Opponent's Report on Dissertation Thesis

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Author:	**Jakub Seidler**
Advisor:	Prof. Ing. Oldřich Dědek, CSc.
Title of the Thesis:	**Credit Risk in the Macroprudential Framework: Three Essays**
Type of Defense:	**DEFENSE**
Date of Defense	September 25, 2012
Opponent:	**Dr. rer. pol. Christian Schmieder**

Overall evaluation:

The dissertation thesis of Jakub Seidler comprises a summary and three essays. The thesis deals with different aspects in the broader context of credit risk, both from a financial perspective and in terms of the macroeconomic conditions, namely:

i. an innovative approach how to determine Loss Given Default,
ii. a contribution to the measurement of excessive credit growth and related policy measures by setting countercyclical capital buffers for banks; and
iii. a novel contribution to bank stress testing, which allows assessing the usefulness of stress tests to forecast macro-financial vulnerabilities (i.e., allows for a validation of stress tests).

All three essays have one common feature: they discuss quantitative modeling that is highly relevant for policy making in the light of the current financial and economic crisis. The discussion of countercyclical capital buffers is highly topical in the context of the revision of bank regulation (Basel III) and comes up with one potential approach to trigger macroprudential action, while the third contribution on stress testing is equally important in terms of policy, and caters to discussions on the usefulness of stress tests as a policy tool.

Overall, the thesis as such, and the revised, final version in particular, is carefully elaborated and meets very solid academic standards in the area of applied macro-financial research. I also want to mention that Mr. Seidler's work successfully combines theoretical and empirical approaches, which is a key pre-condition to be useful for actual practical use. All parts of the thesis were published either in refereed journals or as (refereed) working papers – illustrative evidence that the work has been well elaborated, which is further documented by the fact that all articles have been cited in the academic literature.

My overall assessment is therefore very positive, and **I recommend the thesis for defense without substantial changes**. *In a few areas, I have raised some recommendations, which have been taken up fully by Mr. Seidler.*

Summary of the thesis

The summary of the theses lays out the broader context of the subject matter, namely the measurement of credit risk and the usefulness of macroprudential policies to address the identified risks. The summary starts with a motivation for the studies, which is essentially to fill gaps in the literature, all of which is highly relevant in the context of the financial crisis and the related policy discussion. The sypopsis is very well written and does a good job in embedding the analysis into the broader context, while focusing on key issues.

1st paper: The Merton Approach to Estimating Loss Given Default

The first paper on estimating Loss Given Default (LGD, 1 minus the recovery rate), which is the most technical one of the thesis, is well written, and extends the pertinent literature. The study does a good job in describing the conceptual framework worked out by Mr. Seidler, and showing how the framework can be applied in an empirical context based on illustrative case studies and sensitivity analysis. The paper also highlights possible drawbacks and limitations, such as caveats in terms of the adequacy of market data to calibrate the model and the limitations of the model.

Despite some academic contributions in recent years (including one co-authored by myself, for example), the LGD remains a relatively unexplored territory. As LGDs impact banks' capital adequacy via capital requirements (through Risk-weighted Assets) and credit losses in the case of a materialization of stress, LGDs are at least as important as the modeling of default probabilities (PDs).[1] It should also be noted that LGDs are especially relevant for emerging market countries, where LGDs are typically substantially higher than in advanced countries, mainly due to a lower efficiency of bankruptcy systems, and have been found to increase noticeably under stress. As such, the paper is a meaningful contribution in an important domain for financial stability.

The innovative approach presented by Mr. Seidler is based on the Merton model, which has, to my knowledge, not been applied for LGD modeling, at least not based on a framework that is actually applied in an empirical context (unlike for the estimation of PDs). A key advantage of the framework is that it seeks to include forward-looking information, an important drawback of other (econometric) approaches.

A part of the study has been published as a refereed journal article (and as a CNB Working Paper), and has been cited in articles of the international literature, such as the Journal of Credit Risk and in NBER working papers.

2nd paper: Credit Growth and Capital Buffers

The second study on countercyclical capital buffers contributes to the establishment of macro-financial linkages – an area with (very) limited contributions to date given the relevance of the subject matter, especially as it is part of the forthcoming amended international regulatory rules (Basel III).

