Monitoring and Forecasting Trends in the UK Credit Industry

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Credit Scoring and Credit Control X, Edinburgh 2007
Agenda

• Introduction

• Objectives and Key Components

• Data

• Solution overview

• Further work
Introduction

- Decision Analytics
  - Extract information from data
    - Predictive models for credit and fraud
    - Optimisation
  - Consultancy
  - Strategy Management Software

- Business Strategies
  - Consumer profiling
  - Market segmentation
  - Research into drivers of social, economic and market change
  - Economic forecasting
Introduction - rationale

• Economic change impacts on the amount consumers want to borrow, the speed at which they repay, and their likelihood of default

• Keeping informed of this change is necessary to make the best decision possible when managing existing customers or acquiring new ones

• However, performance differs significantly across consumer segments. Understanding the impact on the organisation/portfolio requires, therefore, a granular approach
Introduction – Information flow

Consequences
- Write–off rate for unsecured debt
- Mortgage repossessions

Individual consumer behaviour
- Redundancy
- Divorce
- Bereavement
- etc.

Economic drivers
- Inflation ↔ Interest rate
- Unemployment rate
- Earnings
- Debt
- etc.

Macroeconomic forecasts

Monitoring and Forecasting solution

Organisations incorporate economic factors
- improve predictive models
- take a forward-looking stance in credit policies
- perform stress testing for regulatory compliance
- evaluate the operational impact of specific scenarios
Introduction - Economic Scenarios

Press release - Experian Business Strategies (April 2007)

Figure 1: Write-off Rates (unsecured lending)

Figure 2: Repossessions

1. Rates stay at 5¼%
2. ¼ point increase to 5½% in May and no further change, up or down, until after 2009.
3. ½ point increase to 5¾% in May and no further change, up or down, until after 2009.
4. ½ point increase to 5¾% in May and a further ½ point increase to 6¼% in July followed by no further change, up or down, until after 2009.
Agenda

- Introduction
- Objectives and Key Components
- Data
- Solution overview
- Further work
Objectives and Key Components

Objectives

• Monitor Credit Industry trends based on new applications for credit
• Use credit industry and significant macroeconomic trends to forecast future consumer default rates
• Provide forecasts at 'risk segment' (i.e. score band) level
• Provide regular updates to the consumer credit industry on the latest trends and forecasts

Key Components

• Aggregated data source that provides a consistent default rate measure over time for a wide range of risk segments (unsecured lending)
• Mosaic-level macroeconomic default rate models
• Quarterly reporting and forecasting service
• On-going development

Mosaic UK classifies all UK consumers into 61 distinct lifestyle types within 11 groups which comprehensively describe their socio-economic and socio-cultural behaviour
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Data part 1: Default rates series

Reciprocity/confidentiality: SCOR

- Large sample of credit applications every quarter (ECAPS)
- Unsecured lending sectors (Retail and Banking & Finance) separated
- Latest Delphi for New Business score - consistent risk measure
- Standard G/B definition - 12 months outcome
- Construct default rate series by risk segment for the recent period
- Aggregation smooths out fluctuations
Data part 2: Macroeconomic models

- Construct default rate series
  - Requires extended time period - CAIS data
  - Mosaic type level
- Example Mosaic UK types: Corporate Chieftains, Town Gown Transition, Greenbelt Guardians
- Model each observed Mosaic default rate series
Aside – Corporate Chieftains

Top business people returning late at night to their big houses in extensive grounds.

Alistair and Penelope

Key Features
• Married
• Teenage children
• Private education
• Movers and shakers
• Senior managers
• Corporate careers
• Large homes in suburbs
• Extensive investments
• Confident

Musselburgh, EH21

Top Postal areas
• Slough (SL)
• Kingston (KT)
• Watford (WD)
• St Albans (AL)
• Hemel Hempstead (HP)
Aside - Town Gown Transition

Students and academics mix with young professionals in terraces close to universities

Tom and Kate

Key Features
- Singles
- Mature students
- Postgraduates
- Idealistic & headstrong
- Freedom before career-dom
- Low incomes
- Alternative lifestyles
- Liberal minded
- Socialising with friends

Top Postal areas
- London (WC)
- Edinburgh (EH)
- Oxford (OX)
- Southampton (SO)
- Leeds (LS)

Plymouth, PL4
Impact of Interest Rate Increases since mid-2006 on Disposable Incomes in 2007 by Mosaic Type

* per cent difference from what they would otherwise have been
Data part 2: Macroeconomic models

