Report on **Bachelor Thesis**

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

Student:	Josef Obořil
Advisor:	PhDr. Zuzana Havránková
Title of the thesis:	Impact of the Great Recession on the European banking sector: The stochastic frontier approach

OVERALL ASSESSMENT:

My general impression of the thesis is favorable. The main body of the thesis is structured in an intelligent way and responds to the questions raised in the introduction. A lot of work lies behind this thesis. It is unfortunate that the author has a hard time selling his findings---there are many, they are important and they are original. The following comments support my final grading:

1. Literature

The relevant literature could be discussed more comprehensively. The literature review is provided to the reader throughout the whole thesis, especially in Chapter 2. Nevertheless, some information from articles seems incomplete or not entirely correct.

- Page 6: "An average operational inefficiency is reported between 20% and 30% (Goddard et al., 2007)." But we do not know what kind of average is this: which states are involved, what time period are we talking about, what kind of banks... Since inefficiency is a relative term, we need this information; otherwise, these numbers tell nothing.

- Page 1: "stochastic frontier approach originally introduced by Aigner et al. (1977)." This was independently developed by Aigner et al. (1997) and Meeusen & van den Broeck (1977), as said on page 9.

- Page 6: "Since the establishment eurozone, a huge shift in technologies has appeared.....According to Altunbas et al. (1999), the annual reduction if cost through improving technology was more than 3%." Author writes about the eurozone efficiency---how is an article published in 1999 relevant?

- Chapter 2 stopped at 2008. Are there or are there not papers discussing the bank efficiency during crisis and after crisis as well? For this reason, Chapter 2 seems incomplete.

- Minor mistakes in bibliography list, eg.: Coelli, T, Rao, D.S.P. and Battese, G.E. (2005), An Introduction to Efficiency and Productivity Analysis, 2nd edition, Springer Verlag.

2. Methods

The author uses the stochastic frontier approach to estimate cost efficiency scores, tests for every important aspect of the models feasibility (very rigorously) and data correctness with software capabilities at hand. He tries to explain heterogeneity behind estimated scores using robust OLS, IRLS and Tobit. Larger part of the work is highly above the current bachelor degree level at the IES. Use of SFA, value-added approach and dataset is reasonably and sufficiently explained (although use of dataset for different SFA models could have been explained more clearly).

The author judges the appropriateness of the different SFA models by information criteria. He concludes the cross-sectional estimation (I think pooled estimation made on the unbalanced panel) is the best model. Nevertheless, I wonder how high the order correlation of the estimated efficiencies (ce1-ce5) is: is the panel estimation really so poor that we throw it away in a work where time series dimension seemingly should be taken into account? This might be a good point to discuss during defense.

Some minor comments to the methodology:

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- Page 10: ui and uj shall be uncorrelated as well, this condition is missing.

- Page 10: "index j specifies input": doesn't it specify the number of outputs? The same applies for k as number of inputs and i for number of firms. Is y in (3.6) the same parameter as q in (3.5)? Are j and k in (3.5) same parameters as m and n in (3.6)? If there is no distinction, it seems very confusing to suddenly change the lettering.

- Page 11: "It enables us to calculate cost frontier from the panel data with a possibility to at least a little modify method of estimation or use observation as simple cross section with assumed distributions of vi and ui." Please clarify this statement.

- We do not know the summary statistics on variables listed in table A.1 (determinants of in/efficiency). We might not have so many observations for some categories (eg. central banks) to be included in the regression.

- How did the author treat the countries that were joining the eurozone gradually in 2007, 2010, 2011…etc in efficiency estimation? If he included all the countries from 2011 as he claims in footnote 1, doesn't he think it distorts the estimate of the area of the eurozone?

- Author uses cross-sectional estimate of efficiency scores (with the assumption of normal/truncted normal model) as a regressand. More thorough discussion on explanatory variables would be appreciated. Are the anti-crisis measures listed in Table A.3 part of the "crisis explanatory variable" coding (or are these somehow else included in regression)? Usage of the variable name "total business" in the abstract makes it for the reader hard to follow.

- I wonder whether Chow test was used when dividing the sample into subsamples (in search for determinants).

3. Contribution

The key and original part of the paper is presented in Section 5, cost efficiency estimation and the search for determinants (backed and reasoned by eurozone banking description in Section 2). The empirical results are robust across different estimation techniques. However, the original contribution (and indeed there are many!) of the thesis could have been presented in a better way. In Section 5 the author provides an avalanche of results. Still, he also clearly states that the most important one is the increasing cost efficiency during crisis.

For the eurozone banking, the author finds interest margin and total business (in sense of deposits and loans) to be the most influential variables of cost efficiency. Commercial, central, cooperative and savings banks increase the average efficiency score. Subsidiaries behave more cost efficiently than mother companies. (Is there an explanation from the author?). Moreover, banks tend to increase their cost efficiency during crisis.

