UNIVERSITI PUTRA MALAYSIA

FINANCIAL INTERMEDIARY DEVELOPMENT, OUTPUT AND EXPORT UNDER CREDIT MARKET IMPERFECTIONS

TANG KIN BOON

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FINANCIAL INTERMEDIARY DEVELOPMENT, OUTPUT AND EXPORT UNDER CREDIT MARKET IMPERFECTIONS

By

TANG KIN BOON

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

December 2007

DEDICATION

To My
Father, Mother and
Sook Sin…

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

FINANCIAL INTERMEDIARY DEVELOPMENT, OUTPUT AND EXPORT UNDER CREDIT MARKET IMPERFECTIONS

By

TANG KIN BOON

December 2007

Chairman : Associate Professor Tan Hui Boon, PhD

Faculty : Economics and Management

This study examines the long-run relationship between financial intermediary development, output and export under three credit market imperfections – role of financial intermediaries, financial accelerator and currency mismatch. In particular, this study has (1) examined the direct relationship between financial intermediary development and output fluctuations (2) examined the dampening and magnifying effects of financial intermediaries on output fluctuations via the propagation of real and monetary shocks, (3) examined the impact of exchange rate movements on exports under the condition of foreign currency borrowing and credit constraint and (4) evaluated the impact of external finance premium on various sectorial productions and aggregate outputs growth. An aggregate data panel is constructed for the countries under study and the cointegration hypothesis among the variables is verified using Pedroni's and Westerlund's panel cointegration tests. The idiosyncratic, individual and group-mean panel cointegrating vectors are then estimated using FMOLS and DOLS developed by Pedroni.

Using data from 17 countries at different income levels in East Asia-Pacific, the empirical results indicate that (1) strong and robust evidence for dampening effect of real shocks, (2) somewhat weak evidence for magnifying effect of monetary shocks, (3) financial intermediary development to some extent have direct impact on output fluctuations if countries are bank-dependent, (4) the larger the level of country's foreign debt and credit constraint results more negative response of exports to currency depreciation, (5) country's export with high foreign currency denominated debt are more vulnerable to negative exchange rate shocks and (6) the negative relationship between the external finance premium and the aggregate output growth seems to be strengthened in middle income than in the sectorial production growth.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

PEMBANGUNAN PENGANTARA KEWANGAN, HASIL KELUARAN DAN EKSPORT DI BAWAH KETIDAKSEMPURNAAN PASARAN KREDIT

Oleh

TANG KIN BOON

Disember 2007

Pengerusi : Profesor Madya Tan Hui Boon, PhD

Fakulti : Ekonomi dan Pengurusan

Penyelidikan ini mengkaji hubungan jangka panjang di antara pembangunan pengantara kewangan, hasil keluaran dan eksport di bawah tiga ketidaksempurnaan pasaran kredit – peranan pengantara kewangan, pemecut kewangan dan ketidakpadanan mata wang. Secara khususnya, penyelidikan ini telah (1) mengkaji hubungan langsung di antara pembangunan pengantara kewangan dan ketidakstabilan hasil keluaran, (2) mengkaji kesan-kesan pelembapkan and pembesaran pengantara kewangan ke atas ketidakstabilan hasil keluaran melalui pembeluasan kejutan-kejutan asli dan kewangan, (3) mengkaji kesan tekanan kadar tukaran asing ke atas eksport di bawah syarat peminjaman mata wang asing dan kekangan kredit, (4) menilai kesan tekanan premium kewangan luar ke atas indeks pengeluaran and hasil keluaran berjumlah. Data panel dibina untuk negara-negara di bawah kajian dan hipotesis hubungan integrasi antara faktor-faktor telah disahkan dengan menggunakan ujian-ujian panel hubangan integrasi yang direka oleh Pedroni dan Westerlund. Vektor-vektor individu dan kumpulan rata ditaksir dengan menggunakan teknik FMOLS and DOLS yang direka oleh Pedroni.

