

**Sovereign debt and regime type:
Re-considering the democratic advantage**

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Abstract

The literature exploiting historical data generally supports the democratic advantage thesis, which holds that democracies can sell more bonds on better terms than their authoritarian counterparts. However, studies of more recent—and extensive—datasets find that democracies have received no more favorable bond ratings from credit rating agencies than otherwise similar autocracies; and have been no less prone to default. These findings raise the question: where’s the democratic advantage? Our answer begins with the premise that countries choose not to enter the international bond market, until they anticipate receiving an acceptable rating from the credit rating agencies. We then develop an estimator of how regime type affects credit ratings and credit access analogous to the “reservation wage” model of labor supply. Our findings indicate that the democratic advantage in the postwar era has taken two forms: first, better access to credit (most autocracies cannot even enter the international bond markets); and second, better ratings, once propensity to enter the market (and other covariates) are controlled.

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Introduction

Do democratic regimes possess a credibility advantage over their authoritarian counterparts in selling bonds? North and Weingast argued that constitutions limiting executive discretion enhance the credibility of a country's sovereign debt.¹ Schultz and Weingast drew the logical conclusion that there should be a "democratic advantage" in debt financing: because they place more limits on their executives, democracies' promises to repay their debts should be more credible.²

The literature exploiting historical data, which includes case studies of 17th-18th century England, 19th century Argentina, and 19th century Brazil, along with panel data on both city states and large states, is generally supportive of the democratic advantage thesis.³ However, studies of more recent—and extensive—datasets show a different picture. A study of 80 developing countries in the period 1971-1997 finds that democracies were more likely to reschedule their debts than autocracies, not less; and that they paid about the same interest rates. Similarly, Archer, Biglaiser and DeRouen's study of 50 developing countries in the period 1987-2003 shows that democracies received no more favorable ratings from the major credit rating agencies than did otherwise similar autocracies.⁴ These findings raise the question: where's the democratic advantage?

Our answer has two parts. First, the studies just cited focus on two variables—interest rates and credit ratings—that reflect the *price* a country has to pay its lenders.⁵

¹ North and Weingast 1989.

² Schultz and Weingast 2003.

³ North and Weingast 1989; Author 2009b; Summerhill 2006; Stasavage 2007; Dincecco 2009.

⁴ Author 2005; Archer, Biglaiser and DeRouen 2007.

⁵ Research has found such variables to be highly correlated. See, for example, Cantor and Packer 1996.

We shall show that democracies have an advantage in the *amount* of debt they can sell on international bond markets. Indeed, while over half of all democracies now sell bonds on the international market, a much smaller proportion of autocracies sell any at all.

Second, even when focusing on the price of debt, one must consider the possibility that countries only seek credit ratings when they anticipate receiving *acceptable* ratings, and hence acceptable interest rates. The fact that far fewer autocracies than democracies have chosen to enter the bond market suggests that single-equation estimates of how regime type affects bond ratings (or interest rates) may run afoul of selection bias. Indeed, once we correct for countries' decisions to enter the bond market or not, we find evidence of a democratic advantage in ratings received.

All told, then, we find a dual democratic advantage. First, democracies have better access to the international bond market than economically comparable autocracies. Second, conditional on entering that market, democracies receive better bond ratings than otherwise comparable autocracies.

In the rest of the paper, we first review the logic of the democratic advantage and the evidence bearing on it. In this section, we also explain why arguments for a democratic advantage in sovereign debt do not imply a necessary advantage in foreign direct or portfolio investment. Next we consider the firms whose credit ratings serve as our dependent variables, and reconsider existing empirical evidence regarding the democratic advantage. We then develop an approach to estimating how regime type affects credit ratings and credit access, analogous to the “reservation wage” model of labor supply.⁶ Finally, we consider how our argument applies to the 1820s, when

⁶ Heckman 1976.

financial intermediaries first played an important role in the international market for sovereign debt.

The democratic advantage

In its first formulation (by North and Weingast), the “democratic advantage” thesis referred primarily to limited government and ran as follows. Governments whose chief executives face constitutional checks and balances (additional veto players) can more credibly commit to repaying their debts, because the chief executive cannot unilaterally repudiate them. The greater credibility of limited governments means *both* that more people are willing to purchase their bonds *and* that those bonds can offer lower interest rates. Or, to turn the point around, the lessened credibility of autocratic governments means both that fewer people are willing to lend them money and that they must offer higher interest rates to attract even those few.⁷

Scholars have reacted to North and Weingast’s argument in several ways. One line of inquiry further develops the theoretical logic of their argument.⁸ Other research disputes either their logic or their evidence. On the logical front, the most recent US credit downgrade, and the potential for similar outcomes in Greece, Spain, and France, might suggest democratic “veto players” are more a problem than a benefit for a

⁷ North and Weingast 1989.

⁸ Stasavage 2003 and Author 2009a, for example, note that the mere existence of multiple actors with a say in default decisions does not ensure bond credibility, because all the veto players may prefer default. Consistent with this point, they show that changes in the preferences of veto players (legislative majorities for Stasavage; key coalition partners for Author) explain interest rate fluctuations. Theories that rely less on constitutional structure include Schultz and Weingast 2003 and Author 2011.

country's credibility. On the evidentiary front, a series of papers that focus on interest rates or credit ratings argue that democracies do not have any observable advantage.⁹

An important issue with which neither “democratic advantage” theorists nor their critics deal is the initial decision to borrow. Extant papers focus—theoretically and/or empirically—only on states that have already decided to enter the bond market; and then seek to explain what determines the credibility of such entrants' bonds. While this focus on “post-entry credibility” makes sense for some purposes, it cannot provide a sound foundation for evaluating the overall democratic advantage in borrowing—simply because the most powerful punishment the market can mete out to a non-credible borrower is refusal to lend at all.

Once we expand our conceptual focus to include a country's decision (or perhaps “ability”) to enter the bond market, some problems in the empirical literature become clear. In particular, studies that explore the determinants of credit ratings, but use data only for countries that have actually received ratings, must implicitly assume that entry is “ignorable” in the statistical sense.¹⁰ If observations are generated at random then the origin of those observations is not important, but where observations are not generated randomly, as with credit ratings, we must consider the process by which certain countries came to receive a rating while others did not.

In this paper, we demonstrate that entry is not ignorable. More importantly, we take a broader conceptual view of the democratic advantage than do articles that examine

⁹ Some negative findings exploit contemporary data—e.g. Archer, Biglaiser, and DeRouen 2007, Author 2005 —while others use historical data—e.g. Sussman and Yafeh 2006.

¹⁰ For recent surveys of studies that examine the determinants of credit ratings, see Hoti and McAleer 2004 and Gaillard 2009. For more on the notion of “ignorability” see Jaeger 2005.

only credit ratings, interest rates, or default probabilities—one that embraces not just the price but also the amount of debt.

As an aside, we should note that none of the arguments for a democratic advantage in sovereign debt clearly imply any advantage in foreign direct or portfolio investment. Consider foreign direct investment (FDI). In a typical transaction, an investor puts money into a “project” and receives non-voting equity (a promise of a share of profits) in return. When deciding whether to invest, the investor considers the risk of promise repudiation. Democracies may have some advantage on this score. However, the investor also considers how costly it will be to purchase the ‘development rights’ needed for the project. Can all the existing rights-holders who stand in the way of the project be pushed aside cheaply? Autocracies often have some advantages on this score. Thus, no clear theoretical argument predicts a net democratic advantage in (this common kind of) FDI. Relatedly, evidence on the existence or non-existence of a democratic advantage in FDI isn’t relevant, in any straightforward way, to assessing whether a democratic advantage in borrowing exists.¹¹ Consider portfolio investment (PI) next. In a typical transaction, a foreign investor might purchase bonds issued by a domestic company. Such debt can be very different from sovereign debt. First, corporations typically cannot selectively default, whereas sovereigns can. Second, bond-holders typically have better legal rights—e.g., to force bankruptcy—vis-à-vis corporations. Thus, whether democracies should have any advantage in these areas remains unclear, on the basis of the theories considered here.

