

# **THE IMPACT OF SUPERVISORY DISCLOSURE ON THE SUPERVISORY PROCESS: WILL BANK SUPERVISORS BE LESS LIKELY TO DOWNGRADE BANKS?**

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## **ABSTRACT**

*An argument for refusing to publicly disclose supervisory ratings of the safety and soundness of banks rests on the claim that such disclosure will reduce supervisory effectiveness. Specifically, some argue that public disclosure of supervisory ratings will reduce the likelihood that bank supervisors take adverse, but deserved, actions against a bank such as a rating downgrade. This argument has not been subject to an empirical investigation. We provide the first test of this claim by examining if and how rating downgrades and upgrades changed when supervisors altered their policies and began disclosing ratings to bank management. If supervisors were more reluctant to alter ratings because of this change in disclosure policy, then it is reasonable to believe that disclosing ratings to the public—the ultimate goal of many proposals--would have as large or a larger effect. After controlling for bank-specific and standard economic factors, we find that more expansive disclosure did not make downgrades less likely. While such results are insufficient by themselves to justify release of bank supervisory data to the public, they are a necessary condition for enacting such a policy.*

## I. INTRODUCTION AND MOTIVATION

Whether to disclose confidential supervisory ratings of banks has been the subject of extensive debate -- see Scott, Jens and Spudeck (1991) for an early discussion. Disclosure of supervisory ratings was reviewed once again as part of the Federal Reserve's recent effort to evaluate the role of market discipline in the supervisory process (Board of Governors, 2000). The major argument for disclosing ratings is to enhance the market discipline that banks face. Simply put, improving the quality of information that bank creditors have at their disposal should lead to more informed pricing by bank creditors as well as more informed decisions about how much exposure creditors assume. More informed decisions by bank creditors enhance resource allocation. This is the same logic that justifies the mandatory disclosure regimes found in the United States and other countries. Justifying this view is evidence, albeit often limited and indirect, that supervisory ratings contain information market participants do not have -- see Allen, Jagtiani, and Moser (2001), DeYoung, Flannery, Lang, and Sorescu (2001), and Berger and Davies (1994).<sup>1</sup>

Despite the potential benefits of disclosing ratings, policymakers have refused to require disclosure of exam ratings to the public. Typically two costs of disclosing exam ratings are alleged to be higher than the benefits of disclosure -- systemic instability and reduction in the supervisory effectiveness.<sup>2</sup> First, it is feared that the release of supervisory ratings will lead informed creditors to run institutions, potentially leading to bank panics. However, the existing evidence does not support claims that releasing supervisory information will lead to greater instability. Gilbert and Vaughan (2001) found no evidence of depositors' reaction to enforcement actions (data 1990-1997). Jordan, Peek, and Rosengren (1999) examined the impact of requiring the disclosure of supervisory information on troubled U.S. banks during a severe banking crises. They concluded that the disclosure was not destabilizing (i.e., did not create bank runs or a

collapse of stock prices). In addition, Johnson and Weber (1977) found that the inadvertent public release of the names of 35 banks on the Federal Reserve's "problem bank" list did not alter market perceptions.

The second argument for not releasing exam ratings to the public is the alleged deleterious effect it will have on the effectiveness of the supervisory process. Unlike the systemic effect of supervisory disclosure, there has been no empirically based analysis of this claim. This argument also takes many forms.

Disclosing exam ratings to the public might impede the flow of information from bank management to examiners, for example. Bankers may be less willing to cooperate voluntarily with bank examiners and try to suppress information that might lead to a downgrade or a poor rating. A former chairman of the Federal Deposit Insurance Corporation recently noted that, "disclosure of CAMEL ratings would only make [examiners] jobs more difficult – since a bank would fight to keep its rating higher and make the exams more difficult and more hostile." (Blackwell, 2002, 6). Disclosure of ratings might therefore lead to less accurate supervisory assessments with a related reduction in "bad" ratings of banks by supervisors or, at a minimum, the need to expend additional resources to generate an accurate assessment of the bank.<sup>3</sup>

Disclosure could lead to a reluctance to downgrade banks or to assign a "bad" rating for other reasons, such as a supervisors fear of spawning contagion—particularly in the case of large banks—or a desire to avoid conflict with supervised entities with which they will have repeated future contact. In commenting on calls to disclose exam ratings, Gerald Corrigan, former president of the Federal Reserve Bank of New York, argued that such public disclosure would "tend to water down the efforts of the supervisory and examination personnel. It would inhibit them from doing what they should do and doing it promptly" (Federal Reserve Bank of Kansas City, 1997, 308).

The claims that disclosure of bank ratings will lead to less effective supervisory assessments has been challenged through what amounts to “logical reasoning.” For example, observers have argued that the disclosure might in fact improve the flow of information as bank management seeks to ensure that examiners have a full understanding of the risks as possible prior to assigning and disclosing the ratings. But such challenges are unlikely to be effective without empirical support.

Our analysis begins to fill the research gap by examining the assignment of ratings before and after a change in the rating disclosure policy, specifically the disclosure of ratings of several bank attributes (e.g., asset quality) to bank management. We aim to determine if, holding several other factors constant, supervisors are less likely to change their ratings of these attributes if they have to disclose the change to bank management. Because the policy change we analyze did not involve disclosure to the public, the evidence we compile is not sufficient to support public disclosure. But our analysis of the less drastic change in policy is nonetheless a necessary condition to support public disclosure. If disclosing supervisory ratings to bank management significantly reduces, for example, the proclivity of supervisors to downgrade institutions, it will be more difficult to justify release of ratings to the public.

The rest of the paper is organized as follows. In the next section, we describe our research strategy. We review our empirical methodology in Section III. Section IV describes our data. Section V summarizes our results. In Section IV we discuss our conclusions and the implications of our work for supervisory policy.

## **II. RESEARCH STRATEGY**

In this section, we first describe the system that bank supervisors use to rate banks. We then describe historical policy changes with regards to disclosure of these exam ratings and how our analysis fits into the debate on disclosing ratings to the public. Specifically, we use a change

in those rules to test the potential effect of rating disclosure on supervisors' downgrading proclivities. Finally, we discuss three important hurdles we face in implementing this general strategy and discuss our approach to them.

