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Bank Rating Changes and Bank Stock Returns—Puzzling Evidence from the Emerging Markets

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Abstract

This paper examines the performance of emerging market bank stocks around the time of rating changes by major international agencies. The data suggest that downgrades on average have followed periods of negative cumulative abnormal returns for banks, although upgrades have not followed periods of positive returns. More important, stock prices either do not respond to rating changes or respond in the opposite direction to what would be expected if announcements conveyed value-relevant information. The paper concludes that there are limits to the extent that supervisors in emerging markets can rely on market participants to monitor the safety and soundness of banks.

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I. INTRODUCTION

Recent emerging market crises raise many questions about the performance of domestic and international capital markets. Some of the most important ones concern the performance of supervisors and regulators, bank management, investors in bank debt and equity, and bank rating agencies in the banking crises that have been seen in many emerging markets.

In this study we explore the relationship between ratings changes and stock market valuations of emerging market banks. We investigate the extent to which bank ratings changes followed periods when bank stocks had underperformed or overperformed other stocks within the same country. We also investigate the movement of bank stock prices around the time of ratings changes. In particular, if ratings agencies convey new and useful information about bank health, we would expect bank stocks to rise following upgrades and fall following downgrades.

This study of the behavior of stock prices around ratings events is indeed one of the first such "event studies" to use data from emerging markets. Thus, it can potentially yield new evidence on the behavior of emerging stock markets. More importantly, it can also yield perspectives on the appropriate supervision of banks in emerging markets. The experience from mature markets would suggest that there is a role for both official supervision and private sector monitoring of banks and other financial institutions. This paper yields some evidence on the nature of the role of two private-sector groups—stock market participants and ratings agencies—in the monitoring of emerging market banks.

To foreshadow the results, we find evidence that the behavior of one or both of these groups is not consistent with a strong private sector oversight of bank management. We focus on those ratings changes that are not immediately preceded by other changes, so as to concentrate on ratings changes which potentially contained new information about bank health, and also to avoid excessive concentration on the numerous ratings changes that have occurred since the onset of the crisis in several Asian countries. While the relatively small sample size of our study is an important caveat, we find that upgrades by ratings agencies have not followed periods of rising prices for bank stocks, although there is a downward drift in bank stock prices prior to ratings downgrades. The result with respect to upgrades would suggest that ratings agencies and stock market participants are using somewhat different procedures or information sets in arriving at their judgments about bank health. More importantly, and unlike in studies involving U.S. data, we find little evidence that bank stock prices respond to ratings changes in the way that one would expect if ratings changes convey information to stock market participants. The data do not permit us to judge whether this reflects a failure of stock market participants to use value-relevant new information, or if it reflects shortcomings in rating agency assessments.

The rest of the paper is organized as follows. Section II reviews existing literature on the stock market response to ratings changes in the United States and on event studies in emerging markets. In Section III, we describe the data used in the study. Section IV outlines

the methodology that is followed and Section V present the empirical results. Conclusions are presented in Section VI.

II. PREVIOUS LITERATURE

The aim of our study is to analyze the relationship between bank ratings changes and stock prices in emerging markets. While there is no previous work on this topic relating to emerging markets, there is a voluminous literature in mature markets (mainly the United States) on the relationship between ratings changes and their effects on bond and stock prices. We begin by reviewing some of this "event study" literature and the conclusions it has drawn about market efficiency and information processing.

The corporate ratings produced by ratings agencies generally relate to the ability of the company to service its debt. Although most event studies that examine the market impact of debt ratings changes actually study the impact on stock prices, there are some studies which look at the effect on bond prices. While some early studies using monthly data provided mixed results, a study using daily data by Hand, Holthausen and Leftwich (1992) indicates that bond prices generally respond negatively to downgrades and positively to upgrades: these results apply both to actual ratings changes and prospective ratings changes which are signaled by a "credit watch" for the company in question. This study would suggest, therefore, that bond ratings announcements convey information to financial markets about the appropriate valuation of corporate bond issues.

The issue of whether bond ratings changes should also convey news about the valuation of corporate equity depends on the nature of the news that is contained in the ratings change. If a bond rating is changed due to a change in the health of the company that issued the bond then it is clear that the price of equity—the residual claim after debt is serviced—should respond in the same direction as the change in the bond price, but probably to a greater extent. However, to the extent that a rating agency changes a bond rating due to perceptions that management is acting so as to transfer wealth between bondholders and equityholders, then a ratings change that drove down (up) bond prices could actually drive up (down) stock prices. An example of such an action would be a change in financial leverage that affected the riskiness and value of existing debt claims but left the total value of the firm unchanged.

This possibility receives some modest support from a study by Goh and Ederington (1993) that differentiates between bond ratings downgrades that are due to deteriorating firm prospects and those that are due to changes in leverage. Those authors find that the former type of downgrades has a significant negative effect on stock prices while the latter have insignificant (albeit still very modestly negative) effects. This finding therefore represents something of a caveat to our study since we are unable to document the reasons for each ratings change. However, we would expect (as with the sample in Goh and Ederington) that the majority of ratings changes in our sample will be due to changes in operating conditions rather than to wealth transfers between groups of claimholders, implying that any randomly

selected group of ratings changes will consist mainly of cases where the impact on bond and stock market returns should be similar in sign.

Indeed, most studies of the effects of bond ratings on stock prices begin with the premise that ratings changes that are good (bad) news for bondholders will—assuming they are "news"—also be good (bad) news for stockholders. Further most recent studies find that downgrades are associated with negative returns for stockholders.[2] These results would be consistent with the notion that the expertise of ratings agencies and their special access to management allows them to sometimes uncover unfavorable information about firms' financial prospects that was not previously available to market participants. However, when studies examine the effect of upgrades, they typically find little or no impact on stock prices. This may well be explained by the notion that management has a strong incentive to distribute favorable information about their firm's prospects.

While many studies find statistically significant announcement-period abnormal returns, these are often quite small, especially in comparison with preannouncement abnormal returns. For example, Holthausen and Leftwich (1986) find cumulative abnormal returns in the 300 trading days prior to ratings changes of 12-15 percent in the case of upgrades and around -20 percent in the case of downgrades. Given that their announcement period (days 0 and +1) underperformance for the downgraded stocks in this study was only about 1 percent, it is clear that the market has already discounted the vast majority of the information that is associated with the downgrades.[3]

The discussion so far has related to event studies of all types of companies, rather than specifically to banks. There are, however, at least two recent U.S. studies showing that ratings changes for bank debt do indeed affect bank stock prices. Based on a sample of 77

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[2]See, e.g., Glascock, Davidson and Henderson (1987), Goh and Ederington (1993), and Hand, Holthausen and Leftwich (1992). It should be noted, however, that several early event studies, typically using monthly data failed to find any announcement period impact on stock prices: for example, Pinches and Singleton (1978) attributed their finding of this result to the stock market having already reflected the information in rating changes over the previous 15-18 months. However, Holthausen and Leftwich (1986) who find evidence of an announcement effect with daily data, contrast their finding with the earlier studies, noting that suggest that daily data permit more powerful tests than monthly data and that the ratings agencies may have improved their performance over time.

