long-term ratings (i.e., 63% of the 278 ratings) to Japanese issuers (S&P's, 2003a). S&P's does not use the terms "solicited" and "unsolicited" in its monthly ratings publications. Rather, it labels unsolicited ratings with "pi" subscripts (e.g., AA_{pi}) which stand for "public information" as opposed to other ratings. According to S&P's, ratings with "pi" subscripts are based solely on the analysis of an issuer's public information,

that is, the issuer's published financial information and additional information in the public domain. They do not reflect in-depth meetings with an issuer's management. Thus, these ratings are based on less comprehensive information than ratings without "pi" subscripts (S&P's, 2000b).

Some firms do not want *solicited* ratings by NRSROs, while others do want to be rated. Consider China, which has regulatory systems and accounting standards different from those in the United States. Chinese bond issuers that intend to offer their bonds only in China are not required to obtain ratings from NRSROs. Hence, they use local rating agencies that are recognized by their own regulatory bodies. However, those issuers that intend to raise funds in international capital markets, or that intend to cross-list their shares on foreign stock exchanges, want ratings from NRSROs to gain international acceptance.

Equally important, not all international issuers want *unsolicited* credit ratings by NRSROs, especially those issuers that have been assigned unfavorable ratings (Adams, 1996; and JEN, 1998). Harington (1997) said that some banks consider Moody's practice of assigning unsolicited ratings as "tantamount to blackmail." This implies that banks would receive more favorable ratings should they cooperate and pay for them. Other issuers have complained that unsolicited ratings mislead investors because they believe that the ratings were assigned without the input of the bond issuer (Gasparino, 1996b; Williams, 2005). This results in an issue of information friction. Recently, the German Insurance Association expressed considerable concern about the appropriateness and transparency of Fitch's methodology in issuing unsolicited ratings (Miller, 2005).

The determinants of credit ratings have been researched extensively. Altman, Avery, Eisenbeis and Sinkey (1981) reviewed the early evolution and application of statistical techniques to bond ratings and other financial analyses. Moon and Stotsky (1993), Cantor and

Packer (1997), and Pottier and Sommer (1999) found that rating scales, rating determinants, or weights attached to rating determinants differ across rating agencies after accounting for self-selection bias. Moon and Stotsky (1993) demonstrated that there is a significant difference between Moody's and S&P's in rating determinants. Their results indicate that split ratings reveal differences in both the degree of importance that is assigned to the specific determinants of the ratings and in the way that the bonds are classified.

Cantor and Packer (1997) used the long-term ratings of U.S. corporations that were assigned by Moody's, S&P's, Duff & Phelps Credit Rating Co. (Duff & Phelps), and Fitch to show that there were differences in the rating scales among these agencies.[1] They provided limited evidence of self-selection bias. After examining a sample of property-liability insurer financial strength ratings that had been assigned by Moody's, S&P's, and A.M. Best (Best), Pottier and Sommer (1999) found that rating determinants and their weights differed across the three agencies. Whereas Moon and Stotsky (1993) detected self-selection bias in Moody's ratings but not in S&P's ratings, Pottier and Sommer (1999) identified selection bias only in Best's insurer ratings but not either Moody's or S&P's ratings.

On the other hand, Poon (2003) used S&P's long-term ratings of 265 corporations in different industries in 15 countries from 1998-2000, and found that unsolicited credit ratings were lower than solicited ratings. Profitability and sovereign credit risk were the two major factors used to determine long-term corporate ratings. Byoun and Shin (2003) used the unsolicited and solicited ratings of non-U.S. corporations between 1996 and 2002 to study the effects of solicited and unsolicited ratings on firm value. For unsolicited ratings, they found significant negative market reactions to downgrade announcements and positive market reactions

[1] Duff & Phelps was acquired by Fitch in April, 2000.

to upgrade announcements. In contrast, for solicited ratings, they found only significant positive market reaction to upgrade announcements.

Butler and Rodgers (2003) examined a sample of 360 bond ratings issued by non-financial companies during 1997. Their results suggest that when relationships exist in the assignment of solicited ratings compared to unsolicited ratings, rating agencies rely less on publicly available "hard" information, and are better able to assess "soft" information about bond issuers. Poon and Firth (2005) used a sample of 1,060 ratings of major banks from 82 countries to analyze shadow ratings[2] which are based largely on public information to shed light on the controversy surrounding unsolicited ratings. Their results indicate that shadow ratings are lower than non-shadow ratings.

Research Issues

In general, the aforementioned studies reveal that unsolicited credit ratings are lower than solicited credit ratings. However, this is not necessarily evidence of the significance of solicitation, the blackmail hypothesis, or evidence of information friction. It is possible that low-quality banks may choose not to solicit ratings or pay for ratings. Accordingly, there is a selection bias issue. Equally important, the financial characteristics of solicited firms and those of unsolicited firms differ. Collectively, these factors could explain the difference in the average ratings, but they do not necessarily support the existence of prejudice or frictional information. Therefore, it is important to control for selection bias and different observable firm characteristics when evaluating the net effect of solicitation.

[2] According to Fitch (2001), "the use of the description 'Shadow' denotes that the Individual ratings is largely based on public information, albeit supplemental with additional information obtained from the rated entity."

The previous factors are important because rating agencies may evaluate financial characteristics differently when the ratings of banks are unsolicited. Hence, we examine the extent to which factors regarding rating procedures contribute to the difference in the credit ratings issued by the credit rating agencies, while at the same time controlling for the effects of different financial profiles. The main objective of our study is to examine whether solicitations matter in bank credit ratings. Thus, we begin by asking whether the credit ratings of unsolicited banks would be higher if they *were solicited*. We also ask whether the credit ratings of solicited banks would be lower if they *were unsolicited*. Obviously, the answers to these questions are not directly observable, and we use testing procedures to provide answers.

3. Research Design

This section describes the sample, data, methodology, and treatment and clientele effects.

3.1 Sample and Data

We examined 460 commercial banks in 72 countries, excluding the United States, that had solicited and unsolicited credit ratings issued by S&P's from 1998 to 2003. We excluded the United States because the only data available was for bank holding companies and not individual commercial banks.

The sample used in this study consists of commercial bank issuers that meet the following two conditions. 1) The commercial bank issuers must have long-term issuer credit ratings in local currency provided by Standard and Poor's Rating Services (S&P's bank ratings are referred to as SPRs hereafter) in each of the Januarys from 1998 to 2003.[3] According to S&P's *Global Ratings Handbook* (2002), an "issuer credit rating" refers to "a current opinion of an obligor's overall financial capacity (its creditworthiness) to pay its financial obligations." 2)

[3] (S&P's, 1998b; S&P's, 1999a; S&P's, 2000a; S&P's, 2001; S&P's, 2002; and S&P's, 2003b)

The commercial banks must not only have issuer credit ratings that are listed in the *Global Ratings Handbook* but also have detailed bank reports provided by the Bankscope financial database (Bankscope) prior to each of the six rating dates. As a result of this two-step screening process, there was data for several U.S. bank holding companies, but none for "commercial banks with issuer credit ratings." Therefore, there are no U.S. commercial bank issuers in our sample.

Data for the financial variables of the sample banks are from the bank reports of Bankscope.[4] Bankscope contains the financial statements and data of over 11,000 public and private banks worldwide (Bankscope, 2003). Most of the financial variables used in this study (see Appendix 1 for the complete list and description) are those that S&P's may examine in determining SPRs.[5] However, S&P's insists that there is no standard group of ratios which sets the minimum requirements for each rating category (S&P's, 1999b). The financial variables measure profitability, asset quality, liquidity, and capital adequacy.

In addition, we use the book value of "total assets" to measure bank size, and the book value of "trading securities" to represent the uniqueness of bank assets. According to Morgan (2002), banks with large trading assets are different from those without trading assets and are a common source of disagreement in ratings between S&P's and Moody's. The risks that are associated with large trading assets are harder to observe and easier to change than the risks associated with loans. UBS (2004) believes that "larger companies tend to have higher credit ratings" and that "size metrics offer the strongest statistical correlation with credit ratings – reflecting important qualitative factors such as geographic and product market diversification, competitive position, bargaining power, market share and brand stature." Because rating

[4] Many international banks and major rating agencies subscribe to Bankscope for detailed bank reports.

agencies consider sovereign credit risk to be important in assessing the credit standing of banks and corporations (S&P's, 1997; and S&P's, 1998a), S&P's sovereign credit rating, represented by SOV, is included in the rating determinant models to explain SPRs.

