A STUDY ON THE DEVELOPMENT OF THE MALAYSIAN DEBT MARKET

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2019

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THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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ABSTRACT

Bond markets are an integral part of a country's capital market and together with the banking sector represent components of the financial system of the country. This study looked at development of the Malaysian debt market, which covered the domestic bond market and banking sector. The study covered the early years when the government began to develop the private domestic bond market to complement the already established government bond market. It also spanned the important periods for the domestic bond market. First, when there was greater activity to access the bond market to raise funds for economic recovery and bank recapitalization following the 1997-98 Asian financial crisis. Subsequently, the years when there was a flurry of government measures to boost the domestic bond market and diversify risks from the banking sector, thus adding breadth and depth to Malaysia's financial system. This study analyzed the impact from various macroeconomic factors as well as impacts of the major financial crises on the Malaysian domestic bond market, banking sector and private financing. The study found that development of the Malaysian domestic bond market has to contend with competition from the country's dominant banking sector and, to a lesser extent, the popular equity market. In fact, it was found during the study period, the bank concentration ratio, which measured the market share and, accordingly, concentration of power in the country's top banks, seemed to exert a greater impact on development of the domestic bond market than the size of the banking sector *per se*. This study also analyzed how the persistent and sizeable fiscal deficits in Malaysia since 1998 have affected the domestic bond market, especially the private bond market. The

study found that development of the domestic government bond market and the trend in the country's fiscal balances have been instrumental in boosting the private domestic bond market. In fact, the size of the domestic government bond market was even more influential than government debt in boosting the development of this segment. Hence, further developing the government bond market will contribute to domestic bond market development and should be given higher priority by the Malaysian authorities. Instability in the Ringgit negatively impacted the domestic bond market. The study also found that the local banking sector was negatively affected by the bank concentration ratio and higher spreads in interest rates, but growth in government debt had a positive impact on bank loans. Meanwhile, private financing, comprising bank loans and corporate bonds, was positively associated with government debt and the local equity market, but negatively impacted by instability in the Ringgit. It is hoped that the findings in this study would be helpful as input to future government policy design and more embracive policies to further develop and / or reform the financial markets, including the domestic bond market. That is, the study findings can be relevant to Malaysia and other developing countries.

Keywords: domestic bond market, determinants, debt, fiscal deficit, banking sector

KAJIAN MENGENAI PEMBANGUNAN

PASARAN HUTANG MALAYSIA

ABSTRAK

Memandangkan kepentingan pasaran hutang, yang terdiri dari pasaran bon tempatan dan sektor perbankan, kajian ini menganalisa pembangunan pasaran bon tempatan Malaysia semasa tempoh pembangunan pesatnya dan juga masa kerajaan Malaysia mengambil langkah membangunkan pasaran bon swasta. Objektif kajian ini termasuk mengenalpasti faktor penentu dan halangan kepada pembangunan, terutamanya, pasaran bon tempatan Malaysia termasuk segmen bon secara berasingan; kedua, sektor perbankan (dari segi saiz pinjaman bank); dan akhirnya, pembiayaan swasta (merangkumi pinjaman bank dan bon swasta / korporat). Kajian ini telah menganalisa impak daripada faktor-faktor seperti hutang kerajaan, defisit fiskal, kadar faedah, kadar pertukaran matawang, saiz sektor perbankan, saiz pasaran saham serta impak krisis kewangan semasa tempoh sampel. Kajian ini telah mengenalpasti persaingan di antara pasaran bon tempatan dengan, terutamanya, sektor perbankan dan, juga sedikit, dengan pasaran saham. Penemuan kajian ini termasuk: (i) peranan positif hutang kerajaan dalam pembangunan pasaran bon tempatan, sektor perbankan dan pembiayaan swasta di Malaysia; dan (ii) peranan negatif nisbah tumpuan perbankan (bank concentration ratio) terhadap pasaran bon tempatan dan juga sektor perbankan. Kajian ini juga mendapati bahawa pembangunan pasaran bon tempatan kerajaan (termasuk defisit fiskal sejak 1998) telah memainkan peranan penting dalam membangunkan pasaran bon tempatan swasta. Oleh itu, polisi kerajaan di masa depan untuk terus membangunkan pasaran bon kerajaan akan menyumbang kepada pembangunan pasaran bon tempatan, termasuk bon swasta, dan harus diberi keutamaan oleh pihak kerajaan Malaysia. Impak bila nilai Ringgit turun-naik adalah negatif

terhadap pasaran bon tempatan dan pembiayaan swasta. Adalah diharapkan penemuan kajian ini dapat dipertimbangkan sebagai input untuk reka bentuk polisi kerajaan di masa depan untuk terus membangun dan / atau mempertingkatkan pasaran kewangan, termasuk pasaran bon tempatan Malaysia. Lagipun, penemuan kajian ini boleh dipertimbangkan untuk lain-lain negara membangun.

ACKNOWLEDGEMENTS

I would like to express my deepest thanks and profound gratitude to my supervisor, Professor Dr. Goh Kim Leng, whose unstinting guidance, vast experience and absolute unflappability have been invaluable to me.

My special thanks to University of Malaya for its grant (through the Postgraduate Research Fund), which has made this study and its findings even more meaningful to me. I would also like to thank the University staff, many family members and friends who all helped me during this period in many ways that I cannot begin to enumerate.

Last but not least, I thank my husband, Michael, my sister, Meng Choo, and younger brother, Chuen Inn, who have been there for me during the ups and many downs these years of study. I also thank other family members, including my in laws, both near and far, for their encouragement. In addition, my utmost gratitude to Him for His Strength and All that have been sustaining me.

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ADF	Augmented Dickey-Fuller Test
AR	Autoregressive
ARDL	Autoregressive Distributed Lag
ASEAN	Association of Southeast Asian Nations
ASEAN+3	ASEAN plus China, Japan and South Korea
BIS	Bank for International Settlements
BLR	Base Lending Rate
CDRC	Corporate Debt Restructuring Committee
CMP1	Capital Market Masterplan 1
CMP2	Capital Market Masterplan 2
CPI	Consumer Price Index
Danaharta	Pengurusan Danaharta Nasional Berhad
Danamodal	Danamodal Nasional Berhad
EMEAP	Executives' Meeting of East Asia-Pacific Central Bankers
FD	Fixed Deposit
FDI	Foreign Direct Investment
FSMP1	Financial Sector Masterplan 1
GDP	Gross Domestic Product
GNP	Gross National Product
IMF	International Monetary Fund
KLIBOR	Kuala Lumpur Interbank Offered Rate
Log	Logarithm
MARC	Malaysian Rating Corporation Berhad
NPL	Non-Performing Loan
PDS	Private Debt Securities
PDS Guidelines	Guidelines on the Offering of Private Debt Securities
RM	Ringgit Malaysia
SRR	Statutory Reserve Requirement
USD	US Dollar

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CHAPTER 1

INTRODUCTION

1.1 Rationale for Study

In its continuous efforts to reduce poverty globally and promote economic growth, the World Bank has viewed financial development as a positive contributor to its work in the areas of poverty reduction and promoting economic growth. Hence, as part of the financial system, the development of a country's capital market,[1] including the bond market, will contribute positively to its financial development. This study on the development of Malaysia's debt market, comprising domestic bond market and bank loans, has its main focus on the former. As Malaysia's bond market is an integral part of the country's financial development, this study examines the development of Malaysia's domestic bond market, or local currency bond market since bonds issued for domestic bond markets are mostly issued in local currencies. Also, the study seeks to add to the existing literature on domestic bond markets given their role in supporting economic growth.

Caprio and Honohan (2001) highlighted findings from a World Bank policy research report that financial development has a positive and material contribution in national economic output, thereby reducing poverty. They noted that the empirical findings provided evidence that finance mattered in poverty eradication, albeit there may still be some debate over the exact contribution of finance to economic growth.

[1] Capital markets are made up of equity and bond markets.

As the world population increases each year, countries across the world need to provide for their growing populations and, *ceteris paribus*, need to ensure their real output growth keeps pace with their population growth just to maintain the same standard of living. In 2017, the United Nations estimated that world population had reached 7.6 billion, with the population growing some 83 million every year (United Nations, 2017). The World Bank (2013), with its mission to eradicate poverty in the world, announced that globally over one billion people still lived in extreme poverty, surviving on less than USD1.90 a day.[2] Given such pressing circumstances and the rapidly growing world population, it was timely the World Bank had set concrete targets by 2030 to sharply reduce extreme poverty and push for faster income growth. Hence, there is an important role that domestic bond markets can play in positively influencing economic growth.

The review by Levine (2005) that spans both theoretical as well as empirical work on links between finance or financial development with economic growth, concluded that overall the existing literature mostly suggested that countries / economies with better developed banking sectors and capital markets achieved faster economic growth. He commented that there was an abundance of research in support of the contribution of financial development to economic growth.[3]

While the studies selected for Levine's review were focused mainly on the financial systems or specifically, the banking sectors and equity markets (the latter as being representative of the capital markets), his review also covered works that encompassed bond markets.[4] Accordingly, bond markets, as a component of the financial system, would also have played a part in contributing to economic growth.

[2] https://*www.worldbank.org/en/topic/poverty*
[3] Levine (2005) included research from as early as 1910s, and in the 1950s to early 1970s.
[4] The definition of a bond is a debt security or debt instrument that pays the holder periodic payments over a specified time (*e.g.* Mishkin, 2013, p. 44).

Fink, Haiss and Hristoforova (2003) looked at the contribution of growth of aggregate or total bond markets to real output growth in 13 developed countries over the period 1950 to 2000. The study, based on empirical evidence, supported the supply-leading hypothesis that development of aggregate bond markets in many of the countries in their sample contributed to real output or economic growth.

Since economic growth and financial development both matter, then further research into bond markets and their development will add value to the existing body of research on finance and economic growth. Indeed, Levine (2005) suggested that overall, much of existing research on finance and economic growth pointed to well-developed financial systems, where banks and markets functioned properly, including bond markets, helping those countries achieve higher economic growth.

Besides bond markets playing a positive role in contributing to faster economic growth, the lack of a well-developed bond market could have adverse consequences. Herring and Chatusripitak (2000) concluded in their paper, which included a case study on Thailand during the 1997-98 Asian financial crisis, that an underdeveloped bond market in any country or economy will result in the firms in that economy relying more heavily on the banking sector to meet their needs for financing. As such, this would result in its banking sector being bigger in the absence of a well-functioning bond market. However, since banks are highly leveraged entities, such a situation would also mean the banking sector could be more vulnerable, especially in times of financial crises.

The necessity for a well-developed bond market during times of financial turbulence was highlighted in a study by van Rixtel, Gonzalez and Yang (2015). The empirical study, which utilized a huge data set of 50,000 bond issuances by 63 banks across 14 European countries, found that the banks with higher ratings had turned to the

bond markets for funding irrespective of cost during the two financial crises, namely the global financial crisis and European sovereign debt crisis. Apart from those crisis periods, banks in the sample group only opted for bond issuance when interest rates were low and made bond issuance a cost-effective method of raising funds.

Additionally, the importance of bond markets as a critical source of funding in the recovery process following a financial crisis was also noted by Herring and Chatusripitak (2000). They pointed out that many countries, including Japan, Scandinavia, the US as well as economies affected by the Asian financial crisis, issued bonds to recapitalize their banking sectors in the aftermath of a crisis. The authors also stressed that without a well-developed bond market to expedite the process of securitizing non-performing loans of the badly affected banking sector, recovery efforts would have been much more difficult.

For the purpose of meeting funding requirements, including matching the maturity of assets and liabilities, while not incurring any foreign exchange rate risks, a country or economy would need a well-functioning domestic bond market. That is, a domestic bond market where bonds can be issued in local currency. As Pettis (2000) noted, domestic bond markets enable issuers of local currency bonds to lock in interest rates and local currency funding. This was not the case in the 1997-98 Asian financial crisis. Hale (2007a) highlighted that in the lending boom prior to the onset of the Asian financial crisis, both public and private borrowers in the emerging markets borrowed heavily from foreign banks and also actively issued international bonds. When the Asian financial crisis unfolded, these borrowers suffered a double hit to their net worth when the local currency weakened, resulting in their liabilities rising while their assets fell.

Malaysia was one of the five worst affected countries in the 1997-98 Asian financial crisis. The severity of the crisis was such that Malaysia imposed selective exchange controls and implemented a currency peg (Bank Negara Malaysia, 1999a; 1999b). In fact, one of the lessons from the Asian financial crisis was the need to further develop the region's then relatively underdeveloped domestic bond markets. Illustrating the benefit of a domestic bond market as an avenue for raising longer-term funds, Malaysia had turned to its domestic bond market to help finance its post-crisis recovery efforts, including recapitalizing its banks. In fact, Malaysia's real gross domestic product (GDP) grew 6.1 percent in 1999, after contracting a sharp 7.4 percent in 1998 (Bank Negara Malaysia, 2003, Table A.1).

When the Asian financial crisis erupted in 1997, Malaysia's ratio of bank loans to GDP was a hefty 145 percent (Ariff & Yap, 2001, p. 312). Between 1988-96 when the Malaysian economy experienced robust growth rates of about 9 percent *per annum* (p. 305), the banking sector was the major source of financing for the local economy. As Herring and Chatusripitak (2000) pointed out, in the absence of a well-diversified financial system that included a well-functioning domestic bond market, the banking sector could be over-extended, as in the case of Malaysia leading up to the Asian financial crisis. This, in turn, made the Malaysian banking sector more vulnerable to financial turmoil as demonstrated by the Asian financial crisis.

The consensus is that the economies most affected by this crisis were excessively dependent on their banking sectors for financing needs (*e.g.* Ariff & Yap, 2001; Herring & Chatusripitak, 2000) and / or had underdeveloped domestic bond markets (*e.g.* Eichengreen & Luengruemitchai, 2004). A better diversified financial system, with well-developed domestic bond markets, could have helped to mitigate the effects of the Asian financial crisis (Eichengreen & Luengruemitchai, 2004; Herring & Chatusripitak, 2000). This was also supported by a study by Kaminsky and Reinhart

(2001) that showed the pull-back of capital from the crisis-affected countries by foreign banks helped to spread the financial turbulence across the five countries worst hit by the Asian financial crisis, namely Malaysia, Indonesia, the Philippines, South Korea and Thailand.

Development of domestic bond markets contributes to economic development. In light of this, what determines the development of Malaysia's domestic bond market and debt market (comprising the bond market and bank loans) is the focus of this study.

1.2 Research Questions and Objectives of Study

From Section 1.1, it can be seen that financial systems, including bond markets, can play a positive and meaningful role in promoting faster economic growth. Furthermore, as highlighted by some of the studies on domestic bond markets and financial crises (*e.g.* Eichengreen & Luengruemitchai, 2004; Herring & Chatusripitak, 2000; Turner, 2012; van Rixtel *et al.,* 2015), well-functioning domestic bond markets can help economies cope better with financial crises, including facilitating a faster recovery in the post-crisis period.

In view of the developments during the Asian financial crisis that unfolded in Malaysia, a study with its main focus on Malaysia's domestic bond market, encompassing its corporate bond market or private debt securities market,[5] would provide valuable insights about the role of the domestic bond market, including beyond its normal functions in an emerging economy. Furthermore, since the 1980s, the Malaysian government had implemented various initiatives, including the establishment of two credit rating agencies in the 1990s. Accordingly, Malaysia's domestic bond

[5] The Malaysian government uses the term private debt securities market to refer to the corporate bond market or corporate debt securities market or corporate debt market (see *e.g.* Bank Negara Malaysia & Securities Commission, 2009, p. 3).

market capitalization had grown from RM50 billion in 1987 to about RM130 billion as at end 1997 and RM157 billion as at end 1998 (Bank Negara Malaysia, 2007a, p. 91; Securities Commission, 2018, p. 88) and could be considered better developed than those of some other Asian economies.

For this study, the main research question is what determines the development of the Malaysian debt market. Answering this research question will provide answers to the following research questions:

(a) What are the determinants and impediments to growth of the Malaysian domestic bond market?

(b) What are the determinants and impediments to growth of the various domestic bond segments?

(c) How have persistent fiscal deficits impacted the development of the Malaysian domestic bond market, including the private bond market?

(d) What are the determinants and impediments to growth of bank loans as well as private financing (comprising bank loans plus domestic corporate bonds)[6]?

