



Volume 33, Issue 4

Test of the Bank Lending Channel: The Case of Australia

Yu Hsing

Southeastern Louisiana University

Abstract

Extending Bernanke and Blinder (1988, 1992), Kashyap and Stein (2000), Peek and Rosengren (2010) and others, this paper incorporates two additional variables - the world interest rate and the exchange rate - into the bank loan supply function. The results show that the demand for bank loans is negatively affected by the lending rate and positively influenced by the interest rate on bonds and real GDP and that the supply of bank loans is positively associated with the lending rate, bank deposits and appreciation of the Australian dollar and negatively impacted by the world interest rate and the cost of borrowings as represented by the target cash rate. Therefore, the bank lending channel is confirmed. In monetary easing, the Reserve Bank of Australia can engage in open market operations to buy government bonds to increase bank deposits/reserves or lower the target cash rate to reduce the cost of borrowings. Both measures will cause the supply of bank loans to rise.

The author is very grateful to the Associate Editor and the referee for valuable comments.

Citation: Yu Hsing, (2013) "Test of the Bank Lending Channel: The Case of Australia", *Economics Bulletin*, Vol. 33 No. 4 pp. 2575-2582.

Contact: Yu Hsing - yhsing@selu.edu.

Submitted: September 02, 2013. **Published:** October 08, 2013.

1. Introduction

The bank lending channel is one of the non-neoclassical channels explaining monetary policy transmission mechanism. According to this view, monetary easing (tightening) is expected to increase (reduce) the supply of bank loans. A study of the bank lending channel is important as many small- and medium-sized firms and households depend on bank loans to finance their operations or purchases. This paper attempts to test whether there is any evidence of the bank lending channel for Australia. The paper has several features. First, the world interest rate and the exchange rate are incorporated into the bank loan supply function in order to capture potential international capital flows. Second, a simultaneous-equation model is specified so that the supply of bank loans can be identified (Suzuki, 2004). Third, the three-stage least squares (3SLS) method is applied in empirical work to correct for any correlation of error terms between the demand for and supply of bank loans.

The bank lending channel has been studied extensively. Bernanke and Blinder (1988), Bernanke and Blinder (1992), Gertler and Gilchrist (1993, 1994), Bernanke and Gertler (1995), Peek and Rosengren (1995a, 1995b, 1997), Kashyap, Stein and Wilcox (1993), and Kashyap and Stein (1995, 2000) find support or argue for the bank lending channel whereas Romer and Romer (1989), Ramsey (1993), Oliner and Rudebusch (1995), Morris and Sellon (1995), and Suzuki (2004) cast doubt on the bank lending channel. In a recent study, Lown and Morgan (2002) show that the impact of the bank lending channel may be pretty small even though it plays a significant role in economic fluctuations. Iacoviello and Minetti (2008) find evidence of the bank lending channel in those countries where households depend more on mortgage finance. For literature surveys of the bank lending channel or the monetary policy transmission mechanism, see Bernanke and Gertler (1995), Peek and Rosengren (2010), and Boivin, Kiley and Mishkin (2010).

2. The Model

Extending Bernanke and Blinder (1988), Bernanke and Blinder (1992), Kashyap and Stein (2000), Peek and Rosengren (2010) and other studies, we can express the demand for and supply of bank loans as:

$$L^d = D(LR, BR, Y) \quad (1)$$

$$L^s = S(LR, BR, DE, CB, WR, EX) \quad (2)$$

where

L^d = demand for bank loans,

L^s = supply of bank loans,

LR = the interest rate on loans,

BR = the interest rate on bonds,

Y = real GDP,

DE = bank deposits,

CB = cost of borrowings,

WR = the world interest rate, and

EX = the exchange rate (nominal effective exchange rate).

The demand for bank loans is expected to be negatively affected by the interest rate on loans and positively associated with the interest rate on bonds and real GDP. The supply of bank loans is expected to be positively influenced by the interest rate on loans, the amount of deposits and the nominal effective exchange rate and negatively impacted by the interest rate on bonds, the cost of borrowings and the world interest rate. As the world interest rate rises relative to the domestic interest rate, international capital outflows would increase, and the supply of loanable funds would decline. A stronger Australian dollar or a higher nominal effective exchange rate tends to increase international capital inflows and the supply of loanable funds.

In equilibrium, we have $L^d = L^s = \bar{L}$. According to comparative static analysis, the impact of a change in one of the exogenous variables on the equilibrium bank loans can be expressed as:

$$\frac{\partial \bar{L}}{\partial BR} = (-D_{BR}S_{LR} + D_{LR}S_{BR})/|J| > or < 0, \quad (3)$$

$$\frac{\partial \bar{L}}{\partial Y} = -D_Y S_{LR} / |J| > 0, \quad (4)$$

$$\frac{\partial \bar{L}}{\partial DE} = D_{LR} S_{DE} / |J| > 0, \quad (5)$$

$$\frac{\partial \bar{L}}{\partial CB} = D_{LR} S_{CB} / |J| < 0, \quad (6)$$

$$\frac{\partial \bar{L}}{\partial WR} = D_{LR} S_{WR} / |J| < 0, \quad (7)$$

$$\frac{\partial \bar{L}}{\partial EX} = D_{LR} S_{EX} / |J| > 0, \quad (8)$$

where $|J|$ is the Jacobian for the endogenous variables and has a negative value.