We also include five year dummies (YR1999, YR2000, YR2001, YR2002 and YR2003), "PROP_SOL", "EXNO1" and "OVERSEAS" as instrumental variables in the selection equation. We assume that the proportion of solicited ratings might change over time. Therefore, PROP_SOL, which represents the proportion (by percentage) of solicited ratings in the respective country of the year, and the year dummies are used in the selection equation. EXNO1 and OVERSEAS are used as proxies for the bank's international operations. EXNO1 refers to the number of overseas exchanges on which the bank was listed while OVERSEAS refers to the number of overseas subsidiaries held by the bank.[6] We argue that international operations may increase a bank's demand for a rating from S&P's.

[SEE APPENDIX 1]

There are two significant benefits from using this sample of international banks. First, we are making international comparisons of firms in the same industry that facilitates comparisons and testing. Second, 1998-2003 includes periods of economic turmoil as well as prosperity. In 1997, financial crises began in Southeast Asia, and spread to Russia, and there was fear that the contagion would spread to Latin America and elsewhere. There was a flight to quality investments, and issuer credit ratings became increasingly important because the credit ratings of large commercial banks may indicate the financial health of the whole banking sector.

[5] See S&P's 1999b, and S&P's RLI, 2002.
[6] The data for EXNO1 and OVERSEAS are as of October 2007 because Bankscope does not have historical yearly data for these two variables.

S&P's considers a bank rating as an overall assessment of a bank's ability and willingness to meet all financial commitments on a timely basis. Bank credit analysts study both quantifiable and non-quantifiable factors in determining SPRs. The comprehensive profile that S&P's analysts examine is called the bank "Rating Analysis Methodology Profile" (RAMP). RAMP encompasses the evaluation of the overall business risk and overall financial risk of each issuer. Economic risk, industry risk, market position, diversification, and management/strategy are the five important factors in determining the overall business risk rating while credit risk, earnings, liquidity and funding, market risk, capitalization, and financial flexibility are the six key factors used to assess the overall financial risk of a bank. A preliminary overall bank rating is derived from both the overall business risk rating and the overall financial risk rating.

Each of the factors used in RAMP is rated/scored, but S&P's claims that its analysts do not use any formula for combining these scores to determine ratings. A lead analyst is responsible for conducting the rating process and several members of the credit analysis team will, when possible, meet with the management of the company to review, in detail, the key factors that affect the rating. Following this review, a rating committee is convened to discuss the lead analyst's recommendation, other important information, and the relevant reports that support the rating. Finally, the committee votes on the recommended rating (S&P's, 1999b; and S&P's RLI, 2002).

3.2 Methodology

Our main research question is whether solicitations matter. Examining the raw differences in the mean or median ratings between the solicited and unsolicited bank groups is naïve in the sense that this does not control for other effects. Moreover, we believe that the decision to solicit is not exogenously given and selection bias may occur (see Poon, 2003). At first, one might think to use a Heckman correction, but this is not appropriate in our analysis

because 1) it does not provide heterogeneous parameter estimates, and 2) it cannot examine various clientele or treatment effects using counterfactual measures. Therefore, we use an endogenous switching model, which captures these latter effects. We expect that the rating agencies may evaluate the financial characteristics of the same bank differently if the bank's solicitation status changes. In the case of solicited ratings, the rating agencies can use interviews and other 'soft' information, whereas the unsolicited ratings are based mainly on the information in the public domain.[7] In this paper, we use an endogenous regime-switching model as our primary tool to determine if solicitations matter.[8] The model is explained as follows.

There are two different regimes in the system. Regime 1 and Regime 0 refer to solicited and unsolicited banks, respectively. Thus, we have two different equations

$$Y_1 = X_1\beta_s + e_1 \qquad \text{Regime 1 (solicited banks)} \qquad (1)$$

$$Y_0 = X_0\beta_u + e_0 \qquad \text{Regime 0 (unsolicited banks),} \qquad (2)$$

where $e_{1i} \sim N(0, \sigma_1^2)$ and $e_{0i} \sim N(0, \sigma_0^2)$. Here, Y_1 denotes the rating of solicited banks, Y_0 denotes the rating of unsolicited banks, and X_1 and X_0 denote the financial characteristics of solicited and unsolicited banks, respectively where X_1 and X_0 contain the same variables. In the above system, we allow for two different sets of heterogeneous parameters (β_s and β_u) for the same regressors in the two regimes. A bank belongs to one of these two regimes following the selection equation

$$I^* = Z\gamma + u, \qquad (3)$$

[7] Butler and Rogers (2003) note this problem and address the issue by incorporating interaction terms between firm characteristics and a dummy variable that indicates whether the rating is solicited or unsolicited. However, the approach using dummy interaction terms still results in endogenous selection bias.

[8] We thank one of the referees for suggesting the regime-switching model used in our study.

where $u_i \sim N(0, 1)$. Let $Corr(e_{1i}, u_i) = \rho_1$ and $Corr(e_{0i}, u_i) = \rho_0$. The regime classification depends on the set of variables Z and the regime is endogenously determined. Thus, the selection is endogenous, and the index function I^* (= $Z\gamma + u$) plays a key role in assigning each observation to each regime. We use the maximum likelihood estimation of the three-equation system based on (1), (2), and (3).[9] This model is known as the move-stay model, and the log-likelihood function is given as

$$\ln L = \sum_{i=1}^{N}\left[I_i \left\{\ln\left[F(w_{1i})\right] + \ln\left[f(e_{1i}/\sigma_1)/\sigma_1\right]\right\} + (1-I_i)\left\{\ln\left[1-F(w_{0i})\right] + \ln\left[f(e_{0i}/\sigma_0)/\sigma_0\right]\right\}\right]$$

where F is the c.d.f. of the standard normal distribution, f is the corresponding density function, and $w_{ij} = (1-\rho_j^{\,2})^{-1/2}(Z_i'\gamma + \rho_j e_{ij}/\sigma_j)$ for j = 0, 1. In summary, the above system of equations can allow for i) different marginal effects of financial characteristics on ratings, and ii) endogenous correction for potential selection bias based on observable firm characteristics.

3.3 Treatment and Clientele Effects

If the solicitation status is important, then a bank's credit ratings will change when the bank's solicitation status changes from "unsolicited" to "solicited" or from "solicited" to "unsolicited". The change in rating is referred to as a treatment effect. Here, we define and use different treatment effects to explain the rating difference when solicitation status changes. It is necessary to obtain counterfactual measures. The difference in ratings between the two groups could be due to the difference in a bank's financial profiles or the difference caused by a change in a bank's solicitation status. Therefore, we decompose the sources of observed ratings

[9] Regime-switching models were initially suggested by Roy (1951) and Lee (1978); see Maddala (1983) for details and extensions. In the finance literature, the following papers utilize these models to obtain some counterfactual measures: Dunbar (1995), Song (2003, 2004), and Li and McNally (1999), among others. The present paper provides comprehensive definitions for various counterfactual measures.

difference into two parts: the part caused by difference in financial characteristics and the part caused by difference in solicitation status.

First, we give the definitions of various treatment effects, which include counterfactual measures. The three treatment effects (TEs) and two clientele effects (CEs) are defined as:

$$TE0 = E(Y_1 \mid X_1, \beta_s) - E(Y_0 \mid X_0, \beta_u) \quad \text{.. observed treatment effects} \quad (4)$$

$$TE1 = E(Y_1 \mid X_1, \beta_s) - E(Y_1 \mid X_1, \beta_u) \quad \text{.. change in ratings of } \textit{solicited} \text{ banks} \quad (5)$$

$$TE2 = E(Y_0 \mid X_0, \beta_s) - E(Y_0 \mid X_0, \beta_u) \quad \text{.. change in ratings of } \textit{unsolicited} \text{ banks} \quad (6)$$

$$CE1 = E(Y_1 \mid X_1, \beta_s) - E(Y_0 \mid X_0, \beta_s) \quad \text{.. if both groups } \textit{were solicited} \quad (7)$$

$$CE2 = E(Y_1 \mid X_1, \beta_u) - E(Y_0 \mid X_0, \beta_u) \quad \text{.. if both groups } \textit{were not solicited} \quad (8)$$

The concept underlying these measures is to obtain the predicted ratings for each group using the different parameter estimates from the rating equations. Thus, to obtain the counterfactual measures, for which the subscripts of X and β differ, we use the parameter coefficients of the rating equation of the opposite group, but the firm characteristics of the bank's own group. For instance, $E(Y_1 \mid X_1, \beta_u)$ is the expected ratings of solicited banks if the ratings were unsolicited. This is a counterfactual measure because the coefficients β_u are applied to solicited banks with X_1 as if they were unsolicited banks. Treatment Effect 0 (TE0) does not include counterfactual measures, and it captures the observed difference in ratings between the two groups.

