



The relationship between stock and real estate prices in Turkey: Evidence around the global financial crisis



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ABSTRACT

Research on the relationship between stock and real estate prices focuses on two transmission mechanisms, namely the wealth and credit-price effects. This paper uses the 2007 global financial crisis as a natural experiment and examines whether the relationship between real estate prices and stock prices has changed after the outbreak of the crisis by using data from the Turkish market. The results based on a threshold cointegration framework indicate that while both effects exist during the pre-crisis period, only a credit-price effect is observed during the crisis period. Moreover, the findings are sensitive to whether or not one allows for asymmetric error correction.

1. Introduction

Research on the impact of wealth on consumption has attracted interest on the relationship between stock and real estate prices. In the resulting literature, two mechanisms have been proposed that may lead to a causal relationship between real estate prices and stock prices. The first mechanism, known as the wealth effect, argues that as the stock market rises, investors with unanticipated increases in wealth will push their demand for real estate up. Hence, the stock market will lead the real estate market. The second mechanism, the so called credit-price effect, emphasizes that real estate serves as collateral to especially credit-constrained firms. An increase in real estate prices would improve the balance-sheet position of these firms and decrease their costs of borrowing. This will lead to a higher level of investment activity by firms accompanied by a rise in their stock prices. Based on this reasoning, the credit-price effect predicts that the real estate market will lead

the stock market. Overall, the majority of the empirical research provides supporting evidence for the wealth effect.¹

Stock and real estate markets are, however, also affected by economic conditions. For example, the 2007 global financial crisis that began in the U.S. had a considerable negative effect on both stock and real estate prices in many countries. As [Lin and Treichel \(2012\)](#) describes “The ensuing financial sector crisis quickly led to a significant decline in credit to the private sector as well as to a sharp rise in interest rates. The resulting collapse in U.S. financial institutions led to a collapse of equity markets, and of international trade and industrial production and spread to other advanced economies as well as to emerging markets and developing countries. Real growth around the world declined sharply below projections and advanced economies, including the U.S., entered into a recession”. [Adair et al. \(2009\)](#) argues that globally \$7 trillion has been wiped off the stock markets over the course of 2008.² Another consequence of the crisis is the collapse of the housing market in many countries.³

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¹ [Green \(2002\)](#), [Kapopoulos and Siokis \(2005\)](#), [Chen \(2001\)](#), [Sutton \(2002\)](#), [Kakes and Van Den End \(2004\)](#), [Ibrahim \(2010\)](#) provide evidence consistent with the existence of a wealth effect. [Lean and Smyth \(2012\)](#), [Liu and Su \(2010\)](#) and [Su \(2011\)](#) report the existence of both effects. Only, [Sim and Chang \(2006\)](#) find the existence of credit effect.

² During 2008, New York's S&P 500, Japan's Nikkei 225 and UK's FTSE 100 indices fell by 38.5%, 42% and 31.3%, respectively.

³ In the US, The Case-Shiller Index shows a 25% drop over the two year period 2007–2008 ([Barker, 2009](#)). According to Nationwide Building Society, for example, the average house price in the UK fell by 14.7% over the course of 2008 ([Adair et al., 2009](#)).

During the first quarter of the 2008, the Turkish stock market, with a decline of 36.62 percent, showed the most drastic reaction to the financial crisis among the countries included in the S&P/Citigroup BMI Global Index (Standard and Poor's, 2008). Moreover, the REIDIN Turkey Residential Property Price Indices show a continual fall in house prices over the period March 2008 to March 2009 (ReidinTurkey, 2010). The overall performance of the economy was unsatisfactory during these two year period, with GDP growth rates of 0.7 percent and 4.7 percent, respectively for 2008 and 2009 (Turkey's Statistical Yearbook, 2009). In spite of the dramatic initial reaction, the Turkish economy has shown recovery by the end of 2010. Coskun (2011) argues "Turkey has faced limited negative impacts from the global financial crisis. The lack of securitization/structured product markets and also inefficient housing credit market may have seemed good news for Turkey during the financial turmoil."

The purpose of this paper is to use this period of crisis as a natural experiment and examine whether the relationship between real estate and stock prices in Turkey has changed following the crisis. While this relationship has been extensively researched in a number of international markets, no attempt has been made to assess Turkey. We examine this issue by using daily Real Estate Investment Trusts (REIT) index, stock market index and interest rate data within the framework of a vector error correction model. Since, as argued in Gonzalo and Pitarakis (2006), omitting the presence of nonlinear components, like threshold effects in long-run equilibrium, can lead to misinterpretations of equilibrium relationships, we employ threshold cointegration where adjustments to a long-run equilibrium only takes place when deviations become large and exceed the threshold.