[3]In addition, a recent study by Dichev and Piotroski (1998) of long-term post-announcement stock performance suggests that post-announcement abnormal returns may also be far larger than announcement-period abnormal returns: those authors find that the stocks of companies whose debt is upgraded outperform downgraded stocks for at least a year after the ratings change, with economically and statistically significant return differentials of 10 percent or more. This return differential is due largely to the return performance of small, low-rated firms, presumably reflecting information problems with these firms.

downgraded bank holding companies, Schweitzer, Szewczyk, and Varma (1992) find an average announcement-window abnormal return of -1.5 percent, after abnormal returns of nearly -7 percent over the previous 60 trading days. They find little difference in announcement-window returns based on the size of the downgrade (within-, as opposed to between-class downgrades) or of the degree of non-ratings-related press coverage. There are, however, some differences in the pre-announcement returns of these groups, with much larger negative pre-announcement returns for banks which experienced larger downgrades or which were the subject of (presumably negative) non-ratings-related news stories. With regard to upgraded banks, the sample of 18 upgrades showed announcement-window abnormal returns of +1.1 percent, after an earlier upward (but statistically insignificant) drift of 3.0 percent. A second study by Billett, Garfinkel and O'Neal (1998) of the stock returns of 59 bank holding companies around downgrades confirms a negative announcement effect: these authors find a 3-day cumulative average abnormal return of -1.1 percent. While they do not provide any data on preannouncement abnormal returns, an interesting finding is that the only variable that appears able to partially explain the announcement-window returns of banks is the proportion of insured deposits in total liabilities, with a high use of insured deposits reducing the effect of a ratings downgrade. The authors conclude that the existence of insured deposits shields banks from the full costs of market discipline.[4]

Some related evidence on the role of the stock market in the bank monitoring process is provided by Simons and Cross (1991) who show that stock market returns provided little advance to warning to regulators in the case of 22 bank holding companies whose safety and soundness (CAMEL) ratings were downgraded by regulators between 1981 and 1987. On the other hand, Berger and Davies (1998) find that in the eight-week window following (unannounced) CAMEL ratings downgrades by regulators, the stocks of affected banks on average showed cumulative negative abnormal return of nearly 5 percent which is consistent with the notion that supervisors uncover information during examinations which either leaks into the market or is reported via the normal reporting process, and which is perceived to be news about the banks' prospects. Furthermore, Berger, Davies and Flannery (1998) find evidence that the information in (confidential) supervisory assessments can be used to help predict the assessments by bond ratings agencies. However, those authors also find that ratings agency assessments also help predict supervisory assessments, and that both ratings agency and stock market assessments (proxied by abnormal stock returns) are more accurate

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[4]Billett at al. (1998) show that banks increase their reliance on insured funding around downgrades, which they interpret as a shift towards (less demanding) regulatory monitoring and away from (more risk sensitive) market monitoring at times of increasing risk. Crabbe and Post (1994) also document a related shift in bank funding around downgrades. A number of studies, including Hannan and Hanweck (1988), and Flannery and Sorescu (1996), show that the interest rates paid by banks on uninsured deposits contain a significant risk premium, thus implying that there is a role for market discipline. Further, studies of depositor behavior—including a study by Martinez Peria and Schmukler (1999) of banks in Argentina, Chile and Mexico—frequently find that depositors punish risky banks by withdrawing deposits.

in predicting future bank performance than supervisory assessments, although this latter finding may be due to the infrequency of supervisory assessments. Overall, Berger, Davies and Flannery (1998, p.26) conclude that "supervisors, bond [ratings agencies], and equity market participants all produce valuable complementary information that may contribute to improving the governance of large banking organizations."

As regards the emerging markets, there appears to be no prior literature on the effect of ratings changes on the stock prices of banks, or even of listed companies more generally. Indeed, the only event study conducted using emerging markets data appears to be a recent paper by Bhattacharya et al. (1998) which tests the significance of daily stock returns in Mexico around corporate news announcements. The study covers 32 announcements of major firm-specific news and finds, contrary to similar studies in the United States, that there is typically no upward or downward jump in stock returns at the time of such announcements. Further, there is no evidence of unusual volatility in the event window, or of unusual trading volume or bid-ask spreads. The authors suggest five possible explanations for their finding: (i) the small data sample; (ii) market inefficiency; (iii) market efficiency but the absence of any value-effects in the corporate actions; (iv) market efficiency and value-relevance, but the but anticipation of the announcements by market participants; or (v) market efficiency and value-relevance, but the presence of prior insider trading. The authors lean toward the final possibility, based on their finding that returns on the class of shares that are held by residents tends to lead the class of shares which tend to be held by nonresident investors, and on some weak evidence that the latter class shows (some very modest) announcement effects

The study by Bhattacharya et al. (1998) raises important questions about the way that information is reflected in emerging equity markets. The current study provides some further evidence on this question by examining the effect of the announcement of changes in the credit ratings of banks on their stock prices. To build up a sufficient sample size, it is necessary for us to combine data from three ratings agencies and many different emerging markets. While this aspect may be less than ideal, our study of ratings changes allows us to separate events into those (upgrades) which should be good news for bank stocks and those (downgrades) which should be bad news. This aspect allows us to conduct tests of the sign of abnormal returns around ratings changes, rather than concentrating mainly on the volatility of returns as Bhattacharya et al. (1998) are forced to do.

III. DATA

Our study uses data for ratings changes from three major ratings agencies, and stock return data from the Emerging Markets Data Base (EMDB) of the International Finance Corporation (IFC).

We began by extracting data for all banks (SIC code 660) included in the EMDB. All stocks in this database must meet certain requirements with regard to liquidity and market capitalization, so we can be confident that the bank stocks included in the study are reasonably actively traded, at least by the standards of emerging markets. Further, our focus on weekly returns rather than daily returns (the latter are not available in the EMDB) means that our results should not be substantially affected by nontrading effects. For each of these banks we calculated the weekly return of the stock in domestic currency, based on data for prices, dividends, issues and capital adjustments due to stock splits and similar factors. We checked for, and corrected, any obvious errors in this database. The price data are end-week (Friday) quotations, and returns data for the period January 6, 1989-June 12, 1998 were used, though for many banks only a much shorter sample is available on the IFC. Corresponding market return data were also extracted from the EMDB based on the IFC "global" indices, which include all large liquid stocks, regardless of their accessability to foreign investors. The bank return data and market data are both expressed in local currency, although our definition of abnormal returns (which is discussed below) as the bank return less the market return (both in logs), means that our abnormal return measure would be the same in dollars or in any other currency unit.

After collecting data for all the banks available in the EMDB, we retained in our sample all of those for which rating changes could be identified in the period when the stock prices were available. We took all rating changes that could be identified in data from Fitch IBCA, Moody's, and Standard & Poor's.[5] Ratings changes were defined as changes in a bank's Long Term Debt rating or Financial Strength rating. When these two categories were not available for a bank, changes in the Unsecured Debt rating or the Short Term Debt rating were included as rating changes.

A few caveats are in order about our ratings data. First, it must be acknowledged that the heterogeneity of ratings sources and ratings type is not ideal, but was undertaken so as to maximize the number of ratings changes that was available for study. Second, we suspect that we have not been able to identify all the ratings changes that occurred for each bank, although we know of no bias in the ratings changes that we were able to identify from our sources. One implication is that it is possible that ratings changes that are identified as "clean" events (no preceding ratings change within a given period) are not clean. Since this is an important caveat, we attempt to take account of it in the discussion of our results. Third, while our

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[5] The sources for these ratings changes were Fitch IBCA's "CreditDisc", Moody's "Global Credit Research" disc, and Standard & Poor's "Credit Analysis Reference Disc." Some supplementary ratings information was also obtained from Bloomberg Financial Markets, L.P.

sources enable us to identify the exact date of the announcement of a ratings change, it does not allow us to identify the time or place of the announcement. Thus, the effect—if any—on bank returns of Friday announcements may not show up until the following week's data if the announcement occurred after a local market had closed. Again, we attempt to account for this possibility in the discussion of our results. Finally, it should be noted that we were unfortunately unable to get information on other firm-specific information released around the same time as rating changes, so that we will not be able to break up any abnormal returns between the effect of the rating change per se, and the effect of other announcements (which might have caused the rating change). Hence our study is best thought of as examining the performance of stock returns around announcement dates rather than the effect of ratings announcements on stock returns.