Our main research question can be addressed by Treatment Effect 1 (TE1) and Treatment Effect 2 (TE2). We are interested in examining the possible change in a bank's rating if the solicitation status of the bank changes. Thus, holding financial characteristics constant, TE1 and TE2 examine the treatment effect of a change in solicitation status on bank ratings. TE1 indicates the *marginal change* (*decrease*) in ratings if a solicited bank changed its solicitation status to unsolicited, while TE2 indicates the *marginal change* (*increase*) in rating if an

unsolicited bank changed its status to "solicited". TE1 is directly associated with our main hypothetical question, "Would the credit ratings of solicited banks be lower if they *were not* solicited?", while TE2 is associated with the hypothetical question, "Would the ratings of unsolicited banks be higher if they *were* solicited?" Here, the second term in TE1 and the first term in TE2 are counterfactual.

Holding solicitation status constant, Clientele Effect 1 (CE1) and Clientele Effect 2 (CE2) examine the clientele effect on bank ratings that is reflected by the difference in financial characteristics of the two groups. These two clientele effects, CE1 and CE2, measure the net effect of different financial characteristics on ratings under the same condition of solicitation status. Specifically, CE1 shows the difference in ratings if both groups *were solicited* and CE2 shows the difference in ratings if both groups *were not solicited*. If the financial characteristics and market performance of a bank are better, its rating is expected to be higher holding the solicitation status constant.

Using our estimated results from the endogenous regime-switching model, we evaluate each of the components in the treatment effects by taking into account conditional distributions as follows.

$$Y_{1s} \equiv E(Y_1 \mid X_1, \beta_s) = X_1\beta_s + \sigma_s\rho_s \, f(Z_1'\gamma)/F(Z_1'\gamma) \tag{9}$$

$$Y_{1u} \equiv E(Y_1 \mid X_1, \beta_u) = X_1\beta_u + \sigma_u\rho_u \, f(Z_1'\gamma)/F(Z_1'\gamma) \tag{10}$$

$$Y_{0s} \equiv E(Y_0 \mid X_0, \beta_s) = X_0\beta_s - \sigma_s\rho_s \, f(Z_0'\gamma)/(1 - F(Z_0'\gamma)) \tag{11}$$

$$Y_{0u} \equiv E(Y_0 \mid X_0, \beta_u) = X_0\beta_u - \sigma_u\rho_u \, f(Z_0'\gamma)/(1 - F(Z_0'\gamma)) \tag{12}$$

The second term on the right-hand side of each of these equations is often referred to as the inverse Mills ratio, which results from taking the conditional expectation of each sub-group of solicited and unsolicited banks. Using the estimates of these terms, we can evaluate each of the

effects using the same definitions as those provided in equations (4)–(8). We refer to the resulting treatment effects and clientele effects as TE0, TE1, TE2 and CE1 and CE2, respectively.[10]

4. Discussion of the Results

The descriptive statistics, estimation results of the endogenous regime-switching models, and treatment and clientele effects from the endogenous regime-switching models are discussed in this section.

4.1 Descriptive Statistics

Table 1 provides definitions of SPRs that range from AAA to SD/D. SPRs are coded as nine ordinal values (from 9 to 1), where AAA = 9, AA = 8, A = 7, BBB = 6, BB = 5, B= 4, CCC = 3, CC = 2, and SD/D = 1. The table also lists the sample frequencies and percentages of the 2,052 observations across the nine rating levels by solicited and unsolicited rating subgroups. Over half of the entire sample (65%) had investment-grade ratings (i.e., BBB or above), while 35% of the sample banks had speculative-grade ratings (i.e., below BBB). It is interesting to note that the sub-sample of solicited ratings accounts for 73% of the investment-grade ratings. Banks with solicited ratings also accounted for most of the selective default (SD/D) ratings. In terms of a single rating category, the "A" rating category had the highest percentage (20%) in the solicited sub-sample, while the "BBB" rating category had the highest percentage (15.5%) in the unsolicited group. There were no banks with a "CC" rating in the sample, and none of the banks in the unsolicited group received a "AAA" rating. In the overall sample, 60.6% of the banks had solicited ratings from S&P's, and 39.4% had unsolicited ratings from S&P's.

[INSERT TABLE 1 ABOUT HERE]

[10] Song (2003, 2004) examines the clientele effects using expressions similar to Equations (9)–(12).

Table 2 shows the distribution of the 460 sample banks (2,052 observations from 1998 to 2003) from 72 countries sorted by country and type of rating.[11] Twenty-five countries had both solicited and unsolicited ratings and there are 1,005 observations in these countries. Some countries, including Italy, had only solicited ratings, and others, including Saudi Arabia, had only unsolicited ratings. Japan had the highest number of ratings in the overall sample (13% of the overall sample) and in the unsolicited sub-sample. Most of the Japanese ratings were unsolicited. This indicates that S&P's has been very aggressive in entering the Japanese market. France had the highest number of ratings in the solicited sub-sample.

[INSERT TABLE 2 ABOUT HERE]

4.2. Preliminary Analysis

The *t*-test and the Mann-Whitney U test results are reported in Table 3. Panel A shows the results of the overall sample from 72 countries, and Panel B displays the results of the 25 countries with both solicited and unsolicited ratings. The results from both parametric and non-parametric tests are consistent and show that solicited ratings are significantly higher than unsolicited ratings across both panels. For the overall sample (Panel A), the difference in the sample means is 1.25, which implies that the solicited group is more than one notch higher than the unsolicited group. The mean difference is much lower for the sub-sample of banks from the countries with both solicited and unsolicited ratings (Panel B). These results are consistent with those reported in Poon (2003). However, they were obtained without controlling for differences in financial profiles and the other important econometric issues described in Section 3.

[INSERT TABLE 3 ABOUT HERE]

[11] A very small number of banks (four from the solicited group and six from the unsolicited group with 18 observations during the sample period) with negative equity are considered outliers and therefore are excluded from the sample. These banks with negative equities are extreme cases.

Table 4 presents the descriptive statistics. To demonstrate if the financial profiles between the solicited ratings group and the unsolicited ratings group are different, we provide the results of the *t*-tests and Mann-Whitney tests for various financial variables and other variables used in the models. Because S&P's RAMP method makes extensive use of a large number of financial variables, and the relative importance of each variable listed in Table 4 may vary from bank to bank, we cannot say with absolute certainty that any one ratio (e.g., ROA) in a group of ratios (e.g., Profitability) is more important than another group (e.g., Liquidity). The *t*- and Z-values reveal significant differences between solicited and unsolicited ratings in some but not all of the measures in each variable – profitability, asset quality, liquidity, capital adequacy, and size.

Those banks with solicited ratings were larger in asset size and the unsolicited banks had higher liquidity. The results are less clear for profitability, asset quality, and capital adequacy. For example, the profitability ratios show that the solicited banks had higher returns on average equity but lower net interest margins. The asset quality ratios indicate that the solicited banks had lower non-performing loans to gross loans, but higher net charge off to average gross loans. Solicited banks also had lower equity to total assets, but were higher in other mean measures (ETL and ETD). Banks with solicited ratings appeared to have more overseas operations than the banks with unsolicited ratings because banks with solicited ratings had more overseas subsidiaries and were listed on more overseas stock exchanges (represented by the variables OVERSEAS and EXNO1).

[INSERT TABLE 4 ABOUT HERE]

4.3 Results of the Endogenous Regime-switching Models

Regarding the endogenous regime-switching model, there are several models one could estimate and we have investigated several[12]. We focus on one representative model (Model 1) and its variations, which we report in Table 5. We think this model is most appropriate because it incorporates the variables that we believe to be important to rating selection and rating determinants in the model (see Section 3.1 for the discussion of these variables). In Model 1, we model the selection equation as a function of S&P's long-term sovereign rating (SOV), bank size (LNASSET), proportion of solicited ratings (PROP_SOL), number of overseas exchanges on which the bank was listed (EXNO1), number of overseas subsidiaries held by the bank (OVERSEAS), and four financial variables. The financial variables are 1) ROA = return on average assets (profitability ratio), 2) LLR/GL = loan loss reserves to gross loans (asset quality ratio), 3) ETA = equity to total assets (capital adequacy ratio), and 4) LTA = loans to total assets (liquidity ratio). We model the rating equation as a function of the variables included in the above selection equation except PROP_SOL, EXNO1, and OVERSEAS.

