Consistency of Global Credit Ratings: An Analysis of Firm versus Country-Specific Factors

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Abstract

We ask whether credit rating agencies use similar methods in assigning ratings to foreign and domestic firms. Is it the case, for example that inputs into the credit rating decision receive similar weight across geographic segments? to answer these questions we develop a model of rating prediction based on firm-specific financial variables. Our results show that the model applies equally well to foreign and domestic firms. We then add country-specific factors to the model to see whether they contribute meaningfully to explaining rating assignments. We discover that once a country's economic cycle is taken into account there is little difference between ratings for foreign and US-domiciled firms.

Credit rating agencies have provided opinions on the creditworthiness of American companies since the early 1900s. Both Moody's Investor Services and Standard and Poor's have grown to the point that they assign ratings to virtually all public debt issued by US firms. Today, as market integration and cross-border financings increase, the growth of these two agencies stems primarily from international sources. Both companies now operate in over 15 countries worldwide and in 1999, Moody's acknowledged that it provided "ratings on 95% of the long-term cross-border debt issued worldwide."[1]

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[1] Source: Moody's website.

The international expansion of Moody's and Standard and Poor's is in response to a changing financial landscape, one that is increasingly global in nature. Between 1969 and 1998, the U.S. share of global financial markets fell from 65 percent to approximately 41 percent.[2] From the perspective of US investors, foreign securities now form an increasingly large portion of their investment opportunity set. Likewise, non-US investors are moving beyond their borders, increasing their holdings in the US corporate debt market from 12.7 percent in 1990 to 18 percent in 1999[3].

The expansion of US rating agencies into new countries has taken many forms. In some cases, the agencies have formed partnerships with existing local rating firms, at other times, they have acquired domestic agencies outright, while yet a third option has been to establish their own operations via branch offices in the foreign country. Regardless of the approach taken, each method faces the same predicament of balancing local knowledge and global consistency of ratings. This balance has received attention from both the rating agencies themselves and the financial institutions that rely on credit ratings as inputs into the regulatory process. Moody's, for example, has formed a Standing Committee on Ratings Consistency with the goal of standardizing the meaning of their ratings across both industry sectors and geographic segments. This is not doubt partly in response to the Basel Committee on Banking Supervision's (1999) proposal for greater use of external ratings in assessing the risk of banks' asset holdings. If rating agencies are to play a larger role in the regulation of financial institutions world-wide, then investors should establish with some confidence that ratings are applied consistently across countries. This paper addresses this issue by examining the ratings of Moody's Investor Services across several different countries. Using an ordered probit model, we analyze the extent to which a set of financial variables can predict the ratings of one country's firms versus another's and question whether the inputs to the credit rating decision receive similar weighting across geographic boundaries.

In comparing the determinants of credit ratings across geographic segments we must first distinguish what we mean by rating "consistency". To this end, we should stress that a uniform scale in which financial variables receive equal weighting in the rating decision across all countries is not necessarily optimal. Moody's ratings are designed to measure the probability of loss which combines an assessment of both the likelihood of default and the recovery rate. Given variations in creditor rights and bankruptcy laws, it is likely that recovery rates in the case of default may systematically differ from one country

[2] Source: Reilly and Brown (1999).

[3] Source: US Census Bureau, *Statistical Abstract of the United States: 120th Edition*, 2000 (page 523).

to another. If this is the case, then the role of firm-specific factors, indicating financial health and performance, may be assessed differently in dissimilar settings. Two firms from different countries may have identical leverage, coverage, and profitability measures yet have vastly disparate recovery rates, implying that "consistent" ratings would classify the two in separate rating categories. If this is the case, we should see more conservative ratings assignments for a given set of financial characteristics in an environment of weak creditor protection with low recovery rates. Therefore, our analysis of the global consistency of credit ratings includes not only firm-specific variables but also country and macro factors, as introduced by La Porta et al (1997) such as origin of the legal system and the rule of law.

Our analysis of Moody's global ratings proceeds as follows. We first discuss the role of US credit ratings in the international environment. Then, in section two we identify the variables that we view as potential inputs into the credit rating decision while section three discusses the dataset constructed to test for the consistency of ratings. We discuss our results in section four and conclude in section five.

Our analysis shows that ratings assignments are remarkably consistent across several countries. With a given set of firm-specific financial variables, our ability to correctly predict rating assignments is not particularly lower for foreign firms than their US counterparts. Once we control for differences in economic cycles we find non significant differences for the ratings of foreign firms. Results are mixed for the impact of a country's legal infrastructure on rating assignments.

1 Credit Ratings in an International Context

With the international expansion of rating agencies, split ratings, or the assignment of different ratings to the same issue by different rating agencies, can just as easily occur in an international setting as a domestic one. Although split ratings between Moody's and Standard and Poor's US ratings have received a significant amount of academic attention (see for example Ederington, Yawitz, and Roberts (1987), Jewell and Livingston (1998), and Cantor, Packer, and Cole (1997)) Cantor and Packer (1994) note that the correlation among the US ratings of these two firms is still extremely high. In 1990 for instance, Moody's and S&P ratings of the same firms were highly correlated at 0.97, indicating that the two firm's rank order of credit risks was very similar. Sixty-four percent of issues rated by both firms received the same rating. This contrasts with the results for Moody's and the Japanese Credit Rating

Agency for which only 11 percent of ratings agreed between the two firms. Japanese and British banks received higher ratings when these ratings were assigned by agencies from their home country whereas Canadian and US banks received lower ratings from their domestic agencies.

While establishing that ratings may differ due to the nationality of the agency is interesting in itself, we are also curious as to how investors interpret these ratings. Researchers using US securities data and ratings from American agencies concluded that investors perceive rating downgrades to convey negative news to the market whereas rating upgrades receive little attention. Hand, Holthausen, and Leftwich (1992), Clark, Foster, and Ghani (1997), and Dichev and Piotroski (2001), have all found that downgrades negatively impact the securities of the rated firms while upgrades have no significant price impact. For our purposes, it is interesting to note that using Australian data, Matolcsy and Lianto (1995) replicate these results. The ratings in this case were those assigned by Standard and Poor's Australian office which emerged from the acquisition of Australian Ratings in 1990. As in the US case, ratings downgrades were associated with negative abnormal security returns whereas no significant price reaction was evident for upgrades.

