

Opponent's Report on Dissertation Thesis

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Title of the Thesis:	Interbank markets, monetary transmission and bank efficiency
Type of Defense:	DEFENSE
Date of Pre-Defense:	February 28, 2018
Opponent:	Michael Brei, Ph.D.

Address the following questions in your report, please:

- a) Can you recognize an original contribution of the author?
- b) Is the thesis based on relevant references?
- c) Is the thesis defensible at your home institution or another respected institution where you gave lectures?
- d) Do the results of the thesis allow their publication in a respected economic journal?
- e) Are there any additional major comments on what should be improved?
- f) What is your overall assessment of the thesis? (a) I recommend the thesis for defense without substantial changes, (b) the thesis can be defended after revision indicated in my comments, (c) not-defensible in this form.

(Note: The report should be at least 2 pages long.)

The underlying dissertation examines empirically the linkages between central bank policies and the Czech banking system. It covers a wide range of topics, including the transmission of monetary policy to bank interest rates and interbank market rates. The three chapters are well developed, motivated by important background readings, and the results are derived from complex bank-specific datasets and advanced econometric methods. The studies offer new insights to the functioning of monetary and regulatory policies in the Czech Republic and as such they are of interest for both academics and central bankers. The three chapters of the dissertation have been published in peer-reviewed journals.

The contribution of Ms. Lešanovská can be clearly recognized, as she took responsibility of the data work and participated in the writing, editing and publication process of the studies. In my view, she has produced an excellent body of interrelated work. The comments I raised in the pre-defense report have been thoroughly addressed and thus I do not have any additional comments for improvement.

The thesis is in my view defensible at my home institution. My overall assessment is (a) and I thus recommend the thesis for defense without substantial changes. In the following, I provide more detailed comments and suggestions.

The first chapter sheds new light on the determinants of interbank rates in the Czech Republic focusing on the apparently different behavior of interbank rates and policy rates. The interbank rate is a key indicator of the liquidity in the banking system and understanding how policy rates and the rates at which banks lend to each other are related is an important topic. By affecting directly bank funding costs, changes in interbank rates will eventually affect bank behavior, both in the form of pricing and investment decisions. An interesting feature of the Czech interbank market is that a substantial part of the trading volume is conducted with non-resident banks, which means that potentially not only domestic monetary policy conditions, but also foreign monetary policy may influence the interbank rate's determination. However, to the extent that on average interbank exposures are relatively low, such effects might be of smaller magnitude.

To uncover the determinants of the domestic interbank risk premium, the authors gather an extensive data set on liquidity and solvency risks of the banks (including those of foreign headquarters), counterparty risk, market risk and interbank relationships. The data come from the Czech National Bank's supervisory reports and credit register, Thomson Reuters and Bloomberg which means that information on bank fundamentals and financial markets are matched and jointly investigated. Such studies are gaining importance since the global financial crisis and the experience that unexpected shocks in financial markets can have deep repercussions on bank stability.

The baseline model is the fixed effects estimator for panel data. The authors employ a general-to-specific estimation procedure to identify the main determinants of the risk premium using Bayesian Model Averaging in combination with the Markov Chain Monte Carlo Model Composition algorithm. This recently developed methodology allows to extract key factors of the variable of interest from a larger set of potentially important determinants (in their case 23 variables).

Using daily data and monthly information of the financial statements of 13 banks over the period 2007-12, the results suggest that liquidity risk is of smaller importance as the only variable that has a relatively high posterior inclusion probability is the provisions ratio. Interestingly, counterparty risk (measured by loan defaults of counterparties and dispersion of CDS spreads of foreign headquarters) appears to be an important driver of the risk premium. This highlights the sensitivity of the Czech interbank market not only to the soundness of domestic institutions but also to foreign banking markets. Another result is that market risks (measured by domestic bond market liquidity and Euro Area money market premium) influence the interbank risk premium. The availability of alternative funding sources hereby puts a downward pressure on the interbank risk premium. And lastly, the connectivity indicators and those on strategic behavior do not seem to have affected the interbank risk premium in the Czech Republic.

In my view, this chapter is very well written, based on a sound conceptual framework, and the pricing of interbank rates is examined in an innovative and competent way. My comments from the pre-defense report have been addressed diligently. More specifically, the results description has been expanded by providing more in-depth analysis of the theoretical justifications. Moreover, the PhD candidate has expanded the discussion on the economic importance of the results.

The second chapter sheds new light on the monetary policy transmission in the Czech banking system to the interest rates charged by banks for various types of loans and those paid out to

depositors. Understanding the transmission mechanism of monetary policy, which differs across countries, is essential for central banks and as such the study is of particular interest for the Czech National Bank. By affecting market rates and the marginal cost of bank funding, monetary policy will have an impact on banks' pricing, investment and funding decisions. A large body of literature has investigated this issue, nevertheless, it is important to study the recent experience within a case study on the Czech banking system. To the extent that banks of different types and in different environments respond differently to changes in monetary policy, the authors examine the role of the cost efficiency of banks and the occurrence of the global financial crisis.

