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# Human vs. High-Frequency Traders, Penny Jumping, and Tick Size☆

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**Abstract**

This paper examines changes in market quality resulting from the smaller tick size of the interbank foreign exchange market. Coupled with the lower tick size, the special composition of traders and their order placement strategies created a suitable environment for high-frequency traders (HFT's) to implement sub-penny jumping strategy to front-run human traders. We show that the spread declined following the introduction of decimal pip pricing. However, benefits of spread reduction were mostly absorbed by the HFT's. Market depths were also significantly reduced with the occupation of the top of the order book by HFT's. This new environment changed the market maker-market taker composition between different traders and altered price impacts of the order flows.

*Keywords:* Interbank Foreign Exchange Market, Tick Size, Market Quality
*JEL:* F31, G14, G15

## 1. Introduction

In this paper, we study changes in Electronic Broking Services (EBS) market quality following the adoption of the decimal pip tick size. EBS is the leading interbank foreign exchange (FX) market, and it is mainly used to trade major currency pairs (EUR/USD, USD/JPY, EUR/JPY, USD/CHF, and EUR/CHF) in units of millions. We show how the specific structure of the EBS market has helped HFT's sub-penny jump human traders to

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