While Matolcsy and Lianto (1995) provide some evidence on the importance of credit ratings for international investors, this evidence is bolstered by the findings of Steiner and Heinke (2001). Steiner and Heinke specifically ask whether non-US investors view ratings from US agencies as relevant information sources. Using S&P and Moody's ratings on eurobonds, the authors find that negative security price reactions are still witnessed upon rating downgrades however the magnitude of this reaction is smaller if the debt was issued by a non-American firm. Therefore ratings from US agencies may be less informative for non-US firms. Potential explanations for this result include credit analysts' reliance on US accounting standards in the interpreting of foreign financial statements or a lack of country-specific knowledge. This paper questions the extent to which a single agency, in our case Moody's, alters its interpretation of inputs in the credit rating decision in response to international differences and country-specific factors. Are measures of operating and financial performance, both of which are defined as primary inputs into the rating decision by a 1998 report on Moody's rating methodology, weighted equivalently across countries, or do interpretations vary based on factors such as bankruptcy laws and creditor protection?

One method of analyzing consistency for a single agency's ratings has been to examine issuer default rates. It is intuitive for instance that issues with the same rating will, over time, exhibit similar default rates. Using this rationale, Cantor and Falkenstein (2001) compare default rates for US and non-US issues that received speculative grade ratings from Moody's. Over the last 30 years, the one-year default rate for the US firms in these rating categories was 3.3 percent while for non-US firms the default rate was 1.8 percent. One may suggest that this implies overly harsh ratings from Moody's for foreign firms. Cantor and Falkenstein however argue that the data is somewhat biased by the fact that most foreign ratings entered the sample in recent years, when default rates have been particularly low, whereas the US data reflects periods of more turbulent economic conditions. Supporting this claim, Moody's committee on rating consistency (2000) has stated that in 1999, 38 percent of all issues rated by Moody's were for non-US domiciled issuers while in 1980 this figure was a paltry 3 percent.

While default rates form one aspect of ratings consistency, they do not address other components. One such component is the risk of a rating transition, even if this transition does not result in default.[4] Nickell, Perraudin, and Varotto (2000) examined differences in Moody's rating transition matrices for issuers domiciled in different countries. While firms from the US and UK exhibited similar rating transitions, Japanese firms with relatively low ratings exhibited substantially less rating volatility. In other words,the tendency for these firms to change ratings in a given year was significantly less than their US counterparts. Other noted differences included the tendency for poorly-rated Japanese and UK firms to be more likely to experience upgrades than similarly rated, US-domiciled firms[5]. Distinctions between Japanese and US-based firms were also noted by Perraudin and Taylor (1999) who studied bond market yields as indications of rating consistency. They found that Japanese-domiciled obligors tended to pay high yields for a particular rating category in comparison to European or American based firms.

There appears to be evidence of differences in default rates and rating transitions across geographic segments for firms rated by Moody's. While these differences may not be surprising, it would be helpful if investors further understood the root of the discrepancies. Are different standards applied to different countries based on nationality alone or are there consistent interpretations of the rating standards for North American versus European versus Asian firms? To what extent is more stringent creditor protec-

[4] We should note that rating transitions will also be impacted by the change in Moody's ratings base over time. Nickell, Perraudin, and Varotto (2000) note that the increasing proportion of foreign firms rated by Moody's "means that transition matrices estimated unconditionally based on all the entities rated at a given moment in time will change even if the underlying approach taken by Moody's is constant."

[5] As in this study, Nickell et al use an ordered probit model to examine differences in ratings across countries. The scope of their analysis differs from this paper however in that we address the role of firm-specific performance in the rating assignment. Nickell et al base their rating transition model on industry, country and stage of the business cycle.

tion taken into account when anticipating the recovery rate and therefore the rating assignments across countries? Using a combination of firm-specific and country factors the following sections hope to shed light on these questions.

2 Inputs into the Rating Assignment

2.1 Firm-Specific Inputs

Academics have a relatively long history of attempting to predict credit ratings with firm-specific financial and market data. To a certain extent, these studies have been relatively successful in correctly classifying credit ratings. One of the earliest studies by Pogue and Soldofsky (1969) relied on financial statement data alone to predicting credit ratings. The authors were correctly able to identify the ratings of 50 of the study's 53 bonds. Subsequent studies summarized by Kaplan and Urwitz (1979) discovered that models including market variables as well as financial statement information, performed far better than those relying on financial statements alone. As to which financial and market variables we include in our analysis, our choice is based on information from previous academic studies and from the rating agencies themselves. Perhaps due in part to increasing concerns for transparency for financial institutions both Moody's and Standard and Poor's publish general guidelines for their rating methodologies, including examples of ratios and indicators that are used in assessing a firm's rating. The financial variables we choose overlap with those included in an S&P report by Chinn and Harvey (2000) and address measures of return on capital, interest coverage, and debt to capitalization. Specifically, our variables are long term debt to total capital, total debt to total capital, interest coverage, return on assets, beta and market capitalization.

The use of leverage ratios is fairly straightforward and intuitive. Following Blume, Lim and MacKinlay (1998) we include both a measure of total debt and a measure reflecting only long term debt to see whether the proportion of debt that is due in the short term influences credit ratings. We also note Rajan and Zingales' (1995) use of debt to capital as a measure that best represents the past financing decisions of firms. They point out that other measures of leverage, particularly those relying on total liabilities may be more susceptible to different accounting standards across countries. For instance, German regulations require the disclosure of both funded and unfunded pension liabilities on the balance sheet while this is clearly not a requirement for all firms within our sample.

Interest coverage is defined as the sum of operating income after depreciation plus interest expense divided by interest expense. Return on assets, defined here as net income before extraordinary items over assets, reflects the firm's profitability and earnings.

The use of equity beta is consistent with Schwendiman and Pinches' (1975) comparison of beta values across bond rating categories. They found that betas were significantly greater for firms with non-investment grade ratings than those with higher ratings. Similarly, Clark, Dellva, and Foster (1993) revealed a relationship between changes in credit ratings and changes in beta. Blume, Lim and MacKinlay (1998) argued that equity beta reflects both the variability of the firm's overall cash flow and the impact of its leverage and therefore should be included in an estimate of credit ratings.

Blume et al. also include firm size as an explanatory measure of credit ratings since it has been found to be positively related to rating level. Dichev and Piotroski (2001) found stock market reaction to downgrades more severe for small firms while Clark, Foster, and Ghani (1997) established that equity analysts were more likely to change their earnings estimates following a rating downgrade for small firms than for large firms.