In line with the above research questions, the over-riding objective of this study concerns the development of the Malaysian debt market, which comprises the domestic bond market and bank loans, with four specific objectives as follows:

(a) Identifying the potential determinants of the Malaysian domestic bond market over a time period that spanned important developments in the domestic bond market.

[6] This definition for "private financing" follows the components of external financing used in an important study by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997). This is discussed further in Chapter 4: Methodology and Data.

(b) Identifying the potential determinants of the various segments of the Malaysian domestic bond market, such as government bonds, corporate bonds and financial bonds.

(c) Investigating any possible impact from Malaysia's monetary and fiscal policies on development of the Malaysian domestic bond market, including effects of crowding-out on Malaysia's private sector, including the private bond market.

(d) Identifying the potential determinants of bank loans as well as private financing (comprising bank loans plus domestic corporate bonds).

For example, it should be noted that between 1998 to 2011, Malaysia registered persistent fiscal deficits, averaging 4.6 percent of GDP, or RM24.3 billion *per annum* (Bank Negara Malaysia, 2003; 2008; 2013). In financing its deficits, the Malaysian government has traditionally favoured non-inflationary domestic sources (including through issuance of Malaysian Government Securities) with some borrowings raised from external sources (*e.g.* Ministry of Finance, 1998). Since the fiscal deficits from 1998 to 2011 totalled some RM340 billion, the impact of such fiscal deficits and growing public debt where they pertain to the Malaysian domestic bond market should be a research-worthy topic, especially as such impacts can feed into the Malaysian economy over time.

In brief, this study aims to help fill existing gaps in the literature by identifying potential determinants of development of the Malaysian domestic bond market, including its major segments. This analysis will also investigate the growth and co-existence of the domestic bond market with the sizeable banking sector as well as the vibrant local equity market. Identification of the potential determinants, including constraints, which have played a part in development of the Malaysian domestic bond market and private financing (the latter comprising bank loans plus domestic corporate

bonds) should be relevant to the government's continued efforts to further develop the Malaysian domestic bond market. Overall, this thesis aims to provide a meaningful contribution to research work done on development of Malaysia's domestic bond and debt markets.

1.3 Significance of Study

While there has been research into bond markets in the US (*e.g.* Schinasi & Smith, 1998), which are considered among the most developed bond markets, sustained interest in bond markets globally was only noticeable in the aftermath of the 1997-98 Asian financial crisis, which most affected five countries, namely Malaysia, Indonesia, the Philippines, South Korea and Thailand. This interest was evident from research led by organizations that included, among others, the Bank for International Settlements (BIS) and International Monetary Fund (IMF).

Research into bond markets gained further impetus from the global financial crisis (2008-09) and, subsequently, the European sovereign debt crisis, which began in 2010 (*e.g.* Eichengreen & Luengruemitchai, 2004; Herring & Chatusripitak, 2000; Turner, 2012; van Rixtel *et al.,* 2015). Such research covered many areas, especially the role of domestic and international bond markets, the role of government and private bond markets, the necessary attributes of well-developed bond markets, and global trends in bond markets. These are all important areas of research, but the critical issues can be broad and, thus, difficult to analyze in a precise manner. Indubitably, the various cross-country studies have also added breadth to the general understanding of bond markets and the environment in which they operate and co-exist with the rest of the financial systems. Nevertheless, much of the research on Asian bond markets has been

on a cross-country basis. Furthermore, there are few studies on determinants of domestic bond markets on single countries, including Malaysia.

The significance of this study is underscored by the following:

(a) This represents a comprehensive analysis of the Malaysian debt market, which covers the domestic bond market and bank loans (*e.g.* Abbas & Christensen, 2007; La Porta *et al.*, 1997).

(b) Careful selection of a single country, such as Malaysia, can offer useful insights based on an in-depth study of its domestic bond market development. Furthermore, as an emerging economy, Malaysia's experience in developing its domestic bond market will be highly relevant in helping other emerging economies develop their domestic bond markets.

(c) At the country level, a careful study of Malaysia's domestic bond market will contribute towards filling existing gaps in research on the Malaysian domestic bond market *per se*.

(d) The role of the domestic bond market for raising funds in Malaysia's post-crisis recovery as well as during times of financial turbulence and the determinants that affect its debt market can also be studied and put to good use by other emerging economies. Examining determinants of debt market development, its over-dependence on its banks and lack of a better diversified financial system as well as the country's experience during the Asian financial crisis can also provide valuable lessons to other emerging economies in developing and diversifying their financial markets.

(e) The advantage of a country study is that Malaysia boasts of a well-established government bond market and, in the recent decade, a vibrant private bond market.

Data from Asian Bonds Online[7] showed that the size of Malaysia's corporate bond market, which is on par with the government bond market, can be viewed as an achievement for a developing country as Japan and certain developed countries still have relatively small corporate bond markets in comparison to their government bond markets.

(f) Furthermore, the growth of Malaysia's corporate bond market has been achieved in the presence of a well-established banking sector and vibrant equity market. As such, analyzing it would add considerable value to the present body of literature on bond and debt markets.

(g) Beyond financial crises (the Asian financial crisis and more recent global and European financial crises), attention on domestic bond markets has also been spurred by government policies, including fiscal policies that have resulted in growing deficits in a number of countries. Multi-lateral organizations such as the IMF and World Bank had previously expressed concern over this trend of chronic fiscal deficits. Malaysia's persistent and sizeable fiscal deficits since 1998 will also be a useful study when analyzing its domestic bond market development. The country's fiscal deficit had reached a high of 6.5 percent of GDP in 2001 (Ministry of Finance, 2001).

(h) Study findings can serve as possible input for crafting future policies to further catalyze the bond market development process within Malaysia's financial landscape, which encompasses both the local banking sector and equity market as well.

Malaysia is a worthy study subject on various fronts. This study will take a closer look into the development of the Malaysian domestic bond market alongside its

[7] https://*asianbondsonline.adb.org/data-portal/*

dominant banking sector and sizeable equity market.[8] Although studies have suggested that competition from a well-established banking sector could inhibit development of bond markets (*e.g.* Eichengreen & Luengruemitchai, 2004), some studies have found that countries with better developed banking sectors also had better developed bond markets (Bae, 2012; Burger & Warnock, 2006). However, there is some evidence pointing to countries with concentrated banking sectors having smaller bond markets (*e.g.* Eichengreen & Luengruemitchai, 2004). The evidence on the relationship between bond markets and equity markets is also mixed (Burger & Warnock, 2006).

Given the on-going debate about the relationships between domestic bond markets with banking sectors and / or equity markets, the findings of this study may add another layer to this engaging and invigorating discussion. Just as important, Malaysia's experience in the 1997-98 Asian financial crisis and its persistent fiscal deficits will also make this study on its domestic bond market one where other countries can gain insight to further develop their bond markets while confronting economic challenges when necessary.

Overall, what would contribute to the present body of literature on bond markets would be an in-depth study of domestic bond market development of an emerging economy in more recent times, where its development path would be relevant and attainable by countries / economies seeking to boost growth or development of their small or nascent bond markets. This study of the Malaysian domestic bond and debt markets, with its many facets, aims to fulfil this purpose.

[8] During the 1993 and 1996 bull runs on the Malaysian equity market, its market capitalization amounted to a staggering 375 percent of GDP in 1993 and 323 percent in 1996 (Ariff & Yap, 2001, p. 309).

1.4 Scope of Study

This study will look into the development of Malaysia's debt market. Its main focus is on covering the more recent periods when there was active government involvement to spur bond market development. Confining this endeavour mainly to a country specific study on Malaysia's domestic bonds will enable a more in-depth analysis of the portion of bond market development in Malaysia that was underdeveloped and played a role in the country falling victim to the Asian financial crisis. Furthermore, Malaysia's domestic bonds traditionally made up over 80 percent of its total bond market (Mihaljek, Scatigna & Villar, 2002). Data from Asian Bonds Online showed that since December 2006, domestic or local currency bonds make up between 85-90 percent of Malaysia's total bond market.[9]

Additionally, the focus is on domestic bond market development as this has the advantage of enabling issuers of local currency bonds to lock in interest rates and local currency funding (Pettis, 2000), thus reducing interest risk and funding mismatch. Hence, even in an economic downturn or a financial / currency crisis, issuance of such bonds would provide bond issuers the benefit of a funding structure with a neutral effect on net worth of bond issuers.

This study will explore factors that may have contributed to or hindered the growth or development of the domestic bond market. It will examine how the domestic bond market has grown alongside Malaysia's well-established banking sector and equity market. In view of the dominance of the Malaysian banking sector, the scope of this study has been extended to identify the potential determinants of the banking sector as well as private financing (comprising bank loans plus domestic corporate bonds). In addition, this study will look into the impact of Malaysia's persistent and sizeable fiscal

[9] https://*asianbondsonline.adb.org/data-portal/*

deficits as well as influences from the country's monetary and fiscal policies on its domestic bond market development.

Data on bank loans will be obtained mostly from Bank Negara Malaysia while the analysis on potential determinants of the Malaysian domestic bond market will be done utilizing data made publicly available by the BIS. There are several advantages in using the data set from the BIS. First, since a number of comprehensive bond studies have been done with similar data from the BIS, using data from the same source would enable meaningful comparison of findings from this study with previous studies. Second, BIS data on domestic bonds for Malaysia have been made available for the period Q4, 1993 to Q4, 2011 for aggregate bonds, government bonds, corporate bonds and financial bonds. The different bond series from the BIS enable regression analysis to be done on all four categories of domestic bonds for Malaysia. A third and important reason for using this set of data from the BIS, especially as regards Malaysian government bonds, is its compatibility with Malaysia's definition of government bonds, which also includes bonds issued by the Malaysian central bank, Bank Negara Malaysia.

However, the data set is restricted to the sample period of Q4, 1993 to Q4, 2011 as the BIS changed its definition for its bonds in early 2012, implementing the changes retroactively, following the global financial crisis of 2008-09 (Gruic & Wooldridge, 2012). Under the new definitions, data on Malaysian domestic bonds are available only from 2005 onwards and the definition of government bonds has been changed so as to classify central bank bond issues as bonds issued by financial corporations, which is different from the definition used by Malaysian authorities (Bank Negara Malaysia & Securities Commission, 2009; Gruic & Wooldridge, 2012).

Using data under the new definitions, which are made available beginning from 2005, will leave out a very important period in the development of the Malaysian domestic bond market. This period, from 1993 to 2004, includes the years when the Malaysian government was running a balanced / surplus budget (1993-97), years of sustained fiscal deficits (beginning 1998), and years when there were major developments in the domestic bond market including those related to the 1997-98 Asian financial crisis.

Equally important, the new BIS definition of classifying bonds issued by central banks with other bonds issued by "Financial Corporations" may lead to different findings for Malaysia's domestic government bond segment as well as its financial bond segment. In view of these serious considerations, this study will utilize data from the BIS based on the old definitions with the sample period confined to Q4, 1993 to Q4, 2011.

1.5 Organization of Study

This study consists of eight chapters, namely Introduction; Literature Review; Background on Malaysian Domestic Bond Market and Banking Sector; Methodology and Data, Analysis of Findings: Domestic Bond Market (Full Sample Period); Analysis of Findings: Domestic Bond Market (Sub-sample Period); Analysis of Findings: Private Financing; and Conclusion.

Chapter 1 lays out the objectives, significance and scope of this study.

Chapter 2 covers the literature review and summarizes the various studies and research done on bond markets. It also highlights studies on domestic bond markets and

their interactions with banking sectors and equity markets, especially those covering Malaysia and other Asian countries.

Chapter 3 sets out the background for the Malaysian domestic bond market and its development in the recent decades, including Malaysia's Islamic bond or *sukuk* segment. It also covers certain important events in the Malaysian banking sector during the sample period of this study. This chapter also provides a brief overview of the effects of the Asian financial crisis on the Malaysian economy and subsequent efforts to develop the domestic bond market and diversify the Malaysian financial system.

Chapter 4 is on Methodology and Data, where the former will be based on past bond market studies and the latter will cover data and their sources.

Chapter 5 reports on the empirical results and analysis of findings for the full sample period of Q4, 1993 to Q4, 2011. The tests are done to identify the potential determinants for Malaysia's domestic aggregate bond market as well as its government, corporate and financial bond segments. Given the country's sustained and sizeable fiscal deficits, this study will also examine the extent to which these deficits have impacted Malaysia's domestic bond market, including any adverse impact on the private bond segment.

Chapter 6 serves the function of a robustness check on Chapter 5's empirical findings by analyzing Malaysia's domestic bond market development during the sub-sample period from Q4, 2005 to Q4, 2011. This sub-sample period starts after the currency peg (RM3.80 = USD1.00) was removed, allowing the Ringgit to float. This chapter will look more closely into the impact on development of the Malaysian domestic bond market from variables influenced by monetary and fiscal policies, such as inflation, interest rates and exchange rates.

Chapter 7 reports on the empirical results and analysis of findings on the potential determinants of loans of the banking sector as well as private financing (comprising bank loans plus domestic corporate bonds). This chapter will examine more closely development of the domestic bond market, alongside the dominant banking sector in the Malaysian context, drawing on the findings of Chapters 5 and 6, too.

Chapter 8 provides a summary of the key findings of the study and draws implications for policy design and implementation of measures to further develop the Malaysian domestic bond and debt markets. This chapter will also suggest further areas of research deemed important for future development of the Malaysian domestic bond and debt markets.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Although it has been over two decades since the Asian financial crisis occurred, its legacy has left an indelible impact on bond market development in Asia and even across the world. Throughout the Asian financial crisis and in its aftermath, there was much research into the source(s) of the crisis, countries that fell victim to the crisis as well as the reasons for the depth and breadth of the crisis. Part of that research was focused on the over-dependence of Asia, including Malaysia, on its banks for financing its massive investments during a period of economic prosperity. As such, the crisis underscored the need for Malaysia and other Asian countries to make greater efforts to reduce their over-dependence on banks as well as further develop and diversify their financial systems, including their underdeveloped domestic bond markets.

Sifting through the existing literature revealed important facts about the state of Asian bond markets, including Malaysia's. However, the search also showed that research on Asian bond markets has been mainly carried out collectively or based on selected groups of countries. In the case of the Malaysian domestic bond market, there are material research gaps and, hence, opportunities for more in-depth research that can benefit Malaysia meaningfully in the country's on-going efforts to develop its domestic bond market for a better diversified financial system. Such research will also be relevant to other developing economies. Success in this endeavour could translate into

possibly less financial turmoil in Malaysia's and other developing economies' future, possibly even fewer financial crises or, at least, on a smaller scale.

This chapter provides a survey of studies as well as empirical work done on bond markets, covering both developed and developing economies. Focus of the literature survey has been on research that included Malaysia and studies that may be directly relevant to the development of the Malaysian domestic bond market. Attention is also given to the Asian financial crisis where it pertains to underdevelopment of Asian bond markets as the unfolding of the Asian financial crisis underscored many Asian economies' over-dependence on their banking sectors and inadequacies of their domestic bond markets.

The rest of this chapter is organized as follows. Section 2.2 is on development of bond markets in general, including their role in the economy as well as characteristics of and issues related to well-developed bond markets. The next section covers selected studies on the Asian financial crisis, examining the role of banks in transmitting the financial turbulence as well as the lack of well-developed bond markets to prevent Asia's, including Malaysia's, over-dependence on banks for financing. Sections 2.4 and 2.5 delve into development of bond markets in countries where there are dominant banking sectors or well-developed equity markets. Both sections will cover the competition and / or complementarities between bond markets and banks / equity markets. Section 2.6 summarizes research gaps in the case of the Malaysian domestic bond market while Section 2.7 concludes.

2.2 Studies on Development of Bond Markets

2.2.1 Role of Bond Markets

Caprio and Honohan (2001), authors of a World Bank policy research report based on various case studies and extensive cross-country data sets, found that financial development had a significant and positive contribution to national economic output and poverty reduction. Levine (2005), who reviewed numerous studies on theoretical and empirical works on links between financial development with economic development, also concluded that economies with better developed banking sectors and capital markets grew faster. That is, the existence of a well-functioning capital market in a country would be crucial to the process of economic development.