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[1] In terms of risk-weighted assets, their impact is more sizeable as for PDs.

The study is well written and does a successful job outlining the pertinent challenges, including for emerging markets. Accordingly, it points to potential conceptual ways how to handle them by means of a comprehensive, European wide empirical study, with a focus on the CEEs. The econometric study uses a data set for 27 European countries, which allows for an estimation of the long-term trend of credit-to-GDP ratios, and thereby allows establishing a meaningful framework for policy-making. The outcome shows that the calibration of thresholds to trigger policy action established by studies carried out at the BIS (especially by Drehmann) can be misleading for emerging market economies, an outcome that is supported by the October 2011 IMF GFSR chapter on macroprudential policies, albeit based on a different approach.

The study has been published as a working paper at the World Bank WP (and the CNB) as well as a policy note.

I view the study as one of the limited number of solid academic contributions in this highly relevant area, with a potential to be used for policy-making in the CEE countries.

3rd paper: Stress Testing: Conservative Calibration and Verification

The third paper on macro stress testing is the one that is most policy-oriented. Stress testing has become an important tool to assess vulnerabilities in the financial sector during the last decade, but especially since the onset of the financial crisis. Despite a number of meaningful contributions in recent years, including my own work at the IMF, various dimensions remain highly challenging, especially the design of meaningful stress scenario – the topic covered by Mr. Seidler's study.

As such, this paper fills an important gap in the stress testing literature: validation and backtesting. To do so, Mr. Seidler proposes using the baseline forecast as part of the stress test framework and to evaluate ex-post how the forecast compares to the actual outcome. His contribution is not only to establish seminal work on this issue, but also his attempt to identify the drivers of potential deviations. To my knowledge, Mr. Seidler's contribution, published in the Czech Journal of Economics and Finance (and previously in the CNB's Financial Stability Report), is among less than a handful of contributions on the broader topic and the only one for solvency stress tests (there is one contribution on liquidity stress testing, Ong and Čihák, 2010).

As his work has been used by the CNB to recalibrate their stress testing framework and thereby establish more meaningful stress test forecasts. Mr. Seidler has thereby established an important element of stress testing carried out by central banks around the world, which has received attention in other countries (including through IMF work using his work as a unique benchmark) and is likely to be implemented by other countries in the future.

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a) Can you recognize an original contribution of the author?

YES, all three papers contribute to the literature on credit risk

b) Is the thesis based on relevant references?

YES, the final version is based on the most relevant literature, and the most recent papers have been added in the final version

c) Is the thesis defendable at your home institution?

YES

d) Do the results of the thesis allow their publication in a respected economic journal?

YES (which is documented by the fact that this has already happened)

e) Are there any additional major comments on what should be improved?

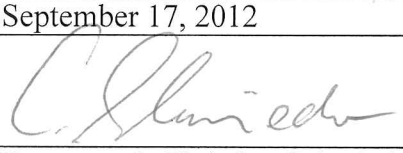
NO, all previous comments were addressed (see below)

f) Were your comments raised at the pre-defense, addressed in the dissertation submitted to the regular defense? (The pre-defense report is enclosed below)

Yes, all previous comments raised in my pre-defense report were addressed; the well-written summary of the thesis is especially useful, as it establishes a broader picture and lays out Mr. Seidler's contributions to the literature

g) What is your overall assessment of the thesis? (a) I recommend the thesis to be defended without major changes; (b) The thesis is not defendable.

I recommend the thesis to be defended without major changes

Date:	September 17, 2012
Opponent's Signature:	
Opponent's Affiliation:	Dr. rer. pol. Christian Schmieder IMF

Enclosure: Pre-Defense Report

Opponent's Report on Dissertation Thesis

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Type of Defense:	**PRE-DEFENSE**
Opponent:	**Dr. rer. pol. Christian Schmieder**

Overall evaluation:

The dissertation thesis of Jakub Seidler comprises three essays, which address different aspects in the broader context of credit risk, both from a financial perspective and in terms of the macroeconomic conditions, namely:

i. an innovative approach how to measure Loss Given Default,
ii. a contribution to coming up with countercyclical capital buffers for banks – an important issue that is both technically challenging and political highly relevant; and
iii. a novel contribution to bank stress testing, which allows assessing the usefulness of stress tests to forecast macro-financial vulnerabilities (i.e., allows for a validation of stress tests).