2.2 Country-Specific Inputs

Establishing the relationship between firm-specific financial measures and credit ratings is nothing new. Extending this analysis to the international environment, brings us insights that will continue to become increasingly relevant with the integration of global financial markets. We hope to be able to provide more insight through the addition of country-specific factors that go beyond identification of the obligor domicile alone. What country-specific factors provide a link in interpreting the application of Moody's standards to international firms? Are firms from countries with poor creditor protection, for instance, systematically treated more conservatively than firms with equivalent financial performance measures due to the legal nature of bankruptcy?

Moody's rating methodology purports to include an assessment of national, political, and regulatory environment in addition to financial position. As a result, we include several country-specific variables in our analysis. Many of these refer to the country's legal system since bankruptcy in itself is a legal construct. The court's ability to successfully administer insolvent firms, ensuring that creditors recover an equitable portion of liquidated assets, will be a primary consideration. Rajan and Zingales (1995) point out that the approach the courts take to bankruptcy differs significantly across countries. For instance, the United States permits management to retain significant power upon filing for bankruptcy and as a result seems to promote a reorganization outcome that views the firm as a going concern. Bankruptcy proceedings in the UK and Germany on the other hand, tend to favour the creditor over management and may therefore be more likely to result in liquidations of the firm. As a result of these differences, we include a measures of creditor protection, the country's legal origin, and the quality of law enforcement. These three measures stem from La Porta, Lopez-De-Silanes, Shleifer, and Vishny's (1997) work on the relation between legal environment and firm financings. A detailed description of these variables and their values for the countries in our sample is provided in the appendix.

In addition to legal measures, we include a variable outlining the phase of the business cycle that the country is currently in. Moody's cites both transparency and the company's ability to meet its obligations throughout normal business cycles as primary inputs into the rating decision.[6] It is particularly important to account for the country's overall economic health lest we make unwarranted inferences on differences in rating scales that may be due solely to the current state of the economy. It would be unfair for instance to argue that Moody's assigns overall harsh ratings to US-domiciled firms, if a larger proportion of these observations are from distressed economic times. Cantor and Falkenstein (2001) address this issue by arguing that most evidence of inconsistencies in Moody's rating scales arises when researchers fail to take into account economic shocks. By including these shocks in the analysis, inconsistencies between default rates for different types of issuers are greatly reduced. As is the case for much of the work in this area (see for example Kealhofer (2003)) actual default rates, rather than consistency within the entire rating scale is the primary measure used in the analysis. For our purposes, we are interested in consistency across all ratings.

[6] Source: Moody's Rating Definitions, National Rating Scales (2002).

3 Characteristics of the Dataset

3.1 Ratings Distribution

In comparison to most studies, the data used in our analysis encompasses a relatively high proportion of foreign firms. The approximately 7000 firm-year observations within our data are roughly two thirds US domiciled companies and one third foreign. None of these ratings represent Moody's National Scale Ratings which are ratings designed to give a relative ranking of creditworthiness within a particular country. National ratings are used in economies defined by Moody's to be subject to "generic 'country risks', [which] ...would otherwise overwhelm and obscure such intended differentiation". Several Latin American firms domiciled in countries that have experienced significant currency fluctuations are assigned national ratings instead of Moody's standard ratings and these firms are not included within the sample.

The large proportion of foreign ratings within our sample is a result of two key features in the construction of the dataset. First, the data focuses on the shorter time period of 1992, the date from which we are able to obtain significant coverage of foreign financial statements from Global Vantage and 2001. As mentioned by Cantor and Falkenstein (2001) the composition of Moody's ratings has changed dramatically over the past 20 years to include a significant jump in the number of foreign ratings. This shorter time-period focuses on the years when foreign firms are abundant. In addition, the dataset relied on Moody's country-specific rating lists when compiling the list of sample firms.

Table I shows the most significant countries represented within the dataset. Although ratings for firms from 15 countries were present, the largest number of ratings outside of the US were for firms from Japan, Canada, France, Germany and the UK. Panel 2 of this table shows the proportion of observations falling within each rating category for the sample as a whole, the US, and our significant foreign countries. It becomes immediately apparent that the non-US-domiciled firms in our sample tend to have higher overall ratings than the US firms. Most foreign ratings are concentrated in Moody's top four rating categories including ratings from Aaa to Baa. For US firms, the proportion of ratings in these categories is 68.43 percent while for our foreign firms it is significantly higher at 85.54 percent. Several factors can be explored to explain these differences. The first is that Moody's routinely rates all publicly issued debt in the US whereas it makes no statement in relation to its foreign coverage and not surprisingly, this coverage is much more sparse. As a result, it may be natural for Moody's to simply rate larger, more visible firms and, as demonstrated by Blume, Lim, and MacKinlay (1998), large firms tend to receive higher ratings then small firms. In addition, Table I shows that the proportion of ratings representing financial firms tends to be larger outside the US. We explore this further in the third panel of the table which focuses only on the ratings of financial firms by country and for the sample as a whole. We note that with the exception of Japan, foreign financial ratings are concentrated in the two highest rating categories, unlike the ratings of US-based financials. This is consistent with the Basel Committee's observation that judging by historical default rates, non-US banks are "particularly safe." Also note that some of our individual country observations for financial firms should be cautiously interpreted since some of the sample sizes are very small.

A final explanation exists as to why Table I shows ratings distributions differing significantly from country to country. In addition to industry bias and somewhat related to the issue of coverage is the observation of how many individual firms are actually represented by the sample. Although we maintain observations on over 7000 firm-years, a single firm may have a relatively long rating history, therefore representing a greater portion of the data. While this is not a significant problem for countries such as the US and Japan with large numbers of observations covering the full 10 year timespan, it may be a significant factor for France and Germany. For example, the sample includes 255 firm-year observations from France however these observations represent the ratings of only 43 distinct firms. If some of these firms maintain particularly high ratings throughout the entire 10 year observation period, it may not be surprising that the distribution of France's ratings appears skewed towards higher ratings than for the sample overall. This is definitely the case for Germany in which firms such as Landesbank Berlin and Deutsche Bank enter the sample with the highest possible rating and maintain this rating for several years.

The next stages of our analysis attempt to take some of these observations into account. We will base much of our work on differences between firm characteristics for companies within the same rating category and will control for industry when examining the key determinants of rating assignment. To this end, Table II presents key financial ratios by rating category and country for our sample firms. Table III provides test statistics indicating whether statistical differences exist among these average financial values across countries. This table permits us to ask such questions as whether it is the case that Baa rated firms tend to be on average more highly levered in Japan then the US.

