

Money Supply Endogeneity and Bank Stock Returns: Empirical Evidence from the G-7 Countries

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Table of Contents

	Page
List of Tables	v
List of Figures	vi
Other Publications Relevant to Thesis but not Forming Part of it	vii
Declaration of Authorship	viii
Abstract	ix
Acknowledgements	xii
Chapter 1 : Money Supply and Bank Stock Returns	1
1.1 Background and motivation.....	1
1.2 Objectives and contribution of the thesis.....	3
1.3 Organisation of the thesis.....	7
Chapter 2 : Theory and Evidence on Money Supply and Bank Stock Returns . 9	
2.1 Introduction.....	9
2.2 Possible link between money supply and bank stock returns	9
2.3 Money supply: Exogenous and Endogenous	10
2.3.1 <i>Exogenous money: Mainstream Keynesian and monetarists' view</i>	11
2.3.1.1 Monetarists	14
2.3.2 <i>Post-Keynesian theory of endogenous money</i>	15
2.3.2.1 The Accommodationist approach.....	18
2.3.2.2 The Structuralist approach.....	24
2.3.2.3 The Liquidity Preference approach.....	27
2.4 Bank stock returns.....	29
2.4.1 <i>Bank behaviour</i>	29
2.4.2 <i>Equity valuation</i>	31
2.5 Empirical evidence on money supply and bank stock returns	33
2.5.1 <i>Exogenous money supply</i>	33
2.5.2 <i>PK theory of endogenous money</i>	37
2.5.3 <i>Empirical evidence on bank stock returns</i>	41
2.6 Discussion.....	43
Chapter 3 : Overview of the Financial System and Monetary Policy in the G-7 Countries	46
3.1 Introduction.....	46
3.2 Canada: Financial system	46
3.2.1 <i>Canada: Monetary policy</i>	48
3.3 Japan: Financial system	48
3.3.1 <i>Japan: Monetary policy</i>	51
3.4 United Kingdom: Financial system	52
3.4.1 <i>United Kingdom: Monetary policy</i>	52
3.5 United States: Financial system.....	53
3.5.1 <i>United States: Monetary policy</i>	55
3.6 France: Financial system.....	56
3.6.1 <i>France: Monetary policy</i>	57
3.7 Germany: Financial system.....	57
3.7.1 <i>Germany: Monetary policy</i>	58
3.8 Italy: Financial system	58
3.8.1 <i>Italy: Monetary policy</i>	59
3.9 The European Monetary System (EMS) and the euro	59
3.10 The Exchange Rate Mechanism (ERM) Crisis	62
3.11 Chapter Summary	63

Chapter 4 : Data Variables, Model and Methodology	64
4.1 Introduction.....	64
4.2 Research questions.....	64
4.3 Hypotheses.....	65
4.3.1 <i>Money endogeneity or exogeneity</i>	65
4.3.2 <i>Monetarist and three money endogeneity views</i>	66
4.3.2.1 Monetarist.....	66
4.3.2.2 Accommodationist.....	66
4.3.2.3 Structuralist.....	67
4.3.2.4 Liquidity preference	68
4.3.3 <i>Bank loans, deposits and money supply</i>	68
4.3.4 <i>Money supply and bank stock prices</i>	69
4.3.5 <i>Simultaneous effects</i>	70
4.4 Empirical model.....	71
4.5 Methodology	76
4.5.1 <i>Unit root tests</i>	76
4.5.2 <i>Johansen cointegration tests</i>	77
4.5.3 <i>Causality tests: VECM and Granger causality</i>	79
4.5.4 <i>Trivariate VAR</i>	80
4.5.5 <i>Panel unit root tests</i>	83
4.5.6 <i>Panel cointegration tests</i>	85
4.5.7 <i>Panel data estimation: Generalised Method of Moments (GMM)</i>	88
4.6 Sources of data.....	91
4.7 Chow breakpoint test	94
4.7.1 <i>Results of the Chow breakpoint test</i>	96
4.8 Chapter Summary	96
Chapter 5 : Results of the Causality Tests and Panel Data Estimation	98
5.1 Introduction.....	98
5.2 Money supply: Is it exogenous or endogenous?	99
5.2.1 <i>Results of the unit root tests</i>	100
5.2.2 <i>Results of Johansen cointegration tests</i>	101
5.2.3 <i>Results of the causality tests</i>	103
5.3 Three views of endogenous money.....	105
5.3.1 <i>Results of the unit root tests</i>	106
5.3.2 <i>Results of the cointegration tests</i>	108
5.3.3 <i>Results of the causality tests</i>	112
5.4 Results of the trivariate VAR.....	119
5.5 Money supply and bank stock prices	124
5.5.1 <i>Results of the unit root tests</i>	124
5.5.2 <i>Results of the cointegration tests</i>	125
5.5.3 <i>Results of the causality tests</i>	127
5.6 Simultaneous equations estimation.....	129
5.6.1 <i>Results of the panel unit root tests</i>	130
5.6.2 <i>Results of the panel cointegration tests</i>	131
5.6.3 <i>Results of the VECM tests</i>	133
5.6.4 <i>Results of the GMM panel data estimation</i>	136
5.6.5 <i>Results of the GMM panel data estimation: Sensitivity analysis</i>	141
5.7 Chapter Summary	142
Chapter 6 : Conclusion, Limitations and Further Research	145
6.1 Summary of the main findings of the thesis	145
6.2 Limitations of the thesis.....	150
6.3 Implications and future research directions	151
6.3.1 <i>Implications</i>	151
6.3.2 <i>Future research directions</i>	152
Appendix A5.1: VECM Test Results	153