These capital markets, which encompass equity and bond markets for medium- and long-term financial assets, would provide users of capital who are seeking funds for productive investments with an alternative to the banking sector as well as a cost-efficient source of medium- and long-term financing. Productive investments would range from public development programmes to private investments (Ariff, Cheng & Neoh, 2009; Bank Negara Malaysia, 1994a; 1999a). In addition, capital markets also assist the banking sector in securitizing their assets. Song and Thakor (2010) suggested that securitization boosted investor participation in capital markets, thereby benefiting both capital markets and banking sectors.

At a micro level, a well-developed capital market would provide both investors and savers with a wider selection of financial instruments to cater to their individual risk-return profiles. At a macro level, the market would enable greater diversification of risks in the financial system. Playing a supporting but necessary role as pricing infrastructure to the capital market, a well-developed money market and futures /

derivatives market would improve the management, transfer and distribution of risks within the financial system (Bank Negara Malaysia, 1999a; Harwood, 2000).

Bond markets often developed as a consequence of governments needing a reliable and cost-effective source of financing for their needs. In fact, government bond markets help fund budget deficits in a non-inflationary way (Turner, 2002; World Bank & International Monetary Fund [IMF], 2001). However, a study by Fink *et al.* (2003) found empirical evidence in support of the hypothesis that development of aggregate bond markets made a positive contribution to real output or economic growth in many of the countries in their survey. Their study was based on data for 13 developed countries over the period 1950 to 2000.

Another reason for developing government bond markets is the need for countries to sterilize large capital inflows. Well-developed bond markets mean that central banks can sterilize such large inflows *via* open market operations by issuing government papers of differing maturities (Mihaljek *et al.,* 2002). While central banks in most emerging countries were initially sterilising such inflows with their short-term bills, most of the economies gradually switched to issuing longer-term government papers for this purpose. If a central bank has to rely exclusively on short-term debt instruments in conducting its open market operations, short-term interest rates may be driven up, thereby encouraging further inflows (Mihaljek *et al.,* 2002).

In recent years, with global long-term interest rates driven low by monetary policies in advanced economies and staying low (Mohanty & Rishabh, 2016; Sobrun & Turner, 2015), central banks in emerging economies have resorted to using multiple instruments; spanning bond market operations, foreign exchange intervention and macroprudential tools or measures in their conduct of monetary policies (Obstfeld, 2015; Park, 2011). Mihaljek *et al.* (2002) also noted that the need to sterilise large

capital inflows during the 1990s provided countries with a major motive for their debt market development. For example, Malaysia's central bank, Bank Negara Malaysia, introduced a new instrument, Bank Negara Bills, in February 1993 to help mop up excess liquidity in the financial system as the country dealt with sizeable capital inflows in the 1990s, up to the onset of the 1997-98 Asian financial crisis. By June 1993, outstanding amount of Bank Negara Bills had reached RM8 billion (Bank Negara Malaysia, 1999a, p. 350).

In addition, developing bond markets in conjunction with money markets can help in the operation of monetary policy. A well-functioning money market, where short-term debt instruments are transacted, is crucial to the smooth transmission of monetary policy, which is increasingly reliant on indirect instruments of control. Besides this, prices in bond markets can provide valuable information about market reaction to monetary policy measures and expectations of likely macroeconomic developments (Harwood, 2000; Mihaljek *et al.,* 2002).

Furthermore, there are other reasons for developing bond markets in general. In the absence of a well-developed bond market, the economy is likely to be heavily dependent on bank intermediation. Since banks tend to be highly leveraged, this could make the economy more vulnerable to crises (Herring & Chatusripitak, 2000). Nevertheless, only well-developed bond markets are able to substitute for banks. Hence, in emerging economies, where bond markets are relatively underdeveloped, bank intermediation remains dominant. In advanced countries, the general pattern observed is for banking to emerge at a much earlier stage of development than bond markets (Hawkins, 2002; Rajan & Zingales, 2003).

A well-developed bond market can serve other important functions, including helping issuers lock in funds *via* issuance of local currency bonds for longer maturities.

Pettis (2000) stated that issuing local currency bonds in domestic bond markets will enable issuers to minimize interest rate and exchange rate risks by locking in interest rate and local currency funding. This is especially beneficial during times of financial turmoil (Bhattacharyay, 2013; Eichengreen & Luengnaruemitchai, 2004).

A recent empirical study by van Rixtel *et al.* (2015) showed banks with higher ratings were able to access the bond markets for funding irrespective of cost during the global financial crisis and European sovereign debt crisis. Their study was based on a huge data set of 50,000 bond issuances by 63 banks across 14 European countries. Aside from the two crisis periods, the banks in the sample group only opted for bond issuance when interest rates were low. Herring and Chatusripitak (2000) also noted that countries such as Japan, Scandinavia, the US and those affected by the Asian financial crisis turned to their bond markets to raise the necessary funds to recapitalize their banking sectors in the respective post-crisis periods. In the case of Malaysia, the government issued bonds in the domestic government bond market to restructure the economy and recapitalize its banks in the wake of the Asian financial crisis (Bank Negara Malaysia, 1999a; National Economic Action Council, 1998).

2.2.2 Main Characteristics of Well-Developed Bond Markets

There is considerable literature on designing and developing government bond markets, which would be useful and relevant to emerging economies / countries including Malaysia. It is also feasible for governments to begin with developing government bond markets as the government bond market is an important foundation for the corporate or private bond market (Bae, 2012; Essers, Cassimon & Flore, 2015; Harwood, 2000; World Bank & IMF, 2001). Most of the literature agrees that promoting liquidity would be a key step in developing government bond markets, while

the lack of liquidity in such markets remained a major hindrance to their progress.[1] Furthermore, in the wake of the financial crises in the mid to late 1990s, there was growing consensus that deep[2] and liquid financial markets, especially government bond markets, are necessary in ensuring a robust and efficient financial system. Overall, there is room for improving liquidity in the bond markets of emerging economies.

Following the Asian financial crisis, the Committee on the Global Financial System (1999) put forward policy recommendations to design deep and liquid markets for government securities. These steps are critical and also endorsed by the World Bank and IMF (World Bank & IMF, 2001). This is because a well-developed government bond market will contribute greatly to the development of private bond markets by providing the following:

(a) An established mindset and culture for debt markets, including bond markets, by educating the authorities, the dealing community as well as the investing parties from various entities such as financial and non-financial institutions;
(b) Necessary infrastructure for the private bond market, such as the institutional, physical and operational infrastructure; and
(c) A benchmark yield curve from government debt securities that can aid in the pricing and trading of private debt securities (Bae, 2012; Harwood, 2000; Schinasi & Smith, 1998; World Bank & IMF, 2001).

Arising from the findings of the Study Group on Market Liquidity under its auspices, the Committee on the Global Financial System (1999) came out with five policy recommendations, based on requisite guiding principles and incorporated practical recommendations in their implementation. They are as follows:

[1] For example, see Amante, Arauho and Jeanneau (2007), Committee on the Global Financial System (1999; 2007; 2016), McCauley and Remolona (2000), and Mohanty (2002).
[2] Depth of a bond market is a characteristic also encapsulated in the definition of market liquidity.

(1) Establishing large benchmark issues at key maturities. This can be achieved by an appropriate distribution of maturities, whereby the government can reduce the number of original maturities by increasing the size of each securities issue. In general, an increase in the trading supply of a financial instrument will improve its market liquidity.

(2) Minimizing liquidity-impairing effects of taxes. Imposing taxes tends to increase transaction costs, thus hindering market liquidity.

(3) Improving transparency. Transparency matters to market liquidity in the following aspects: 1) transparency of issuers; 2) transparency of the issues schedule; and 3) transparency of market information. In terms of transparency of market information, the dissemination of prevailing prices to the broader trading community will improve market liquidity.

(4) Ensuring safety and standardization in trading and settlement practices. Safety in trading and settlement is a pre-requisite for liquid markets with a greater number of investors drawn to trading in safe markets. Standardization of trading and settlement practices improves market liquidity as there is less market fragmentation.

(5) Developing the repo, futures and options markets. The development of these markets means that hedging, arbitrage and speculative transactions can be conducted easily, thus enhancing market liquidity. Dealers can finance long positions and cover short positions *via* repo transactions. A well-structured futures market means lower hedging costs while an options market can facilitate hedging and arbitrage.

All the five policy recommendations by the Committee on the Global Financial System (1999) for liquid and deep government bond markets are in line with research on government bond markets identifying three common characteristics of a liquid bond market, namely depth; tightness; and resilience (Amante *et al.,* 2007, p. 74; Committee on the Global Financial System, 2007, p. 44). A deep market is one where participants

will be able to execute large-volume transactions, leaving little impact on price and without disturbing the equilibrium prices. Tightness measures the cost-efficiency of transactions, as reflected in bid-ask spreads. Resilience reflects the market's ability to absorb shocks. Accordingly, in brief, a liquid market should be characterized by large turnover, low bid-ask spreads and limited day-to-day volatility.

A liquid bond market will also confer other benefits. For example, under normal circumstances, greater liquidity in a market will translate into a reduction of the liquidity risk premium embedded in government bond yields. According to Goldstein and Folkerts-Landau (1994), this, in turn, results in lower financing costs for the government (as cited by Mohanty, 2002). Improved liquidity in the government bond market will also aid development of other financial market segments *via* the creation of a representative "risk-free" yield curve that can serve as a benchmark for pricing and trading of other financial assets (Amante *et al.,* 2007; Harwood, 2000; Schinasi & Smith, 1998; World Bank & IMF, 2001). This benchmark yield curve derived from government bond yields will be critical when it comes to developing the corporate bond market. Improved market liquidity will also be crucial in the conduct of monetary policy, as liquid asset markets will facilitate the conduct of monetary policy and extract market expectations (Amante *et al.,* 2007; World Bank & IMF, 2001).

In contrast, an illiquid market can cause many problems, especially during times of financial instability. In times of heightened political uncertainty, government bond markets could see liquidity drained off as participants demand a large liquidity premium. Also, an illiquid market with a narrow investor base will increase the market's vulnerability to "herding" investor behavior (Amante *et al.,* 2007; Turner, 2012). Ultimately, illiquid markets amplify the effects of shocks by causing huge price changes and generating unstable price expectations with a greater risk of spillover to other market segments. However, liquid markets play important roles in facilitating the

conduct of monetary policy as well as enhancing stability of the financial system by helping to absorb occasional market stresses.[3] Such stresses can cause excessive price fluctuations, thereby increasing the risks of financial system disruptions (Committee on the Global Financial System, 2007; 2016).

In view of the above, liquidity in bond markets is critical. Based on the previously mentioned three common characteristics of depth, tightness and resilience to measure liquidity in government bond markets, there has been improvement in the years since the Asian financial crisis. Despite the improvements, liquidity continued to be low in many countries. This was especially so for long-term bonds. Looking at the bid-ask spreads as a measure of tightness in the bond markets, such spreads were among the lowest in Brazil, Chile, India, Singapore and South Korea (Committee on the Global Financial System, 2007). Nevertheless, low bid-ask spreads may not be an accurate measure of liquidity if transaction costs vary greatly from the most to the least traded securities. In some countries, market makers in bond markets may be constrained in their spreads by market regulation, including in recent years due to tighter regulation following the global financial crisis (Committee on the Global Financial System, 2007; 2016; Mohanty, 2002).

The third dimension of market liquidity in bond markets, resilience, can be more difficult to gauge. A simple measure of market resilience may be the annualized volatility of local currency bond returns in major emerging markets *vis-à-vis* in the US during a specified period. Assuming that liquidity premia were embedded in bond returns, illiquid markets would exhibit higher volatility than liquid markets. Given the sharp decline in volatility in Asian markets in 2006-07 compared to markets in the US,

[3] However, Park (2016) cautioned that bond market development that could theoretically bring benefits could also increase the risk of financial contagion.

this development should indicate greater resilience in the Asian markets (Committee on the Global Financial System, 2007).

2.2.3 Size Threshold for Liquid Government Bond Markets and Other Pertinent Issues

Besides liquidity, size of the bond market also plays an important role. According to a study on size and liquidity of government bond markets, the size threshold for liquid government markets may be around USD100-200 billion, a range that is based on the success of government bond futures markets as well as bid-ask spreads in Group of 10 markets (McCauley & Remolona, 2000). The authors said that sustaining a liquid government bond market below that range would not be easy.

In another study on liquidity in the domestic government bond market of Brazil, Amante *et al.* (2007) also referred to the same size threshold of USD100-200 billion for development of a liquid market for government bonds. Based on this USD100-200 billion as reference, recent figures indicated the Malaysian domestic government bond market should have sufficient volume to be considered liquid (Bank of International Settlements [BIS], 2018). That is, long-term domestic debt securities issued by the Malaysian "General Government" (as *per* the BIS's 2012 new definition for its domestic debt securities data) amounted to USD166.0 billion (BIS, 2018, p. 223). While the size of the Malaysian domestic government bond market is within the range of USD100-200 billion, the parties holding Malaysian government bonds tend to be institutional investors, which include Malaysia's state pension fund, the Employees Provident Fund, who typically holds these bonds to maturity (Bank Negara Malaysia, various years). In fact, Sahay *et al.* (2015), in their extensive report on various countries covering the period 2009-2013, commented that the Employees Provident Fund represented a "key institutional investor with assets at 60 percent of GDP" (p. 20).

In addition, there are numerous pertinent issues that need to be dealt with when countries look to develop their own bond markets. In the case of developing countries that made relatively recent transition to modern economies, that could mean dealing with underdevelopment of market-supporting institutions that are necessary to oversee and support financial markets (Eichengreen & Luengnaruemitchai, 2004; 2006; Essers *et al.,* 2015). Also, accounting standards in emerging economies may be lower than those in a developed economy. Higher accounting standards can help ensure greater transparency and stronger corporate governance among bond issuers. These factors may impact on the creditworthiness of bond issuers as well as the level of risks to which bond investors are exposed (Eichengreen & Luengnaruemitchai, 2004; Harwood, 2000; La Porta *et al.*, 1997).

Furthermore, these countries may need to look into the structure and management of their financial systems. This will be reflected by the degree of competition among their financial institutions, the quality of prudential supervision and regulation of their financial authorities, the existence of a well-defined yield curve, availability of institutional investors and credit rating agencies, adequacy of trading, and settlement and clearing systems in the particular country (Edwards, 2005; Eichengreen & Luengnaruemitchai, 2004; 2006; Hale, 2007a; Harwood, 2000; Keller, 2005; Schinasi & Smith, 1998).

While the government bond market is an important foundation for corporate bond market, governments should not crowd out the private sector from investment (Harwood, 2000; World Bank & IMF, 2001). Still, a government benchmark is ideal as other alternatives are usually not available in emerging markets. "Interest rate structures tend to be skeletal, particularly after one-year maturities, and few high-quality credit alternatives exist" (Harwood, 2000, pp. 13-14).

Governments in Malaysia and other Asian countries could add impetus to the development of their bond markets by replicating the process of how US corporate debt markets achieved their success. According to Schinasi and Smith (1998), the main factors behind the success of US corporate debt markets were: a well-functioning money market; balanced and well-defined supervisory and regulatory system; sufficient infrastructure in the primary and secondary markets; increasing the number of market participants so that market power in the financial industry was limited; and developing a broad investor base.

Ensuring a government benchmark was important as suggested by another study looking into the pre-requisites for development of the local corporate bond market (Luengnaruemitchai & Ong, 2005). The study also touched on the importance of benchmarking, corporate governance and disclosure, credit risk pricing, availability of reliable trading systems, and the development of hedging instruments. These core aspects were key to improving the breadth and depth of corporate bond markets. Also, demand and supply of corporate bonds were dependent on factors such as investor base, government policies on issuance process and related costs as well as taxation regime (Bae, 2012; Luengnaruemitchai & Ong, 2005; World Bank & IMF, 2001). As regards the taxation regime, it should be noted that taxes can change relative costs of different products (Bae, 2012; Harwood, 2000). While bonds do not need preferential treatment to compete with alternative products such as bank loans and equity, they cannot operate at a disadvantage. Governments need to pay attention to the impact of stamp duties, transaction taxes *etc.* or bonds may not be able to compete.

