

# Alpha Asymmetry in Foreign Exchange Markets

*An Investigation of Exploitability*

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## Abstract

This paper investigates whether distributional asymmetries in foreign exchange alpha signals represent exploitable market inefficiencies. Using EUR/JPY data spanning November 2015–August 2025 (510 weekly observations), we document statistically significant departures from normality across five alpha types, with pronounced right-skewness in tail alpha (5.05) and momentum signals (2.12). However, we find that these asymmetries do not translate to economically significant trading profits. The GPD shape parameter is not significantly different from zero ( $\xi = -0.23$ , 95% CI:  $[-1.79, 0.24]$ ), indicating asymmetry arises from outlier frequency rather than heavy tails. Strategy returns include zero in confidence intervals after HAC correction; cross-market validation fails for equities and commodities; and transaction costs eliminate the modest gross edge. We conclude that alpha signal asymmetry, while statistically detectable, does not constitute an exploitable market inefficiency in FX markets. These null findings caution against over-interpreting higher-moment statistics as trading signals without rigorous economic validation.

**Keywords:** null result, alpha asymmetry, foreign exchange, skewness, market efficiency, extreme value theory

**JEL Codes:** G11, G14, G15, C58

## 1 Introduction

Financial markets exhibit persistent deviations from the efficient market hypothesis (Fama, 1970), with alpha signals—measures of risk-adjusted excess returns—displaying systematic patterns that sophisticated traders exploit (Jegadeesh and Titman, 1993; Moskowitz et al., 2012). While considerable literature examines alpha generation and decay, less attention has been paid to the *distributional properties* of alpha signals themselves. This is surprising given well-documented evidence that asset returns deviate substantially from normality, exhibiting fat tails (Mandelbrot, 1963; Cont, 2001) and asymmetric distributions (Harvey and Siddique, 2000).

The preference for skewed returns has deep roots in asset pricing theory. Kraus and Litzenberger (1976) established that investors prefer positive skewness and dislike negative skewness, implying that assets with lottery-like payoffs command lower expected returns. Subsequent work has confirmed that skewness affects both individual asset pricing (Harvey and Siddique, 2000; Bali et al., 2011) and portfolio construction (Mittton and Vorkink, 2007; Brunnermeier et al., 2007).

This paper investigates whether alpha signals exhibit systematic asymmetries in their probability distributions, and whether such asymmetries can inform profitable trading strategies. We test this hypothesis rigorously and report negative findings: while asymmetry is statistically de-