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Has the Basel Accord improved risk management during the global financial crisis?☆

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ABSTRACT

The Basel II Accord requires that banks and other Authorized Deposit-taking Institutions (ADIs) communicate their daily risk forecasts to the appropriate monetary authorities at the beginning of each trading day, using one or more risk models to measure Value-at-Risk (VaR). The risk estimates of these models are used to determine capital requirements and associated capital costs of ADIs, depending in part on the number of previous violations, whereby realised losses exceed the estimated VaR. In this paper we define risk management in terms of choosing from a variety of risk models, and discuss the selection of optimal risk models. A new approach to model selection for predicting VaR is proposed, consisting of combining alternative risk models, and we compare conservative and aggressive strategies for choosing between VaR models. We then examine how different risk management strategies performed during the 2008–09 global financial crisis. These issues are illustrated using Standard and Poor's 500 Composite Index.

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1. Introduction

The global financial crisis of 2008–09 has left an indelible mark on economic and financial structures worldwide, and left an entire generation of investors wondering how things could have become so severe (see, for example, Borio, 2008; Shehzad & De Haan, 2013). There have been many questions asked about whether appropriate regulations were in place, especially in the US, to permit the appropriate monitoring and encouragement of (possibly excessive) risk taking.

The Basel II Accord was designed to monitor and encourage sensible risk taking using appropriate models of risk to calculate Value-at-Risk (VaR) and forecast daily capital charges. VaR is defined as an estimate of the probability and size of the potential loss to be expected over a given period, and is now a standard tool in risk management. It has become especially important following the 1995 amendment to the Basel Accord, whereby banks and other Authorized Deposit-taking Institutions (ADIs) were permitted (and encouraged) to use internal models to forecast daily VaR (see Jorion, 2000 for a detailed discussion). The last decade has witnessed a growing academic and professional literature comparing alternative modelling approaches to determine how to measure VaR, especially for large portfolios of financial assets.

When the Basel I Accord was concluded in 1988, no capital requirements were defined for market risk. However, regulators soon recognized the risks to a banking system if insufficient capital is held to absorb the large sudden losses from huge exposures in capital markets. During the mid 90's, proposals were tabled for an amendment to the 1988 Accord, requiring additional capital over and above the minimum required for credit risk. Finally, a market risk capital adequacy framework was adopted in 1995 for implementation in 1998. The 1995 Basel I Accord amendment provides a menu of approaches for determining market risk capital requirements, ranging from a simple, to intermediate and advanced approaches. Under the advanced approach (the internal model approach), banks are allowed to calculate the capital requirement for market risk using their internal models. The use of internal models was only introduced in 1998 in the European Union. The 26 June 2004 Basel II framework, implemented in many countries in 2008 (though not yet formally in the USA) enhanced the requirements for market risk management by including, for example, oversight rules, disclosure, management of counterparty risk in trading portfolios.

In the 1995 amendment, p. 16, a similar capital requirement system was recommended, but the specific penalties were left to each national supervisor. We consider that the penalty structure contained in Table 1 of this paper belongs only to Basel II, and was not part of Basel I or its 1995 amendment.

The amendment to the initial Basel Accord was designed to encourage and reward institutions with superior risk management systems. A back-testing procedure, whereby actual returns are compared with the corresponding VaR forecasts, was introduced to assess the quality of the internal models used by ADIs. In cases where internal models lead to a greater number of violations than could reasonably be expected, given the confidence level, the ADI is required to hold a higher level of capital (see Table 1 for the penalties imposed under the Basel II Accord. Penalties imposed on ADIs affect profitability directly through higher capital charges, and indirectly through the imposition of a more stringent external

Table 1
Basel Accord penalty zones.

Zone	Number of violations	k
Green	0 to 4	0.00
Yellow	5	0.40
	6	0.50
	7	0.65
	8	0.75
	9	0.85
Red	10+	1.00

Note: The number of violations is given for 250 business days. The penalty structure under the Basel II Accord is specified for the number of violations and not their magnitude, either individually or cumulatively.