Uruguay Sustainability-Linked Bond: market update

Josephine Richardson (*)

Uruguay (ticker URUGUA) issued its inaugural Sustainability-Linked Bond (SLB) (ISIN US760942BE11) in October 2022, with an innovative symmetric step-up/step-down structure. At inception the bond seemed to trade fairly flat to the vanilla debt curve.

Since then, and particularly in the last quarter, the bond has outperformed (see Figure 1). We evaluate KPI data from Uruguay, and use the AFII option pricing framework, to understand the impact of option pricing changes on recent performance of this bond.

We analysed the bond in January, and estimated an option value of -1.8bp, suggesting investors would expect the coupon to step down, and so would need to receive a spread slightly higher than the Equivalent Vanilla Bond (EVB) to buy the bond.

Since then new data points have been released, with updated dynamics of the KPIs. The Sustainability Performance Targets (SPTs) on KPI1 look less likely to be achieved, while progress has been made towards the SPTs of KPI2.

Updated pricing shows that changes to the option values should have delivered 0.86% of outperformance to SLB investors, compared to an equivalent vanilla bond.

Pleasingly, the change in option value matches the relative performance between the Uruguay SLB and its closest vanilla bond since issuance. This validates the AFII option pricing approach.


1 Two KPIs were used (GHG emissions / real GDP, and native forest area compared to a 2012 baseline), and each had an upper and lower target. The bond pays a step-up if the KPI is above the upper target, and a step-down if below the lower target. The bond is covered in full details as a case study in “Understanding dynamics between sustainable and traditional debt: to SLB or not to SLB?”, AFII, 26 Jan 2023.

2 For full details of our option pricing framework please see “An option pricing approach for sustainability-linked bonds”, AFII, 8 Nov 2022.

Not investment advice. This version 5 Jun 2023. Important disclaimers at end of the document.

(*) Anthropocene Fixed Income Institute (www.anthropocenefii.org), Author for contacts: jor@anthropocenefii.org
Bond moves

Figure 2 shows bid spreads for Uruguay USD bonds. The dates chosen are 25 Oct 2022 (first pricing date of the SLB), and 31 May 2023.

At issuance the SLB seemed to be roughly flat to the vanilla curve, which would suggest no optionality attributed to the net SLB step-coupons. The symmetric structure was an innovation at the time, and combining step-ups with step-downs may have contributed to the market implying no net coupon changes.

Since then the SLB seems to have outperformed, moving from around 15bp wide of the bond curve, to just below it. Comparison with the URUGUA $7.625 26s, the vanilla bond with closest maturity, illustrates the relative tightening of the SLB.

Figure 1 shows the returns to bond investors from the SLB, and its nearest shorter and longer maturity bond. The SLB and 36s performed better than the 31s in Q4 2022, likely due to longer duration. In the last quarter we have seen the SLB move higher than the 36s, ending with a return of +11.5% over the period, compared to +10.6% for the 36s.

SLB option pricing

When an SLB offers the chance for investors to receive an increased or reduced coupon, such an option can be priced.² The value of the option should serve to increase or decrease the spread which investors should require to invest in the bond. In the simplest case, if investors have a high chance of receiving a step-up coupon in the future, they should accept a lower spread today.

The Uruguay SLB has a novel structure; there are two KPIs each with two targets. Meeting neither target results in a step-up. Meeting both targets results in a step-down.³ From a pricing point of view, there are four options; the step-ups should serve to reduce the required spread of the bond, and the step-downs to increase the required spread of bond.

We analysed the bond in Jan 2023,¹ when the SLB was trading wider than the vanilla curve. Our pricing of the structure calculated a total option price of -1.8bp running, i.e. investors on average

---

¹ Step-down structures are uncommon. For a pricing review please see "Notes on risk-neutral pricing of SLBs and step-down structures", AFII, 25 Oct 2022.
were expecting the coupon to step-down. This would imply the bond trading slightly wide of vanilla debt would be expected.

In Jan 2023 the latest data was 2019 for KPI1 and 2016 for KPI2. In the interim data to 2021 has been released for both. Figure 3 and Figure 4 show updated KPI data, with new points shown in red.

Figure 3. KPI1 Aggregate GHG/Real GDP for Uruguay. Source: Uruguay, accessed 1 Jun 2023.