Appendix A5.2: Trivariate VAR	157
Appendix A5.3: Money Supply and Bank Stock Returns.....	159
Appendix B1: <i>DataStream</i> Data Sources	162
Bibliography.....	164

List of Tables

	Page
Table 2.1: Two possible balance sheets of banks.....	17
Table 2.2 Empirical studies relating to exogenous money.....	36
Table 2.3 Empirical studies relating to endogenous money.....	38
Table 3.1 Summary of financial system and monetary policy of the G-7 countries.....	63
Table 4.1 Summary of causality implications of different approaches towards monetary theory.....	68
Table 4.2 MacKinnon, Haug and Michelis (1999) critical values.....	79
Table 4.3 Sample periods used for each country.....	92
Table 4.4 Number of banks included in Datastream Bank Price Index.....	92
Table 4.5 Descriptive statistics.....	93
Table 4.6 Descriptive statistics: Panel data variables.....	94
Table 4.7 Changes in monetary policy regime.....	95
Table 4.8 Chow breakpoint test results.....	96
Table 5.1 Unit root test results (Phillips-Perron).....	100
Table 5.2 VAR optimal lag length.....	101
Table 5.3 Johansen cointegration test results.....	102
Table 5.4 Error-correction terms.....	103
Table 5.5 Results of causality test: <i>BL</i> and <i>MS</i>	104
Table 5.6 Unit root test results (Phillips-Perron).....	107
Table 5.7 VAR optimal lag length.....	109
Table 5.8 Johansen cointegration test results.....	110
Table 5.9 Error-correction terms.....	114
Table 5.10 Summary of endogenous money views found in G-7 countries.....	116
Table 5.11 Unit root test results (Phillips-Perron).....	119
Table 5.12 VAR optimal lag length.....	120
Table 5.13 Trivariate VAR results.....	121
Table 5.14 Unit root test results (Phillips-Perron).....	125
Table 5.15 VAR optimal lag length.....	126
Table 5.16 Johansen cointegration test.....	126
Table 5.17 Error-correction terms.....	128
Table 5.18 Results of causality test: <i>MS</i> and <i>RET</i>	128
Table 5.19 Unit root test – Fisher Phillips-Perron tests.....	130
Table 5.20 Panel cointegration results - Pedroni (1997) test.....	132
Table 5.21 Cointegrating relations.....	133
Table 5.22 VECM causality test.....	135
Table 5.23 Results of GMM panel data estimation.....	137
Table 5.24 Expected and actual signs for variables in GMM estimation.....	138
Table 5.25 Results of GMM estimation: Sensitivity analysis.....	142
Table 6.1 Summary of findings.....	146

List of Figures

	Page
Figure 2.1 The unexplored link between money supply and bank stock returns.....	10
Figure 2.2: Accommodationist model (adapted from Palley, 1994, p. 74).....	21
Figure 2.3 The structuralist model (adapted from Palley, 1994, p. 76).....	24

Other Publications Relevant to Thesis but not Forming Part of it

Refereed Conference Papers:

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Badarudin, Z. E., A. Khalid and M. Ariff, Money supply behaviour in Asia Pacific emerging economies compared, *Journal of Asia Pacific Economy* (Revision submitted).

Declaration of Authorship

This thesis is submitted to Bond University in fulfilment of the requirement for the Degree of Doctor of Philosophy.

This thesis represents my own work and contains no material which has been previously submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made.

