

The Effects of a Non-traditional Monetary Policy on Housing Prices in Taiwan

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Abstract

The well-known "Quantitative Easing" (QE) is a kind of non-traditional monetary policy. The United States and Japan are two typical examples that executed non-traditional monetary policies on a large-scale since 2000s. This research uses multiple regression analysis to examine the effects of non-traditional monetary policies abroad on housing prices in Taiwan. More specifically, the research would like to find out whether the mechanism of monetary transmission could successfully transmit the shocks of external monetary policies to the internal housing market. The empirical result indicates that the four QE factors had inconsistent outcomes. Japan QE and US QE1 are significantly negative related with Cathay housing price index, and while US QE2 and US QE3 are positive related to the index, the results are not significant. There is an inconsistent conclusion among non-traditional monetary policy. Moreover, the government policy is significantly and positively related with index. It indicates that government policy can't restrain the increasing housing price index. Finally, all of the macroeconomic variables match the research expectation, except for population growth rate.

Keywords

Housing market, Quantitative easing, Housing bubble, Macroeconomic variables.

Introduction

Many developed countries have still not completely recovered from the financial crisis that started in 2008 with the collapse of the financial crisis. These mortgaged-based securities (MBS) ran into trouble when the debtors could not make repayments on time, which happened to increase numbers of them after the US Federal Reserve Committee (FED) increased interest rates. This led to a chain reaction that affected the entire investment banking system, and ultimately caused the collapse of Lehman Brothers. Japanese economic performance has not been improved since the economic bubble burst in the 1990s, although the government has attempted to deal with this situation with a policy of large-scale QE. Similarly, US economic conditions have still not completely recovered from the subprime mortgage crisis, although the FED is currently executing the third round of QE. This research will focus on the effect of unconventional monetary policies in Taiwan, with a focus on efforts to examine increasing housing price trend, as well as the relationship between a number of macroeconomic variables and the housing market.

Literature Review Monetary policy and the housing market

Jarocinski and Smets (2008) examine how monetary policy affects the housing market by analyzing US housing prices and investment. The results indicate that a loose monetary policy has a significant, positive effect on residential investment and housing prices.

Xu and Chen (2012) analyze Chinese housing market data during which the housing price growth rate was positively correlated with a loose monetary policy. They find that policies of decreasing long-term interest rates, increasing the money growth rate and loosening mortgage down payments could all positively affect the housing price growth rate. There is also a positive correlation between the stock price index and housing price growth rate, with stock price booms influencing housing prices through the wealth effect.

Ahearne et al. (2005) find that real housing prices are positively correlated to several macroeconomic indices, such as a low interest rate, moderate liquidity, financial deregulation, the prosperity cycle, and demographics. Central banks can use loose monetary policy to improve the economy, and this is usually accompanied by a rise in housing prices. Furthermore, they find that even if a central bank has already used a tight monetary policy to restrain inflation, it can still prevent house prices from increasing, and thus prevent housing demand from overheating.

Other macroeconomic variables and the housing market

Chang et al. (2009) analyze the relationships among average housing prices, income, and rent, to see whether the latter two variables are significantly related to housing price bubbles. They found that both housing prices and rent and housing prices and income are positive correlated with each other, and follow similar tendencies.

Zhang (2013) examine the relationships among Chinese housing price inflation, consumer price index (CPI), and monetary policy and made three conclusions. First, the housing sector should be taken into account when considering the effectiveness of monetary policy; second, housing price fluctuations should have a higher weight in CPI calculations; and third, when the government aims to cut inflation, the related policy should focus on housing price-based inflation rather than imported-based inflation. Since housing prices are strongly correlated with the CPI, the government should pay high attention to them.



According to life cycle theory (Ando and Modigliani, 1963), people tend to purchase houses when they are young because they have jobs and steady incomes. Their study concludes that as a population ages the housing supply will increase and housing prices will decrease.

Regulation

To prevent housing price from increasing, the Taiwanese Executive Yuan declared that the vacant land tax, which had been suspended since 1985, would be imposed once again in 2011. This policy is aimed at preventing speculation and increasing land utilization.