*Rating System.* Banks are currently examined by supervisory authorities at least every 18 months.<sup>4</sup> After each examination, commercial banks receive a CAMELS ratings on a scale of 1 (strongest) to 5 (weakest) from the supervisor carrying out the exam. CAMEL is an acronym for Capital adequacy, Asset quality, Management quality, Earnings, Liquidity and Sensitivity to Market Risk. Supervisors assign ratings for each of the components (C, A, M, E, L, and S). Supervisors also assign an overall or composite rating which is not an arithmetic average of the component ratings. The current rating system, formally known as the Uniform Financial Institutions Rating System has been in place since 1979. The "S" rating was added in 1997 and therefore cannot be reviewed in our framework. As a result, we will refer to the rating system as CAMEL in the rest of the paper.

There are three bank supervisors on the federal level as well as bank supervisors for each of the 50 states. The Office of the Comptroller of the Currency (OCC) examines and rates banks with national charters. The Federal Reserve (FED) in conjunction with state bank supervisors examines and rates banks with state bank charters that are members of the Federal Reserve System. The Federal Deposit Insurance Corporation (FDIC) in conjunction with state bank supervisors examines and rates banks with state bank charters that are not members of the Federal Reserve System. Typically, the FED and FDIC alternate with the state bank supervisors in leading the bank exam and assigning the bank ratings under their supervision. Unless a bank is in poor condition or deteriorating rapidly, this means that FED and state exams, for example, will be roughly one year to eighteen months apart.

*Disclosure Rules.* Researchers analyzing the potential effect of releasing ratings to the public would naturally want to analyze cases where such disclosure has occurred. Some of the literature already cited, for example, reviews observations where ratings were indirectly released through reporting of supervisory actions against banks in poor condition. This indirect approach is taken because repeated, regular releases to the public of exam data for a significant percent of all banks have not occurred. We are also forced to rely on an indirect method for evaluating the merits of disclosing supervisory ratings to the public.

Specifically, we take advantage of a change in disclosure policy with regards to bank management. Neither the composite or component CAMEL ratings were disclosed to bank management when the CAMEL rating system first went into effect in 1979. In fact, guidance from the three federal banking supervisors explicitly warned examiners against providing the exact rating to bank managers or directors. Instead, examiners were to discuss the supervisory issues, problems, or concerns that resulted in the assigned ratings.

In the early 1980s, the federal bank supervisors began to rethink this policy of not disclosing ratings to bank managers and directors. Between 1982 and 1988, the agencies allowed examiners to disclose the composite rating and its definition to bank management and directors (see Table 1). The goal of disclosure to banks was to improve the communication of exam findings to banks. It was also argued that disclosure would better focus management attention on possible areas of weakness. Such disclosures were typically made in the summary section of the official examination report that was provided to management. They were also made in writing to boards of directors in summary reports prepared for them.

Policies varied among the different agencies with respect to the amount of discussion that examiners were allowed to have with management concerning the composite rating. For example, OCC examiners were specifically instructed not to engage in a discussion of the rating with bank officials while FED examiners were encouraged to clearly explain the meaning of the composite rating to management. All three agencies continued to require that examiners not provide or discuss the component CAMEL ratings.

In some ways, the disclosure of the composite ratings to banks was a test case. From the view of supervisors, the test went well. By the mid-1990s, federal supervisors had come to believe that the same objectives that had been met by disclosing composite ratings could be met by providing component ratings. In particular, they argued that that disclosure of component ratings could encourage more complete and open discussions of examination findings. It would also enable management to better focus on timely corrective actions. Thus, in addition to modifying the rating system at the end of 1996 to include the sensitivity to market risk component, the federal agencies also elected to begin disclosing the numeric component ratings in the same manner as the composite ratings. Moreover, all bank examiners were explicitly instructed to fully discuss the factors considered in assigning each component rating, as well as the overall composite rating, during exit meetings with senior management. Table 2 reports the dates at which this change went into effect.

We hypothesize that supervisors will be more reluctant to downgrade a bank's rating once they are required to provide the rating to bank management. Although we do not think the effect on supervisors of disclosing to management will be as strong as it would be for public disclosure, the direction of the effect should be the same. In both cases, supervisors may be less willing to downgrade because of fear that disclosing the change will have significant costs.

As already noted, we view this test as a necessary but not sufficient hurdle that advocacy for releasing ratings to the public must meet. If we find that disclosure to management leads to an undesired change in behavior -- such as a reduced probability of downgrading a bank that would otherwise face such action -- then we can reasonably assume that public disclosure would have had a similar but potentially more significant effect on supervisory effectiveness. Thus, we believe reviewing a change in disclosure policy to bank management is an important foundation on which discussions of a more dramatic change in disclosure should take place.

*Hurdles.* Our research strategy must confront three hurdles. First, composite ratings data is not available in a very reliable form during the period when the disclosure of such ratings to management was made. We therefore focus exclusively on the disclosure of component ratings. A potential concern about this strategy is that the composite rating, which was being disclosed to management even when components were not, would have indirectly conveyed to bank management some information on the component ratings. This concern would be justified if the composite rating is frequently the same as each of the component ratings. However, for the period for which we analyze ratings (January 1992 to December 2001), 80 percent of the exams had at least one component rating that differed from the composite (this percent falls to about 60 percent when considering just the ratings for capital, asset quality and management). While the management rating only differs from the composite rating a quarter of the time, other components, particularly earnings and liquidity are different about 40 percent of the time.<sup>5</sup> Moreover, our focus on the components has the advantage that a review of composite disclosure to management could be confounded by release of such information to the public (e.g. through disclosure of supervisory actions against banks.)

Second, as noted, both the FED and FDIC rotate the examination and rating of banks with the state bank supervisors. The state bank supervisors did not have to adopt the change in

disclosure policy at the same time as the federal supervisors. As a result, it might be possible for a bank to simultaneously face two different disclosure regimes depending on which supervisors is leading the exam and providing the rating. To address the hurdle of alternative exams, we gathered data through the Conference of State Bank Supervisors (CSBS) on the exam disclosure policy of state banking agencies. In our analysis, we only include data on state chartered banks that were examined by state banking supervisors that changed their disclosure policy at the same time as the federal supervisors.<sup>6</sup> We include data on national chartered banks in all states because the OCC does not rotate exams.

