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Are options redundant? Further evidence from currency futures markets

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Abstract

This paper investigates the impact of the introduction of options on the underlying asset's price formation process, using Geweke feedback measures. We derive the feedback measures from the Deutsche Mark, British Pound, Swiss Franc, Japanese Yen and Canadian Dollar futures and spot prices, before and after the introduction of options for these currency futures. While each currency market maintains some distinct characteristics in the post-option period, a common theme is found: after the option introduction, the instantaneous feedback between spot and futures markets improves drastically. The feedback from the spot to the futures market tends to decrease and remains small. The feedback from the futures market to the spot market tends to decrease as well. These results confirm the dominance of options markets, probably due to their smaller transaction costs. When made available, options assume a leading role for information transmission in currency markets.
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1. Introduction

An option contract allows the owner of the contract to buy (call) or sell (put) an underlying asset at a pre-specified price. The well-known Black and Scholes (1973) pricing model assumes that the financial option is a redundant security and it therefore can be valued with no-arbitrage argument. It implies that the introduction of options into financial markets has no effect on the

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underlying asset. Conrad (1989), Detemple and Jorion (1990) and Sorescu (2000) tested this hypothesis using U.S. stocks data and found significant price effect on the underlying asset as a result of stock options introduction. The result is justified by the argument that the financial market is incomplete with stocks only. The introduction of stock options could potentially complete the market (Ross, 1976). However, the price effect of the introduction of options may be positive or negative. For example, Urrutia and Vu (2001) show that the return and volatility may increase or decrease after the introduction of stock options.

Connolly (1996) examines the introduction of options on currency (FX) futures contract and finds no significant price effect on FX futures. It is argued that options on FX futures might be redundant because other derivatives (options on spot currency, forward contracts) on FX assets are widely available at the time of option introduction. A generalized conjecture implies that any option on assets with a wide range of other derivatives may be redundant. On the other hand, Hwang and Satchell (2000) find that the introduction of European-style options on FTSE100 index futures reduces the price volatility of FTSE100 index futures.

Hull (1997) provides some reasons as to why futures options are popular. The examples given as supports, however, are commodity futures that are relatively more expensive to trade, and/or give or take delivery of the underlying spot assets. Currency options are settled in cash so the cost issue associated with commodity futures does not apply to the currency futures. One possible explanation is the relatively large initial capital required to take position in currency futures makes it less attractive than currency futures options. It is also suggested that the transaction costs for futures options are lower than that of the futures contracts.

In this paper, we utilize FX futures and spot data to revisit the issue of whether options on futures contracts are redundant assets using measures other than returns or volatility of the futures prices. More specifically, we employ the Geweke feedback measure to study whether the introduction of options affects the transmission of information between futures and spot markets for FX. Suppose that options are a cheaper investment instrument; after the introduction of FX options, we expect that the information will flow from options to both spot and futures markets. As a result, the two markets will be more contemporaneously related. Meanwhile, the price discovery function of the futures market will decrease, as options play a major role. The total information flow between the two markets tends to increase as the increases in contemporaneous relationships are likely to dominate the reduction in price discovery function.

On the other hand, if the options are expensive to trade, the introduction of options will have limited effects on the relationship between spot and futures markets. Geweke measures help to quantify the information flow for both pre- and post-option introduction periods. However, the trading of futures and the futures options are arranged in pits side by side in the same exchange. This could facilitate hedging, arbitrage, and speculation, thus improving the trading volumes of futures contracts. Therefore, it could also make the market more efficient and improve the information flows between markets. By comparing the Geweke measures, we can determine the total effect of options introduction on spot and futures FX markets.

The remainder of this paper is organized as follows: the methodology used in this study is provided in Section 2; Section 3 provides some data analysis; the empirical results are provided in Section 4; and this paper ends with a conclusion in Section 5.

2. Methodology

Futures markets provide a tool for risk management and price discovery. The price discovery function arises because spot market participants can observe the information revealed by the

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