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# Time-dependent lead-lag relationship between the onshore and offshore Renminbi exchange rates

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## Abstract

We employ the thermal optimal path method to explore both the long-term and short-term interaction patterns between the onshore CNY and offshore CNH exchange rates (2012-2015). For the daily data, the CNY and CNH exchange rates show a weak alternate lead-lag structure in most of the time periods. When CNY and CNH display a large disparity, the lead-lag relationship is uncertain and depends on the prevailing market factors. The minute-scale interaction pattern between the CNY and CNH exchange rates change over time according to different market situations. We find that US dollar appreciation is associated with a lead-lag relationship running from offshore to onshore, while a (contrarian) Renminbi appreciation is associated with a lead-lag relationship running from onshore to offshore. These results are robust with respect to different sub-sample analyses and variations of the key smoothing parameter of the TOP method.

**Keywords:** Renminbi exchange rates; Onshore and offshore markets; Lead-lag structure; Thermal optimal path

**JEL classification:** C14, F31, G15.

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