Stress testing the banking system: A case study

This case study covers the topic of system-wide stress testing of banking systems. The purpose of this case study is to provide policy analysts and policymakers with an introduction to issues, techniques, and challenges related to financial sector analysis. Given the vastness of this topic, the case study focuses on only the basics of financial sector analysis. The case study assumes that course participants are making an assessment of macrofinancial linkages and financial stability. This case study provides participants with “hands-on” experience with several analytical approaches and tools associated with elements of macro stress testing.
I. Macroeconomic and Financial Sector Developments

Part I provides information for making initial assessments of a country’s macroeconomy and its financial system. The objectives of this section are to:

- Identify possible macroeconomic and/or financial market “trigger events”,
- Construct a short-term, macroeconomic scenario that is likely to develop in response to the trigger events,
- Assess the stage of development of the financial system, and
- Discuss potential risks that may arise in financial sector as a result of the macro scenario.

A. Overview of the economy

The real sector

Following a recession in 2006, real GDP growth averaged 4.6 percent over the 2007-2012 period. GDP growth is projected at 4.6 and 4.7 percent for 2013 and 2014, respectively. GDP growth has been driven by accelerating growth in private consumption and investment in recent years and has been accompanied by rapid expansions in domestic credit and imports. Domestic demand growth is seen to moderate in coming years, though remaining high as a share of GDP. With strong demand for imports, an underperforming export sector, and higher international energy prices, the current account deficit remains quite large – at around 8 percent of GDP.

Figure 1: GDP growth, 2005-2013 (in percentage points)

Headline inflation has been contained to 2-4 percent by a combination of a broadly stable exchange rate and limited pass-through of rising international energy prices. Meanwhile, the
unemployment rate remains high – at around 12 percent. The unemployment has fallen somewhat in recent years, reflecting both an increase in employment growth but also a worrisome drop in labour market participation, most likely the result of persistently-high unemployment and the generous structure of welfare benefits.

Although there have been some improvements in the business environment, several impediments remain that significantly constrain economic growth:

- There are high, numerous, and non-transparent local fees for businesses,
- Property-related legal uncertainties are high, specifically land ownership issues and enforcement of property rights,
- Some observers also see complex local government regulations as conducive to corruption, and
- Bankruptcy and contract enforcement procedures remain very slow.

**Fiscal policy**

The fiscal deficit has been substantially reduced, from 6.1 percent of GDP in 2009 to 2.8 percent in 2012. This reduction was largely due to continued pension reform, wage moderation, and investment cuts. In addition, a large state-owned enterprise scaled back its quasi-fiscal activity. The authorities’ target for the 2007 fiscal deficit is 2.8 percent of GDP, but spending pressures are likely to continue with an upcoming election cycle.

The state’s presence in many areas of economic activity remains significant. Analysts are strongly calling for further fiscal consolidation and reducing the size of government, which would have a number of mutually reinforcing benefits to the economy:

- Boosting economic efficiency by shifting activity to the private sector,
- Reducing the large current deficit and ensuring that public and external debt are on a sustainable path,
- In light of a fixed exchange rate and limited monetary policy, enhancing the flexibility of fiscal policy to address possible economic shocks, and
- Reducing the probability that continent liabilities associated with quasi-fiscal activities will be realised.

**Monetary policy and the financial sector**
The country has maintained a tightly managed floating exchange rate. However, limited exchange rate volatility created complacency regarding exchange rate risk, leading to very large, unhedged borrowings in foreign currency.

Figure 2: Lending and deposit rates, 2005-2013 (in percentage points)

Lending and deposit rates have also remained subdued in recent years. Bank restructuring and privatization have strengthened the financial sector, resulting in strong credit expansion and credit market growth. These developments – in conjunction with a stable exchange rate and relatively low and stable borrowing rates – also raise some concerns: Nearly 70 percent of banks loans are linked or indexed to foreign currencies, and more than 80 percent of loans have variable rates. The share of all bank loans to households increased significantly from 33 percent in 2003 to 55 percent in recent months. Mortgage loans now comprise about 40 percent of household borrowing, and the share of lending to low and middle-income households is growing.
The external sector

With strong import demand and relatively weak exports, the current account deficit is sizeable – at about 8 percent of GDP. As a consequence, gross external debt has jumped to over 80 percent of GDP. While market access is strong, and international reserves have increased, a number of downside risks are present:

- Privatization receipts are expected to drop sharply after 20013 and sizeable new FDI is not assured,
- The central bank has recently warned of risk of debt-service and rollover difficulties should investors’ sentiment toward emerging markets turn negative,
- Although government external debt borrowing has slowed, private-sector foreign borrowing has risen sharply, and
- The proportion of short-term debt has increased, lowering the average maturity of external debt.