3. Empirical Results

The data were collected from the *International Financial Statistics* and the *Financial Soundness Indicators* published by the International Monetary Fund. Bank loans are measured in millions of dollars. The interest rate on bank loans is represented by the bank lending rate. The interest rate on bonds is represented by the government bond yield with a 15-year maturity. Real GDP is measured in billions of dollars with 2011-2012 as the base year. Bank deposits are measured in billions of dollars. The cost of borrowings is represented by the target cash rate that is controlled by the Reserve Bank of Australia. The world interest rate is represented by the 3-month U.S. Treasury bill rate. The exchange rate is represented by the nominal effective exchange rate. An increase means appreciation of the Australian dollar. The consumer price index is used to calculate real bank loans and real bank deposits. To reduce potential multicollinearity, bank loans, real GDP and bank deposits are expressed on the log scale. The lending rate, the interest rate on bonds, the target cash rate, the 3-month U.S. Treasury bill rate and the nominal effective exchange rate are expressed in the level form because the log value of some of these variables are negative. The sample period ranges from 2007.Q1 to 2012.Q4. Complete data for bank loans and deposits earlier than 2007.Q1 are not available.

The three-stage least squares (3SLS) method is applied in empirical work to estimate equations (1) and (2) simultaneously. Table 1 presents estimated coefficients, z values and other related statistics. A preliminary analysis shows that the coefficient of the interest rate on bonds in the supply of bank loans is found to be negative but insignificant at the 10% level. Hence, this variable is deleted from the regression for the supply of bank loans. Approximately 88.71% of the variation in the demand for bank loans can be explained by the lending rate, the interest rate on bonds, and real GDP. The coefficients of these three variables have the expected signs and are significant at the 1% or 5% level. If the lending rate rises 1 percentage point, the demand for bank loans on the log scale will decline by 0.0251. The demand for bank loans on the log scale will increase by 0.0299 when the interest rate on bonds rises 1 percentage point. If real GDP rises 1%, the demand for bank loans will increase by 2.5480%.

In the estimated regression for the supply of bank loans, the explanatory power of the five right-hand side variables is 99.58%. The estimated coefficients have the expected signs and are significant at the 1% level. A higher lending rate will cause the supply of bank loans to rise whereas a higher target cash rate or world interest rate will reduce the supply of bank loans. More bank deposits increase the supply of bank loans. Specifically, a 1% increase in bank deposits will lead to a 0.2581% increase in the supply of bank loans. A stronger Australian dollar

will result in more bank loan supply. In view of the above findings, we can confirm the bank lending channel because the Reserve Bank of Australia can engage in open market operations by buying government bonds and increase bank deposits/reserves and the supply of bank loans and/or lower the cost of borrowings by reducing the target cash rate and increase the supply of bank loans.

Table 1. 3SLS Estimation of Demand for and Supply of Bank Loans in Australia

Log(Demand for bank loans)		
	Coefficient	z statistic
Lending rate	-0.0251 ^a	-2.94
Interest rate on bonds	0.0299 ^b	2.06
Log(Real GDP)	2.5480 ^a	8.61
Intercept	-0.7391	-0.42
R-squared	0.8871	
Sample period	2007.Q1-2012.Q4	
Log(Supply of bank loans)		
	Coefficient	z statistic
Lending rate	0.0469 ^a	5.97
Log(Deposits)	0.2581 ^a	5.66
Target cash rate	-0.0472 ^a	-6.69
World interest rate	-0.0203 ^a	-7.45
Nominal effective exchange rate	0.0019 ^a	9.79
Intercept	10.1844	16.46
R-squared	0.9958	
Sample period	2007.Q1-2012-Q4	

Notes: The superscript letter a or b indicates that a coefficient is significant at the 1% or 5% level.

4. Summary and Conclusions

This paper has examined the bank lending channel for Australia. A major contribution of this study is to incorporate the world interest rate and the exchange rate into the bank loan supply function. The three-stage least squares method is applied in estimating the demand for and

supply of bank loans simultaneously. The results show that the demand for bank loans is negatively associated with the lending rate and positively influenced by the interest rate on bonds and real GDP and that the supply of bank loans has a positive relationship with the lending rate, bank deposits and the appreciation of the Australian dollar and a negative relationship with the target cash rate and the 3-month U.S. Treasury bill rate. Hence, there is strong evidence of the bank lending channel in Australia.

There are several policy implications. First, in examining the bank lending channel, the world interest rate and the exchange rate need to be considered as international capital flows may affect the supply of loanable funds and bank loans. Second, the impacts of monetary policy on the supply of bank loans can be measured by a change in bank deposits or the target cash rate. Incorporating both variables in the equation for the supply of banks loans would capture both effects. Third, the three-stage least squares method in estimating a simultaneous-equation model helps us separate the supply of bank loans from the demand for bank loans.