The Taiwanese government declared to establish a real estate transaction database in December, 2011. The government thus cooperates with private real estate companies to create this database by providing updated transaction information quarterly, including details of the location, construction year, and unit price of various properties.

Moreover, in September, 2008, the Taiwanese Executive Yuan implemented a policy of providing preferential loans to the

young to boost the poor housing market. The government is aiming to help people to purchase houses.

Research Design

Research structure and methodologies

This research analyzes the relationship between an unconventional monetary policy and Taiwanese housing prices. The structure of this research is presented in Figure 1.

The regression model of housing price index

 $\begin{array}{l} HP{=}\alpha+\beta_1M2+\beta_2R+\beta_3NI+\beta_4CPI+\beta_5G+\beta_6AGE+\\ \beta_7MBS+\beta_8D1+\beta_9D2+\beta_{10}D3+\beta_{11}D4+\beta_{12}D5+\beta_{13}D6+\\ \beta_{17}D7+e \end{array} \tag{Eq 1}$

Where,HP: Cathay Housing Price Indexα: Constant terme: Residual termM2: M2 money supplyR: Rediscount rate

Table 1: Summaries of variables

Variables code	Research variables	Operational definition	Data time period	Period	Data resources
HP	Housing price index	Cathay housing price index	2003/04~2013/12	Second-hand/ season	Real estate transaction database
M2	Money supply	M2	2003/04~2013/12	Second-hand/ season	Central Bank
R	Rediscounting rate	Rediscounting rate	2003/04~2013/12	Second-hand/ season	Central Bank
NI	National income	Nominal national income per capita	2003/04~2013/12	Second-hand/ season	ТЕЈ
СРІ	Consumer price index	Core CPI growth rate	2003/04~2013/12	Second-hand/ season	Directorate-General of Budget, Accounting and Statistics
MBS	Securities purchase by FED	MBS and T-bond net variation	2003/04~2013/12	Second-hand/ season	FRED
G	Population growth rate	Population growth rate	2003/04~2013/12	Second-hand/ season	Directorate-General of Budget, Accounting and Statistics
AGE	Average population age	Average population age	2003/04~2013/12	Second-hand/ season	Directorate-General of Budget, Accounting and Statistics
D1	Preferential loans	0=No 1=Yes	2003/04~2013/12	Quarterly	Construction and Planning Agency
D2	Reimposing the vacant land tax	0=No 1=Yes	2003/04~2013/12	Quarterly	Ministry of Finance
D3	Establishing a real estate transaction database	0=No 1=Yes	2003/04~2013/12	Quarterly	Ministry of the Interior
D4	Japanese QE1	0=No 1=Yes	2003/04~2013/12	Quarterly	Central Bank
D5	US QE1	0=No 1=Yes	2003/04~2013/12	Quarterly	Central Bank
D6	US QE2	0=No 1=Yes	2003/04~2013/12	Quarterly	Central Bank
D7	US QE3	0=No 1=Yes	2003/04~2013/12	Quarterly	Central Bank

QE: Quantitative easing, FED: Federal Reserve Committee, MBS: Mortgaged-based securities





Figure 1: The structure of this research. (Source: This Study)

NI: National income

CPI: Consumer price index

- G: Population growth rate
- AGE: Average population age
- D1 = 1, During the announcement of preferential loans period = 0, otherwise
- D2 = 1, Since the Announcement of re-imposing the vacant land tax period = 0, otherwise
- D3 = 1, Since the announcement of establishing a real estate transaction database period = 0, otherwise
- D4 = 1, Japanese QE = 0, otherwise
- D5 = 1, United States QE1 = 0, otherwise
- D6 = 1, United States QE2 = 0, otherwise
- D7 = 1, United States QE3 = 0, otherwise
- Where QE = Quantitative Easing (Source: This Study).

Empirical Research

After previous tests, now we get final regression model which is shown in Table 2. In final regression result, G, D2, and D4 are significant under the 1% significance level. MBS and D3 are significant under the 5% significance level.