The results indicate that the nature of the long-run relation has changed after the outbreak of the crisis. When we compare pre-crisis and crisis periods, it is noteworthy that while both credit-price and wealth effects exist during the pre-crisis period, only a credit-price effect is observed during the crisis period. Moreover, the findings are sensitive to whether or not one allows for asymmetric error correction.

The remainder of the paper is organized as follows. The next section gives a brief review of the literature. The third section presents the data and methodology used in the study. The fourth section reports and discusses the empirical results. The last section provides the concluding remarks.

2. Literature review

Early research on the relationship between real estate and stock prices has examined correlations between the returns on these two investment alternatives using U.S. or U.K. data.⁴ Most of these articles report that real estate and stock returns are negatively correlated. However, the evidence in these studies cannot be used to distinguish between the credit-price or wealth effect, since they do not test for the direction of causality.

The next wave of studies applies the concept of Granger causality, vector autoregression (VAR) modeling and cointegration techniques to examine the causal interactions between real estate and stock prices. Green (2002) and Kapopoulos and Siokis (2005) test for Granger causality using a single-equation framework. Chen (2001), Sutton (2002), Kakes and Van Den End (2004) and Sim and Chang (2006) use VAR modeling. Ibrahim (2010) and Lean and Smyth (2012) use the cointegration technique and vector error correction modeling. Overall, only Sim and Chang (2006) and Lean

and Smyth (2012) provide supporting evidence for the credit-price effect. Each of the other studies, though, favors the wealth effect.

Both Green (2002) and Kapopoulos and Siokis (2005) use differenced series in a single equation framework. Green (2002) uses data from San Francisco Bay area, which is argued to be a prime candidate for a wealth effect to be large for the following reasons. First, high income households in this region are expected to hold relatively large amounts of stock. Second, compared to workers elsewhere workers in San Francisco Bay area are more likely to be paid in stocks. The paper provides evidence, consistent with this conjecture that stock prices Granger cause real estate prices in this region. Similarly, Kapopoulos and Siokis (2005) reports evidence in favor of the wealth effect hypothesis for Athens real estate prices, but not for other urban real estate prices.

One of the studies that use a VAR framework, Chen (2001), examines the relation in Taiwanese market by including rediscount rates and the total amount of bank loans as control variables. The findings indicate that stock prices Granger cause housing prices, but not vice versa. Moreover, changes in bank loans, but not changes in rediscount rates, are significant in predicting both stock and housing prices. Another study, Sutton (2002), examines the extent to which house price changes in six developed markets, namely the United States, the United Kingdom, Canada, Ireland, the Netherlands and Australia, can be explained by changes in national incomes, interest rates and stock prices. This study also provides evidence in favor of the wealth effect.

A further study that uses VAR modeling, Kakes and Van Den End (2004), examines the Dutch market using real disposable income and the ten-year government bond yield as control variables. The findings show that stock prices and interest rate have explanatory power for future changes in house prices. Moreover, their results indicate the absence of a credit-price effect in the Dutch market. The results also show, consistent with the evidence in Green (2002), that an increase in homeowners' participation in the stock market increases the sensitivity of house prices to stock market. A similar paper, Sim and Chang (2006), examines the Korean market by using the growth rate of GDP and three-year corporate bond yield as control variables. Overall, the results show that house and land prices Granger-cause stock prices in most regional housing and land markets, but there is no converse causation from stock to real estate markets. The findings reveal that the credit-price effect is particularly associated with industrial land markets.

The first of the two papers that use a cointegration framework, Ibrahim (2010), examines the relation between stock and real estate prices in the Thai market. By including real output and consumer price data in the analysis, the paper finds strong evidence in favor of a wealth effect. It also documents that real activity has significant impact on both real estate and stock prices. The second paper, Lean and Smyth (2012), examines Malaysia by employing interbank deposit rates as control variable. The paper uses individual REIT rather than REIT index data. While a wealth effect is found for some REITs, for most of the others there is evidence of feedback effects between real estate and stock markets.

Other recent studies, recognizing that standard cointegration technique fails to capture real world economic phenomena such as the possible impact of market frictions, asymmetric information and transaction costs on the adjustment to the long-run equilibrium, employ threshold cointegration modeling. This method, in which adjustments to a long-run equilibrium only take place when deviations become large and exceed the threshold, has been popular after the seminal paper of Balke and Fomby (1997). As Gonzalo and Pitarakis (2006) points out, omitting the presence of nonlinear components, like threshold effects in long-run equilibrium, can

⁴ See, for example, Ibbotson and Siegel (1984), Hartzell (1986) and Eichholtz and Hartzell (1996).

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