In our sample, 25 out of 72 countries have both solicited and unsolicited ratings. Whereas the mean difference of the whole sample is 1.25, the observed difference in ratings between the two groups in this sub-sample of 25 countries is 0.42 (see Panels A and B in Table 3).[13] Given the different results in the mean ratings between the sub-sample and the whole sample, it is important to consider this sub-sample on its own. Therefore, we develop two models (Models 2 and 3) as variations of Model 1 to explore the findings of this sub-sample. In Model 2, we add a dummy variable (S1) to Model 1 as an instrument variable, where S1 = 1 when the sample bank is in one of the 25 countries with both solicited and unsolicited ratings,

[12] Some of those results are in an earlier version of this paper, which are available upon request.
[13] The number of observations used in the models in Table 5 is smaller (e.g., 1633 for Model 1) than the number of observations in the entire ratings sample (i.e., 2,052) that was reported in Table 3. Because some of the banks in our sample do not have observations on all regressors, the sample size is reduced.

and S1 = 0 otherwise. [14] [15] In addition, Model 3 uses a sub-sample of banks from the 25 countries with both solicited and unsolicited ratings. As we expect that the proportion of solicited ratings might change over time, in addition to the inclusion of PROP_SOL in the selection equation, we also add five year dummy variables to Models 1, 2, and 3, and the resulting models are Models 4, 5, and 6. The results in Table 5 show that none of the year dummies is significant in Models 4-6, and the estimation results of Models 4-6 are similar to those of Models 1-3; therefore, we focus the following discussion of results on the results of Models 1-3 only.[16]

We now examine the estimation results in the selection equation. We believe that banks are more likely to seek credit ratings from S&P's if they want to obtain capital from the international capital markets in addition to their local markets, and therefore they require the certification from international rating agencies like S&P's. These banks usually are larger and have better financial performance than other banks. Therefore, we hypothesize that banks are more likely to obtain bank ratings if they are bigger (higher LNASSET) and have better financial

[14] Additionally, we considered a common method of using 71 country dummy variables. However, including many country dummy variables leads to the incidental parameter problem, that is, there are too many parameters to estimate in a nonlinear model so the models do not converge. We considered an alternative procedure, that is, to regress each of the independent variables (and dependent variables) on the country dummy variables and then use each of the residuals as independent variables in the regime-switching model. This procedure is suboptimal as we do not find global optimal parameter values of the dummy coefficients. We omit these results from the present paper.

[15] We also considered two additional dummy variables, S2 and S3. S2 is equal to 1 when the bank is in the country with only solicited ratings and 0 otherwise. S3 is equal to 1 when the bank is in the country with only unsolicited ratings and 0 otherwise. However, including any two of these three dummy variables (S1, S2, and S3) will cause a collinearity problem in the regime-switching model. To account for this, we note that the solicitation status for Y is 1 when S2 = 1, and 0 when S3 = 0. This relationship causes a conflict with the selection equation and thus we include neither S2 nor S3.

[16] We have also examined other model specifications using different combinations of instrumental variables and alternative proxy variables for the bank's international operations. The estimation results and the main conclusions of these models are similar to those of Models 1-3. The results of these models are available from the authors upon request.

performance. Regarding the estimation results in Models 1 and 2, the coefficient of LNASSET is significant in both selection models, which suggests that larger banks are more likely to seek ratings from a rating agency than are smaller banks. The results of the selection equations in both models are quite similar. This finding confirms our expectation that larger banks have more need for international capital and hence are more likely to seek ratings from S&P's. The results of the selection equation also show that neither of the two proxies for the bank's international operations (EXNO1 and OVERSEAS) are significant. The variable PROP_SOL is significant in all models.

We conjecture that the sovereign rating of a country can affect the bank's propensity to seek credit ratings in two possible directions. In one direction, sovereign risk rating serves as a proxy for an environment with a high level of information asymmetry. Banks in countries with a lower sovereign risk rating have a higher level of informational asymmetry and a higher propensity to seek credit ratings because they need certification from rating agencies. The need for certification to resolve the information asymmetry problem (i.e., certification effect) is the main driver for these banks to seek a credit rating. Hence, we hypothesize that the lower the sovereign rating the higher the probability a bank will seek a credit rating (the certification hypothesis).[17] The other direction is the opposite of the certification effect. We assume that sovereign risk rating can capture some institutional differences among countries including the differences in their legal, accounting, and disclosure environments. Low sovereign risk ratings reflect the (possibly) poor legal systems and disclosure environments of these countries, which will make the certification of credit ratings less credible. Then, banks in countries with a low sovereign rating will be less likely to seek a rating (counter-certification hypothesis). Looking at

the estimation results in Table 5, we can see that the coefficient of SOV (sovereign rating) is not significant in the selection equation of any of the models.[18] This finding does not confirm either the certification hypothesis or the counter-certification hypothesis suggested above. It is possible that the two opposing effects might have offset each other**.**

Next, we examine the rating equations. Because some financial variables are highly correlated with others, multicollinearity problems may arise. With this in mind, sovereign rating, bank size, and the four key variables that represent profitability, asset quality, capital adequacy, and liquidity are selected to explain bank ratings. UBS (2004) showed that large companies tend to have higher credit ratings. Size reflects qualitative factors such as geographic and product diversification, and other factors. Along this line, Kwan (2004) found that large publicly held bank holding companies tend to be more profitable and better capitalized than smaller privately held ones. However, Demsetz and Strahan (1997) point out that the large bank holding companies have used their size and diversification to operate with lower capital ratios to pursue riskier activities. Therefore, we use the size variable (LNASSET) and four financial variables (ROA, LLR/GL, ETA, and LTA) to explain bank ratings. In addition, we include SOV in the ratings equations. We believe that the sovereign rating of a country is important in determining individual bank ratings because it captures some important macroeconomic and institutional characteristics of the countries in which the banks are located. We use the explanatory variable SOV in the ratings equations to control for some important country effects. The S&P's sovereign rating of a country is determined by the key economic and institutional factors of that country. According to S&P's (1997), exchange rates, inflation, regulatory environment, taxation,

[17] We thank the referee for suggesting the certification hypothesis and the information asymmetry problem to us.

[18] SOV was significant in the previous version of the paper but it is not significant in this version when we use the standard errors adjusted for clustering on each country following the referee's suggestion.

infrastructure availability, labor market conditions, and the size, structure, and growth of the economy, among other things, are the factors that determine the sovereign rating of a country. The key economic and political risks that S&P's considers when rating sovereign debt include stability of political institutions, income and economic structure, fiscal policy and budgetary flexibility, monetary policy and inflation pressures, and public and private sector debt burdens (S&P's, 1998a).

The estimation results of Table 5 show that SOV, ROA, and LNASSET are significant in most of the rating models for both groups (Y_1 and Y_0). The results suggest that sovereign risk, profitability, and bank size are important in determining bank ratings. Specifically, larger and more profitable banks in countries with higher sovereign risk ratings tend to have ratings higher than those of smaller and less profitable banks that are located in countries with lower sovereign risk ratings. Our findings are consistent with the finding by UBS (2004) that large companies tend to have higher credit ratings. As expected, return on average assets (ROA, the profitability ratio) positively affects ratings. For the unsolicited group, the results of all models indicate that loan loss reserves to gross loans (LLR/GL, asset quality ratio) negatively affects ratings. Loan loss reserves to gross loans ratio represents the amount of reserves for expected losses expressed as a percentage of loans. Holding the charge-off policy constant, the higher this ratio the poorer the quality of the loan portfolio is, and therefore the lower the bank rating.

Finally, we examine the Wald statistics shown at the bottom of Table 5. Our six estimated models are all significant and the results are quite robust. In all cases, we reject the null hypothesis that the two sets of parameters in rating equations (1) and (2) are identical (H_0: $\beta_1 = \beta_0$) at the 1% level of significance. This finding supports the use of endogenous regime-switching models rather than Heckman-type models, in which the same set of regression

parameters is adopted. It also provides empirical evidence that the rating agencies may evaluate financial characteristics differently along with the heterogeneous parameters in the different rating equations. To further examine the issue of the different responses of rating agencies, we examine the difference between each of the coefficients (β_{1i} - β_{0i}) of the two groups. One variable is noticeable among others. The difference is significant in all models for SOV, which suggests that rating agencies tend to give higher ratings to solicited banks than the ratings given to unsolicited banks as the value of SOV increases. Overall, the results from this experiment reinforce the importance of SOV in our understanding of why rating agencies evaluate financial characteristics differently in different solicitation groups.

