**Impact of sovereign rating on borrowing costs**

This section produces a descriptive market analysis to reveal the impact of our benchmark findings on borrowing costs for sovereigns. Figure 1 below shows data from the St Louis Federal Reserve. This graph reveals how the full scale of credit quality (denoted by rating categories) is associated with varying spreads above a corresponding treasury benchmark. These are option-adjusted spreads, which represent the additional rate at which payments from a fixed-income instrument need to be discounted against to match their market price. In simple terms, this represents the additional cost of borrowing for a bond within the given credit rating category. Figure 1 presents this data through time, which reveals that not only do lower credit quality instruments have higher borrowing costs, but that these costs are subject to much greater variation.

Figure 1

A graph of different colored lines

Description automatically generated

To illustrate the effect we observe in this study we use this data to measure the marginal borrowing cost associated with changes in the variables of interest. To do this, we obtain the median spreads from Figure 1 for each category of rating quality and perform an interpolation exercise. We then propose changes in the values of political quality and ENV 1.2 as per specification (3) in Table 4. We focus on this example as it reveals the most economically significant interaction effect and represents salient macroeconomic announcements to protect biodiversity. Table 1 shows that when political quality and ENV 1.2 are both 1 SD above average, this is associated with an approximate rating of 41.551 (29.749 + 9.458 + 2.344, where 29.749 represents the average rating as shown in Table 1). A rating of this number would be priced by the market at a borrowing rate of approximately 1.16% above treasury, assuming all other controls exhibit their mean values. This table reveals the lack of economic incentives for countries with lower political quality to motivate investments into biodiversity protection. We propose that this result shows a systematic mispricing of natural capital in sovereign debt markets.

Figure 2

A graph of a function

Description automatically generated

Table 1

|  |  |  |  |
| --- | --- | --- | --- |
| Change in Political Quality | Change in ENV 1.2 | Approximate rating | OAS Spread (%) |
| 1 | 1 | 41.551 | 1.16 |
| 2 | 2 | 58.041 | 0.70 |
| -1 | 1 | 17.947 | 4.46 |
| -2 | 2 | 1.457 | 9.39 |

**Alternative interpretations:**

**For instance, referring to specification (3), when ENV 1.2 is 2 standard deviations above its mean, the change in ratings is 14.146 (9.458 + 2 🞨2.344 = 14.146), assuming all other controls exhibit their mean values. This means that a -1 to +1 standard deviation change in political quality is associated with a rating of approximately 28.29 notches higher (14.146 🞨2) than the mean value.**