Sovereign Debt and Regime Type: Reconsidering the Democratic Advantage

Emily Beaulieu, Gary W. Cox and Sebastian Saiegh

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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—data sets 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 is the democratic advantage? Our answer is that previous assessments of the democratic advantage have typically (1) ignored the democratic advantage in credit access; (2) failed to account for selection effects; and (3) treated GDP per capita as an exogenous variable, ignoring the many arguments that suggest economic development is endogenous to political institutions. We develop an estimator of how regime type affects credit access and credit ratings analogous to the "reservation wage" model of labor supply and treat GDP per capita as an endogenous variable. Our findings indicate that the democratic advantage in the postwar era has two components: first, better access to credit (most autocracies cannot even enter the international bond markets); and second, better ratings, once propensity to enter the market is controlled and GDP per capita is endogenized.

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

1. North and Weingast 1989.
2. Schultz and Weingast 2003.

The literature exploiting historical data, which includes case studies of seventeenth- to eighteenth-century England, nineteenth-century Argentina, and nineteenth-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—data sets show a different picture. A study of eighty developing countries in the period 1971–97 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 fifty 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 is the democratic advantage?

Our answer has three 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] But the debate over a democratic advantage is incomplete without also considering countries' ability to *access* credit. We argue that many autocracies did not enter the international bond markets because they knew they could not find purchasers at prices they were willing to pay. Thus, the democratic advantage has two components—better access and better prices. Moreover, the first component is more important than the latter. Having to pay a higher interest rate disadvantages autocracies; but being denied access to credit entirely, or having to pay so much higher rates that access is no longer worthwhile, disadvantages them substantially more.

Even when focusing solely on the price of debt, one must consider the possibility that countries seek credit ratings only when they anticipate receiving acceptable ratings, and hence acceptable interest rates. We will show that far fewer autocracies than democracies have chosen to enter the international bond market, suggesting that single-equation estimates of how regime type affects bond ratings (or interest rates) may run afoul of selection bias.

Some previous studies include gross domestic product (GDP) per capita as an exogenous control variable, ignoring arguments by North and Thomas, North and Weingast, Acemoglu, Johnson, and Robinson, and others that good political institutions are a fundamental cause of consistent economic growth.[6] Following the logic of these arguments, some of our specifications treat GDP per capita as an endogenous variable, seeking to purge it of any portion because of the cumulative past effect of good governing institutions.

All told, we argue for a dual democratic advantage. First, democracies have better access to the international bond market than economically comparable autoc-

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3. See North and Weingast 1989; Saiegh 2009b; Summerhill 2006; Stasavage 2007 and 2011; and Dincecco 2009.
4. See Saiegh 2005; and Archer, Biglaiser, and DeRouen 2007.
5. Research has found such variables to be highly correlated. See, for example, Cantor and Packer 1996.
6. See North and Thomas 1973; North and Weingast 1989; and Acemoglu, Johnson, and Robinson 2001 and 2005.

racies. Second, conditional on entering that market, democracies receive better bond ratings than otherwise comparable autocracies.

We first review the logic of the democratic advantage and the evidence bearing on it. 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 both credit access and credit ratings, analogous to the "reservation wage" model of labor supply.[7] Finally, we consider how our argument applies to the 1820s, when 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.[8]

Scholars have reacted to North and Weingast's argument in several ways. One line of inquiry further develops the logic of their argument.[9] Other research disputes either their logic or their evidence. On the logical front, the credit downgrade of the United States in 2011, after months of wrangling between a Democratic president and Republican House of Representatives, might suggest that democratic "veto players" sometimes worsen rather than enhance a country's credibility. On the evidentiary front, recent studies of credit prices argue that democracies lack any observable advantage.[10]

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7. Heckman 1979.
8. North and Weingast 1989.
9. Stasavage 2003; and Saiegh 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 Saiegh) explain interest rate fluctuations. Theories that rely less on constitutional structure include Schultz and Weingast 2003; and Cox 2011.
10. Some negative findings exploit contemporary data—see, for example, Archer, Biglaiser, and DeRouen 2007; and Saiegh 2005—while others use historical data—for example, Mauro, Sussman, and Yafeh 2006.

An important issue with which neither proponents of a democratic advantage nor their critics tend to deal is the initial decision to borrow.[11] Most studies focus 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 "postentry 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 noncredible borrower is refusal to lend at all.[12]

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.[13] If observations are generated at random, then the origin of those observations is not important, but where observations are not generated randomly, we must consider why certain countries came to receive a rating while others did not.

In this article, we demonstrate that entry cannot be ignored. More importantly, we take a broader conceptual view of the democratic advantage than do articles that examine only credit ratings, interest rates, or default probabilities—one that embraces not just the price of, but also access to, credit.[14]

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 U.S. Securities and Exchange Commission. Moreover, they continue to dominate the rating industry today.[15]

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11. The works of Stasavage 2007 and 2011 are the main exceptions here. The selection issue has also been acknowledged in some studies of the economic determinants of sovereign credibility, for example, Eichengreen and Mody 1998, and in some studies of foreign direct investment (FDI), for example, Jensen 2003.

12. On reputation and credibility, see Tomz 2007. For more on credit rationing, see Ghosh, Mookherjee, and Ray 2001; and Robinson 2006.

13. 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.