B. Overview of the financial sector

The financial system has grown rapidly in recent years, with total financial assets increasing from about 120 percent of GDP at end-2005 to almost 160 percent by end-2012. The financial system is dominated by commercial banks, although banks’ share of total financial assets is slowly eroding. At the end of 2012, banking sector assets were about 120 percent of GDP, and they accounted for approximately 77 percent of total financial assets. The banking system is 90 percent foreign owned – all subsidiaries. The banking sector is also highly
concentrated with the five largest banks accounting for more than 70 percent of total banking assets.

Non-bank financial institutions (NBFIs) are a relatively small segment of the financial system, but they nearly doubled in size from 2005 to 2012 and accounted for about one-quarter of all financial assets at end-2006. Leasing companies are the second largest segment of the financial system, and their increasing importance reflects tighter requirements imposed on banks in an attempt to contain rapid credit growth. Insurance companies are also important, partly stimulated by strong bank credit, as banks require various forms of collateral (including life or hazard insurance) and as banks insure part of their credit risk by transferring it to the insurance companies. Investment and pension funds have also grown rapidly.

There are important interlinkages between banks and NBFIs. Some of the NBFIs are direct subsidiaries of foreign parent banks, while others are owned by local banks. Larger banks generally have cross-sector subsidiaries or affiliates, including brokerage firms, pension funds, leasing companies, and asset management companies. While the exposure of banks to NBFIs appears relatively small, the full scope of inter-linkages is not fully known.

Financial markets are relatively underdeveloped:

- The interbank money market is shallow and segmented, and the market is unable to efficiently move liquidity across banks. About 80 percent of transactions take place bilaterally rather than occurring in the interbank market.
- The FX market is more active and less volatile. Daily turnover has increased more than four-fold since 2003. Although spot transactions have traditionally accounted for the bulk of FX transactions, FX derivatives now account for over half of all FX transactions.
- There is no longer-term money market for managing interest and exchange rate risk.
- Capital markets are booming. However, they lack depth and liquidity and are dominated by equities (118 percent of GDP).

C. Questions for group discussion

*Macroeconomic risks*
1. Discuss recent economic developments in the case study country. What concerns do you have? Based on your concerns, construct an “exceptional but plausible” scenario that could test the vibrancy of the financial system.

2. How does this scenario translate into changes in the following types of financial risk:
   - Interest rate risk,
   - Exchange rate risk,
   - Liquidity risk,
   - Credit risk, and
   - Solvency risk?

3. Assuming that you had detailed data on balance sheets of households, firms, the government, and banks, what types of mismatches would you focus your attention on?

4. Are you more concerned about direct or indirect risks for the financial system?

Financial market structure

1. How important are banks in this economy? How important are foreign-owned banks relative to domestically-owned banks? How is this information useful for assessing the importance of macroeconomic risks to the financial system?

2. In your view, how important are the interlinkages between banks and non-bank FIs?
II. Evaluating financial stability

The main objectives of this section are to:

- Become familiar with how sectoral balance sheets are constructed and their potential limitations for analysis of direct and indirect risks within various sectors,
- Understand how to identify balance sheet mismatches and how these imbalances may also imply risks for other sectors of an economy,
- Identify possible risks and vulnerabilities that are associated with balance sheet mismatches in particular sectors of the economy,
- Identify other sectors of the economy that may be indirectly exposed to these mismatches because of intersectoral linkages,
- Discuss strategies for further analysis of macro and financial stability and how the stability of the real and financial sectors are inter-related.
- Become familiar with the purpose and drawbacks of financial soundness indicators (FSIs),
- Understand the mechanics of conducting a stress test of the financial sector, including the assumptions and simplifications necessary to make a stress test feasible, and
- Conduct a reasonable stress test of banks, based on the result of analysis in Parts I and II of the case study.