3.2 Financial Characteristics

From Table II we observe some general patterns on the financial characteristics of firms within a given rating category. Table III provides a somewhat more rigorous examination of these patterns by comparing whether the average observation for a given country significantly differs from the average observation for US firms. T-tests of these sample means are conducted for each country versus the US to establish whether foreign firms have significantly different characteristics than US-domiciled firms in the same rating category. In addition, due to our observation that the population of foreign firms contains a greater proportion of financial companies, we also examine the differences between US industrials versus US financial firms. These tests provide us with some insight into what portion of the differences that we observe between countries are related to differences in the industry composition of our sample. T statistics are provided in Table III for each of these comparisons. For both of Tables II and III we focus on only the first four rating categories since these constitute the vast majority of our observations.

Our first observation from the tables is that foreign firms in the top rating categories tend to be more highly levered than their American counterparts. In particular, well-rated European firms have significantly higher long term debt to total capitalization measures than US-domiciled firms. We note however, that this observation also holds true for financial versus industrial firms. US-domiciled financial firms in a given rating category tend to be significantly more levered than US-based industrials. Distinct from this trend is the leverage pattern for Canadian firms. Canadian firms tend to be less highly levered, in the sense of both total and long term debt, than US firms across the entire rating spectrum. In general, across all countries, fewer significant differences can be found for leverage levels as we move towards the lower end of the rating scale.

Consistent with observations in the US, a relationship between firm size and rating category seems to exist in several countries. Large firms tend to be better rated than small firms and this is the case for companies within Canada, the US, the UK and all foreign firms in general. There appears to be no systematic differences in firm size within a rating category for foreign versus US firms. For the top two rating categories, foreign firms tend to be smaller then their US counterparts however this result reverses in the lower portion of the rating spectrum. This may not be surprising however since both Moody's ratings and the financial databases from which we retrieve the financial ratios have far greater coverage of small north American firms than small foreign firms. For these reasons, the foreign component of our sample may be somewhat biased towards large firms and this becomes particularly apparent in the lower portion of the rating spectrum where small firms are dominant.

As measured by return on assets, foreign firms within a giving rating category appear to have lower profitability levels than US-based firms. Here, we measure return on assets as net income before extraordinary items divided by assets and find that across all categories, foreign firms on average have a lower level of return on assets. This is particularly the case for France, Germany, and Japan. Interestingly, financial firms also maintain significantly lower levels of return on assets however we should note that the UK with 30 percent of its observations representing financial firms does not have consistently lower profitability levels then similarly rated US firms.

Other observations include the fact that interest coverage tends to be significantly lower in foreign firms than US firms within the equivalent rating category, particularly for well-rated firms. No clear pattern for beta emerges. Finally, we note that Altman's Z-score, representing an aggregate measure of potential bankruptcies, tends to be lower for foreign firms than US-based firms. However, we note that the pattern of this measure does not act as expected even within US firms alone. The greater a firm's bankruptcy potential, the lower its Z-score should be. Looking at the average Z-scores across rating categories, we see no clear sign of decline as we move from firms with good ratings to firms with poor ratings. One possible explanation for this result is that the traditional coefficients established by Altman are no longer relevant for today's firms. This has been noted by Hillegeist, Keating, Cram, and Lundstedt (2002) among others, who choose to use both the traditional coefficients and more recently estimated ones in their study on default prediction.

4 Determining the Relative Importance of Rating Inputs

While Tables II and III provide us with some interesting observations on international differences in the average values of firm-specific financial performance within a given rating category, we now turn to a more robust analysis of the determinants of rating inputs. The methodology we will employ is the ordered probit model, used recently in the study of credit ratings by Blume, Lim and MacKinlay (1998) and Nickell, Perraudin, and Varotto (2000). Whereas Blume et al used this method in conjunction with firm-specific financial data for US firms alone, Nickell et al applied it to international credit ratings, without including financial variables. We see therefore that this paper helps to fill the gap between these two studies by determining the role of firm and country specific variables in the rating assignment.

4.1 Model Prediction

Our first task is to establish whether the financial variables that we have identified as being potentially important for the rating decision do in fact help explain rating assignments. We focus only on the firm-specific financial inputs first and move to country-specific variations in the next section. Table IV reports the results of the ordered probit model that maps our observed financial characteristics to specific rating assignments. The first two columns of the table use the entire sample of observations in estimating the coefficients of the model whereas the third and fourth columns use only observations from US-domiciled firms. We are curious to see to what extent our coefficient estimates vary when foreign firms are excluded to get a sense of whether our financial variables are given the same weight in rating assignments by Moody's worldwide operations.

For the most part, our coefficient estimates are in the direction expected. Well-rated firms are more profitable as measured by return on assets, tend to have greater interest coverage, and are larger than firms in the lower part of the rating spectrum. These results are all significant at the one percent level regardless of the sample that is used, whether it be all observations or only those from the US. Somewhat surprisingly, our leverage variables do not always play a significant role in explaining credit ratings, particularly when foreign firms are included in the sample. When only US firms are examined, total debt to capital is negatively related to ratings implying that firms with more debt tend to receive poorer ratings. In addition, the ratio of long term debt to capital is positively related to ratings in that firms with a larger portion of their debt being long term, receive better ratings than those with more short term debt. Both of these results are intuitive and consistent with the findings of Blume, Lim, and MacKinlay (1998). When foreign firms are included however, these relationships between leverage and rating do not always hold. No significant relationship exists between total leverage and rating. This is perhaps due to the tendency for well-rated foreign firms to have significantly higher holdings of debt than their US counterparts as indicated by Table II.

In addition to the leverage, profitability, and coverage ratios, our analysis includes a dummy variable for financial firms and beta estimates based on three years of monthly stock returns. Despite the large differences in average financial characteristics for financial versus industrial firms, the financial indicator is not significant in any of our model specifications. Nor, for that matter, is the beta estimate which perhaps is not surprising given our analysis from Table II which showed little evidence of a pattern for beta measures across either ratings or countries. A likelihood ratio test demonstrates that beta does not contribute significantly to the prediction of credit ratings and as a result, we provide models that drop it from the analysis.

The coefficients estimated from the entire sample versus only the US-based firms, do not differ dramatically from one another. Typically, any differences exist in the third decimal place. The pseudo R^2 measure as derived from the likelihood ratio indicates that applying the model to only the US firms increases our ability to predict ratings slightly. A more thorough analysis of the model's fit however is presented in Table V. This table reports the proportion of ratings that the ordered probit model using only US firms (without the inclusion of beta) is able to correctly identify. When the highest probability of a particular rating is associated with the rating that is in fact assigned, we say that an exact prediction has occurred. We note that for US-domiciled firms exact predictions happen 48.43 percent of the time. Interestingly, companies from Canada and the UK have even higher prediction rates at 53.43 percent and 54.32 percent respectively. One interpretation of this result is that the application of Moody's US-based methodology to similar common law countries is fairly straightforward and little adjustment is made to the weighting scheme for inputs into the rating decision. Applying these weights to German and French firms results in lower rates for successful prediction at 40.35 percent and 44.59 percent.

