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# Pricing efficiency of the 3-month KLIBOR futures contracts: an empirical analysis

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## Abstract

This study is an empirical investigation of the pricing efficiency of Malaysia's interest rate futures contract, the 3-month Kuala Lumpur Interbank Offered Rates (KLIBOR) futures contract. This article also examines several issues related to pricing efficiency. The study spans the contract's entire 10-year history, June 1996 to June 2006. In line with findings in other markets, we find a pre-ponderance of overpricing. Almost 80% of the mispricing constituted overpricing of the futures contract. Mean overpricing was 8 basis points. Our results lend support to the hypothesis that there may be a 'Futures Habitat Premium'. Underpricing, though less frequent was of a larger magnitude and had higher volatility. Even after adjusting for brokerage costs, most of the price deviations were arbitrageable. We find the extent of mispricing to be dependent on the trend and volatility of the underlying rate. Analysis of the impact of switch in Central Bank target policy rate, away from the underlying asset of the futures contract, showed

higher pricing deviation post switch. Our examination of the interest rate announcement effect showed the spot market to be more responsive and faster in reaction than the futures market. The magnitude of reaction to rate cuts appears to be different at different interest rate levels.

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## Notes

<sup>1</sup> Futures Industry Association; [www.futuresindustry.org](http://www.futuresindustry.org)

<sup>2</sup> See Cornell ([1981](#)).

<sup>3</sup> Malaysian Government Securities (MGS) future contracts of 3, 5 and 10 years maturity were introduced in 2003.

<sup>4</sup> Taufiq et al. ([2006](#)), 17th AFA Conference Proceedings.

<sup>5</sup> Poskitt ([1998](#)) states that there is one limitation in this analysis, i.e. futures contract is treated as a forward contract with daily settlement-to-market feature of a futures contract being ignored. He argued that the limitation is justified since the expected path of futures yield is unknown and the present value of the daily settlement-to-market cash flows could not be determined. Thus, it is impossible to know if the futures contract should trade at a discount or premium to an equivalent forward contract.

<sup>6</sup> Overpricing occurs when quoted futures price exceeds theoretical price and its matching arbitrage strategy is cash and carry arbitrage strategy. Underpricing occurs when theoretical price exceeds quoted futures price and its matching arbitrage strategy is reverse cash and carry arbitrage strategy.

<sup>7</sup> For Rendlemen and Carabini ([1979](#)), quasi-arbitrage opportunity involves selling of securities from an existing portfolio and the extent of mispricing allows trader to earn a profit in excess of low-transaction cost. In contrast, pure arbitrage opportunity involves

short selling in the spot market and the extent of mispricing allows trader to earn a profit in excess of all transaction cost. Elton et al. ([1984](#)) argued that unlike closing prices, high-frequency data could capture profit from intraday trades. Since simultaneous transactions could not occur at the same time, intraday prices enable to provide a realistic assumption at what price the trade is taken place. Thus, they found the market is not perfectly efficient for pure arbitrage strategy.

<sup>8</sup> The rate cuts undertaken by the Fed following the September 11 attacks helped to narrow the otherwise negative spreads.

<sup>9</sup> The announcement of 3 September 1998 which was made during trading hours (3.00 p.m.), this was necessitated by the capital controls imposed the prior day.

<sup>10</sup> Capital controls were in place, but exporters were delaying remitting funds back home in order to take advantage of higher rates in US.

<sup>11</sup> The three increases were in the OPR rate.

<sup>12</sup> Note that in [Fig. 3](#), overpricing is shown as plots below the zero mispricing line whereas underpricing would have plots above the line.

<sup>13</sup> Cash and carry would be to reduce the 3-month KLIBOR futures and long the 6-month KLIBOR spot. A reverse cash and carry would be the opposite.

<sup>14</sup> The 30-month period spans the period from the breakout of the crisis and imposition of capital controls/moratorium on capitals outflows (September 1998) until the lifting of the moratorium a year later.

<sup>15</sup> Since July 1998, BNM has publicly announced its interest rate policy.

<sup>16</sup> The exception was Thursday, 3 September 1998 when the announcement came during trading hours, the announcement a week from the previous announcement.

<sup>17</sup> Chow and Brophy (1982) cited in Hegde and Branch ([1985](#)).

<sup>18</sup> See [Table 2](#), overpricing on 2063 days, underpricing on 472 days.

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