# Gain or Loss: An analysis of bank efficiency of the bail-out recipient banks during 2008 - 2010

Ali Ashraf, Ph.D.

Assistant Professor of Finance

Department of Marketing & Finance

Frostburg State University

101 Braddock Road, Frostburg, MD 21532

Phone: 301-687-4046

Cell: 301 − 338- 0934

Email: aashraf@frostburg.edu


M. Kabir Hassan, Ph.D.

Professor of Finance

Department of Economics & Finance

University of New Orleans

New Orleans, LA 70148

Email: mhassan@uno.edu

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*Abstract*

This is one of the early studies to analyze the impact of the Bank Bailout program initiated by the FDIC following the 2007 global financial crisis over the 2008 to 2010 period. We argue that post-bail-out efficiency of the participating institutions should be better than the same of the pre-bailout efficiencies. Besides, we also investigate whether the bail-out program has imparted additional liquidity and eradicated the insolvency risks of the recipient banks. We perform survival analysis to investigate the probabilities of failure among the participating banks.

**Gain or Loss: An analysis of bank efficiency of the FDIC failed-bank acquisitions** [1]

1. Introduction

Following the financial crisis of 2007 and thereafter the liquidity melt down, the Federal Reserve System and the United States Department of the Treasury had undertaken a set of actions to stabilize the financial sector. Earlier, on February 11, 2013, the US Department of the Treasury submitted Troubled Asset Repurchase Program (TARP), Monthly report to the Congress – January 2013 that summarizes the latest stance of the different intervention windows.

Although a trend of recent studies has analyzed the impact of the different intervention windows initiated by the FED and US Treasury, few studies attempt at the analysis of the long-term impact on these market interventions (*Al-Mamun et al. 2011, Cúrdia et al. 2010, and Joyce et al. 2010*). This is one of the early papers to analyze whether the bank bail-out program undertaken during the 2008- 2010 period has been successful or not.

Existing bank efficiency literature suggests that may attain efficiency gains from bank mergers and acquisitions (see: Rhoades (1998)). James and Wier (1987) present empirical evidence that, on the average, the acquiring banks gain abnormal returns from the acquisition of FDIC failed banks and there is a wealth transfer from FDIC to the acquiring banks. However, the existing literature on bank efficiency provides few evidence on whether active intervention by the regulators have a long-term positive impact over the banking sector or not.

[1] *Authors: Ali Ashraf, PhD. Assistant Professor of Finance, Frostburg State University, Maryland and M. Kabir Hassan PhD., Professor of Finance, University of New Orleans may be reached at aashraf@frostburg.edu and mhassan@uno.edu respectively. Any comment on this version of draft would be sincerely appreciated.*

Accordingly, this paper is motivated to analyze if there is any gain in efficiency for the participating banks who avail benefits from the bail-out funds from the US Treasury. First, we argue that, for the bank bail-out to be successful, there should be a positive efficiency gain by the participating banks; hence the post-bail-out efficiency of these banks should be better than the same of the pre-bail-out efficiencies. Second, we also analyze whether the bail-out program has any impact on the liquidity crisis on the participating banks of the benefit year(s). Third, we investigate if there is any significant impact on the capital adequacy and insolvency risks of the beneficiary banks. Finally, we also analyze if the probability of the bank-run or bank-failure is being reduced for the participating banks after availing the bail-out window benefits.

Given the changing regulatory paradigm following the Dodd Frank act of 2010, the importance of the FDIC as a deposit insurance provider and as a regulatory authority is re-assessed by the regulators and financial economists alike. Our dataset consists of FDIC listed banks that participated in the 2008-2010 bail-out program with a sample period of 2000 to 2013. We argue that our dataset allows us to analyze the efficiency gain or loss for the participating banks for both the financial crisis period and non-crisis period and may provide us additional insight if any significant differences may exist.

