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Wall Street's bailout bet: Market reactions to house price releases in the presence of bailout expectations

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ABSTRACT

The rise and subsequent collapse of US house prices was one of the factors underlying the recent financial crisis. One could expect that the crisis brought increased attention to the housing market and thus led to stronger market reactions to house price news. We find that reactions indeed change, but with a peculiar twist: from September 2008 on, *good* news from the housing market are associated with *falling* US stock prices, and vice versa. The likely explanation, for which we provide cross-sectional evidence, is that falling house prices increased the market's trust in a government bailout, thereby increasing market valuations of firms that were expected to benefit from government rescue measures.

1. Introduction

The rise and subsequent collapse of US house prices was one of the factors underlying the recent financial crisis. One could expect that the crisis brought increased attention to the housing market, but while there are many studies on the effect of macroeconomics news to stock prices,[1] reactions to house price news have not been studied before.

We analyze the stock market reaction to house price announcements both on a daily and intraday basis. We find stock market reactions to be small and positive, i.e. higher house prices lead to higher stock returns, before August 2008 only. From September 2008 on, bad news from the housing market lead to *rising* US stock prices and *falling* volatility, while good news are associated with *falling* prices and *rising* volatility.

Our favored explanation is that falling house prices increased the market's trust in government rescue operations, thereby lowering uncertainty and increasing market valuations. The opposite can hold for rising house prices.

We find this "bad news is good news" effect to be stronger for firms that benefit most from a government bailout.[2] Motivated by the common too-big-to-fail assumption we use firm size as ex-ante proxy for expected bailout benefits and show that stock returns of larger firms of any industry show a higher positive effect on negative house prices. This effect is most pronounced for the banks and financial industry supporting the view of higher systemic risk steaming from the financial than the non-financial sector.

When expecting a bailout stock market participants interpret declining house prices as an increase in the likelihood of beneficial government action. For this interpretation there is anecdotal evidence: An article focusing on the Fed's interest rate policy, published on the day after the October 2008 release of the Case-Shiller data, claims: "*The case for more rate cuts strengthened Tuesday, with new reports* [Case-Shiller 20 cities index and Conference Board measure of consumer confidence] *showing the economy deteriorating sharply*". (Wall Street Journal, 29 October 2008: A.1). Interventions mentioned in the article include Fed purchases of commercial paper and a possible government loan to General Motors. The

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[1] Cf. the literature review Section 2 of this paper.

[2] In order to avoid misunderstandings about our usage of the term *bailout*, we would like to note that we do not use it only in conjunction with capital injections, but also with other measures such as general monetary or fiscal stimuli, mortgage relief programs or car scrappage schemes.

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market thus seems to links house price news not only to rescue measures closely related to the housing market, but also with other rescue actions. Signs of house market recovery would be perceived as decreasing the likelihood of further financial and industrial bailout measures.

In an article that describes the release of the Case-Shiller data in December 2008, the description of the new data is followed by a comment on possible government actions: "*The deepening economic woes renew pressure on the incoming Obama administration and Democrat-controlled Congress to try to stem the decline in housing prices*". (Wall Street Journal, 31 December 2008: A.2) Similarly, "*The latest Case-Shiller numbers provide more ammunition to Washington policy makers who want to do more to fix the housing mess, according to Jaret Seiberg, an analyst with the Stanford Group, the policy research firm. 'These data just add to the tremendous pressure on the president-elect and the Democrats to stimulate housing,' he sa*id". (CNNMoney, 31 December 2008). Both comments further add to our hypothesis that the market was expecting government action and the likelihood of these actions would increase with each new round of declining house price announcements.

Another article from the same day contrasts the negative Case-Shiller data with the price increase of auto shares: "There's an acceptance of the reality that [...] given the economy's vulnerable state, to allow the bankruptcies of these companies now would just exacerbate unemployment problems", said Quincy Krosby, chief investment strategist at Hartford Financial Services, noting that auto manufacturing and related industries account for as many as one in 10 US jobs. "You can't allow the collateral damage from these companies going under", said Ms. Krosby". (Wall Street Journal, 31 December 2008: C.5). This article exemplifies the prevailing argumentation for non-financial bailout measures and an article entitled "Decline in Home Prices Accelerates; Fed's Efforts Have Only Muted Effect On Mortgage Rates" and published on the day after the February 2009 Case-Shiller release summarizes the position of the Federal Reserve as follows: "A top Federal Reserve official indicated the housing slump and its broadening impact on the economy probably would keep the central bank biased in favor of more interest-rate cuts". (Wall Street Journal, 27 February 2008: A.1). Both anecdotes show that we should expect stock market reactions not limited to firms directly invested in the housing market, but a more general transmission of bad housing numbers to beneficial government bailout measures.