The sequencing of reforms was also crucial to overall market development although there was no single optimal development strategy suitable for all countries (Harwood, 2000; Luengnaruemitchai & Ong, 2005). While there may not be a single optimal development strategy that would suit every emerging economy, as a general

rule, a gradual and complementary approach would be beneficial. However, in moving to develop corporate bond markets as the next step once government bond markets have been established, the development of "well-functioning money markets" as a "critical first step" was the view expressed by Harwood (2000), Luengnaruemitchai and Ong (2005), and Schinasi and Smith (1998). Money markets would provide an anchor for the short-end of the yield curve, thereby serving as a benchmark for pricing other fixed-income securities that differed in terms of liquidity, maturity and credit quality. Essentially, these short-term markets served as catalyst for the development of longer-term debt markets.

2.2.4 Trends in Bond Markets in Recent Decades

Overall, there have been developments in recent decades in bond markets globally. A study group of BIS found in 2001 that there was a remarkable shift underway in the world's major bond markets. The relative supplies of government and non-government bonds have shifted rapidly in the years preceding 2001, as governments in the US and some other countries began paying down their debt. However, the Japanese government issued record amounts of bonds (BIS, 2001). During that decade, bond issuance by corporations and other non-government borrowers also surged. Such shifts in supply and earlier episodes of stress in financial markets encouraged market participants to explore the suitability of other instruments as benchmarks and hedging instruments in financial markets. The process of adjustment was such that a range of non-government debt securities emerged to perform the functions traditionally fulfilled by government securities (BIS, 2001).

In the years following the Asian financial crisis, countries in the region concentrated on diversifying and deepening their financial markets, including developing their bond markets. Many of these Asian economies achieved notable

results (Burger, Warnock & Warnock, 2015; Didier, Hevia & Schmukler, 2012; Gyntelberg, Ma & Remolona, 2005; Mu, Phelps & Stotsky, 2013; Park, 2016). For example, in Malaysia, the corporate bond market had overtaken the government bond market, accounting for 52 percent of total outstanding bonds in 2005 (Committee on the Global Financial System 2007, p. 60). By end 2008, the Malaysian bond market had grown to RM524 billion, almost four times its size at end 1997 (Bank Negara Malaysia & Securities Commission, 2009, p. 1). Accordingly, with the help from better diversified and deeper financial markets that provided the necessary funds for fiscal stimulus packages, these Asian economies managed to pull through the 2007-08 global financial crisis (Burger, Warnock & Warnock, 2012; Mu *et al.*, 2013; Park, 2016). In fact, Park (2016) noted that between 2008 and 2015, total issuance of local currency bonds by emerging economies in Asia almost doubled due to strong demand from foreign investors.

Turner (2012) found evidence that developing economies in Asia and Latin America fared better during the global financial crisis due to development of their domestic bond markets in the years preceding the global crisis. Their respective domestic bond markets enabled the governments to reduce their foreign borrowings or international bond issuance while increasing the issuance of local currency government bonds at longer maturities. However, Didier *et al.* (2012) disagreed that developing economies performed better than the developed economies during the global financial crisis. Nevertheless, they acknowledged that certain countercyclical policies including promoting local currency and long-term bond markets, and adopting more responsible monetary policies helped the emerging economies weather the global crisis better.

2.3 Asian Financial Crisis: Lessons and Remedial Action

Given the breadth of the Asian financial crisis with five countries – Malaysia, Indonesia, the Philippines, South Korea, and Thailand – as the main victims, this section on the Asian crisis will discuss the issues and impacts based mainly on Malaysia's experience. Confining the length and scope of the discussion to Malaysia is to facilitate a more in-depth exploration of the problems Malaysia faced, including the lack of a well-diversified financial system. This will better serve as a background for the following chapters of this study.

2.3.1 Crisis Reveals Over-Dependence on Banks

While efforts in the late 1980s and much of the 1990s to develop Malaysian domestic bond market had borned results, the 1997-98 Asian financial crisis and its concomitant effects on the Malaysian economy highlighted the need for further development of the domestic bond market. Despite the progress made in the Malaysian domestic bond market, it was still relatively underdeveloped to meet the nation's funding requirements. In fact, a big portion of funding for Malaysia's privatization and infrastructure projects during the 1980s and 1990s was met by short-term bank borrowings. When the 1997-98 crisis hit, the corporate sector was badly affected in the resulting liquidity crunch arising from the serious mismatch of long-term financing requirements and short-term bank borrowings (Bank Negara Malaysia, 1999a).

Goldstein (1998) considered banking sector exposure to the property sector as a useful indicator in predicting banking crises. Goldstein noted that in many of the crisis-affected Asian countries, estimates of the share of bank lending to the property sector were in excess of 25 percent. The Malaysian banking sector was heavily exposed to the broad property sector (December 1996: 31.4 percent of total loans), consumption credit

(12.5 percent) and purchase of stocks and shares (7.4 percent), built up in the years prior to the 1997-98 crisis (Bank Negara Malaysia, 1998, p. 75 & 137). Athukorala (2001a) also commented that rapid loans growth to the Malaysian property sector resulted in a bubble in that sector.

Besides the above problems affecting the Malaysian banking sector, one could discern other worrying trends within the banking sector. Between 1992 and 1994, total loans growth averaged 12.2 percent *per annum*. However, loans growth was a hefty 28.6 percent in 1995 and 26.7 percent in 1996. In early 1997, before the Asian financial crisis erupted, monthly total loans growth (year-on-year) was over 30 percent (Yap, 1999, p. 3). Accordingly, Malaysia's heavy reliance on its banking sector to meet the country's financing needs was reflected by its ratio of banking sector loans to GDP rising from just above 100 percent in the period 1992-94 to 145 percent in 1997 (Ariff & Yap, 2001, p. 312). Gourinchas and Obstfeld (2012) noted that, over a three-year horizon, a rapid expansion in bank loans was a key predictor to financial crises, including currency crises. They stated that another significant predictor was real currency appreciation. This was also observed in the currencies for Malaysia and the other Asian financial crisis victims (*e.g.* Athukorala, 2001a; Goldstein, 1998).

As the crisis unfolded, the Malaysian economy slumped and net non-performing loans ratio for the Malaysian banking system more than doubled from 4.1 percent of total outstanding loans at end 1997 to 9.0 percent at end 1998 (Ariff & Yap, 2001, p. 323). This resulted in banks moving to protect their balance sheets and pulling back from extension of new loans, eventually cutting off credit to viable or healthy businesses. In fact, loan growth slowed to just 1.3 percent at end 1998 (Bank Negara Malaysia, 1999a, p. 586). This was in sharp contrast to the years 1995-97 when loans growth averaged some 29 percent *per annum* (National Economic Action Council, 1998, p. 13). The sharp recession suffered by the Malaysian economy in 1998, when

GDP contracted by 7.4 percent (Ministry of Finance, 2001), could have been mitigated by having better diversified financial markets with the domestic bond market reducing any over-dependence on the banking sector for financing.

Using Thailand as a case study, Herring and Chatusripitak (2000) highlighted Thailand's excessive dependence on its banking sector, in the absence of a well-developed bond market. As at end 1996, just before the Asian financial crisis began, external financing from its banking sector was equal to 100 percent of the country's GDP while outstanding domestic corporate debt issues was just 3.9 percent of GDP. This trend could also be seen in the other countries badly affected in the Asian financial crisis, although to a lesser extent than Thailand's. Bhattacharyay (2013), Eichengreen and Luengnaruemitchai (2004), and Herring and Chatusripitak (2000) were of the view that developing bond markets could help lengthen the tenure of debt *via* placements of domestic bonds, thereby limiting maturity mismatches on corporate (and also banking) balance sheets.

Additionally, Hanna (2000) noted the indebtedness of countries in the region to international banks as well as domestic ones, with Malaysia, South Korea and Thailand having total debt to GDP ratios of about 200 percent while Japan's was nearly 300 percent (pp. 49-50).[4] However, given the short-term nature of bank loans, the disruptive credit crunch in the wake of the Asian financial crisis resulted in serious damage to the balance sheets of indebted corporations, even pushing many to bankruptcy or the brink of it (Eichengreen & Luengnaruemitchai, 2004). As Hale (2007a) pointed out, loan contracts carried covenants that enabled banks to pull back their financing with relatively short notice, thus raising the likelihood of liquidity crises and financial contagion.

[4] In Hanna's study (2000), total debt included external and domestic debt. To avoid double counting, the foreign debt of the banking system was netted off based on the assumption that these foreign borrowings were on-lent domestically.

Kaminsky and Reinhart (2001) noted that earlier literature had ignored the role banks played in transmitting disturbance across countries. In the Asian financial crisis, the turmoil erupted in Thailand, but soon spread to the other four crisis-affected countries, namely Malaysia, Indonesia, the Philippines and South Korea. Prior to the onset of the crisis, for much of the 1990s, international capital had been pouring into many Asian countries, in particular Malaysia, Indonesia and Thailand. According to Bank Negara Malaysia (1994b), it was dealing with increasingly large capital flows into Malaysia during this period. Such capital inflows, which included short-term funds, spiked in 1993-94.

A big share of these capital inflows into Asia was in the form of bank lending, especially in the two years preceding the crisis. According to Hanna (2000), from 1995 to mid-1997, external claims on Asia of reporting commercial banks to the BIS rose an additional USD203 billion, which corroborated what Kaminsky and Reinhart (2001) said. Furthermore, during 1989-94, Hanna's study found reporting banks' external claims on Asia had grown from USD141 billion to USD372 billion (p. 49). In the case of the Asian financial crisis, it was also aggravated by the fact that debt contracts in emerging markets were of very short duration, "typically less than one month" (Mishkin & Eakins, 2009, p. 394).

According to Kaminsky and Reinhart (2001), the main reason behind this surge was a big expansion in credit from the Japanese banks, which had been left with surplus funds due to a slumping Japanese economy and little domestic loan demand at home. A second reason was the drive by European banks to expand their market share in emerging markets, especially in South Korea. When the Asian crisis was triggered, the Japanese banks were the first to pull out of emerging Asia and their lending fell 10 percent in just six months (June to December 1997). Between June 1997 to December 1998, Japanese bank lending to emerging Asia had plunged 24 percent, which translated

into a massive USD26 billion drop (Kaminsky & Reinhart, 2001, pp. 77-79). The Asian financial crisis also prompted calls for reforms to international capital markets (see *e.g.* Krugman, Obstfeld & Melitz, 2015).

Likewise, Hanna (2000) showed that when the Asian crisis began, there was a sharp reversal of flows by reporting banks to the BIS. Within a nine-month period (from July 1997 to March 1998), USD63 billion left Asia. In a subsequent 12-month period (second half of 1998 and first half of 1999), a further USD270.5 billion was withdrawn from the Asian region (p. 49).

In contrast to the three decades after World War II when default crises were rare, major default crises have occurred more frequently since 1970s as international capital flows grew (Krugman *et al.*, 2015, p. 713). Sachs and Woo (2000) said that the Asian financial crisis was "characterized by an abrupt and significant shift from net capital inflow to net capital outflow from one year to the next" (p. 17). Hanna (2000) attributed the crisis to the "massive outflow of capital after June 1997 that reversed an equally massive capital inflow in the preceding three years" (p. 49). Globally, cumulative current account balances for developing countries for the period 1990-98 amounted to USD522.7 billion (Krugman *et al.*, 2015, p. 710). Of concern, growing international capital flows have increased debt levels of such developing countries to almost USD7 trillion in gross terms as at end 2013 (p. 709).

2.3.2 Crisis Spurs Research into Development of Bond Markets

An important lesson from the Asian financial crisis was that Asian countries needed better diversified financial systems, including more developed bond markets to reduce excessive dependence on their banking systems. The existence of deep and liquid bond markets to complement the banking systems in the Asian economies would

help alleviate the disruption and distress from future financial crises. There was a need for more research into development (or lack thereof) of Asian bond markets (Bhattacharyay, 2013; Burger *et al.*, 2012; 2015; Burger & Warnock, 2006; Eichengreen & Luengnaruemitchai, 2004; 2006; Harwood, 2000; Luengnaruemitchai & Ong, 2005; Mihaljek *et al.,* 2002; Turner, 2002).

Eichengreen and Luengnaruemitchai (2004) delved into the reasons behind the slow development of Asian bond markets. Their study covered the period 1990-2001 and was based on annual frequency bond market capitalization data for all 41 countries made available from the BIS.[5] Bonds in this study included only domestic-currency bonds issued by residents in the respective countries and targeted to local investors, which is the same as the focus of this study. Those 41 countries included, among others, those in Asia, Latin America, Central Europe and developed countries. Besides Malaysia, other Asian countries or economies in the study were China, Hong Kong, Japan, Singapore, South Korea, and Thailand.

Meanwhile, the study by Bhattacharyay (2013) on East Asian bond markets and their determinants was based on a sample group of 10 countries. Covering the period 1998 to 2008 based on data from Asian Bonds Online,[6] Bhattacharyay's study included Malaysia, China, Hong Kong, Indonesia, Japan, the Philippines, Singapore, South Korea, Thailand and Vietnam.

Figures quoted in Eichengreen and Luengnaruemitchai (2004)'s study showed that as at end 2001, bond market capitalization (sum of corporate, financial institution and public-sector issues) for Emerging Asia, which included China, Hong Kong,

[5] While the study by Eichengreen and Luengnaruemitchai (2004) was on Asian bond markets, the authors acknowledged that their data from the BIS included both long-term and short-term debt securities (Footnote No. 6, p. 5). This is discussed further in Chapter 4 of this study.

[6] Data on "local currency bonds outstanding" from Asian Bonds Online are split into "government" and "corporate" bonds. Government bonds comprise those issued by the "central government, local governments and the central bank". Bonds issued by corporates "comprise both public and private companies, including financial institutions". https://*asianbondsonline.adb.org/data-portal/*

Singapore, South Korea as well as Malaysia, was 45 percent of GDP, compared with 39 percent for all emerging economies and 139 percent for developed countries (which included Japan). Group averages masked considerable differences across countries in the same regions. Looking at data for 2008, Bhattacharyay (2013) also commented that corporate bond market capitalization to GDP ratios differed greatly across the East Asian economies.

However, looking at the split in domestic external financing between bonds, bank loans and equity markets as at end 2001 for the sample countries, Eichengreen and Luengnaruemitchai (2004) found that Asia relied less on bond markets and more on bank loans than other emerging regions. Share of bond financing in total external financing was 14 percent for Asia, 26 percent for Latin America and 34 percent for Emerging Central Europe. However, share of bank loans was 55 percent for Asia, 38 percent for Latin America and 48 percent for Emerging Central Europe.

The above pattern in Asia underscored the point made by Herring and Chatusripitak (2000) that over-dependence on the banking sector in an economy would result in underdevelopment of its bond market. Nevertheless, loans growth in the post-crisis years for Malaysia slowed to an average of 5 percent *per annum* between 1998 to 2007 (calculated based on figures from Bank Negara Malaysia website),[7] in line with the behaviour of banks reallocating their asset portfolio away from loans in the aftermath of a banking crisis (Demirguc-Kunt, Detragiache & Gupta, 2000).

Eichengreen and Luengnaruemitchai (2004) concluded that underdevelopment of Asian bond markets reflected a confluence of various factors. These included, among others, structural characteristics of the Asian economies such as their size, openness and location, their developmental stage, origin of their legal systems as well as

[7] https*://www.bnm.gov.my/index.php?ch=statistic*

macroeconomic policies. Some of these factors may be difficult to change, especially size of their economies (Eichengreen, Hausmann & Panizza, 2002).

Despite the differences in the studies by Eichengreen and Luengnaruemitchai (2004) and Bhattacharyay (2013), including data sources, study period and slightly different sample groups of Asian economies, the overall findings on determinants of bond market development were compatible. Both studies suggested that the size and openness of the economies, level of economic development and size of the banking sector had a positive impact on bond market development. Also, excessive variability in interest rates and exchange rates had a negative effect on bond market development. However, both studies acknowledged that the handicap in terms of the small size of Asian economies could be partly overcome through regional initiatives (see Section 3.5 on regional collaboration). Park's study (2016), on 10 Asian economies,[8] was based on data from Asian Bonds Online for the period Q1, 1996 to Q4, 2015. The study found that better macroeconomic performance, in terms of faster economic growth and lower inflation, and a well-developed banking sector and better institutions all contributed positively to local currency bond market development.