A. The balance sheet approach

The balance sheet approach (BSA) views the economy as a stylized system of balance sheets with a balance sheet for each the economy’s main sectors – government, financial, nonfinancial, and external. The BSA differs from the more traditional approach that looks at economic and financial flows – aggregate demand and supply, the fiscal balance, the current account balance, and capital flows. Instead, the BSA examines stocks, primarily the assets and liabilities of various sectors at a certain point in time. The two approaches are complementary, of course, since stocks are merely an accumulation of past flows. However, focusing only on flow variables ignores the various risks and vulnerabilities that can be associated with stocks.

Balance sheet data were collected for 2005 and 2012. The data are broken down by maturity (short- and long-term) and by currency (domestic and foreign). The data are available in a separate Excel spreadsheet called Balance Sheet Data.

B. Indicators of financial sector soundness
Table provides a number of FSIs for assessing the health of the country’s households, corporations and banks.

Table 1: Selected FSIs for case study country

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
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</thead>
<tbody>
<tr>
<td><strong>CORE SET</strong></td>
<td></td>
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<tr>
<td><strong>Commercial Banks</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Regulatory capital to total risk-weighted assets</td>
<td>17.4</td>
<td>16.5</td>
<td>16.0</td>
<td>15.2</td>
</tr>
<tr>
<td>Regulatory tier one capital to total risk-weighted assets</td>
<td>15.2</td>
<td>14.1</td>
<td>13.7</td>
<td>13.5</td>
</tr>
<tr>
<td>NPLs net of loan loss provisions to capital</td>
<td>19.6</td>
<td>22.6</td>
<td>19.0</td>
<td>16.7</td>
</tr>
<tr>
<td>NPLs to total gross loans</td>
<td>10.2</td>
<td>8.9</td>
<td>7.5</td>
<td>6.2</td>
</tr>
<tr>
<td>Sectoral distribution of loans to total loans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-financial corporations</td>
<td>45.0</td>
<td>41.0</td>
<td>39.5</td>
<td>38.5</td>
</tr>
<tr>
<td>Households</td>
<td>44.5</td>
<td>47.8</td>
<td>49.5</td>
<td>49.7</td>
</tr>
<tr>
<td>Other sectors</td>
<td>10.5</td>
<td>11.2</td>
<td>10.6</td>
<td>11.7</td>
</tr>
<tr>
<td>Return on assets</td>
<td>1.6</td>
<td>1.6</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Return on capital</td>
<td>13.7</td>
<td>14.1</td>
<td>16.1</td>
<td>15.1</td>
</tr>
<tr>
<td>Net interest income to gross income</td>
<td>56.3</td>
<td>58.9</td>
<td>56.6</td>
<td>57.9</td>
</tr>
<tr>
<td>Non-interest expenses to gross income</td>
<td>72.9</td>
<td>72.7</td>
<td>68.0</td>
<td>66.7</td>
</tr>
<tr>
<td>Liquid assets to total assets</td>
<td>17.6</td>
<td>18.7</td>
<td>16.1</td>
<td>11.5</td>
</tr>
<tr>
<td>Liquid assets to short-term liabilities</td>
<td>57.8</td>
<td>66.8</td>
<td>62.0</td>
<td>42.1</td>
</tr>
<tr>
<td>Net open position in foreign exchange to capital</td>
<td>n.a.</td>
<td>24.7</td>
<td>18.2</td>
<td>7.4</td>
</tr>
<tr>
<td><strong>ENCOURAGED SET</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Commercial banks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital to assets</td>
<td>9.5</td>
<td>8.9</td>
<td>8.6</td>
<td>9.0</td>
</tr>
<tr>
<td>Large exposures to capital</td>
<td>151.3</td>
<td>128.4</td>
<td>161.4</td>
<td>122.6</td>
</tr>
<tr>
<td>Geographical distribution of loans to total loans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residents</td>
<td>99.5</td>
<td>99.6</td>
<td>99.8</td>
<td>99.7</td>
</tr>
<tr>
<td>Non-residents</td>
<td>0.5</td>
<td>0.4</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Gross asset position in derivatives to capital</td>
<td>n.a.</td>
<td>n.a.</td>
<td>0.8</td>
<td>0.6</td>
</tr>
<tr>
<td>Gross liability position in derivatives to capital</td>
<td>n.a.</td>
<td>n.a.</td>
<td>1.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Non-interest income to total income</td>
<td>43.7</td>
<td>41.1</td>
<td>43.4</td>
<td>42.1</td>
</tr>
<tr>
<td>Personnel expenses to non-interest expenses</td>
<td>33.9</td>
<td>32.5</td>
<td>32.7</td>
<td>34.1</td>
</tr>
<tr>
<td>Spread between domestic lending and deposit rates</td>
<td>11.0</td>
<td>10.1</td>
<td>9.9</td>
<td>9.5</td>
</tr>
<tr>
<td>Spread between foreign exchange lending and deposit rates</td>
<td>5.5</td>
<td>5.0</td>
<td>4.2</td>
<td>3.8</td>
</tr>
<tr>
<td>Non-interbank loans to non-interbank deposits</td>
<td>80.9</td>
<td>87.0</td>
<td>92.2</td>
<td>10.1</td>
</tr>
<tr>
<td>Foreign currency-denominated loans to total loans</td>
<td>75.8</td>
<td>70.9</td>
<td>76.7</td>
<td>78.5</td>
</tr>
<tr>
<td>Foreign currency-denominated liabilities to total liabilities</td>
<td>76.0</td>
<td>76.1</td>
<td>78.1</td>
<td>78.8</td>
</tr>
<tr>
<td>Net open position in equities to capital</td>
<td>n.a.</td>
<td>n.a.</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Non-financial corporations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total debt to equity</td>
<td>44.5</td>
<td>40.9</td>
<td>45.9</td>
<td>49.3</td>
</tr>
<tr>
<td>Return on equity (corporates)</td>
<td>3.6</td>
<td>1.8</td>
<td>2.7</td>
<td>4.4</td>
</tr>
<tr>
<td>Net foreign exchange exposure to equity</td>
<td>8.0</td>
<td>10.0</td>
<td>10.9</td>
<td>12.4</td>
</tr>
<tr>
<td><strong>Households</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
C. A framework for stress testing banks