Dengan menggunakan data dari 17 negara-negara di Asia-Pacific Timur yang separas dengan tingkat pendapatan yang berlainan, hasil-hasil empirik menunjukkan (1) bukti yang kukuh dan konsisten mengenai kesan pelembapkan oleh kejutan asli, (2) bukti yang lemah mengenai kesan pembesaran oleh kejutan kewangan, (3) pada tahap tertentu pembangunan pengantara kewangan menunjukkan kesan langsung ke atas ketidakstabilan hasil keluaran di negara-negara yang sangat bergantung kepada bank, (4) hutang luaran dan kekangan kredit negara yang tinggi akan mengakibatkan balasan negatif eksport, (5) hutang mata wang asing negara yang tinggi juga akan mengakibatkan eksportnya lebih mudah diserang oleh kejutan-kejutan negatif tukaran asing dan (6) hubungan premium kewangan luar dengan perkembangan hasil keluaran berjumlah adalah lebih kukuh di negara-negara berpendapatan tengah berbanding dengan hubungannya dengan perkembangan indeks pengeluaran.

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I certify that an Examination Committee has met on 12th December 2007 to conduct the final examination of Tang Kin Boon on his Doctor of Philosophy thesis entitled "Financial Intermediary Development, Output and Export under Credit Market Imperfections" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the student be awarded the degree of Doctor of Philosophy.

Members of the Examination Committee were as follows:

Law Siong Hook, PhD
Senior Lecturer
Faculty of Economics and Management
Universiti Putra Malaysia
(Chairman)

Taufiq Hassan, PhD
Lecturer
Faculty of Economics and Management
Universiti Putra Malaysia
(Internal Examiner)

Zulkarnain Muhamad Sori, PhD
Associate Professor
Faculty of Economics and Management
Universiti Putra Malaysia
(Internal Examiner)

Mansor Hj. Ibrahim, PhD
Professor
Kulliyyah Ekonomi dan Sains Pengurusan
Universiti Islam Antarabangsa Malaysia
(External Examiner)

____

HASANAH MOHD. GHAZALI, PhD
Professor and Deputy Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 29 January 2008

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

Tan Hui Boon, PhD
Associate Professor
Faculty of Economics and Management
Universiti Putra Malaysia
(Chairman)

Zulkornain Yusop, PhD
Associate Professor
Faculty of Economics and Management
Universiti Putra Malaysia
(Member)

Zaleha Mohd Noor, PhD
Lecturer
Faculty of Economics and Management
Universiti Putra Malaysia
(Member)

____

AINI IDERIS, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 21 February 2008

DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

TANG KIN BOON

Date: 1 January 2008

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LIST OF ABBREVIATIONS/ NOTATIONS/ GLOSSARY OF TERMS

ADF	Augmented Dickey-Fuller
DGP	Data Generating Process
DOLS	Between-dimension Dynamic OLS
FD	Financial intermediary development
FMOLS	Between-dimension Fully Modified OLS
GMM	Generalized Method of Moment
H-P filter	Hodrick-Prescott filter
IFS	International Financial Statistics
IPS	Im, Pesaran and Shin
IV	Instrumental Variable
PP	Phillips-Perron
PZ	Parametric Statistic
SPR	External Finance Premium (Interest Rate Spread)
SZ	Semi-parametric Statistic
TFP	Total Factor Productivity
VR_G	Group-Mean Ratio Statistic
VR_P	Panel-Variance Ratio Statistic
WBES	World Business Environment Survey
WDI	World Development Indicators

CHAPTER 1

INTRODUCTION

1.1. Background

Standard macroeconomic models typically assume that credit markets are perfect. In recent years, however, a body of theoretical work has challenged the key assumptions required for perfect credit markets.[1] The current work on the mechanics of credit market imperfections suggests that output and trade are interrelated with private credit and foreign debt. The financial crisis in East Asia has rekindled economists' interest in the reasons and consequences of intervention in the financial markets. A lesson seems to have emerged from the issue of financial crisis, the role of financial intermediaries, bank failures and balance of payment problems. It seems that holding of excessive foreign currency liabilities by firms and banks have played havoc in East Asia. The external debt that many Asian countries accumulated to finance their development was almost strictly denominated in foreign currencies which are external to the region.[2] Besides, the crisis has highlighted the role financial development in propagating negative shocks to the economy. This is naturally led to an interest in the determinants of these frictions and their effects on the macroeconomy, particularly on output fluctuations and export. In light of that, credit market imperfections that based on asymmetric information, agency costs and other credit frictions in financial markets, is one of the theories that has been advanced in an attempt to provide a plausible explanation for the propagation of cyclical fluctuations.