[INSERT TABLE 5 ABOUT HERE]

4.4 Treatment and Clientele Effects from the Endogenous Regime-switching Models

Table 6 presents the expected ratings from the above estimated six endogenous regime-switching models (Models 1 to 6). The results in Table 6, which are based on equations (9) – (12), are used to evaluate five different treatment and clientele effects. The results of treatment and clientele effects using equations (9)– (12) are reported in Table 7.[19]

Our methodology permits us to look into sources of the observed treatment effects, which is the main goal of our analysis. We examine the net effects of financial characteristics on credit ratings (the clientele effect), controlling for the effect of solicitation status using CE1 and CE2. Then, we examine the net effects of a change in solicitation status (the treatment effect of solicitation), controlling for the effects of financial characteristics using TE1 and TE2.

[19] Measures that use equations (9)–(12) have been popular because the error terms in these equations will have a zero mean. For example, TE0 is expected to be consistent with the corresponding values of the mean difference in ratings reported in Table 3. As explained in Section 4.3, Models 1 and 2 use 1,633 observations out of the entire sample of 2,052 ratings, therefore the raw mean rating difference, 1.17 (TE0), is slightly different from the mean difference of 1.25, which are reported in Table 3 because of smaller sample size.

First, CE1 and CE2 give the net difference in ratings under the condition of the same solicitation status. CE1 denotes the net difference in ratings that can be caused by differences in financial profile if both groups *were* solicited, and CE2 provides the same measure if neither group *was unsolicited.* We find that the net difference in ratings is actually much smaller when controlling for solicitation status. In Model 1 (see Table 7), CE1 is 0.453 and CE2 is 0.647. These results show that due to the differences in financial profile between the two groups of banks, the ratings of the unsolicited banks might still be lower than the ratings of the solicited banks. This can be so even if unsolicited banks *had* solicited ratings from the rating agency, or if solicited banks *had not solicited* ratings. However, the difference in ratings is much smaller than TE0.

Second, we examine the net effects of a change in solicitation status under the condition of the same financial characteristics. As previously noted, the main questions posed in this paper are "Would the ratings of solicited banks be lower if they *were not solicited*?" and "Would the ratings of unsolicited banks be higher if they *were solicited*?" These questions can be answered by TE1 and TE2, which give the net treatment effects of a change in solicitation status while controlling for financial characteristics. TE1 indicates the *marginal decrease* in rating if a solicited bank *had changed* its solicitation status to "unsolicited," while holding its financial profile constant. TE2 indicates the *marginal increase* in rating if an unsolicited bank *had changed* its solicitation status to "solicited," holding its financial profile constant.

Table 7 shows that for Model 1, TE1 is 0.522 and TE2 is 0.716. On average, the ratings of solicited banks would decrease by 0.522 if they *had* changed their solicitation status to "unsolicited." Similarly, the ratings of unsolicited banks would increase by 0.716 if they *had* changed their solicitation status to "solicited." These treatment effects are significant at the 1%

level in all cases. Note that the raw rating difference represented by TE0 is equal to the sum of TE1 and CE2 or the sum of TE2 and CE1 (that is, TE0 = TE1 + CE2 or TE0 = TE2 + CE1). The results of comparisons between TE2 and CE1 are mixed. That is, the treatment effect of solicitation status on ratings (TE2) dominates the clientele effect of financial characteristics on ratings (CE1) in Models 1 and 3 but not in Model 2. Comparing TE1 to CE2, the results are robust for all six models. The clientele effect of financial profile is larger than the treatment effect of solicitation on ratings in all models.

We examine briefly the results of Models 3 and 6, which use the sub-sample of 25 countries (848 observations) with both solicited and unsolicited ratings. We carry out this sub-sample analysis because it is possible that the magnitude of the solicitation treatment effect could be overstated in the whole sample (1,633 observations) if we do not control for country effects. Note that the observed difference in ratings between the two groups in this sub-sample is 0.42 (Panel B in Table 3), which is much smaller than that in the full sample (1.25).[20] We observe that the treatment effects measured by TE0 become smaller when using the sub-sample.

Overall, our results show clearly that the difference between solicited and unsolicited ratings is not merely due to differences in financial characteristics. Most important, our findings clearly demonstrate that solicitation status is one of the main determinants of bank ratings. Moreover, our results provide evidence that the rating agencies do evaluate financial characteristics differently depending on solicitation status, as we can decisively reject the

[20] Another reason to run such a sub-sample analysis is that for self-selection to be meaningful, a firm should be given the opportunity to choose. In countries with only solicited or unsolicited ratings, these banks may not have a meaningful economic choice regarding solicitation and the observed differences between these countries may be due to other institutional factors. We are grateful to an anonymous referee who suggested this line of reasoning.

hypothesis that the coefficients representing financial characteristics are the same in both rating equations.[21]

In summary, although the difference in the observed bank ratings between solicited and unsolicited groups can be explained by both the difference in financial profile and the difference in solicitation status, our results suggest that solicitation status has a significant effect on rating differences. Clearly, solicitations matter. In some cases, the effect of solicitation is stronger than the effect caused by differences in financial profile.

[INSERT TABLES 6 AND 7 ABOUT HERE]

To check the robustness of our results, we utilize other traditional methods and the propensity score matching (PSM) method, which is a popular new treatment effect model. Traditional methods include the OLS estimation and Heckman's treatment effect model.[22] The PSM approach involves a counterfactual measure and permits us to examine a treatment effect similar to CE1. Overall, although the magnitude of each treatment effect differs, it is clear that the difference in ratings is significant in all cases. However, these approaches do not permit us to examine the sources of the treatment effects. Our analysis using the endogenous regime-switching models is more fruitful, because the models provide a more precise measure of the

[21] If so, the remaining question is why solicitation status matters. An anonymous referee pointed out two possible reasons. First, if firms do not pay, the rating agencies may assign lower ratings to pressure them to pay, which is the so-called blackmail hypothesis. Second, firms may choose not to pay because they have something to hide, in which case they do not want to open their books to the rating agencies and, suspecting that the firms have something to hide, the rating agencies assign lower ratings. However, the factors that distinguish the above two reasons may not be observable. Because our regime-switching model that corrects for selection bias is based on publicly observable financial characteristics, it cannot identify which of the above reasons dominates, which is a limitation of the methodology. Rather, this paper provides significant empirical evidence that ratings are not lower simply because unsolicited banks are lower quality in terms of observed financial characteristics or because of differences in country risk. Why solicitation status matters is an interesting topic to investigate, but it is beyond the primary scope of our study and can be examined in future research.

[22] The details of the results of the OLS estimation, Heckman's treatment effect model and the probit model for the PSM are omitted here, but are available upon request.

treatment effects. Our endogenous regime-switching models provide the sources of the significant treatment effects, which the usual treatment effects model cannot provide.

5. Conclusions

The intent of this study is to resolve the controversy surrounding the unsolicited credit ratings of international commercial banks. Unsolicited ratings tend to be lower than solicited ratings. We used pooled time-series cross-sectional data from 460 commercial banks in 72 countries during 1998-2003. Using S&P's sample ratings, the major findings of our paper indicate that solicited ratings tend to be significantly higher than unsolicited ratings. In addition, we found that banks with solicited ratings tend to be larger, have relatively less non-performing loans to gross loans, and have higher returns on equity than unsolicited banks. We used an endogenous regime-switching model and counter-factual arguments to determine the major causes of the difference between solicited and unsolicited ratings. This allowed us to take into account the financial characteristics of the two groups, self-selection bias, and regime changes. The bottom line is that the difference in ratings between the two groups can be explained by differences in their solicitation status and financial profile when observable factors are taken into account. The data suggest that the solicitation status has a significant impact on ratings; hence, solicitations matter in bank ratings. In some cases, the effect of solicitations on bank ratings is stronger than the effect caused by differences in financial profile.

