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Addendum 1 to the CRI Technical Report (Version: 2020, Update 1)

This document updates the Technical Report (Version: 2020, Update 1) and details the change of the calibration frequency for one Distance-to-Default (DTD) parameter from monthly to daily. The change has been implemented since 14 Sep 2020.

Increase the updating frequency for one DTD parameter from monthly to daily

This addendum describes the change to the calibration frequency for one parameter used in Distance-to-Default (DTD) which is in turn a critical default predictor in the CRI-PD model documented in Technical Report (Version: 2020, Update 1). The main change is the estimation of σ, which is the volatility of the market value of a firm's assets. The revised method calibrates σ daily instead of monthly in order to reflect in a timelier manner any change in asset volatility caused by a shift in, say, capital structure, market capitalization, etc.

Through a user's feedback, the CRI team studied the case of Singapore Airlines Ltd (SIA) subsequent to its renounceable rights issue with effect on May 29, 2020. SIA's rights issue was to raise equity capital of approximately SGD 8.8bn[1]. Immediately after the exercise period on May 29 2020, its CRI 1-year PD dropped by more than 60 bps (the blue curve in Figure 1). The drop is expected because its market capitalization went up substantially on that day in response to the equity injection through the rights issue. However, a suspicious increase in PD was observed on June 15, 2020, which is the day that DTD parameters were updated as per the CRI monthly calibration practice.

A closer examination reveals that the decrease in PD can largely be attributed to the procedural design and is not a genuine decrease in credit risk of that magnitude. By the original CRI design, the two DTD parameters (σ and δ) are re-estimated and updated on a monthly basis which typically takes place at between the 10th and 15th day of each month. On the day of switching parameters, σ may jump but δ is structurally much more stable because it is a sectorial average value (financial vs non-financial). Monthly calibration of σ is indeed the culprit for the SIA double-jump pattern displayed in the blue curve of Figure 1.

The jump-down was an over-reaction in response to the surge in market capitalization on May 29, 2020. Because σ was not revised upward until later, the implied asset value had to go up more to respond to the significantly increased market capitalization, and correspondingly DTD had to go up to result in a large decrease in PD. The subsequent jump-up was a delayed correction that was only allowed to kick in on the day of applying the monthly updated σ.

To address the initial over-reaction and subsequent correction, the revised procedure updates σ daily in the second stage of the two-stage estimation procedure while keeping the δ updating on its original monthly frequency. The effect of the revised method is clearly shown through the orange curve in Figure 1. The double-jump phenomenon has vanished.

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[1] https://www.singaporeair.com/saar5/pdf/Investor-Relations/Rights-Issue/Rights-Issue-Launch-Announcement.pdf

The first jump duly reflects the rights issue with its magnitude suitably moderated whereas the second jump, originally induced by monthly calibration on June 15, 2020, no longer occurs.
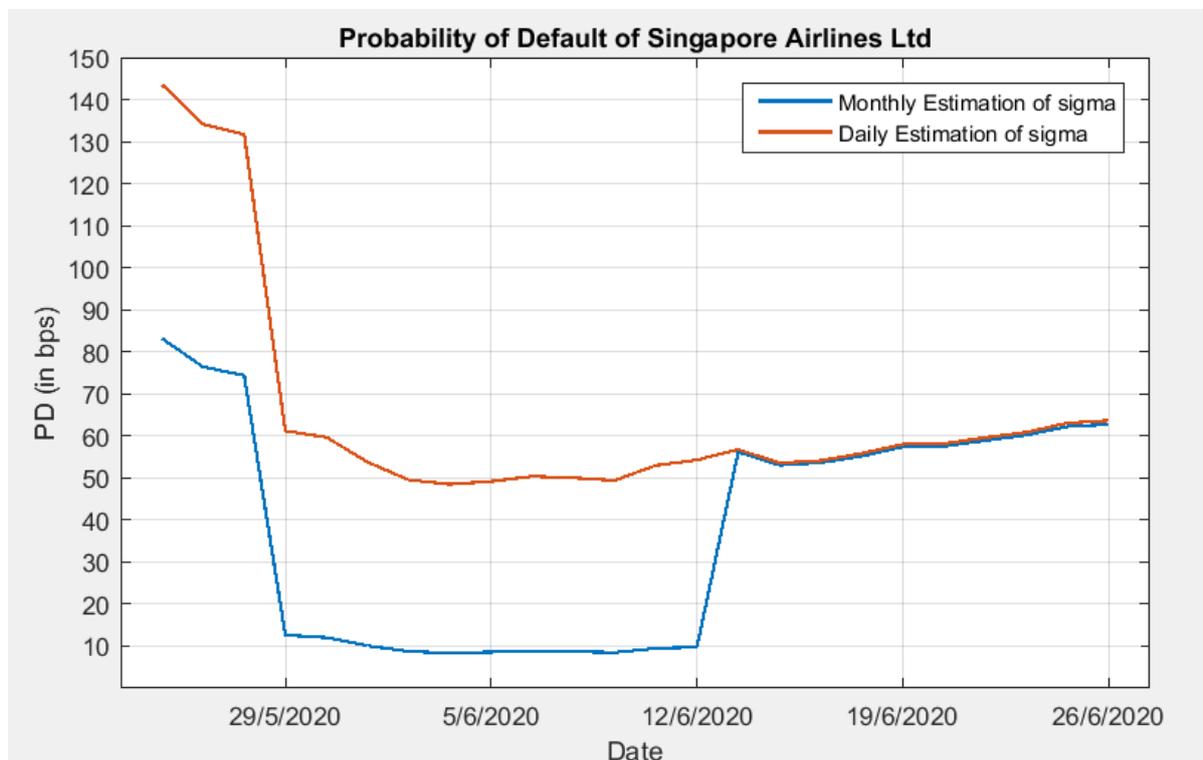
Figure 1: Comparison between monthly and daily estimation of σ with their impacts on the 1-year PD of SIA

Our investigation shows that this change has no significant effect on firms with stable market capitalization but is capable of timely and properly reacting to market capitalization changes. Our research also finds this procedural change not to have a material impact on the calibrated PD model because only DTD at the end of each month enters into the PD model calibration but the month-end DTDs are little affected by this change. The revised performance study confirms that the accuracy ratio (AR) for the 1-year CRI-PDs remains almost identical after incorporating this change.

References
Credit Research Initiative, 2020, "NUS Credit Research Initiative Technical Report Version: 2020 update 1", National University of Singapore.