Our final dataset included returns data for the week of the ratings change, and—where available—up to 50 weeks around the change: 35 weeks prior to, and 15 weeks following, the event: the event time-line is illustrated below. With the event week specified as week 0, we use weeks -35 to -4 as the "estimation window", weeks -3 to +2 as "event window", with the remainder of the post-announcement data (weeks 3 to 15) being included only for anecdotal interest of how these bank stocks performed after ratings changes. In choosing the length of the estimation window, there is a tradeoff between the length of the window, and the number of "clean" events (i.e., events for which there is no preceding event in the estimation window). While it is somewhat arbitrary, our choice of 35 pre-event weeks appears a reasonable tradeoff and yields reasonable sample sizes.
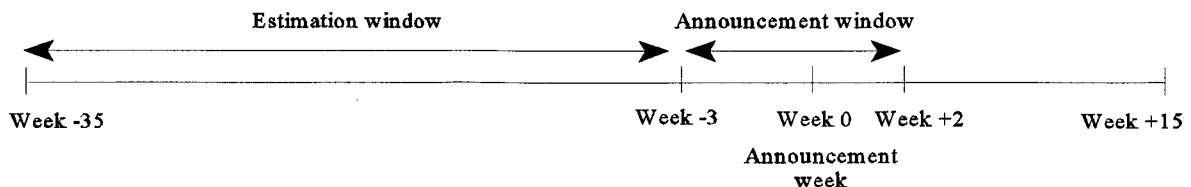
After omitting all ratings changes without at least 15 weeks of stock return data before the change, we are left with 219 bank-weeks with ratings changes (in a few cases there are changes by more than one agency within a week), for 49 different banks, in 15 countries. The countries include Korea (67 ratings changes), Thailand (61), Brazil (19), Indonesia (19), the Philippines (11), Argentina (10), Venezuela (10), Malaysia (9), Turkey (5), Egypt (2), Taiwan Province of China (2), Chile (1), Colombia (1), Pakistan (1) and Peru (1). Of the 219 ratings changes, 67 occur prior to the onset of the Asian financial crisis (i.e., prior to the devaluation of the Thai baht on July 2, 1997) and 152 occur after the onset of the crisis.

Many of the 219 ratings changes occur close to other ratings changes for the same bank, which will complicate the task of identifying the path of stock returns around any particular ratings change. There are, however, 15 upgrades and 43 downgrades that occur

with no ratings change in the previous 35 weeks.[6] We refer to these two groups as the "clean" upgrades and downgrades, respectively. The 15 upgrades relate to 14 different banks, in 8 different countries (2 in Asia, 4 in Latin America, and 1 in each of Egypt and Turkey). Of the 15 upgrades, 7 occur in Latin American banks, 6 in Asian banks, and 2 in "other" countries. The 43 downgrades relate to 38 different banks in 10 different countries (5 in Asia, 3 in Latin America, and 1 in each of Pakistan and Turkey). Of the 43 downgrades, 26 occur in Asian banks, 13 in Latin American banks and 4 in "other" countries. Thus, the clean upgrades and downgrades occur in a wide range of banks and countries. Further, 12 of the 15 clean upgrades and 24 of the 43 clean downgrades occur prior to the onset of the Asian crisis. Hence, we are fairly confident that our samples of clean upgrades and downgrades are not excessively influenced by the Asian financial crisis.

Of the remaining 160 "dirty" events, there are 47 downgrades that occur without a ratings change in the previous 5 weeks (i.e. in weeks -5 to -1). We refer to these as the "contaminated" downgrades and examine them separately to check the robustness of the conclusions based on the clean upgrades and downgrades.[7] These 47 contaminated downgrades relate to 29 different banks in 8 different countries (5 in Asia, 2 in Latin America, and 1 in Turkey). Of the 47 downgrades, 42 occurred in Asian banks, 4 in Latin American banks, and 1 elsewhere. Further, of the 47 downgrades, 42 relate to the post-crisis period, so it is obvious that this sample is substantially dominated by post-crisis Asian downgrades. We take account of this fact in our discussion of the results.[8] Among the 47 downgrades, all but 5 were preceded by downgrades rather than upgrades, with an average of four downgrades in weeks 1-32.

The number of ratings changes in our three groups is small, but certainly not without precedent in many other event studies. For example, the number of events (43 and 47) in our two downgrade samples are larger than the number of events (32) in Bhattacharya et al. (1998) and comparable with the sample sizes in many U.S. studies. The small number of upgrades (15) is of greater concern, but the work of Schweitzer at al. (1992) provides an example where an announcement-window cumulative abnormal return of only 1.2 percent that is derived from only 18 events is sufficient is significant.

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[6]There were actually 16 clean upgrades, but estimation-period abnormal returns for one event (an upgrade of Banespa, a Brazilian bank, in 1990) were so much more volatile than the rest of the sample of upgrades and downgrades that it was excluded to provide smaller standard errors and improve the power of tests. There was no attempt to exclude data based on announcement window data, as this would raise more serious questions about selection bias.

[7]We do not examine the 5 upgrades that meet the "near-clean" criterion as the sample is too small for any robust inference.

[8]Among all the clean and contaminated ratings changes, only 8 appear to be for banks that had (as of late 1998) issued ADRs. Due to this small number, it was not possible to examine any hypotheses about differences in the behavior of different classes of bank investors.

A final noteworthy aspect of our ratings data is that it is very rare that two ratings agencies make rating changes for the same bank in the same week. This is in part a reflection of the fact that it is quite common for only one rating agency to cover a particular bank. However, in cases where more than one agency rates a bank, we interpret this as a manifestation of the fact that debt ratings, which are supposed to represent estimates of the probability of default, are both incremental and highly subjective. It may also be evidence that it is rare that agencies make rapid decisions to change an emerging-market bank rating based on a single piece of news, such as an earnings announcement that was very different to expectations. We interpret this as suggestive of the likelihood that many of the ratings changes in our sample probably occurred without any contemporaneous corporate announcements that may contaminate an estimate of the effect of the ratings change per se.

IV. METHODOLOGY

We used three types of standard event study tests to examine the significance of abnormal returns around the announcement of ratings changes: (i) tests on average abnormal returns; (ii) tests on standardized abnormal returns; and (iii) nonparametric tests for the proportion of positive and negative abnormal returns around the event.[9]

With all returns defined as 100 times the log of the return relative (i.e., $100*log(1+r_t)$), we define the abnormal return (AR_{it}) for event i in event period t to be the bank's stock return (r_{it}) less the corresponding market return (r_{mt}),

$$AR_{i,t} = r_{it} - r_{mt} . \tag{1}$$

Our rationale for market-adjusted returns rather than estimating a market model is based on the short estimation window. With only 32—and sometimes fewer—observations for estimating a market model, there is a possibility of substantial estimation error in the standard market-model estimates of alpha and beta, and accordingly substantial possibility of estimation error in the abnormal returns (i.e., $r_{it} - \alpha^e - \beta^e r_{mt}$) implied by market-model estimates. Since we know of no reason for assuming that bank alphas and betas should not be distributed around zero and unity, respectively, we impose these values in the expectation that the imposed model error may be smaller than the estimation error that might otherwise result. Further, while it might have been interesting to include other bank stocks as a control portfolio in the calculation of the abnormal return, we do not do so both out of concern that the other banks in the country might be affected by the event that we are studying and because the EMDB database often does not contain a sufficient number of other bank stocks within the country to calculate an appropriate control portfolio.

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[9]See, for example, MacKinlay (1997) for a recent survey article on event study methodology. In preliminary work, we also used a joint time-series cross-section system approach (i.e., in calendar-time rather than event-time) but the results were no more promising than those reported here.