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Table 1
Rating Definitions and Distribution of Standard & Poor's Bank Ratings by Rating Categories in the Sample During the Period 1998-2003

Rating	Frequency in the sample (Percentage in the sample)		Rating definitions/subtotal
	With solicited rating	With unsolicited rating	
AAA	29 (1.4%)	-	**EXTREMELY STRONG** capacity to meet its financial commitments.
AA	283 (13.8%)	3 (0.1%)	**VERY STRONG** capacity to meet its financial commitments. It differs from the highest rated issuers only by a small degree.
A	413 (20.1%) *	43 (2.1%)	**STRONG** capacity to meet its financial commitments.
BBB	244 (11.9%)	319 (15.5%) *	**ADEQUATE** capacity to meet its financial commitments.
Subtotal of "BBB" or above ratings	**969 (47.2%)**	**365 (17.8%)**	**1,334 (65.0%)**
BB	167 (8.1%)	273 (13.3%)	**LESS VULNERABLE** in the near term than other lower-rated issuers.
B	83 (4.0%)	139 (6.8%)	**MORE VULNERABLE** than the issuers rated "BB", but the issuer currently has the capacity to meet its financial commitments.
CCC	15 (0.7%)	29 (1.4%)	**CURRENTLY VULNERABLE**
CC	-	-	**CURRENTLY HIGHLY VULNERABLE**
SD/D	10 (0.5%)	2 (0.1%)	An "SD" **(SELECTIVE DEFAULT)** rating is assigned when S&P's considers that the issuer has selectively defaulted on a specific issuer or class of obligations when it comes due. A "D" rating is assigned when S&P's considers that the default will be a **GENERAL DEFAULT,** and that the issuer will fail to pay all or substantially all of its obligations as they come due.
Subtotal of "BB" or below ratings	**275 (13.4%)**	**443 (21.6%)**	**718 (35.0%)**
Total	**1,244 (60.6%)**	**808 (39.4%)**	**2,052 (100.0%)**

Notes :
1. All solicited ratings with "+" or "-" designations are grouped according to their corresponding letter grades.
2. Percentage in the sample is in parenthesis.
3. *indicates the highest number/percentage in each column excluding subtotals.
4. Rating definitions are extracted from S&P's Global Ratings Handbook, February 2002 (S&P's, 2002).

Table 2
Distribution of Sample Banks by Country

Country	Frequency in the sample (Percentage in the sample)					
	With solicited rating		With unsolicited rating		Total	
	Sub-total		Sub-total			
1. Argentina	21	(1.0)	6	(0.3)	27	(1.3)
2. Australia	83	(4.0)	-	-	83	(4.0)
3. Austria	12	(0.6)	-	-	12	(0.6)
4. Bahrain	12	(0.6)	-	-	12	(0.6)
5. Belgium	8	(0.4)	-	-	8	(0.4)
6. Bermuda	1	(0.0)	-	-	1	(0.0)
7. Bolivia	9	(0.4)	-	-	9	(0.4)
8. Brazil	16	(0.8)	17	(0.8)	33	(1.6)
9. Bulgaria	14	(0.7)	-	-	14	(0.7)
10. Canada	41	(2.0)	-	-	41	(2.0)
11. Chile	23	(1.1)	-	-	23	(1.1)
12. Colombia	-	-	17	(0.8)	17	(0.8)
13. Costa Rica	2	(0.1)	-	-	2	(0.1)
14. Croatia	5	(0.2)	-	-	5	(0.2)
15. Cyprus	-	-	2	(0.1)	2	(0.1)
16. Czech Republic	23	(1.1)	-	-	23	(1.1)
17. Denmark	9	(0.4)	-	-	9	(0.4)
18. Egypt	11	(0.5)	12	(0.6)	23	(1.1)
19. El Salvador	2	(0.1)	-	-	2	(0.1)
20. Estonia	2	(0.1)	5	(0.2)	7	(0.3)
21. Finland	5	(0.2)	-	-	5	(0.2)
22. France	170*	(8.3)*	-	-	170	(8.3)
23. Germany	24	(1.2)	-	-	24	(1.2)
24. Greece	25	(1.2)	7	(0.3)	32	(1.6)
25. Hong Kong	18	(0.9)	42	(2.0)	60	(2.9)
26. Hungary	-	-	35	(1.7)	35	(1.7)
27. India	1	(0.0)	26	(1.3)	27	(1.3)
28. Indonesia	9	(0.4)	25	(1.2)	34	(1.7)
29. Ireland	32	(1.6)	-	-	32	(1.6)
30. Israel	10	(0.5)	20	(1.0)	30	(1.5)
31. Italy	63	(3.1)	-	-	63	(3.1)
32. Jamaica	2	(0.1)	-	-	2	(0.1)
33. Japan	95	(4.6)	172*	(8.4)*	267*	(13.0)*
34. Kazakhstan	11	(0.5)	-	-	11	(0.5)
35. Korea	30	(1.5)	7	(0.3)	37	(1.8)
36. Kuwait	9	(0.4)	-	-	9	(0.4)

Country	Frequency in the sample (Percentage in the sample)					
	With solicited rating		With unsolicited rating		Total	
	Sub-total		Sub-total			
37. Lebanon	18	(0.9)	-	-	18	(0.9)
38. Liechtenstein	6	(0.3)	-	-	6	(0.3)
39. Lithuania	-	-	4	(0.2)	4	(0.2)
40. Luxembourg	21	(1.0)	-	-	21	(1.0)
41. Luxembourg	21	(1.0)	-	-	21	(1.0)
42. Malaysia	12	(0.6)	36	(1.8)	48	(2.3)
43. Malta	-	-	2	(0.1)	2	(0.1)
44. Mexico	31	(1.5)	10	(0.5)	41	(2.0)
45. Morocco	3	(0.1)	19	(0.9)	22	(1.1)
46. Netherlands	37	(1.8)	-	-	37	(1.8)
47. New Zealand	25	(1.2)	-	-	25	(1.2)
48. Norway	2	(0.1)	-	-	2	(0.1)
49. Oman	-	-	8	(0.4)	8	(0.4)
50. Peru	2	(0.1)	16	(0.8)	18	(0.9)
51. Philippines	1	(0.0)	54	(2.6)	55	(2.7)
52. Poland	4	(0.2)	27	(1.3)	31	(1.5)
53. Portugal	18	(0.9)	-	-	18	(0.9)
54. Romania	6	(0.3)	-	-	6	(0.3)
55. Russia	24	(1.2)	-	-	24	(1.2)
56. Saudi Arabia	-	-	42	(2.0)	42	(2.0)
57. Singapore	8	(0.4)	10	(0.5)	18	(0.9)
58. Slovak Republic	9	(0.4)	12	(0.6)	21	(1.0)
59. Slovenia	6	(0.3)	15	(0.7)	21	(1.0)
60. South Africa	4	(0.2)	9	(0.4)	13	(0.6)
61. Spain	47	(2.3)	-	-	47	(2.3)
62. Sweden	19	(0.9)	-	-	19	(0.9)
63. Switzerland	9	(0.4)	-	-	9	(0.4)
64. Taiwan	23	(1.1)	24	(1.2)	47	(2.3)
65. Thailand	30	(1.5)	18	(0.9)	48	(2.3)
66. Trinidad & Tobago	2	(0.1)	-	-	2	(0.1)
67. Tunisia	-	-	36	(1.8)	36	(1.8)
68. Turkey	4	(0.2)	32	(1.6)	36	(1.8)
69. United Arab Emirates	-	-	30	(1.5)	30	(1.5)
70. United Kingdom	70	(3.4)	-	-	70	(3.4)
71. Venezuela	5	(0.2)	4	(0.2)	9	(0.4)
72. Vietnam	-	-	7	(0.3)	7	(0.3)
Total	1244	(60.6)	808	(39.4)	2,052	(100.0)

Notes: 1. * indicates the highest number/percentage in the column.
2. Percentage in the sample is in parenthesis.

Table 3
Mann-Whitney U test and *t*-test Results

Panel A: Overall sample from 72 countries			
Sub-sample	**Number of observations**	**Mean rank**	**Sample Mean**
Solicited rating	1244	1251.16	6.51
Unsolicited rating	808	680.61	5.26
Difference		570.55	1.25
Test statistic:			
Mann-Whitney U	223100.5		
Wilcoxon W	549936.5		
Z	21.814***		
t-test statistics	24.228***		
Panel B: Sub-sample from 25 countries with both solicited and unsolicited ratings			
Sub-sample	**Number of observations**	**Mean rank**	**Sample Mean**
Solicited rating	380	577.14	5.64
Unsolicited rating	625	457.92	5.22
Difference		119.22	0.42
Test statistic:			
Mann-Whitney U	90576.5		
Wilcoxon W	286201.5		
Z	6.628***		
t-test statistics	5.890***		

Notes: 1. The ratings are coded as AAA = 9, AA = 8, A = 7, BBB = 6, BB = 5, B= 4, CCC = 3, CC = 2, and SD/D = 1.
2. *** indicates significance at the 1% level.