Third and finally, the supervisory guidance issued by the FED and OCC with regard to the change in disclosure to management suggests that supervisors might have already been releasing CAMEL ratings to bank management. According to the policy change, some FED and OCC supervisors provided bank management with “key words” equivalents for component and composite ratings (e.g., strong = 1, satisfactory = 2, fair = 3, etc...). However, the extent and effectiveness of key word communication is not clear. For example, supervisory staff responsible for the policy change did not have evidence on the extent of key word communication. Indeed, it is unclear why supervisory agencies would issue formal guidance heralding a change in policy in the name of clearer communication if ratings were effectively conveyed.<sup>7</sup> Even if key words were provided, it is not clear if bankers understood the words to have the same meaning as the numerical ratings.

In addition, some of the supervisory guidance, particularly guidance from the FDIC, indicates that examiners should not discuss the historical component ratings with banks, and that examiners should avoid unnecessary discussion about the factors considered in assigning ratings at previous examinations. Such dictates would not be necessary if bank managers already knew of their ratings through a key word discussion. This guidance also suggests that at least relative

to other agencies, it seems less likely that the FDIC used key words. We take advantage of these potential different treatment of the disclosure change in our analysis section by analyzing data for banks examined by the FDIC separately from data for banks examined by the FED or the OCC.

### III. EMPIRICAL METHODOLOGY

In this section, we describe our research strategy in more detail. We first review how we model the relationship between the change in disclosure regimes, other variables that effect rating decisions and actual component ratings, focusing on the similarity of our approach to that of supervisors. We then describe the types of rating behavior we model and the explanatory variables in our regressions.

#### Modeling the Relationship Between Disclosure and Change in Supervisors' Willingness to Downgrade

To determine how the change in disclosure regimes alters supervisors' behavior we estimate a series of logistic regressions that predict the likelihood of a change in each of the five component ratings. Our modeling strategy and choice of variables is based on supervisory practices. In the most general sense, our empirical approach implicitly assumes that the relationship between factors used to assign a rating and the rating itself can be captured in such a statistical prediction model. This assumption follows the same one that supervisors use when deploying their rating prediction models currently. The Federal Reserve supervisors have used a model -- called the System to Estimate Examination Ratings or SEER -- for at least ten years (Cole, Cornyn and Gunther 1995).<sup>8</sup> And these rating prediction models are at the core of the off-site monitoring conducted by supervisors. Based on the results of these models, for example, banks with a rating estimate of "3" or worse are more closely supervised and monitored (Board of Governors 1994 and 2000).

More specifically, our models are built along the general guidelines of the SEER rating model, focusing on the change in the supervisory ratings from the previous exam to the current exam (either upgrade or downgrade). We include financial ratios that supervisory models and guidance indicate that supervisors use in assigning specific component ratings (see Board of Governors 1996 for such guidance). We include proxies for nonfinancial data -- such as previous ratings -- that help capture additional information that supervisors would review.

We also include other variables that would not be in supervisors' models (at least not in the manner we include them). Most importantly, we review the sign and significance of a variable that indicates whether the rating was disclosed to management as evidence for the effect of disclosure on supervisory behavior. We also include factors, such as economic conditions, that supervisors would consider in our model.

Using a logistic regression analysis, we investigate the relationship between the probability that a bank will be downgraded (or upgraded) and the supervisory disclosure policy, controlling for the bank's relevant risk characteristics, economic condition, and the regulatory agency involved in assigning the ratings. We estimate a separate model for each of the component ratings (C, A, M, E, and L). The logit model we estimate may be written as follows:

$$\begin{aligned} \text{Log} [P_i/(1-P_i)] = & a_{1i} + a_{2i} [X_{1,i}] + a_{3i} [Y_{1,k}] + a_{4i} D\_Post + a_{5i} D\_OCC + a_{6i} D\_FDIC \\ & + a_{7i} D\_STATE + a_{8i} [RATING_{i,(t-1)}] + a_{9i} INTERVAL_i + a_{10i} (LOGTA_{i,t}) \quad \text{-----} \quad (1) \end{aligned}$$

### Dependent Variables

The variable  $P_i$  is the probability that bank  $i$  will be downgraded (or upgraded) at time  $t$ . We utilize three different definitions of downgrades (and upgrades) for each of the rating components in our analysis. First, we examine a general definition of downgrades where  $P_i$  would take a value of 1 (and zero otherwise) if the bank's rating at time  $t$  (current exam) is worse than its rating at time  $t-1$  (previous exam). Banks that were already a "5" are excluded from the

sample since it would not be possible for these banks to be downgraded. This portion of our analysis will explain whether the change in disclosure policy affected bank supervisors' willingness to downgrade banks.

Second, we also focus on those downgrades that cross the supervisory threshold for each of the components – from “satisfactory” (1- or 2-rated) to “unsatisfactory” (3-, 4-, or 5-rated) by supervisors' standards. This supervisory threshold has important implications for banks. For example, banks controlled by a holding company must have a satisfactory Management (M) rating before the holding company can take advantage of the expanded powers offered by the Gramm-Leach-Bliley Act. In this case, we restrict our sample to include only those banks that were downgraded. This portion of our analysis further explains the impact of change in the disclosure policy—whether the policy change affected bank supervisors' willingness to downgrade banks across the supervisory threshold, given that the banks were being downgraded.

Third, we examine downgrades that would label the banks as problem banks – i.e. downgrades from “1”, “2”, or “3” to 4-rated or 5-rated. Banks with “4” or “5” ratings are generally subject to some type of supervisory enforcement actions. Again, only observations with downgrades are included in this portion of the analysis.

*Impact of Supervisory Disclosure on Rating Downgrades (or Upgrades):*

The impact of supervisory disclosure policy is expected to be captured by our dummy variable  $D\_Post$ , which is equal to 1 (and zero otherwise) for ratings that were assigned after the change in disclosure policy; i.e., after the CAMEL component ratings started to be disclosed. We interpret  $D\_Post$  as follows. If  $D\_Post$  is statistically significant and negative in a model of downgrades, we would find that the change in disclosure regimes made supervisors less likely to downgrade banks. If  $D\_Post$  is insignificant or statistically significant and positive, we would find that the change in disclosure policy did not make supervisors less likely to downgrade. Our

analysis excludes the first exam rating after the policy change because bank management would not have known whether the new rating following the change in policy was a downgrade, upgrade or a confirmation of the existing rating.

*Controlling for Risk Characteristics of the Bank:*

The  $[X_{i,j}]$  in equation (1) is a vector of risk characteristics  $j$  of bank  $i$ . These risk characteristics are measured both in terms of ratios at time  $t$  and as a change in the ratios from time  $t-1$  to time  $t$ . Guidance provided to supervisors, that we already referenced, suggests that both changes and levels are factors considered by supervisors when assigning ratings.