This section describes the framework used in this case study to conduct stress tests of banks in the case study. This framework is implemented in a separate Excel spreadsheet called *Bank Stress Tester 1.0*.

The framework employs a top-down approach to stress testing. Balance sheet and income statement data are provided for the 10 largest banks, which account for more than 90 percent of total banking assets. The case study focuses on credit risk. Once participants enter a set of macro shocks, these shocks are translated automatically into changes to bank balance sheets. Changes in interest rates and exchange rates have a *direct* effect on banks’ balance sheets, and the sign and size of these changes depend on the characteristics of banks’ portfolios. In addition, changes in interest rates, exchange rates, GDP growth, and the unemployment rate have *indirect* effects on bank balance sheets as a result of a change in credit quality (e.g., a change in loan loss reserves).

Finally, the results of the stress test are summarized with graphs that: (i) compare the post shock capital adequacy ratios (CAR) of various categories of banks with their CARs under the baseline (pre-shock) scenario; (ii) present the amount of capital (as a percent of GDP) that will be necessary to recapitalize banks; and (iii) assess the systemic importance of the test by illustrating the concentration of “bad assets” in the banking system, by bank category.

D. Mapping macro shocks into changes in credit quality
This section of the study describes a simple “back of the envelope” approach to calculating changes to bank capital as a result of changes in the macroeconomy.

**Direct interest rate risk**
Calculating the direct effects of an interest rate shock on the balance sheet and income statements of banks is a very complicated procedure that requires detailed knowledge of every asset and liability of the bank.

