Examining the impact of the US Federal Reserve's Quantitative Easing on Bank Lending, 2009-2012

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What is Quantitative Easing?

"We print it digitally. So we-- you know, we-- as a central bank, we have the ability to create money digitally and we do that by buying Treasury Bills or bonds or other government guaranteed securities and that actually increases the money supply." -Federal Reserve Chairman Jerome Powell (60 Minutes Interview)

"Quantitative Easing" of "QE" is a colloquial term for a type of unconventional expansionary monetary policy. Specifically, Quantitative easing is a solution to the Liquidity Trap issue that arises when overnight interest rates (ie. The Federal Funds Rate) become constrained by the zero lower bound of interest rates.

By inducing controlled, but accelerated inflation, Central Banks are able to effectively bypass the Zero lower bound constraint and further inject liquidity into a struggling economy faced with a liquidity trap.

Introduction

Banks play an important role in implementing monetary policy, as they are the intermediaries between the Central Bank and Firms & Households

While the impacts of conventional monetary policy on Bank Lending are well-known, there is a less established literature on the effects of Quantitative Easing on Bank Lending. This is likely due to the fact that Quantitative easing is a relatively new field, and has only been implemented in practice in the 21st century.

However, QE has become a key policy tool to help the Federal Reserve combat both the 2008 Great Recession as well as, more recently, the recession caused by the COVID-19 Pandemic in early 2020. By better understanding how QE affects Bank lending behavior, the policy can hopefully be further refined for maximum efficacy.

Methodology & Data

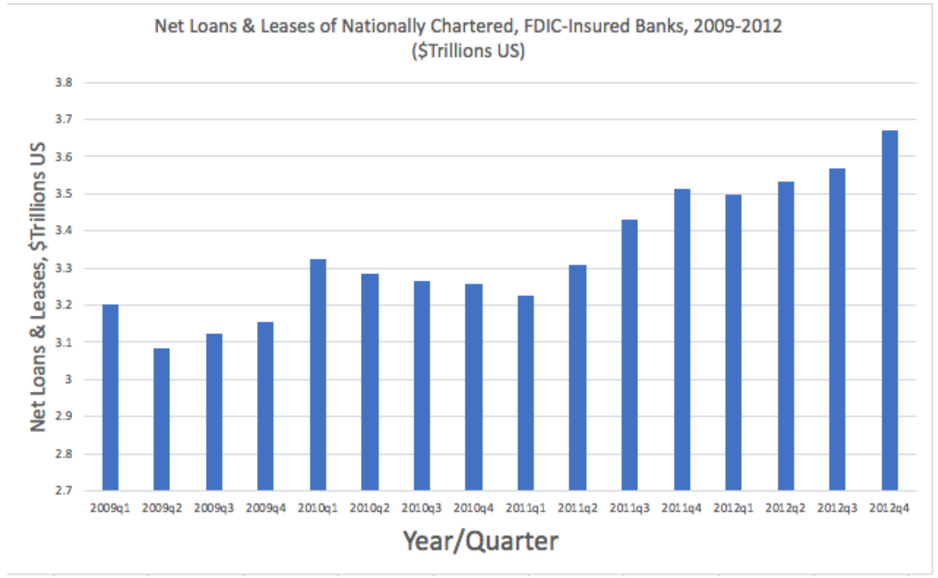
This research examined a set of 1,186 nationally chartered, Federal Reserve Member banks in the United States from January 1, 2009 to December 31, 2012.

The lending behavior of Bank *i* at time *t can be given by the equation:*

$$lnd_{i,t}=\beta_0+\beta_1 Size_{i,t}+\beta_2 BankMBS_{i,t}+\beta_3 LevRat_{i,t}+\beta_4 ROA_{i,t}+\beta_5 FedMBS+\beta_6 Tbill+\beta_7 GDPgrowth+\beta_8 Inf$$

Bank-Level Data was collected from quarterly FDIC disclosure documents, while macroeconomic data was collected from the United States Federal Reserve, using their FRED interface.

Variable	Mean	Std. Dev.	Min	Max
Total Loans	2949085	3.35e+07	.2	7.95e+08
Total Assets	5911219	7.66e+07	3368.5	1.84e+09
Bank MBS	648857.5	9170900	0	2.98e+08
Pre-Tax ROA	.9007594	3.825492	-125.5087	137.7178
LeverageRatio	10.97663	7.069443	-7.425917	118.6412
GDP Growth	1.475	2.256855	-4.4	4.7
Inflation	2.044983	.3685882	.9472131	2.467167
tbillone	.2865879	.1355617	.1138333	.5719672
tbilltwo	.5961631	.2924953	.2569841	1.03
tbillfive	1.599784	.6433945	.6680952	2.4675
tbillten	2.763475	.7036273	1.641746	3.720645
tbillthirty	3.787229	.6414807	2.745873	4.62629



Results

lognetlns	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
logsize	1.066399	.0024673	432.22	0.000	1.061563	1.071235
logbankmbs	-.0322506	.0012095	26.66	0.000	-.0346213	-.02988
roaptx	.0031505	.0008989	3.50	0.000	.0013887	.0049124
levrat	.0019777	.0007006	2.82	0.005	.0006046	.0033508
inflationten	-.0312693	.0063673	4.91	0.000	-.043749	-.0187896
logfedmbs	.0630464	.0066454	9.49	0.000	.0500218	.0760711
lead2_gdpgrth	.0061583	.0005142	11.98	0.000	.0051505	.0071662
l4_tenbill	-.0095621	.0019607	-4.88	0.000	-.013405	-.0057192
l6_thirtybill	-.0350885	.002329	15.07	0.000	-.0396532	-.0305238
_cons	-1.776391	.0873589	20.33	0.000	-1.947611	-1.605171

Sector-Wide Real Dollar Impacts:

MBS Purchase Effect: $441.6 Billion (Per 100% increase in Fed MBS Holdings)

MBS Rebalancing Effect:225.7 Billion (Per 100% Decrease in Bank MBS Holdings)

Leverage-Based Rebalancing: $69.3 Billion (Based on an industry-wide 50% leverage increase)

Ten Year T-Bill: $66.6 Billion per percentage point drop (4 quarter lag effect)

Thirty Year T-Bill: $245 Billion Per Percentage point drop (6 quarter lag effect)

Findings:

-Bank Lending, as an industry, experiences increasing returns to scale.

-Long-maturing T-Bill (10 & 30 year Treasury Securities) rates were inversely related with lending, but had a lagged effect of 4-6 quarters.

-Federal Reserve MBS purchases had a positive, immediate, & significant impact on lending.

-Additionally, this research has found that increasing leverage during a QE period has a positive impact on lending. In conjunction with the findings of Darmouni & Rodnyansky (2017)'s research, this can be determined to be confirmation of banks rebalancing their portfolios (and re-levering) after the large-scale sale of MBS products to the Federal Reserve.

Conclusions

This research confirms existing findings regarding QE's impact on Bank lending, specifically that MBS purchases by the Fed drive an increase in lending.

Expanding on the work of Darmouni & Rodnyansky (2017), I find that banks who increase their leverage as a result of the portfolio rebalancing that happens post-MBS sale have significantly higher loan output..

While Treasury Securities with long maturity periods did impact lending behavior, MBS purchases clearly had the largest impact on bank lending, likely due to the collapse of the American housing market on which MBS products are based.

Potential Future research could expand on this model by finding other ways in which portfolio rebalancing in a QE period increases loan output.

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