¹¹ Regarding evidence on the existence or non-existence of a democratic advantage in FDI, see Li and Resnick 2003; Jensen 2003.

Our empirical analyses focus on credit ratings issued by Standard and Poor's and Moody's. Until 1990, these two were the only National Recognized Statistical Rating Organizations (NRSROs) designated by the US Securities and Exchange Commission. Moreover, they continue to dominate the rating industry today.¹² In the next section, we briefly describe these firms and their ratings.

The credit ratings agencies

Over the last thirty years, domestic and international markets for stocks, bonds and a variety of other tradable securities have burgeoned, while reliance on traditional bank loans and deposits has lessened.¹³ This increased reliance on securities markets has opened the door for an important new actor: the Credit Rating Agency (CRA).

CRA's began rating bonds in the U.S. in the second half of the 1800s, as a response to "market turbulence created by failed railroads, dubious Florida land schemes, and other property deals in the newly opened lands of the western United States."¹⁴ Sensing demand for information regarding potential investments, Henry V. Poor published a series of journals and manuals on U.S. railroads. John Moody followed suit with his *Manual of Industrial Statistics* in 1900. These early investor services positioned Poor and Moody (and the companies bearing their names) to offer bond ratings, which took off following the Glass-Steagall Act of 1933.¹⁵ To begin with, the CRA's issued credit ratings mainly for U.S. companies and municipalities.

¹² In the mid-1990s several smaller ratings agencies emerged, and were ultimately absorbed into a third agency: Fitch. See Vaaler and McNamera 2004. While Fitch has grown as a result of its acquisitions, and is considered by Archer Biglaiser and DeRouen 2007, it is still considered a "distant third" relative to Moody's and S&P. See T. Sinclair 2003.

¹³ Rodrik 1997; Häusler 2002; Rudra 2002; Rudra and Haggard 2005; Das 2006.

¹⁴ T. Sinclair 2005, 23.

¹⁵ For more detailed information on the evolution of CRA's, see T. Sinclair 2005.

Beginning in the late 1970s, however, more and more countries sought ratings of their sovereign debt (and typically paid for the privilege).¹⁶ When CRAs rate sovereign debt, they attach a “grade” value to the country’s initial issuance of debt, which comes to represent the country’s creditworthiness more generally. Although the specific grades attached to various increments differ across the agencies, all CRAs assign ratings along a scale (typically 16 point) that ranges from AAA (Aaa for Moody’s) to C.¹⁷ Credit ratings provide potential investors with information about the probability that their loans will be repaid. Any rating in the top nine points of the sixteen-point scale is considered investment-grade, while ratings in the lowest 7-point range (BB+ (Ba1) – C) are considered speculative or “junk”. After a country receives an initial rating, the CRAs continuously monitor its creditworthiness and adjust their ratings accordingly. In our dataset there is no case of a country securing a rating and subsequently becoming unrated. So far, it has been “once rated, always rated.”

In deciding each country’s rating, CRA analysts consider many factors. One approach to assessing whether any democratic advantage exists in ratings is simply to ask the analysts. Here, the evidence seems mixed. On the one hand, the sovereign debt raters interviewed by Archer, Biglaiser, and DeRouen had difficulty identifying any specific political criteria as influencing their decisions.¹⁸ On the other hand, David Levey, managing director of Moody’s sovereign ratings division from 1985 to 2004, has said the assessment that informed a sovereign credit rating was “always a political analysis as much as an economic analysis.” He also noted that, while the economic indicators

¹⁶ According to Cantor and Packer 1994, the practice of debt issuers paying for their ratings began after the \$82 million default of Penn Central in 1970. After that incident, issuers sought credit ratings as a means of assuaging investor concerns about credit risks.

¹⁷ A country in default can receive a rating of “D”.

¹⁸ Archer, Biglaiser, and DeRouen 2007, 357.

informing a rating decision were easily quantifiable, the political analysis was always more “qualitative,” which may help explain why the raters interviewed by Archer, Biglaiser and DeRouen had difficulty identifying clear and specific political criteria.¹⁹

Another point we would make is that the CRAs’ internal procedures have likely been affected by who their customers are. CRAs honed many of their ratings methodologies on corporate firms and securities, not sovereign states. Thus, the expertise undergirding the ratings process is more financial than political. Furthermore, if our basic thesis is correct, then raters will have observed a biased sample of autocracies. Perhaps, if random samples of autocracies and democracies had sought ratings, raters would have developed an explicit preference for democracies over autocracies.

Reconsidering the evidence

Archer, Biglaiser and DeRouen present a model in which the dependent variable is the rating (from Moody’s, Standard and Poor’s, or Fitch) that a country’s sovereign bonds receive in a given year. Their predictive variables measure natural resource endowments; history of bond default; macroeconomic conditions such as total external debt, inflation, and current account balance; and various political factors, including a continuous measure of democracy from the Polity IV dataset. Their main finding is that “regime type and most other political factors have little effect on bond raters. Instead, trade, inflation, growth and [a past history of] bond default strongly affect sovereign ratings.”²⁰ In other words, economic fundamentals and past behavior drive the credit ratings a country receives; no democratic advantage exists.

¹⁹ Information from personal interview, conducted 10.12.2009.

²⁰ Archer, Biglaiser, and De Rouen 2007, 341.

Archer, Biglaiser and DeRouen do show that, among a sample of developing countries in 1987-2003, ratings were driven by economic considerations and not by regime type.²¹ However, our data indicate that relatively few autocracies secured ratings during this period, whereas relatively many democracies did.²² Of all autocratic country-years during the period between 1987-2003, 17% were rated by either or both of the two top CRAs (Moody's and S&P). In contrast, 67% of democratic country-years in this period were rated. Most democracies (51 out of 56) had entered the international market for sovereign debt and received ratings by 2003, whereas a significant number of autocracies (12 out of 33) had not.

Furthermore, if the democratic advantage is large, then democracies can enter the bond market with relatively poor economic fundamentals. Lacking any credibility advantage, however, autocracies can only enter the market on the strength of their economic credentials. Thus, if the democratic advantage is significant, then rated *democracies* should on average have poorer natural resource endowments, smaller domestic markets, and so forth than rated *autocracies*.

Our sample, covering the period between 1963-2008 (summarized in Appendix 1), provides some illustrative evidence for this prediction: many autocracies that had entered the bond market by 2008 had sterling economic fundamentals. For example, Bahrain, Kuwait, Oman, and Saudi Arabia have oceans of oil and together account for 40 cases (country-years) of an autocracy issuing bonds and receiving a rating. China, Malaysia, and Singapore have stable hegemonic parties sitting on important emerging markets;

²¹ Archer, Biglaiser, and DeRouen 2007.

²² Following Przeworski et al. 2000, a country is considered democratic if during a particular year it satisfies all four criteria: (1) the chief executive is elected, (2) the legislature is elected, (3) more than one party competes in elections, (4) incumbent parties have in the past or will have in the future lost an election and yielded office. All countries that fail to satisfy at least one of these four criteria are classified as autocratic.

South Korea before democratization can be added to this group. Altogether, these countries account for 47 years of the data on autocracies with credit ratings.

In addition to good economic fundamentals, three regional groupings of non-democratic countries appear to have entered the bond markets in part due to their geo-political location and with considerable encouragement from the west. First, Ecuador, Mexico, Panama, and Peru account for 23 country-years in which an autocracy received a rating. Second, Belarus, Kazakhstan, and Bosnia and Herzegovina account for 16 country-years. Third, Egypt, Jordan, Morocco, Tunisia, and Pakistan account for 46 country-years.

If one excludes these three groups—the oil-rich, the stable rulers of important markets, and the geo-politically favored—the chance that an autocracy will receive a rating is substantially lower. Of the 780 autocratic country-years in our sample only 5.6% of those receiving a rating did not fall into one of these three categories.

More systematic evidence that rated democracies had, for the most part, poorer economic fundamentals than entering autocracies in the 1963-2008 period can be seen in Table 1, which compares average values across regime type for several key economic indicators and tests the difference in means.