A subsequent study (Eichengreen & Luengnaruemitchai, 2006), which looked at Asian bond markets (including Malaysia's) in terms of financial integration with other regions, was done using data for the period 2001-03 in their gravity model. This study found that, as expected, Europe was more financially integrated than the other regions. However, Asia had made significant progress on this front when compared with Latin America and other regions. The improvement in Asian bond markets was attributed to stronger creditor and investor rights, improved contract enforcement and greater transparency. These factors, all of which were conducive to intraregional cross holdings

[8] They were China, Hong Kong, India, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Thailand and Vietnam.

of Asian bonds, also boosted foreign participation in local bond markets. Eichengreen, Borensztein, and Panizza (2006), when comparing East Asia with Latin America, also noted that bond market development in East Asia benefited from certain factors, including better investor protection and greater savings.

Bae (2012) examined bond market development of 43 countries over the period 1990 to 2009. Unlike some previous studies, Bae looked into the determinants of bond market development by separately analyzing the different segments of the domestic or local currency bond market, namely government, corporate and financial segments. This was done as Bae considered the various segments with "substantially different" characteristics (abstract). Covering 23 advanced economies and 20 emerging markets (including Malaysia in the latter grouping), Bae found that the level of economic development, as proxied by GDP per capita in the study, was the most important determinant for all three types of bonds. In addition, Bae's study showed that local currency or domestic government bond markets were positively related to the other important determinant in the study, namely fiscal deficits, in line with various other studies (Eichengreen & Luengnaruemitchai, 2004; Essers *et al.,* 2015; Mu *et al.,* 2013).

Concentrating credit intermediation on banks, which tend to be highly leveraged entities, makes an economy more vulnerable to crises. Better developed bond markets, resulting in more complete financial markets, would have helped to reduce the currency, interest rate and funding exposures that precipitated the Asian financial crisis (Harwood, 2000; Herring & Chatusripitak, 2000). The absence of bond markets usually means firms have to finance the acquisition of long-term assets by incurring short-term debt (for example, *via* bank intermediation), thereby exposing them to significant mismatches between their assets and liabilities (Bhattacharyay, 2013; Pettis, 2000). While it is difficult to determine if a market-based or bank-dominated financial system is better, it is likely a more diversified financial system would mitigate a country's

vulnerability to systemic risk (Luengnaruemitchai & Ong, 2005). Also, the damage from such crises on the real economies can be higher and the bank restructuring process more difficult without a well-functioning bond market (Herring & Chatusripitak, 2000; Turner, 2002).

2.3.3 Currency Mismatch Adds to Crisis Severity

Prior to the crisis, many borrowers in Asia relied on short-term, foreign currency funding due to their buoyant economies and strong local currencies. In that situation, the borrowers gained a two-fold benefit when their revenues and assets increased (tied to the rising fortunes of their economies and local currency) while their liabilities fell (as the local currency strengthened). Issuers of international bonds would also benefit in a similar manner. However, as the Asian financial crisis unfolded, the reverse happened. The borrowers (including issuers of international bonds) suffered a double hit to their net worth as liabilities rose and assets fell (due to weakening of the local currency). Hence, if countries had sizeable issues of international bonds, currency mismatch can have serious consequences during crises, similar to problems caused by foreign loans (Bhattacharyay, 2013; Eichengreen & Luengnaruemitchai, 2004; Hale, 2007a; Herring & Chatusripitak, 2000; Pettis, 2000).

The solution to this problem lies in developing domestic bond markets as issuing local currency bonds would enable issuers (who are issuing local currency bonds) to lock in both interest rates and local currency funding. This would ensure a funding structure with a neutral effect on net worth of the issuers in an economic downturn (Bhattacharyay, 2013; Burger *et al.*, 2015; Pettis, 2000). However, the IMF (2015) pointed out that during times of financial turbulence, tenures of bond issuance will be shortened.

Hale (2007a) noted that during the lending boom of the 1990s, public and private borrowers in emerging markets borrowed heavily from foreign banks as well as actively issued international bonds. [9] However, convincing potential borrowers during good times that economic fortunes could reverse may not be an easy task. On the positive side, it should be noted that foreign bank lending has the ability to reinforce financial stability, when it is countercyclical (Gadanecz, 2005). Nevertheless, the Asian financial crisis showed that, on the down side, such foreign lending had the tendency to distort credit allocation or amplify asset price cycles (Ariff & Yap, 2001; Athukorala, 2001a; Sachs & Woo, 2000).

Worth noting is a study on the development of 49 local bond markets by Burger and Warnock (2006), covering developed as well as developing countries or economies, which included Malaysia. They found strong evidence that countries with better inflation performance,[10] possibly the result of more stable monetary and fiscal policies, had larger local currency bond markets and relied less on foreign currency bonds. Their study also indicated that countries with stronger institutions (high score on rule of law) had broader local currency bond markets and those countries with stronger creditor rights relied less on foreign currency bonds. They concluded that emerging economies were "not inherently dependent on foreign currency debt" (p. 144). Furthermore, Burger and Warnock (2007) and Burger *et al.* (2012) found that countries adopting more responsible macroeconomic policies with improved economic performance also benefited from higher foreign participation in their domestic bond markets. Rose (2014), who examined countries with inflation-targeting as their monetary strategy or

[9] According to Hale (2007a), it was noted that the two foreign debt instruments – bank loans or bonds – had their advantages and disadvantages when it came to restructuring the debt. However, for the purpose of this chapter, it is sufficient to be cognizant of the problems caused by significant currency mismatches between the assets and liabilities (either foreign loans or international bonds) of the borrowers or issuers.

[10] The variable used was inflation variance (the variance of the inflation rate over the past 10 years) as a measure of whether the country's policies had been creditor-friendly. The study was carried out using bond data as of end 2001.

policy, found the existence of local currency bond markets contributed to lower inflation by some 3-4 percent.

In the study by Mihaljek *et al.* (2002), the authors also considered the trade-off between international and domestic bonds. That is, the development of domestic bond markets was expected to enable the public and private sectors to reduce international bond issuance. For their sample of 21 economies as a whole (which included Malaysia), domestic and international bond issuance were negatively correlated (coefficient of correlation was -0.4). When public sector and private sector securities were considered separately, domestic and international bond issuance were also negatively correlated, with the coefficient of correlation in both cases being -0.3. That is, the development of local bond markets would help reduce the reliance on international bond issuance, which is supported by studies by Bhattarcharyay (2013), Burger *et al.* (2012; 2015), Burger and Warnock (2006; 2007), Eichengreen and Luengnaruemitchai (2004), and Park (2016).

Furthermore, it has been shown that by improving policy performance and strengthening institutions, economies could develop their local currency bond markets, reduce their currency mismatch and lessen the likelihood of future financial crisis. As at end 2011, Burger *et al.* (2015), in their study of 43 economies covering both advanced and emerging economies, noted that some 91 percent of bonds issued by the advanced economies and 87 percent by emerging economies were local currency bonds (p. 7). Park (2016) noted that Asian local currency bonds had emerged as a new class of investment assets due to greater demand from investors in the period following the global financial crisis.

2.3.4 Post Crisis Sees Bigger Fiscal Deficits: Case of Malaysia

Finally, to counter the effects of the Asian crisis on the Malaysian economy, the government had to undertake countercyclical measures beginning 1998. As a result, Malaysia has registered overall fiscal deficits since 1998. This was in contrast to the five years of balanced or surplus budgeting for 1993-97 by the Malaysian government (Ministry of Finance, 1998). In fact, between 1998 to 2011, Malaysia registered persistent fiscal deficits, averaging 4.6 percent of GDP, or some RM24 billion *per annum* (Bank Negara Malaysia, various years). Fiscal deficits between 1998 and 2011 totalled some RM340 billion. The fiscal deficit had reached a high of 6.5 percent of GDP in 2001 (Ministry of Finance, 2001). This trend of growing fiscal deficits from sharp increases in government spending after the Asian financial crisis is in line with past studies by Borio, Lombardi and Zampolli (2016), and Reinhart and Rogoff (2013), where government debt can rise substantially following financial crises.

Since the *raison d'être* for developing bond markets is to help governments fund their budget deficits in a non-inflationary way, it is worth studying what impact, if any, Malaysia's sizeable fiscal deficits have had on the development of its domestic bond market. In financing its deficits, the Malaysian government has traditionally favoured non-inflationary domestic sources (including Malaysian Government Securities) with some borrowings raised from external sources (*e.g.* Ministry of Finance, 1998).

Eichengreen and Luengnaruemitchai (2004) found that stronger fiscal balances were inversely related to bond market capitalization. That is, budget deficits were a significant determinant of public bond market capitalization, but not private bond capitalization. It would appear that public-sector deficits do not encourage private bond issuance. Likewise, Burger and Warnock (2006) found that "a tendency to run fiscal deficits" was associated with larger government bond markets, but had no influence on

the size of private bond markets (p. 142). When commenting on a possible trade-off between the size of government bond markets and crowding-out in the private bond market, McCauley and Remolona (2000) highlighted Japanese issuance of domestic corporate bonds for 1998 was a record high even as the country's government bond market became the world's largest, on the back of continued fiscal deficits. However, they also noted that reduction in the issuance of government debt in the 1990s in the US and Europe was accompanied by a noticeable increase in corporate debt issues.

In Malaysia's case, with the expressed preference of the Malaysian government to depend on mainly domestic sources to finance government development expenditure and debt, the nation's fiscal deficits would likely have resulted in growing issuance of domestic government bonds. Nevertheless, it will be useful to study the impact of Malaysia's fiscal deficits on its private bond market and see how its experience compares with past studies that fiscal deficits have no impact on private bond markets.

2.4 Bond Markets alongside Developed Banking Sectors

2.4.1 Dominance of Banking Sector in Malaysia

Like many emerging economies, Malaysia's financial system is dominated by its banking sector. In fact, as early as 1954, the International Bank for Reconstruction and Development (1955), in its mission to Malaya (as it was known then), found that there was already "a relatively well-developed banking system and banking habits" (as cited in Securities Commission, 2004, p. 6).

At the time of establishment of the Central Bank of Malaya in 1959, the country already had a total of 26 commercial banks, of which 18 were foreign. There was a network of 111 branch offices nationwide, which were concentrated in the main

population hubs. Their primary business was in financing international and domestic trade as well as providing working capital to the larger firms (Ahmad & Rosly, 1994; Bank Negara Malaysia, 1994a, p. 140). In view of the dominance of the Malaysian banking sector and its long presence in the country, the development of the Malaysian domestic bond market would have been influenced by the sizeable Malaysian banking sector. It will be useful to investigate if the overall effect was positive or negative.

Between 1988-97 when the Malaysian economy experienced robust growth, the banking sector was the major source of financing for the local economy. In fact, when the Asian crisis erupted in 1997, the ratio of bank loans to GDP for Malaysia was a hefty 145 percent (Ariff & Yap, 2001, p. 312). Total loans growth averaged 19.2 percent *per annum* during this period (Bank Negara Malaysia, 1999a, p. 405). During this period, the ratio of net funds raised in the capital markets to loans extended by the banking sector stood at an average of 0.6, which meant bank loans extended were some 67 percent higher than net funds raised in the capital market (p. 303).

2.4.2 Bond Markets and Banks: Competitors or Complements?

Since both bond markets and banks essentially serve a similar function – providing finance – in the economy, there is concern that bond markets could take away business from the banks. That is, countries seeking to develop their bond markets may need to carefully consider any possible negative impact on their banking sectors. On the other hand, well-developed bond markets confer benefits, including providing firms with a more stable source of financing, eventually making firms less vulnerable to weaknesses in the banking system. Furthermore, banks also stand to profit in developing a private bond market since they rank among the most important issuers, holders, and dealers. Banks are also the advisers, underwriters, guarantors, trustees,

custodians and registrars in this market (Harwood, 2000; Hawkins, 2002; World Bank & IMF, 2001).

Similarly, Eichengreen *et al.* (2006) suggested that bond market development was encapsulated within the financial development of a country or economy. Hence, it was reasonable that bond markets and banking sectors would develop side by side. Mu *et al.* (2013) suggested that bond markets and banks complemented each other since bond markets were better suited at meeting longer-term needs such as financing government deficits and infrastructure development as well as longer-term capital for companies or private entities, while banks were better positioned to provide shorter-term financing to companies or private entities, including working capital.

Various studies have argued about the relationship between domestic bond markets and the banking sectors, based on numerous reasons. Studies that gave weightage to the banking sector being the traditional force behind the development of financial markets, have suggested that banks would exert a negative impact on the growth of domestic bond markets (Bentson, 1994; Rajan & Zingales, 2003; Schinasi & Smith, 1998). In fact, Sharma (2001), in a study on the constraints on development of corporate bond markets in South East Asia, found close and sometimes interlocking ties between political parties and groups controlling banks and conglomerates in Malaysia, Indonesia and Thailand. In turn, such relationships resulted in heavy reliance on bank loans as a source of external finance by companies in these countries.

Maeda and Sakai (1998) constructed a model for a possible but likely infrequent event, whereby a number of distressed banks moving quickly to dispose of their bond holdings could trigger a bond market crash. In turn, the bond market crash could set off a banking crisis, *via* widespread failure of banks already burdened with weakened portfolios. However, the authors considered such an event unlikely and precipitated

only by troubled banks. A well-diversified financial sector with a sound banking sector and orderly domestic bond market should prevent any such financial turmoil (Harwood, 2000; Hawkins, 2002). Furthermore, in subsequent stages of bond market development, as in Japan after 1993, the entry of banks into the bond underwriting market led to lower costs of issuing bonds by Japanese corporates, thereby aiding bond market development (Takaoka & McKenzie, 2006).

Notwithstanding the above, bond markets could erode banks' market share of lending activities as the former become well developed (Das, 2003). For example, US corporate bond markets, considered most developed globally, have supplanted their domestic banks in a substantial portion of lending activities. In fact, this has occurred to some extent in Malaysia in the period since the Asian financial crisis. According to Bank Negara Malaysia (2011a), corporate debt securities accounted for almost 60 percent of total corporate financing as at end 2010, up from some 46 percent in 2001 (p. 56). Possibly arising from this shift, the banking sector has changed focus to concentrate on households in Malaysia. In fact, this shift by the banks was noted earlier by Goh and Hooy (2008), who commented that the proportion of bank loans for residential property and consumption credit doubled from 1996 to 2006. They attributed the banking sector's diminished role in providing capital to the large corporates as a result of the Asian financial crisis and further development of the Malaysian capital market. Regionally, Park (2016) noted a similar trend with corporate bonds playing an increasingly important role in corporate financing.

Indubitably, bond markets can take good lending business away from banks. In general, companies that choose to issue bonds rather than take loans are more highly rated (Harwood, 2000; Hawkins, 2002). Except in the US, where there is a well-developed market for lower-rated ("junk") bonds, most investors prefer to buy securities issued by "blue-chip" companies (Hawkins, 2002, p. 44; Gyntelberg *et al.*, 2005). In

Malaysia, in the initial stages of developing its corporate bond market, only highly-rated companies were allowed to issue bonds. Subsequently, the cut-off rating requirement was gradually lowered (Securities Commission, 2004, pp. 162-168).

Although some economists are of the view that competition from a well-established banking sector could inhibit the development of bond markets, various cross-country studies, some of which included Malaysia, have found that countries with better developed banking sectors also had better developed bond markets (that is, both public and private bonds). For example, the study on 41 economies, including Malaysia, by Eichengreen and Luengnaruemitchai (2004) found the size of banking sector had a positive effect on total bonds and private bonds while Bhattacharyay (2013)'s study on East Asian economies noted the positive impact of the banking sector on total and government bonds. Claessens, Klingebiel and Schmukler (2007) found a positive association between well-developed financial systems, proxied by bank deposits and equity market capitalization, with domestic bond markets. The study by Mu *et al.* (2013), which was carried out on 36 countries in sub-Saharan Africa with data from 1980 to 2010, found a positive relationship between the size of the banking sector with the corporate bond market, but not the government bond market. Meanwhile, Bae (2012), in a study covering 43 economies, noted that a well-developed banking sector contributed positively to development of government bond markets and especially to private bond markets. Overall, their findings lent support to banks and bond markets being complements rather than substitutes.