First, it is assumed that there are no *capital losses* associated with assets and liabilities that are subject to repricing within a year. In other words, these short-term assets and liabilities are immediately rolled over at the new market interest rate. In this case, the net change to net interest income (and to capital) in response to a change in the short-term interest rate is:

\[ \Delta \text{NII} = \text{GAP}_s \times \Delta R_s \]

where NII is net interest income, GAP\(_s\) is net assets subject to repricing within a year, and R\(_s\) is the short-term interest rate (expressed in basis points).

Second, it is assumed that the average duration for assets and liabilities subject to repricing after one year is five (5) years. It is also assumed that there is no short-term change to income for these longer-term assets and liabilities. Therefore the capital losses associated with a change in the long-term interest rate is:

\[ \Delta C = -\text{DUR} \times \text{GAP}_L \times \Delta R_L \]

where C is equity capital, DUR is the average duration of net long-term assets and liabilities (assumed to be five), GAP\(_L\) is net assets subject to repricing after more than one year, and R\(_L\) is the long-term interest rate (expressed in basis points).

**Direct foreign exchange rate risk**
Let \( F \) denote the net open position in foreign exchange and \( C \) the amount of regulatory capital, both denominated in local currency units. Let \( e \) denote the exchange rate expressed in terms of foreign currency per unit of domestic currency. A change in the exchange rate (positive changes correspond to appreciations) leads to a proportional decrease in the domestic currency value of the net open position:

\[ \Delta F / F = -\Delta e / e \]
If we assume that a decline in the net open position translates directly into a decline in capital (due to a change in profits) and that risk-weighted assets are not affected by the exchange rate change, then the change in capital is simply:

$$\Delta C = -F \Delta e / e$$

**Credit risk**

The case study focuses on four indirect sources of changes in credit quality as a result of changes in macro variables – real GDP growth ($\%\Delta y$), the unemployment rate (UR), the long-term interest rate ($R_L$), and the growth rate of the exchange rate ($\%\Delta e$).

One way to model credit risk is to simply regress an aggregate bank balance sheet ratio – usually NPL-to-total loans or LLR-to-total loans – on a set of macro variables. Since both of these ratios is confined to a range of (0, 1), a linear regression with the ratio the dependent variable would result in non-normal errors. Instead, using a logit transformation of the ratio:

$$\text{logit}(x) = x / (100 - x)$$

results in a dependent variable that can be used in linear regressions.

IMF (2007b) reports such regressions for modelling loan loss reserves in a number of countries in Eastern and Central Europe. The regressions have the following logit specification:

$$\text{logit}(\text{LLR}/\text{TL})_t = \alpha_0 + \rho \text{logit}(\text{LLR}/\text{TL})_{t-1} + \alpha_1 \%\Delta y_t + \alpha_2 \text{UR}_t + \alpha_3 R_L + \alpha_4 \%\Delta e_t + \eta_t$$

where LLR is loan-loss reserves, TL is total loans, and $\eta_t$ is a white-noise error.

To calculate the effects of a change in one of the right-hand side variables – call it $z$ – on loan loss reserves, take a derivative of the above equation with respect to $z$:

$$\Delta \text{LLR} = \text{TL} * \alpha_z / (1 - \rho) * \left(\bar{x} / 100 - \bar{x}^2 / 100\right) * \Delta z$$

where $\bar{x}$ is the average LLR/TL ratio in the data sample (equal to seven(7)).

Several specifications of the regression were estimated, and a summary of the specific coefficients are shown in the table below:
Table 2: Estimates of coefficients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan-loss reserves/loans t-1</td>
<td>0.706** (24.24)</td>
</tr>
<tr>
<td>Real GDP growth t-1</td>
<td>-0.0334** (-2.986)</td>
</tr>
<tr>
<td>Unemployment rate t</td>
<td>0.0173** (3.655)</td>
</tr>
<tr>
<td>Exchange rate change t</td>
<td>-0.34500 (-1.432)</td>
</tr>
<tr>
<td>Long-run interest rate t</td>
<td>0.0109* (2.416)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.688</td>
</tr>
</tbody>
</table>

*Z-statistics in parentheses
**p<0.01, *p<0.05, +p<0.1

Note that some of the coefficients are insignificant, and others have the “wrong” sign. This could be the result of several factors. First, this set of countries have had very little volatility in interest rates, exchange rates, and unemployment rates in recent years, making it difficult to capture the relationship between loan loss reserves and the macro environment. In addition, banks and bank supervisors in different countries may have different responses to changes in the macro environment, while the panel regression is explicitly assuming that their responses are relatively the same.