Averaging across the n (or fewer) events within each period of event time, we obtain the portfolio or average abnormal return (AAR_t) in event period t,

$$AAR_t = \frac{1}{n} \sum_{i=1}^{n} AR_{it} .$$ (2)

Then summing across event periods, we obtain the cumulative average abnormal return $(CAAR_{\tau1, \tau2})$ in any period from τ_1 to τ_2,

$$CAAR_{\tau_1, \tau_2} = \sum_{t=\tau_1}^{\tau_2} AAR_t .$$ (3)

Tests of the statistical significance of average abnormal returns in the event window are based on estimates of the standard deviation of the average abnormal return in the estimation window (weeks -35 to -4)

$$s(AAR_t) = \sqrt{\frac{1}{31} \sum_{t=-35}^{-4} (AAR_t - \overline{AAR})^2} .$$ (4)

Under the assumption of i.i.d. normally-distributed abnormal returns, the ratio of the average abnormal return to the standard deviation is distributed as a Student's t with n degrees of freedom.[10] Further, under these assumptions, the standard deviation of the $CAAR_{\tau1, \tau2}$ is given by $s(AAR_t)$ multiplied by the square root of the number of periods in the cumulated return (i.e., by $\sqrt{\tau_2 - \tau_1 - 1}$), and the significance of the $CAAR_{\tau1, \tau2}$ is again tested using a t test with n degrees of freedom.

In addition to the basic tests based on average abnormal returns, tests are also conducted based on standardized abnormal returns. The standardized abnormal return for each event and period (SAR_{it}) is calculated by dividing returns for each security by an estimate of the standard deviation of the security return, based on the returns in the estimation window,

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[10]We tested for first-order autocorrelation and first-order ARCH effects in each market-adjusted returns series and found only infrequent evidence of these, so the assumption that the test statistics approach their respective asymptotic distributions may be a reasonable one. The assumption that individual abnormal returns are normally distributed is less supported by the data, but the grouping of events into portfolios much reduces any problems from nonnormality. Finally, the events being examined are reasonably well distributed over time with relatively little clustering—at least in the clean samples—so there is little need to correct for this.

$$SAR_{it} = \frac{AR_{it}}{\sqrt{\dfrac{1}{31}\sum_{t=-35}^{-4}(AR_{it} - \bar{AR}_i)^2}} \; . \tag{5}$$

The average standardized abnormal return ($ASAR_t$) is then calculated across all n events,

$$ASAR_t = \frac{1}{n}\sum_{i=1}^{n} SAR_{it} \; , \tag{6}$$

with standardization having the effect of reducing the influence of events involving securities with high return variances. The significance of the average standardized abnormal returns in the announcement window is then tested via a Z-test that relies on the $ASAR_t$ being asymptotically distributed as Normal (0, $1/\sqrt{n}$). Furthermore, when the cumulative average standardized abnormal return in any period from τ_1 to τ_2 is divided by $\sqrt{\tau_2 - \tau_1 - 1}$), the resulting statistic is also asymptotically distributed as Normal (0, $1/\sqrt{n}$).

Finally, in light of some evidence that abnormal returns for some banks may not be normally distributed, we also provide the results of a nonparametric binomial test for the proportion of positive and negative abnormal returns. In this case, we use the normal approximation to the binomial distribution, and calculate the test statistic $n(p-0.5)/\sqrt{n/4}$, where p is the observed proportion of positive returns, n is the number of events, and the expected proportion of positive abnormal returns under the null is 0.5. This statistic is distributed as a standard Normal variable.

V. RESULTS

A. The Variance of Abnormal Returns

We begin by examining the variance of abnormal returns. The median standard deviation of estimation-window abnormal returns in our sample is 4.2 percent per week for upgrades, 5.7 percent per week for downgrades, and 6.8 percent for contaminated downgrades. That is, weekly abnormal returns on individual emerging market bank stocks are fairly volatile.

Of course, when abnormal returns are averaged across events, the standard deviation of average abnormal returns (equation 4) is substantially lower. In particular, the estimation-period standard error that will be used to test the significance of announcement-window average abnormal returns is 1.36 percent for upgrades, 1.09 percent for clean downgrades, and 1.67 percent for contaminated downgrades. Still, these numbers indicate that

announcement-week average abnormal returns will not be significant at conventional levels unless they reach 2-3 percent, a figure that is fairly large compared with the 2- or 3-day announcement-window returns that are typically observed in event studies of U.S. rating changes.

Also of interest is the cross-sectional standard deviation of abnormal returns in event time, as this may indicate if there is an increase in the variance of abnormal returns around ratings changes, which would constitute some preliminary evidence either that ratings change provide information to the market or that they occur in response to other information that has an effect on returns.[11] In Figure 1, we show the cross-sectional standard deviation of abnormal returns for the clean upgrades and downgrades for each week of event time. The data confirm the indications from the previous paragraph that there is substantial variation in abnormal returns on emerging-market bank stocks. For the entire 51-week sample, the average weekly cross-sectional standard deviation is 4.7 percent for upgraded banks and 6.4 percent for downgraded banks. When the dispersion of abnormal returns in the estimation window (weeks -35 to -4) and the announcement window (weeks -3 to +2) is compared, there is no substantial evidence for the variance of abnormal returns to increase in the case of upgrades (4.5 percent and 4.8 percent, respectively) but some indication that return volatility may increase for downgrades (6.2 percent and 8.2 percent, respectively).

From these data, one might conclude that abnormal returns for these stocks are quite volatile, which may make it difficult to reject the hypothesis about shifts in returns, but also that there is no strong evidence for higher return volatility around ratings changes. The latter conclusion would appear somewhat consistent with the finding of Bhattacharya et al. (1998) that return volatility shows no tendency to increase around corporate news announcement in Mexico.

B. Cumulative Returns Prior to Ratings Changes

We begin the analysis of the abnormal returns by examining the performance of bank stocks prior to upgrades and downgrades. Data for cumulative abnormal returns are shown in Figure 2. In the 35 weeks prior to ratings upgrades, the 15 bank stocks experiencing upgrades

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[11]If all ratings upgrades (downgrades) had the same effect at the same time on returns or occurred in response to news that had the same impact on returns, one would expect to see a difference around ratings announcements in the *level* of returns but not in the *cross-sectional standard deviation*, which is shown in Figure 1. Given that these conditions are unlikely to hold, we would expect to see an increase in cross-sectional dispersion in returns around upgrades and downgrades if there is some linkage—in either direction—between ratings changes and stock market returns, albeit a smaller increase in dispersion than if all ratings changes—upgrades and downgrades—were lumped together without regard to direction. The latter case would be similar to the work of Bhattacharya et al (1998) who test for increased return volatility around corporate news announcements, without regard to whether the news should have a positive or negative effect on stock returns.