For those ratings that were not correctly predicted, Table V also asks how far off the prediction was. We find that for the entire sample, over 42 percent of all firms ratings were off by a single category. This combines with the exact predictions to result in over 92 percent of firm ratings being predicted within plus or minus one category. Interestingly, the country with the lowest proportion of predictions falling within this range is the US with 91.53 percent of predictions falling within one category. This is despite the fact that the model making the predictions was based entirely on US observations. .In contrast over 95 percent of French ratings are correctly predicted within one rating category. These results cause us to suspect a reasonable level of ratings consistency in Moody's worldwide ratings, not only in the case of defaults which has formed the basis for most previous studies, but also within the full range of its rating scale.

4.2 Including Country-Specific Factors

Having established the predictive capacity of firm-specific characteristics, we then ask more rigorously how country-specific factors affect the ratings assignment. For instance is it the case that given the same weight on firm-specific factors, firms from a particular country will continue to be assigned systematically higher or lower ratings? Table VI conducts this analysis by assuming the same coefficients for firm-specific factors across all countries and then including dummy variables representing nationality. The first column of this table simply tests whether non-US firms, regardless of nationality, are treated any differently than US-domiciled firms. The indicator variable labeled "foreign" is in fact significant and is negatively related to ratings, indicating that foreign firms tend to receive better ratings than US firms. At first glance one may argue that this result is consistent with rating agencies being tempted to offer attractive ratings in the hopes of gaining market share as they expand internationally. However the second column of Table VI implies that this is not necessarily the case. Here we replace the foreign indicator variable with individual country variables and note that higher ratings are not consistent across all countries. While Japanese firms with a given set of financial characteristics tend to receive higher ratings then other firms, British companies tend to fare slightly worse, receiving more conservative ratings.

Our next step is to attempt to establish why we may witness any difference at all in ratings across countries. As has been often argued, differences in international rating assignments may simply be a factor of differences in the time periods in which the ratings occur and the corresponding economic conditions occurring in a particular country at the time. For this reason, Table VII replaces the foreign country indicators used in the previous table with a variable describing the stage of the economic cycle. For each country within the sample we acquire dates of peaks and troughs in the economic cycle from the OECD. Using these dates, we create a variable that indicates whether or not the economy is in a state of decline in that it has recently experienced a peak but not yet hit its full trough. We match this variable to the date of the rating and in this way attempt to control for the economic conditions under which the rating was assigned and held. When we include this variable, it is significant at the one percent level and intuitively is positively related to rating level in that worse ratings are assigned during periods of economic decline. Our other coefficient estimates remain similar to our previous model in that return on assets, interest coverage, and market capitalization are again significant predictors of ratings.

We are interested in the extent to which accounting for economic conditions reduces the perceived discrepancies between ratings across different countries. We note that when the foreign and economic decline indicators are both included in the model, the foreign indicator loses its predictive power and in fact a likelihood ratio test confirms that it no longer contributes significantly to the model.

In addition to economic conditions, the infrastructure of the country itself, as it relates to bankruptcy, should be accounted for. To this end we include our three country-specific factors relating to the legal environment of the country. Recall that La Porta et al found that legal origin was important in determining the development of external finance markets for debt and equity and that countries with common law backgrounds appeared to provide an environment conducive to the growth of these markets. We also include a measure of creditor protection within the country with Germany and the United Kingdom ranking relatively high on this measure and France relatively low. Finally, as bankruptcy proceedings are overseen by the courts we also include a measure of the rule of law in the country with Canada and the US ranking highly on this measure.

The second column of Table VII shows the results of this analysis. All of our country-specific factors are estimated with significant coefficients, however their interpretation provides us with mixed results. Countries with a high regard for law and order as measured by the rule of law variable may be assigned higher ratings given that a firm's financial characteristics are the same as a company from a country with poorer respect for the law. Disappointingly, we find unintuitive coefficient estimates for our other measures of legal infrastructure. Subsequent versions of this paper will further explore these results.

5 Conclusion

We ask whether rating agencies such as Moody's apply a consistent rating methodology to firms from different countries. Using firm-specific characteristics of our sample firms we establish that our ability to predict ratings does not differ significantly from country to country. Most notably, the ability to correctly predict the ratings of US-domiciled firms is not significantly greater than our ability to predict the ratings of foreign firms. Return on assets, firm size, and interest coverage are consistently significant determinants of ratings. Interestingly leverage variables are not always helpful, perhaps due to large differences in the proportion of debt held by US and foreign firms. Foreign firms with very good ratings tend to be significantly more levered than their US-counterparts.

Using the same model of rating prediction across countries acts to place the same amount of weight on each of the firm-specific financial determinants of ratings. Keeping these weights fixed, we ask whether foreign firms receive systematically higher or lower ratings. We find that overall, ratings for foreign firms tend to be higher given a certain combination of financial characteristics however this is not uniformly the case across all countries. Japanese firms in particular tend to be assigned better ratings. We then proceed to ask why this is the case and first focus on the particular economic conditions occurring in a country at the time that a rating is assigned. We find that poor economic conditions are associated with lower ratings and interestingly, the inclusion of this variable eliminates the significance of our foreign country indicator. This result is consistent with the work of Cantor and Falkenstein (2001) which concludes that perceived differences in rating scales among countries are often the result of differences in economic conditions.

Including variables related to the legal infrastructure of the country provides mixed results. While it is intuitive that countries with a higher score for the rule of law variable receive better credit ratings, while maintaining the same financial health, we find unintuitive results for the creditor protection and legal origin variables.

Overall, we conclude that although the average characteristics of firms within a given rating category may vary significantly by country, there is little systematic bias in the way that Moody's applies its rating standards internationally. Any bias that may at first appear may be explained by referring to the economic conditions of the country during the time of the rating. There is little evidence that the legal infrastructure as it relates to bankruptcy is systematically considered in rating assignments.

References

[1] Altman, E. (1968) Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. Journal of Finance 23 (4) 589-609.

[2] Basel Committee on Banking Supervision (1999). Capital Adequacy Framework, (June).

[3] Blume, M., F. Lim, and A. MacKinlay. (1998). The declining credit quality of US corporate debt: Myth or reality? Journal of Finance 54 (4) 1389-1413.

