

# Accepted Manuscript

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PII: S1042-4431(16)30091-9  
DOI: <https://doi.org/10.1016/j.intfin.2017.12.006>  
Reference: INTFIN 1006

To appear in: *Journal of International Financial Markets, Institutions & Money*

Received Date: 22 September 2016  
Accepted Date: 29 December 2017

Please cite this article as: A. Kanas, P. Molyneux, Macro stress testing the U.S. banking system, *Journal of International Financial Markets, Institutions & Money* (2017), doi: <https://doi.org/10.1016/j.intfin.2017.12.006>

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## Macro stress testing the U.S. banking system

Angelos Kanas<sup>1</sup> and Phil Molyneux<sup>2</sup>

### Abstract

We extend previous methodologies on macro stress testing by considering an additive semi-parametric quantile analysis which does not suffer from various specification problems and linearity limitations associated with standard approaches. Macro stress tests for the aggregate U.S. commercial banking system are conducted and probabilities of default are estimated. The 90% and 95% quantiles of non-performing loans (NPLs) are determined non-linearly by real GDP growth, the effective federal funds rate, the federal debt to GDP ratio, and the trade weighted average exchange rate. Linear effects are through a broad-based macroeconomic (Leading Economic Index,) and labor market (Coincident Economic Activity Index) indicators. The 90% and 95% quantiles of NPLs for various stress tests under adverse scenarios are estimated in the range of 4.27%-4.86%. This level of NPLs can be reduced by policy action in the form of currency appreciation. The average probability of default is estimated in the area of 0.0010%-0.0020%. The results are robust to alternative macro indicators and other measures of banking sector health.

*Keywords:* Macro stress tests, additive semi-parametric quantiles, non-performing loans, simulations, probability of default.

*JEL Classification:* G21, G10.

Revised version: 26 October 2017

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