FIM500 Project Assignment 1 Report – Team 2005

We use dataset from Fannie Mae and note that if a borrower has ever hit 3 delinquency, we regard him as defaulted. And a summary of loss rate shows below.

Table 1 Loss rate of loans between 2005 to 2010

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| 2005 | 0.1029% | 0.2731% | 0.5207% | 1.2297% | 2.0748% | 1.7258% |
| 2006 |  | 0.0861% | 0.6558% | 1.9857% | 3.2418% | 2.4826% |
| 2007 |  |  | 0.1579% | 2.0647% | 4.0622% | 3.0673% |
| 2008 |  |  |  | 0.5167% | 2.3029% | 2.0319% |
| 2009 |  |  |  |  | 0.0653% | 0.2392% |
| 2010 |  |  |  |  |  | 0.0150% |

From the table, we found that loans created before 2008 start to default in a higher percentage while loans created after 2008 don’t. This means that the financial crisis in 2008 seemed to influence the loans greatly. And after 2010, the loss rate keeps stable and goes to normal level.

As for prediction, our group uses unemployment rate and CPI because the forecast for housing price is unavailable right now. We get those data from Goldmann Salch (Unemployment rate) and OECD (CPI). The prediction results show below.

Table 2 Prediction using unemployment rate

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| LossRate(Esti) | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| 2005 | 0.1029% | 0.2731% | 0.5207% | 1.2297% | 2.0748% | 1.7258% |
| 2006 | 0.0861% | 0.6558% | 1.9857% | 3.2418% | 2.4826% | 1.6243% |
| 2007 | 0.1579% | 2.0647% | 4.0622% | 3.0673% | 2.2203% | 1.4605% |
| 2008 | 0.5167% | 2.3029% | 2.0319% | 2.8294% | 1.9963% | 1.3429% |
| 2009 | 0.0653% | 0.2392% | 2.7169% | 2.5439% | 1.8356% | 1.1274% |
| 2010 | 0.0150% | 0.3318% | 2.4428% | 2.3392% | 1.5410% | 0.9529% |
| Average | 0.1573% | 1.1735% | 2.2934% | 2.5419% | 2.0251% | 1.3723% |
| Loss/Q factor | 2.44% | 16.51% | 29.79% | 31.02% | 24.35% | 17.81% |

Table 3 Prediction using CPI

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| LossRate(Esti) | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| 2005 | 0.1029% | 0.2731% | 0.5207% | 1.2297% | 2.0748% | 1.7258% |
| 2006 | 0.0861% | 0.6558% | 1.9857% | 3.2418% | 2.4826% | 0.5593% |
| 2007 | 0.1579% | 2.0647% | 4.0622% | 3.0673% | 0.7644% | 0.3687% |
| 2008 | 0.5167% | 2.3029% | 2.0319% | 0.9741% | 0.5039% | 0.2618% |
| 2009 | 0.0653% | 0.2392% | 0.9354% | 0.6422% | 0.3579% | 0.2885% |
| 2010 | 0.0150% | 0.3707% | 0.6167% | 0.4560% | 0.3944% | 0.0214% |
| Average | 0.1573% | 1.1813% | 2.3704% | 2.8958% | 5.6849% | 1.7644% |
| Loss/Q factor | 6.47% | 49.43% | 107.91% | 147.24% | 356.05% | 105.23% |

Table 4 Difference between prediction using unemployment rate and actual values

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Diff | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| 2005 | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| 2006 | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% | -0.226% |
| 2007 | 0.000% | 0.000% | 0.000% | 0.000% | -0.105% | -0.084% |
| 2008 | 0.000% | 0.000% | 0.000% | 1.291% | 1.005% | 0.795% |
| 2009 | 0.000% | 0.000% | 2.412% | 2.271% | 1.642% | 0.973% |
| 2010 | 0.000% | 0.232% | 2.301% | 2.217% | 1.427% | 0.853% |
| Average | 0.000% | 0.039% | 0.786% | 0.963% | 0.662% | 0.385% |

Table 5 Difference between prediction using CPI and actual values

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Diff | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
| 2005 | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% |
| 2006 | 0.000% | 0.000% | 0.000% | 0.000% | 0.000% | -1.291% |
| 2007 | 0.000% | 0.000% | 0.000% | 0.000% | -1.561% | -1.176% |
| 2008 | 0.000% | 0.000% | 0.000% | -0.564% | -0.487% | -0.286% |
| 2009 | 0.000% | 0.000% | 0.631% | 0.370% | 0.165% | 0.134% |
| 2010 | 0.000% | 0.271% | 0.475% | 0.333% | 0.280% | -0.078% |
| Average | 0.000% | 0.045% | 0.184% | 0.023% | -0.267% | -0.450% |

Overall, the predictions using unemployment are mostly higher than the actual values except for 3 predictions. That means using unemployment rate to predict tends to give a higher loss rate. But as for the predictions using CPI, it looks like half to half comparing to the unemployment group. And in 2011 and 2012, if we prepared the loan loss reserves according to the prediction using CPI, probably it would be smaller than the actual loss and cause a decline in revenue.

In summary, according to our results, we have two conclusions for the loan data from 2005 to 2010:

1. Financial crisis in 2008 did hit the loan market and raised the loss rate from 2008 to 2010.
2. According to the performance, it would be better to use unemployment rate to predict the loss rate.