[4] Cantor, R. (2000) Promoting global consistency for Moody's ratings. Moody's Standing Committee on Ratings Consistency.

[5] Cantor, R. and E. Falkenstein (2001). Testing for rating consistency in annual default rates. Moody's Standing Committee on Ratings Consistency.

[6] Cantor, R. and F. Packer (1994) The credit rating industry. FRBNY Quarterly Review (Summer-Fall).

[7] Cantor, R., F. Packer, and K. Cole. (1997). Split ratings and the pricing of credit risk. The Journal of Fixed Income 7 (3) 72-82.

[8] Chinn, W.E. and P.B. Harvey (2000). Adjusted key US industrial financial ratios. Standard and Poor's Credit Week September 20, 39-44.

[9] Clark, C., W. Dellva, and P. Foster. (1993). Bond rating changes and beta risk: An analysis of the relationship through the use of influence statistics. Journal of Business and Economic Studies. 2 (1) 23-46.

[10] Clark, C., P. Foster, and W. Ghani. (1997). Differential reaction to bond downgrades for small versus large firms: Evidence from analysts' forecast revisions. Journal of Fixed Income 7 (3) 94-99.

[11] Dichev, I. and J. Piotroski. (2001). The long-run stock returns following bond ratings changes. Journal of Finance 56 (1) 173 - 203.

[12] Ederington, L., J. Yawitz, and B. Roberts. (1987). The informational content of bond ratings. Journal of Financial Research 10 (3) 211-226.

[13] Hand, J., R. Holthausen, and R. Leftwich. (1992). The effect of bond rating agency announcements on bond and stock prices. Journal of Finance 47 (2) 733-752.

[14] Hillegeist, S.A., E. K. Keating, D. P. Cram, and K. G. Lundstedt (2002) Assessing the probability of bankruptcy. Working paper.

[15] Jewell, J. and M. Livingston (1998). Split ratings, bond yields, and underwriter spreads. Journal of Financial Research 21 (2) 185-204.

[16] Kaplay, R. and G. Urwitz. (1979) Statistical models of bond ratings: A methodological inquiry. Journal of Business 52 (2) 231-261.

[17] Kealhofer. S. (2003). Quantifying credit risk I: Default prediction. Financial Analysts Journal 59 (1) 30-44

[18] La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R.W. Vishny (1996) Law and Finance, NBER Working Paper 5661.

[19] La Porta, R., F. Lopez-de-Silanes, A. Shleifer, R. W. Vishny (1997) Legal determinants of external finance. Journal of Finance 52 (3) 1131-1150.

[20] Matolcsy, Z. P. and T. Lianto (1995). The incremental information content of bond rating revisions: The Australian evidence Journal of Banking and Finance 19 (5) 891-902.

[21] Nickell, P., W. Perraudin, and S. Varotto (2000) Stability of rating transitions. Journal of Banking and Finance 24 203-227.

[22] Perraudin, W. and Alex Taylor (1999). On the consistency of ratings and bond market yields. Bank of England working paper.

[23] Pogue, T. and R. Soldofsky (1969). What's in a bond rating? Journal of Financial and Quantitative Analysis 4 (2) 201-228.

[24] Rajan, R.G. and L. Zingales (1995). What do we know about capital structure? Some evidence from international data. Journal of Finance 50 (5).

[25] Reilly and Brown (1999) Investment Analysis and Portfolio Management, 6th edition.

[26] Schwendiman C. and G. Pinches. (1975). An analysis of alternative measures of investment risk. Journal of Finance 30 (1) 193-200.

[27] Steiner, M. and V.G. Heinke (2001). Event study concerning international bond price effects of credit rating actions International Journal of Finance and Economics 6 139-157.

Table I
Distribution of Ratings Across Countries and Rating Categories

	USA	**Canada**	**France**	**Germany**	**Japan**	**UK**	**All Foreign**	**Entire Sample**
Observations	4650	390	255	158	1320	142	2393	7043
Financial Co's	9.09%	17.69%	47.45%	59.49%	20.61%	30.28%	28.08%	15.54%

Rating Categories - All Firms

	USA	**Canada**	**France**	**Germany**	**Japan**	**UK**	**All Foreign**	**Entire Sample**
Aaa	1.33%	–	14.90%	24.68%	2.20%	–	4.76%	2.50%
Aa	8.26%	15.64%	49.80%	45.57%	13.26%	23.94%	21.52%	12.76%
A	33.16%	27.69%	19.61%	17.72%	28.18%	42.96%	28.25%	31.49%
Baa	25.68%	34.87%	14.51%	8.23%	38.71%	28.17%	31.01%	27.49%
Ba	16.49%	15.13%	0.39%	2.53%	12.65%	2.82%	10.24%	14.37%
B	12.11%	6.67%	0.78%	0.63%	4.55%	2.11%	3.93%	9.33%
Caa	2.09%	–	–	–	0.45%	–	0.25%	1.46%
Ca	0.84%	–	–	0.63%	–	–	0.04%	0.57%
C	0.04%	–	–	–	–	–	–	0.03%

Rating Categories - Financial Firms Only

	USA	**Canada**	**France**	**Germany**	**Japan**	**UK**	**All Foreign**	**Entire Sample**
Aaa	–	–	7.44%	41.49%	4.04%	–	8.78%	5.39%
Aa	12.77%	62.32%	73.55%	47.87%	6.99%	58.14%	39.73%	29.32%
A	50.59%	20.29%	18.18%	10.64%	38.97%	41.86%	29.32%	37.53%
Baa	17.73%	15.94%	0.83%	–	47.43%	–	20.98%	19.73%
Ba	12.06%	1.45%	–	–	1.47%	–	0.74%	5.11%
B	5.20%	–	–	–	1.10%	–	0.45%	2.28%
Caa	–	–	–	–	–	–	–	–
Ca	1.65%	–	–	–	–	–	–	0.64%
Observations	423	69	121	94	272	43	672	1095

Table 1: Distribution of Ratings Across Countries

Table I describes the distribution of our sample firms across country, rating, and industry. Panel 1 of the table describes the proportion of financial firms within the sample, panel 2 the ratings distribution for each country, and panel 3 the ratings distribution for financial firms. We note that the foreign portion of our sample tends to have higher ratings and more financial firms.