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[1] See Bernanke (1983), Bernanke and Gertler (1989) and Bernanke *et al.* (1998).
[2] See Bordo and Meissner (2006) for the role of foreign currency debt in financial crises.

Over the last two decades, East Asian economies have experienced accelerate financial development, periods of rapid credit expansion, associated with high level foreign borrowing and rapid economic growth.[3] Concerns have been raised on the role of excessive credit growth in the previous financial crises in Asian markets. These problems are associated with low investment, sharp increases in insolvencies and bankruptcies, rising debt burdens, collapsing equity prices, bank failures, high rate of defaults and output contraction. The third generation crises models have considered credit market imperfections as key fundamentals. According to this view, deteriorating credit market conditions are not simply passive reflections of a declining real economy, but are in themselves a major factor depressing economic activity. The key elements described above are based on borrowers' credit worthiness, supply of loans by commercial banks, unwarranted non-performing loans and companies with excessive foreign currency-denominated debt. These factors are among the most important elements in explaining both the credit and output fluctuations in the region. This third generation model is particularly well suited to analyze the case of economies like in East Asia, where the source of currency crises lied primarily in the deteriorating balance sheets of private domestic firms and commercial banks rather than in uncontrolled budget deficit policies by local governments (e.g., see Mishkin, 1999).

[3] The main stylized facts on credit expansion and output cycles are described in Schneider and Tornell (2004).

The idea that credit market imperfections play a central role in the propagation of cyclical fluctuations has a long-standing tradition in macroeconomics. Since Irving Fisher's debt-deflation theory of Great Depression, many economists have argued that deteriorating credit market conditions are in themselves a major factor depressing real economic activity. Beginning with Bernanke and Gertler (1989) and Kiyotaki and Moore (1997) balance sheet effects were the initial efforts to introduce such effects into mainstream economic models in a formal way. In particular, endogenous developments in credit markets may work to propagate and amplify shocks to the economy (Bernanke and Gertler, 1995). More recently, Beck *et al.* (2006) has developed a theoretical model to assess the dampening effect of real shocks and magnifying effect of monetary shocks on output fluctuations.

Under credit market imperfections, output relates to the net effect of the procyclical movements in borrowers' net worth (i.e. balance sheet effects) and countercyclical movements in the external finance premium (i.e. the difference between the cost of funds raised externally and the opportunity cost of funds generated internally). Such a mechanism tends to constrain profitable investment opportunities and to produce inefficient decline in output. Within this context, balance sheets of some economic agents are highly vulnerable to adverse demand shocks because of the liabilities accumulated during the credit boom periods. These balance sheet exposures can be the sources of amplification and propagation during the downturn. One can define that the degree of credit market imperfections are depending on the magnitudes of these balance sheets exposures to negative aggregate shocks.

The traditional "credit channel" literature examines the impact of asymmetric information via the changes in agency costs on real spending and economic activity. Literature of credit channel is divided into two schools of thought, balance sheet and bank lending channels. The bank credit channel analyses the impact of shocks on the supply of loans by depository institutions, whereas the balance sheet channel focuses on the potential impact of shocks on firms' balance sheets and their ability to borrow. Both channels emphasize on the asymmetric information between the borrowers and lenders which alter the costs of financing that have significant consequences on output fluctuations. Although both channels theoretically quite different, we do not intend to distinguish them empirically.

Nevertheless, both channels are based on one key fundamental, the "financial accelerator".[4] The financial accelerator hypothesis says that credit market distortions magnify economic fluctuation. Accordingly, small credit distortions may lead large and persistent fluctuation in output. In other words, credit market distortions create a financial accelerator which destabilizes the economy. While in some cases the distortions destabilize the economy, they sometimes stabilize the economy.[5] Many empirical studies are unable to distinguish between financial accelerator and stabilizer. In order to fill the gap in the literature, this study attempts to distinguish them empirically by considering various macroeconomic shocks.

