

Chapter 1

Early Warning System for Banking Crisis Causes and Impacts

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ABSTRACT

The purpose of this chapter is to present with an overview of the early warning systems (EWS) applied to global banking crises. Numerous past studies have focused on the EWS of banking crisis. The majority of these studies have developed a predictive model to forecast the likelihood of banking crisis. Relatively less studies in the past show an attempt to predict both crisis likelihood and timing of the crisis likelihood. Precision of timing with respects to a specific type of financial crisis is undeniably difficult. Nonetheless, knowing the timing of crisis likelihood will make policy more effective. Policy makers will be able to response promptly to the upcoming banking crisis by taking pre-emptive measures which are crucial to mitigate the impact from the crisis. Specifically, this would help to avoid the widespread of crisis. It is aware that a banking crisis can transform into a systemic banking crisis which possibly ruins the function of the domestic financial system.

INTRODUCTION

In last few decades, countries around the world have had experienced a number of devastating banking crises. The U.S. credit or subprime mortgage crisis is probably the recent most striking banking crisis episode that heightens global awareness of the severity of banking crisis. The crisis began in the second-half of 2006 (Eubanks,

2010) and co-exists with the Great Recession which started in 2007:12 and last until 2009:6.¹ The chronology of the crisis event is available from Bassarab (2010). More than 25 subprime lending companies in U.S. had declared bankruptcy during the short time period of 2007:2-3. Bank of America announced to purchase Countrywide Financial, a major domestic mortgage lender for about US\$4 billion on 11 January 2008. On 16-17 March 2008,

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Bear Stearns, formerly the fifth largest U.S. investment bank agreed to a purchase deal by JPMorgan Chase with US\$2 per share which was then revised to US\$10 per share. On 11 July 2008, IndyMac Bancorp, Inc., another major U.S. mortgage lender was seized by the Federal regulator after a bank run. Lehman Brothers, previously the U.S. fourth largest investment bank declared bankruptcy on 15 September 2008. On the same day, Merrill Lynch, the world largest brokerage agreed to a US\$50 billion purchase deal by Bank of America. Just after a few days, on 21 September 2008, two other US largest investment banks, Goldman Sachs Group and Morgan Stanley became bank holding companies under the regulation by the Federal Reserve Board. According to Mehl (2013), the demise of Lehman Brothers had pushed risk aversion and global uncertainty to the historic level. In fact, the U.S. subprime crisis had triggered the 2007-2009 financial crisis that spread over to the European Union's (hereafter, EU) economies and United Kingdom. Much of the U.S. securitized-debt was originated to be distributed to European institutions and investors which caused them to suffer substantial losses for investing in the U.S. subprime mortgage securities, for instance, a large German bank, IKB undergone a massive bailout by the German government (see Eubanks, 2010). Further, in United Kingdom, banks were highly depending on short-term funding for financing the holding of long-term mortgages. The weakened securitized products market forced them to depend upon the funding provided by wholesale money market. Problem arose when these banks could not attract fund from the money market. Northern Rock, for example, was forced to seek for assistance form the Bank of England. This provoke a run by depositors and resulted in nationalization (Dimsdale, 2009).

No doubt, banking crisis is a threat to the resilience of banking sector. It can cause severe disruption in the domestic banking system. In addition, it may be magnified by the contagion effect

because financial institutions are interconnected through the financial system. Thus, policy makers and regulators of the banking system require an effective early warning system (hereafter, EWS) to detect the emergence of banking crisis. Generally, EWS is applied to various types of financial crises such as banking crisis, currency crisis, speculative bubbles and crashes, and sovereign default. By definition, Boiton (2012) refers EWS as the mechanism that transforms the information contained in economic and financial indicators into a measure of future vulnerability. Lestano *et al.* (2003) explain that EWS is a monitoring tool used to predict financial crisis which all existing EWS models apply fundamental determinants of both the domestic and external sectors as explanatory variables. The importance of EWS is irrefutable. Bussiere and Fratzscher (2002) have mentioned that EWS models are developed to identify economic weaknesses as well as vulnerabilities of emerging markets and ultimately to anticipate such events. An effective EWS will provide accurate crisis signals for the use of policy makers as well as regulators of the banking system, in which the information contained in the crisis signals is crucial for setting pre-emptive measures prior to the arrival of financial crisis. Moreover, EWS has great value due to the awareness that financial crisis will incur large costs (Lestano *et al.*, 2003), while having a potential for contagion (Özlale and Metin-Özcan, 2007; Boitan, 2012). Developing an effective EWS is a difficult task. According to Bussiere and Fratzscher (2002), it is challenging to reliably predict the occurrence of a crisis in a particular country. In addition, it is highly ambitious to predict the accurate timing of a crisis. Berg and Pattillo (1999) point out that the predictive power of even the best crisis forecasting models may be limited. As Bussiere and Fratzscher (2002) note, EWS models are subject to post-crisis bias, thus it is not easy to select the optimal threshold or cut-off level in a logit model. Furthermore, Edison (2003) highlights that predictive models

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