[Table 1 about here]

Over this period, rated autocracies had an average natural resource endowment double that of rated democracies. Autocracies' inflation rates were four times lower on average. Their current account and trade balances were also on average more favorable than their democratic counterparts'. Growth rates of rated autocracies were larger on average by more than one percentage point than democratic countries. Their populations

were on average larger. While average rates of default show no statistically significant difference across regime type, the only rating criteria on which entering autocracies looked significantly worse than entering democracies was that the size of their economies and their per capita incomes were lower on average. In terms of the ratings themselves, Table 1 shows that democracies received significantly higher average ratings from both Moody's and Standard and Poor's (but of course this comparison does not control for economic factors).²³

Selection bias in estimating the democratic advantage

The large difference in the rate at which autocracies and democracies participate in the international bond market, together with the systematic economic differences between participating autocracies and democracies, raises the possibility that a single-equation estimator of the impact of regime type on default rates, credit ratings or interest rates will underestimate the relevant effects. In particular, sample selection biases may explain why Archer, Biglaiser and DeRouen find no evidence of a democratic advantage.²⁴ One does not directly observe how much autocracy depresses credit ratings because those autocracies that would receive low ratings decide not to enter the bond market.

We should note that empirically there were two routes by which a country might enter the sample of rated polities. One route, traveled by a substantial majority of new entrants, particularly since the mid-1990s, was self-selection: the country itself requested

²³ If one excludes from our sample four long-term democracies that first secured ratings in the period 1963-2008 (namely, Belgium, India, Italy, and Netherlands), the evidence for the hypothesis that rated democracies had poorer economic fundamentals than rated autocracies is unchanged.

²⁴ Archer, Biglaiser, and DeRouen 2007.

a rating from one of the CRAs. A second route, traveled by the remaining minority, was selection by interested third parties, either international investment bankers or development banks providing concessionary funding.²⁵

Although these modes of entry into the sample might appear quite different, in principle and in practice, they were very similar. To call country requests for ratings “self-selection” is somewhat misleading in that, typically, investment bankers would alert a country when its economic and/or political circumstances had reached a point where it might think about accessing the international bond market, and then subsequently offer to underwrite the country’s first bond issue.²⁶ Hence, whether the request for rating came directly from the investment banker or from the country on the advice of the investment banker, these financial intermediaries were clearly central to the decision to enter the market for sovereign debt. Accordingly, in what follows we pool data from self-selected and banker-selected entrants.

Road map

To explore the possibility that selection bias may have affected estimation of the democratic advantage, we pursue two distinct lines of investigation. First, we consider a selection model in which all and only countries that can earn a rating above their “reservation rating” enter the international bond market, using data from 1987-2003 and 1963-2008 to test it. Second, we consider evidence from the 1820s, arguing that a similar

²⁵ From 1986 to the mid-1990s, Moody’s rated some countries “without request.” According to David Levey, the decision to rate “without request” was always motivated by investor interest; either investment bankers would signal that a particular country had the potential to enter the international bond market, or investors would request ratings on sovereign debt that had already been issued, which was primarily restricted to those bonds issued in the Brady Bond conversions. Standard and Poor’s has officially declined to rate sovereign debt without request, but did participate in an IMF/World Bank program that occurred in 2003-2004 whereby a handful of African countries, including Kenya, received credit ratings, at the request of these concessionary lenders, in an attempt to help these countries gain access to capital markets. Moody’s did not participate in this program.

²⁶ Information from Levey interview 10.12.2009.

form of selection bias influences the patterns observed then (in which some absolutist regimes were able to access credit on terms as favorable as those received by limited governments).

The “reservation rating” model

Under a “reservation rating” model, countries that have not yet secured ratings anticipate the rating they would earn, were they to seek one. They actually secure a rating if and only if their anticipated rating exceeds their reservation (or minimum acceptable) rating. In the rest of this section, we elaborate on the factors that influence each country’s anticipated and reservation ratings.

Since ratings map directly into interest rates—lower ratings, higher interest rates—we can also view this as a “reservation interest rate” model. Under this interpretation, countries secure ratings if and only if their anticipated interest rate falls short of their reservation (maximum acceptable) interest rate.²⁷

Anticipated ratings

To explain country j ’s anticipated rating, let p_{jt} be the probability that j will keep to its repayment schedule on a loan taken out in year t . Suppose that country j ’s credit rating will be $R[p_{jt}]$, where R is a monotonic increasing function. That is, the credit rating agencies will correctly calculate each country’s probability of honoring its debt, p_{jt} , and transform this monotonically into a rating somewhere from C (the lowest possible) to AAA (the highest possible). It will be more convenient to use a numerical version of country j ’s bond rating. Following Archer, Biglaiser and DeRouen, we convert the letter

²⁷ The average first rating that countries receive in our sample is indeed investment grade (10.18 if rated by Moody’s and 10.11 if rated by Standard and Poor’s), consistent with the idea that countries only decide to get rated when they anticipate a favorable rating.

ratings to a 0-16 scale. In other words, we can think of R as mapping p_{jt} into a value between 0 and 16.²⁸

We assume country j 's anticipated rating equals the rating it would in fact get, were it to solicit one. It is as if country j knows its true probability of honoring its debts (p_{jt}) and knows the function R that maps this into a credit rating.

We next assume that p_{jt} , and hence $R[p_{jt}]$, depends on country j 's economic fundamentals, X_{jt} , and its regime type, D_{jt} (where $D_{jt} = 1$ if j is a democracy at t). Letting $r_{jt}^a = R[p_{jt}]$ represent country j 's anticipated credit rating at time t , we write

$$r_{jt}^a = X_{jt}\beta + \gamma D_{jt} + \varepsilon_{jt} \quad (1)$$

Here, β and γ are parameters to be estimated; and ε_{jt} is an error term. Special interest attaches to the parameter γ , which represents the democratic rating advantage, or how much more credit-worthy a country is when it is democratic rather than non-democratic, holding economic fundamentals constant. We specify particular operational variables representing each country's "economic fundamentals" below but note here that they include current account balances, economic growth rates, size of economy, inflation, trade, resource endowments and default history.

Reservation ratings

Country j 's reservation rating is the minimum rating (equivalently, maximum interest rate) that it would be willing to accept. To clarify the factors that influence a country's reservation rating, consider each country's marginal debt financing opportunity. After allocating all its available funds (from taxes, state-owned enterprises, foreign aid, and so forth) optimally, country j at time t identifies its next best as-yet-

²⁸ Archer, Biglaiser, and DeRouen 2007.

unfunded investment opportunity (henceforth: its marginal project). We assume that j chooses one of the following three options: (1) to forego the opportunity (netting 0); (2) to borrow without securing a rating and use the loan proceeds to finance the project (yielding an expected profit of W_{jt}); and (3) to borrow after securing a rating and use the loan proceeds to finance the project.

Assuming for convenience that country j is risk neutral, we can define its reservation rating as that rating which yields zero excess profits over its next best option (which is the better of (a) debt financing the project without securing a rating and (b) foregoing the project). Suppose that country j 's marginal project at time t requires an investment of L_{jt} and will yield an expected return of $V_{jt}(L_{jt})$. Country j 's expected profit—if it secures a rating, debt finances its project and honors its debt—is then $V_{jt}(L_{jt}) - L_{jt}(1+i_{jt}) - c_{jt}$, where i_{jt} is the interest rate on its bonds and c_{jt} represents the fixed costs of the debt issue.²⁹ The fixed costs include any payments made to a CRA to secure a rating and, more importantly, the fees paid to international bankers to handle the marketing of the bonds (which typically run at about 2% of the total revenue generated by the bond issue). The maximum interest rate country j will accept is

$$i_{jt}^r = [V_{jt}(L_{jt}) - L_{jt} - c_{jt} - \max\{0, W_{jt}\}] / L_{jt}; \quad (2)$$

and we can denote the corresponding minimum acceptable credit rating by r_{jt}^r .³⁰

A country's reservation rating, r_{jt}^r , declines as its reservation interest rate, i_{jt}^r , increases. Thus, r_{jt}^r declines as the country: acquires more attractive projects to finance

²⁹ We simplify by assuming that the borrowing nation is patient (its discount factor is unity).

