Measuring economic downturns: Past recessions and their implication for forward looking provision models as required under IFRS9

Credit Scoring and Credit Control XIII Conference

Mark Somers, Judit Sandor
August, 2013
Contents

1 Overview
2 Definition of Business Cycle
3 Measuring Business Cycle
4 Calculation of Provisions
5 Comparison of Provisioning Methodologies
6 Linking provision calculation to economic drivers
7 Results
8 Conclusions
Overview

▸ The delayed recognition of credit losses that are associated with loans and other financial instruments was identified during the financial crisis as a weakness in existing accounting (IFRS, 2013)

▸ The 'incurred loss model' that is currently in existence is a backward-looking model hence it delays the recognition of credit losses until it occurs

▸ Under IFRS 9, alternatives to the incurred loss model are explored that would use information that is more forward-looking

▸ This paper shows that applying IFRS 9 rules to recent past recessions of the UK economy, credit losses could have been recognised earlier and would have decreased quicker back to pre-recession level

▸ Linking the provision calculation to economic drivers allows a flexible, forward-looking provision calculation and also enables stressing by different economic scenarios
Business Cycle

- **Business cycle** is recurring and fluctuating levels of economic activity that an economy experiences over a long period of time.

- **Recession** is a significant decline in economic activity spread across the economy, lasting more than a few months (*NBER, 2010*).

- *Economic Cycle Research Institute* is publishing business cycle peak and trough dates in the UK since the early 1970s, using the same methodology as for the official U.S. business cycle dates (*ECRI, 2013*).

- Based on the ECRI peak and trough dates, the main drivers of an economic recession are identified.
Measuring business cycle

- Based on the ECRI peak and trough dates, selected economic variables were plotted when negative growth in that particular economic measure occurred for all past recessions in the UK:
  - GDP
  - Unemployment Rate
  - Household Final Consumption
  - Household Savings Ratio
  - Gross Disposable Income
  - Gross Saving
  - Total Gross Fixed Capital Formation
  - Business Investment
  - Total Export
  - Total Import
  - HPI
  - Annual HPI growth
  - Interest Rate
  - Productivity measures

- As an example, plot of the 2008-09 recession is presented below:

### Most consistent indicators of recession:
- GDP
- Unemployment Rate
- Total Gross Fixed Capital Formation
- HPI
- Household Final Consumption

### Best indicator of the end of the recession:
- Unemployment Rate
Measuring business cycle

- The National Bureau of Economic Research methodology of dating the business cycles involves measuring a “significant decline in economic activity spread across the economy” using a broad array of indicators, including real GDP, real income, employment, industrial production, and wholesale-retail sales (NBER, 2003)

- In this paper, five economic measures were identified as the most consistent indicators of an economic recession moving alongside the ECRI peak and trough dates:
  - GDP
  - Unemployment
  - Household Final Consumption
  - Total Gross Fixed Capital Formation (~Net Investment)
  - House Price Index
Measuring business cycle

- Measuring business cycle by the five identified economic indicators in two ways, by the **greatest decrease** (severity) and **how long it took to recover** (duration)

- **1 in n** economic scenarios: based on the frequency of similar recessions occurred in the past, a probability (1 in n years) measure has been introduced

- Based on the 1 in n scenarios, a relationship has been set up between the severity and the 1 in n measure; and the duration and the 1 in n measure.

- For example, based on a scenario of a downturn expected 1 in 25 years, the contraction in GDP is expected to be as of severity of of -7%, with a duration of 19 quarters to recovery
Similar 1 in n economic scenarios were plotted for the other four key economic drivers:

Arrows in the charts show that there is insufficient data to cover up to 100 years history for that particular characteristic – the last data point could be anywhere on the straight arrow line.
Based on the five identified drivers of economic downturn, an \textit{average 1 in 25 years business cycle} is drawn:

- Recession: values are based on the 1 in 25 years scenario
- Expansion: rest of the time, with an average growth rate

<table>
<thead>
<tr>
<th>1 in 25 years scenario</th>
<th>Expansion</th>
<th>Recession</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Increasing growth rate, quarters</td>
<td>Decreasing growth rate, quarters</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td>29</td>
<td>27</td>
</tr>
<tr>
<td>GDP</td>
<td>57</td>
<td>24</td>
</tr>
<tr>
<td>HPI</td>
<td>37</td>
<td>30</td>
</tr>
<tr>
<td>Fixed Capital Formation</td>
<td>36</td>
<td>41</td>
</tr>
<tr>
<td>Hh final consumption expenditure</td>
<td>61</td>
<td>25</td>
</tr>
</tbody>
</table>

Recession hits all economic drivers at the same time.