A different set of risk characteristics are used for the different component rating models we estimate to only include those variables that supervisors consider when assigning the specific component ratings. Table 3 lists the variables for each of the regressions. The expected signs for each of the risk variables are shown for each component rating in our downgrade analysis. The rationale for including these variables for the specific component regression and the expectations for their sign in the case of downgrades are fairly intuitive so we only provide several general examples of our approach.

The likelihood of a downgrade in the capital component should be positively related to measures of asset quality and negatively associated to measures of capital. Similarly, there should also be a positive relationship between measures of asset quality and the probability of downgrade for the asset quality variable. The likelihood of a management downgrade should be positively associated with measures of “waste” and negatively associated with measures of stewardship. The effect of size on rating is ambiguous. Larger banks may have a smaller chance for downgrade in several components because of a potentially greater ability to diversify and manage risk and a potentially greater chance for taking advantage of scale economies. At the

same time, larger banks could “spend” their diversification benefit by taking on riskier assets or holding less capital, which could make them riskier.

*Controlling for Economic Environment:*

The  $[Y_{t,k}]$  in equation (1) is a vector of economic variables  $k$  at time  $t$ . The economic variables included in our analysis for each of the models are unemployment rate at the state level (*Econ\_Employ*), the log growth rate of per capita income, defined as personal income divided by the labor force at the state level (*Econ\_Income*), credit spreads defined as Moody’s seasoned AAA corporate bond yield minus Moody’s seasoned Baa corporate bond yield (*Econ\_AAA\_Baa*), and term structure spreads defined as 10-year Treasury bond yield minus 3-month Treasury bill yield (*Econ\_10yr\_3mo*).

*Controlling for Different Standards and Practices Across Supervisory Agencies:*

In addition to economic condition and the disclosure regime, we control for several other nonfinancial data that might have some influence in the component ratings being studied. Since different regulatory agencies may apply different standards for assigning the ratings, we control for the bank’s supervisory agency, using three dummy variables; i.e.,  $D_{OCC}$ ,  $D_{FDIC}$ , and  $D_{STATE}$ . These variables are defined to be equal to 1 (and zero otherwise) for the ratings that were assigned by the OCC, the FDIC, and the state as lead-agency for the examination, respectively. The base cases are those examinations led by the FED. These dummy variables control for the differences in standards and practices across supervisory agencies that assigned the ratings.

*Controlling for the Bank’s Existing Financial Condition and Size:*

The  $RATING_{i,(t-1)}$  in equation (1) is a vector of dummy variables representing bank  $i$ ’s previous component rating at time  $t-1$  (previous exam). We include the previous component rating as a control factor because the level and change in the financial data may differ in its

relationship with the rating downgrades (or upgrades). For example, a three percent change in a bank's capital ratio may have different implications for the Capital (C) rating of banks already viewed by supervisors as being in weak condition than it might for banks with a currently strong Capital rating. The previous rating variable is entered in our model as dummy variables  $D\_Rate\_1$ ,  $D\_Rate\_2$ , and  $D\_Rate\_4$ . These dummy variables have a value of 1 (0 otherwise) if the bank's previous component rating was 1, 2, and 4, respectively. Banks with previous component ratings of "5" are excluded from our analysis of rating downgrades, since a downgrade is not possible for these banks. Similarly, banks with previous component ratings of "1" would be excluded in our analysis of rating upgrades, and the dummy variables used in the model would vary accordingly.

In addition to the previous ratings, we also include a variable *INTERVAL* to account for the number of months between the current (t) and previous exam (t-1). The shorter the interval between exams, the more likely is a rating downgrade. This is because banks are generally examined (full-scope examination) every 12 to 18 months. But, based on their off-site monitoring results, bank supervisors would perform on-site exams more frequently for those banks that are suspected to have some financial difficulties. Finally, we also control for bank size ( $LOGTA_{i,t}$ ), which is measured by bank i's log of total assets at time t.

#### IV. THE DATA

Our CAMEL ratings and the risk characteristics come from the National Examination Database (NED) and the Report of Condition and Income (i.e., the "Call Report"), respectively. The ratings information is matched with the Call Report data as of end of quarter prior to the exam (start) date. The sample includes all examination ratings from January 1992 to December 2001.<sup>9</sup> We have a total of 11,819 observations, with 6,450 observations in the pre-disclosure period and 5,369 observations in the post disclosure period. Of these observations, roughly a

third were assigned by the FDIC and the states, a quarter were assigned by the OCC and the remaining roughly ten percent by the Fed.

We expunge several types of institutions from the data set. First, we remove banks that are less than five years old (i.e., “de novo” banks) because their financial data is likely to differ materially from more established institutions. For the same reason, we exclude banks that concentrate on credit card lending, which has been associated with higher returns and losses than more diversified banks might face. All observations from any bank that had a credit card loan to total loan ratio equal to or greater than 50 percent in any quarter are deleted from our analysis. Only commercial banks are included in the sample. Thrifts, credit unions, trust banks, and other noncommercial bank institutions are excluded.

Several descriptive statistics are worth noting. Summary statistics of the sample are presented in Table 4, panels A and B. As noted, we examine three types of downgrades -- any downgrades, downgrades from “1” or “2” to the unsatisfactory ratings of “3”, “4” or “5”, and downgrades from “1”, “2” or “3” to the unsafe/ problem ratings of “4” or “5”. Overall, not controlling for the risk characteristics or the economic environment, the ratio of all downgrades to total exams is generally larger in the post-disclosure period (December 1996 to December 2001) than in the pre-disclosure period (January 1992 to September 1996). This is true for all components except for the L (Liquidity). The ratio of downgrades to total exams was not much different in the pre- and post-disclosure periods for downgrades to unsatisfactory or unsafe ratings.

## **V. THE EMPIRICAL RESULTS**

Tables 5 presents the results of the impact of supervisory disclosure on examiners’ willingness to downgrade banks in general. Table 6 focuses on those banks that were downgraded, and presents the results of supervisory disclosure on examiners’ willingness to

downgrade banks across the supervisory threshold from “satisfactory” (1- or 2-rated) to “unsatisfactory” (3-, 4-, or 5-rated). Finally, Table 7 presents the results of the supervisory disclosure on examiners’ willingness to downgrade banks across another supervisory threshold to a “problem” category (4- or 5-rated). In each table, there are five models reported – one for each of the CAMEL components. The results are summarized below.