Notwithstanding the above findings, it may be simplistic to assume the relationship between bond markets and banks is purely competitive in nature or wholly synergistic. Their actual relationship is likely to be a result of a more complex blend of competitive as well as complementary forces at work. In fact, Song and Thakor (2010),

in their examination of the architecture of financial systems,[11] noted that there has been no strong empirical evidence that capital markets, including bond markets, and banks always competed. In their review of existing literature on the relationship between capital markets and banks, they noted that in developed countries such as Germany, Japan, the UK and the US during the period 1960 to 2003, capital markets and banks mostly complemented each other, with the exception of "occasional spurts of competition" (p. 1022). This suggested that over the longer term, the banks and capital markets in those economies impacted each other positively. However, for certain brief time periods, they may have competed actively, resulting in a negative relationship during those spells.

The authors stated that previous studies had considered the competition and complementarity angles only. Their study, which was on the co-evolution of capital markets and banks, was extended to cover securitization by banks and bank capital, two aspects that they said were not covered in previous work done on the relationship between capital markets and banks. With banks undertaking securitization to assist companies in accessing capital markets to raise funds in an efficient manner, the authors stated that the interaction between banks and capital markets would be elevated beyond mere complementarity to co-evolution. At this higher level of co-evolution, both capital markets and banks stood to benefit. In addition, as capital markets developed, they enabled banks to raise equity capital in the markets more efficiently and at lower costs. Eventually, enabling the banks to serve a growing number of borrowers, even higher-risk borrowers. Thus, by extending their study to cover aspects of securitization as well as easier access and cheaper cost of raising bank capital, Song and Thakor demonstrated that over a sufficiently long period, capital markets, including domestic bond markets,

[11] In their study on architecture of the financial system, Song and Thakor (2010) defined the phrase as the relative roles of the banks and financial markets in an economy.

and banks not only competed with or complemented each other, but co-evolved to derive mutual benefits.

When investigating the relationship between bond market and banking sector development, Burger and Warnock (2006) found the necessary conditions for bond market development, such as creditor-friendly policies and laws, were similar to those fostering development of the banking system. That is, countries with bigger bond markets tended to have bigger banking systems. Since bond market and banking system development appeared to be "so closely related", Burger and Warnock (2006) concluded that "financial literature might benefit from a shift in focus to debt[12] versus equity rather than the current focus on bank-based versus market-based systems" (p. 144). In Chapter 7 of this study, an attempt is made to analyze the potential determinants of the Malaysian banking sector and private financing. For the analysis in Chapter 7, private financing is defined as bank loans plus corporate bonds, in line with the debt instruments analyzed by La Porta *et al.* (1997).

2.4.3 Possible Impact from Concentrated Banking Sector

In Eichengreen and Luengnaruemitchai (2004), disaggregating the data showed that size of the banking system mattered to the capitalization of the private debt markets. That is, there was evidence of complementarities between development of the banking system and development of the private bond markets. However, their study also pointed to countries with concentrated banking sectors having smaller bond markets. This finding was consistent with views that banks with market power may use it to discourage bond flotations. In fact, some studies (including Bentson, 1994; Rajan & Zingales, 2003; Schinasi & Smith, 1998) suggested that banks with market power

[12] Comprising bonds and bank lending.

could hinder development of corporate bond markets by strategically setting loan and deposit rates, thereby making it costly for firms to get financing from bond markets.

The definition of bank concentration by Eichengreen and Luengnaruemitchai (2004) followed that used in a study on links between bank concentration and financial crises (Beck, Demirguc-Kunt & Levine, 2003). That is, bank concentration was defined as the share of assets of the three largest banks in a country. The study on bank concentration by Beck *et al.* (2003), which covered 79 countries, including Malaysia, and 51 crisis episodes, showed that concentration levels can range from less than 20 percent for the US to 100 percent for many African countries. The study found that bank concentration reduced the fragility of the banking system. This may be accomplished by bigger banks and / or greater bank profits within concentrated banking systems. The suggestion of bigger banks as well as greater bank profits appeared to correspond to studies by Bentson (1994), and Schinasi and Smith (1998), where banks with market power may act to stifle the development of corporate bond markets. However, the study by Beck *et al.* (2003) also found some evidence that the stabilising effect of bank concentration was "weaker at higher levels of concentration" (p. 21).

Bae (2012) also suggested that higher levels of concentration within the banking sector could be a drag on bond market development and even development of the banking sector itself. The study found that in 2009, the five largest banks in China accounted for some 70 percent of the total assets of the country's 50 largest banks (p. 22). Furthermore, this percentage was over four times what was held by the next five largest banks (p. 22). According to Bae (2012), the high level of banking sector concentration resulted in a rather limited investor base.

2.5 Bond Markets alongside Developed Equity Markets

2.5.1 Malaysia Boasts of Vibrant Equity Market

During the 1993 and 1996 bull runs on the Malaysian equity market, its capitalization amounted to a staggering 375 percent of GDP in 1993 and 323 percent in 1996 (Ariff & Yap, 2001, p. 309). In addition to the local equity market's much longer history, it was also the more popular avenue for fund raising within the capital market for many years (Bank Negara Malaysia, 1999a). As such, it is useful to consider development of Malaysian domestic bond market in the presence of the large and vibrant Malaysian equity market.

As at end 2001, equity market capitalization to GDP for Malaysia was 132 percent, but the figure rose to 172 percent at end 2007.[13] More recently, its market capitalization to GDP was 141 percent and 149 percent for 2011 and 2014, respectively. Figures from Eichengreen and Luengnaruemitchai (2004) showed that as at end 2001, 36 percent of Malaysia's total external finance was from its equity market against 41 percent from its banks and 23 percent from its bond market. This figure of 36 percent was higher than the average for Asian economies (31 percent), Developed Countries (29 percent), Emerging European Economies (18 percent) and Emerging Markets as a whole (32 percent).

2.5.2 Key Difference between Bond and Equity Markets

According to Herring and Chatusripitak (2000), equity markets may thrive in environments with weak financial infrastructure while bond markets failed to develop. One of the reasons for this development was the difference between debt (including

[13] These ratios have been calculated from figures obtained from Bank Negara Malaysia's website: https*://www.bnm.gov.my/index.php?ch=statistic*

bonds) and equity contracts. Debt claims promised principal repayment and interest. The main challenge in pricing a bond was setting an interest rate that would compensate for, among others, the opportunity cost of funds, default, purchasing power and liquidity risk. Beyond these issues, Harwood (2000) stressed that developing bond markets was more complex than developing equity markets as the former actually needed more sophisticated market participants.

In environments with weak financial infrastructure, determining this interest rate may be rendered more difficult by: (1) Lack of a secondary market trading risk-free debt of comparable maturity that would add to the difficulty of identifying the appropriate opportunity cost of funds; (2) Lack of credible accounting, auditing and disclosure practices as well as reliable bond ratings that would hinder estimation of probability of default and expected recovery from liquidation or sale of firm in the event of default (Herring & Chatusripitak, 2000); and (3) Lack of clear laws on the bondholders' rights in the event of default, with weak mechanisms for enforcing such rights, or inefficient judiciary overseeing the enforcement of creditor rights (Burger & Warnock, 2006; Essers *et al.*, 2015; Herring & Chatusripitak, 2000).

In contrast to the above, an equity claim had an unlimited upside return, which could compensate for the perceived riskiness of the claim. Even minority shareholders would profit in a rising share price, along with controlling shareholders and management. Accordingly, if there was an active secondary market and reliable clearing and settlement procedures for buying or selling of equity contracts, an active secondary market may develop for a firm's equity even if investors were unwilling to buy its bonds (Herring & Chatusripitak, 2000; La Porta, Lopez-de-Silvanes, Shleifer & Vishny, 1998).

Some studies have shown that bond market development could benefit from the legal systems of certain countries. According to La Porta *et al.* (1998), since UK common law systems had stronger investor, including minority investor, protection than French civil law, countries with the former legal system could have more developed financial markets. Their study found a positive relationship between (Total Loans plus Corporate Bonds) to Gross National Product (GNP) and common law systems. Burger and Warnock (2006) found that countries with more developed domestic bond markets had better records on rule of law and creditor rights. Another study by Essers *et al.* (2015), found that domestic government bond markets in African countries were, on average, larger in countries with legal systems of common law origins.

2.5.3 Contrasting Findings on Relationship between Bond and Equity Markets

Based on the above arguments, a positive correlation between equity market capitalization and the size of bond market does not appear to be a foregone conclusion. This seems to the case as the study by Burger and Warnock (2006), which covered 49 economies, including Malaysia, and using data for end 2001, found that countries with larger local bond markets tended to have larger banking systems, but not larger equity markets. In their multivariate analysis on those 49 countries based on bond data for end of 2001, the coefficient of correlation between local bond market development (represented by size of the local currency bond market over GDP) and equity development was -0.11 while the coefficient was 0.70 between local currency bond market and banking system (ratio of bank credit to the private sector to GDP).

However, in contrast to the study by Burger and Warnock (2006), Mihaljek *et al.* (2002) found a positive relationship between the equity and bond markets for 21 emerging economies, which also included Malaysia, in their sample based on a

correlation analysis.[14] They attributed the relationship to possibly positive spillover from the development of domestic bond markets on other forms of financing (in this case, equity financing). In addition, market capitalization of the equity market can reflect the level or extent of development of a country's capital market (Garcia & Lin, 1999; Bae, 2012). According to Harwood (2000), and the World Bank and IMF (2001), there would be synergies in the development of bond markets and equity markets, *e.g.* in terms of existing infrastructure for the equity market that can accommodate the bond market and for a thriving equity market to establish an adequate disclosure practice among corporates.

It is somewhat puzzling that the two studies by Mihaljek *et al.* (2002) and Burger and Warnock (2006) had conflicting findings on the relationship between bond and equity market development. First, all 21 emerging economies in the study by Mihaljek *et al.* (2002) were also in the study by Burger and Warnock (2006). Second, the bond data for both studies were obtained from the BIS. Perhaps the different findings arose because Burger and Warnock used outstanding domestic currency bond data for end 2001 while Mihaljek *et al.* used data on domestic private sector bonds issued cumulatively for the period 1995-2000. Besides the 21 emerging economies in the study by Mihaljek *et al.* (2002), Burger and Warnock (2006) also included 23 developed countries. The greater coverage of countries in the later study, especially the inclusion of numerous developed countries, may also have contributed to the contrasting findings of the studies.

[14] Statistical data for their article were based on a total of 21 emerging economies with 19 grouped into three regions, namely, Asia, Latin America, and central Europe.

2.6 Research Gaps

This section identifies research gaps classified into three main themes as set out below. An attempt is made in this study to bridge these gaps, as outlined in objectives (a) to (d) in Section 1.2.

2.6.1 Study of Malaysian Domestic Bond and Debt Markets

The Malaysian government, in particular Bank Negara Malaysia, had been cognizant of the critical need for a broad, deep and well-developed bond market. As such, the Asian financial crisis and its accompanying effects on the Malaysian economy provided the necessary impetus to accelerate the development of the Malaysian domestic bond market (Bank Negara Malaysia, 1999a, National Economic Action Council, 1998).

Some studies that encompassed Malaysia's bond market included those done by Eichengreen and Luengnaruemitchai (2004; 2006). However, both studies were looking at bond market development of Asian countries *vis-à-vis* other developed countries and emerging countries. Malaysia was only one of the large number of countries covered by their studies (41 countries in the 2004 study and some 60 countries in the 2006 study). Likewise, Malaysia was one of many countries included in the studies by Bae (2012), Bhattacharyay (2013), Burger and Warnock (2006), Mihaljek *et al.* (2002) and Park (2016). Other recent bond studies by Essers *et al.* (2015), and Mu *et al.* (2013) were also carried out on a group of countries, rather than on individual countries. Hence, there is potential for more in-depth research to be done on the development of Malaysian domestic bond market, including the different segments of the bond market, and identification of their potential determinants. Variables that are likely to be selected

for analysis include interest rates, exchange rates, inflation rates, government debt and fiscal balances as well as proxies for the Malaysian equity market and banking sector.

For example, Harwood (2000) suggested that a well-developed equity market implied the country would have a "capital markets culture" along with supporting institutions, issuers with disclosure experience and investors who understood what it meant to invest in securities (p. 14). Furthermore, existing infrastructure for equity markets such as trading, clearing and settlement systems could be modified to accommodate bonds. As such, the existence of a thriving equity market in Malaysia should have aided in the development of the domestic bond market. Indeed, Mihaljek *et al.* (2002) found a positive relationship between equity markets and bond markets.

The study by Burger and Warnock (2006) on 49 countries including Malaysia, found a negative relationship between bond market and equity market development. Nevertheless, whatever the reasons for the contrasting findings of the two studies (Burger & Warnock 2006; Mihaljek *et al.* 2002), which both included Malaysia in their sample group, there is certainly scope for looking into the relationship between Malaysia's equity and domestic bond markets. Lastly, extending the analysis to include bank loans will also facilitate a closer look at the Malaysian debt market.

2.6.2 Impact from Government Policies including Fiscal Deficits

This study will also examine the impact of government policies on development of the Malaysian domestic bond market and the various segments. The Malaysian government was active in developing the domestic government bond market as a stable source of financing for its development expenditure and debt (Bank Negara Malaysia, various years). Variables that are selected for analysis in this study will include those that are impacted by monetary and fiscal policies to enable a closer examination of the

impact of government policies on the domestic bond market during the study's sample period.

Given the relationship between fiscal deficits and government bond markets (see *e.g.* Bae, 2012; Burger & Warnock, 2006; Didier & Schmukler, 2014; Eichengreen & Luengnaruemitchai, 2004; Mihaljek *et al.*, 2002), a study on the impact of Malaysia's persistent fiscal deficits on its domestic bond market could also look into the possibility of crowding-out on Malaysia's private bond market. Malaysia has registered fiscal deficits since 1998, with 2017 likely to be its 20th year of negative balance (Bank Negara Malaysia, 2018). In view of the significant impact of the Asian financial crisis on the Malaysian economy, its toll on the country's finances is not without justification. Various studies have shown that financial crises have exacted a heavy cost on economies' government debt as public expenditure soared, including for bank recapitalization (Borio *et al.*, 2016; Hauner, 2009; Reinhart & Rogoff, 2013). In fact, the more severe such crises especially when output and asset prices collapse coupled with currency depreciation, the greater the impact on public expenditure and public debt.

2.6.3 Exploring Links between Malaysian Domestic Bond Market and Banking Sector

Various cross-country studies, some of which included Malaysia, found countries with better developed banking sectors also had better developed bond markets (Bae, 2012; Bhattacharyay, 2013; Burger & Warnock, 2006; Eichengreen & Luengnaruemitchai, 2004; Mu *et al.,* 2013). However, some of these cross-country studies and other studies found countries with concentrated banking sectors having smaller bond markets (Bae, 2012; Eichengreen & Luengnaruemitchai, 2004).

The Malaysian banking scene has long been dominated by Malayan Banking Berhad, the largest commercial bank in Malaysia. Malaysia's bank concentration ratio as *per* the definition by Beck *et al.* (2003) was 52.8 percent as at end 2011 (based on the assets of its top three banks, namely Malayan Banking Berhad, CIMB Bank Berhad and Public Bank Berhad).[15] Of this, Malayan Banking Berhad accounted for 19 percent of total assets of commercial banks in Malaysia.

In view of the above figures, which indicate that Malaysia has a dominant banking sector that can be considered as exhibiting a fairly high level of concentration, there is scope to explore further the impact of the dominant local banking sector and its level of concentration on development of the domestic bond market. It will be of interest to find out if Malaysia's banking sector has affected the domestic bond market from a competitive or complementary angle. If it is a case of competition, some observations may be drawn as to whether this is the result of the Malaysian banking sector being concentrated in terms of market power.[16]

Furthermore, given the notable progress made by the Malaysian domestic corporate bond market after the Asian financial crisis, a closer examination of the potential determinants of private financing in Malaysia, comprising bank loans and domestic corporate bonds, as analyzed by La Porta *et al.* (1997) and advocated by Burger and Warnock (2006), may provide valuable insights for Malaysia's policy-makers in future development and reform of the local financial landscape. As the Malaysian domestic bond market grows in size, its future alongside the well-established banking sector should be given careful consideration by the policy-makers.

[15] Calculated from figures in the database used for this study and published financial statements of CIMB Bank Berhad (2012) and Public Bank Berhad (2012).
[16] While Malaysia's bank concentration ratio of 52.8 percent is higher than the bank concentration ratio of 20 percent in the US as quoted in Beck *et al.* (2003)'s study, it is much lower than the 100 percent for African countries in the same study.