[4] The term "financial accelerator" was first introduced by Bernanke and Gertler (1989).
[5] See a recent study by House (2006) where the stabilizing forces are closely related to forces that cause overinvestment in static models.

In a world of imperfect credit market, financial intermediaries are important because of information and transactions costs that arise from imperfect information between the borrowers and lenders. This information asymmetry is opening up the possibility of an interesting interaction between financial intermediary development and output fluctuations. As a result, questions have been raised on the dampening and amplifying effect of financial development on output fluctuations. Numerous studies have focused on financial development and economic growth (e.g. Rajan and Zingales, 1998; Levine *et al.*, 2000; Beck *et al.*, 2000b),[6] however, the indirect effect of financial development on output fluctuations has not been studied thoroughly yet. [7] This study examines on both the direct and indirect effects of financial intermediary development on output fluctuations.

The credit market imperfections can also affect the way in which an economy reacts to exchange rate movements through different channels. For example, after the large exchange rate depreciations following the 1997 East Asian crisis, export volumes from East Asian countries did not increase with respect to the large currency depreciations.[8] Two main explanations for this phenomenon have been proposed, excessive foreign currency borrowing affected firms' balance sheets and contraction in domestic credit affected supply of exports.

[6] Rajan and Zingales (1998) argue that financial development facilitates economic growth as it reduces external costs of finance to firms.
[7] See a latest study by Beck *et al.* (2006).
[8] See Duttagupta and Spilimbergo (2004) for a survey of Asian exports during the crisis.

The first channel related to this view is foreign currency borrowings where share of firms' liability is denominated in foreign currency, thus exchange rate depreciation will increase the amount of this debt. This will deteriorate firms' balance sheets and thus decrease the amount of their production.[9] The second channel that can be observed is the presence of credit constraints where depreciation can decrease the amount of firms' cash flow if their assets are denominated in domestic currency; if this cash flow determines firms' net worth, investment will decrease after depreciation and if this investment is necessary to produce and export, trade will decrease too. The complementary of these two channels is called the "currency mismatch". The effects would be the same if countries have large debt denominated in foreign currency to finance their development while the cash flow that serve those debts are denominated in domestic currency, a depreciation of currency exacerbating debt-service difficulties and increasing the likelihood of default of domestic banks and firms and consequently economic collapsed.

This view is argued by Eichengreen and Hausmann (1999) that the danger of exchange rate fluctuations in the face of foreign currency borrowing might force many countries to adopt hard currency pegs. They coined the term "original sin" because they argued foreign currency denominated debt was imposed by international capital markets. Nations with poor reputations, and even nations with ostensibly good reputations or solid fundamentals, are obliged to issue debt in key international currencies. In other words, domestic policies or problems were not the only reason countries could not borrow in their own currencies.

[9] See for example, Deardorff (2000), Jeanne (2002) and Cespedes *et al.* (2004).

This study considers three literatures of credit market imperfections – credit channel (or the role of financial intermediaries), financial accelerator and currency mismatch focusing on the selected countries in East Asian and Pacific region. In particular, this study is related to four different stands of literature. First, this study is based on a large empirical literature on the relationship between financial development and output fluctuations. A second relevant stand of literature is the accelerating effects of credit market imperfections on the propagation of various economic shocks. A third related literature is the effect of exchange rate movements on export when foreign currency borrowing and the level of credit constraint are considered. A fourth related line of work is the literature on the credit channel of monetary transmission mechanism where monetary policy impacts on real economy through the balance sheet and bank lending channels.

In the following sections, a descriptive analysis of how credit market imperfections at work with respect to the changes in various financial market indicators is reviewed. Such indicators are the role of credit constraints in output fluctuations, the importance of bank loans for bank-dependent borrowers, the balance sheet effects with or without the foreign currency denominated debt and the rapid expansions of guaranteed debt by the public entities. Based on the descriptive analysis, three hypotheses are proposed in which will be examined in the later parts of this study.