14. We should note that none of the arguments for a democratic advantage in sovereign debt clearly imply any advantage in FDI or portfolio investment. Consider FDI. In a typical transaction, an investor puts money into a "project" and receives nonvoting 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 rightsholders 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 nonexistence of a democratic advantage in FDI (on which see Li and Resnick 2003; and Jensen 2003) is not relevant, in any straightforward way, to assessing whether a democratic advantage in borrowing exists. Thus, whether democracies should have any advantage in these areas remains unclear, on the basis of the theories considered here.

15. 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 acqui-

The Credit Ratings Agencies

During the past 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.[16] This increased reliance on securities markets has opened the door for an important new actor: the credit rating agency (CRA).

CRAs began rating bonds in the United States 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."[17] 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.[18] To begin with, the CRAs issued credit ratings mainly for U.S. companies and municipalities.

Beginning in the late 1970s, however, more and more countries sought ratings of their sovereign debt (and typically paid for the privilege).[19] 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 points) that ranges from AAA (Aaa for Moody's) to C.[20] Credit ratings provide potential investors with information about the probability that their loans will be repaid. Any rating higher than the seven lowest positions on the sixteen-point scale is considered investment-grade, while ratings in the range BB+ (Ba1 for Moody's) to 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 data set 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 diffi-

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sitions, and is considered by Archer, Biglaiser, and DeRouen 2007, it is still considered a "distant third" relative to Moody's and Standard and Poor's. T. Sinclair 2003.

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

17. Sinclair 2005, 23.

18. For more detailed information on the evolution of CRAs, see Sinclair 2005.

19. According to Cantor and Packer 1996, 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. See also Torres and Zelter 1998.

20. A country in default can receive a rating of D.

culty identifying any specific political criteria as influencing their decisions.[21] 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."[22]

Another point is that the CRAs' internal procedures have likely been affected by who their customers are. If our basic thesis is correct, then raters will have observed a biased sample of countries and developed rules of thumb to deal with that sample. 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 data set. 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."[23] In other words, economic fundamentals and past behavior drive the credit ratings a country receives; no democratic advantage exists.

One caveat to register about Archer, Biglaiser, and DeRouen's results is that relatively few autocracies secured ratings during their period, whereas relatively many democracies did. Using the Przeworski and colleagues' definition of "democracy,"[24] we find that 67 percent of democratic country-years during the period 1987–2003 were rated by Moody's or Standard and Poor's. In contrast, only 17 percent of autocratic country-years in this period were rated. Moreover, rated autocracies were an unusual lot, consisting mostly of oil-rich kingdoms (Bahrain, Kuwait, Oman, Saudi Arabia), stable regimes sitting atop important emerging markets (China, Malaysia, Singapore, and South Korea before democratization), and dictatorships of geopolitical interest to the west (for example, Egypt).

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21. Archer, Biglaiser, and DeRouen 2007, 357.
22. Phone interview by Emily Beaulieu with David Levey, 12 December 2009.
23. Archer, Biglaiser, and DeRouen 2007, 341.
24. According to 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, and (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.

Suppose that democracies are more likely than autocracies to sell bonds (and hence get ratings) because they expect to receive a ratings "bonus," purely for being democratic. In this case, autocracies can enter the market only on the strength of their economic credentials; but democracies may gain access to credit partly on the basis of their superior political institutions. Thus, we might expect to find that democracies enter the bond market with poorer economic fundamentals than autocracies.

Some evidence supporting this conjecture can be seen in Table 1, which compares average values across regime type for several economic indicators and tests the difference in means (all for the 1963–2008 period). As can be seen, 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 that of their democratic counterparts. Growth rates of rated autocracies were larger on average by more than one percentage point than that of democratic countries. Their rated autocracies populations were on average larger. The only rating criteria on which entering autocracies looked significantly worse than entering democracies was that their GDPs and their per capita GDPs 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.

TABLE 1. *Average values of economic indicators for rated countries, by regime*

Economic indicators (units)	Democracy	Dictatorship	t
Natural resources (% merchandise exports)	16.49	36.11	8.91***
Current accounts (% GDP)	−1.31	2.15	5.25***
GDP per capita growth (annual %)	2.19	3.35	4.10***
GDP (in US$ 100,000,000 units)	373.98	167.97	−6.42***
Inflation (annual % change in CPI)	27.94	7.78	−3.06**
GDP per capita (US$)	11,955	4,092	−17.48***
Trade (% GDP)	64.53	89.51	6.48***
Default (= 1 for default or debt restructure)	.08	.09	0.11
Population (in millions)	51.95	142.61	4.02***
Moody's rating (16-point scale)	10.82	7.63	−10.87***
S&P rating (16-point scale)	10.84	7.04	−12.87***

Notes: The third column reports the t-statistic used to test the difference in means between regime types. Statistically significant differences are at ** 95% confidence level; *** 99% confidence level.

Selection Bias in Estimating the Democratic Advantage

The large difference in the rate at which autocracies and democracies participate in the international bond market is important in and of itself. It also raises the

possibility that a single-equation estimator of how regime type affects credit ratings or interest rates will underestimate the relevant effects. One does not directly observe how much autocracy depresses credit ratings (increases interest rates) because those autocracies that would receive low ratings (high rates) 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 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 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 both alert a country that it should think about accessing the international bond market and 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.

The "Reservation Rating" Model

We propose a "reservation rating" model that both recognizes the importance of credit access and offers a way to correct for selection bias in assessing credit ratings. In this 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

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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. Phone interview by Emily Beaulieu with David Levey, 12 December 2009. 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. Phone interview by Emily Beaulieu with David Levey, 12 December 2009.