The study provides an interesting and in-depth literature review on the pass-through of monetary policy to the interest rates set by banks. To examine the pass-through on the bank-level, the authors gather an extensive data set consisting of detailed monthly information on the financial statements of banks. Interestingly, the data allow distinguishing loans by type (small/large corporate loans (fixed vs floating rates), mortgages, and consumer loans) and deposits by maturity (less/more than a withdrawal term of 1 day). Overall, the study covers 52 banks (of which 25 banks reported at a higher frequency) over the period 2004-2013.

The baseline model in the form of an error-correction framework is estimated with the pooled mean group estimator, which allows for heterogeneous short-term responses on the bank-level, but assumes that the long-term equilibrium relationship is similar across banks. This specification is confirmed by the Hausman test, since the null hypothesis that long-term coefficients are common to all banks cannot be rejected. In turn, the individual estimates are aggregated to the average response using a weighted least squares procedure. The baseline model hereby explains changes in the individual bank interest rates using their lag, the change in the relevant market rate and the difference of the lagged level between the two with respect to a constant mark-up applied to bank rates.

The results suggest that the long-term pass-through is almost complete for most products considered, except for mortgages and overnight deposits where the pass-through amounts to 45 and 28 percent, respectively. The speed of adjustment hereby seems to be similar across products, even though the interest rates of household products react more sluggishly compared to firm products. When investigating the post-crisis period 2008-13, the authors find significant differences in the way banks react to market rates. While the pass-through to mortgage rates increased, in the other market segments the long-term impact becomes smaller.

When introducing bank efficiency, which itself is estimated using auxiliary regressions, the authors examine potential differences in the way bank interest rates respond to monetary policy. A particular focus is set on the (i) strength of the long-term pass-through, (ii) adjustment lag between the short- and long-term, and (iii) interest rate spreads. The results suggest that cost efficiency does not affect the long-term pass-through, but it affects the adjustment lag (more efficient banks respond more sluggishly) and the interest rate spread (less efficient banks charge higher markups). A similar analysis is conducted for banks with a high/low long-term pass-through for deposit products. Further regression analysis is conducted on the determinants of (i)-(iii) using information on cost efficiency, bank size and other critical determinants such as credit, liquidity and solvency risks. A number of interesting results emerge. For example, efficiency only seems to increase the adjustment lag (i.e. not the spread), while liquidity reduces both the long-term pass-through as well as the adjustment lag. There is also some evidence that better capitalized banks, more retail- and mortgage-oriented banks charge lower interest rate spreads.

In my view, this chapter is again very well written, based on a sound conceptual framework, important background reading, and the pricing of loan and deposit products is examined in an innovative and competent way using appropriate estimation methods. The comments that have been raised in the pre-defense report have been taken into account, i.e. the PhD candidate has expanded the discussion of the link between the pass-through and increased competition in the mortgage market in the post-crisis period. Moreover, other monetary policy changes, such as the exchange rate commitment of the central bank and the tightening of monetary policy.

The final chapter of the dissertation examines the relationship between regulatory capital and efficiency in the Czech banking sector. It thus introduces another dimension of monetary policy in the form of prudential capital regulation. In light of the recent regulatory changes the Czech banking system is undergoing since the global financial crisis, the study is of interest for the Czech National Bank and other central banks in the region, since tighter and complex capital regulation might arguably affect bank efficiency. It also contributes to the debate that focuses on the macroeconomic impact of tighter capital regulation which often is based on the assumption that capital is costlier for banks compared to other forms of funding. The authors highlight the importance of asymmetric information and associated agency costs in this context and argue that higher capital can have both positive and negative effects on cost efficiency. However, as has been argued, the causality might as well go from efficiency to capital, again with opposing effects (risk vs franchise value view).

Because the literature provides conflicting predictions on the relationship between capital and efficiency and has pointed out the reverse causality issue, the study employs Granger causality testing, embedded in a system GMM framework, to a large data set on the Czech banking industry. More specifically, the authors gather an extensive data set consisting of detailed quarterly information on the regulatory reports of banks. Overall, the study covers 29 privately-owned banks over the period 2002-2013. Bank efficiency is estimated using frontier efficiency techniques. In turn, the efficiency scores of each bank obtained from the stochastic frontier analysis are used to investigate their relationship with both total and regulatory capital.

The results show that the capital position of banks does not Granger-cause their cost efficiency. As the authors argue the insignificance of the relationship in the Czech banking industry might be due to its specific nature (high foreign bank participation) which in turn leads to greater agency costs between shareholders and managers relative to those between shareholders and debtholders. In other words, the two effects offset each other, whereas in other banking regions the latter effect dominates (China and Europe). Similar, insignificant results are found when considering the causality from efficiency to capital. As the authors argue the two potential effects efficiency might have on bank capitalization offset each other. The results are robust to a number of robustness tests that allow, amongst other things, a longer time lag in the response of the two variables or the effect of the global financial crisis.

In my view, this chapter is again very well written, based on a sound conceptual framework, important background reading, and the relationship between bank capitalization and bank efficiency is examined in a competent way using appropriate estimation methods for dynamic panel settings. The PhD candidate has in response to my comments in the pre-defense report included a graphical representation of the main variables of interest along with an in-depth in discussion.

Overall, I would rate the PhD thesis as excellent and thus recommend that the PhD student should be granted a PhD.

Date: 19 May 2018	
Opponent's Signature:	
Opponent's Affiliation:	Michael Brei, Ph.D. The University of the West Indies & University Paris Nanterre