Table 4

Descriptive Statistics and Statistical Test Results of Various Financial Variables of the Sample Banks

Overall sample from 72 countries										
	Solicited Rating				Unsolicited Rating				*t*-test	Mann-Whitney Test
Variable	Mean	Median	S.D.	N	Mean	Median	S.D.	N	*t-value*	*Z-value*
Profitability										
NIM	2.85	2.46	2.40	1175	3.58	2.99	2.71	729	-6.01 ***	-8.63 ***
NIMA	2.54	2.22	2.05	1175	3.18	2.74	2.18	729	-6.35 ***	-8.97 ***
PROA	0.96	0.88	1.53	962	0.67	0.61	1.94	556	3.06 ***	2.46 **
ROA	0.78	0.72	1.39	1184	0.66	0.72	1.82	733	1.56	0.00
ROE	9.92	12.16	21.77	1183	4.49	9.06	34.32	733	3.84 ***	6.52 ***
DPO	47.34	41.58	53.39	873	42.55	35.18	55.62	500	1.56	3.47 ***
CTI	62.68	61.49	42.80	1171	62.57	60.36	35.84	729	0.06	1.53
Asset Quality										
LLR/GL	4.10	2.82	4.07	1057	5.28	3.80	5.01	678	-5.18 ***	-7.80 ***
LLP/NIR	26.57	15.10	76.60	1137	30.97	23.67	74.55	718	-1.22	-8.32 ***
LLR/NPL	117.99	82.34	120.95	821	66.52	53.43	64.66	592	10.32 ***	12.98 ***
NPL/GL	5.55	3.17	7.07	835	9.06	7.19	7.54	596	-8.92 ***	-13.85 ***
NCO/AGL	1.25	0.42	3.23	620	0.88	0.19	2.31	440	2.14 **	6.58 ***
NCO/BNI	34.13	18.54	93.44	621	18.78	6.36	78.48	444	2.91 ***	8.11 ***
Liquidity										
INTERBANK	166.59	92.96	186.09	1005	258.33	171.43	237.20	538	-7.78 ***	-8.96 ***
LTA	54.78	57.08	20.91	1181	55.68	57.27	14.51	733	-1.12	-0.16
LTD	78.94	72.21	58.52	1177	66.70	67.56	18.94	733	6.64 ***	6.22 ***
LTDB	65.81	67.79	24.48	1140	64.60	66.69	16.38	708	1.27	2.42 **
LATD	25.93	19.53	38.96	1126	22.51	17.82	16.95	652	2.56 **	0.64
LATDB	21.63	16.49	20.54	1085	21.93	16.60	16.83	630	-0.33	-1.88 *
Capital Adequacy										
TIER1	9.86	8.00	7.30	773	10.03	8.84	4.70	397	-0.49	-2.57 **
CAR	13.99	11.40	10.05	907	14.10	12.08	6.33	582	-0.25	-2.38 **
ETA	7.45	5.87	6.99	1184	8.53	8.06	4.10	733	-4.29 ***	-9.67 ***
ETL	22.52	10.62	56.34	1179	18.10	14.83	19.73	733	2.46 **	-6.51 ***
ETD	13.52	7.54	37.27	1183	10.52	9.64	5.80	733	2.71 ***	-4.77 ***
Size										
LNASSET	16.69	16.66	1.92	1182	15.88	15.98	1.19	733	11.46 ***	9.65 ***
LNTSEC	13.26	13.88	3.60	510	10.22	10.63	2.98	573	15.02 ***	16.06 ***
Other Variables										
SPR	6.51	7.00	1.38	1244	5.26	5.00	0.97	808	24.23 ***	21.81 ***
SOV	7.93	9.00	1.49	1221	7.07	7.00	1.33	705	13.07 ***	15.26 ***
PROP_SOL	0.86	1.00	0.25	1244	0.21	0.20	0.21	808	63.32 ***	36.23 ***
EXNO1	1.20	0.00	2.47	1244	0.38	0.00	1.16	808	10.08 ***	7.14 ***
OVERSEAS	47.69	2.00	189.12	1244	3.91	1.00	12.80	808	8.14 ***	6.75 ***

Notes: 1. See Appendix 1 for variable definitions.

2. Descriptive statistics include the mean, median, standard deviation (S.D.), and number of observations (N) of each variable. The t-values and Z-values refer to the t-test statistics of the means and Mann-Whitney test statistics of the medians between the solicited rating group and the unsolicited rating group. Note that Bankscope does not have detailed bank reports for all sample banks with S&P's Long-Term Issuer Credit Ratings. There are also missing data in Bankscope so the number of observations varies across financial variables.

3. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 5

Estimation Results of the Endogenous Regime-switching Models

		Without year dummies in the selection equation						With year dummies in the selection equation					
		Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
		Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Sel	SOV	0.046	0.84	0.019	0.37	-0.036	-0.61	0.047	0.84	0.019	0.36	-0.035	-0.58
	ROA	0.023	0.38	0.007	0.10	-0.002	-0.03	0.023	0.36	0.007	0.10	-0.002	-0.03
	LLR/GL	0.001	0.06	-0.001	-0.06	-0.006	-0.24	0.002	0.11	-0.001	-0.03	-0.006	-0.23
	ETA	0.055	1.45	0.052	1.71 *	0.049	1.86 *	0.059	1.45	0.056	1.66 *	0.052	1.69 *
	LTA	-0.002	-0.25	-0.003	-0.24	-0.004	-0.25	-0.003	-0.31	-0.004	-0.28	-0.004	-0.27
	LNASSET	0.195	2.18 **	0.297	2.66 ***	0.317	2.87 ***	0.208	2.10 **	0.307	2.57 **	0.327	2.64 ***
	S1			-0.745	-2.50 **					-0.750	-2.51 **		
	PROP_SOL	4.386	16.33 ***	4.145	14.58 ***	3.472	13.11 ***	4.425	14.95 ***	4.181	13.46 ***	3.508	12.07 ***
	EXNO1	0.051	0.59	0.034	0.35	0.011	0.10	0.046	0.52	0.031	0.31	0.009	0.08
	OVERSEAS	0.002	0.21	0.004	0.38	0.004	0.40	0.002	0.19	0.004	0.37	0.004	0.40
	YR1999							-0.091	-0.52	-0.104	-0.53	-0.098	-0.36
	YR2000							-0.186	-0.94	-0.160	-0.73	-0.115	-0.38
	YR2001							-0.297	-1.28	-0.259	-1.02	-0.201	-0.60
	YR2002							-0.226	-1.12	-0.219	-0.92	-0.184	-0.56
	YR2003							-0.224	-0.87	-0.204	-0.70	-0.164	-0.43
	Constant	-5.905	-4.38 ***	-6.519	-4.83 ***	-6.830	-5.42 ***	-5.930	-4.37 ***	-6.505	-4.75 ***	-6.850	-5.24 ***
Y1	SOV	0.662	16.98 ***	0.622	12.00 ***	0.529	8.92 ***	0.662	16.98 ***	0.623	12.02 ***	0.531	8.95 ***
	ROA	0.109	3.40 ***	0.091	3.78 ***	0.103	5.01 ***	0.109	3.38 ***	0.091	3.77 ***	0.103	5.05 ***
	LLR/GL	-0.020	-1.03	-0.021	-1.07	-0.037	-3.21 ***	-0.020	-1.03	-0.021	-1.07	-0.036	-3.24 ***
	ETA	-0.007	-1.36	-0.001	-0.16	0.003	0.57	-0.007	-1.36	-0.001	-0.19	0.002	0.49
	LTA	-0.003	-1.05	-0.002	-0.88	-0.009	-2.61 ***	-0.003	-1.06	-0.002	-0.88	-0.009	-2.55 **
	LNASSET	0.106	3.07 ***	0.129	4.12 ***	0.101	1.49	0.106	3.06 ***	0.128	4.05 ***	0.098	1.38
	S1			-0.407	-2.47 **					-0.395	-2.39 **		
	Constant	-0.287	-0.38	-0.336	-0.46	0.728	0.75	-0.280	-0.37	-0.329	-0.45	0.771	0.76
Y0	SOV	0.428	7.25 ***	0.427	8.22 ***	0.423	7.65 ***	0.429	7.24 ***	0.428	8.19 ***	0.424	7.57 ***
	ROA	0.072	2.29 **	0.069	2.27 **	0.055	1.64	0.072	2.30 **	0.069	2.27 **	0.055	1.65
	LLR/GL	-0.025	-2.24 **	-0.023	-2.35 **	-0.023	-1.79 *	-0.025	-2.25 **	-0.023	-2.37 **	-0.023	-1.80 *
	ETA	0.025	0.89	0.032	1.38	0.034	1.25	0.025	0.89	0.032	1.39	0.034	1.26
	LTA	-0.003	-0.55	-0.005	-0.82	-0.004	-0.53	-0.003	-0.55	-0.005	-0.83	-0.004	-0.53
	LNASSET	0.250	3.03 ***	0.325	4.28 ***	0.324	3.37 ***	0.246	2.88 ***	0.322	4.09 ***	0.320	3.09 ***
	S1			-0.532	-3.17 ***					-0.532	-3.17 ***		
	Constant	-1.627	-1.17	-2.392	-1.94 *	-2.905	-1.87 *	-1.586	-1.11	-2.354	-1.86 *	-2.857	-1.75 *
	σ_1^2	0.672	12.40 ***	0.649	11.51 ***	0.594	14.37 ***	0.672	12.40 ***	0.649	11.50 ***	0.593	14.59 ***
	σ_0^2	0.594	11.22 ***	0.567	11.30 ***	0.589	11.03 ***	0.593	11.34 ***	0.567	11.47 ***	0.588	11.38 ***
	ρ_1	-0.408	-2.49 **	0.028	0.15	0.172	1.14	-0.417	-2.48 **	0.001	0.01	0.143	0.80
	ρ_0	0.256	0.84	0.137	0.48	0.152	0.38	0.230	0.67	0.108	0.34	0.115	0.25
	# obs	1633		1633		848		1633		1633		848	
	Log-lik	-1990.2		-1944.7		-1156.9		-1988.7		-1943.7		-1156.4	
Wald	all $\beta = 0$	696.7 ***		873.4 ***		NA		690.6 ***		841.3 ***		NA	
Wald	β_s-$\beta_u = 0$	365.88 ***		135.74 ***		30.30 ***		368.13 ***		136.77 ***		30.52 ***	