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 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 the following:

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

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 creditworthy a country is when it is democratic rather than nondemocratic, 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 oppor-

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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 decide to get rated only when they anticipate a favorable rating.

28. Archer, Biglaiser, and DeRouen 2007.

tunity. 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-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.

Whether country j seeks a rating from a CRA does not affect how much it would pay to bank finance its marginal project, and hence does not affect W_{jt}. To see why, note that j's expected cost of bank financing its project equals the upfront cost of securing the loan, plus the discounted present value of the loan repayments the country expects to make. The upfront costs do not depend on whether the country secures a credit rating because each bank, after completing its research with due diligence, can learn nothing further merely by observing whether the country has sought a rating or not (or received a particular rating). The loan terms the country anticipates getting also do not depend on whether the country secures a rating because the bank will be fully informed by the time it makes a loan offer.[29]

Assuming for convenience that country j is risk neutral, we can define its reservation rating as that rating that yields zero excess profits over its next best option (which is the better of (1) debt financing the project without securing a rating and (2) 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.[30] 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 percent of the total revenue generated by the bond issue). The maximum interest rate country j will accept is

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

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29. The main reason a country might prefer floating bonds to securing a bank loan is that the fixed costs of borrowing are lower per dollar borrowed. When borrowing from a bank, the country must first pay the bank to inform itself about the country's creditworthiness. The country will then have access to loans from that bank, up to some limit determined by the bank's holdings and willingness to lend. In contrast, when selling bonds, the country must first pay a CRA to inform itself about the country's creditworthiness (and the research costs will be essentially identical to those borne by a bank). The country will then have access to millions of small investors unable to conduct their own research. If a country anticipates a good enough rating, then it will typically prefer access to the larger pool of investors. However, if a country can attract loans at a reasonable interest rate only by posting collateral or engineering other complex credit enhancements, then it will prefer bank loans.

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

and we can denote the corresponding minimum acceptable credit rating by r_{jt}^r.[31]

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 ($V_{jt}(L_{jt}) - L_{jt}$ 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 $W_{jt} > 0$).

The expected returns of the investment projects available to most of the countries of the world should have increased during the postwar 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.[32] Thus, we expect globalization should have produced a secular decline in countries' reservation ratings (r_{jt}^r).

If reservation ratings declined globally, then the total number of countries participating in the bond markets should have increased over time; and the average rating given to newly rated countries should have declined. Consistent with the first expectation, the total number of countries with bond ratings from either Moody's or Standard and Poor's increased from three, in 1974, to 101, in 2003. Consistent with the second 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.[33]

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

$$r_{jt}^r = Z_{jt}\xi + \nu_{jt} \tag{3}$$

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 ν_{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

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31. Equation (2) follows by noting that securing a rating will be country j's best option if and only if $V_{jt}(L_{jt}) - L_{jt}(1 + i_{jt}) - c_{jt} > \max\{0, W_{jt}\}$.
32. Phone interview by Emily Beaulieu with David Levey, 12 December 2009.
33. Moody's decline was statistically significant; Standard and Poor's was not.

that choose to secure them. Let $I_{jt} = 1$, if country j receives a rating in year t; let $I_{jt} = 0$, otherwise.

Following Heckman, we assume the errors in equations (1) and (3) follow a bivariate normal distribution:[34]

$$\begin{pmatrix} \varepsilon_{jt} \\ \nu_{jt} \end{pmatrix} \sim N\left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_{\varepsilon}^2 & \sigma_{\varepsilon\nu} \\ \sigma_{\varepsilon\nu} & \sigma_{\nu}^2 \end{pmatrix} \right]$$

With this assumption, $\Pr[I_{jt} = 1 | X_{jt}, D_{jt}, Z_{jt}] = \Pr[X_{jt}\beta + \gamma D_{jt} + \varepsilon_{jt} > Z_{jt}\xi + \nu_{jt} | X_{jt}, D_{jt}, Z_{jt}] = \Pr[\nu_{jt} - \varepsilon_{jt} < X_{jt}\beta + \gamma D_{jt} - Z_{jt}\xi | X_{jt}, D_{jt}, Z_{jt}]$. Since the composite error $\nu_{jt} - \varepsilon_{jt}$ is normally distributed with mean zero and variance $\tau^2 = \sigma_{\varepsilon}^2 + \sigma_{\nu}^2 + 2\sigma_{\varepsilon\nu}$, 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 credit ratings, r, to $r' = \dfrac{1}{16} + \dfrac{255}{256} r$, and then take the natural logarithm. Thus, our rating variable is $\ln(r')$, rather than r.

Data and Estimation

Sample

Our theory provides no justification for limiting analysis to a particular time period, so we cover the entire period over which new ratings were issued (1963–2008). Similarly, our theory provides no justification for limiting analysis to developing countries, so we include developed ones as well. From an econometric perspective, including the Organization for Economic Cooperation and Development (OECD) countries makes sense because it increases the within-sample variance on our key regressor, democracy. All told, then, our sample includes all countries (both developed and developing) not rated as of 1951, and all years from 1963 to 2008.[35]

Method

We use Heckman's method to estimate the impact of democracy on sovereign credit ratings.[36] The model he suggests first estimates a probit model of the

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34. Heckman 1979.
35. As of 1951, only Canada and the United States were rated. No new ratings were issued between 1951 and 1963.
36. Heckman 1979.