³⁰ Equation (2) follows by noting that securing a rating will be country j 's best option if and only if $V_{jt}(L_{jt}) - L_{jt}(1+i_{jt}) - c_{jt} > \max\{0, W_{jt}\}$.

($V_{jt}(L_{jt}) - L_{jt}$ increases); faces lower fixed costs of floating bonds (c_{jt} declines); and has a poor ability to debt finance its projects absent a rating ($W_{jt} < 0$ rather than $W_{jt} > 0$).

We argue that the expected returns of the investment projects available to most of the countries of the world should have increased during the post-war period, due to the globalization of markets and the reduction in trade barriers. We also believe that the fixed costs of issuing and marketing sovereign debt declined over this period, as the international bond market matured.³¹ Thus, *we expect globalization should have produced a secular decline in countries' reservation ratings (r_{jt}^r)*.

There are two direct implications of our argument about globalization. First, if reservation ratings declined globally, then the total number of countries participating in the bond markets should have increased over time. Consistent with this expectation, the total number of countries with bond ratings from either Moody's or Standard and Poor's increased from 3, in 1974, to 101, in 2003. Second, if reservation ratings declined globally, then the average rating given to newly rated countries should have declined over time. Consistent with this expectation, Moody's new ratings declined by about one fifth of a point per year (on a 16-point scale) over the period studied by Archer, Biglaiser and DeRouen, while Standard and Poor's new ratings declined by about one seventh of a point per year.³²

To express our argument about reservation ratings econometrically, let r_{jt}^r denote country j 's reservation rating in year t and assume

$$r_{jt}^r = Z_{jt}\xi + v_{jt} \quad (3)$$

³¹ Interview, David Levey, 10.12.2009.

³² Moody's decline was statistically significant; Standard and Poor's was not.

Here, Z_{jt} is a matrix of regressors affecting j 's reservation rating in year t , ξ is a column vector of parameters to be estimated; and v_{jt} is an error term. Following our discussion above, we assume that Z_{jt} includes a set of temporal fixed effects. The temporal effects allow the global mean reservation rating to adjust from year to year. If our globalization hypothesis is correct, we should find that the coefficients on the year dummies show a pattern of increasingly negative values.

Entry

In our model, country j will enter the bond market if and only if it anticipates receiving a sufficiently high rating: $r_{jt}^a \geq r_{jt}^r$. We observe ratings only for countries that choose to secure them. Let $I_{jt} = 1$ if country j receives a rating in year t , $= 0$ otherwise.

Following Heckman, we assume the errors in equations (1) and (3) follow a bivariate normal distribution:³³

$$\begin{pmatrix} \varepsilon_{jt} \\ v_{jt} \end{pmatrix} \sim N \left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_\varepsilon^2 & \sigma_{\varepsilon v} \\ \sigma_{\varepsilon v} & \sigma_v^2 \end{pmatrix} \right)$$

With this assumption, $\Pr[I_{jt} = 1 | X_{jt}, D_{jt}, Z_{jt}] = \Pr[X_{jt}\beta + \gamma D_{jt} + \varepsilon_{jt} > Z_{jt}\xi + v_{jt} | X_{jt}, D_{jt}, Z_{jt}] = \Pr[v_{jt} - \varepsilon_{jt} < X_{jt}\beta + \gamma D_{jt} - Z_{jt}\xi | X_{jt}, D_{jt}, Z_{jt}]$. Since the composite error $v_{jt} - \varepsilon_{jt}$ is normally distributed with mean zero and variance $\tau^2 = \sigma_\varepsilon^2 + \sigma_v^2 + 2\sigma_{\varepsilon v}$, one can model the decision to secure a rating as a probit: $\Pr[I_{jt} = 1 | X_{jt}, D_{jt}, Z_{jt}] = \Phi[(X_{jt}\beta + \gamma D_{jt} - Z_{jt}\xi)/\tau]$.

The main problem with assuming a bivariate normal distribution for the errors is that the rating variable runs from 0 to 16. To deal with this we linearly transform the

³³ Heckman 1976.

credit ratings, r , to $r' = \frac{1}{16} + \frac{255}{256}r$, and then take the natural logarithm. Thus, our rating variable is $\ln(r')$, rather than r .

Estimation and results

We use Heckman's method to estimate the impact of democracy on sovereign credit ratings.³⁴ The model he suggests first estimates a probit model of the decision to enter the market, with dependent variable I_{jt} and regressors X_{jt} , D_{jt} and Z_{jt} . It then runs a second-stage regression, in which the actual credit rating received by countries choosing to be rated is the dependent variable.³⁵ The first-stage results allow us to correct for sample selection in the second-stage regression.³⁶

Although the Heckman model is identified when the same independent variables appear in both the selection and outcome equations, it is generally recommended to include at least one extra explanatory variable that influences selection but not the subsequent outcome of interest. Here we include a variable measuring a country's exports to the United States. This measure proxies a country's friendliness with major western powers, which should affect its decision to seek a rating but not the rating it receives, given that we already account for total trade. We noted earlier that many of the authoritarian regimes seeking ratings had close ties to the West. More generally we would expect close economic and political ties to the West to encourage countries to seek

³⁴ Heckman 1979.

³⁵ In a slight departure from standard reservation wage models, where a single wage is observed after entry, we observe a short panel of ratings for each country after entry. Our current model treats these different ratings symmetrically. Our results are robust to alternative specifications which allow the propensity score's influence on ratings to decay with time, but given the short times span of these panels and the relatively durable considerations that tend to influence ratings, our current modeling decision seems appropriate.

³⁶ The standard errors of the estimates also must be adjusted for the selection process. See Greene 1993. In the results presented below, all standard errors have already been corrected.

ratings, regardless of regime type. We also include a series of year effects in the selection equation.³⁷ Finally, we use clustered error terms to account for the likely non-independence of observations from the same country; and estimate using MLE.³⁸

1987-2003

We first evaluate the impact of democracy over the same time period as Archer, Biglaiser and DeRouen. Our sample for this analysis consists of country-years in the period 1987-2003 for all countries that had not yet received a credit rating by 1986. As of 1986, all the OECD members were rated, except for Belgium, Greece, Iceland, Luxembourg and Turkey, all of which had secured ratings by 1989. Thus, the bulk of the OECD countries never enter our analysis, and our sample is largely similar to Archer, Biglaiser and DeRouen's.³⁹

Our results (reported in Appendix 2) reveal that (a) democracies are significantly more likely to receive a rating; (b) there is significant cross-equation error correlation, underlining the possibility of selection bias; and (c) democracies receive higher ratings than autocracies, although the difference is not statistically significant. We favor a slightly different specification than that used by Archer-Biglaiser-DeRouen and, as explained below, under this specification a democratic advantage appears in both access to credit and received rating. Rather than demonstrate this fact just for the time period 1987-2003, we expand our data coverage to include both developing and developed

³⁷ Because our observations I_{jt} —which represent whether a country receives a credit rating in a given year—are equivalent to grouped duration data, the temporal effects approximate a baseline hazard function, following Beck, Katz, and Tucker 1998, 1268.

³⁸ MLE tends to be less robust but is more efficient when v_{jt} and ϵ_{jt} really are jointly normally distributed. Woolridge 2002.

³⁹ Archer, Biglaiser, and DeRouen 2007. A replication using the exact same countries as Archer Biglaiser and DeRouen provides only 8 observations of “unrated” countries and, as such, does not provide adequate information for the 2nd stage analysis.

countries over the period 1963-2008, since there is no reason why the theory presented in this paper should be more applicable to developing countries than developed; or to one period rather than another.

1963-2008

Table 2 presents the results of three different specifications for credit ratings given by both Moody's and Standard and Poor's: a main model (1) and two robustness checks (2-3).

[Table 2 about here]

Model 1 covers the years 1963-2008 and all sovereigns that had not yet received a credit rating by 1951. The dependent variable in stage 1 of the model (reported in the *bottom* portion of the table) is whether a country received a rating from Moody's Credit Rating Agency (1a) or Standard and Poor's (1b) in a given year. The positive and statistically significant coefficient on *Democracy* in this stage shows that democracies were much more likely than autocracies to receive a rating. Our results also show that countries which had previously defaulted, and those that traded less with the US, were less likely to receive a rating.