2.7 Conclusion

Based on the literature surveyed in this chapter, domestic bond markets form an essential part of well-diversified financial systems and could play a critical role in averting financial turmoil or crises. As underscored by research into the Asian financial crisis, Malaysia and other Asian economies were over-dependent on banks for financing in the absence of well-developed domestic bond markets. The existence of such bond markets could have helped reduce the currency, interest rate and funding exposures, which precipitated the Asian financial crisis.

When looking into the state of Asian bond markets, various studies have detailed the requirements of well-developed bond markets, focusing on the need for depth and liquidity in such markets. Nevertheless, the survey of various studies carried out on bond markets in Asia and other regions showed much of the research has been carried out on large sample groups of countries. Hence, there is ample scope for more in-depth research on development of the Malaysian domestic bond market *per se*.

One area for future research includes the possible impact of Malaysia's persistent and sizeable fiscal deficits on its domestic bond market, especially its private bond market. Another interesting area is development of its domestic bond market in the presence of a dominant local banking sector. Past studies, conducted on large groups of countries that included Malaysia, showed that size and concentration of the banking sector may have different impact on the development of bond markets. Given Malaysia's dominant banking sector, which is also fairly concentrated, investigating the overall impact of the Malaysian banking sector and its concentration level on bond market development should provide useful input for policy-making pertaining to future bond market development. Furthermore, undertaking a study that also covers bank

loans and private financing (comprising bank loans plus domestic corporate bonds) should provide a more comprehensive analysis of the Malaysian debt market.

As such, research into development of the Malaysian domestic bond market would contribute materially to filling the current gaps in research on bond markets, especially in the case of Malaysia. Further work on the above areas, extending to the broader financial landscape, will help identify possible determinants of development of the Malaysian domestic bond market as well as those of the banking sector and local debt market. Careful promotion of the growth factors *via* future policy-making should provide impetus to further development of the Malaysian domestic bond market and translate into a better diversified financial system for the country. By laying the foundation for a better diversified financial system, the country will be less vulnerable in future financial crises and better placed to achieve sustained economic growth.

CHAPTER 3

BACKGROUND ON MALAYSIAN DOMESTIC BOND MARKET AND BANKING SECTOR

3.1 Introduction

Chapter 3 provides an overview of the important developments and events pertaining to the Malaysian domestic bond market and banking sector in recent decades, especially during the study's sample period. However, its emphasis will be on the Malaysian domestic government and corporate bond segments, which are the major segments of the Malaysian domestic bond market. Nevertheless, it will also touch on developments of the Malaysian Islamic capital market, including the *sukuk*[1] market, and major events affecting the local banking sector and economy. All this will serve as the backdrop for the analysis of the Malaysian domestic bond market, banking sector and private financing in Chapters 5, 6 and 7.

Specifically, this chapter will also discuss, in some detail, Malaysia's experience during the 1997-98 Asian financial crisis. Even though the Asian financial crisis occurred some two decades ago, this crisis set off a chain of events locally and altered the mind-set of the Malaysian government as regards the importance and necessity of a well-diversified financial system, including a well-developed domestic bond market in Malaysia.

[1] These are Islamic debt securities (see Section 3.2.1).

This chapter traces the main developments of the Malaysian domestic bond market through the following sections. Section 3.2 provides a brief overview of the beginnings of the Malaysian capital market and development of the domestic bond market. This section focuses on the government bond market and private debt securities market in the earlier years before the Asian financial crisis. Section 3.3 covers developments of the Malaysian banking sector. This section traces the banking sector's strong growth in the years before the Asian financial crisis, events during the crisis, its recovery from the crisis and the subsequent years. Recovery of the banking sector was greatly expedited by bank recapitalization financed by funds raised in the domestic bond market.

Section 3.4 deals with developments in the Malaysian domestic bond market, both conventional and Islamic, in the post-crisis period as the Malaysian authorities worked to diversify risks away from the banking sector, including the launch of the Capital Market Masterplan 1 (2001-10) and, subsequently, Capital Market Masterplan 2 (2011-20). Malaysia's contribution to efforts in developing regional bond markets is covered in Section 3.5 while Section 3.6 concludes.

3.2 Development of Malaysian Capital Market

3.2.1 Domestic Capital Market, including Islamic Capital Market

Malaysia's financial system consists of its financial markets and financial intermediaries. The financial intermediaries include banking institutions and non-bank financial intermediaries. The financial markets comprise the money market, foreign exchange market, derivative market, offshore market and capital market, with the last being a major component. According to the country's central bank, Bank Negara Malaysia, the Malaysian capital market encompasses the conventional and Islamic

markets for medium- and long-term financial assets[2]. The financial assets in the conventional capital market mainly comprise (Bank Negara Malaysia, 1989; 1994a; 1999a):

(a) corporate stocks and shares, which have no fixed maturity and are transacted in Malaysia's equity market;

(b) public and private debt securities with maturity exceeding one year, which are transacted in the bond market; and

(c) commodity futures, which are transacted in the derivatives markets.

Meanwhile, development of Malaysia's Islamic capital market was given a boost when the Securities Commission was set up in 1993. The Securities Commission's mandate was to oversee the regulation and develop the overall capital market, including the Islamic capital market (*e.g.* Ariff *et al.*, 2009; Securities Commission, 2004; 2017). Financial assets in the Islamic capital market comprise the following:

(a) *Shariah*-compliant equities;[3]

(b) *Sukuk* or Islamic debt securities, which are structured to comply with *Shariah* principles.

Prior to the establishment of the Securities Commission in 1993, the oversight of the securities industry, including matters pertaining to the domestic bond market, was under various agencies and institutions. These included the Capital Issues Committee, the Registrar of Companies, Bank Negara Malaysia and the Foreign Investment

[2] In contrast, short-term financial assets will be transacted in the money market. The traditional cut-off between short-term and long-term financial assets is one year. See, for example, Fabozzi and Modigliani, (2003, p. 10).

[3] *Shariah* principles forbid the charging of interest (see *e.g.* Bank Negara Malaysia & Securities Commission, 2009, p. 3).

Committee, with broad oversight powers under the Ministry of Finance and then-named Kuala Lumpur Stock Exchange (Securities Commission, 2004).[4]

3.2.2 Beginnings of Capital Market

The Malaysian capital market had its humble beginnings in the form of informal share broking activity as far back as the 1870s. In those early days when the country was still under British rule, securities were transacted at popular meeting places such as colonial clubs, shophouses and coffee shops (Securities Commission, 2004). Various developments, including the Wall Street crash in 1929 and need to regulate the conduct of local stockbrokers, led to the establishment of the first formal organization of stockbrokers, the Singapore Stockbrokers' Association, on 23 June 1930. This association was re-registered in 1938 as the Malayan Stockbrokers Association, and, subsequently, played a role in the creation of the local stock exchange in 1960.

During the initial years after Malaya (as Malaysia was then known) gained its independence in 1957, the country's first stock exchange, the Malayan Stock Exchange[5], and its central bank, the Central Bank of Malaya, were established (Bank Negara Malaysia, 1989; Securities Commission, 2004). Following the formation of Malaysia in 1963, the nation's central bank was renamed the Central Bank of Malaysia, or Bank Negara Malaysia. Malaysia's initial development efforts were focused on promoting more effective financial intermediation throughout the country.

[4] The Kuala Lumpur Stock Exchange was demutualized in 2004 and renamed Bursa Malaysia Berhad (Securities Commission, 2005).

[5] In fact, the Malayan Stock Exchange was created with four stockbrokers gathering in the central bank's clearing house in Kuala Lumpur to conduct the first "call" and price marking session on 9 May 1960. To further aid the exchange, the central bank provided clerical assistance and telephone facilities. With increasing demand for longer trading hours as the market expanded, the exchange eventually moved to its own trading room in the Mercantile Bank building in 1962 (Bank Negara Malaysia, 1989; Securities Commission, 2004).

Accordingly, the central bank was given a key role in developing the country's nascent capital market.

Overall, development of the capital market in Malaysia, including the bond market, has been boosted by prerequisites such as political stability, and sound macroeconomic policies that have ensured healthy economic growth in an environment of stable prices (Athukorala, 2001a; Bank Negara Malaysia, 1999a). Furthermore, strong infrastructure and a comprehensive legal, regulatory and administrative framework have underpinned the development process.

3.2.3 Government Bond Market takes off

The Malaysian domestic bond market has traditionally been dominated by the issuance of government bonds. Up until the mid-1950s, the issuance of domestic debt securities was insignificant as the dominant banking sector provided much of the funding for domestic economic activities (Ariff *et al.*, 2009; Securities Commission, 2004). There was little need for the government to borrow due to national budget surpluses resulting from years of high commodity prices and procyclical fiscal policies. In fact, by the time of the country's independence in 1957, with the exception of Japan, Malaya had the highest per capita income in the region (Athukorala, 2001b).

However, Okposin and Cheng (2000) (as cited in Securities Commission, 2004) noted that the onset of the global commodity downturn, which persisted from mid-1950s to late 1950s, adversely affected Malaya due to its heavy dependence on the primary sector, consisting mainly of agriculture and mining. This spurred the government to embark on a strategy of economic diversification and industrialization.

To fund the huge outlay needed to develop the necessary infrastructural base, attention was given to the proper development of a government securities market. According to Yakcop (1991) (as cited in Securities Commission, 2004), policy-makers had identified several necessary pre-conditions for a healthy and viable government securities market. These were: (1) Sufficiently large outstanding volume of securities; (2) Stable interest rate environment; (3) Large number of players; (4) Predictable timetable of regular issues; and (5) Innovation in the context of market requirements.

During the 1950s, Malaysian Government Securities, *i.e.* long-term securities or bonds, were issued primarily to meet the Employees Provident Fund's investment needs. Formed under the Employees Provident Fund Ordinance 1951, the Employees Provident Fund was the first national employees' provident fund in the world with its main objective as a trust fund to provide old-age benefits for its members upon retirement. The establishment of the Employees Provident Fund in 1951 was a major catalyst in the mobilization of private funds for investment and by the late 1960s, savings through contractual schemes (mostly through the Employees Provident Fund), in terms of GNP, were among the highest in the world. The Malaysian Government Securities, essentially medium- to long-dated fixed-rate bonds, were initially issued on a subscription basis to select institutional investors, including the Employees Provident Fund, who mostly held these bonds to maturity to meet their statutory requirements. As such, there was very little secondary trading (Securities Commission, 2004).

There were some measures to make the government bond market more attractive, including the acceptance of advance subscriptions for future issues of government securities in 1960 (Bank Negara Malaysia, 1989, p. 368), and issuing government securities with shorter maturities of 2-5 years to complement the existing longer-term maturities of 16-20 years (Securities Commission, 2004, p. 14). However, in those early years of independence, the government mostly concentrated on ensuring

there was a sufficiently large volume of government securities. Until the late 1980s, issuance of Malaysian Government Securities dominated the long-term portion of the Malaysian bond market. As at end September 1988, distribution of outstanding Malaysian Government Securities issues based on original maturities of 2-9 years, 10-15 years and 16-21 years was 16 percent, 22 percent and 62 percent, respectively (Bank Negara Malaysia, 1989, p. 370).

Between 1970 and 1980, the government securities market grew further with total gross issues of Malaysian Government Securities reaching RM17 billion from just RM3 billion in 1970 (Securities Commission, 2004, p. 18). That decade also witnessed the focus of Malaysian Government Securities issuance shifting from the investment needs of the Employees Provident Fund to financing rising public sector development expenditure (Bank Negara Malaysia, 1989; Securities Commission, 2004).

3.2.4 Secondary Market for Malaysian Government Securities Lacklustre

Between 1970s to mid-1980s, the rapid growth of the Malaysian Government Securities primary market did not result in an active secondary Malaysian Government Securities market. Trading volume in the secondary market was low due to, among others, the "holding" bias among the "captive" market. Many institutions in Malaysia, including the Employees Provident Fund and other pension funds, insurance companies and banking institutions were required by regulatory provisions to invest a certain proportion of their funds in Malaysian Government Securities. Such regulatory provisions ensured that these institutions held a percentage of their resources in the form of Malaysian Government Securities as well as Malaysian Treasury Bills and contributed towards the financing of government development expenditure and debt (Bank Negara Malaysia, 1989). Since such investments were perceived as risk-free,

these institutions may invest well in excess of the minimum legal requirement in Malaysian Government Securities and hold them till maturity, forming a sizeable "captive" market for Malaysian Government Securities (Bank Negara Malaysia, 1999a). In fact, Sahay *et al.* (2015) noted that the Employees Provident Fund was a "key institutional investor with assets at 60 percent of GDP" (p. 20). Their report on financial deepening in emerging economies covered the period 2009-2013.[6]

In addition, the steady and regulated Malaysian Government Securities yields further contributed to the lacklustre secondary market. This trend of low and relatively stable yields of Malaysian Government Securities prior to 1990 offered little incentive to investors to adjust their portfolios (Bank Negara Malaysia, 1989; 1999a). Although after 1990, coupon rates of new Malaysian Government Securities issues were changed from time to time, such rates generally lagged behind the prevailing rates for other market instruments (Bank Negara Malaysia, 1999a).

There was another reason for the low secondary trading volume in the 1990s. Between 1988 to 1997, when the government reduced its borrowings substantially, Malaysian Government Securities issues were lower at RM39.7 billion compared with RM45.9 billion in the preceding ten-year period of 1978-87. Redemptions between 1988 to 1997 were significantly higher at RM22.2 billion (1978-87: RM7.9 billion) (Bank Negara Malaysia, 1999a, p. 341). As a result of such developments, total amount of Malaysian Government Securities outstanding fell between 1993 to 1995 and in 1997 (Bank Negara Malaysia, 1996, pp. 187-188; 1999a).

With the increasing size of institutional investors' portfolios, the shortage of Malaysian Government Securities limited secondary trading. It is likely that secondary trading of Malaysian Government Securities has remained fairly limited even in more

[6] This extensive report, in the form of an *IMF Staff Discussion Note*, was authored by 12 persons.

recent years. According to the report by Sahay *et al.* (2015) on financial deepening in emerging markets, assets of nonbank financial institutions in Malaysia rose from 45 percent of GDP to 60 percent of GDP for the period of 2009-2013 (p. 20). These institutions constituted the majority of passive investors in Malaysian Government Securities (Bank Negara Malaysia, various years).

3.2.5 Introduction of Islamic Government Bonds

With the introduction of Islamic banking in 1983, the Malaysian government also issued for the first time long-term Islamic securities or bonds, namely Government Investment Certificates or Government Investment Issues as they were later called (Bank Negara Malaysia, 1989; 1994a; Securities Commission & Bank Negara Malaysia, 2009). The short-term Islamic securities were Malaysian Islamic Treasury Bills. These Malaysian Islamic Treasury Bills were the Islamic equivalents of the Malaysian Treasury Bills, the conventional short-term papers issued by the Malaysian government.

In 1993, following the introduction of interest-free banking schemes among the commercial banks in Malaysia, as they were referred to then, there was much greater demand for Government Investment Issues, which were non-interest bearing certificates based on *Shariah* principles. In December 1998, Bank Negara Malaysia replaced the term "interest-free banking scheme" with "Islamic Banking Scheme" (Bank Negara Malaysia, 1999a, p. 245). Outstanding issues of Government Investment Issues rose from RM1 billion as at end 1988 to RM2 billion as at end 1993 (Bank Negara Malaysia, 1994a, pp. 380-381).

3.2.6 Emergence of Private Debt Securities

To complement the government bond market and thriving equity market, measures were implemented to spur development of the corporate debt or private debt securities (PDS) market (Bank Negara Malaysia & Securities Commission, 2009, p. 3). Such measures were given impetus by the government policy in the mid-1980s to promote the private sector as the engine of growth for the Malaysian economy. In tandem with this shift in government policy, the government also launched its privatization programme in 1983.[7]

Organizations such as the World Bank and IMF have also recognized that the growing needs for investments in housing, utilities and infrastructure projects in many countries around the world meant that their governments were resorting to privatizations. In this aspect, the development of PDS markets was a viable long-term solution. Furthermore, the Asian financial crisis highlighted the dangers of relying on foreign borrowings or the local banking sectors to meet long-term funding requirements (World Bank & IMF, 2001).