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.[37] The first-stage results serve double duty, both measuring the democratic advantage in credit access and allowing us to correct for sample selection in the second-stage regression.[38]

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 both decade fixed effects and a variable measuring a country's exports to the United States. This latter 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.[39]

Finally, to account for the likely nonindependence of observations from the same country, we (1) use clustered error terms and (2) replicate our core specification using Prais-Winsten regression (which captures any first-order autocorrelation in the errors and produces panel-corrected standard errors). Our results just clustering the errors are very similar to those when using Prais-Winsten.

Control Variables

Our control variables are mostly standard and require no discussion. As noted in the introduction, however, one control—GDP per capita—deserves some scrutiny.

While some studies of sovereign creditworthiness do not include per capita income at all,[40] those that do typically treat it as exogenous to regime type.[41] Treating GDP per capita as exogenous, however, ignores a central claim of institutional theorists—namely, that good political institutions exert a long-term and

37. 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 multiple alternative specifications: (1) allowing the propensity score's influence on ratings to decay with time; (2) modeling the ratings process as a hazard function; and (3) dropping additional observations once a country receives an initial rating. Given the short time span of these panels and the relatively durable considerations that tend to influence ratings, and the robustness of our results to alternative specifications, our current modeling decision seems appropriate.

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

39. The results we obtain including the "TRADE WITH US" variable are robust to alternative specifications that exclude this variable. In one model we utilized Sartori's approach, including the same variables in the selection and outcome model and converting the dependent variable in the outcome equation to a binary variable that takes on a value of 1 if a country received an investment grade rating of A3 or higher, and a 0 otherwise. Sartori 2003. In another specification we relied entirely on the Heckman model's distributional assumptions to identify effects.

40. Eichengreen and Mody 1998.

41. Archer, Biglaiser, and DeRouen 2007.

cumulative influence on economic growth.[42] In these theorists' views, the observed level of per capita income in any country-year partly reflects how long that country has enjoyed good governance, rather than being wholly a function of "economic" circumstances. For example, North, Wallis, and Weingast argue that democracies on average offer a more level economic playing field, with wider opportunities to open businesses and secure basic enforcement of contracts and property rights. More level playing fields lead, in turn, to more people having the confidence to invest and, hence, to higher per capita incomes and wealth.[43] Most of the empirical support for this view comes from historical or long-term analyses, but a recent pair of difference-in-differences studies examining postwar data have found that democratization results in a permanent increase in growth rate of about 1 percent.[44]

Given these arguments and empirical evidence, including both democracy and GDP per capita in analyses of credit access and credit ratings does not provide a fair test of the democratic advantage. The inclusion of both variables would potentially wash out the effects of a measure of contemporaneous democratic governance (democracy) with a variable that is largely driven by past experience with democratic governance (GDP per capita). To put it in Angrist and Pischke's terms, GDP per capita is a "proxy control"—that is, causally "affected by the variable of interest"—and hence not a good candidate as a control variable.[45]

We have taken two approaches to dealing with this problem. The first is to include GDP in our analyses, instead of GDP per capita. The theoretical arguments reviewed above connect democracy specifically to GDP per capita, rather than to GDP. And, empirically, GDP is not nearly as highly correlated with regime type as GDP per capita, while still conveying information about a country's ability to pay.

Our second approach uses the regressions of log GDP per capita proposed by Acemoglu, Johnson, and Robinson (henceforth AJR) to parse national income into "political" and "nonpolitical" components.[46] Letting Y_{jt} denote the log GDP per capita in country j, year t, we first regress Y_{jt} on the settler mortality instrument (and other regressors) proposed by AJR. Conceptually, this procedure splits Y_{jt} into two components. The first component, $\hat{Y}_{jt}$, represents the expected GDP per capita in country-year jt, based solely on its past experience with democratic institutions. The second component, $Y_{jt}^{resid} = Y_{jt} - \hat{Y}_{jt}$, represents how much richer country-year jt is than would be expected, given the quality of its past institutions. We substitute Y_{jt}^{resid} for Y_{jt} in some of our specifications.

42. See North and Thomas 1973; North and Weingast 1989; and Acemoglu, Johnson, and Robinson 2005.
43. North, Wallis, and Weingast 2009.
44. See Persson and Tabellini 2006; Papaioannou and Siourounis 2008.
45. Angrist and Pischke 2009, 66.
46. Acemoglu, Johnson, and Robinson 2001.

Results

Table 2 reports the results from two "reservation ratings" models, one of which controls for GDP (Model 1) and one of which controls for GDP per capita (Model 2). These models follow previous practice of either excluding GDP per capita or treating it as an exogenous variable. Sample statistics on all variables are provided in Appendix 1.

Heckman Stage 1 (Selection) Results

The dependent variable in stage 1 of the models (reported in the bottom portion of Table 2) is whether a country received a rating from Moody's credit rating agency (a) or Standard and Poor's (b) in a given year. Our main finding is that across all models democracies were much more likely than autocracies to receive a rating. Our results also show that countries that had previously defaulted, and those that traded less with the United States, were less likely to receive a rating.