Regarding the eurozone banking, Subsection 5.4 is concluded by another important finding: although banking sector of the Czech Republic was more cost efficient before crisis than the eurozone banking on average (by 4%), the cost efficiency was improved more significantly in an average eurozone bank, lowering the efficiency difference to 1 per cent. This is very interesting result that deserves to be discussed more than what was provided by the author---on the other hand, nice discussion of the time variance of cost efficiency is provided in the following subsection, concluding with a following notion: even

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though the US crisis outbreak left the eurozone weakened in sense of cost management, eurozone banks managed to improve the efficiency, ending up with an overall positive effect.

Finally, the author looks at the characteristic features of the most and least efficient banks. He finds out that the best banks in terms of cost efficiency have the highest ratio of business transactions (loans and deposits) relative to their total assets. Spain seems to have more cost efficient banking while Germany or France lack in this respect. It is hard to judge which part of efficiency increase happened due to bailouts and which part due to cost management improvements, acquisitions or foreign exposure. I appreciate that the author points out the relativity of his findings.

Although the author does not point out his contribution, empirical investigation ensures the originality of the thesis. Did the author confirm the previous findings; does it support any other literature? The results are interesting and conclusive and I believed they can be graded by close to full score.

4. Manuscript Form

Structure and form. The author uses and advanced typesetting program, creating a professional image of the thesis. Effective referencing of graphs and tables in the text, and an accurate bibliography documented to support the research is present. The thesis demonstrates logical and fairly clear arrangement of ideas but to lesser extent the effective use of transitions and the unity and the coherence of paragraphs. The hypotheses are stated very briefly and in more of a general form.

Language. The thesis is relatively easy to read, but precision of phrasing could be improved in some cases:

- The most representative part of thesis, the abstract, should be rewritten in order to express more clearly the contribution. In similar tone, the language of Conclusion deserves proofreading.

- Page 1: "Nevertheless, to our present knowledge there is no study which shows an impact of the crisis on efficiency of the banking sector." This sentence should be considered as the core reason for writing the thesis. Yet by simple google-search we get plenty of hits that put a large question mark to this purpose of thesis. Did the author search for such a study? Or maybe the author wanted to be more specific---banking efficiency research is still missing for a specific kind of efficiency, a specific time period, specific countries… Still, it is not for the reader to guess.

- Out of 44 pages only 1 page is dedicated to Introduction. Introductory part should be simple but motivating; it must catch the reader's attention and make him want to read the rest of the work---summarizing in a clear way what is the general issue, the motivation, author's approach to the issues raised and his original contribution, ending up with how the thesis will be structured. Hypotheses should not be omitted. In this introduction (even thesis), motivation is, safe to say, almost missing.

- Introduction and Chapter 2 lacks mentioning there will be a comparison towards the Czech Republic. Therefore, it comes as a surprise in the latter parts of the thesis.

- Figures 5.1-5.6: description of figures should rather provide an explanation on the difference between the cost efficiencies ce# so that the reader does not need to hunt for it in text.

- Few typos of minor relevance were spotted during reading: "crucial ones(Barros et al. (2005))", "Result of existence of obstacles to full integration…", on p. 6 "the annual reduction if cost" and "the establishment eurozone" and "in september 2008", on p. 7 "It helped the banks to not stop lending activity", on p. 12 "terms, if not stated other." and "in years 2003 - 2010 about", p. 16 "observations per bank in average" and "the numbers of observations in the year 2010 is much", p. 19 "...model... have

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not converged", p. 20 "the difference is higher estimation efficiency", p. 25 "..coefficients… differs and changes…", footnote 3 missing brackets, etc. Same format of brackets in other brackets is used. Mixed format of decimal separators (dots and commas) in tables is present. Author should not shorten the words in academic language (write "do not" instead of "don't"). Author should avoid using the verb "to prove", unless it is mathematically precise. Subsection 5.3 has misleading headings.

Overall assessment: There is no doubt the thesis is technically advanced, well-structured and well-written; a significant contribution to the current discussion on eurozone cost efficiency during the recent bank crisis is present. The author made a substantial effort to finish this piece and I am convinced it deserves to be awarded (if the examining committee finds the answers to questions raised satisfactory). In any case, I strongly recommend the thesis to be evaluated as ***excellent***.

SUMMARY OF POINTS AWARDED:

CATEGORY		POINTS
Literature	*(max. 20 points)*	16
Methods	*(max. 30 points)*	27
Contribution	*(max. 30 points)*	29
Manuscript Form	*(max. 20 points)*	18
TOTAL POINTS	*(max. 100 points)*	**90**
GRADE	**(1 – 2 – 3 – 4)**	**1**

NAME OF THE REFEREE: Zuzana Havránková

DATE OF EVALUATION: June 7th, 2012

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Referee Signature