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Bank regulation and international financial stability: A case against the 2006 Basel framework for controlling tail risk in trading books[☆]



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In attempting to promote international financial stability, the Basel Committee on Banking Supervision (2006) provided a framework that sought to control the amount of tail risk that large banks around the world would take in their trading books relative to their corresponding minimum capital requirements. However, many of these banks suffered significant trading losses during the recent financial crisis. Our paper examines whether the Basel framework allowed banks to take substantive tail risk in their trading books without a capital requirement penalty. We find that it allowed banks to do so and that its minimum capital requirements can be notably procyclical. Hence, focusing on the way the Basel framework sought to control the amount of tail risk in trading books relative to their corresponding minimum capital requirements, our paper supports

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the view that it was not properly designed to promote financial stability. We also discuss alternative regulatory frameworks that would potentially be more effective than the Basel framework in preventing banks from taking substantive tail risk in their trading books without a capital requirement penalty.

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1. Introduction

In attempting to promote international financial stability, the [Basel Committee on Banking Supervision \(2006\)](#) provided a framework that sought to control the amount of tail risk that large banks around the world would take in their trading books relative to their corresponding minimum capital requirements (hereafter, ‘Basel framework’).³ However, in contrast with the Basel framework’s intent, many banks suffered significant trading losses during the recent financial crisis (hereafter, ‘crisis’).⁴ For example, in 2008, Royal Bank of Scotland and UBS reported trading losses of, respectively, GBP 8.5 billion and CHF 25.8 billion.⁵ Of particular interest is the question of whether the Basel framework allowed banks to take substantive tail risk in their trading books without a capital requirement penalty. In this paper, we find that it allowed them to do so and that its minimum capital requirements can be notably procyclical (e.g., notably higher minimum capital requirements in a period involving the crisis than in a period not involving one). Hence, focusing on the way the Basel framework sought to control the amount of tail risk in trading books relative to their corresponding minimum capital requirements, our paper supports the view that it was not properly designed to promote financial stability.

The Basel framework required large banks to use Value-at-Risk (VaR) to measure tail risk in their trading books and to determine the corresponding minimum capital requirements. It also required them to use Stress Testing (ST) to supplement VaR.⁶ Not surprisingly, VaR and ST were utilized to set risk exposure limits (see [Basel Committee on Banking Supervision \(2005, p. 12\)](#)).

Since Conditional Value-at-Risk (CVaR) has advantages over VaR, several researchers recommend using it as a measure of tail risk.⁷ An important assumption of our paper is that we follow their recommendation. We examine the effectiveness of three sets of constraints in controlling tail risk: (1) a VaR constraint; (2) ST constraints; and (3) VaR and ST constraints. Within the context of the Basel framework, our results are pertinent when both types of constraints (i.e., VaR and ST) are used and either just one or both types bind.

³ We emphasize that, for brevity, we use the terms ‘Basel framework’ to refer to the regulatory framework for trading books (not for banking books). The Basel framework was originally introduced as an Amendment to Basel I but later became part of Basel II; see [Basel Committee on Banking Supervision \(1996, 2006\)](#). Basel II is currently being phased out and replaced with Basel III; see [Basel Committee on Banking Supervision \(2011\)](#). While the Basel framework is often considered in the context of commercial banks, regulators also endorsed its use for investment banks. In 2004, the U.S. Securities and Exchange Commission (SEC) adopted the framework for the capital requirements of certain broker-dealers whose holding companies voluntarily elect to be supervised by the SEC; see [Financial Crisis Inquiry Commission \(2011, p. 152\)](#). Subsequently, Bear Stearns, Lehman Brothers, Merrill Lynch, Goldman Sachs, and Morgan Stanley elected to be supervised by the SEC. However, recognizing that voluntary supervision did not work, the SEC ended it in 2008; see [Financial Crisis Inquiry Commission \(2011, p. 154\)](#).

⁴ For discussions on the causes of the crisis, see [Claessens et al. \(2009\)](#), [Kane \(2009\)](#), [Caprio et al. \(2010\)](#), [Dewatripont et al. \(2010, Ch. 2\)](#), [Levine \(2010a\)](#), and [Gorton and Metrick \(2012\)](#).

⁵ Note that the trading losses of these banks (like those of many other banks) had a notable impact on their 2008 overall net income (including trading and non-trading activities). While Royal Bank of Scotland’s overall net income was minus GBP 24.1 billion, UBS’s overall net income was minus CHF 21.3 billion. Regulators recognize that banks suffered sizeable trading losses; see, e.g., [Basel Committee on Banking Supervision \(2011, p. 1\)](#). Furthermore, [Duffie \(2012\)](#) argues that the crisis was exacerbated by the trading losses of, for example, Bear Stearns, Lehman Brothers, Merrill Lynch, and Royal Bank of Scotland.

⁶ ST is sometimes categorized into ‘micro’ and ‘macro’ ST. Micro (macro) ST seeks to assess the resilience of individual banks (the overall financial system). While we focus on ‘micro’ ST, for brevity our paper omits the term ‘micro.’ For an examination of ‘macro’ ST, see, e.g., [Pritsker \(2012\)](#), [Acharya et al. \(2013\)](#), and [Borio et al. \(2014\)](#).

⁷ CVaR has two advantages over VaR. First, CVaR considers the size of losses beyond VaR, whereas VaR does not; see, e.g., [Basak and Shapiro \(2001\)](#). Second, CVaR is sub-additive (i.e., the CVaR of a two-asset portfolio is less than or equal to the sum of the asset CVaRs), but VaR is not; see, e.g., [Artzner et al. \(1999\)](#). However, [Garcia et al. \(2007\)](#) find that the cases where VaR is not sub-additive are rare. Nevertheless, there is an extensive literature that recognizes the drawbacks of using VaR as a measure of tail risk. Furthermore, the literature has yet to compare the effectiveness of jointly using VaR and ST to control tail risk. Our paper fills this gap.

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