Table II

Mean Financial Variables by Rating and Country

	USA	Canada	France	Germany	Japan	UK	Foreign	Entire Sample
Aaa Rated Firms								
LT Debt to Capital	22.15	–	54.34	90.74	29.58	–	58.35	45.09
Debt to Capital	57.68	–	118.02	109.73	35.45	–	71.52	65.37
Return on Assets	12.30	–	1.55	0.14	0.91	–	1.43	5.26
Interest Coverage	24.82	–	6.21	–	4.94	–	13.88	20.98
Ln Market Cap.	11.11	–	–	8.51	9.46	–	9.24	10.16
Beta	0.84	–	–	–	0.89	–	0.74	0.79
Altman's Z-score	1.22	–	–	0.13	0.62	–	1.04	1.16
Aa Rated Firms								
LT Debt to Capital	30.07	25.75	41.84	63.10	43.23	41.72	44.39	38.60
Debt to Capital	72.14	93.87	93.64	65.32	63.97	111.63	81.21	77.26
Return on Assets	7.20	2.36	1.22	1.69	1.67	2.91	1.72	3.89
Interest Coverage	16.73	8.61	4.93	8.59	11.65	7.32	10.19	13.62
Ln Market Cap.	9.83	9.05	7.00	10.04	9.56	9.97	8.95	9.31
Beta	0.93	0.80	0.54	0.59	0.55	0.63	0.63	0.76
Altman's Z-score	1.43	0.98	1.00	0.86	0.80	0.84	0.85	1.15
A Rated Firms								
LT Debt to Capital	37.44	33.12	62.73	50.62	33.75	38.43	39.32	38.04
Debt to Capital	76.22	45.01	102.71	88.64	72.82	67.88	70.79	74.51
Return on Assets	4.40	3.10	1.10	1.42	1.70	3.46	2.07	3.61
Interest Coverage	7.47	5.65	4.33	4.09	18.01	4.77	12.56	8.99
Ln Market Cap.	8.55	8.64	8.36	9.42	8.72	9.27	8.73	8.61
Beta	0.84	0.90	0.46	–	0.80	0.70	0.80	0.82
Altman's Z-score	1.09	0.66	0.66	0.94	1.32	0.71	1.07	1.08
Baa Rated Firms								
LT Debt to Capital	42.11	33.96	40.31	41.12	39.77	66.89	40.37	41.40
Debt to Capital	54.75	37.74	79.91	53.42	78.88	67.65	70.22	61.11
Return on Assets	3.52	2.45	1.11	0.87	0.60	5.17	1.20	2.51
Interest Coverage	5.52	4.87	5.13	2.66	6.16	3.49	5.58	5.54
Ln Market Cap.	7.66	7.84	8.50	7.16	7.80	8.25	7.85	7.74
Beta	0.84	0.77	1.43	–	0.89	0.44	0.84	0.84
Altman's Z-score	1.59	0.61	0.80	1.22	0.93	1.21	0.89	1.31

Table 2: Mean Financial Variales by Rating and Country

Table II provides the average observations for our financial variables of interest across country and rating category.

Table III

Test Statistics for Differences in Mean Financial Variables by Rating Category

	US Financial vs US Indust.	Canada vs US	France vs US	Germany vs US	Japan vs US	UK vs US	Foreign vs US
Aaa Rated Firms							
LT Debt to Capital	–	–	3.97**	24.90**	1.19	–	7.89**
Debt to Capital	–	–	2.86**	3.23**	-2.04*	–	1.18
Return on Assets	–	–	-10.69**	-12.66**	-11.73**	–	-10.74**
Interest Coverage	–	–	–	–	-7.58**	–	-2.46*
Ln Market Cap.	–	–	–	-8.34**	-5.42**	–	-7.77**
Beta	–	–	–	–	0.59	–	-1.01
Altman's Z-score	–	–	–	–	-6.09**	–	-1.24
Aa Rated Firms							
LT Debt to Capital	7.41**	-3.13**	3.64**	7.42**	5.66**	3.17**	8.47**
Debt to Capital	6.30**	1.92	1.79	-0.88	-1.30	3.08**	1.48
Return on Assets	-16.77**	-8.06**	-14.05**	-10.67**	-13.79**	-5.79**	-14.04**
Interest Coverage	0.66	-4.40**	-8.54**	-1.83	-2.54*	-5.98**	-3.87**
Ln Market Cap	0.72	-8.44**	-9.73**	1.29	-2.46**	0.64	-7.70**
Beta	5.28**	-1.99	-2.59*	-3.59**	-8.90**	-1.76	-7.50**
Altman's Z-score	–	-3.21**	-3.08**	-4.23**	-4.78**	-3.75**	-4.58**
A Rated Firms							
LT Debt to Capital	5.07**	-2.29*	6.94**	2.26*	-2.53*	0.36	1.66
Debt to Capital	10.68**	-7.50**	3.11**	1.58	-0.53	1.19	-1.23
Return on Assets	-28.03**	-2.84**	-8.53**	-8.02**	-14.72**	-1.54	-13.49**
Interest Coverage	-13.50**	-3.63**	-5.03**	-4.17**	6.24**	-6.37**	4.90**
Ln Market Cap	2.57*	0.86	-0.94	3.60**	2.51*	5.54**	3.31**
Beta	6.11**	0.95	-1.87	–	-1.35	-1.41	1.48
Altman's Z-score	–	-12.13**	-7.89**	-2.02	1.39	-4.80**	-0.17
Baa Rated Firms							
LT Debt to Capital	-3.11**	-6.43**	-0.49	-0.26	-2.28*	0.64	-0.76
Debt to Capital	1.63	-10.59**	2.87**	-0.32	11.41**	0.27	4.87**
Return on Assets	-1.21	-1.40	-4.12**	-3.72**	-17.21**	0.72	-9.47**
Interest Coverage	-4.18**	-1.38	-0.33	-5.95**	1.22	-4.21**	0.15
Ln Market Cap	-3.09**	2.48*	2.89**	-1.31	2.32*	4.54**	3.55**
Beta	0.17	-1.26	–	–	-1.27	-2.14*	-0.01
Altman's Z-Score	–	-1.86	-1.50	-0.68	-1.25	0.69	-1.34

Table 3: Test Statistics for Differences in Mean Financial Variables by Rating Category

* Indicates significance at the 5 percent level. ** Indicates significance at the 1 percent level