The remainder of the paper is structured as follows. In the following Section 2 we review the relevant literature. Section 3 describes the data and our modeling of house prices. Section 4 summarizes the regression-based study of announcement effects and Section 5 concludes.

2. Literature review

There is a number of papers studying market reaction to macroeconomic announcements. Flannery and Protopapadakis (2002) examine a large number of macroeconomic announcements including new home sales and housing starts but do not include house prices. Several papers document the possibility or existence of asymmetric and time-varying price reactions. Veronesi (1999) shows within an equilibrium model that investors may underreact to good news in bad times and overreact to bad news in good times. Boyd et al. (2005) document that rising unemployment is good news for stocks during good times and bad news during bad times; the reason is that unemployment contains information about different value drivers, whose importance varies with economic conditions. Beber and Brandt (2010) examine consumer and producer price changes, unemployment and nonfarm payrolls and find that bad news has the largest influence in expansions and, to a lesser extent, good news about inflation in contractions. They also find that macroeconomic announcements impact the volatility of bond returns. Ederington and Lee (1996) obtain that a reduction in uncertainty leads to a decline in volatility after scheduled announcements, whereas unscheduled announcements are associated with an increase in volatility. Recent contributions to the study of stock market reactions to macroeconomic news include Rangel (2011) who examines the effect of the Beber and Brandt (2010) macro variables' announcements plus the US federal fund rate on the stock market volatility and finds differences in the persistence of the announcement effect as well as an asymmetry in the jump intensities' responses. Birz and Lott (2011) look at the effect of newspaper coverage by calculating a news index and examine the effect of GDP, unemployment, retail sales and durable goods surprises on the S&P500 returns. The relevance of bailout expectations for market valuations is supported by Gandhi and Lustig (2010), who show that large banks have lower average returns, and Jagtiani and Brewer (2009), who conclude that acquiring banks are willing to pay a premium in order to become too big to fail.

3. Data and modelingc

We study market reactions to the monthly release of Case-Shiller home price index values. Detailed information on the index family is available in Standard and Poor's (2009). On the last Tuesday of each month, at 9.00 A.M. Eastern Time, index values for the last but 1 month are released. Case-Shiller home price indices are value-weighted indices based on the repeat-sales method, cf. Case and Shiller (1989) and Shiller (1991). Monthly indices are available for 20 cities as well as for two aggregates: the Case-Shiller composite of 10 cities and the composite of 20 cities. We focus on the Case-Shiller composite 20 as it is the one usually referred to in the news.[3] For the sake of brevity, we will often simply write "Case-Shiller index" when we refer to the Case-Shiller composite of 20. There are other house price indices, notably the house price index HPI compiled by the Office of Federal Housing Enterprise Oversight (OFHEO), which in 2008 was merged into the Federal Housing Finance (FHFA). Until February 2008, OFHEO published only quarterly index values. When comparing pre-crisis and in-crisis reactions, the Case-Shiller index therefore yields more release dates.

Revisions to house price index values released in previous months are frequent. When studying announcement effects, it is therefore important to use real-time data. The source of our Case-Shiller data is the website of Standard and Poors, which includes the full history of real-time data releases. That is, we do not only know the actual values released at time t, we also know the full index history that was made available at time t. In accordance with the recommendations of Blitzer et al. (2010), we use data before seasonal adjustment.

In an efficient market, one would expect that the market reacts only to unexpected changes in house price values. To separate expected from unexpected changes, we use forecasts based on time series models. We consider standard integrated autoregressive-moving average processes, ARIMA(p,d,q), i.e.

$$y_t = \alpha + \sum_{i=1}^{p} \rho_i y_{t-i} + \sum_{j=1}^{q} \theta_j \varepsilon_{t-q} + \varepsilon_t \quad (1)$$

The model selection is made separately for each date, using the real-time data available at that date. We start by determining the order of differencing d. We difference the logarithmic index value until the Dickey–Fuller test rejects the hypothesis of a unit root at a significance level of 5% or better. For this differenced series, we estimate all ARIMA(p,d,q) resulting from combining

[3] On February 12, 2010, a Google search for ("Case-Shiller" and "10 cities") led to 3.280 hits, while a search for ("Case-Shiller" and "20 cities") led to 67.400 hits.