To clarify how much democracy boosts credit access (i.e., receiving a rating), Figure 1 overlays two density plots, showing how many autocracies (respectively, democracies) had each possible estimated probability of receiving a credit rating.⁴⁰ The results show that, even after we control for economic conditions, democracies have a higher probability of obtaining a credit rating.

⁴⁰ These results correspond to the analysis of Moody's credit ratings; a similar exercise using Standard and Poor's ratings yields similar results.

[Figure 1 about here]

The dependent variable in stage two of the model is the actual credit rating assigned to each country that received a rating in a given year. While several economic variables significantly affect sovereign credit ratings, the positive and significant coefficient for *Democracy* shows that regime type also influences a country's credit rating. That is, once we control for selection, democracies receive more favorable credit ratings than otherwise comparable autocracies.⁴¹

To further examine the relationship between political regimes and countries' ratings, we fit a fractional polynomial on the data. Specifically, we calculate the predicted value of each country's Moody rating based on a fractional polynomial of their predicted probability of being rated obtained from our "selection" equation described above. Figure 2 shows the resulting curves, along with 95 percent confidence intervals (denoted by the shaded areas) of the estimated means for each type of political regime.⁴²

[Figure 2 about here]

The estimates presented in Figure 2 represent a convenient way to match on propensity score and compare credit ratings. As Figure 2 indicates, democratic countries with any given probability of entering the credit market tended to obtain better ratings than their autocratic counterparts.⁴³

⁴¹ The effect of the economic variables is even more pronounced when we estimate our models using a "two-step" Heckman rather than MLE. The effect of democracy remains unchanged.

⁴² Fractional polynomials were first introduced by Royston and Altman (1994) as a method for determining the functional form of a continuous covariate from a flexible range of candidate models. Their use has been advocated as the analysis does not depend on the number and choice of cut points when categorizing continuous variables. Lambert et. al. 2005.

⁴³ This analysis, however, does not take into account the varying numbers of democracies and autocracies at each estimated probability of being rated. Moreover, matching on propensity score should ensure equal values of "anticipated rating - reservation rating," rather than equal values of actual ratings. So, it is possible that autocracies with a given probability of being rated have quite different reservation ratings than democracies with the same estimated probability.

To illustrate the magnitude of the democratic advantage in ratings, we focus on a hypothetical borrower rated in the 1980s, which had not recently defaulted, and set all other variables to the sample average. The predicted credit rating in that case would increase by 10 points, if the country possessed democratic rather than autocratic institutions (equivalent to going from a Baa3 rating to a Aa2 rating).⁴⁴

In addition to documenting a dual democratic advantage, Models 1a-1b also demonstrate a more general point—that the relationship of regime type to credit ratings is best modeled as a selection process. The parameter rho (ρ), reported at the bottom of the table, captures the correlation between the errors in the first and second stage equations.⁴⁵ Its statistical significance indicates that any attempts to model the determinants of credit ratings in a single-equation model will return biased results—not just in estimating the democratic advantage but in estimating all parameters of the model.

To further address any problems caused by temporal correlation of the observations from each country (recall that we cluster the errors by country), we also estimated our core specification using Prais-Winsten regression. This captures any first-order autocorrelation in the errors and produces panel-corrected standard errors (PCSEs). The results are very similar to those reported in Table 2.

⁴⁴ The nonlinear nature of our estimator means that there is no single marginal effect of democracy. Another example would be a borrower rated in the 1980s, which had defaulted on its sovereign debt, and had all other variables at the sample mean. The predicted credit rating in that case would increase from a C rating (the lowest possible score) to an A3 rating, if the country possessed democratic institutions.

⁴⁵ For estimation purposes, the correlation is reparameterized using a Fisher's z transformation, represented by $z=(1/2)\ln((1+\rho)/(1-\rho))$. The reason is that not all positive and negative numbers represent valid values for correlations or standard deviations, which can make it more difficult to estimate the model. The transformation is a way to work around this problem. See Buis 2011.

Robustness Checks

Models 2 and 3 check the robustness of Model 1 against potentially competing arguments. Model 2 considers whether stability might be a more important political consideration than regime type in determining a country's access to credit and subsequent credit rating. To capture political stability, we use an indicator of the regime leader's years in office from the World Bank's Database of Political institutions.⁴⁶ This variable does not attain statistical significance in either stage of the model; and *Democracy* continues to boost both the probability of receiving a rating and the actual substance of the rating. Moreover, the rho parameter remains highly significant, indicating selection effects.

Model 3 considers two different alterations to the econometric specification. First, it includes per-capita GDP, rather than GDP, to measure national income. Second, to address possible differences between developed and developing countries, it excludes developed countries from the analysis.⁴⁷

The results remain similar in two crucial respects. First, democracies remain significantly more likely to receive a rating than autocracies. Second, the rho parameter continues to indicate that significant selection effects exist. However, in this specification, democracies exhibit no advantage in the ratings they receive (stage-two).

⁴⁶ See the data appendix. Unfortunately, including the political stability measure reduces the sample size. To ensure that the democratic advantage is robust to changes in the sample, we re-estimated our core specification using this reduced sample. The effect of regime type on creditworthiness remains robust.

⁴⁷ Following the World Bank's criteria, we consider a country with a per capita income in excess of \$12,275 USD to be a high-income, or developed, country.

Democracy or Development?

The disappearance in Model 3 of “half” the democratic advantage (that pertaining to ratings received) is due to the inclusion of GDP per capita, instead of GDP.⁴⁸ In this section, we defend our original specification (using GDP).

We would argue that per capita GDP cannot be justified as a purely economic predictor of credit ratings. If lenders properly assess a country’s credit-worthiness, when they first lend it money, then the only variables that predict default should be those measuring *unanticipated changes* in the polity’s financial health. If country *j* borrows at time *t* with economic fundamentals X_{jt} , and these do not change in unanticipated ways, then *j* should repay its debts.

All the variables we include in Model 1 are change variables (e.g., change in GDP per capita), or are level variables that actually change over short time spans in sometimes unpredictable ways (e.g., GDP). The same cannot be said for population; it changes relatively slowly and predictably over time. Thus, if lenders lend optimally, variations in GDP, not variations in population, should be the main predictors of variations in a country’s credit-worthiness.

Readers convinced by this “rational expectations” argument should prefer Model 1 to Model 3—in which case a dual democratic advantage is in evidence.⁴⁹ Those unconvinced by our argument may prefer Model 3 to Model 1. In this case, the most we can say is that a democratic advantage exists in credit access; there is clearly evidence of selection effects, making single-equation estimation of how regime type affects credit

⁴⁸ We estimated a version of Model 3 which included all the observations in our sample, adding a “dummy” variable for developed democracies. The results were virtually identical to those reported in Table 2.

⁴⁹ Of course, the logic of our remarks is that a better variable than GDP would be a measure of unanticipated changes in GDP.

ratings improper; but our best effort at correcting for selection does not show any democratic advantage in credit ratings—presumably because of the high correlations between per capita GDP and democracy.

Does financial intermediation reduce the democratic advantage?

At this point, we turn our focus from contemporary cross-national analysis to an historical case study—for two reasons. First, having asserted that the logic of our theory should be generalizable beyond any particular period of time or set of countries, we have an opportunity to expand our analysis beyond the post-WWII era and consider whether events in the international bond market of the 1820's lends support to, or challenges, our theory. Second, this time period provides the opportunity to investigate one remaining counter-argument: that the existence of financial intermediaries such as CRAs effectively nullifies any democratic advantage, as the reputations of the financial intermediaries, not the sovereign regimes, become relevant to investors. Flandreau and Flores argue that, when the first robust international market for sovereign bonds got going in the 1820s, strong financial intermediaries played a crucial role that largely defused the democratic advantage.⁵⁰ Their argument runs as follows.