From Tables 5, 6, and 7, the coefficients for most of the control variables have the expected signs and are mostly significant. For example, bank size seems to be one of the important factors that affect the probability that a bank’s components will be downgraded, holding everything else fixed. The reason for this may be related to the fact that larger banks generally hold a more diversified portfolio. As expected, the time period between examination, *INTERVAL*, is generally negatively related to the probability of being downgraded, indicating that examination resources have been directed towards banks that are facing some problems and are likely to be downgraded. The only exception is for those downgrades of M and E from “satisfactory” to “unsatisfactory” ratings. The majority of coefficients of the agency variables, *D\_OCC*, *D\_FDIC*, and *D\_STATE*, are not significant. In approximately one-third of the cases, there was a statistically significant difference between the FED and other agencies in their willingness to downgrade banks, controlling for risk characteristics of the banks.

In addition, weaker economic conditions are generally associated with higher probabilities of being downgraded, suggesting that supervisors are more cautious in assigning CAMEL ratings when unemployment rates are high or personal income is low. We also find that the likelihood of a downgrade is greater both when default risk is rising, (as reflected in the positive coefficient on the corporate credit risk spread) and when the Treasury yield curve becomes flatter or negatively sloped (indicated by the negative coefficient on this term).

Our key variable for measuring the impact of the supervisory disclosure is the dummy variable  $D\_Post$ . If  $D\_Post$  were negative and significant, this would suggest that the disclosure change had an effect on ratings behavior by reducing supervisors' willingness to downgrade banks. However,  $D\_Post$  is almost always positive and when it is negative, it is either not significant or significant only at the 10 percent level. We describe these findings in more detail.

The coefficients of  $D\_Post$  are mixed, depending on the components and the definition of downgrades. From Table 5, the coefficients of  $D\_Post$  are either significantly positive or insignificant, suggesting that bank supervisors' willingness to downgrade banks in general was not reduced by the enhanced disclosure of CAMEL components in 1997.

When focusing on the downgrades across supervisory threshold from "satisfactory" to "unsatisfactory", the results, as presented in Table 6, are generally consistent. The coefficients of  $D\_Post$  are insignificant for the C, A, and L components, and significantly positive for E. It is perhaps noteworthy that  $D\_Post$  is negative for the M component. The rating for the quality of management is typically viewed as most subjective factor of all the components. As such, one might hypothesize that if the disclosure change were going to alter any of the ratings, it would be the M component. However, this variable is only significant at the 10 percent level, and, thus, does not materially alter our general results. Moreover, when focussing on those banks that are facing real difficulties (4- or 5-rated), we find that most of the coefficients of  $D\_Post$  are insignificant, but significantly positive for the M component.

Our results on general upgrades (not shown) show that the coefficients of  $D\_Post$  are significantly negative for the C, A, M, and E components and insignificant for the L component. This suggests that, overall, the enhanced disclosure of CAMEL components in 1997 did not increase the likelihood that bank supervisors would upgrade banks. This is consistent with our downgrade results for the general disclosure.

Finally, we use the same logistic regressions for exams conducted by the FDIC. Recall that the FDIC appears the least likely to have used key words that might have already disclosed component ratings to bank management. *D\_Post* is never negative and significant for these exams in the downgrade models.

## VI. CONCLUSIONS AND POLICY IMPLICATIONS

Over the last several years, supervisors and policymakers have stepped up their rhetorical support for using market discipline to better manage the risk taking of banking organizations (see Olson 2002 for example). Support for a larger role for market discipline is often contingent on enhanced disclosure and increased confidence that creditors have adequate information to evaluate the safety and soundness of banking organizations. A frequently debated option for enhancing the information set of creditors, and therefore market discipline, is to release the safety and soundness ratings of bank supervisors to the public. The supervisory agencies currently argue that the costs of disclosing ratings exceed the benefits. An alleged cost of disclosure is a decreased willingness of supervisors to take adverse rating actions, such as a rating downgrade.

We empirically examine the effect of increased disclosure of ratings on the willingness of supervisors to change bank ratings by comparing downgrade and upgrade behavior in a period when ratings were not disclosed to banks (1992-1996) to such behavior in a period with disclosure to banks (1997-2001). After controlling for several economic and bank specific factors, we find that supervisors were just as or more willing to downgrade banks in the disclosure period as they were in the no disclosure period. These results are not sufficient in and of themselves to support the release of supervisory ratings to the public. The disclosure change we study involved the release of previously confidential ratings to management and not to bank

creditors. Moreover, our results may reflect limitations in our ability to explain rating changes as well as other confounding influences rather than the change in disclosure.

Nonetheless, our findings are a necessary condition for support of efforts to increase consideration and study of the release of supervisory ratings. After all, if we found that disclosure to management reduced the effectiveness of supervision, then the debate might very well end at the status quo. And given the alleged costs of disclosing ratings, it seems sensible to follow a policy that relies on incremental release of information, such as to management of banks before the public, and testing the results. Under the incremental strategy, policymakers might now want to consider a limited release of supervisory ratings, perhaps in a pilot program.

If policymakers do not wish to release supervisory ratings, they could consider providing other heretofore confidential supervisory information. Hoenig (2003), for example, argues for releasing material supervisory findings with a detailed description of problems facing the banks in order to enhance transparency and market discipline. He claims that release of such supervisory findings would be superior to disclosing CAMEL ratings which were not designed for public disclosure, but instead fit into a supervisory context where they are supplemented with additional information. As a result, the supervisory ratings may not contain meaningful information for the public unless they are offered with supporting information contained in the examination reports.

In any case, our findings support the notion of moving forward with additional supervisory disclosures. Our results are generally consistent with the limited evidence on disclosing ratings. The potential benefits of disclosure are real while the potential costs may have been exaggerated to date.