Figure 1: Standard Deviation of Abnormal Returns in Event Time

This chart shows the cross-sectional standard deviation in event time of abnormal returns on emerging market bank stocks around ratings changes. Event week 0 is defined as the week of the ratings change, and is highlighted. The clean upgrades and downgrades are those ratings changes that were not preceded by a ratings change in the previous 35 weeks. Abnormal returns are defined as the percentage return on the bank less the market return for that country. Further details on the methodology and data are provided in the text.
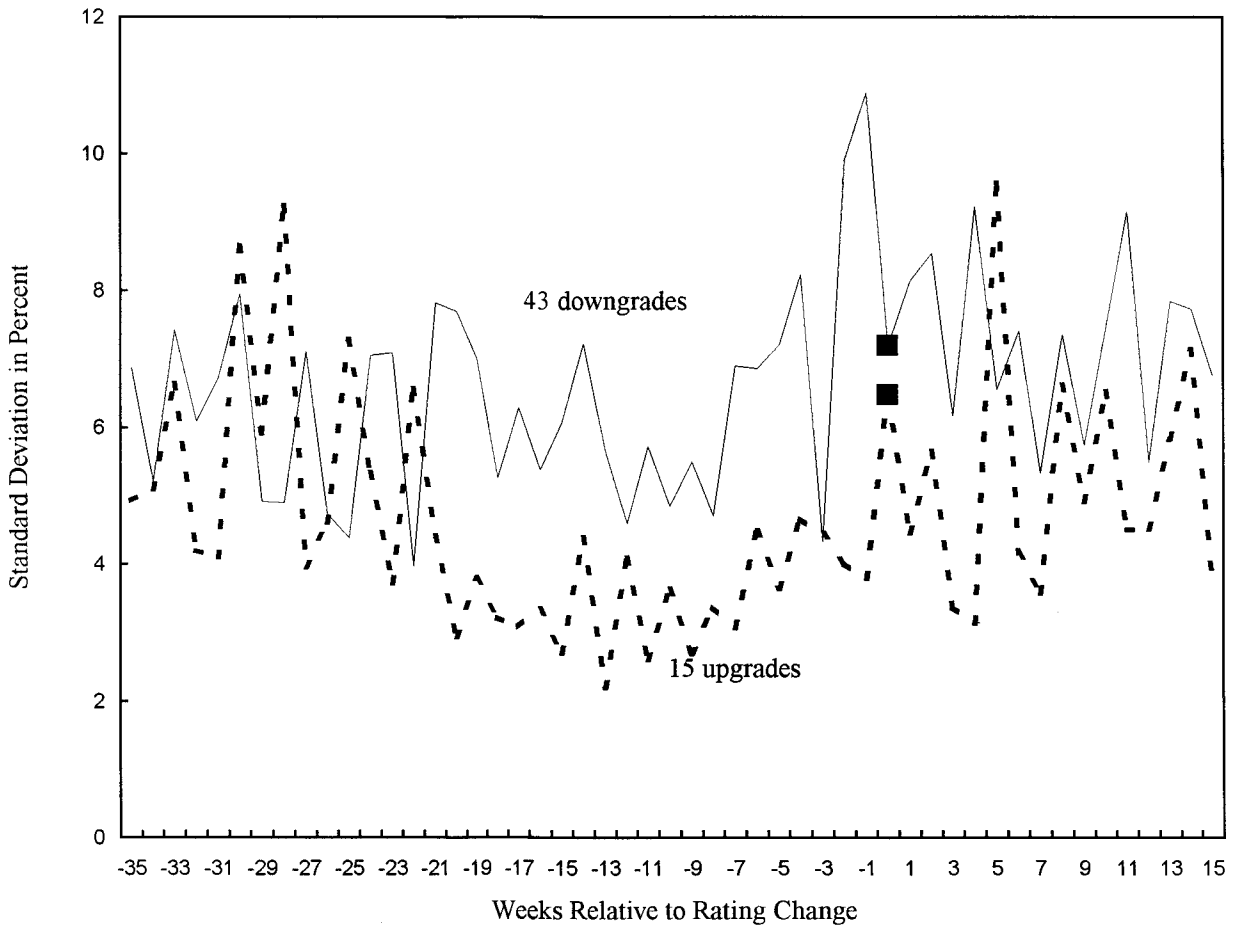
showed cumulative abnormal returns of -1 percent, i.e. essentially zero.[12] That is, the factors that resulted in the ratings agency deciding that bank health had improved were apparently not reflected in higher stock market valuations (relative to other domestic stocks) of these banks. One explanation for this apparently puzzling result might be that it is due to the small sample of only 15 upgrades. Another possibility is that the improvement in bank health that the rating agencies are responding to is largely an improvement in the overall economy. This possibility can be examined by looking at the performance of the respective national stock markets prior to the upgrades. When we did this, we found that the national markets of those banks experiencing upgrades had been essentially flat on average over the 35 preannouncement weeks, as had the IFC composite index for all emerging markets. Thus, there is no evidence from looking at national stock market performance that the upgrades for banks essentially represented an upgraded outlook for the entire country.

In the same 35-week pre-announcement period, the 43 banks experiencing "clean" downgrades (downgrades in week 0, but no ratings changes in the previous 35 weeks) showed negative abnormal returns of about 13 percent. This evidence of underperformance of banks (relative to other stocks in their national market) prior to downgrades might be viewed as evidence that downgrades by ratings agencies were a response to bad news that was reflected earlier in stock prices. This 13 percent underperformance would appear to be both economically and statistically significant.[13] When the sample is divided into downgrades that occurred before and after the onset of the Asian crisis, we find a substantially larger preannouncement weakness for those downgrades that occurred after the onset of the Asian crisis (-20 percent) than those that occurred prior to the crisis (-7 percent). This difference may represent evidence that the agencies were slower than usual in their actions in the case of the initial downgrades that followed the onset of the Asian crisis.

With regard to the 47 "contaminated" downgrades (downgrades in week 0, no ratings change in weeks -5 to -1, but ratings changes—typically several downgrades—during weeks -35 to -6) there is substantially more evidence of underperformance prior to the downgrades in week 0. In particular, this group experienced cumulative abnormal returns of around 31 percent during weeks -35 to -1. This may not be surprising in that this group of banks typically experienced several downgrades in this period, and because the vast majority of these events occurred following the onset of the Asian crisis, a period in which many banks obviously experienced problems.

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[12]The percentage return data cited here and elsewhere are log-differenced returns rather than exact percentage returns: the difference is minor, even for the cumulative returns in Figure 2.

[13]Given that we cannot be sure that our data sources allowed us to capture all ratings changes that actually occurred, we cannot rule out the possibility that some of these supposedly "clean" downgrades were actually preceded by other downgrades in weeks -35 to -1.

Figure 2: Cumulative Average Abnormal Returns Around Bank Ratings Changes

This chart shows the cumulative abnormal return on bank stocks in emerging markets around ratings changes. Event week 0 is defined as the week of the ratings announcement. The clean upgrades and downgrades are ratings changes in event week 0 that were not preceded by a ratings change in the previous 35 weeks. The contaminated downgrades are downgrades that occurred in week 0 that were preceded by ratings changes in weeks -35 to -6 but not by ratings changes in weeks -5 to -1. Cumulative abnormal returns are measured as the percentage return on each bank less the market return for that country. Further details on the methodology and data are provided in the text.