First, the intermediaries—the Rothschilds, Barings and other large banks—in effect loaned their reputations to sovereign borrowers. Bond purchasers relied, not on the reputation of the sovereign borrower, but rather on the reputation of the intermediary. Second, the most prestigious banks—the Rothschilds and Barings—were willing to lend their sterling reputation to any state which “could implement the policy adjustments” they required; and the ability to implement these adjustments depended mainly on “the quality

⁵⁰ Flandreau and Flores 2009.

of the administrative apparatus and centralization of decision making” in the state.⁵¹ Thus, stable and centralized autocratic states such as Russia, Austria and Prussia were able to borrow on favorable terms. In other words, since intermediaries’ reputations were what mattered, and intermediaries were willing to deal with autocrats, no democratic advantage existed. Indeed, Flandreau and Flores conclude (p. 679) that “there was a bias in favor of arch-conservatives who had no remorse about implementing unpopular policies or even ruthless repression.⁵² This somewhat frightening conclusion is antithetic to the ‘democratic advantage’ view...”

While we agree that financial intermediaries in the 1820s could in effect rent their reputations to sovereign borrowers, we do not agree with the ultimate conclusion that this lessened the democratic advantage. Rather, we believe that sample selection, similar to that we have identified above, occurred in the 1820s as well; and that once one accounts for this, the success of a few exceptional autocracies no longer casts much doubt on the overall thesis.

Suppose the intermediaries of the 1820s judged a country more credit-worthy when its executive faced more democratic restraints, controlling for economic fundamentals. They might still deal with some autocracies—those which could overcome their credibility deficit with other characteristics making them an attractive client. But democracies should still have had an advantage in accessing credit at a reasonable price (interest rate).

The evidence from the 1820s seems broadly consistent with this view. First, Ferguson, echoing Polanyi, argues that the Rothschilds favored borrowers with more

⁵¹ Flandreau and Flores, 679.

⁵² Ibid.

democratic restraints in the early 1800s.⁵³ More colorfully, consider the case of Gregor MacGregor, a Scottish swindler who managed to sell sovereign bonds for the non-existent Central American country of Poyais. MacGregor clearly was fully in control of the characteristics of Poyais and he saw fit to endow it, not simply with abundant natural resources ripe for exploitation, but also with a democratic form of government.⁵⁴ Thus, even swindlers preferred to market sovereign bonds that were backed by more democratic regimes. Second, and more importantly, the vast bulk of autocracies worldwide did not issue sovereign bonds in the 1800s. In contrast, a much higher proportion of the very few states with limited government issued bonds. Thus, the democratic advantage appeared mostly in the form of superior access to credit, rather than in the form of better interest rates, conditional on access.

The evidence from the contemporary period seems similar to that from the 1820s. First, the intermediaries seem to view democracies as more credit-worthy, all else equal. Second, as shown above, a hefty portion of the democratic advantage takes the form of denying autocracies access to credit, rather than charging them a higher price for it.

Conclusion

Beginning with North and Weingast's (1989) seminal treatment, various scholars have argued that democracies should be perceived as more credit-worthy than otherwise similar autocracies, leading to a "democratic advantage" in borrowing.⁵⁵ Yet, the evidence on this score is decidedly mixed.

⁵³ Ferguson 1998, 131-134; Polanyi 1944.

⁵⁴ D. Sinclair 2003.

⁵⁵ North and Weingast 1989; Schultz and Weingast 2003; Author 2009b; Author 2011.

One contribution we make in this paper is conceptual. We stress that there should, in principle, be a *dual* democratic advantage, with democracies both having better access to debt markets and being able to price their debt more favorably. The critical literature has focused exclusively on the latter issue, ignoring the theoretical issue of entry.

A second contribution we make is methodological. Studies finding no evidence of a democratic advantage have all pursued single-equation estimation strategies, estimating the effect of democracy on interest rates, credit ratings or default rates without considering self-selection into the sample available for analysis. Our results show that significant selection effects exist, so that single-equation models cannot be justified.

Our final contribution is substantive. We provide the first estimates of the democratic advantage that take a multi-equation approach, in which the decision to access international markets is proxied by the decision to seek a rating from either Moody's or Standard and Poor's; and interest rates are proxied by the rating received. Once one accounts for the fact that countries choose whether to seek ratings, and do so in light of the ratings they anticipate receiving, the two components of the democratic advantage come into clearer focus. We find that democracy is a strong and consistent predictor of a country's decision to seek a credit rating (i.e., seek access). We also find some evidence that democracies receive better ratings than autocracies, although our results here are not robust to a plausible (albeit debatable) alternative specification.

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Tables and Figures

Table 1. Average Values of Economic Indicators for Rated Countries, by Regime

Economic Indicators (<i>units</i>)	Democracy	Dictatorship	t
Natural Resources (<i>% Merchandise Exports</i>)	16.49	36.11	8.91***
Current Accounts (<i>% GDP</i>)	-1.31	2.15	5.25***
GDP per capita Growth (<i>annual %</i>)	2.19	3.35	4.10***
GDP (in US\$ 100,000,000 units)	384.30	177.81	-6.14***
Inflation (<i>annual % change in CPI</i>)	27.94	7.78	-3.06**
GDP per capita (US\$)	11,955	4,092	-17.48***
Trade (<i>% GDP</i>)	64.53	89.51	6.48***
Default (=1 for default or debt restructure)	.08	.09	0.11
Population (<i>in millions</i>)	53.07	149.15	4.01***
Moody's Rating (<i>16 point scale</i>)	10.82	7.63	-10.87***
S&P Rating (<i>16 point scale</i>)	10.84	7.04	-12.87***

Column three reports the t-statistic used to test the difference in means between regime types. Statistically significant differences are indicated at 95% (**), and 99% (***) confidence levels.

Table 2. Effect of Democracy on Credit Ratings

<i>Credit rating</i>	Moody's (1a)	S&P (1b)	Moody's (2a)	S&P (2b)	Moody's (3a)	S&P (3b)
Democracy	0.534 (3.24) ^{***}	0.501 (3.62) ^{***}	0.548 (2.44) ^{**}	0.638 (3.04) ^{***}	-0.179 (0.85)	-0.214 (1.41)
Years in Office (logged)			0.074 (0.61)	0.092 (0.89)		
Current Account (lag)	0.018 (1.98) ^{**}	0.015 (1.92) ^{**}	0.014 (1.11)	0.009 (0.82)	0.013 (1.24)	-0.004 (0.53)
GDP/cap Growth (lag)	0.023 (2.09) ^{**}	0.022 (1.98) ^{**}	0.025 (2.39) ^{**}	0.026 (2.14) ^{**}	0.044 (3.32) ^{***}	0.044 (3.92) ^{***}
GDP (lag)	0.001 (2.48) ^{**}	0.001 (2.47) ^{**}	0.001 (2.35) ^{**}	0.001 (2.28) ^{**}		
Log of GDP/Cap (lag)					0.469 (3.15) ^{***}	0.419 (4.22) ^{***}
Inflation (lag)	-0.001 (0.90)	-0.001 (0.56)	-0.001 (1.04)	-0.001 (0.58)	-0.001 (1.03)	-0.001 (0.35)
Trade (lag)	0.005 (3.07) ^{***}	0.004 (2.76) ^{***}	0.005 (3.08) ^{***}	0.004 (2.42) ^{**}	0.003 (1.24)	0.001 (0.94)
Resource Endowment (lag)	-0.001 (0.15)	-0.001 (0.53)	-0.002 (0.49)	-0.003 (0.78)	-0.004 (0.96)	-0.002 (0.70)
Default	-1.568 (4.55) ^{***}	-1.543 (4.68) ^{***}	-1.567 (4.08) ^{***}	-1.531 (3.64) ^{***}	-0.949 (2.96) ^{***}	-0.951 (2.90) ^{***}
Intercept	1.061 (3.43) ^{***}	1.203 (4.77) ^{***}	0.962 (2.08) ^{**}	0.949 (2.16) ^{**}	-2.251 (1.85) [*]	-1.741 (2.27) ^{**}