Consistent with our motivation, we address following research questions: What is the impact of the bank bail-out program on the participating FDIC listed banks? Whether the pre-bail-out and the post-bail-out efficiency of the acquiring banks are different? And, which types of efficiencies are different? Is the pattern in changes in bank efficiency changes different for the acquisitions taken place during the 2008 financial crisis? Whether the bank-bail-out program has significant impact on reducing the solvency risks of the participating banks?

We expect that this study may contribute to the extant literature in several different ways. First, this is one of the early studies to analyze changes in bank efficiency of the acquiring banks in the pre-bail-out and the post-bail-out phases. Second, existing bank efficiency literature does not provide evidence on bank efficiency for the bank-bail-out participating banks; hence contribution of this study is unique. Third, the analysis of possible impact of financial crisis on the participating banks' the pre-bail-out and post-bail-out efficiency may provide different insights.

We consider both Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) approaches in our analysis; both of these techniques are essentially non-parametric techniques where statistical significance on hypothesis testing is not possible through traditional approach. However, a recent set of studies, come up with unique solution to the short-comings of using DEA and SFA analysis; these studies calculate the three efficiency scores for individual banks and then use the scores as dependent variable in a regression set up. Besides different types of non-parametric statistical techniques, such as Wilcox-t test, Pearson correlation, and K-squared tests can be performed to overcome such shortcomings. To analyze the probabilities of bank failure, we use the survival analysis approach; we analyze hazard function of the participating banks.

2. Methodology

2.1    Data

Our dataset consists of FDIC listed banks that participated in the 2008-2010 bail-out program with a sample period of 2000 to 2013. We consider the variables as components for the input vector: (1) labor, (2) fixed capital, and (3) customer and short-term funding funds. We

measure the labor by staff costs, capital by cots on premises and fixed assets, and customer and short-term funds by the sum of deposit (demand and time) and non-deposit funds as of the end of the respective year. For the output vector, we consider: (1) total loan (2) other earning assets and (3) Off-balance sheet items.

## 2.2 Hypotheses

Consistent with our first research question, we argue that the participating banks should attain higher efficiency during the post-bail-out period as compared to their pre-bail-out efficiencies. Accordingly we hypothesize that:

*H1: there should be a significant enhancement in efficiency scores for the participating banks during the pre- and the post-bail-out phase.* We use Wilcox t-test to analyze our hypothesis.

Our second research question is motivated by the recent financial crisis; we argue that there could be significant difference in the pattern of changes in the efficiency scores of the acquiring banks during the recent financial crisis. Accordingly, we

*H2: the changes in efficiency scores for the acquiring banks during the pre- and post-acquisition phase may be different during the financial crisis period as compared to otherwise non-crisis period.* We use Wilcox t-test to analyze our hypothesis.

To analyze the argument whether the bail-out program has been successful in imparting liquidity and reducing solvency risk, we argue that:

*H3: the probability of bank-run should be lower for the participating banks during the post-bail-out period as compared to the pre-bail-out period.* We use survival analysis to analyze the bank-run risks.

## List of Reference

Aly, H. Y. and Grabowski, R. (1990) Technical, scale, and allocative efficiencies in U.S. banking: an empirical investigation, The Review of Economics and Statistics, 72, 211–9.

Berg, S. A., Førsund, F. R., Hjalmarsson, L. and Suominen, M. (1993) Banking efficiency in the Nordic countries, Journal of Banking and Finance, 17, 371–88.

Berger, A. N. and De Young, R. (1997) Problem loans and cost efficiency in commercial banks, Journal of Banking and Finance, 21, 849–70.

Berger, A. N. and Humphrey, D. B. (1991) The dominance of inefficiencies over scale and product mix economies in banking, Journal of Monetary Economics, 28, 117–48.

Berger, A. N. and Humphrey, D. B. (1992) Measurement and efficiency issues in commercial banking, in Output Measurement in the Service Sector (Ed.) Z. Griliches, NBER, 245–79.

Berger, A. N. and Mester, L. J. (1997), Inside the black box: what explains differences in the efficiencies of financial institutions, Journal of Banking and Finance, 21, 895–947.