- Construct default rate series
  - Requires extended time period - CAIS data
  - Mosaic type level
- Example Mosaic types: Corporate Chieftains, Town Gown Transition, Greenbelt Guardians
- Model each observed Mosaic default rate series

\[
\ln(PD_{m,t}) = \beta_1 \ln(PD_{m,t-1}) + \beta_2 \ln(GEARING_{m,t-1}) + \beta_3 \ln\left(\frac{LIAHON_{m,t-1}}{DISPINC_{m,t-1}}\right)
+ \beta_4 \Delta \ln(UNEMPLT_{m,t-1}) + \beta_0 + r_t
\]

\[
GEARING_{m,t} = \frac{(INTRATEM_{t,CDWELHHN_{m,t}} + INTRATEU_{t,CCREDHHN_{m,t}})}{(DISPINC_{m,t} + INTRATEM_{t,CDWELHHN_{m,t}} + INTRATEU_{t,CCREDHHN_{m,t}})}
\]

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<thead>
<tr>
<th>Variable</th>
<th>Description</th>
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<tr>
<td>GEARING</td>
<td>Income gearing</td>
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<tr>
<td>LIAHON</td>
<td>Financial liabilities of households</td>
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<td>DISPINC</td>
<td>Disposable income (after interest payments)</td>
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<tr>
<td>UNEMPLT</td>
<td>Long-term unemployment rate</td>
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<tr>
<td>INTRATEM</td>
<td>Average interest rate on mortgages</td>
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<tr>
<td>CDWELHHN</td>
<td>Mortgage debt outstanding</td>
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<tr>
<td>INTRATEU</td>
<td>Average interest rate on unsecured debt</td>
</tr>
<tr>
<td>CCREDHHN</td>
<td>Unsecured debt outstanding</td>
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</table>
Data part 2: Macroeconomic models

Use the PD models to evaluate the impact of specific economic scenarios for each Mosaic type
- Interest Rate Changes
- Unemployment Changes
Data flow

New Applicants
Default rate series

Default rates by risk segment for new applicants

Forecast: extrapolate default rate series

Report forecast default rates by risk segment adjusted according to base or scenario economic trends

Mosaic level
Default rate series

Macroeconomic models

Mosaic level income and spending forecasts

Mosaic level default rate forecasts
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The Consumer Credit Monitor Report

- Population stability and Score robustness
- Extrapolation of Observed Default rates
- Macroeconomic forecasts
- Adjustment to Default rate extrapolations
- Conclusions
Population stability

Retail Sector Score distribution by Risk segment and Quarter

Risk segments: score deciles based on samples for the last 4 complete Quarters up to the present

Key
Observation quarter: (ie. Quarter in which application was made)

Score robustness

Retail Sector Default rate by Risk segment and Quarter

1. Gini index variation over time
Extrapolation of Observed Default rates

- ‘Status quo’ economic scenario
- Observe trend with full outcome over 18 months
- Enhance with ‘scaled up’ rates where only 6 or 9 months outcome available
- Weight recent data preferentially
Macroeconomic forecasts

Observed and Forecast Default rate by Mosaic Type – Expected (base) economic scenario

- Corporate Chieftains
- Greenbelt Guardians
- Pastoral Symphony
- City Adventurers
- Town Gown Transition
- Bedsit Beneficiaries
- Dignified Dependency
- Low Horizons
- Tower Block Living
- Families on Benefits

Outcome Quarter

- 1998 Q1
- 1999 Q1
- 2000 Q1
- 2001 Q1
- 2002 Q1
- 2003 Q1
- 2004 Q1
- 2005 Q1
- 2006 Q1
- 2007 Q1
- 2008 Q1
- 2009 Q1
- 2010 Q1
- 2011 Q1
- 2012 Q1

Default rate (%)

0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50

Observed

Forecast
Macroeconomic forecasts - alternative scenario

Dinky Developments

Higher Interest Rates

Base

Singles and childless couples in cul de sacs of small, often brownfield-site, newly built town houses
Adjustment to Default rate extrapolations

For illustration

Retail score - total population

Application Quarter

Bad rate (%)
Adjustment to Default rate extrapolations

For illustration

Retail Sector Default rate by Risk segment and Quarter

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Segment 1</th>
<th>Segment 2</th>
<th>Segment 3</th>
<th>Segment 4</th>
<th>Segment 5</th>
<th>Segment 6</th>
<th>Segment 7</th>
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# Application of the Default Rate Forecasts

<table>
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<th>Application Score Range</th>
<th>Expected Default Rates</th>
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<td>Score</td>
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<td>12%</td>
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<td>5%</td>
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<td>High</td>
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Expected default rates calculated from scorecard development sample observation period
Application of the Default Rate Forecasts

<table>
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<tr>
<th>Application Score Range</th>
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<th>Forecast Default Rates</th>
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<td>1%</td>
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Score

Cut-off

Expected default rates calculated from scorecard development sample observation period

Forecast default rates calculated for the next 3 months based on most likely economic scenario
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Further work

CCM Roll-out

- Better, forward-looking, risk-adjusted strategies
  - Targeting, origination, facilities management, collections, revenue growth
- Evaluation of the unexpected (and better communication to financial markets)
  - Volatility, stress
- Compliance
  - Basel II/CRD

Next Steps

- More systematic adjustment of forecast default rates
- Impact of different macroeconomic scenarios
- Longer term forecasts

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