## NOTES

1. The value of older exam ratings is less clear. Research has shown that supervisory information is not always up-to-date; i.e., it becomes “stale” after a short period varying from 6 months to 18 months. See Cole and Gunther (1998), Berger, Davies, and Flannery (1998), and Hirtle and Lopez (1999) for more detail.
2. Additional concerns about releasing exam ratings have been offered but less frequently. For example, some argue that disclosure of supervisory information could reduce the market’s incentives to continue making their own independent judgements of a bank’s condition and prospect.
3. In fact, supervisors of insurance firms are moving to a policy of less disclosure of exam findings in the hopes of gaining greater access to more accurate information from the managers of the firms they supervise (see National Association of Insurance Commissioners, 2000).
4. The Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) required that federal banking agencies conduct full-scope on-site examinations of each insured depository that it supervised at least annually. FDICIA allowed some small well-managed and well-capitalized banks to be examined once every 18 months. This exemption has been expanded several times since then. See Board of Governors 1997 for a description of the most recent expansion.
5. Capital was different from the composite 27 percent of the time. The percent for the other components was 25 percent for asset quality, 21 percent for management, 35 percent for earnings and 39 percent for liquidity.
6. State banks in the following states are included in our analysis. : NH, NJ, NY, PA, VM, IA, KY, MN, WI, WV, GA, LA, FL, TN, VA, TX, AL, CA, and KA
7. We also reviewed about 60 exams and found that key words were used only in a minority of cases. However, this review was not from a random sample of exams.
8. The FDIC and the OCC have also used a similar model called the Statistical CAMELS Offsite Rating or SCOR model for similar purposes.
9. Due to unavailability of reliable CAMEL ratings in the 1980s and late 1970s, our analysis is based on data from the 1992-2001 period. Economic conditions were generally good and improving during the period. Less than 15 percent of sampled banks were downgraded during the period. Examiners may be less reluctant to downgrade banks in such a benign economic environment. Our results may, therefore, not predict how examiners might have behaved if the change in disclosure occurred during a period of weak economic conditions.

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<i>Table 1. Disclosure of Numeric Composite CAMEL Ratings To Bank Senior Management and Directors</i>			
	FDIC/State	OCC	Fed
1979-1982	NO	NO	NO
1982-1986	YES (9/24/82)*	NO	NO
1987- Present	YES	YES (3/31/87)**	YES (12/88)***

Sources: \* FDIC Division of Bank Supervision Memorandum System, "Uniform Financial Institutions Rating System," Transmittal No. 184 and OCC Examination Issuance EC-238. \*\* OCC Examination Issuance EC-238. \*\*\* Board of Governors Supervision and Regulation Letter, SR 88-37.

<i>Table 2. Disclosure of Numeric Component CAMEL Ratings To Bank Senior Management and Directors</i>			
	FDIC/State	OCC	Fed
1979-1997	NO	NO	NO
1997-Present	YES (9/30/96)*	YES (1/1997)**	YES (1/1997)***

Sources: \* Federal Register, December 19, 1996, page 67029. \*\* OCC 97-1 and Federal Register. \*\*\* Board of Governors Supervision and Regulation Letter, SR 96-26.

<i>Table 3. Expected Sign of Call Report Data Used in Component Regressions for Downgrades.</i>					
Independent Variables	C	A	M	E	L
Log of Total Assets ( <i>LOGTA</i> )	?	?	?	?	?
Delinquent Loans/ Total Assets ( <i>DQL_A</i> )	+	+			
NonCurrent Loans/Total Assets ( <i>NCL_A</i> )	+	+			
NonAccruing Loans/Total Assets ( <i>NAL_A</i> )	+	+		+	
Other Real Estate Owned/Total Assets ( <i>OREO_A</i> )	+	+			
Return on Average Assets ( <i>ROAA</i> ) <sup>1</sup>	-				
Provisions/ Average Assets ( <i>PROV_AA</i> )	+	+			
Tangible Equity Capital/ Total Assets ( <i>TEQC_A</i> ) <sup>2</sup>	+		-	-	
Total Loans/ Total Deposits ( <i>LOAN_Dep</i> )			+		+
Core Deposits/ Total Deposits ( <i>CoreDep_TDep</i> )			-		-
(Net-Interest Income + Non- Interest Income)/ NonInterest Expense ( <i>EFF_Ratio</i> )			-	-	
Non-Interest Expense/ Average Assets ( <i>NONINT_AA</i> )			+		
Full Time Employees/ Total Assets ( <i>EMPLOY_A</i> )			+		
Loans to Insiders/Total Assets ( <i>LOANEXE_A</i> )			+		

<sup>1</sup> This is a measure of annualized quarterly income divided by average assets.

<sup>2</sup> Tangible Equity is defined as total equity capital less goodwill less other intangible assets.

<i>Table 4 Panel A. Distribution of Downgrades in the Pre- and Post-Disclosure Periods.</i>						
Pre-Disclosure Change Period (Total Exams = 6450)						
Component	All Downgrades	From 1/2 To 3/4/5	From 1/2/3 To 4	All Downgrades (% of total exams)	From 1/2 To 3/4/5 (% of total exams)	From 1/2/3 To 4/5 (% of total exams)
Capital	464	118	48	7.2%	1.8%	0.7%
Asset Quality	558	192	45	8.7%	3.0%	0.7%
Management	643	294	99	10.0%	4.6%	1.5%
Earnings	683	237	101	10.6%	3.7%	1.6%
Liquidity	690	155	26	10.7%	2.4%	0.4%
Post-Disclosure Change Period (Total Exams = 5369)						
Component	All Downgrades	From 1/2 To 3/4/5	From 1/2/3 To 4	All Downgrades (% of total exams)	From 1/2 To 3/4/5 (% of total exams)	From 1/2/3 To 4/5 (% of total exams)
Capital	527	146	43	9.8%	2.7%	0.8%
Asset Quality	782	291	68	14.6%	5.4%	1.3%
Management	688	285	94	12.8%	5.3%	1.8%
Earnings	731	299	102	13.6%	5.6%	1.9%
Liquidity	546	98	12	10.2%	1.8%	0.2%

Table 4 Panel B. Summary Statistics of Explanatory Variables.