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Abstract

This thesis is about (a) money supply being determined by banking behaviour, or by the behaviour of central banks and (b) the influence of money supply on bank stock returns. That money is endogenously determined is a proposition of post-Keynesian (PK) economists suggesting that money supply is determined by the behaviour of commercial banks as banks adjust money creation in response to credit demands by the public. This theory challenges the monetarist view of exogenous money supply, where the central bank is said to control money supply. This thesis examines how, under the credit-creation behaviour of banks, the money supply affects bank stock returns in a multi-equation model.

The theory of endogenous money is founded on the idea that loans made by banks cause deposits, and that deposits in banks, as a component of money supply, thus create more money supply. In the process, due to the changes in loans and deposits experienced by banks, the stock returns of banks may also be affected, since banks' profit margins are affected by the changes in credits. Whether endogeneity is in fact the way the money supply behaves has not yet been widely tested and there is also not yet any published study on the behaviour of aggregate *bank stock prices in relation to money supply changes*. Hence, the aim of this thesis is to provide new findings on this unexplored relationship between endogenous money supply and bank stock returns by testing this proposition across several key economies over a long period, taking into account the actual monetary policy regimes in place in these economies.

The empirical evidence in this thesis is obtained by using quarterly data from 1973 to 2007 for the G-7 countries: Canada, France, Germany, Italy, Japan, the United Kingdom (UK) and the United States (US). As the data series covering the sample is over a long period, important monetary-policy regime changes – especially in Canada, the UK and the US – are considered and used in the empirical tests of the underlying hypotheses. The empirical tests conducted begin with unit root and Johansen cointegration tests to test for stationarity of the variables and whether the variables are cointegrated, followed by vector error-correction models (VECM) and

Granger causality tests to test whether there is one-way or bidirectional causality in the long run and in the short run. These tests are used to determine (1) whether money is endogenous or exogenous, (2) if money is endogenous, which of the three views of PK theory is supported in this study, and (3) whether there exists a relationship between money supply and bank stock returns. Trivariate VAR tests developed by Toda and Yamamoto (1995) are used to test whether deposits are an important variable in the causality between bank loans and money supply.

Later, a simultaneous equation model is developed to explore the possible simultaneous relationship between aggregate bank stock returns and money supply, and money supply and bank loans. This model is tested using Generalised Method of Moments (GMM) panel data estimation as proposed by Arellano and Bond (1991). Prior to the model estimation, panel unit root tests are applied following procedures provided in Maddala and Wu (1999) and Choi (2001) to test for stationarity in the variables; Pedroni (1997) panel cointegration is performed to establish whether the variables are cointegrated. VECM and Granger causality tests are also employed to determine whether there is causality between the variables in the equations.

The results of this thesis provide several important new and useful leads. Firstly, bank loans are found to cause money supply; bidirectional causality exists between bank loans and money supply, suggesting that money is endogenous (except for two cases). Secondly, for the countries where money is found to be endogenous, there is mixed evidence as to which of the three views are supported by the test results – accommodationist, structuralist or liquidity preference. Mainly the structuralist and liquidity preference views were supported for Canada (1976:3 to 1990:4), France, Germany, Japan, the UK (1992:4 to 2006:2), and the US. Thirdly, the results indicate that there is a difference between long-term and short-term causality – for example, where there is support for structuralist or liquidity preference in the long run, evidence is in support of the accommodationist view in the short run, as in the cases of Japan, Canada (1976:3 to 1990:4) and the US (1987:1 to 2007:1).

Fourthly, as indicated by the robust results of the trivariate VAR tests, bank deposits are found to be a significant variable in all samples except those of Canada

(1991:1 to 2007:1) and Italy. Fifthly, it is found that with the exception of US (over 1975:3 to 1986:4), there is a relationship between money supply and bank stock returns. The US has the most competitive banking system. Finally, the findings using the panel data estimation show that there is a positive relationship from money supply growth to growth of bank stock returns, but negative from the growth of bank stock returns to money supply growth. This may be explained through the central bank changing interest rates with the aim of negating inflation. This action leads to a rise in interest rates and subsequently to reduced money supply. It was also found, in this context, that there is a bidirectional positive relationship between bank loan growth and money supply growth, which supports the PK theory of endogenous money. Thus, the money-to-bank-stock-returns relation is founded on money being endogenous, meaning that bank credit creation is the source of the effect of the money supply on bank stock returns. The money supply to bank stock returns were tested for robustness using three different tests. All tests provided confirmation of the relationship (except for the US).

Apart from the very important empirical evidence that the thesis brings to bear on this new PK theory for a group of seven key developed economies, the findings of the thesis have important implications as to the key functioning of a banking system. Banks are not only *transmitters* of monetary policy but are also important in the development of the growth of money through *loan creation* to the money supply and bank stock price formation.

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