<i>Rated by Credit Agency</i>	Moody's (1a)	S&P (1b)	Moody's (2a)	S&P (2b)	Moody's (3a)	S&P (3b)
Democracy	1.287 (6.15)***	1.422 (6.38)***	1.197 (4.39)***	1.547 (5.31)***	0.701 (3.09)***	0.864 (3.27)***
Years in Office (logged)			-0.135 (1.29)	-0.015 (0.14)		
Current Account (lag)	0.017 (1.33)	0.014 (0.98)	0.017 (1.41)	0.014 (1.15)	0.022 (1.51)	0.013 (0.94)
GDP/cap Growth (lag)	0.006 (0.60)	0.005 (0.47)	0.011 (0.98)	0.008 (0.57)	0.009 (0.79)	0.006 (0.36)
GDP (lag)	0.001 (0.74)	0.001 (0.92)	0.001 (0.80)	0.001 (0.63)		
Log GDP/cap (lag)					0.529 (4.03)***	0.562 (4.75)***
Inflation (lag)	-0.001 (0.02)	-0.001 (0.85)	0.001 (0.15)	-0.001 (0.67)	0.001 (0.57)	-0.001 (0.75)
Trade (lag)	0.002 (0.63)	0.001 (0.16)	0.005 (1.39)	0.003 (0.94)	-0.001 (0.20)	-0.005 (1.24)
Resource Endowment (lag)	-0.002 (0.06)	0.004 (1.08)	-0.001 (0.31)	0.004 (0.78)	-0.002 (0.66)	0.005 (1.06)
Default	-0.828 (3.23)***	-1.348 (6.10)***	-0.972 (3.64)***	-1.609 (6.55)***	-0.384 (1.68)*	-1.056 (5.60)***
Trade with U.S.	0.001 (2.58)***	0.001 (2.72)***	0.001 (2.61)***	0.001 (2.89)***	0.001 (2.27)**	0.001 (2.67)***
Intercept	-0.103 (0.22)	-0.455 (1.07)	0.239 (0.38)	-0.417 (0.69)	-4.707 (4.08)***	-5.628 (5.29)***
Decade fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
ρ (rho)	0.573 (5.09)***	0.513 (5.02)***	0.577 (3.83)***	0.544 (4.05)***	0.467 (4.19)***	0.305 (2.59)***
Wald test ($\rho = 0$) χ^2	25.93***	25.16***	14.167***	16.42***	17.56***	6.70**
Observations	2055	1989	1657	1612	1580	1522

Notes: The decade fixed effect results are not shown. Z-statistics are in parentheses. Statistical significance at 90% (*), 95% (**), and 99% (***) confidence level.

Figure 1. Predicted Probability of Securing a Rating by Regime Type.

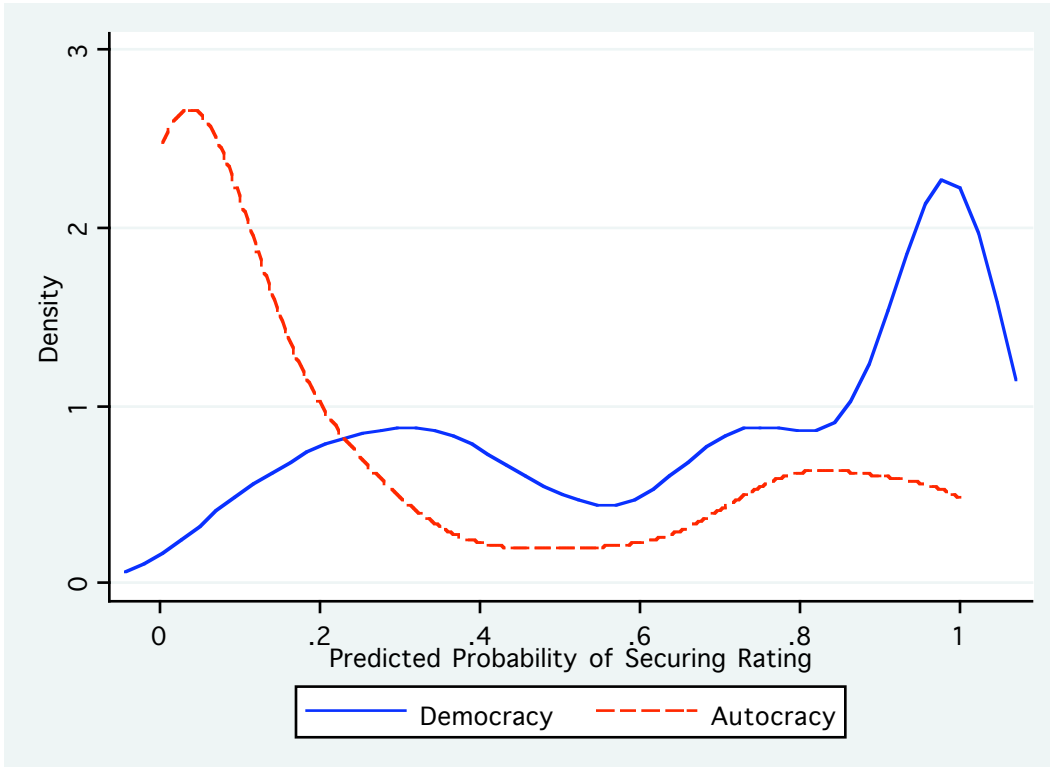
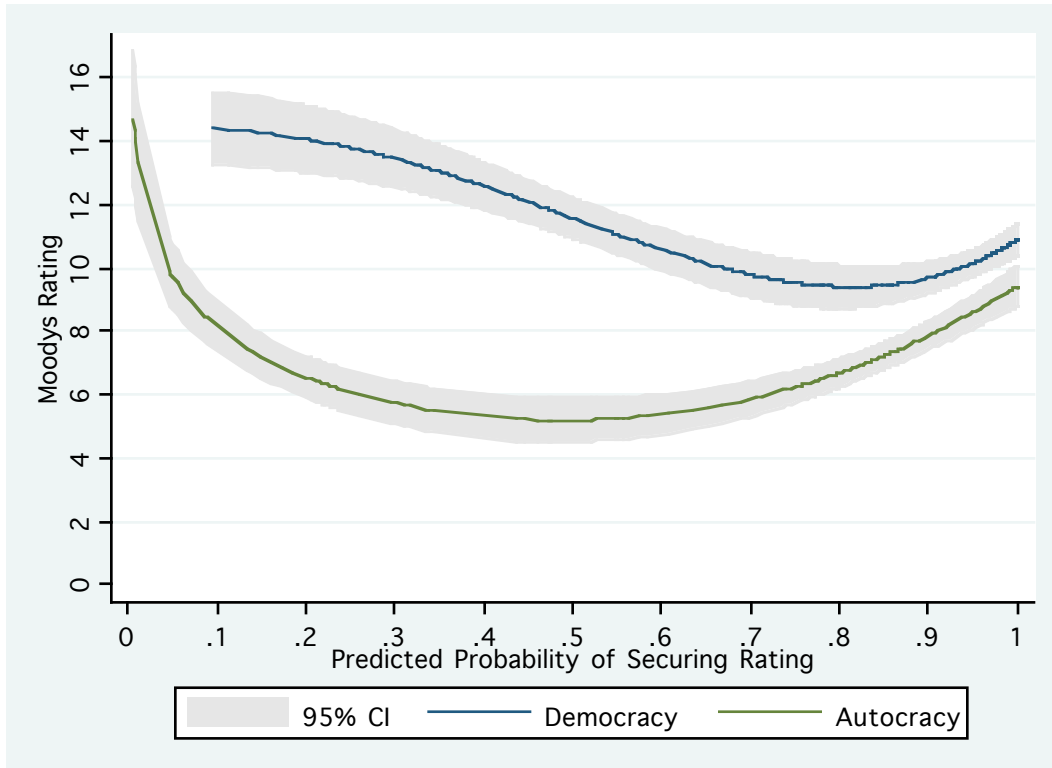


Figure 2. Countries' actual ratings as a function of their predicted probability of being rated, by political regime (fractional polynomial)