Figure 4. KPI2 Native forest area compared to 2012 baseline. Source: Uruguay, accessed 1 Jun 2023.

KPI1

KPI1 was priced using a Black-Scholes approach, estimating drift and volatility from historical data. The new data points change the trend, and volatility, of emissions.

Table 1 shows the changes to historic drift and volatility calculations.

Table 1. Uruguay KPI1 historical dynamics. Source: Uruguay, AFII.

<table>
<thead>
<tr>
<th></th>
<th>Jan-23</th>
<th></th>
<th>Jun-23</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average annual drift</td>
<td>Annualised volatility</td>
<td>Average annual drift</td>
<td>Annualised volatility</td>
</tr>
<tr>
<td>1990-2021</td>
<td>-1.98%</td>
<td>3.65%</td>
<td>-1.26%</td>
<td>4.31%</td>
</tr>
<tr>
<td>2010-2021</td>
<td>-2.43%</td>
<td>2.23%</td>
<td>-0.84%</td>
<td>4.26%</td>
</tr>
<tr>
<td>2014-2021</td>
<td>-1.57%</td>
<td>1.58%</td>
<td>0.67%</td>
<td>4.39%</td>
</tr>
</tbody>
</table>

In January we used the full historical data set to estimate dynamics. Updating the latest KPI levels, our drift to -1.26% and volatility to 4.31%, changes the probability of hitting the targets significantly. Updated values are shown in Table 2.

This changes the option value by 14bp running, and should make investors willing to accept a 14bp lower spread to buy the bond.

KPI2

KPI2 did not have sufficient historical data to be priceable, and so estimated probabilities were used. Figure 4 shows that native forest area has increased from 2016 to 2021, to the level equal to the lower target, and so we have adjusted our probabilities.

Table 3 shows estimated probabilities and associated option value. There are increased challenges in pricing coupon steps of this type, but we use these estimated probabilities to illustrate the changed dynamic.

This bond has gone from expecting a step down, to expecting a step-up, which when using the AFII pricing model, would result in a potential widening of the spread by 4bp.

Summary

New data points on the KPIs for Uruguay’s SLB have changed market predictions about meeting the Sustainability Performance Targets. Aggregate GHG emissions intensity has increased, making it more likely investors will receive a step-up on KPI1. Native forest area has also increased, making it more likely investors will receive a step-down on KPI2.

Combining these two suggests the value of the option in this SLB has moved from -1.8bp to +7.9bp, i.e. a 9.7bp outperformance compared to vanilla bonds. Using a duration of 8.85 (from Bloomberg YAS) this equates to an outperformance of 0.86% in price terms. This agrees with the SLB’s relative performance to its closest vanilla bond in Figure 1.

The observed price moves are consistent with the AFII option pricing approach, which illustrates a strong relationship between anticipated option value and SLB pricing.
IMPORTANT DISCLAIMER:

This report is for information and educational purposes only. The Anthropocene Fixed Income Institute ('AFII') does not provide tax, legal, investment or accounting advice. This report is not intended to provide, and should not be relied on for, tax, legal, investment or accounting advice. Nothing in this report is intended as investment advice, as an offer or solicitation of an offer to buy or sell, or as a recommendation, endorsement, or sponsorship of any security, company, or fund. AFII is not responsible for any investment decision made by you. You are responsible for your own investment research and investment decisions. This report is not meant as a general guide to investing, nor as a source of any specific investment recommendation. Unless attributed to others, any opinions expressed are our current opinions only. Certain information presented may have been provided by third parties. AFII believes that such third-party information is reliable, and has checked public records to verify it wherever possible, but does not guarantee its accuracy, timeliness or completeness; and it is subject to change without notice.

Any reference to a company’s creditworthiness or likelihood of positive or negative performance in the current or future market is purely observational and should not be taken as a recommendation or endorsement or critique of such company or security.

AFII is a non-profit organization “to monitor, advocate for and influence the impact of the fixed income and bond markets in the age of human induced climate change.” For more information about the Institute, please visit www.anthropocenefii.org.

AFII is not in any way associated with, nor are any of its directors, employees or advisors, any of the companies it references in its materials or reports and is not receiving compensation or consideration of any nature for its observations and/or insights.