Table IV
Firm-Specific Determinants of Credit Ratings

	Entire Sample		**Entire Sample**		**US Only**		**US Only**	
LT Debt to Capital	0.001		0.003**		0.008**		0.008**	
	(0.001)		(0.001)		(0.001)		(0.001)	
Debt to Capital	0.001		0.001		-0.004**		-0.003**	
	(0.001)		(0.001)		(0.001)		(0.001)	
Return on Assets	-0.031**		-0.031**		-0.036**		-0.038**	
	(0.003)		(0.003)		(0.004)		(0.004)	
Interest Coverage	-.099**		-0.010**		-0.018**		-0.14**	
	(0.002)		(0.002)		(0.003)		(0.003)	
Ln. Mkt Cap	-0.658**		-0.660**		-0.598**		-0.609**	
	(0.016)		(0.014)		(0.020)		(0.018)	
Financial	0.310		0.308		0.259		0.253	
	(0.209)		(0.190)		(0.201)		(0.206)	
Beta	0.004		–		0.004		–	
	(0.005)		–		(0.006)		–	
Cuttoff Points								
Cut 1	-8.60	0.18	-8.70	0.16	-8.22	0.22	-8.38	0.20
Cut 2	-7.16	0.15	-7.15	0.13	-6.88	0.19	-6.94	1.67
Cut 3	-5.56	0.13	-5.60	0.12	-5.04	0.16	-5.15	0.14
Cut 4	-4.29	0.12	-4.28	-0.11	-3.91	0.15	-3.97	0.13
Cut 5	-3.20	0.12	-3.22	0.10	-2.85	0.14	-2.92	0.13
Cut 6	-1.37	0.13	-1.32	0.12	-1.07	0.15	-1.06	0.14
Cut 7	-0.49	0.18	-0.40	0.17	-1.01	0.21	-0.06	0.18
Pseudo R^2	0.27		0.28		0.30		0.30	

Table 4: Firm-Specific Determinants of Credit Ratings

Results of the ordered probit estimation predicting rating category given a particular set of firm-specific financial variables are reported in the table above.

*Indicates significance at the 5 percent level.

** Indicates significance at the 1 percent level.

Table V
Prediction Ability of US Rating Scale

	Exact Prediction	**Within One Rating**	**Exact or Within One Rating**
Entire Sample	49.43%	42.86%	92.29%
United States	50.40%	41.13%	91.53%
Canadian	53.43%	40.79%	94.22%
French	44.59%	51.35%	95.94%
German	40.35%	54.39%	94.74%
Japanese	45.92%	47.27%	93.19%
British	54.32%	38.27%	92.59%

Table 5: Prediction Ability of US Rating Scale

We establish how well the ordered probit model based on US firms can correctly predict the actual ratings of the firms in our sample. Interestingly, the model based on US firms correctly identifies a similar proportion of foreign ratings as it does US ratings.

Table VI

Differences in Credit Rating Assignments Among Countries

LT Debt to Capital	0.002**	0.002*
	(0.001)	(0.001)
Debt to Capital	0.001	0.001*
	(0.001)	(0.001)
Return on Assets	-0.033**	-0.034**
	(0.003)	(0.003)
Interest Coverage	-0.010**	-0.009**
	(0.002)	(0.001)
Ln Market Cap	-0.657**	-0.660**
	(0.014)	(0.015)
Financial	0.292	0.270*
	(0.190)	(0.124)
Foreign	-0.093**	–
	(0.039)	–
Canada		0.102
		(0.069)
France		-0.096
		(0.130)
Germany		-0.268
		(0.148)
Japan		-0.135**
		(0.046)
United Kingdom		0.270*
		(0.124)
Cutoff Points		
Cut 1	-8.71 0.16	-8.73 0.16
Cut 2	-7.16 0.13	-7.18 0.13
Cut 3	-5.61 0.12	-5.62 0.12
Cut 4	-4.30 0.11	-4.30 0.11
Cut 5	-3.23 0.10	-3.24 0.10
Cut 6	-1.31 0.12	-1.31 0.12
Cut 7	-0.38 0.17	-0.38 0.17
Pseudo R^2	0.28	0.28

Table 6: Differences in Credit Rating Assignments Among Countries

We examine whether the inclusion of indicator variables describing firm nationality significantly influences our model estimates.

Table VII
Country-Specific Factors in Determining Credit Ratings

LT Debt to Capital	0.003**		0.001	
	(0.001)		(0.001)	
Debt to Capital	0.000		0.001	
	(0.001)		(0.001)	
Return on Assets	-0.030**		-0.34**	
	(0.003)		(0.003)	
Interest Coverage	-0.010**		-0.092**	
	(0.002)		(0.002)	
Ln Mkt Cap	-0.665**		-0.660**	
	(0.014)		(0.015)	
Financial	0.308		0.270	
	(0.190)		(0.190)	
Economic Decline	0.158**		0.173**	
	(0.036)		(0.037)	
Creditor Protection			-0.232**	
			(0.073)	
Rule of Law			-0.638**	
			(0.156)	
French Civil Law			-1.097**	
			(0.235)	
German Civil Law			-0.586**	
			(0.108)	
Cutoff Points				
Cut 1	-8.66	0.16	-15.32	1.64
Cut 2	-7.09	0.13	-13.72	1.63
Cut 3	-5.55	0.12	-12.17	1.63
Cut 4	-4.23	0.11	-10.84	1.63
Cut 5	-3.17	0.11	-9.78	1.63
Cut 6	-1.26	0.12	-7.83	1.63
Cut 7	-0.33	0.17	-6.89	1.64
Pseudo R^2	0.28		0.28	

Table 7: Country-Specific Factors in Determining Credit Ratings

We examine the impact of a country's economic conditions and legal infrastructure on our model of rating assignment using the ordered probit methodology.

* Indicates significance at the 5 percent level.

** Indicates significance at the 1 percent level.

Appendix A

Definitions for Country-Specific Variables

(Source: La Porta et al (1997))

Rule of Law

"Assessment of the law and order tradition in the country. Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for less tradition for law and order. Source: International Country Risk Guide."

Creditor Rights

"An index aggregating creditor rights. The index is formed by adding 1 when: (1) the country imposes restrictions, such as creditors' consent or minimum dividends, to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) the debtor does not retain the administration of its property pending the resolution of the reorganization; (4) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm; The index ranges from 0 to 4. Source: Company Law or Bankruptcy Laws and La Porta et al. (1996)."

Table A.1
Country-Specific Factors

	Legal Origin	**Rule of Law**	**Creditor Protection**
United States	Common Law	10.00	1
Canada	Common Law	10.00	1
France	French Civil	8.98	0
Germany	German Civil	9.23	3
Japan	German Civil	8.98	2
United Kingdom	Common Law	8.57	4
Others			
Australia	Common Law	10.00	1
Finland	Scandinavian	10.00	1
Italy	French Civil	8.33	2
Malaysia	Common Law	6.78	4
Netherlands	French Civil	10.00	2
Sweden	Scandinavian	10.00	2