To clarify how much democracy boosts credit access (that is, 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
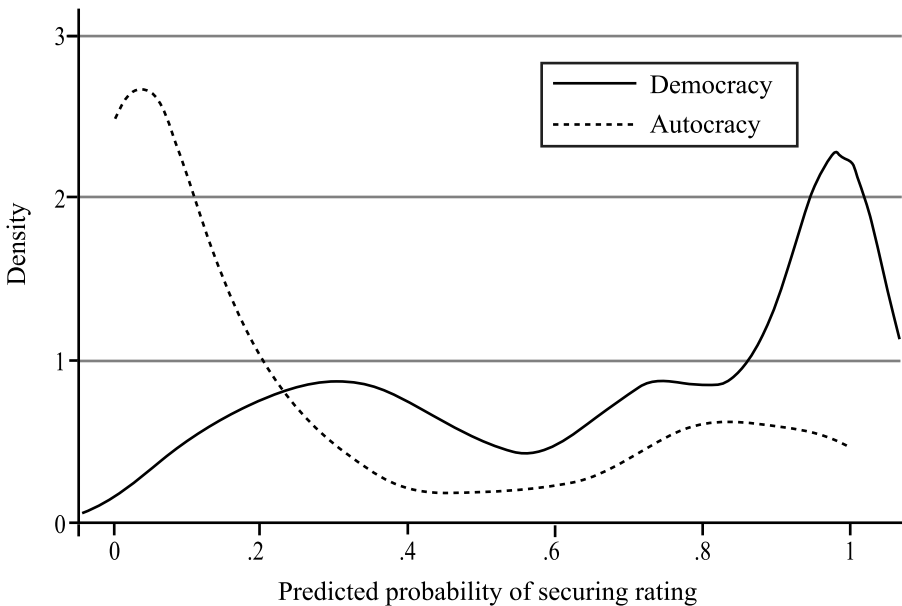

FIGURE 1. *Predicted probability of securing a rating by regime type*

TABLE 2. *Effect of democracy on credit access and ratings*

Credit rating	Moody's (Model 1a)	S&P (Model 1b)	Moody's (Model 2a)	S&P (Model 2b)
DEMOCRACY	0.534 (3.24)***	0.501 (3.62)***	−0.179 (0.85)	−0.214 (1.41)
CURRENT ACCOUNT (*lag*)	0.018 (1.98)**	0.015 (1.92)**	0.013 (1.24)	−0.004 (0.53)
GDP/CAP GROWTH (*lag*)	0.023 (2.09)**	0.022 (1.98)**	0.044 (3.32)***	0.044 (3.92)***
GDP (*lag*)	0.001 (2.48)**	0.001 (2.47)**		
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 (1.03)	−0.001 (0.35)
TRADE (*lag*)	0.005 (3.07)***	0.004 (2.76)***	0.003 (1.24)	0.001 (0.94)
RESOURCE ENDOWMENT (*lag*)	−0.001 (0.15)	−0.001 (0.53)	−0.004 (0.96)	−0.002 (0.70)
DEFAULT	−1.568 (4.55)***	−1.543 (4.68)***	−0.949 (2.96)***	−0.951 (2.90)***
INTERCEPT	1.061 (3.43)***	1.203 (4.77)***	−2.251 (1.85)*	−1.741 (2.27)**

Credit access: Rated by credit agency

	Moody's (Model 1a)	S&P (Model 1b)	Moody's (Model 2a)	S&P (Model 2b)
DEMOCRACY	1.287 (6.15)***	1.422 (6.38)***	0.701 (3.09)***	0.864 (3.27)***
CURRENT ACCOUNT (*lag*)	0.017 (1.33)	0.014 (0.98)	0.022 (1.51)	0.013 (0.94)
GDP/CAP GROWTH (*lag*)	0.006 (0.60)	0.005 (0.47)	0.009 (0.79)	0.006 (0.36)
GDP (*lag*)	0.001 (0.74)	0.001 (0.92)		
LOG GDP/CAP (*lag*)			0.529 (4.03)***	(4.75)***
INFLATION (*lag*)	−0.001 (0.02)	−0.001 (0.85)	0.001 (0.57)	−0.001 (0.75)
TRADE (*lag*)	0.002 (0.63)	0.001 (0.16)	−0.001 (0.20)	−0.005 (1.24)
RESOURCE ENDOWMENT (*lag*)	−0.002 (0.06)	0.004 (1.08)	−0.002 (0.66)	0.005 (1.06)
DEFAULT	−0.828 (3.23)***	−1.348 (6.10)***	−0.384 (1.68)*	−1.056 (5.60)***
TRADE WITH U.S.	0.001 (2.58)***	0.001 (2.72)***	0.001 (2.27)**	0.001 (2.67)***
INTERCEPT	−0.103 (0.22)	−0.455 (1.07)	−4.707 (4.08)***	−5.628 (5.29)***
Decade fixed effects	Yes	Yes	Yes	Yes
ρ (*rho*)	0.573 (5.09)***	0.513 (5.02)***	0.467 (4.19)***	0.305 (2.59)***
Wald test (ρ = 0) Chi²	25.93***	25.16***	17.56***	6.70**
Observations	2055	1989	1580	1522

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

from Moody's.[47] The results show that, even after we control for economic conditions, democracies have a substantially higher probability of obtaining a credit rating.

Heckman Error Correlations

In addition to documenting a democratic advantage in credit access, both analyses in Table 2 also demonstrate 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.[48] 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. Indeed, we show in Appendix 3 that the estimated effect of democracy on credit ratings is always lower in models that fail to correct for selection than in those that do, and the magnitude of the bias is sufficient to eliminate any evidence of a democratic advantage when such evidence exists.

Heckman Stage 2 (Ratings) Results

The dependent variable in stage two of the models (reported in the top portion of Table 2) is the actual credit rating assigned to each country that received a rating in a given year. In this stage, we find a democratic advantage in Model 1 but not in Model 2. We think the "disappearance" of a democratic ratings advantage in Model 2 (of Table 2) is misleading, because GDP per capita is itself partly caused by democracy. Thus, we conducted additional analyses to identify that part of GDP per capita due to nonpolitical factors and then used the resulting variable in place of GDP per capita.