In the mid-1980s, the PDS market in Malaysia was essentially non-existent. The bulk of the domestic (issued in Ringgit) bond market was made up of government securities, namely, Malaysian Government Securities and Government Investment Issues. For example, in 1987, PDS made up barely 1 percent of the Ringgit bond market. Malaysian Government Securities made up 98 percent of the market and

[7] According to a speech in 1994 by then-Prime Minister, Mohamad (1994), the preferred privatization route by the government was two-staged. First, the entity would be corporatized "to remove it from bureaucratic procedures" and freed to adopt commercial practices. Next, after about two years when the entity's performance improved, shares of the entity would be sold to the public with the government possibly divesting all its shares or retaining a "golden share" where public or national interest was involved (as cited in Securities Commission, 2004). In another speech in 2003, Mohamad (2003) said the 471 government entities that were privatized between 1983 and 2002 resulted in gains to the public sector amounting to RM149 billion (as cited in Securities Commission, 2004).

Government Investment Issues the remaining 1 percent. The size of the Ringgit bond market as at end 1987 was RM49.7 billion (Bank Negara Malaysia, 1999a, p. 338).

A major step taken by the government to develop a viable and liquid PDS market was the establishment of Cagamas Berhad, or the National Mortgage Corporation, in 1986 and commencement of its operations in 1987 (Bank Negara Malaysia, 1989, pp. 58-59; 1999a, pp. 348-350). The purpose of Cagamas Berhad was to purchase housing loans from the loan originators (such as banking institutions and Treasury's Housing Loans Division, Malaysian Government) and "repackage" them into fixed-rate bearer bonds that can be offered to investors with long-term funds and traded in the secondary market. In effect, Cagamas Berhad converted a long-term illiquid asset (*e.g.* housing and industrial property loans) into liquid and tradable debt securities. With effect from 19 October 1987, Cagamas bonds also qualified as part of liquid assets of financial institutions, further boosting the attraction of Cagamas bonds (Bank Negara Malaysia, 1989, p. 140).[8] By issuing a large volume of mortgage-backed debt securities and thereby developing the Malaysian fixed-income securities market, Cagamas Berhad acted as a catalyst for the development of a vibrant PDS market.

Furthermore, Cagamas Berhad also facilitated the integration of the Malaysian long-term mortgage market with the local financial markets, thus helping to reduce the cost of housing finance. The importance of Cagamas Berhad's role is underlined by the fact that the ratio of outstanding housing mortgage loans to nominal GDP was over 20 percent in Malaysia in the late 1990s, way above the ratio of 5 percent in many other developing countries (World Bank & IMF, 2001, pp. 371-372). In 1998, securities of Cagamas Berhad made up about 13 percent of Malaysia's fixed-income securities market and some 40 percent of the financing of residential mortgages (p. 372).

[8] Commercial banks in Malaysia are required to maintain a minimum liquidity ratio, which is calculated as a minimum level of Malaysian liquid assets against their eligible liabilities. This minimum liquidity ratio serves two functions, namely, prudential and monetary control (Bank Negara Malaysia, 1989, pp. 176-177).

There are four types of debt securities issued by Cagamas Berhad. They are: 1) Cagamas fixed-rate bonds, which have tenures between 1.5 to 7 years and carry fixed coupon rates determined at the point of issuance; 2) Cagamas floating-rate bonds, with tenures up to 7 years and an adjustable interest rate pegged to the 3-month or 6-month Kuala Lumpur Interbank Offered Rate;[9] 3) Cagamas short-term discount notes, which are short-term instruments with maturities ranging from 1 to 12 months and issued at a discount from their face value; and 4) Cagamas *Mudharabah* bonds (*Sanadat Mudharabah* Cagamas), being Islamic bonds issued under Islamic principle of *Al-Mudharabah* (profit-sharing) to finance the purchase of Islamic housing finance debts (Bank Negara Malaysia, 1999a).

The domestic bond market received a further boost when Malaysia's first independent credit rating agency, Rating Agency Malaysia Berhad, was set up in November 1990. Rating Agency Malaysia Berhad was also the first credit rating agency in ASEAN and the first in Asia, outside of Japan (Bank Negara Malaysia, 1994a, pp. 370 & 400; 1999a, pp. 353-354). Rating Agency Malaysia Berhad would provide some form of independent credit risk assessment, a key prerequisite for development of a corporate bond market (Bank Negara Malaysia & Securities Commission, 2009; Turner, 2002). The need for independent credit risk assessment to support development of a corporate bond market was based on the US experience in developing its corporate bond market. With Rating Agency Malaysia Berhad in place to provide professional assessment of a corporation's creditworthiness, the need for over-protective policies regarding potential bond issues was reduced.

Although credit rating agencies are included among the market institutions necessary for bond market development (Bank Negara Malaysia, 1999a; Harwood, 2000), several points should be noted about the role of credit rating agencies. First,

[9] The interest rate is reset every three or six months.

credit rating information can only support, not replace, due diligence on the part of investors. Second, credit rating agencies should also take into account system-wide risk, especially in cases of rapid growth of the same type of debt instruments. Otherwise, there could be problems as highlighted by the poor performance of credit rating agencies in rating structured finance products backed by US subprime mortgages (Gadanecz, 2008).

In October 1995, Malaysia's second rating agency, the Malaysian Rating Corporation Berhad, was incorporated. A new rating agency would foster competition and provide a second opinion on rating as well as ensure a more competitive fee structure. The existence of a second rating agency was also made possible by the growing number of applications for PDS issuance (Bank Negara Malaysia, 1996, pp. 180 & 186; 1999a, p. 354).

All of the above yielded positive results, as the size of the PDS market grew from RM395 million at the end of 1987 to RM75 billion at the end of 1998. As a percentage of GDP, the PDS market rose from just 0.5 percent at the end of 1987 to 26.5 percent at the end of 1998 (Bank Negara Malaysia, 1999a, p. 360). In line with the market expansion, the range of debt securities also grew. From just two types of bonds (fixed-rate Cagamas bonds and straight bonds) in 1987, the range widened to include more sophisticated securities such as bonds with warrants, convertible bonds, Islamic debt securities, floating-rate bonds, zero-coupon bonds, bonds with step-up coupons, bonds with detachable coupons and bonds with call / put options (p. 348).

Notwithstanding these achievements, the Malaysian government acknowledged that the Malaysian capital market, which encompassed the domestic bond market, was "relatively narrow" in the mid-1990s. In fact, the Malaysian authorities recognized that the heavy reliance on the domestic banking sector to finance long-term infrastructure

projects and the resulting mismatch of using essentially short-term finance to meet long-term funding needs played a major part in Malaysia's involvement in the Asian financial crisis (National Economic Action Council, 1998; Securities Commission, 2012).

3.2.7 Developing Other Markets in concert with Bond Market and Other Measures

Measures undertaken in the 1980s and 1990s by Bank Negara have contributed immensely to the development of the Malaysian bond market by fulfilling the necessary conditions of developing corporate bond markets as identified by Harwood (2000), Luengnaruemitchai and Ong (2005), and Schinasi and Smith (1998). These are, among others, a well-functioning money market, importance of benchmarking, available and reliable trading systems, credit risk pricing, increasing the number of market participants and developing a broad investor base.

Bank Negara Malaysia worked hard at developing the money and foreign exchange markets as the smooth functioning of these and other domestic financial markets was an important objective of the central bank. Without these, the effective transmission of monetary policy and exchange rate policy would be undermined. Together with the foreign exchange market, the money market was integral to the functioning of the Malaysian banking system. Financial assets traded in the money market are denominated in Ringgit. These included Treasury bills, Bankers Acceptances, Negotiable Certificates of Deposit, Cagamas notes and bonds, Khazanah bonds and Malaysian Government Securities. Major participants in the Malaysian local market included, among others, commercial banks, insurance companies, large

corporations and pension funds. Trading in the foreign exchange market would be in foreign currencies or against the Ringgit (Bank Negara Malaysia, 1999a).

Significant events and measures taken by Bank Negara Malaysia then were as follows:

(a) In the late 1980s, the Malaysian money market was hampered by illiquid pricing, limited range of instruments and inadequate market infrastructure. To improve liquidity in the secondary market, Bank Negara Malaysia introduced a Principal Dealership system in 1989, whereby the central bank appointed selected banking institutions as Principal Dealers. Their responsibilities included, among others, participating in money market tenders conducted by Bank Negara Malaysia, providing information as required by the central bank, and providing reasonable two-way price quotations to increase liquidity in the secondary market. In exchange, Bank Negara Malaysia granted Principal Dealers certain privileges (Bank Negara Malaysia, 1999a).

(b) As mentioned earlier, the secondary bond market lacked liquidity. It also suffered from a lack of sufficient securities issues and benchmark issues. In order to construct a benchmark for long-term yields from Malaysian Government Securities, Cagamas bonds and selected government-guaranteed bonds for the debt securities market, Bank Negara Malaysia reviewed the performance of the Principal Dealers in early 1996 (Bank Negara Malaysia, 1996, p. 63).

(c) Subsequently, it was acknowledged that prior to 1997, there was no reliable market-based benchmark yield curve in the Malaysian bond market. Since Malaysian Government Securities yields were not reflective of market rates, there were no suitable market-based benchmark securities. To overcome this lack, in September 1997, Khazanah bonds were introduced to facilitate the creation of a benchmark

yield curve (Bank Negara Malaysia, 1998, pp. 150-151; 1999a, p. 305). Besides developing a risk-free yield curve, benchmark securities also helped to reduce the servicing costs to the government. According to Goldstein and Folkerts-Landau (1994) (as cited in Mohanty, 2002), in developed countries, savings to governments for selling benchmark issues were estimated to be in the order of 5-15 basis points.

(d) To enhance market-based pricing mechanism, Bank Negara was gradually liberalizing its "administered" interest rate regime (Bank Negara Malaysia, 1999a, p. 267).

(e) In 1996, to raise efficiency and mitigate inherent risks involved in the primary auction of Government securities and Cagamas bonds, a Fully Automated System for Tendering was introduced (Bank Negara Malaysia, 1999a, p. 268). This system was upgraded in the following years to include tendering of other debt securities, including short-term commercial papers, and execution of other transactions until it was replaced by a web-based application (Bank Negara Malaysia, various years).

(f) This was followed in 1997 by the introduction of the Bond Information and Dissemination System, with the members comprising commercial banks, merchant banks, discount houses, Cagamas Berhad and the two rating agencies, to address the problem of the lack of an organized information dissemination network on a real-time basis for market participants in the Malaysian bond market (Bank Negara Malaysia, 1998, p. 130; 1999a, pp. 268-269).

(g) Bank Negara also undertook efforts to develop infrastructure for the settlement of money market transactions. Two systems were designed and implemented to provide faster settlement and clearing arrangement for both securities as well as money market funds. Subsequently, in 1999, a new system, Real-Time Electronic Transfer of Funds and Securities, was introduced so that fund transfers were

processed and settled simultaneously as compared to settlement of funds at the end of the day under the old system. The new system, which introduced a delivery-versus-payment arrangement for securities transactions, reduced settlement risks for market participants (Bank Negara Malaysia, 1999a, p. 268).

(h) Fiscal incentives, including tax exemption for interest income from certain types of PDS, were introduced by the government to increase the attractiveness of investing in the Malaysian domestic bond market (Bank Negara Malaysia, various years; Ministry of Finance, various years).

(i) In 1993, to familiarize Malaysians with the concept of investing in bonds, Bank Negara Malaysia also issued a five-year discounted savings bonds, the Malaysian Savings Bond (also referred to as "Bon Simpanan Malaysia"), to the public. Since then, the central bank has issued bonds to the public periodically (Bank Negara Malaysia, various years).

To reduce the heavy reliance on a "captive" market in Malaysia, there was a need to broaden the investor base. However, Eichengreen *et al.* (2006, p. 29) commented that the Employees Provident Fund was estimated to have bought up to 60 percent of the bonds issued in the Malaysian bond market with the state provident fund deemed as a buy-and-hold investor, based on their study covering the period from 1997 to 2004 (p. 29). A broader investor base would improve market liquidity as well as ensure a large number of investors with diverse risk profiles that would enable smooth dissipation of market shocks (Bank Negara Malaysia, 1999a; Mohanty, 2002; Park, 2016).

3.2.8 Developments in Islamic Capital Market

Malaysia is recognized as one of the pioneers in developing the Islamic capital market. In 1990, Islamic debt securities made their debut when the first Ringgit *sukuk*, amounting to RM125 million, was issued by Shell MDS (Malaysia) (Bank Negara Malaysia, 1999a, pp. 254-255; Bank Negara Malaysia & Securities Commission, 2009, p. 4), while the first *Sanadat* (bonds) *Mudharabah* Cagamas, amounting to RM30 million, was issued in May 1993 (Bank Negara Malaysia & Securities Commission, 2009, p. 4).

The Islamic money market was established on 3 January 1994, as part of Islamic banking (Bank Negara Malaysia, 1999a, p. 247). Similar to the conventional capital market, the Islamic capital market comprises the primary market, where new issues of Government Islamic securities and corporate Islamic securities are offered, and the secondary market, where those securities are traded (Bank Negara Malaysia, 1999a). In 1993, the first Islamic equity unit trust fund was launched while 1994 witnessed the setting up of the first Islamic stockbroking company (Securities Commission, 2017). In the Islamic equity market, two Islamic indices were introduced in the early years, namely the RHB Islamic Index and the KLSE Islamic Index (Bank Negara Malaysia, 1999a).

When the Securities Commission was set up in 1993, it was given the mandate to regulate and develop the overall capital market, including the Islamic capital market. Efforts by the Securities Commission to ensure clarity and provide guidance in *Shariah* issues pertaining to the capital market included the establishment of its *Shariah* Advisory Council in 1996. In Malaysia, the process of issuing and offering *Shariah*-compliant products and services is subjected to the same requirements on disclosure, transparency, governance and best practices pertaining to products and services for the

conventional capital market. That is, the Securities Commission has ensured that investors in the Islamic capital market and conventional capital market have the same level of legal and regulatory protection (Securities Commission, 2017).

3.3 Malaysian Banking Sector

3.3.1 Years Leading to Asian Financial Crisis

By the early 1990s, the banking system in Malaysia was already well-established, with the main financial institutions then being commercial banks, finance companies and merchant banks. Among these, the major players were the commercial banks, which made up about three-quarters of the Malaysian banking system (Bank Negara Malaysia, 1999a, p. 390).

The years between 1988 to 1996, just before the Asian financial crisis, represented a period of robust economic growth for Malaysia. The Malaysian economy grew almost 9 percent *per annum* during this period with inflation averaging a fairly low 3.5 percent *per annum*. Its unemployment rate was only 2.5 percent in 1996 (Ariff & Yap, 2001, p. 305). This was achieved following structural reforms implemented by the Malaysian government to enable the economy to recover from the mid-1980s recession. Its manufacturing sector expanded by 14 percent *per annum* and the manufacturing sector's share in GDP rose from about 20 percent in 1987 to 34 percent in 1996 (Athukorala, 2001a, p. 14).

Major government initiatives were also directed at the services sector, including airline, education, tourism, and port and port-related services industries, to support Malaysia's economic transformation from a country that was heavily dependent on primary commodities to an industrialized nation. In fact, value-added of the services

sector grew at a double-digit rate of 10.8 percent *per annum* between 1988 and 1997 (Bank Negara Malaysia, 1999a, p. 12). The manufacturing and services sectors acted as the new growth drivers for the Malaysian economy.

Malaysia's economic transformation was accomplished *via* government policies geared towards boosting private sector enterprise and export-oriented industrialization. All these were in tandem with measures to encourage foreign direct investment (FDI), including generous fiscal incentives and up to 100 percent of foreign equity ownership of export-oriented companies (Ariff & Yap, 2001; Athukorala, 2001a; Bank Negara Malaysia, various years). With the government's pro-business stance, FDI inflows from 1988 to 1997 were substantial and accounted for about one-third of total private investment and reached about 8 percent of GNP (Bank Negara Malaysia, 2001, p. 55). The success of such government policies was reflected by Malaysia's total merchandise exports to GDP ratio almost doubling from about 50 percent in the mid-1980s to 80-95 percent for the period 1990-97 (Athukorala, 2001a, p. 15).

Rodrik's survey (1999) showed that Malaysia was among the economies that achieved high per capita GDP growth as well as big increases in their Export-GDP ratios for the period 1975-94. During that period, