

CASE STUDY

Bank Failure Case Study: Bank of Cyprus PLC

Authors

Yanruo Wang
 Associate Director
 1.415.874.6232
 Yanruo.wang@moodys.com

Clara Bernard
 Research Data Analyst
 1.415.874.6110
 clara.bernard@moodys.com

Irina Korablev
 Senior Director
 1.415.874.6278
 irina.korablev@moodys.com

Editor

Christopher Crossen
 Assistant Director- Research
 Associate 1.415.874.6251
 christopher.crossen@moodys.com

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Contact Us

Americas
 +1.212.553.1658
 clientservices@moodys.com

Europe
 +44.20.7772.5454
 clientservices.emea@moodys.com

Asia (Excluding Japan)
 +85 2 2916 1121
 clientservices.asia@moodys.com

Japan
 +81 3 5408 4100
 clientservices.japan@moodys.com

Abstract

In this report, we demonstrate the performance of the RiskCalc™ Banks v4.0 model on government bailout banks.

Default Event

In March 2013, the Cyprus government imposed a “haircut” on its large depositors in exchange for a €10 billion support package from the European Stability Mechanism.¹ A few months later, in July 2013, Cyprus' Central Bank announced that 47.5% of the Bank of Cyprus' deposits exceeding €100,000 would be converted into equity.

Company Profile

The Bank of Cyprus Group was founded in 1899 and headquartered in Nicosia, Cyprus. The financial institution “... offers directly, or through subsidiary companies, banking, insurance and other financial services. The company operates in Cyprus, Greece, the United Kingdom, Australia, Romania, Russia, and the Channel Islands. It offers retail, corporate and investment banking, private banking, factoring, leasing, life and general insurance, brokerage, mutual funds management.³ As of December 2011, the Bank of Cyprus had €37,475 million of assets and liabilities and shareholders' equity.

CCA EDF Credit Measure

To demonstrate the use of the RiskCalc Banks v4.0 model, we look at the 1-year Credit Cycle Adjusted (CCA) EDF of the Bank of Cyprus, beginning January 2008. RiskCalc produces a default probability combining bank-specific financial statement information and forward-looking banking-sector-wide equity market information. For calendar months June to next May, monthly CCA EDF is based upon financial statements from previous year-end and corresponding monthly Credit Cycle Adjustment. For example, the June 2012 CCA EDF is based upon 2011 year-end financial data and the June 2012 Credit Cycle Adjustment.

¹For more information, please refer to Moody's Investors Service “Cyprus Bailout is Credit Negative for Bank Depositors Across Europe; Credit implication for Sovereigns is Unclear”

²Factiva

³Bloomberg

1. RiskCalc Banks v4.0 1-Year CCA EDF Values

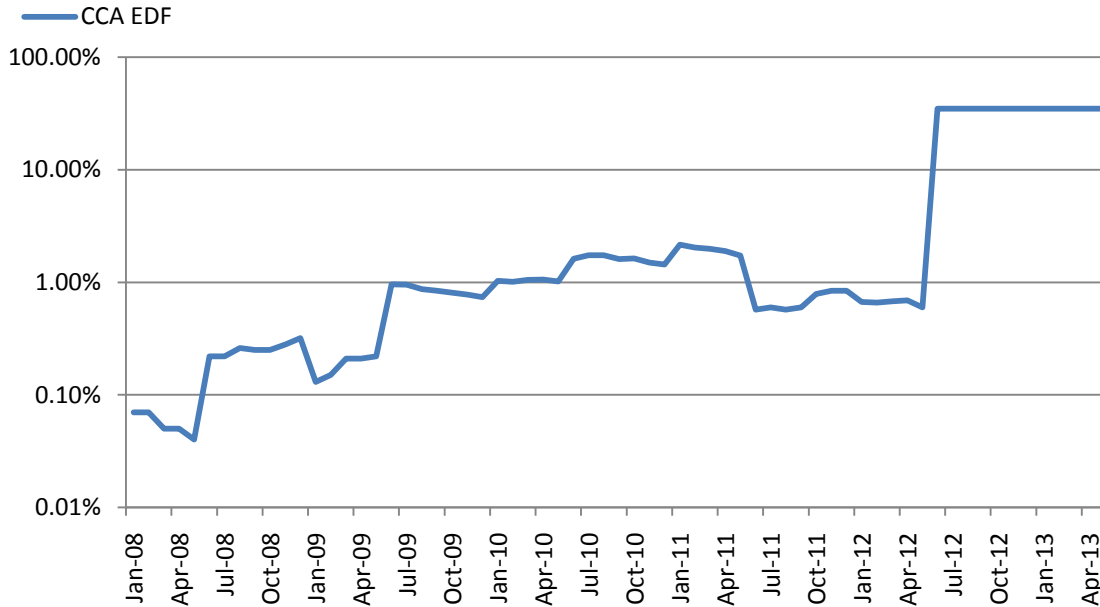
Figure 1

Financial Statement Variables in RiskCalc Banks v4.0

Category	Ratio
Profitability	ROA (Net Income/Assets)
Asset Quality	Non-Performing Assets/(Equity+Loan Loss Reserves)
Asset Quality	Loan Loss Provision/Net Loans
Liquidity	Net Loans/Deposits
Leverage	Equity/Assets
Growth	Change in ROA (Net Income/Assets)
Portfolio Risk	Distance-to-Default Factor (five-year model only)

RiskCalc Banks v.4.0 model evaluates banks' standalone risk using a ratio-based approach. In the one-year model, we select six financial ratios, which can be grouped into four categories: Asset Quality, Profitability, Liquidity, and Leverage. Profitability is measured as ROA (net income divided by assets). The asset quality group includes non-performing (impaired) assets divided by equity plus loan loss reserves, and loan loss provision divided by net loans. Leverage is measured by equity divided by assets, and last, growth is measured by change in net income over assets.

Figure 2
Bank of Cyprus monthly CCA EDF values



In 2012, CCA EDF was based upon 2011 year-end financial statements and Credit Cycle adjustment in each month. The bank's one-year probability of default increased from 0.07% in 2008 to 35% in 2012, placing the company in the 100th percentile, compared to its peers. A few months prior to the bank's failure, its one-year probability of default was already high, near 1%, before reaching 35% in 2012. During financial year-end 2011, the bank showed weaker profitability when compared to a year prior. ROA (Net Income/Total Assets) decreased from 0.205% in year-end 2010 to -10.91%, indicating low profitability and negative growth (see Figure 4).

Bank of Cyprus' liquidity deteriorated in year-end 2011 compared to year-end 2010, as measured by the loan-to-deposit ratio. In 2011, liquidity reached 122.91%, while at 103.563% one year ago. As stated in their financial statement,⁴ Bank of Cyprus did not meet the capital adequacy ratios required by the Central Bank of Cyprus on September 30, 2012, which led the bank to apply for capital support from the government.

During 2011, the bank's non-performing assets ratio [Non-Performing Assets to (Equity + Loan Loss Reserves)] jumped from 45% in 2010 to 166% in 2011, contributing to an increase in EDF. Bank of Cyprus' asset quality was affected by the economic crisis in the Republic of Cyprus and Greece. The bank was impacted by the impairment of Greek Government Bonds and impairment losses on loans and advances. Also, in June 2012, the Republic of Cyprus applied for financial assistance to the European Union and the International Monetary Fund, affecting the Group's financial situation.

The RiskCalc Banks v.4.0 model metrics reflect the Bank of Cyprus' financial challenges, which led to its rescue by European and international institutions, more than a year prior to default.

⁴ Bank of Cyprus Group, Interim Condensed Consolidated Financial Statements for the nine months ended 30 September 2012.

2. Percentile, Relative Contribution, and Relative Sensitivity Graphs

The Percentile, Relative Contribution, and Relative Sensitivity Graphs in RiskCalc Plus v4.0 Banks help us understand what drives the bank's EDF credit measure.

2.1 Percentile Graph

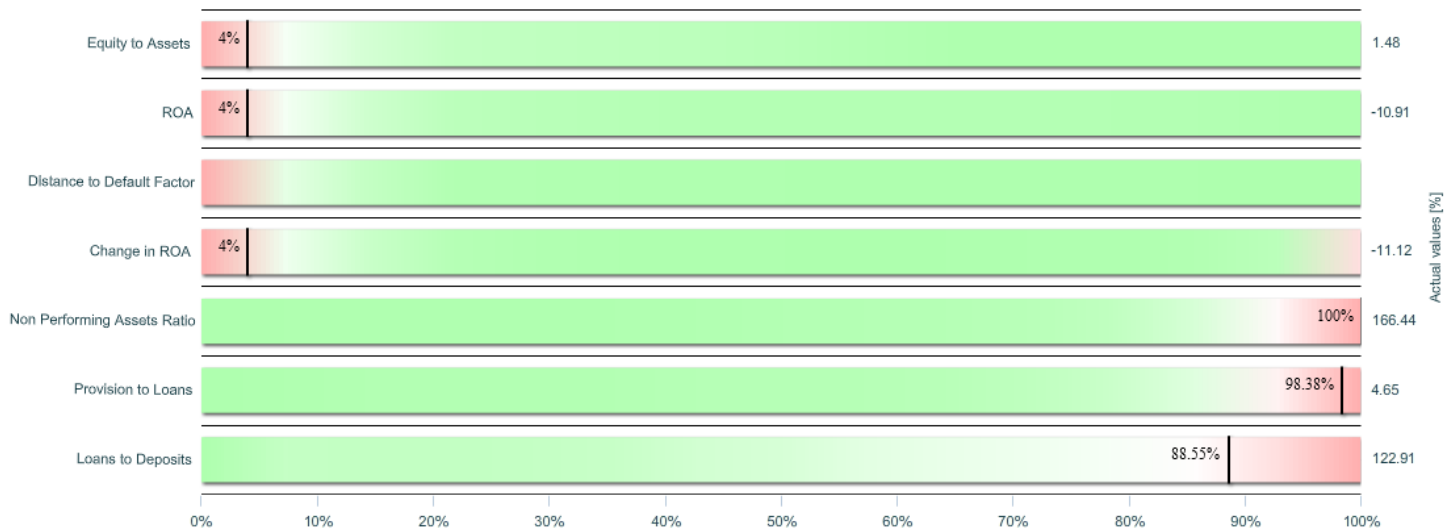
The **Percentile Graph** provides a visual representation of how each of the bank's ratios compares with those global banks used to build the RiskCalc Banks v4.0 model.

The Percentile Graph plots the percentile of each ratio and provides the actual value in the right-hand column. The colors **RED**, **LIGHT GRAY**, and **GREEN** correspond to the risk level, **HIGH**, **MEDIUM**, and **LOW** associated with the specific value of the ratio.

The Percentile Graph does not consider the weight the model places on each ratio in determining the EDF level.

Figure 3

Percentile Graph- Bank of Cyprus financial statement for FYE 2011



In the Percentile Graph using Bank of Cyprus' 2011 Financial Statement, we observe that all the ratios are solidly in the red. On the right-hand side, we observe that *Non-Performing Assets Ratio* is in the 100th percentile.