All three essays have one common feature: they discuss quantitative modeling that is highly relevant for policy making in the light of the current financial and economic crisis. The discussion of countercyclical capital buffers is highly topical in the context of the revision of bank regulation (Basel III) and comes up with one potential approach to trigger macroprudential action, while the third contribution on stress testing is equally important in terms of policy, an pre-empts discussions that can be expected in the future.

Overall, the thesis is carefully elaborated and meets very solid academic standards in the area of applied macro-financial research. I also want to mention that Mr. Seidler's work successfully combines theoretical and empirical approaches, which is a key pre-condition to be useful for actual practical use. All parts of the thesis were published either in refereed journals or as (refereed) working papers – illustrative evidence that the work has been well elaborated, which is further documented by the fact that all articles have been cited in the academic literature.

My overall assessment is therefore very positive, and **I recommend the thesis for defense without substantial changes**. Notwithstanding the high quality of the work, I would like to raise a couple of ideas below that could help further improving the final version of the thesis.

1st paper: The Merton Approach to Estimating Loss Given Default

The first paper on estimating Loss Given Default (LGD, 1 minus the recovery rate), which is the most technical one of the theses, is well written, and extends the pertinent literature. The study does a good job in describing the conceptual framework worked out by Mr. Seidler, and

showing how the framework can be applied in an empirical context based on illustrative case studies and sensitivity analysis. The paper also highlights possible drawbacks and limitations, such as caveats in terms of the adequacy of market data to calibrate the model and the limitations of the model.

Despite some academic contributions in recent years (including one co-authored by myself, for example), the LGD remains a relatively unexplored territory. As LGDs impact banks' capital adequacy via capital requirements (through Risk-weighted Assets) and credit losses in the case of a materialization of stress, LGDs are at least as important as the modeling of default probabilities (PDs).[1] It should also be noted that LGDs are especially relevant for emerging market countries, where LGDs are typically substantially higher than in advanced countries, mainly due to a lower efficiency of bankruptcy systems, and have been found to increase noticeably under stress. As such, the paper is a meaningful contribution in an important domain for financial stability.

The innovative approach presented by Mr. Seidler is based on the Merton model, which has, to my knowledge, not been applied for LGD modeling, at least not based on a framework that is actually applied in an empirical context (unlike for the estimation of PDs). A key advantage of the framework is that it is forward-looking, an important drawback of other (econometric) approaches. A part of the study has been published as a refereed journal article (and as a CNB Working Paper), and has been cited in articles of the international literature, such as the Journal of Credit Risk and in NBER working papers.

I consider this paper as final. Given its relevance and the attention received, the author might consider integrating the study even more into the broader context of the thesis, such as the macroprudential framework.

2nd paper: Credit Growth and Capital Buffers

The second study on countercyclical capital buffers contributes to the establishment of macro-financial linkages – an area with (very) limited contributions to date given the relevance of the subject matter, especially as it is part of the forthcoming amended international regulatory rules (Basel III).

The study is well written and does a successful job outlining the pertinent challenges, including for emerging markets. Accordingly, it points to potential conceptual ways how to handle them by means of a comprehensive, European wide empirical study, with a focus on the CEEs. The econometric study uses a data set for 27 European countries, which allows for an estimation of the long-term trend of credit-to-GDP ratios, and thereby allows establishing a meaningful framework for policy-making. The outcome shows that the calibration of thresholds to trigger policy action established by studies carried out at the BIS (especially by Drehmann) can be misleading for emerging market economies, an outcome that is supported by the October 2011 IMF GFSR chapter on macroprudential policies, albeit based on a different approach.

The study has been published as a working paper at the World Bank WP (and the CNB) as well as a policy note.