Pre-Disclosure Change Period					
Independent Variables	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile
Total Assets	17445	29043	57972	140558	463810
<i>DQL A</i>	0.12%	0.33%	0.72%	1.32%	2.12%
<i>NCL A</i>	0.00%	0.00%	0.07%	0.28%	0.68%
<i>NAL A</i>	0.00%	0.06%	0.29%	0.83%	1.76%
<i>OREO A</i>	0.00%	0.00%	0.10%	0.44%	1.28%
<i>ROAA</i>	0.41%	0.81%	1.14%	1.46%	1.76%
<i>PROV AA</i>	0.00%	0.00%	0.12%	0.29%	0.57%
<i>TEQC A</i>	6.68%	7.58%	8.80%	10.52%	13.03%
<i>LOAN DEP</i>	43.6%	55.2%	66.3%	76.1%	84.4%
<i>CORE DEP</i>	51.1%	57.8%	64.4%	70.6%	75.5%
<i>EFF RATIO</i>	172.9%	210.5%	251.0%	298.3%	352.6%
<i>NONINT AA</i>	2.18%	2.62%	3.19%	3.92%	5.01%
<i>EMPLOY A</i>	0.03%	0.04%	0.05%	0.06%	0.07%
<i>LOANEXE A</i>	0.01%	0.22%	0.75%	1.64%	2.92%
Post-Disclosure Change Period					
Total Assets	24052	41110	85305	267149	930456
<i>DQL A</i>	0.11%	0.30%	0.67%	1.24%	2.03%
<i>NCL A</i>	0.00%	0.00%	0.07%	0.26%	0.65%
<i>NAL A</i>	0.00%	0.04%	0.23%	0.59%	1.19%
<i>OREO A</i>	0.00%	0.00%	0.02%	0.15%	0.47%
<i>ROAA</i>	0.44%	0.81%	1.13%	1.43%	1.78%
<i>PROV AA</i>	0.00%	0.03%	0.13%	0.27%	0.52%
<i>TEQC A</i>	6.83%	7.77%	8.96%	10.87%	13.84%
<i>LOAN DEP</i>	52.5%	63.5%	74.7%	85.1%	94.3%
<i>CORE DEP</i>	50.2%	57.2%	64.3%	70.8%	76.2%
<i>EFF RATIO</i>	193.1%	229.5%	275.8%	328.5%	389.5%
<i>NONINT AA</i>	2.01%	2.41%	2.95%	3.69%	4.60%
<i>EMPLOY_A</i>	0.02%	0.03%	0.04%	0.05%	0.06%
<i>LOANEXE_A</i>	0.02%	0.25%	0.76%	1.64%	2.92%

*Table 5. Impact of Supervisory Disclosure on CAMEL Downgrades – Any Downgrades  
January 1992 – December 2001 (11,819 observations).*

Independent Variables	C	A	M	E	L
<i>Intercept</i>	1.4675**	-3.9304***	0.1052	-0.2164	-1.8781***
<i>D_Post</i>	0.4786***	0.3467***	0.2375**	0.1146	-0.1560
<i>D_OCC</i>	0.1440	0.2093	-0.3179***	-0.3235**	-0.3017**
<i>D_FDIC</i>	0.2496*	0.0349	-0.3148***	-0.1478	-0.0995
<i>D_STATE</i>	0.1515	0.0857	-0.5765***	-0.3622**	-0.0671
<i>INTERVAL</i>	-0.0267**	-0.0206**	-0.0029	0.00212	-0.0117
<i>D_Rate_1</i>	4.5043***	3.3987***	1.9297***	3.3881***	2.3074***
<i>D_Rate_2</i>	1.7359***	2.1618***	0.6999***	1.8145***	0.2962
<i>D_Rate_4</i>	-2.2850***	-1.8596***	-0.4365*	-0.1853	-12.0943
<i>Econ_Employ</i>	0.1101***	-0.0400	0.1555***	0.0600**	0.0784**
<i>Econ_Income</i>	-4.0721**	-2.2491	0.0547	-0.5299	0.9285
<i>Econ_10-yr_3mo</i>	-0.0009*	-0.0006	-0.0008*	-0.0008*	0.0008*
<i>Econ_AAA_Baa</i>	0.0017	0.00629*	-0.0007	0.0067*	-0.0105**
<i>LOGTA</i>	-0.2876***	-0.1472***	-0.2982***	-0.1941***	-0.2156***
<i>C_DQL_A</i>	-12.6868***	-3.9757			
<i>C_NCL_A</i>	15.9775*	14.6208*			
<i>C_NAL_A</i>	1.2342	32.6288***			
<i>C_OREO_A</i>	14.7572*	21.8912**			
<i>C_ROAA</i>	3.0087			- 36.2265** *	
<i>C_PROV_AA</i>	-8.6391	12.9658			
<i>C_TEQC_A</i>	-11.2368***		-8.0978***	-6.4319**	
<i>C_LOAN_Dep</i>			-0.3517		2.5295***
<i>C_CoreDep_TDep</i>			-0.7887		-2.4152***

<i>C_EFF_Ratio</i>			-0.0956	-0.0912	
<i>C_NONINT_AA</i>			6.6532		
<i>C_EMPLOY_A</i>			1175.3**		
<i>C_LOANEXE_A</i>			1.7985		
<i>DQL_A</i>	33.2576***	37.3380***			
<i>NCL_A</i>	15.9764*	40.6152***			
<i>NAL_A</i>	24.6878***	30.3234***			
<i>OREO_A</i>	21.4541***	20.6731***			
<i>ROAA</i>	-51.7939***			-130.2***	
<i>PROV_AA</i>	41.2811***	68.6168***			
<i>TEQC_A</i>	-48.3064***		-3.5433***	-6.6174***	
<i>LOAN_Dep</i>			0.6036***		2.9053***
<i>CoreDep_TDep</i>			-0.5979*		-1.2919***
<i>EFF_Ratio</i>			0.0073	-0.1088**	
<i>NONINT_AA</i>			13.8510***		
<i>EMPLOY_A</i>			-148.900		
<i>LOANEXE_A</i>			-8.2581***		
-2 Log Likelihood	5198.254	7222.200	7712.067	7172.408	6816.550
% Concordant	85.8	76.9	70.0	81.3	79.0
% Discordant	13.8	22.6	29.2	18.3	20.5

\*\*\*, \*\*, and \* denote significance at the 1 percent, 5 percent, and 10 percent respectively

*Table 6. Impact of Supervisory Disclosure on CAMEL Downgrades – From (1,2) To (3,4,5)  
Jan 1992 – Dec 2001 (Only downgraded banks for each component are included).*