E. Questions for group discussion

The following questions are based on the data in the Excel spreadsheet called Balance Sheet Data.

1. Which sectors are borrowing abroad? Are there any sectors that have positive net claims on non-residents? Do you have any concerns about these overall developments in the external sector? Based on your concerns, what sectors would you investigate next and what would you be looking for?
2. The “Non-Residents” worksheet also provides some information about the maturity and the currency structure of the external position. What can you conclude about the average maturity structure of external debt? Is there any useful information regarding the currency structure in the table?

3. The worksheet titled “General Government” provides data on net financial claims of the government on other economic sectors. What do these data tell you about the public sector? What key concerns do you have at this point in your analysis?

4. Using the worksheet “Private Sector”, answer the same questions as in Question 3.

5. The worksheet titled “Financial Sector” provides data on net financial claims of the financial sector.
   - Banks have significantly higher claims on the central bank and the general government. What could account for this?
   - On the other hand, banks have net liabilities to the private sector? What does this imply about the relative composition of bank liabilities and assets?
   - What observations can you make about banks’ obligations to non-residents?

6. What do the following aspects of the financial sector tell you about possible risks and vulnerabilities:
   - Long-term versus short-term claims?
   - Foreign-currency versus domestic-currency claims?
   - Long-term versus short-term domestic-currency claims?

7. What concerns do you have about the financial sector at this point in your analysis?

8. Your next task will be to design a stress test of the banks. Using the information you gained so far, what will be your focus in terms of areas of risks and vulnerabilities in the financial sector, and what will be a reasonable set of trigger events (macro shocks) to assess the importance of these vulnerabilities?

**Financial soundness indicators**

1. Review the set of FSIs for banks. Qualitatively, what do the various indicators tell you about risks in the banking system? Based on these FSIs, do you see any vulnerabilities to the various types of risks?

2. What drawbacks do these indicators have for assessing future financial soundness?

3. Review the FSIs for the private sector. Are there any indicators that raise “red flags” as possible areas of vulnerability? Do they suggest any threats to the banking system?
Stress test exercise

1. The Excel workbook Bank Stress Tester 1.0 contains all information necessary to carry out various stress tests, and it is organized as follows:
   - “A. Data”: Contains balance sheet and income statement data for the 10 largest banks, as well as a number of financial soundness indicators. Data is provided for individual banks and for subtotals based on bank size
   - “B. Assumptions”: Assumptions for the stress test are entered in the sheet.
   - “C. GDP Shock”, “D. UR Shock”, “E. IR Shock”, and “F. ER Shock”: These worksheets calculate the direct and indirect effects of various shocks based on the structure of the banking system and shows the effects of individual shocks on bank capital and CARs (details of the calculations are presented in section F.)
   - “G. Scenario”: Summarizes the aggregate results of the full scenario.

2. Examine the sheets associated with calculating the effects of the various macro shocks. What assumptions are being used? What simplifications are being made to make the calculations? Are they reasonable? What type of information would you need to improve the accuracy of the calculations?

3. Familiarize yourself with the “G. Scenario” worksheet. Note how the effects of the shocks are being aggregated. Why might this approach underestimate the aggregate effects of all shocks?

4. Once you are comfortable with the stress test framework, enter the changes in the macro variables for your stress test scenario derived in Parts I and II of the case study. (Make sure you keep a clean copy of the stress testing worksheet as you proceed!)

5. What are the effects of individual shocks on bank capital, risk-weighted assets, and CARs? How many banks fall below the minimum CAR as a result of the shocks? Are these banks small, medium, or large banks? Do these results seem reasonable? Why or why not?

6. What are the aggregate effects of the stress test scenario on bank capital, risk-weighted assets, and CARs? Do these results seem reasonable? Why or why not? How would you assess the overall impact of your scenario? Are you concerned about the stability of the banking system? If so, where is the focus of your concern?
III. REFERENCES