References

Bernanke, Ben S. and A. S. Blinder (1988) "Credit, Money, and Aggregate Demand" *American Economic Review* 78, 435-439.

Bernanke, Ben S. and A. S. Blinder (1992) "The Federal Funds Rate and the Channels of Monetary Transmission" *American Economic Review* 82, 901-921.

Bernanke, Ben S., J. Boivin, and P. Elias (2005) "Measuring the Effects of Monetary Policy: A Factor-Augmented Vector Autoregressive (FAVAR) Approach" *Quarterly Journal of Economics* 120, 387-422.

Bernanke, Ben S. and M. Gertler (1995) "Inside the Black Box: The Credit Channel of Monetary Policy Transmission" *Journal of Economic Perspectives* 9, 27-48.

Boivin, J. and M. Giannoni (2002) "Assessing Changes in the Monetary Transmission Mechanism: A VAR Approach" *Federal Reserve Bank of New York Economic Policy Review* 8, 97-111.

Boivin, J. and M. Giannoni (2006) "Has Monetary Policy Become More Effective?" *Review of Economics and Statistics* 88, 445-462.

Boivin, J., M. T. Kiley, and F. S. Mishkin (2010) "How Has the Monetary Transmission Mechanism Evolved over Time?" NBER Working Paper No. 15879, pp. 1-88.

Christiano, L., M. Eichenbaum, and C. Evans (1996) "The Effects of Monetary Policy Shocks: Some Evidence from the Flow of Funds" *Review of Economics and Statistics* **78**, 16–34.

Gertler, M. and S. Gilchrist (1993) "The Role of Credit Market Imperfections in the Monetary Transmission Mechanism: Arguments and Evidence" *Scandinavian Journal of Economics* **95**, 43-64.

Gertler, M. and S. Gilchrist (1994) "Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms" *Quarterly Journal of Economics* **109**, 309-340.

Iacoviello, M. and R. Minetti (2008) "The Credit Channel of Monetary Policy: Evidence from the Housing Market" *Journal of Macroeconomics* **30**, 69-96.

Kashyap, A. K., J. C. Stein, and D. W. Wilcox (1993) "Monetary policy and credit conditions: Evidence from the composition of external finance" *American Economic Review* **83**, 78-99.

Authors:

Kashyap, A. K. and J. C. Stein (1995) "The Impact of Monetary Policy on Bank Balance Sheet" *Carnegie-Rochester Conference Series on Public Policy* **42**, 151-195.

Kashyap, A. K. and J. C. Stein (2000) "What Do a Million Observations on Banks Say About the Transmission of Monetary Policy?" *American Economic Review* **90**, 407-428.

Kishan, R. P. and T. P. Opiela (2000) "Bank Size, Bank Capital, and the Bank Lending Channel" *Journal of Money, Credit and Banking* **32**, 121-141.

Lown, C. S. and D. P. Morgan (2002) "Credit Effects in the Monetary Mechanism" *Federal Reserve Bank of New York Economic Policy Review* **94**, 276-299.

Mishkin, F. S. (1995) "Symposium on the Monetary Policy Transmission Mechanism" *Journal of Economic Perspectives* **9**, 3-10.

Morris, C. S. and G. H. Sellon (1995) "Bank Lending and Monetary Policy: Evidence on a Credit Channel" *Federal Reserve Bank of Kansas City Economic Review* **80**, 59-75.

Oliner, S. D. and G. D. Rudebusch (1995) "Is there a bank lending channel for monetary policy?" *Economic Review* **2**, 3-20.

Peek, J. and E. S. Rosengren (1995a) "The Capital Crunch: Neither a Borrower nor a Lender Be Source" *Journal of Money, Credit and Banking* **27**, 625-638.

Peek, J. and E. S. Rosengren (1995b) "Is Bank Lending Important for the Transmission of Monetary Policy? An Overview" *Federal Reserve Bank of Boston New England Economic Review*, 3-11.

Peek, J. and E. S. Rosengren (1997) "The International Transmission of Financial Shocks: the Case of Japan" *American Economic Review* **87**, 495-505.

Peek, J. and E. S. Rosengren (2010) "The Role of Banks in the Transmission of Monetary Policy", in *The Oxford Handbook of Banking*, Allen Berger, Phillip Molyneux, and John Wilson, eds. Oxford: Oxford University Press.

Ramsey, V. A. (1993) "How Important is the Credit Channel in the Transmission of Monetary Policy?" NBER Working Paper No. 4285, National Bureau of Economic Research, Inc.

Romer, C. D. and D. H. Romer (1989) "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz" *NBER Macroeconomic Annual* 1989, Volume 4, 121-184.

Suzuki, T. (2004) "Is the Lending Channel of Monetary Policy Dominant in Australia?" *Economic Record* **80**, 145-156.

Taylor, John B. (1995) "The Monetary Transmission Mechanism: An Empirical Framework" *Journal of Economic Perspectives* **9**, 11-26.

Vera, D. (2012) "How Responsive are Banks to Monetary Policy?" *Applied Economics* **44**, 2335-2346.