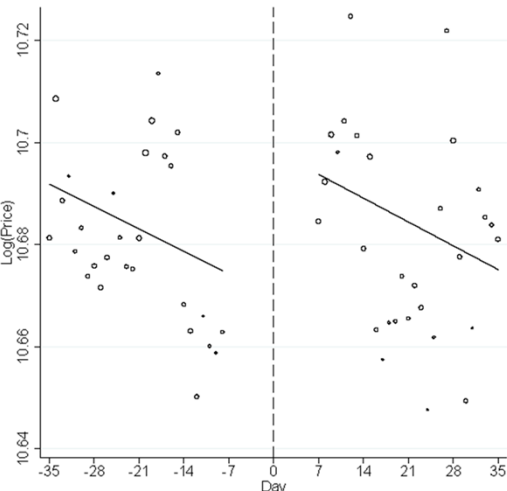


Monetary Policy and Home Prices: Big Data Research Applications at BEA

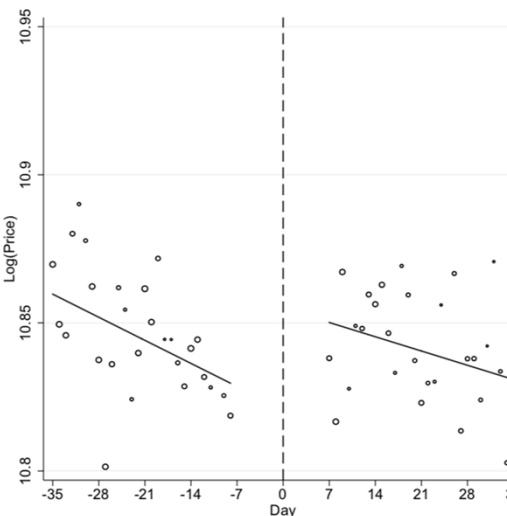
Scott Wentland (BEA) & Jeremy Moulton (UNC) – Big Data Day 2018



Greenspan Era – Surprise rate cuts led to a 2.86% jump in home prices, on average



“Easy” QE Announcements – led to a 3.4% jump in home prices per announcement, on average.



Abstract

Using a new "Big Data" source at BEA, this project explores how Zillow "ZTRAX" data (i.e. daily-level data microdata) can be applied to key macroeconomic research questions. In this working paper, we examine the extent to which a less liquid market, residential housing, responds to monetary policy announcements using a novel dataset that covers millions of individual property transactions nationally. Methodologically, rather than using monthly or quarterly aggregated data, this transactions-level intra-monthly data better exploits the timing of the announcements for cleaner identification (akin to an event study), providing new insights into how monetary policy shocks affect a market that makes up a substantial portion of the economy, where interest rates are thought to play a key role. We show that unanticipated target rate changes and expansionary quantitative easing (QE) generally increase home prices within about seven days of an announcement. Given that markets can respond so quickly to policy changes and announcements, this research motivates the use of more “Big Data” within the national accounts to continue to improve timeliness and accuracy of the estimates for our users.

Methods

- We compare the effect of “surprise” announcements to “expected” announcements on home prices using a regression discontinuity design (RDD), similar to an event study framework that leverages the timing of a given shock.
 - We use an hedonic RD regression (see below), where the cutoff (C) is the announcement date. The approach exploits daily variation in home prices within several weeks prior and following an announcement, omitting the week directly before/after.
- We also explore the effects of quantitative easing (QE) announcements on the housing market as well as geographical variation in the effects using the same regression discontinuity design.

$$\text{Log}(\text{SalePrice}_h) = \alpha + \beta_1(\text{SaleDay}_h - C) + \beta_2(\text{SaleDay}_h - C)\mathbf{1}(\text{SaleDay}_h \geq C) + \beta_3\mathbf{1}(\text{SaleDay}_h \geq C) + \beta_h X_h + \epsilon_h$$

β_3 : Difference between intercept post and pre announcement (*treatment effect*)

Results Summary

- Results from this “Big Data” source show that monetary policy has immediate potency for long term assets like homes
- Each announcement of a surprise cut in the federal funds rate during the Greenspan Era corresponded to as much as a 2.86% increase in home prices, on average.
 - This effect was much larger (approx. 4.16%) in so-called sand states (Arizona, California, Florida, and Nevada)
- Expansionary QE announcements also had an immediate impact on home prices, raising home prices by as much as 3.4% on average.
- For more info: e-mail Scott Wentland (scott.wentland@bea.gov) for the most recent draft of this working paper.

	Surprise vs. Expected RD Effects of Announcements [Dep. Var.: log(Sale Price)]			
	Surprise	Surprise (no change)	Expected	Expected (big change)
Discontinuity	0.0286*** (0.0020)	0.0243*** (0.00318)	0.0020 (0.0016)	0.0163*** (0.0017)
PreTrend	-0.0006*** (0.0001)	-0.0008*** (0.00010)	-0.0001** (0.0000)	0.0002*** (0.0001)
PostTrend	-0.0000 (0.0001)	0.0009*** (0.00013)	0.0002*** (0.0001)	-0.0005*** (0.0001)
Controls	Yes	Yes	Yes	Yes
Observations	1,467,263	525,251	2,240,625	1,840,659
Dates Included	15oct1998 03jun2001 18apr2001 17sep2001	24sep1996 20may1997	31jan1996 29sep1998 17nov1998 27jun2001 21aug2001 11dec2001	31jan2001 20mar2001 15may2001 02oct2001 06nov2001 05mar2002

*Robust standard errors in ()

	Expansionary “Easy QE”	Mixed QE
Dependent Var:	Log(Price)	Log(Price)
Discontinuity	0.0340*** (0.0025)	0.0157*** (0.0021)
Trend	-0.0011*** (0.0001)	0.0008*** (0.0001)
Post-Trend	0.0004*** (0.0001)	-0.0020*** (0.0001)
N	2,243,007	3,483,564
Controls	Yes	Yes

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