"Ripple effects" and forecasting home prices in Los Angeles, Las Vegas, and Phoenix

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Received: 14 July 2009 / Accepted: 2 November 2010 / Published online: 19 November 2010
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Abstract We examine the time-series relationship between house prices in Los Angeles, Las Vegas, and Phoenix. First, temporal Granger causality tests reveal that Los Angeles house prices cause house prices in Las Vegas (directly) and Phoenix (indirectly). In addition, Las Vegas house prices cause house prices in Phoenix. Los Angeles house prices prove exogenous in a temporal sense and Phoenix house prices do not cause prices in the other two markets. Second, we calculate out-of-sample forecasts in each market, using various vector autoregressive and vector error-correction models, as well as Bayesian, spatial, and causality versions of these models with various priors. Different specifications provide superior forecasts in the different cities.

JEL Classification C32 · R31

1 Introduction

This paper considers the dynamics of house prices and the ability of different pure time-series models to forecast house prices in three Southwestern Metropolitan Statistical Areas (MSAs)—Los Angeles, Las Vegas, and Phoenix. Recent popular wisdom argues that residents of Southern California sell their local homes, cash out significant

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UK house experts identified a “ripple” effect of house prices that begins in the Southeast UK and proceeds toward the Northwest. Meen (1999) describes four different theories that may explain the ripple effect—migration, equity conversion, spatial arbitrage, and exogenous shocks with different timing of spatial effects. A ripple effect does not yet receive much support in the US economy. For example, most analysis relates to a given geographic housing market, such as a metropolitan area (Tirtiroglu 1992; Clapp and Tirtiroglu 1994; Gupta and Miller 2010). Additional evidence across census regions also exists, which may reflect the fourth of Meen’s explanations (Pollakowski and Ray 1997; Meen 2002).

Visual evidence of house price movements in the Los Angeles, Las Vegas, and Phoenix MSAs reveal a consistent pattern. See Fig. 1. All three markets exhibit a large run up in house prices in real terms, beginning at least by 2003 and peaking at the same time in late 2006. From the mid-1980s through early 1990s, Los Angeles experienced a smaller run up and decline in house prices, not followed by such movements in Las Vegas or Phoenix. In addition, the movement of people from Los Angeles to Las Vegas and Phoenix after retirement may link these three MSAs housing markets. Further, the purchase of houses in Las Vegas and Phoenix as second homes or as investments by

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1 In fact, other Mountain Southwest MSAs may also respond to home prices in Los Angeles (and San Francisco). Recently, the Brookings Institution (2008) released a report on the rapid growth in the Mountain Southwest, identifying five megapolitan areas—Las Vegas, Phoenix, Denver, Salt Lake City, and Albuquerque.