Appendix 1 - Summary Statistics and Definitions

Descriptive Statistics – Selection Equation (Moody's)

Variable	N	Mean	Std. Dev.	Min.	Max.
Rated	2055	0.523	0.499	0	1
Democracy	2055	0.620	0.485	0	1
Years in Office (Log)	1657	1.940	0.906	0.693	4.634
Current Account	2055	-2.144	7.029	-44.838	53.234
GDP/cap growth	2055	1.789	4.212	-28.717	23.261
GDP	2055	260.272	522.757	0.217	5081
GDP/cap (Log)	2055	7.999	1.427	4.666	10.626
Inflation	2055	48.856	459.459	-7.634	11749
Trade	2055	65.332	36.219	6.320	397.304
Resource Endowment	2055	22.358	26.602	0.001	100
Default	2055	0.184	0.388	0	1
Exports to U.S.	2055	9311.69	30421	0	340118

Descriptive Statistics – Rating Equation (Moody's)

Variable	N	Mean	Std. Dev.	Min.	Max.
Moody's Rating	1076	10.182	5.255	0	16
Democracy	1076	0.799	0.400	0	1
Years in Office (Log)	964	1.828	0.859	0.693	4.276
Current Account	1076	-0.421	6.312	-24.849	44.615
GDP/cap growth	1076	2.373	3.439	-15.132	23.261
GDP	1076	342.851	684.941	1.12	5081
GDP/cap (Log)	1076	8.739	1.191	5.606	10.626
Inflation	1076	24.761	181.623	-1.407	3079
Trade	1076	69.269	39.759	12.725	397.30
Resource Endowment	1076	19.884	24.568	0.146	97.897
Default	1076	0.093	0.291	0	1
Exports to U.S.	1076	16729.56	40567.97	14.9	340118

Descriptive Statistics – Selection Equation (Standard and Poor’s)

Variable	N	Mean	Std. Dev.	Min.	Max.
Rated	1989	0.508	0.500	0	1
Democracy	1989	0.618	0.485	0	1
Years in Office (Log)	1612	1.964	0.911	0.693	4.634
Current Account	1989	-2.150	7.094	-44.838	53.233
GDP/cap growth	1989	1.810	4.210	-28.717	23.261
GDP	1989	210.286	538.695	0.217	5081
GDP/cap (Log)	1989	7.965	1.454	4.666	10.626
Inflation	1989	43.392	452.436	-7.634	11749
Trade	1989	64.851	34.639	6.320	397.304
Resource Endowment	1989	23.057	27.166	0.001	100
Default	1989	0.167	0.372	0	1
Exports to U.S.	1989	9449.75	30903.5	0	340118

Descriptive Statistics – Rating Equation (Standard & Poor’s)

Variable	N	Mean	Std. Dev.	Min.	Max.
S&P Rating	1010	10.113	5.263	0	16
Democracy	1010	0.807	0.394	0	1
Years in Office (Log)	919	1.865	0.869	0.693	4.276
Current Account	1010	-0.320	6.390	-22.460	44.615
GDP/cap growth	1010	2.451	3.367	-14.296	23.261
GDP	1010	359.681	715.300	0.891	5081
GDP/cap (Log)	1010	8.720	1.265	5.493	10.626
Inflation	1010	12.427	89.815	-1.407	2075
Trade	1010	68.578	37.204	14.730	397.3
Resource Endowment	1010	21.099	25.737	0.146	99.66
Default	1010	0.053	0.225	0	1
Exports to the U.S.	1010	17486.56	41749.4	0.8	340118

Rated: Dummy Variable; takes the value of 1 if a country received a rating by either Moody's or S&P. Otherwise, it takes the value of 0. Sources: Archer, Biglaiser and DeRouen (2007) and own calculations.

Moody's Rating: Rating obtained from Moodys rating agency, reflecting a country's probability of honoring its debt. It ranges from C (the lowest possible) to AAA (the highest possible). Following Archer, Biglaiser and DeRouen (2007), we convert the letter ratings to a 0-16 scale. In addition, we linearly transform these ratings, r , to $r' = 1/16 + 255/256r$, and then take the natural logarithm. Sources: Archer, Biglaiser and DeRouen (2007) and own calculations.

S&P Rating: Rating obtained from S&P rating agency, reflecting a country's probability of honoring its debt. It ranges from C (the lowest possible) to AAA (the highest possible). Following Archer, Biglaiser and DeRouen (2007), we convert the letter ratings to a 0-16 scale. In addition, we linearly transform these ratings, r , to $r' = 1/16 + 255/256r$, and then take the natural logarithm. Sources: Archer, Biglaiser and DeRouen (2007) and own calculations.

Current Account (lag): Current Account. Lagged by one year. Source: World Development Indicators.

Default (lag): Dummy Variable; takes the value of 1 to indicate if an external default or restructuring of a country's sovereign debt exist. Otherwise, it takes the value of 0. Sources: Archer, Biglaiser and DeRouen (2007), Reinhart (2010), Reinhart and Rogoff (2010), Saiegh (2005), Sturzenegger and Zettelmeier (2006), Suter (1992), Moody's, Standard and Poor's, and news reports.

Democracy: Dummy Variable; takes the value of 1 if a country is considered democratic according to the criteria in Przeworski et. al. (2000). Otherwise, it takes the value of 0. Source: Cheibub et. al. (2010).

Exports to the U. S.: Annual exports to the United States measured in current US millions of dollars. Source: Correlates of War Project Trade Data Set

GDP (lag): Gross Domestic Product (expressed in US\$ 100,000,000 units). Lagged by one year. Source: World Development Indicators.

GDP/cap (lag): GDP per capita. Lagged by one year. Source: World Development Indicators.

GDP/cap Growth (lag): Annual change in GDP per capita. Lagged by one year. Source: World Development Indicators.

Inflation (lag): Change in CPI. Lagged by one year. Source: World Development Indicators.

Political Stability: This measure is the number of years the party of the chief executive has been in office (logged). Source: Keefer (2009).

Resource Endowment (lag): This measure is constructed by adding annual ores and metals exports (as a percent of merchandise exports) to fuel exports (as a percent of merchandise exports). Lagged by one year. Source: World Development Indicators.

Trade (lag): This measure is the sum of exports and imports of goods and services measured as a share of gross domestic product. Lagged by one year. Source: World Development Indicators.

Appendix 2 – 1987-2003 Period (excluding developed countries)

<i>Credit rating</i>	Moody's	S&P
Democracy	0.254 (1.29)	0.193 (1.42)
Current Account (lag)	0.002 (0.32)	-0.008 (0.93)
GDP/cap Growth (lag)	0.065 (3.55)***	0.065 (3.97)***
GDP (lag)	0.001 (2.10)**	0.001 (1.64)*
Inflation (lag)	-0.001 (0.99)	-0.001 (0.44)
Trade (lag)	0.008 (3.30)***	0.004 (2.27)**
Resource Endowment (lag)	-0.001 (0.09)	-0.001 (0.41)
Default	-0.876 (3.57)***	-1.057 (3.32)***
Intercept	0.674 (1.56)	0/976 (3.29)***

<i>Rated by Credit Agency</i>	Moody's	S&P
Democracy	0.994 (4.08)***	1.084 (4.15)***
Current Account (lag)	0.019 (1.43)	0.020 (1.52)
GDP/cap Growth (lag)	0.011 (0.83)	0.011 (0.77)
GDP (lag)	0.010 (4.04)***	0.010 (3.97)***
Inflation (lag)	-0.001 (0.03)	-0.001 (2.38)**
Trade (lag)	0.009 (2.02)**	0.007 (1.70)*
Resource Endowment (lag)	0.001 (0.33)	0.007 (1.33)
Default	-0.746 (3.04)***	-1.254 (5.53)***
Trade with U.S.	0.001 (0.34)	0.001 (0.58)
Intercept	-1.133 (2.37)**	-1.445 (2.69)***
Decade fixed effects	Yes	Yes
ρ (rho)	0.291 (2.42)**	0.297 (2.62)***
Wald test ($\rho = 0$) χ^2	5.84*	6.88**
Observations	863	817