

Abstract

This dissertation thesis consists of three chapters devoted to analyzing residential and commercial real estate prices, assessing risks related to residential real estate exposures for financial stability, and calibrating borrower-based macroprudential measures to address those risks. Each chapter presents a general approach(es), which can be used - after certain adjustments - for similar analyses across countries and application to the Czech Republic or the CEE countries.

In Chapter 1, we first show the application of a standard inverted demand model of the equilibrium house prices, which we extend to take into account the population ageing in the Czech Republic with potential impact on the effective demand for owner-occupied housing. Then, we present an alternative model that considers possible amplification between house prices, mortgage credit, and the real economy and investigates whether non-linearities in the short-term house price dynamic are present in the Czech Republic. By this, we extend the scarce empirical literature on non-linearities in house prices. Next, we abstract from economic determinants of house prices, which may lead to biased results if procyclical, and analyze the interaction between asking and transaction prices as a kind of revealed expectations of buyers and sellers in the housing market. This approach is, to our limited knowledge, an original contribution to the house price analysis. Finally, we check the plausibility of the assumption about the stability of house prices to incomes, which is used in the models including ours, for catching-up economies such as the Czech Republic.

Chapter 2 presents an approach to assessing risks related to the mortgage exposures and to calibrating borrower-based macroprudential measures to address those risks. The flow approach is a relative measure that analyzes the evolution of risks in time and searches for risky tails in the lending distribution. To this end, we stress-test individual new mortgage loans for the ability of the borrowers to service their loans and repay the loans over maximum maturity. Results for the Czech Republic suggest that new loans with loan-to-value over 80%, loan service-to-income over 40% and loan-to-income over 8 could be deemed relatively riskier in the second half of 2017. Using this approach, all measures are calibrated using a set of metrics that are linked to each other. Therefore, the value-added of the approach is that it should lead to higher effectiveness of the policy mix and reduce overlaps. The stock approach is an early attempt to extend the flow approach to measures the risks in absolute terms. To this end, we stress-test the entire portfolio of mortgage loans that we simulated in a forward-looking way. Finally, we show how this approach can be

used for partial assessment of the effectiveness of borrower-based measures. The results for the Czech Republic suggest that if the economic expansion continued from 2020 onwards, risks related to the mortgage portfolio would have been significantly higher if borrower-based measures had not been introduced in the past. By this approach, we extend the empirical literature which is emerging in this field.

Chapter 3 presents a model for estimating the under- or overvaluation of commercial property, distinguishing between property types. To this end, we present semi-structural model that imitates the functioning of the commercial real estate market, and estimate this model on a panel of five CEE countries and Germany. Comparing the results with cyclical component of property prices derived using HP filter suggests that using HP filter with very high values of the smoothing parameter yield similar results. This would confirm that the commercial property price cycle has a longer length than the business cycle, possibly because of their linkages to the credit and financial cycle. The model contributes to the existing research on commercial property prices, which has been limited to the analysis of individual property types or the use of statistical measures.