

# Unconventional Monetary Policy through Open Market Operations: A Principal Component Analysis

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## Abstract

This paper examines the unconventional monetary policies of the Bank of Japan from 2002 to 2019 with a focus on open market operations. We apply a principal component analysis to investigate the complexity of the operations. We find that four principal components (PCs) explain most of the variance of the Bank of Japan's operations of various facilities and measures. We are able to distinguish between 'quantitative easing policy', which is 'asset purchase measures' including JGBs, ETF and J-REIT (PC1), and different liquidity supply measures (PC2-4). The results are robust among different variable sets and time frames. We also find the complexity, measured by the number of PCs needed to explain the variance, differs substantially between three sub-periods of different governorships: Fukui (2003-2008), Shirakawa (2008-2013) and Kuroda (2013-present). We observe that open market operations of the Shirakawa era were the most complex, resulting in an increased number of PCs (five to seven depending on particular specifications). In contrast, the corresponding number in the other eras has been at most two (Fukui) and four (Kuroda).

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