Notes:
1. See Appendix 1 for variable definitions.
2. Models 4-6 have five year dummy variables in the selection equation whereas Models 1-3 do not have these variables.
3. In Models 3 and 6, the sub-sample of 25 countries with both solicited and unsolicited banks are used. In Models 2 and 5, a dummy variable S1 is added to the set of regressors in Models 1 and 4.
4. The t-statistics are based on the standard errors adjusted for clustering on each country.
5. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 6

Results of the Expected Ratings from the Endogenous Regime-switching Models

	Y_{1s}	Y_{1u}	Y_{0s}	Y_{0u}
Model 1	6.433	5.911	5.980	5.264
Model 2	6.434	6.199	5.602	5.264
Model 3	5.641	5.559	5.499	5.274
Model 4	6.433	5.898	5.983	5.264
Model 5	6.434	6.187	5.619	5.264
Model 6	5.641	5.532	5.522	5.274

Note: See the footnotes of Table 5 for brief descriptions of the models.

Table 7

Results of Treatment and Clientele Effects of the Endogenous Regime-switching Models

	TE0	TE1	TE2	CE1	CE2
Model 1	1.170 ***	0.522 ***	0.716 ***	0.453 ***	0.647 ***
Model 2	1.171 ***	0.236 ***	0.339 ***	0.832 ***	0.935 ***
Model 3	0.367 ***	0.082 ***	0.226 ***	0.142 **	0.286 ***
Model 4	1.169 ***	0.535 ***	0.720 ***	0.450 ***	0.635 ***
Model 5	1.171 ***	0.248 ***	0.355 ***	0.815 ***	0.923 ***
Model 6	0.367 ***	0.109 ***	0.248 ***	0.119 *	0.258 ***

Notes: 1. The three treatment effects and two clientele effects are:

TE0 = $Y_{1s} - Y_{0u}$ = observed difference in ratings between the solicited and unsolicited groups

TE1 = $Y_{1s} - Y_{1u}$ = *marginal decrease* in ratings if a solicited bank *had* changed its solicitation status to *unsolicited*

TE2 = $Y_{0s} - Y_{0u}$ = *marginal increase* in ratings if an unsolicited bank *had* changed its solicitation status to *solicited*

CE1 = $Y_{1s} - Y_{0s}$ = clientele effect of financial characteristics on ratings if both groups *were solicited*; and

CE2 = $Y_{1u} - Y_{0u}$ = clientele effect of financial characteristics on ratings if both groups *were unsolicited*.

We note that TE0 = TE1 + CE2 and TE0 = TE2 + CE1.

2. ***, **, and * indicate significance at the 1%, 5%, and 10% levels respectively**.**

APPENDIX 1
List of financial variables used for statistical analyses

Variable Code	Variable Name and Brief Explanation
	Profitability
NIM	Net interest margin *= net interest revenue/average total earning assets* *(where net interest revenue = interest received – interest paid;* *total earning assets = loans + other earning assets excluding fixed assets)*
NIMA	Net interest revenue/average total assets
PROA	Pre-tax operating income/average total assets
ROA	Return on average assets *= net income/average total assets*
ROE	Return on average equity *= net income/average equity*
DPO	Dividend payout
CTI	Cost to income ratio (also called "expenses to revenue ratio") *= overhead/(net interest revenue + other operating income)*
	Asset Quality
LLR/GL	Loan loss reserves (LLR)/gross loans *(where gross loans = loans + LLR)*
LLP/NIR	Loan loss provisions (LLP)/net interest revenue
LLR/NPL	Loan loss reserves (LLR)/non-performing loans (NPL)
NPL/GL	Non-performing loans (NPL)/gross loans
NCO/AGL	Net charge off (NCO)/average gross loans *(where net charge off = the amount written off from LLR less recoveries from loans)*
NCO/BNI	Net charge off (NCO)/net income before loan loss provisions *(where net income before loan loss provisions = net income + LLP)*
	Liquidity
INTERBANK	Interbank ratio *= money lent to other banks(due from other banks)/money borrowed from other banks(due to other banks)*
LTA	Loans to total assets *(indicates what percentage of the assets of the bank are tied up in loans)*
LTD	Loans/customer and short-term funding *(loans to deposits ratio)*
LTDB	Loans/total deposits and borrowings *(loans to deposits and borrowings with the exception of capital instruments)* *(where total deposits and borrowings = customer and short-term funding + other funding – hybrid capital – subordinated debt)*
LATD	Liquid assets/customer and short-term funding *(a deposit run off ratio that looks at what percentage of customer and short-term funds could be met if they were withdrawn suddenly)* *(where liquid assets = cash and due from other banks + deposits with other banks + due from Central Banks + trading securities)*
LATDB	Liquid assets/total deposits and borrowings *(looks at the amount of liquid assets available to depositors as well as borrowers)*

APPENDIX 1 (continued)
List of financial variables used for statistical analyses

	Capital Adequacy
TIER1	Tier 1 capital ratio *(Basel's Tier 1 capital ratio, which should be at least 4%)*
CAP	Capital adequacy ratio *(Basel's total capital adequacy ratio which measures Tier 1 and Tier 2 capital and should be at least 8%)*
ETA	Equity to total assets *= book value of equity/total assets* *(measures the amount of protection afforded to the bank by the equity they invested in it)*
ETL	Equity to loans *= book value of equity/loans* *(measures cushion available to absorb losses on the loan book)*
ETD	Equity to customer and short-term funding *= book value of equity/customer and short-term funding* *(measures the amount of permanent funding relative to short term potentially volatile funding)*
	Size
LNASSET	Logarithm of book value of total assets (in US thousand dollars)
LNTSEC	Logarithm of book value of trading securities (in US thousand dollars)
	Other Variables
SPR	S&P's long-term bank ratings *(The ratings are coded as AAA = 9, AA = 8, A = 7, BBB = 6, BB = 5, B= 4, CCC = 3, CC = 2, and SD/D = 1.)*
SOV	S&P's long-term sovereign ratings *(The ratings are coded as AAA = 9, AA = 8, A = 7, BBB = 6, BB = 5, B= 4, CCC = 3, CC = 2, and SD/D = 1.)*
YR1999	Year dummy where YR1999 = 1 when the rating was issued in 1999, and 0 otherwise.
YR2000	Year dummy where YR2000 = 1 when the rating was issued in 2000, and 0 otherwise.
YR2001	Year dummy where YR2001 = 1 when the rating was issued in 2001, and 0 otherwise.
YR2002	Year dummy where YR2002 = 1 when the rating was issued in 2002, and 0 otherwise.
YR2003	Year dummy where YR2003 = 1 when the rating was issued in 2003, and 0 otherwise.
PROP_SOL	Proportion (by percentage) of solicited ratings in the respective country of the year.
EXNO1	No. of overseas exchanges on which the bank was listed.
OVERSEAS	No. of overseas subsidiaries held by the issuer.

Note: The average value of each variable is equal to the arithmetic mean of the values at the end of years t and t-1.