Report on **Bachelor / Master Thesis**

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

Student:	**Bc. Jacopo Messina**
Advisor:	**PhDr. Ing. Petr Jakubík, Ph.D.**
Title of the thesis:	**Stress Testing the Italian Banking System during the Global Financial Crisis**

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

The thesis deals with the relevant and up-to-date topic of banking sector stress testing. First, the Global Financial Crisis is analyzed. The author discusses origins and causes as well as the role of monetary policy. Second, macro-prudential analysis and stress testing methodology are described. Third, an empirical exercise is conducted to stress Italian banking sector using the estimated credit risk model.

The diploma thesis covers theoretical background, descriptive as well as empirical analysis. Despite the thesis contains many references, the author contribution is not always very clear as citation is not properly done (see e.g. pp 59-61 – taken from Jakubik (2007), but not properly cited). The thesis could better distinguish between the author contribution and literature survey. However, my major comments are related to the empirical part containing credit risk model estimate. It is not very well done. The empirical part is not very clear and contains some inaccuracies. It took me a while to understand how the model was estimated and what exactly was done by the author. He claims that a one factor model is employed. However, due to difficulties with estimation, he finally assumes that latent factor (within the assumed framework) is constant and does not need to be considered within the estimation, but it is not mentioned in the thesis at all. As a one factor model is nonlinear, it is quite difficult to estimate the coefficients of the model and the standard techniques cannot be used. A conditional number of defaults of economic agents depending on the realization of random variable, which represents latent factor in the model, is under the applied assumptions a random variable with a binomial distribution. The binomial distribution is an important assumption for the model estimation. However, it is not mentioned in the thesis. The difficulties in estimation of the model stem from the integral over the random factor in the likelihood function. A one factor model for default rate has the following functional form:

$$df_t = \psi(\beta_0 + \sum_{i=1}^{K} \beta_i x_i),$$

where df_t denotes the dependent variable of the model (i.e. the default rate of the corporate sector), Ψ denotes the distribution function of the standard normal distribution that represents the impact of changes in the macroeconomic indicators, β_0 is a constant and β_j are the coefficients of the macroeconomic variables, x_{jt}. Due to the standard normal distribution function, the coefficients of the original model cannot be interpreted as elasticities.

The author deviate quite substantially from this model despite he claims, that a one factor model is employed. A description of estimation contains a lot of inaccuracies.

1. Follow from the author estimation, the latent factor in the model is assumed to be constant. However, based on the original one-factor model and also the equation 4.3. (p 59), it is assumed to follow standard normal distribution.
2. The author claim that all time series were transformed into the logarithm of the variation in order to interpret the regression parameters as elasticises (it cannot be

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done in original version of a one factor model). However, I assume that the author just applied logarithm transformation on the first differences of the original time series.

3. The equation 5.1 of the estimated model is not explained at all. One can learn only from the content what the variable on the left side could be.
4. The whole chapter 5.3, especially stress test exercise using the estimated model and results are very poorly described.

Apart from my major comments on the empirical part, I would also prefer standardised charts without a grey background in the whole thesis.

The author chose probably too ambitious goal as some simple approach to credit risk modelling could be satisfactory. Moreover, author modifies the original one-factor model for the estimation without mentioning this fact or any support of this estimate by some references. This adjustment in fact corresponds to simple empirical approach. Despite of my comments, I still think that a lot of work was done within the thesis. Hence, I recommend the thesis for the defence and suggest **grade B**. The empirical part could be discussed during the defence and author can clarified all applied assumptions which are not mentioned in the thesis.

SUMMARY OF POINTS AWARDED *(for details, see below):*

CATEGORY		**POINTS**
Literature	*(max. 20 points)*	14
Methods	*(max. 30 points)*	20
Contribution	*(max. 30 points)*	24
Manuscript Form	*(max. 20 points)*	18
TOTAL POINTS	*(max. 100 points)*	**83**
GRADE	**(1 – 2 – 3 – 4)**	**76**

NAME OF THE REFEREE: PhDr. Ing. Petr Jakubík, Ph.D.

DATE OF EVALUATION: 7.9.2011

Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

Strong	*Average*	*Weak*
20	*10*	*0*

METHODS: *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

Strong	*Average*	*Weak*
30	*15*	*0*

CONTRIBUTION: *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

Strong	*Average*	*Weak*
30	*15*	*0*

MANUSCRIPT FORM: *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

Strong	*Average*	*Weak*
20	*10*	*0*

Overall grading:

TOTAL POINTS	**GRADE**		
81 – 100	**1**	= excellent	= výborně
61 – 80	**2**	= good	= velmi dobře
41 – 60	**3**	= satisfactory	= dobře
0 – 40	**4**	= fail	= nedoporučuji k obhajobě