

# Report on Master Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University in Prague

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| Student:             | Bc. Málek Jan  |
| Advisor:             | PhDr. Jakub Seidler, Ph.D.   |
| Title of the thesis: | What Drives the Aggregate Credit Risk:<br>The Case of the Czech Republic |

## OVERALL ASSESSMENT (provided in English, Czech, or Slovak):

The thesis is dealing with modelling systemic credit risk. It uses linear regression and Kalman filtering. It is well written, with some (not that rare) typing and grammar mistakes, but overall the English used is on a very good level.

For the defense, I suggest the author to explain the following questions:

- 1) In (2.1) the target variable is defined, but I do not see the definition of default. Is it Basel 2 default? What are the conditions for a loan to get to default? Is it just DPD, or are there some other institutional sufficient conditions for being in a default? Is the default contagious, i.e. can loan be in a default when it is 0 DPD just because the client is in default on some other exposure in the same financial institution? What does it mean „amount of non-defaulted loans“? Is it their actual principal exposure at the beginning of month  $t$ ? And what do we account for in the nominator? Are those also principal exposures at the end of months  $t+1$ ,  $t+2$  and  $t+3$ ?
- 2) Regarding the (2.1) author claims that: „Any model that estimates  $DR_{1t}$  based on informations available at time  $t$  in fact forecast the development of default rates over next 3-months.“ Firstly, the word „information“ is uncountable, so there is no „informations“. Secondly, if the  $DR_{1t}$  is defined as the sum of loans in default within some period over the sum of loans non-defaulted at the beginning of this period, how can we conclude, that estimating  $DR_{1t}$  stands for a default rate? The definition is not clear to me. Default rate should correspond to the probability of default within some period, but when we take loans that defaulted within the three months after the month  $t$ , and divide their exposure at default by the exposure of all the non-defaulted loans at the end of month  $t$ , we are surely not dealing with default rate. In fact newly approved loans in month  $t$  can not default within the next three months if 90DPD default is used.
- 3) Did author account for correlations among predictors? Equation 3.8 stands for the case when the correlations are negligible, but has author always checked for this fact? Has author thought of using some Hausman-type test for correct specification? And how about testing for robustness, i.e. searching for one observation being too influential in terms of outlier or leverage point? How about some stability checks for overfitting?

I don't like some of the notation used. For example author defines  $D_{1t}$  and then uses just  $D_1$  and moreover denotes sector specificity as a second subscript ( $D_{1,Man}$ ). I wish to have the notation more consistent.

I am not persuaded that changes in NPL is the appropriate target as it depends on changes in provided volumes. We divide the NPL also by loans approved in month  $t$ , while they can not influence the nominator in DR definitions. So if there is an increase in approved volumes it will force the DR to get lower for at least one period, no matter of the portfolio quality (in terms of credit risk). This is also one of the reasons, why logit transformation can not generally be used. If author choosed a different target variable, the range of modelling methods could be wider and maybe also more convenient.

I also found many typing and grammar mistakes in the text.

On the other hand the work is well structured, author uses appropriate software and deals with the methods more or less appropriately. It is also a good amount of work, relevant literature is used and the topic is clear, recent and results can be very usefull. I appreciate the part 3.2 with model estimation description. Author seems to deal with almost all the possible problems that can arise with OLS estimation. Overall I like the work and in the case of successful defense, I recommend to evaluate it by the grade „výborně“ (excellent, 1).

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## **SUMMARY OF POINTS AWARDED:**

| <b>CATEGORY</b>                         | <b>POINTS</b> |
|---|---------------|
| <i>Literature</i> (max. 20 points)      | 20            |
| <i>Methods</i> (max. 30 points)         | 24            |
| <i>Contribution</i> (max. 30 points)    | 28            |
| <i>Manuscript Form</i> (max. 20 points) | 12            |
| <b>TOTAL POINTS</b> (max. 100 points)   | <b>84</b>     |
| <b>GRADE</b> (1 – 2 – 3 – 4)            | <b>1</b>      |

**REFEREE'S NAME:** Pavel Doležal

**DATE:** 4. 9. 2013

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**REFEREE'S SIGNATURE**