Latest to start recovery is unemployment rate.
# Calculation of Provisions

- International Accounting Standards Board (IASB) and the US Financial Accounting Standards Board (FASB): re-issuing the key accounting standards that apply to banks

- **IAS 39 Financial Instruments: Recognition and Measurement**
  - **IFRS 9 Financial Instruments**

<table>
<thead>
<tr>
<th></th>
<th>IAS 39</th>
<th>IFRS 9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impairment model</strong></td>
<td>Incurred Loss model</td>
<td>Expected Loss model</td>
</tr>
<tr>
<td><strong>Expected Credit Recovery</strong></td>
<td>All credits will be recovered until evidence to the contrary (trigger event) is identified.</td>
<td>Not all credits will be recovered. Expected ‘cash shortfalls’ over the lifetime of the financial instrument.</td>
</tr>
</tbody>
</table>
| **Provisions**         | 1) Related to the estimated losses to individually significant impaired instruments  
                         | 2) Related to the remainder of the portfolio that have been incurred, but yet observed | Three-bucket approach:  
                         | Bucket 1: no identified credit deterioration since initial recognition  
                         | Bucket 2/3: transfer from bucket 1 if there is significant deterioration in credit quality |
| **Future losses**      | No provisions are made.                      | Lifetime expected loss is covered with the likelihood of loss event in the next 12 months. |
Calculation of Provisions

- Applying IFRS 9 provision calculation to UK mortgages portfolio

- Data used: UK mortgages data including arrears and possession information, from 1970 to 2012

- The calculations are a **high level approximation** of how provision estimates might change according to three hypothetical scenarios

- Assumptions:
  - **IAS 39**: 4 year backward looking provision to cover 4 years of historic write-offs - provision rate based on 6+ last year applied to this years 6+ balances.
  - **IFRS 9 (lagging)**: same as IAS 39, but an extra year of backward looking provision is added to cover the increased provisions due to accounts moving to Bucket 2 at 30 days in arrears under IFRS 9.
  - **IFRS 9 (forward looking)**: same as IFRS 9 with lagging, but with forward looking provision estimates (with the benefit of hindsight, hence no forecasting error).
Results – Comparison of Provisions

- Provision Rate is calculated as:
  
  \[ \text{Provision Rate} = \frac{\text{Backward \ or \ Forward \ Looking \ Write-off \ %}}{\text{Proportion of 6+ Balances}} \]

- Comparison of the three provision calculation methodologies:
  
  ▲ Under the forward looking scenario, loss is recognised earlier and peaks higher, at the same time it decreases quicker after the recession is over.
  
  ▲ The overall increase in the provision rate is due to the increase in LEL provision for the 30-180 day bucket and higher forecast losses are correlated with higher arrears buckets.
Regression Modelling

*Proportion of Properties Taken Into Possession*

- To extrapolate behaviour to a 1 in 25 years average business cycle, we need to build a model of econometric factors.
- Estimating the *proportion of properties taken into possession* enables to link the provision calculation to economic drivers.
- Based on the proportion of properties taken into possession, expected write-off percentage is calculated that feeds into the IFRS 9 (forward looking) provision rate calculation.

Two economic variables were particularly highly correlated with the dependent variable:
- Unemployment Rate (%)
- Annual % change in HPI.

<table>
<thead>
<tr>
<th>Correlation Matrix</th>
<th>% Possession</th>
<th>Unemployment</th>
<th>HPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Possession</td>
<td>1</td>
<td>0.24</td>
<td>0.41</td>
</tr>
<tr>
<td>Unemployment</td>
<td>1</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>HPI</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
A stepwise multiple regression model was fitted:

| Variables   | Estimate | Standard Error | t value | PR(>|t|)   |
|-------------|----------|----------------|---------|-----------|
| Unemployment (%) | 0.0338   | 0.0034         | 9.903   | 3.37E-12 *** |
| Annual % change in HPI | -0.042   | 0.0018         | -2.385  | 0.0221 *   |
| Recession dummy | 0.2604   | 0.5992         | 4.347   | 9.58E-05 *** |

Variables in the final model:
1) Unemployment Rate (%)
2) Annual % change in HPI
3) Recession dummy
   *(1 if economy is in recession)*

Model Adjusted R-squared: 85%
Results – Comparison of Provisions

- Based on the average 1 in 25 years business cycle, the expected provision rate is presented by both IFRS 9 (forward looking) and IAS 39 scenarios

- The 1 in 25 recession is stressed by a 1 in 50 and 1 in 100 years economic scenario (the expansion period is not stressed)

- Comparison of IFRS 9 (forward-looking) and IAS 39 provision rate estimates by different severity of economic scenarios:

  1 in 100 scenario: required provision rate is 150% higher than for the 1 in 25 scenario and peaks four years later.

  1 in 50 scenario: required provision rate is 63% higher than for the 1 in 25 scenario and peaks one year later.

  Provision rates under the IFRS 9 (forward looking) scenarios peak higher and earlier than under the equivalent IAS 39 scenarios
Conclusions

▸ What we did:

– Forward looking provisioning is linked to changes in the economy → quicker increase in provision rates due to recession and decreases back to normal as soon as recession is over
– Stressing provision rates by different economic scenarios → allows better planning and provision allocation based on current and expected future position in the business cycle
– Greater volatility in provision accounts → higher economic capital requirement

▸ Areas for further exploration:

– Small sample sizes in terms of past recessions (about 15 in 100 years) and limited historic economic data availability
– Key economic drivers might not be hit by recession to the same extent simultaneously – some might be hit harder than others. A simulation could generate a range of plausible scenarios instead of the static results presented in this paper.
– No guarantee that recessions in the past are going to be similar to future recessions
References

▸ ECRI - Business cycle chronologies
http://www.businesscycle.com/ecri-business-cycles/international-business-cycle-dates-chronologies

▸ NBER – The NBER's Business-Cycle Dating Procedure

▸ NBER – Conference Paper

▸ IFRS - ED Financial Instruments Expected Credit Losses
Questions