Publication Date: Apr 19, 2021
Effective Date: Apr 19, 2021
Addendum 2 to the CRI Technical Report (Version: 2020, Update 2)

This document updates the Technical Report (Version: 2020, Update 2) and details the introduction of an additional covariate for China's listed firms. The changes have been implemented for the computation of the Probabilities of Defaults (PDs) and Actuarial Spreads (AS) starting 19 Apr 2021.

Chinese state-owned enterprises (SOEs) are generally perceived by the market to be "safer" as compared to their non-SOEs counterparts. Historically, central and/or local governments in China tended to bail out troubled SOEs to avoid an increase in unemployment, tax revenue losses, etc. Due to such implicit state guarantees, borrowing costs of many Chinese SOEs have often been lower vis-a-vis non-SOEs.[1] The governmental backing should naturally be manifested in a lower default rate for Chinese SOEs as compared to their non-SOE counterparts. Notwithstanding firms' SOE status, they may differ in many other aspects. Therefore, we should only expect SOEs to face lower PDs, ceteris paribus.

It has been brought to our attention that the CRI PDs for Chinese SOEs are often higher than those of non-SOEs.[2] Our investigation also confirms this observation, which reveals that since 2009, the CRI aggregate PD for SOEs is generally higher than that of non-SOEs. Intuitively, we might conjecture that the credit risks for Chinese SOEs are equivalent to those of non-SOEs after controlling for differences in important financial characteristics. If, for example, SOEs had poorer financials, they would inherently face higher credit risks, and the CRI PD model would in that case reflect their financial conditions.

To address this issue, we have introduced in this revision to the CRI model a dummy variable for Chinese SOEs to account for the potential difference between SOEs and non-SOEs that has not been duly captured by other covariates. We obtain a firm's SOE status based on the Chinese government's official enterprise information that is publicly available. Operationally, we update the SOE list on a regular basis.

Per our standard treatment of deterministic covariates, the SOE dummy variable is subject to the following Nelsen-Siegel (NS) function with four parameters, $[\rho_0, \rho_1, \rho_2, d]$:

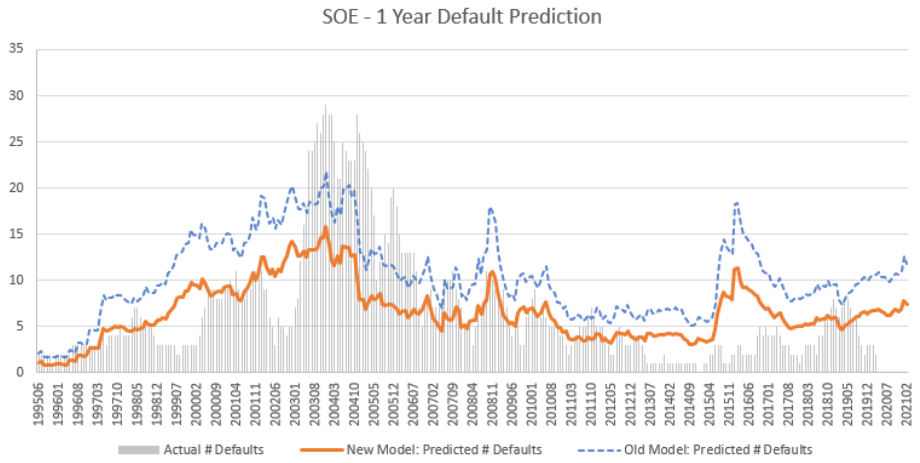
$$\rho_0 + \rho_1 \left[\frac{1-\exp(-\tau/d)}{\tau/d}\right] + \rho_2 \left[\frac{1-\exp(-\tau/d)}{\tau/d} - \exp(-\tau/d)\right]$$

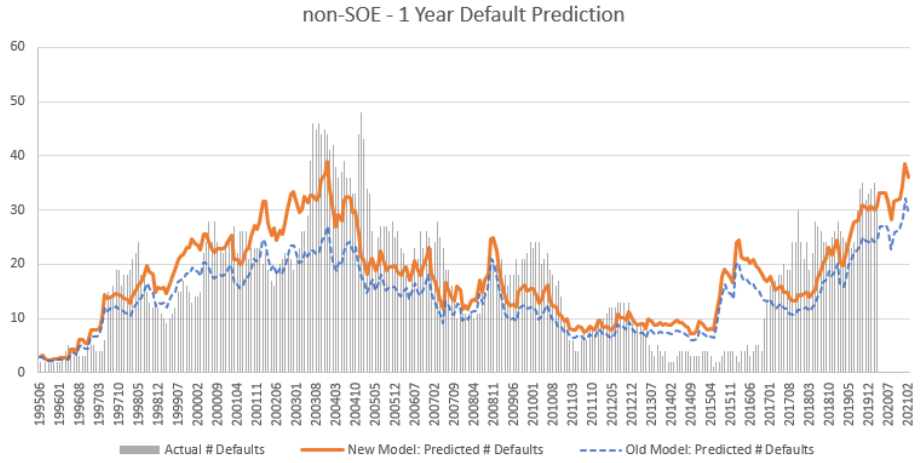
where τ stands for the forward-starting time.

After incorporating the SOE dummy variable, the new CRI model's overall accuracy ratio (AR) has marginally improved. For example, the AR of 1-year CRI PDs (calibrated in Feb 2021) increases from 65.8% to 67.9%. Although the increase in the AR is not pronounced, the revised model has delivered improvement in the predicted number of defaults versus the subsequently realized number for either SOEs or non-SOEs:

[1] https://www.sciencedirect.com/science/article/pii/S0378426617302352

[2] We thank the research team comprising Professors Annita Florou and Xiaoxi Wu of Bocconi University as well as Qiru Zhang, a PhD student at Duke University for sharing their observation with us, which prompted this model revision.





In addition, the aggregate 1-year PD of SOEs under the revised CRI model for Chinese firms is lower than that of non-SOEs, suggesting that SOEs generally face lower credit risks, ceteris paribus.