Weeks Relative To Ratings Change
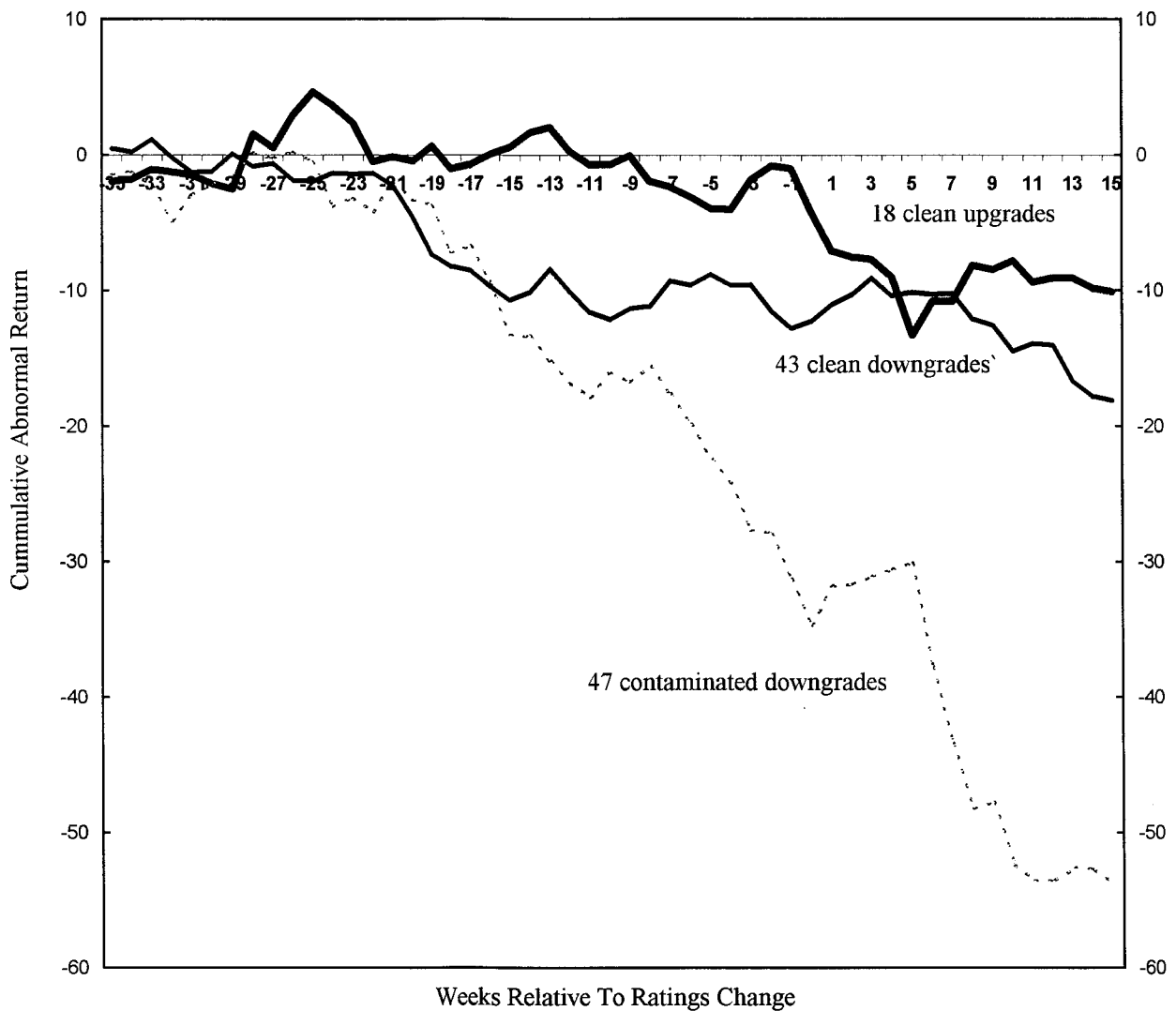
C. Announcement Window Returns

Turning to the announcement-window returns, we show data for these in Table 1 and (along with abnormal returns for the rest of the 51 event weeks) in Figure 3. In Table 1, we present results for significance tests for returns in the announcement week and in each of the three preceding and two following weeks (i.e., weeks -3 to +2). This period should be sufficient to allow for some delayed response in the stock market after the announcement. It should also be long enough to capture any stock market movement immediately prior to the announcement, due either to the leakage of news about the downgrade or to the ratings change being a direct response to value-relevant information that becomes available shortly before the ratings change. In addition to testing the significance of returns in each separate week, we also test the significance of announcement-period returns for three periods: (i) the announcement week and the following week (weeks 0 and 1) which should capture the immediate announcement effect, including if the announcement occurs on a Friday after the local stock market has closed; (ii) the preannouncement period (weeks -3 to -1); and (iii) the announcement week, the three preceding weeks and the two following weeks (weeks -3 to +2).

Looking first to the upgrades, the most interesting—and surprising—finding is the indication that abnormal returns in the announcement and post-announcement week are estimated to be negative. This finding shows up in both the t- and Z-tests for raw returns and for standardized returns, respectively. While the proportion of positive abnormal returns in these weeks (at 0.33) is substantially less than 0.5, this difference is not sufficiently large to be significant, given the small sample. The data for the median abnormal returns, which are included to provide a robustness check on the average abnormal returns, also suggest that returns in these weeks are negative. With regard to the other individual weeks, there is some weak evidence of positive abnormal returns in week -3, although the lack of any significant positive abnormal returns in weeks -2 or -1 would suggest that this may be a Type 1 error rather than a robust observation.

With regard to the multiweek windows, the data for weeks 0 and +1 combine to yield a cumulative average abnormal return of -6.1 percent, and rejections in all three tests. That is, bank stocks are estimated to substantially underperform other stocks in their national markets in the week of, and immediately following, an upgrade. The magnitude of this apparently perverse effect is certainly economically significant, although the small sample size (15 upgrades) suggests that this finding remains tentative in the absence of further studies with more data. The preannouncement weeks (-3 to -1) yield cumulative average abnormal returns of 3.0 percent and the "correct" sign, although they are not significant. As for the more extended announcement window (weeks -3 to +2), the cumulative abnormal return is negative, reflecting the effect of weeks 0 and -1, but far from significant.

The data for the clean downgrades provide fewer significant results, but are also puzzling in nature. The only significant result for the individual weeks—which is at least the expected sign—is a negative abnormal return of 1.9 percent two weeks before the ratings announcement. The negative return in this week also contributes to a significantly negative

Figure 3: Average Abnormal Returns Around Bank Ratings Changes

These charts show the average abnormal returns in event-time of emerging market bank stocks around ratings changes. Event week 0 is defines as the week of the ratings change and is shown in below. Further details on the methodology and data are provided in the text.

Weeks Relative to Rating Change
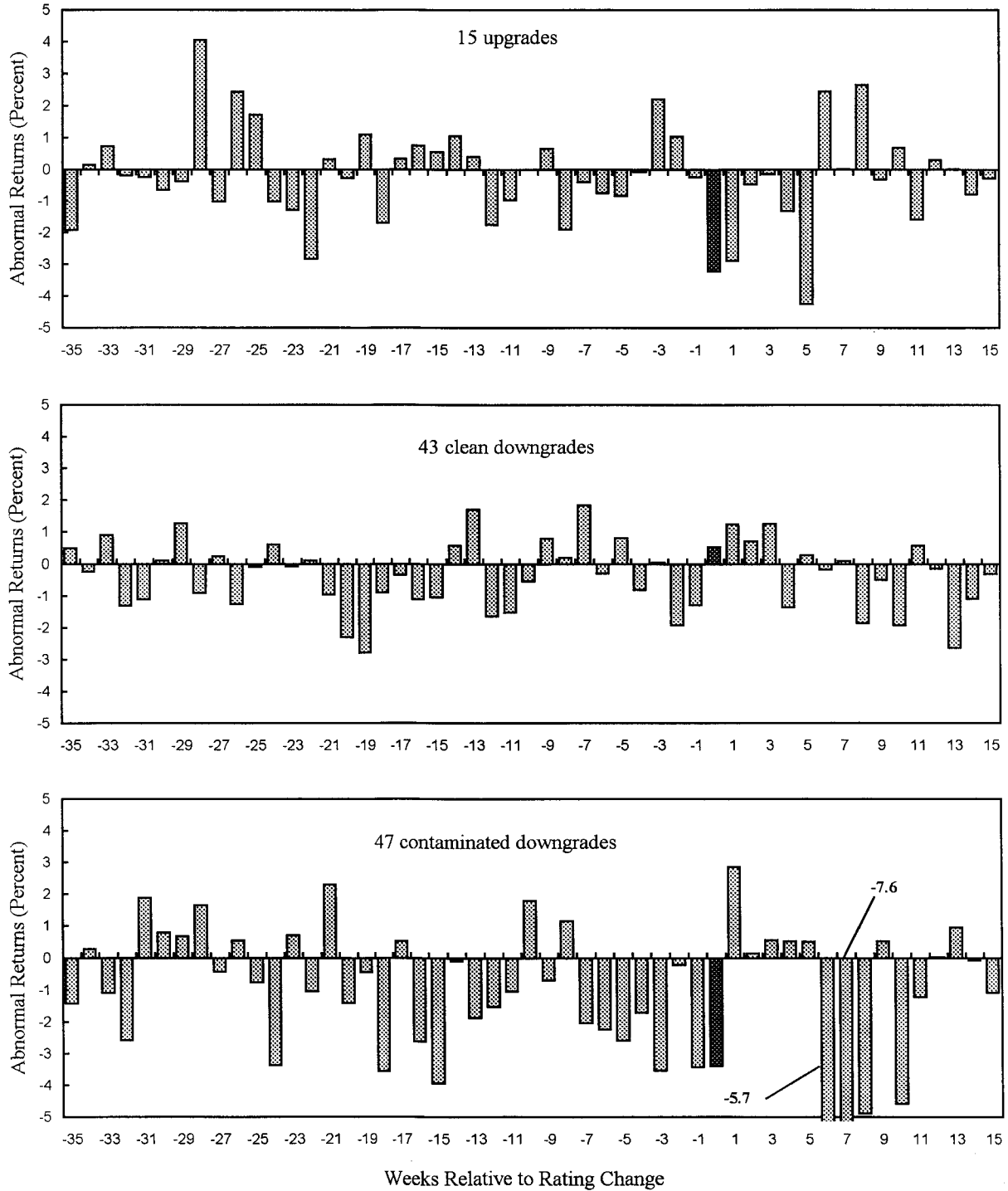
abnormal return of 3.2 percent in weeks -3 to -1, although the data for median returns and the proportion of upgrades in this period provide less indication of negative returns in this period. However, in the two weeks closest to the announcement (weeks 0 and +1), abnormal returns are perversely estimated to be positive, albeit insignificantly so, at 1.8 percent. For the entire announcement window, cumulative returns are essentially zero, with the mean and median returns actually showing different signs.[14]