[1] In terms of risk-weighted assets, their impact is more sizeable as for PDs.

The final version of this study could benefit from the following, limited amendments, which would further strengthen the quality of the paper:

- The subject matter has received increased attention during recent months. I would recommend adding this literature (such as the chapter on macroprudential policies in the autumn 2011 IMF Global Financial Stability Report). In this context, a discussion on when to release the buffer could also be discussed, an issue that will become relevant once banks will have build buffers and a downturn period occurs.
- In the context of Basel III implementation, a natural question would be how to implement the proposed (long-term) calibration in countries with short time series (due to structural breaks, for example), such as the CEE countries. A natural case to illustrative this would be the Czech Republic.
- Providing some additional descriptive statistics in the Appendix could be helpful, at least for the credit-to-GDP ratios.

Based on the proposed amendments, I view the study as one of the limited number of solid academic contributions in this highly relevant area, with a potential to be used for policy-making in the CEE countries.

3rd paper: Stress Testing: Conservative Calibration and Verification

The third paper on macro stress testing is the one that is most policy-oriented. Stress testing has become an important tool to assess vulnerabilities in the financial sector during the last decade, but especially since the onset of the financial crisis. Despite a number of meaningful contributions in recent years, including my own work at the IMF, various dimensions remain highly challenging, especially the design of meaningful stress scenario – the topic covered by Mr. Seidler's study.

As such, this paper fills an important gap in the stress testing literature: validation and backtesting. To do so, Mr. Seidler proposes using the baseline forecast as part of the stress test framework and to evaluate ex-post how the forecast compares to the actual outcome. His contribution is not only to establish seminal work on this issue, but also his attempt to identify the drivers of potential deviations. To my knowledge, Mr. Seidler's contribution, published in the CNB's Financial Stability Report, is among less than a handful of contributions on the broader topic and the only one for solvency stress tests (there is one contribution on liquidity stress testing, Ong and Čihák). As his work has been used by the CNB to recalibrate their stress testing framework and thereby establish more meaningful stress test forecasts. Mr. Seidler has thereby established an important element of stress testing carried out by central banks around the world, which has received attention in other countries (including through IMF work using his work as a unique benchmark) and is likely to be implemented by other countries in the future.

For the final version of the dissertation, the following add-ons could be worth to be addressed:

- In order to establish a common ground for the stakeholders interested in the study, including from a policy perspective, an illustrative figure on the typical architecture of stress testing framework could be added.
- The usefulness of the paper could be further strengthened by embedding it more into the stress testing literature. As such, the study could be linked to Ong and Čihák (IMF working paper) and Borio, Drehmann and Tsatsaronis (BIS working paper) – two recent studies that were related to Mr. Seidler's work by challenging the benefits of stress testing as an early warning tool.

- A potential amendment of the analysis could be the investigation of the impact of shorter (e.g., 1-year) and longer projection horizons, which are especially relevant for the policy debate, though this might be challenging.[2] This recommendation could form the basis of a follow-up paper given the scope of such analysis and constitutes a "nice-to-have" element.

Based on the above, I would like to answer your overarching questions as follows:

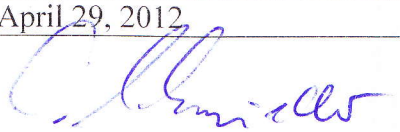
a) Can you recognize an original contribution of the author?
YES

b) Is the thesis based on relevant references?
YES (the dissertation would benefit from adding some recent references in the final version)

c) Is the thesis defendable at your home institution or another respected institution where you gave lectures?
YES

d) Do the results of the thesis allow their publication in a respected economic journal?
YES (which has already been the case for two of the three papers)

e) Are there any additional major comments on what should be improved?
I do not have any major comments/ I have suggested a few minor changes/amendments, which would further strengthen the very solid and useful work conducted by Mr. Seidler.

Date:	April 29, 2012
Opponent's Signature:	
Opponent's Affiliation:	Dr. rer. pol. Christian Schmieder IMF

[2] It is fairly standard to project stress for 3 to 5 years, which implies that the outcome in the outer years becomes highly uncertain and subject to large confidence intervals.