Available online at www.sciencedirect.com

ScienceDirect

Procedia Economics and Finance 38 (2016) 17 – 37

Procedia Economics and Finance

www.elsevier.com/locate/procedia

Istanbul Conference of Economics and Finance, ICEF 2015, 22-23 October 2015, Istanbul, Turkey

Macro Stress Testing and an Application on Turkish Banking Sector[1]

Savas ONDER[a2], Bulent DAMAR[b], Alper Ali HEKIMOGLU[c]

[a]*Savas ONDER, Ankara, 06680, Turkey*
[b]*Bulent DAMAR, Ankara, 06680, Turkey*
[c]*Alper Ali HEKIMOGLU, Ankara, 06680, Turkey*

Abstract

Especially after the recent financial crisis that started in mortgage markets and spread all over international markets, in order to better monitor financial risks, the importance and use of stress testing has increased. In this study, top-down macro stress testing from a supervisory perspective was analyzed and discussed in general terms. Then, probable effects of credit, interest rate, exchange rate, and contagion risks on capital adequacy of Turkish banking sector in specified baseline and adverse scenarios were examined. First, different satellite panel econometric models for corporate and retail loans were used to estimate loan growth and non-performing loans. Second, model results were utilized to see effects of macro-economic scenarios on Turkish banking system according to the Basel's standard and economic capital approaches. Results of the study showed that economic growth and interest rates change had significant effects on corporate loans while along with these variables unemployment rate had significant effect on retail loans. Moreover, economic growth, exchange rates, and unemployment rate had significant impacts on corporate non-performing loans while only economic growth and unemployment rate had significant impact on non-performing retail loans. According to the study results, while there was no significant impact of exchange rates on net income of the sector because of low level net foreign currency positions, the main effect was on capital adequacy via revaluation of foreign currency denominated risk weighted assets. We found that the robust capital base of Turkish banking sector was a crucial factor in resilience of the sector' capital adequacy against financial shocks.

Peer-review under responsibility of the Organizing Committee of ICEF 2015.

Keywords: Stress Testing, Turkish Banking Sector, Credit risk, Interest Rate Risk, Exchange Rate Risk, GMM

Acknowledgement: The information and views set out in this article are those of the authors and do not necessarily reflect the official opinion of the Banking Regulation and Supervision Agency of Turkey

[1] This research was supported by Aziz Turhan, Murat Dicle, Gülsün Özyurt, Ebru Sonbul İskender and Petr Jakubik. Authors thank each of them for their support, insight, and expertise that greatly assisted the research.

* Savas ONDER Tel.: +90-312-455-67-72
E-mail address: onders@bddk.org.tr

Peer-review under responsibility of the Organizing Committee of ICEF 2015.
doi:10.1016/S2212-5671(16)30173-3

1. Introduction

We all know that in all financial interactions participants seek for the accurate financial information. This is all for the pricing of the financial instruments, valuation of the financial companies, and even for the reliability of macroeconomic indicators. In this context, banking sector is also going through this way and both for micro and macro levels, financial intermediaries and participants are continuously looking for the correct financial information to get correct decisions.

This aforementioned concern on pricing in the area of whole finance seems to be advanced in the developed countries because of their long financial history, well developed markets, and research activities. However, during economic crises we saw that markets' functioning was not always being as expected. Since financial parties realized that in the global environment they were not independent from each other and financial systems needed to be managed and supervised better, global financial supervision has been changing. International institutions, especially the Basel Committee is leading this change in global banking system.

This observed change in banking system is from the historic financial analysis based supervision to a new supervision approach focusing on financial institutions' goals, financial expectations, and probabilities. This forward looking financial expectation based supervision approach forces regulators and supervisors to act as a leading/coaching authority that helps banks to build their own internal control systems, risk management frameworks, and self-control mechanisms. Basel Banking Committee has been constantly working on new studies, principals, regulations, and approaches in this area to provide a comprehensive framework for banks that help them to conduct their activities safely by their own.

In this context, although it is not enough, capital adequacy ratio has been focused as a final, or let us say unique indicator. For a healthy bank, it is generalized to be that a certain level of capital adequacy ratio is said to be safe. Afterwards, following the recent US mortgage crisis liquidity coverage ratios were also introduced by Basel III Rules. Here comes the question. To which extend these measures are enough?

As it is known, capital adequacy ratio indicates a financial institution's capital as a resistance against losses. After the initial capital, a financial institution's loss or gain is simply the main factor for the capital. Also, losses exposed can be distinguished to expected and unexpected. Banks are expected to count their ongoing financial and operational losses and they are assumed to hold reserves for their expected losses. On the other hand, unexpected loss is the big question for banks since any unexpected loss greater than a bank's capital means default. At this stage stress testing is in charge and becomes an important tool to test if banks have enough capital in case of an unexpected but plausible event.

The purpose of this study is to present and discuss the main framework of a top down macro stress testing and in this aspect analyze Turkish banking industry's capital adequacy level within a set of scenarios. We hope that the study will give important outputs about the industry's current situation and potential. In addition we hope that it will be helpful for academics and practitioners.

2. Literature Review

Although several studies have been made about stress testing, these studies are mainly focused on a specific portfolio or a specific structure of a credit institution. Moreover, studies which are about macro-economic variables and credit risk parameters can be defined as supportive analysis for stress testing rather than being a single stress testing study. On the other hand our way of studying macro stress testing is on the supervisory perspective which focuses on a much wider scope. In this perspective we see very practical examples from International Monetary Fund (IMF).