

## NON-TECHNICAL SUMMARY

### SHORT AND LONG RUN BEHAVIOUR OF HOUSE PRICES IN EASTERN EUROPEAN COUNTRIES: A COMPARATIVE APPROACH

This paper uses cointegration and error correction models in order to examine the long run and short run behaviour of house prices in Eastern European countries and compare it to developed EU countries in order to explore the key similarities and differences between Eastern European and developed European Union countries. Four transition countries (Bulgaria, Croatia, the Czech Republic, and Estonia) and three developed countries (Ireland, Spain, and the U.K.) are included in the sample. House prices behaviour for each country is modelled separately as a function of income, interest rates, credit, construction activity, employment and house price persistence.

The results of this study offer the following tentative conclusions:

- GDP and interest rates matter the most for house price behavior in the long run. Long run interest rates elasticities are quite high in all countries except Ireland and in most countries they in absolute terms exceed income elasticities.
- In the short run income and interest rates also determine the behavior of house prices. Income is significant and correctly signed in all countries, with most of the individual country elasticities revolving around 1. Interest rates are significant in all countries except Estonia and Spain, with their elasticities varying from high to low.
- Except in Estonia, house prices are not weakly exogenous. However, the adjustment parameters are quite low for most of the countries. Smaller adjustment parameters can be a consequence of house price persistence which prevents fundamentals from correcting the discrepancies.
- House price persistence is significant and, if judging from the magnitude of lagged house price coefficients, rather strong in all countries except Ireland.
- Construction output determines house prices in about half of the countries in the sample, but the elasticity of house prices to construction output changes is quite low. In the short run these elasticities are higher in transition countries when compared to developed countries, while the opposite is true for the long run elasticities.
- The results of cointegration and error correction models for the U.K. estimated on longer (1969) and shorter (1995) reveal that the influence of financial sector developments on housing market has increased over time. Moreover, the house price persistence also has increased over time.

Key words: house prices, cointegration, error correction, transition

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### THE NONLINEAR HOUSE PRICE ADJUSTMENT PROCESS IN DEVELOPED AND TRANSITION COUNTRIES

The aim of this paper is to test for nonlinear house price properties, such as threshold cointegration and the asymmetric adjustment of house prices in relation to the long-run discrepancies proposed by Enders and Siklos (2001). We test the given methods on a sample that includes four developed countries (Ireland, Spain, the United States, and the United Kingdom) and four transition countries (Bulgaria, Croatia, the Czech Republic, and Estonia). To the best of our knowledge this is the first paper that applies this methodology on house prices and one of the few papers dealing with house price nonlinearities in general.

The results of this study offer the following tentative conclusions:

- The adjustment process of house prices in four transition countries in Europe (Croatia, Bulgaria, the Czech Republic, and Estonia) that experienced an intensive increase of house prices is asymmetric.
- The asymmetric adjustment of house prices is also present in the USA, while no evidence of threshold cointegration is found in three developed European countries that also witnessed strong house price appreciation.
- House prices are not weakly exogenous, but threshold adjustment parameters are small in magnitude for all Countries except Croatia.
- An asymmetric error correction model of house prices suggests that in Bulgaria, the Czech Republic, Estonia, and the USA, past values of house price changes Granger cause present house price changes. The existence of house price persistence might explain persistence of disequilibria. This conclusion is strengthened by the fact that Croatia is the only country where house price persistence does not seem to play a role and, consequently, its adjustment coefficient is much larger when compared to other countries.
- Granger causality test results indicate that changes in GDP lead to house price changes in Estonia and the USA; while interest rate changes influence house prices in Bulgaria, Croatia, and the USA (when tested on the shorter sample).
- House prices in the observed period were not completely detached from fundamentals, but the emergence of the house price boom was supported by house price persistence coupled with a slow and asymmetric adjustment process.
- Interest rates do not Granger cause house prices in the USA when threshold error correction model is estimated on the sample starting in 1975, while they do seem to matter in the model estimated from 1995 onwards. This suggests that financial liberalization in the USA during the last decade of 20<sup>th</sup> century played an important role in house price developments.

Key words: house prices, threshold cointegration, asymmetric adjustment, transition