Ferrier, G. D. and Lovell, C. A. K. (1990) Measuring cost efficiency in banking: econometric and linear programming evidence, Journal of Econometrics, 46, 229–45.

Fries, S. and Taci, A. (2005) Cost efficiency of banks in transition: evidence from 289 banks in 15 post-communist countries, Journal of Banking and Finance, 29, 82–110.

Isik, I. and Hassan, M. K. (2003) Financial deregulation and total factor productivity change: an empirical study of Turkish commercial banks, Journal of Banking and Finance, 27(8), 1455–85.

Luenberger, D. (1992) Benefit functions and duality, Journal of Mathematical Economics, 21, 461–81.

Banker, R. D., Charnes, A. and Cooper, W. W. (1984), Some models for estimating technical and scale inefficiencies in data envelopment analysis, Management Science, 30, 1078–92.

Coelli, T., Prasada Rao, D. S. and Battese, G. E. (1999), An Introduction to Efficiency and Productivity Analysis, 2nd edn, Kluwer Academic Publishers, Dordrecht.

Debreu, G. (1951) The coefficient of resource utilization, Econometrica, 19, 273–92.

Giokas, D. (1991) Bank branch operating efficiency: a comparative application of DEA and the log-linear model, OMEGA International Journal of Management Science, 19, 549–57.

Rogers, K. E. (1998) Nontraditional activities and the efficiency of US commercial banks, Journal of Banking and Finance, 22, 467–82.

Chambers, R. G., Chung, Y. and Fa¨re, R. (1998) Profit, direc-tional distance functions and Nerlovian efficiency, Journal of Optimization Theory and Applications, 95, 351–64.

Ferrier, G. and Lovell, C. A. K. (1990) Measuring cost efficiency in banking: econometric and linear programming evidence, Journal of Econometrics, 46, 229–45

Aigner, D., C.A.K. Lovell and P. Schmidt (1977), 'Formulation and Estimation of Stochastic Frontier Production Models',Journal of Econometrics, Vol. 6, pp. 21–37.

Altunbas, Y. and S.P. Chakravaty (2001), 'Frontier Cost Functions and Bank Efficiency', Economics Letters, Vol. 72, No. 2, pp. 233–40

Battese, G.E. and T.J. Coelli (1992), 'Frontier Production Functions, Technical Efficiency and Panel Data: With Application to Paddy Farmers in India', Journal of Productivity Analysis, Vol. 3, pp. 153–69.

Bauer, P. W. (1990), Recent developments in the econometric estimation of frontier, Journal of Econometrics, 46, 39–56.

Kalirajan, K. P. and Shand, R. T. (1994) Economics in Disequilibrium: An Approach from the Frontier, Macmillan India Ltd.

Kumbhakar, S. C. and Lovell, C. A. (2000), Stochastic Frontier Analysis, Cambridge University Press, Cambridge and New York.

James, C. and Wier, P. (1987), An analysis of FDIC failed bank auctions, Volume 20 (7), 141-153


Al-Mamun, A., Hassan, M. K., and Johnson, M., 2011, "How did the Fed do? An empirical assessment of the Fed's new initiatives in the financial crisis," Applied Financial Economics, Vol. 20, pages 15-20.

Cúrdia, V., and Woodford, M., 2010, Conventional and Unconventional Monetary Policy Federal Reserve Bank of St. Louis Review, July/August 2010, 92(4), pp. 229-64.

Joyce, M., Lasaosa, A., Stevens, I. and Tong, M., 2010, The financial market impact of quantitative easing. Bank of England, Working Paper No. 393, July 2010, revised August 2010. Klyuev, V, de Imus, P and Srinivasan, K, 2009, Unconventional choices for unconventional times: credit and quantitative easing in advanced economies, IMF Staff Position Note, SPN/09/27, November 2009

Thorbecke, W., 1997, On Stock Market Returns and Monetary Policy, The Journal of Finance, Vol. 52, No. 2 (Jun., 1997), pp. 635-654.