Stage 0: The Endogenity of GDP per Capita

The results of replicating AJR's instrumental variables model of log GDP per capita on our sample are displayed in Appendix 2. Like them, we find that settler mortality is a strong predictor of log GDP per capita. Also as they did, we rely on the instrument (European settler mortality) to ameliorate concerns about both omitted variables and endogeneity. Simply put, settler mortality in the seventeenth to nineteenth centuries should be orthogonal to most plausible omitted variables and not caused by democracy as of the years of our study.

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47. Similar results follow for Standard and Poor's ratings.

48. 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. Buis 2011.

Given that AJR's instrument has been challenged, we also provide two other instruments in Appendix 2.[49] One is based on urbanization levels in 1500, the other on twenty-year lagged values of the executive constraints variable from the Polity IV data set. Our results hold for any of these ways of identifying the "political" and "residual" components of GDP per capita.

We interpret DEMOCRACY and $\hat{Y}_{jt}$ as two distinct ways of measuring a country's institutional quality, one contemporaneous (DEMOCRACY), and one historical ($\hat{Y}_{jt}$). In Table 3, we use either DEMOCRACY (Models 1a, 2a) or (Models 1b, 2b) to measure "democraticness;" and we use $\hat{Y}_{jt}^{resid}$ to measure how much "nonpolitical" factors affect national income.

Heckman Results

The models in Table 3 show that, once GDP per capita is purged of that portion attributable to the historical impact of political institutions, democracies enjoy an advantage in both access to credit and credit ratings.[50] Regardless of how we measure institutional quality, we find that democracies are more likely to be rated and more likely to receive higher ratings, conditional on being rated.

The Size of the Democratic Advantage in Ratings

Given that any model that does not take GDP per capita as exogenous demonstrates a democratic advantage in ratings, we return to results from Model 1 in Table 2 to provide a more substantive interpretation of the relationship between political regimes and countries' ratings. In Figure 2, we display a fractional polynomial fit of the data. Specifically, we calculated 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.[51]

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.[52]

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49. Albouy 2008.
50. The results in Table 3 were generated using Moody's ratings. Similar results follow for Standard and Poor's ratings.
51. Fractional polynomials were first introduced by Royston and Altman as a method for determining the functional form of a continuous covariate from a flexible range of candidate models. Royston and Altman 1994. Their use has been advocated because the analysis does not depend on the number and choice of cut points when categorizing continuous variables. Lambert et al. 2005.
52. 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 rat-

TABLE 3. *Effect of democracy on credit access and credit ratings (Moody's)*

	Model 1a	Model 1b	Model 2a	Model 2b
Panel A: Credit rating				
DEMOCRACY	0.491		0.631	
	(1.88)*		(2.64)***	
YHAT		0.615		0.568
		(5.41)***		(3.60)***
YRESID	0.604	0.512	0.701	0.620
	(1.78)*	(1.59)	(3.55)**	(2.82)***
Economic controls	Yes	Yes	Yes	Yes
Panel B: First stage—Rated by credit agency				
DEMOCRACY	1.118		0.899	
	(4.29)***		(3.64)***	
YHAT		1.047		0.977
		(4.64)***		(3.80)***
YRESID	0.541	0.588	0.482	0.329
	(2.91)***	(2.37)**	(1.73)*	(1.02)
Economic controls	Yes	Yes	Yes	Yes
Decades fixed effects	Yes	Yes	Yes	Yes
ρ (rho)	0.692	0.592	0.963	0.706
	(4.10)***	(3.48)***	(3.45)***	(2.76)***
Wald test ($\rho = 0$) Chi^2	16.83***	12.08***	11.91***	7.63**
Panel C: Ordinary least squares (GDP/cap)				
Log settler mortality	✔	✔		
Urbanization 1500			✔	✔
Observations	1068	1068	874	874

Notes: The variable YHAT equals the fitted value from a regression of log GDP per capita on either log settler mortality (Models 1a and 1b) or urbanization in 1500 (Models 2a and 2b). Details of these regressions are provided in Appendix 2. The variable YRESID equals the residual from the same regression.

    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).[53]

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ings. 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.
    53. 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.
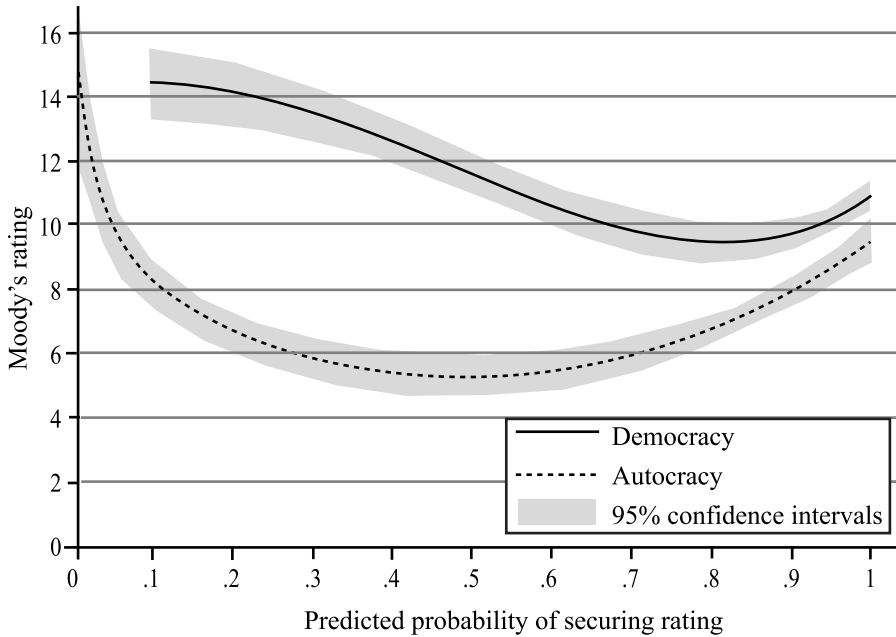
FIGURE 2. *Countries' actual ratings as a function of their predicted probability of being rated, by political regime (fractional polynomial)*