CPI and NI are significant under the 10% significance level. Other variables, such as R and D5, are not significant in the final regression model.

According to previous results, the regression model of Taiwanese housing price index can be expressed as following:

 $\begin{array}{l} HP = 78.21344 - 2.627364 \times R + 0.000231 \times NI + 1.925282 \times \\ CPI - 16.29721 \times G + 3.8 \times MBS + 16.47377 \times D2 + \\ 7.856362 \times D3 - 12.4487 \times D4 - 5.440291 \times D5 \end{array} \tag{Eq 2}$

Conclusions and Suggestions Research conclusion

This research examines the effect of non-traditional monetary policy on Taiwanese housing price index with the focus on QE in United States and Japan, considering both quantitative and qualitative dimension. It also takes government policies that to prevent housing price from bubbling and several macroeconomic variables into account. The quantitative variables have significant positive effect on the Taiwanese housing price index while the dummy variables do not have clear effect. The housing price index increased more dramatically under stronger monetary shock. Second, in regulation part, the policies of re-imposing the vacant land tax and establishing real estate transaction database

 Table 2: Final regression result

Dependen HP	e:	Sample: 43				
Method: Least squares						
Variable Coeffic		ient Std. err		or t-statistic		Prob.
R	R –2.6273		1.9241	20	-1.365489	0.1813
NI 0.00023		31	0.00011		1.955655	0.0590*
MBS 3.80E-0)5	1.43E-0		2.665334	0.0118**
G	G –16.297		4.903103		-3.323857	0.0022***
D5	D5 -5.4402		4.160140		-1.307718	0.2000
D4	-12.448	370	2.486591		-5.006334	0.0000***
D3	7.85636	52	3.360579		2.337801	0.0256**
D2	16.4737	77	3.058955		5.385426	0.0000***
CPI	1.925282		1.051898		1.830293	0.0763*
С	78.21344		16.11230		4.854270	0.0000
R-squared		0.961882		Mean dependent var		93.35977
Adjusted R-squared		0.951486		S.D. dependent var		18.67438
S.E. of regression		4.113217		Akaike info criterion		5.866712
Sum squar resid	558.3122		Schwarz criterion		6.276293	
Log-likeli	-116.1343		Hannan-Quinn criterion		6.017753	
F-statistic	92.52466		Durbin-Watson stat		1.876166	
Prob (F-st	0.000000		Ì		1	

Note: Significant level 10%*, 5%**, 1%***. (Source: This Study). R: Rediscounting rate, NI: National income, MBS: Mortgaged-based securities, CPI: Consumer price index, G: Population growth rate, HP: Housing price index

are not significant to prevent housing price from bubbling. The housing price index is not slumped as expected after these policies have been executed. Third, all macroeconomic variables are consistent with expected signs except for population growth rate, while population average age and M2 are excluded from the regression model due to multicollinearity.

Research limitation

There are some operational restrictions in this study. Some explanation about these restrictions will be delivered in this section and be provided with suggestions for future research directions.

- 1. Housing market is heterogeneous. It should better use a weighted average when analyzing housing market. For example, the weight of an empty warehouse is totally different from a business building located in downtown.
- 2. It is economic and policy dimension that this study focus on Taiwanese housing price index. There are has other factors may affect the housing price index in reality.

There are still other factors that may affect housing market except for economic and policy dimension, what this study does not cover.



Suggestions

At first, Cathay housing price index is chosen to be dependent variables in this study. It should better use a symbolic index when analyzing specific housing market rather than an overall price index. Second, QE3 in United States is expected to persist securities purchase until the end of 2014. The researcher can analyze the overall non-traditional monetary policy effect on Taiwanese housing market after QE3 has completely tapered.

Finally, it is economic and policy dimension that this study focus on Taiwanese housing price index. These are only two of factors that probably affect housing market. Stocks, bonds, raw materials, and gold market may be variables could affect housing market. Future research can take these factors into account and focus on the interaction relation among the dependent variables.

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