The sample of contaminated downgrades provides the most rejections, but also provide some puzzling results. Abnormal returns in weeks -3, -1, and 0 are estimated to be significantly negative, based on several of the tests. Our results do not allow us to judge if the results in these periods represent a reaction to the news that is reflected in the ratings downgrade in week 0, or if they are due to lagged responses to earlier bad news and the ratings downgrades that most of these banks experienced in weeks -35 to -6: it should be recalled that most of these downgrades occurred in the context of the Asian crisis. These three weeks of negative returns contribute to significantly negative cumulative abnormal returns of -7.6 percent for weeks -3 to +2. Somewhat puzzling, however, is the result that abnormal returns are estimated to significantly positive in week +1, i.e. the week immediately following the ratings announcement. It is unclear if this is a type 2 error, or a robust result. For the 6-week announcement period as a whole, cumulative abnormal returns are estimated to -7.6 and significant.

To sum up, we find several apparently perverse effects: (i) announcement abnormal returns (weeks 0 and -1) are of the "correct" sign in only one of the three cases; and (ii) cumulative average abnormal returns over a longer announcement window (weeks -3 to +2) are also of the "correct" sign in only one case.

D. Regressions of Announcement-Window Abnormal Returns for each Bank on other Variables

Using each of our three samples, we also regress cumulative abnormal returns for the announcement-period (defined to be weeks 0 and +1) for each event on a series of explanatory variables that might possibly influence the magnitude of any price reaction to ratings changes. This can be viewed as an attempt to include in a rudimentary way some allowance for whether a ratings change is expected, and whether there are confounding factors occurring at the same time which might explain differences in the degree of market reaction to the ratings change.[15]

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[14]When the sample is divided depending on whether the downgrade occurred before or after the onset of the crisis, the smaller samples yield results that are even more difficult to interpret, but the conclusion in each case is that cumulative abnormal returns over the 6-week announcement window are in each case very little different to zero.

[15]See Billett et al. (1998) for an example of a study which uses a sample of all banks and

Where possible, we regressed the announcement window returns on a constant and the following variables, some of which were suggested by earlier research:[16]

- a dummy variable for a ratings upgrade (+1) or downgrade (-1) of more than one notch. The expected sign is positive.
- dummy variables for an upgrade (+1) or downgrade (-1) that respectively moves the bank through the investment grade barrier. The expected sign is positive.
- dummy variables for an upgrade (+1) or downgrade (-1) in the event week by more than one rating agency. The expected sign is positive.
- dummy variables for whether an upgrade (+1) or downgrade (-1) had been preceded by a credit watch by the agency making the rating change.[17] The expected sign is negative.
- dummy variables for an upgrade (+1) or downgrade (-1) in the country rating in event week 0. The rationale is that ratings changes that are the result of a change in the country ceiling or occur in an environment of an overall country-rerating convey little bank-specific information about bank health. The expected sign is negative.
- dummy variables for an upgrade (+1) or downgrade (-1) in event week 0 for another bank within the same country. The rationale is that simultaneous changes in the ratings of other banks in the country may be a more powerful indicator of changes in the health of all banks, including the event bank. The expected sign (assuming that this "contagion" effect outweighs any "competitive" effect) is positive.
- dummy variables for upgrades (+1) or downgrades (-1) in weeks -3 to -1 for another bank within the same country. The rationale is that earlier changes in the ratings of other banks may have prompted the market to expect the change that occurs in week 0. The expected sign is negative.

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[15](...continued)
various control variables to estimate the probability that a ratings change was expected for a particular bank that did experience a ratings change. A number of authors also split their samples into uncontaminated and contaminated subsamples based on whether there was other news about the company in question at the time of the ratings change.

[16]One potentially important variable that was not available was the reason for the ratings change. Another variable which is not included in the regressions in Table 2 is the preannouncement runup in returns (i.e., the cumulative abnormal return for each stock in the three preannouncement weeks). This variable will have an expected positive sign if the degree of anticipation of ratings changes is the same for all banks. If this assumption is not correct, the expected sign of this variable is not clear. In results not reported here, the variable was never significant and did not substantially affect the parameter estimates for the other variables.

[17]For some variables, most notably for the credit watch variable, we suspect that our coverage is less than complete, thus introducing the possibility of some measurement error into the explanatory variables.

For each of the three groups of events, we checked for cases of multicollinearity between the explanatory variables, and for cases where there was insufficient variation in the variables (i.e. where the dummy was almost always zero, or +/-1). In several instances of the latter, we omit the variable in question from the equations shown in Table 2.

The results shown in Table 2 are disappointing, but probably not surprising in light of the earlier results. In particular, only five coefficient estimates are significant, and four of these take the "wrong" sign.[18] That is, in addition to the earlier finding that announcement-window returns on average generally do not respond as we might expect, we find that the relative size of the response within each class of events is also contrary to expectations. We might thus conclude that there is little evidence from the current dataset that emerging equity markets react to bank ratings changes in the way that one would expect if ratings changes convey valuable information.

VI. CONCLUSION

Previous research on the U.S. equity market suggests that statistically significant negative returns are typically observed following the announcement of bond rating downgrades. Researchers have attributed this to the role of rating agencies in providing new and useful information to the financial markets about deteriorating firm prospects. In the case of upgrades, researchers' results are mixed, with some findings of statistically significant positive abnormal returns and others of no significant effects. The rationale for the latter finding is presumably that management has strong incentives to convey positive information about firm prospects to the financial markets. For both upgrades and downgrades, however, the evidence suggests that the abnormal returns around announcements are small compared with the magnitude of the abnormal returns witnessed over the previous year or so. That is, stock prices appear to reflect most of the information contained in ratings changes before the change actually occurs.