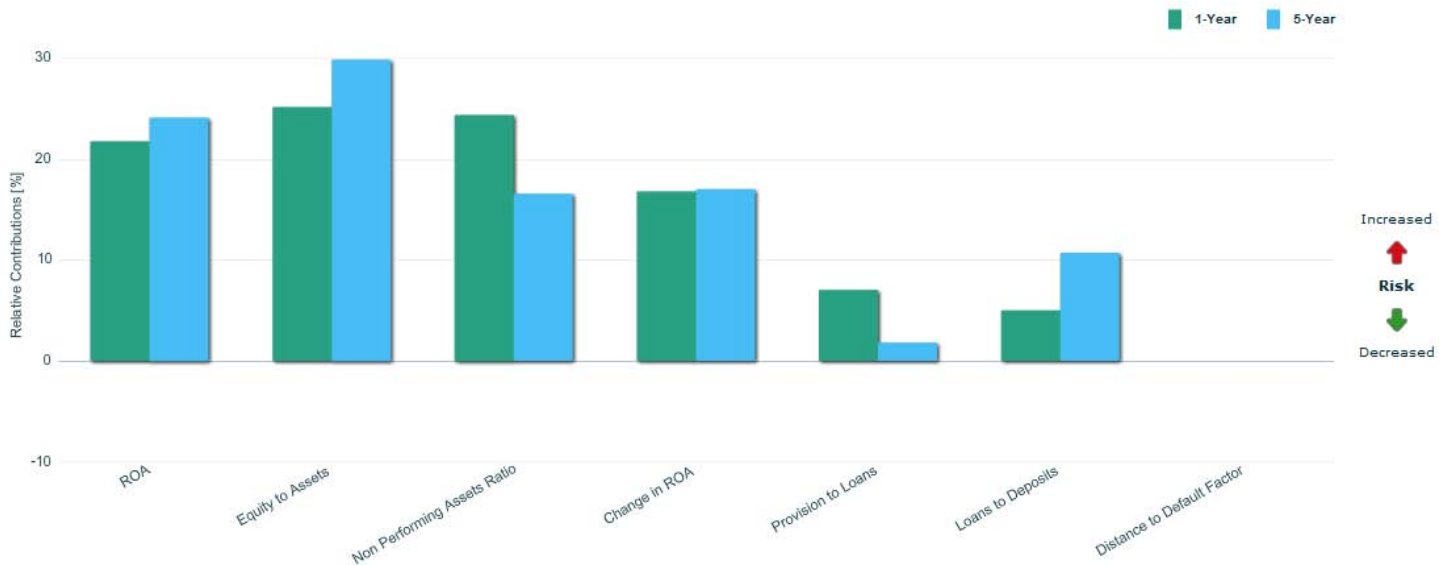
2.2 Relative Contribution Graph

The **Relative Contribution** graph is helpful in identifying the bank's financial strengths and weaknesses with respect to default risk.

The Relative Contribution graph explains how each ratio moves the bank's EDF level away from the average bank used in the model's development. Relative Contributions are expressed relative to one another.

Figure 4

Relative Contribution Graph- Bank of Cyprus for FYE 2011



Based on Bank of Cyprus' 2011 financial statement, *Equity to Assets*, and *Non-Performing Assets Ratio* are the weakest ratios pulling up Bank of Cyprus' EDF level relative to the average EDF level, with relative contributions of 25.12% and 24.36%, respectively. All others ratios increase the Bank of Cyprus' EDF level.