Does Financial Intermediation Reduce the Democratic Advantage?

We turn our focus from contemporary cross-national analysis to a 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–World War II era and consider whether events in the international bond market of the 1820s lend support to, or challenge, 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.[54] Their argument runs as follows.

54. Flandreau and Flores 2009.

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 that "could implement the policy adjustments" they required; and the ability to implement these adjustments depended mainly on "the quality of the administrative apparatus and centralization of decision making" in the state.[55] Thus, stable and centralized autocratic states such as Russia, Austria, and Prussia were able to borrow on favorable terms. In other words, because intermediaries' reputations were what mattered, and intermediaries were willing to deal with autocrats, no democratic advantage existed. Indeed, Flandreau and Flores conclude that "there was a bias in favor of arch-conservatives who had no remorse about implementing unpopular policies or even ruthless repression. This somewhat frightening conclusion is antithetic to the 'democratic advantage' view."[56]

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 here, 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 creditworthy when its executive faced more democratic restraints, controlling for economic fundamentals. They might still deal with some autocracies—those that 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 democratic restraints in the early 1800s.[57] More colorfully, consider the case of Gregor MacGregor, a Scottish swindler who managed to sell sovereign bonds for the nonexistent 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.[58] 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

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55. Ibid., 679.
56. Ibid.
57. See Ferguson 1998, 131–34; and Polanyi 1944.
58. D. Sinclair 2003.

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 creditworthy, all else equal. Second, as we've shown, 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 seminal treatment, various scholars have argued that democracies should be perceived as more creditworthy than otherwise similar autocracies, leading to a "democratic advantage" in borrowing.[59] Yet, the evidence on this score is mixed. We have argued a series of conceptual, methodological, and substantive points.

First, we stress that there should be a dual democratic advantage, with democracies both having better access to debt markets and being able to price their debt more favorably. Underlining this point is necessary because the critical literature has focused exclusively on variables reflecting the price of credit, such as interest rates or credit ratings, thereby ignoring the theoretically most important part of the democratic advantage.

Second, we provide robust evidence that democracies in the postwar era have in fact had a large advantage in accessing credit. Democracies were roughly four times more likely to secure credit ratings in the period 1987–2003 and this difference remains after we control for economic fundamentals, expand the sample years, and try various specifications.

Our third contribution concerns unbiased estimation of the democratic advantage in credit prices. Studies finding no evidence of such an advantage have thus far pursued single-equation 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 study shows that selection effects are very large and cannot be ignored. First, as already noted, democracies are significantly more likely to secure credit ratings than autocracies. Second, those autocracies that do secure ratings are a very nonrandom sample from all autocracies. Third, in all our models, regardless of specification, the main statistic designed to test for the existence of selection effects is highly significant. We conclude that future studies of credit price must take selection effects seriously.

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59. See North and Weingast 1989; Schultz and Weingast 2003; Saiegh 2009b; and Cox 2011.

A fourth contribution pertains to another threat to proper measurement of how democracy affects credit prices. Previous studies have sometimes included GDP per capita as an exogenous regressor. We have pointed out that the same theorists who predict a democratic advantage in borrowing also argue that GDP per capita reflects past experience with democracy. If one accepts these arguments, then GDP per capita is a "proxy" control variable because it is causally downstream from the regressor of primary interest.[60] We take Angrist and Pischke's injunction against using such variables seriously and seek alternative controls. When we do so, we are better able to discern the democratic advantage in credit ratings. We would argue that future studies of the democratic advantage should also avoid using the proxy control, GDP per capita.

Finally, when we correct for selection effects (using a Heckman model), avoid including proxy control variables, and expand our sample to include all countries, we find a statistically and substantively significant democratic advantage in credit ratings, contrary to previous studies. As to which of the three changes (correcting for selection, avoiding proxy controls, expanding the sample) is most important to revealing the democratic advantage in credit ratings, unfortunately one can't decompose the total effect additively and attribute a share to each source. To see why, consider the interaction between sampling and correcting for selection bias. Previous studies have examined only countries that have ratings and, if one sticks with that sample, there is no information from which to estimate selection and correct for it. Thus, we cannot correct for selection without expanding our sample to include both rated and nonrated countries.

With that point registered, we can say the following (based on the results in Appendix 3, which compare the size and significance of the democracy coefficient across different model specifications). First, if we do not control for selection, none of our models indicate a democratic advantage for ratings. Second, avoiding the proxy control variable is also essential to uncovering the democratic advantage. Third, expanding the sample from developing to all countries is much less important. Restricting the analysis to developing countries reduces the proportion of democracies in the sample, thereby reducing the variance of the regressor of main interest and rendering our estimates of its effects less precise. But those effects are still statistically discernible in some specifications.