Our prior expectation was that informational problems in emerging markets might imply that data for emerging markets would yield larger abnormal returns following the announcement of ratings changes. In particular, one might expect that as compared with mature markets, there is less information—in terms of both quantity and quality—provided to the public about banks in emerging markets by supervisors, bank management and market analysts. Further, there may be a presumption that bank supervision and regulation is weaker in these countries, increasing the importance of monitoring by market participants. In these circumstances, ratings agencies ought to play an especially important role, in acquiring new

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[18]The lack of success with this regression is not, however, without precedent: the regression in Schweitzer et al (1992) to explain the magnitude of abnormal stock returns following bank downgrades contains three explanatory variables, with only one showing (borderline) significance.

information from their discussions with bank management, and also applying their expertise from other industries and countries in processing existing publicly available information in a way that effectively provides new information to the market. In these circumstances, we would have expected financial markets to be highly responsive to new information revealed by rating agencies. Indeed, given that banks' operating profits are highly dependent upon the cost of their funding, we would have expected ratings changes to have greater effects for banks than for companies in other industries.[19]

Instead, our two samples of clean events (events where we could not identify another ratings change in the previous 35 weeks) suggest that average abnormal returns tend to respond in the "wrong" direction immediately following ratings changes. In the case of upgrades, where the result appears to be statistically quite strong, we have to be cautious about our finding because of the small sample of events: clearly, there is a scope for further study of emerging market ratings changes for all industries—not just banks—to increase the sample size. And in the case of downgrades, the positive announcement period return is far from statistically significant. More generally, it is possible that our data may not be a complete listing of all ratings changes for all emerging market banks in IFC database. Further, we have not been fully able to take account of all confounding events that may have occurred around the time of the ratings announcements. It is also possible that daily as opposed to our weekly data might show different results, but we suspect that nontrading biases and possible inefficiencies in emerging markets make weekly data the preferred frequency for analysis. In any case, for the announcement-week results, the problem is with the sign of the estimated effect rather than merely the size of the standard errors.

Our methodology does not allow us to conclude whether the lack of significant announcement effects is a reflection of shortcomings in stock market participants or in the ratings agencies. However, our perverse results add to the evidence of Bhattacharya et al. (1998) that firm-specific announcements in emerging markets may not have the same impact on returns that we would expect from previous studies in mature markets. While those authors suggest insider trading as a probable explanation for their finding, this does not seem likely in our case. While we do see downward drift in the 35 weeks prior to downgrades, we see no similar upward drift prior to upgrades to suggest that markets have already reflected the information in those announcements. A more likely candidate is simply that the ratings process is a difficult one that the agencies are still perfecting—as is witnessed by the slowness of some ratings downgrades during the Asian crisis—so that markets do not pay much attention to them. This would be consistent with some of the early U.S. studies which failed to find announcement effects. At the same time, there may well be some information in ratings changes that markets may not react to for weeks or months. This might explain why we do find negative announcement window returns in weeks -3 to +2 in the sample of "contaminated" downgrades: these negative returns may be more a delayed reaction to downgrades and other negative news that occurred in weeks -35 to -6. This explanation

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[19]This assumes that bank equityholders are not perceived to be protected by explicit or implicit government guarantees.

would appear consistent with a recent study by Dichev and Piotroski (1998) which suggests that even in the supposedly highly efficient U.S. capital market, the full adjustment to ratings changes for low-rated, small firms—a description that would fit many emerging markets banks—may take as much as one year. However, regardless of whether or our result shows up shortcomings in the ratings process or in stock market valuations, it seems clear that supervisors in regulators in emerging markets cannot rely too heavily on financial market participants to monitor the safety and soundness of banks, but must improve their own prudential frameworks and examination skills.

Table 1. Tests of Average Abnormal Returns

This table shows tests for the significance of various measures of abnormal returns (the return on the bank less the national market return) on emerging market bank stocks around ratings changes (weeks -3 to +2, where week 0 is the week of the ratings announcement). Column 1 shows the average abnormal return (AAR), while Column 2 shows the t-statistic for a test that the AAR is different to zero. Column 3 shows the Z-statistic for the test that the average standardized abnormal return is different to zero. Column 4 shows the proportion of event weeks showing positive abnormal returns and any rejections of the hypothesis that this is equal to 0.5. Column 5 shows the median abnormal return. Rejections of the null hypothesis (i.e. indication that outturns in the announcement window are significantly different to expectations) in one-sided tests at the 1, 2.5, 5 and 10 percent levels are shown by ***, **, * and #, respectively.

Week	Average Abnormal Returns (AAR)	t-Statistic for AAR	Z-Stat. for Average Abnormal Return	Proportion of Events Showing Positive Abnormal Returns	Memo item: Median Abnormal October 1999 Return
			15 upgrades		
-3	2.2#	1.6	1.9*	0.60	0.6
-2	1.0	0.8	1.3	0.53	0.5
-1	-0.2	-0.2	-0.5	0.40	-0.4
0	-3.2**	-2.4	-2.6***	0.33	-1.5
+1	-2.9*	-2.1	-2.8***	0.33	-3.1
+2	-0.5	-0.3	-0.1	0.60	0.9
-3 to -1	3.0	1.3	0.9	0.51	0.7
0 to 1	-6.1***	-3.2	-2.7***	0.33**	-4.6
-3 to +2	-3.6	-1.1	-0.5	0.47	-3.0
			43 clean downgrades		
-3	0.0	0.0	0.3	0.60	0.5
-2	-1.9*	-1.8	-1.8*	0.44	-0.6
-1	-1.3	-1.2	-1.2	0.47	-0.4
0	0.5	0.5	0.5	0.51	0.7
+1	1.2	1.1	1.1	0.58	1.2
+2	0.7	0.6	0.6	0.47	-0.7
-3 to -1	-3.2*	1.7	-0.7	0.50	-0.5
0 to 1	1.8	1.1	1.3	0.55	1.9
-3 to +2	-0.7	-0.3	0.3	0.51	0.7
			47 contaminated downgrades		
-3	-3.5**	-2.1	-2.1*	0.38#	-1.9
-2	-0.2	-0.1	-0.1	0.49	-0.3
-1	-3.4**	-2.0	-2.0*	0.43	-2.6
0	-3.4**	-2.0	-2.0*	0.38#	-2.4
+1	2.9*	1.7	1.1	0.60#	1.3
+2	0.1	0.1	-0.2	0.47	-0.1
-3 to -1	-7.2***	-2.5	-1.4#	0.43#	-4.8
0 to 1	-0.5	-0.2	-0.5	0.49	-1.1
-3 to +2	-7.6*	-1.8	-0.9	0.46#	-6.0

Table 2. Regressions to Explain Announcement Period Returns

This table contains the results of three regressions that attempt to explain the magnitude of bank abnormal returns around ratings changes. The dependent variable is the cumulative abnormal return in event weeks 0 and +1 (the week of, and the week following, the ratings announcement). Explanatory variables are shown in the first row and are dummy variables taking the values -1, 0 or +1, depending on the group of events included in the regressions: further details are provided in the text in Section V. The expected signs for each variable, based on the assumption that ratings changes convey information to equity markets, are shown in parentheses in the first row. The data shown are the regression coefficients, with their heteroskedasticity-consistent standard errors in parentheses. Instances where no estimate is shown correspond to cases where there was insufficient variation in the explanatory variable for the group of events. Estimates that are significant at the 1, 2.5, 5 and 10 percent levels in one-sided tests are denoted by ***, **, * and #, respectively.

	Constant (positive for upgrades and negative for downgrades)	Rating change of more than one notch (positive)	Rating moved through the investment grade barrier (positive)	Rating change by more than one agency in the week (positive)	Rating change preceded by a credit watch (negative)	Rating change accompanied by a country rating change (negative)	Rating change accompanied by change for other banks in same country (positive)	Rating change preceded by change for other banks in same country (negative)
15 upgrades	-3.4 (3.0)	—	—	—	—	8.6# (4.4)	-13.6*** (4.3)	—
43 clean downgrades	-0.7 (1.8)	-1.1 (6.0)	6.2 (7.4)	9.0 (7.9)	—	-9.6 (5.8)	-0.1 (3.1)	-3.6 (6.0)
47 contaminated downgrades	13.2** (5.4)	-1.9 (4.2)	-0.8 (4.0)	—	0.3 (5.1)	5.0 (7.7)	11.5# (6.1)	18.7*** (6.8)

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