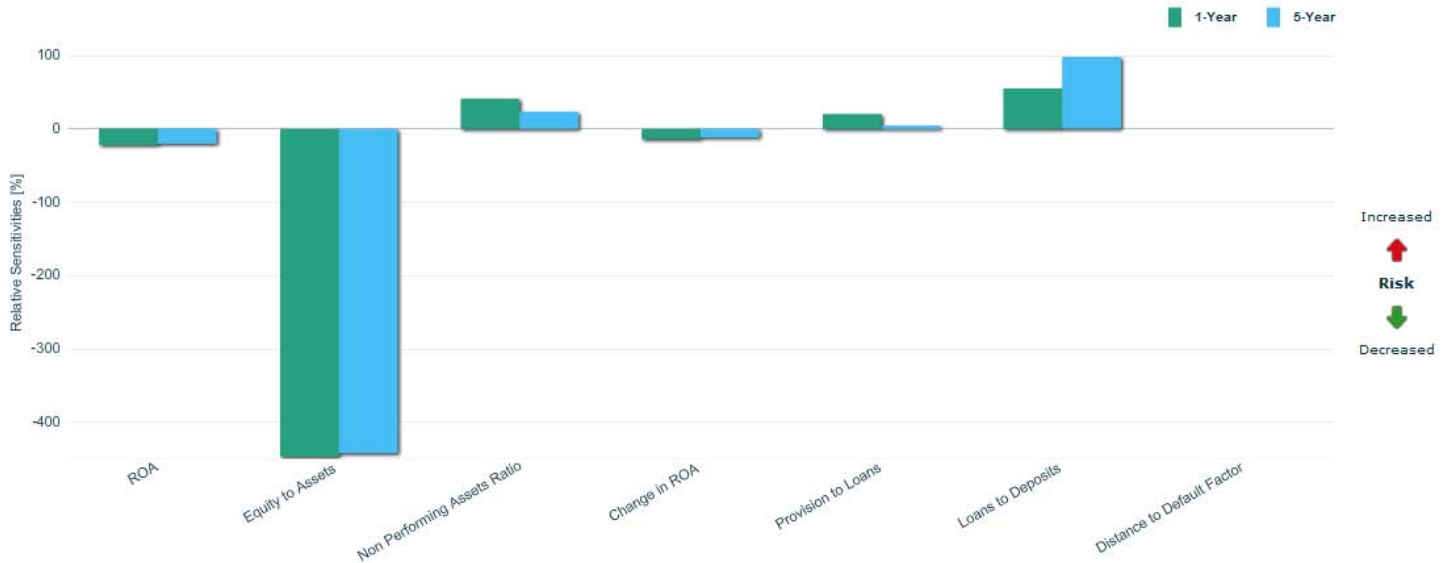
2.3 Relative Sensitivity Graph

The **Relative Sensitivity** graph indicates the relative impact that a small increase in a ratio has on the EDF level, all else being equal.

In the Relative Sensitivity analysis, we set the reference point as the average absolute change in the bank's EDF level, when each ratio is given a small shock. The magnitude of a ratio's Relative Sensitivity is expressed as a multiple of the average sensitivity across the ratios.

Figure 5

Relative Sensitivity Graph- Bank of Cyprus for FYE 2011



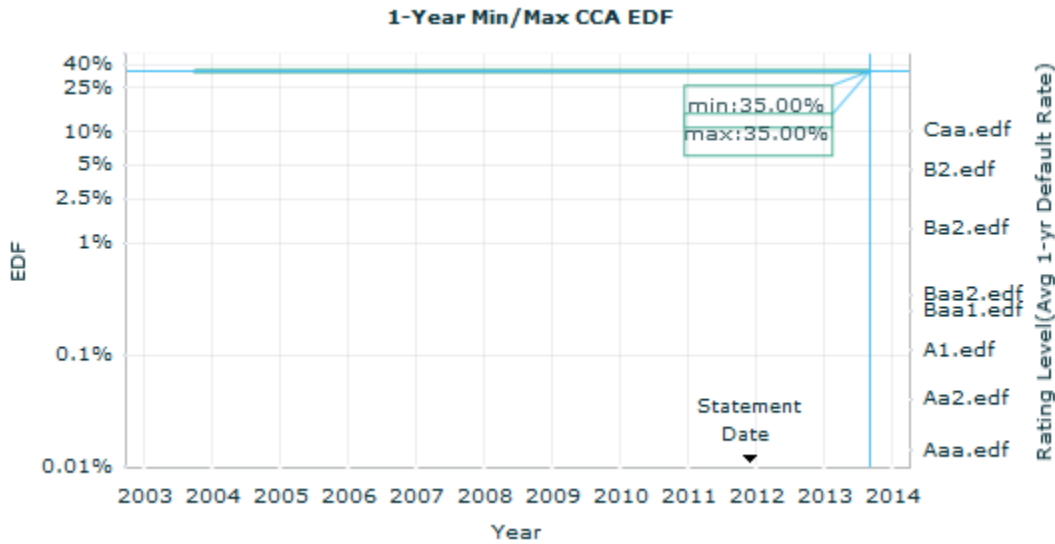
Equity to Assets, ROA, and Change in ROA have a negative relative sensitivity. The magnitude of the Relative Sensitivity of Equity to Assets is -447.16%, which means that shocking the bank's Equity to Assets leads to an EDF level change 4.47 times the size of the average EDF level change from shocking any ratio.

Loans to Deposits has the most positive Relative Sensitivity. The magnitude of the Relative Sensitivity of Loans to Deposits is 55.22%.

3. Year Min/Max CCA EDF Graph

The Min/Max CCA EDF Graph shown below presents the EDF values at different time points given the same set of financial ratios. In this tool, the EDF value changes across time as the credit cycle adjustment factor changes value. For the RiskCalc Banks v4.0 model, the CCA factor is based upon an aggregation of all publicly listed banks within a specific country/region. If the country's banking industry shows higher default risk at a time point relative to the historical level, the EDF value of the evaluated bank would increase, or vice versa.

Figure 6
 1-Year Min/Max CCA EDF Graph- Bank of Cyprus for FYE 2011



Based upon the 2011 financial statement, the Bank of Cyprus would have an EDF value of 35%, at any stage of the credit cycle.

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