The credit rating process is nuanced and, in many ways, opaque. Economic fundamentals are clearly important to the assessments that CRAs make, but it has been widely acknowledged by scholars and practitioners alike that domestic politics also influence credit ratings. With this work, we have attempted to mirror some of the nuance involved in assigning ratings by thinking carefully about how countries come to receive ratings and what some available, and commonly used, indicators are actually telling us about a country's economic and political

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60. Angrist and Pischke 2009, 66.

circumstances. Our results suggest that, in fact, democratic political regimes enjoy an advantage both in access to international financial markets and in credit prices, compared to their authoritarian counterparts.

Appendix 1. Summary Statistics and Definitions

TABLE A1. *Descriptive statistics—selection equation (Moody's)*

Variable	N	Mean	Standard deviation	Minimum	Maximum
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	206.272	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

TABLE A2. *Descriptive statistics—rating equation (Moody's)*

Variable	N	Mean	Standard deviation	Minimum	Maximum
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

TABLE A3. *Descriptive statistics—selection equation (Standard and Poor's)*

Variable	N	Mean	Standard deviation	Minimum	Maximum
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

TABLE A4. *Descriptive statistics—rating equation (Standard & Poor's)*

Variable	N	Mean	Standard deviation	Minimum	Maximum
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

Variable Definitions

CURRENT ACCOUNT (lag): Current account, lagged by one year. Source: World Bank 2010.

DEFAULT (lag): Dummy variable that 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. Source: 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 that 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, Gandhi, and Vreeland 2010.

EXPORTS TO THE U.S.: Annual exports to the United Sates measured in current US millions of dollars. Source: Barbieri and Keshk 2008.

GDP (lag): Gross domestic product (expressed in US$100,000,000 units). Lagged by one year. Source: World Bank 2010.

GDP/CAP (lag): GDP per capita, lagged by one year. Source: World Bank 2010.

GDP/CAP GROWTH (lag): Annual change in GDP per capita, lagged by one year. Source: World Bank 2010.

INFLATION (lag): Change in CPI, lagged by one year. Source: World Bank 2010.

MOODY'S RATING: Rating obtained from Moody's 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. Source: Archer, Biglaiser, and DeRouen 2007; and authors' calculations.

RATED: Dummy variable that 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. Source: Archer, Biglaiser, and DeRouen 2007; and authors' calculations.

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 percentage of merchandise exports), lagged by one year. Source: World Bank 2010.

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. Source: Archer, Biglaiser, and DeRouen 2007 and authors' calculations.

TRADE (lag): The sum of exports and imports of goods and services measured as a share of gross domestic product, lagged by one year. Source: World Bank 2010.

YEARS IN OFFICE: The number of years the party of the chief executive has been in office (logged). Source: Keefer 2009.

Appendix 2. Instrumental Variable Models

TABLE A5. *Auxiliary equations: OLS regression of log GDP per capita*

Log GDP per capita	Model (1)	Model (2)	Model (3)
LOG OF SETTLER MORTALITY	−2.874 (5.26)***		
URBANIZATION IN 1500		−0.091 (2.12)**	
CONSTRAINTS ON EXECUTIVE (*lagged 20 years*)			0.132 (3.08)***
AFRICA DUMMY	−0.786 (3.28)***	0.168 (0.41)	−1.047 (5.05)***
ASIA DUMMY	−1.408 (3.84)***	−0.895 (1.85)*	−0.670 (1.47)
"OTHER" CONTINENT DUMMY	−0.213 (0.49)	1.37 (4.86)***	0.107 (0.31)
LATITUDE			3.854 (4.77)***
Intercept	11.885 (14.32)***	8.25 (24.70)***	6.553 (25.02)***
R^2	.60	.40	.59
Observations	2136	1471	2230

Appendix 3. Comparing the Democratic Advantage Across Model Specifications

TABLE A6. *Democracy's impact on Moody's credit ratings—developing countries*

	Inclusion of proxy control variable (GDP per capita)	Exclusion of proxy ontrol variable (via instrument): SETTLER MORTALITY	Exclusion of proxy control variable (via instrument): URBANIZATION IN 1500
No correction for selection bias	−0.316 (1.54)	−0.033 (0.13)	0.152 (0.59)
Correction for selection bias via Heckman model	−0.179 (0.85)	0.304 (1.08)	0.465 (1.86)*

Notes: For developing countries only, the table lists DEMOCRACY's impact on Moody's credit rating, as a function of whether selection bias is corrected or not, and whether the proxy control problem is corrected or not. Z-statistics are in parentheses. Confidence level: * statistical significance at 90%; ** statistical significance at 95%; *** statistical significance at 99%.

TABLE A7. *Democracy's impact on Moody's credit ratings—full sample*

	Inclusion of proxy control variable (GDP per capita)	Exclusion of proxy control variable (via instrument): SETTLER MORTALITY	Exclusion of proxy control variable (via instrument): URBANIZATION IN 1500
No correction for selection bias	−0.306 (1.58)	0.178 (0.74)	0.313 (1.35)
Correction for selection bias via Heckman model	−0.229 (1.17)	0.491 (1.88)*	0.631 (2.64)***

Notes: For the full sample of countries, the table lists DEMOCRACY's impact on Moody's credit rating, as a function of whether selection bias is corrected or not, and whether the proxy control problem is corrected or not. Z-statistics are in parentheses. Confidence level: * statistical significance at 90%; ** statistical significance at 95%; *** statistical significance at 99%.

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