

基於SOFR期貨校估利率市場期間結構： COVID-19與非COVID-19時期之比較

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本研究基於芝加哥商品交易所掛牌交易之有抵押隔夜融資利率(Secured Overnight Financing Rate, SOFR)期貨，沿用 Heitfield and Park (2019) 之模型，探討 COVID-19(Coronavirus Disease 2019)疫情與貨幣政策轉變下的 SOFR 期限結構之校估與建立。本研究透過均方根誤差 (Root Mean Square Error, RMSE) 以及平均絕對百分比誤差(Mean Absolute Percentage Error, MAPE)比較模型評價結果之準確度，並透過選取隔夜指數交換(Overnight Index Swap, OIS)利率作為衡量標準來探討校估得到之 SOFR 期限結構對於市場特徵的捕捉及對於政策效果的反映。實證結果發現，該模型所建立之 SOFR 期限結構與 OIS 利率有著一定的相關程度，尤其受到整體利率市場狀態的影響，在疫情爆發過後兩者走勢幾乎完全一致；而模型 RMSE 在疫情前的短期飆升可以被 SOFR 期貨契約的換約交易所有效解釋。此外，雖然 Term SOFR - OIS 利差在疫情爆發前後存在較大轉變，但不同期限之利差在不同樣本期間下均能各自維持在穩定區間範圍內，且估計得到之 SOFR 期限結構與 OIS 的相對性質在不同利率環境下均和 SOFR 與聯邦資金有效利率(Effective Federal Funds Rate, EFR)的相對性質保持一致。由此可見，SOFR 是目前美國聯邦儲備系統 (Federal Reserve System, Fed)能夠有效調控市場的利率指標。

關鍵詞：LIBOR、利率期間結構、SOFR、SOFR 期貨、Fed 貨幣政策。

「政策與管理意涵」

本研究旨在探討隨著 LIBOR 退出市場後，美國市場如何建立 SOFR 這一替代參考利率之期限結構。透過採用 Heitfield and Park (2019) 所提出之模型，分析 COVID-19 疫情前後與貨幣政策轉變下的 SOFR 期間結構之校估與建立。透過本研究，能夠協助投資者和市場實務者深入理解在 LIBOR 轉變後新的參考利率架構，並更有效地進行風險管理與投資決策。

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Calibration of the Market Term Structure with SOFR Futures: Comparison between COVID-19 and Non-COVID-19 Periods

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In this paper, we adopt the model of Heitfield and Park (2019) to discuss the calibration of the SOFR term structure with SOFR futures listed on the Chicago Mercantile Exchange (CME) under the COVID-19 and the monetary policy changes. We evaluate the model performance through Root Mean Square Error (RMSE) and Mean Absolute Percentage Error (MAPE). Furthermore, we explore whether the calibrated SOFR term structure can capture the market characteristics and reflect the monetary policies effects by choosing Overnight Index Swap (OIS) as the benchmark. The empirical results show that The term structure of the SOFR model is highly correlated with the OIS rate. In particular, the overall interest rate market state is influenced by the fact that the two movements are almost identical after the outbreak. Besides, the SOFR spike can be explained by the changes in

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trading of SOFR futures. Furthermore, although Term SOFR-OIS spread has changed significantly before and after the outbreak, the spreads of different tenors can be maintained within the stable range respectively under different sample periods. Generally speaking, the properties between the calibrated SOFR term structure and OIS are consistent with relative properties between SOFR and EFFR (Effective Federal Funds Rate) under different interest rate environments. Therefore, SOFR can be viewed as the indicative reference rate that the Fed (Federal Reserve System) can use to effectively regulate the market.

Key Words: LIBOR, Interest Rate Term Structure, SOFR, SOFR Futures, Fed Monetary Policy.