Independent Variables	C	A	M	E	L
<i>Intercept</i>	3.5140***	-0.9462	2.0309*	1.5911**	-3.0952***
<i>D_Post</i>	0.1804	0.1103	-0.3822*	0.3684**	-0.2079
<i>D_OCC</i>	0.6631**	0.4161	0.0944	0.3291	-0.6220*
<i>D_FDIC</i>	0.3678	0.2504	0.0038	-0.0782	-0.3293
<i>D_STATE</i>	-0.1737	0.3100	0.2543	0.3233	-0.1919
<i>INTERVAL</i>	-0.0481*	0.0222	0.0808***	0.0527***	0.0078
<i>Econ_Employ</i>	0.1314*	0.0524	0.1125**	-0.0166	0.1756***
<i>Econ_Income</i>	1.7758	-2.4158	1.5962	0.1829	-0.4793
<i>Econ_10-yr_3mo</i>	-0.0010	-0.0003	-0.0006	0.0010	0.0011
<i>Econ_AAA_Baa</i>	0.0239***	0.0127*	0.0180***	0.0027	-0.0139
<i>LOGTA</i>	-0.3007***	-0.1611***	-0.2641***	-0.1834***	-0.2507***
<i>C_DQL_A</i>	-6.5474	-8.9207			
<i>C_NCL_A</i>	-1.0407	-41.0681***			
<i>C_NAL_A</i>	18.2302	-31.9900***			
<i>C_OREO_A</i>	0.7735	48.9836***			
<i>C_ROAA</i>	24.5839*			28.6818***	
<i>C_PROV_AA</i>	37.6941**	7.7178			
<i>C_TEQC_A</i>	14.3530**		-1.3331	-1.7063	
<i>C_LOAN_Dep</i>			-0.1858		-3.8793***
<i>C_CoreDep_TDep</i>			1.4445		-0.1913
<i>C_EFF_Ratio</i>			0.1981	0.2313	
<i>C_NONINT_AA</i>			7.1589		
<i>C_EMPLOY_A</i>			171.8		
<i>C_LOANEXE_A</i>			0.7195		

<i>DQL_A</i>	19.0091**	13.0728*			
<i>NCL_A</i>	39.9175**	65.6116***			
<i>NAL_A</i>	11.9836	34.7581***			
<i>OREO_A</i>	-22.0046**	-5.3906			
<i>ROAA</i>	-2.7465			-32.1366***	
<i>PROV_AA</i>	4.6590	0.8606			
<i>TEQC_A</i>	-43.4447***		-6.3539***	-3.8252*	
<i>LOAN_Dep</i>			0.4386		7.1316***
<i>CoreDep_TDep</i>			-1.7077**		-0.6549
<i>EFF_Ratio</i>			-0.1312	-0.2189**	
<i>NONINT_AA</i>			-12.6565		
<i>EMPLOY_A</i>			339.1		
<i>LOANEXE_A</i>			-2.9038		
-2 Log Likelihood	939.958	1635.889	1721.734	1787.675	1086.057
% Concordant	81.5	70.4	65.8	65.8	77.0
% Discordant	18.3	29.2	33.9	33.8	22.7
Observation Number	991	1340	1331	1414	1236

\*\*\*, \*\*, and \* denote significance at the 1 percent, 5 percent, and 10 percent respectively

*Table 7. Impact of Supervisory Disclosure on CAMEL Downgrades – From (1,2,3) To (4,5)  
Jan 1992 – Dec 2001 (919 observations, only downgraded banks are included).*

Independent Variables	C	A	M	E	L
<i>Intercept</i>	9.4505***	-3.5152**	4.2477***	2.8391**	2.7854
<i>D_Post</i>	0.5316	0.7147*	0.9410***	0.1791	0.0682
<i>D_OCC</i>	-1.2129**	0.6539	0.2855	-0.7050**	-0.1768
<i>D_FDIC</i>	-0.9748**	0.8081	-0.1082	-0.4296	-1.0334*
<i>D_STATE</i>	-1.2342**	-0.0362	-0.6795**	-0.7126**	-1.6903**
<i>INTERVAL</i>	-0.0742	-0.0937**	-0.0628**	-0.654**	-0.2443***
<i>Econ_Employ</i>	0.5399***	0.4536***	0.4281***	0.1677**	0.2403*
<i>Econ_Income</i>	2.3856	-4.5241	-7.0569	-1.3735	-6.4595
<i>Econ_10-yr_3mo</i>	-0.0072***	-0.0034**	-0.0012	-0.0035***	-0.0016
<i>Econ_AAA_Baa</i>	-0.0145	0.0103	0.0051	0.0097	0.0051
<i>LOGTA</i>	-0.5850***	-0.2267**	-0.5016***	-0.1724**	-0.6591
<i>C_DQL_A</i>	5.1125	-22.2195**			
<i>C_NCL_A</i>	-3.5250	-2.1483			
<i>C_NAL_A</i>	-23.0862	14.8564			
<i>C_OREO_A</i>	12.6566	8.7894			
<i>C_ROAA</i>	-87.6856***			1.3663	
<i>C_PROV_AA</i>	-28.4963	11.1933			
<i>C_TEQC_A</i>	71.4829***		-2.6584	2.5198	
<i>C_LOAN_Dep</i>			-1.6639**		-5.3079**
<i>C_CoreDep_TDep</i>			-1.6394		-2.1649
<i>C_EFF_Ratio</i>			0.0481	0.1351	
<i>C_NONINT_AA</i>			8.7482		
<i>C_EMPLOY_A</i>			374.4		
<i>C_LOANEXE_A</i>			0.6061		

<i>DQL_A</i>	14.3128	55.2945***			
<i>NCL_A</i>	9.5805	23.0500			
<i>NAL_A</i>	36.4994***	29.0789**			
<i>OREO_A</i>	9.5388	14.0522			
<i>ROAA</i>	37.0922**				
<i>PROV_AA</i>	23.8542*	29.0775*			
<i>TEQC_A</i>	-73.5669***		-9.4392***	- 10.9864** *	
<i>LOAN_Dep</i>			0.8625		7.1973***
<i>CoreDep_TDep</i>			-2.2508***		-3.1685**
<i>EFF_Ratio</i>			-0.2495	-0.5181**	
<i>NONINT_AA</i>			14.9795		
<i>EMPLOY_A</i>			-620.900		
<i>LOANEXE_A</i>			-1.0952		
-2 Log Likelihood	375.703	546.025	912.809	967.849	252.568
% Concordant	91.4	88.4	80.5	82.2	88.2
% Discordant	8.3	11.2	19.2	17.5	11.0
Observation Number	991	1340	1331	1414	1236

\*\*\*, \*\*, and \* denote significance at the 1 percent, 5 percent, and 10 percent respectively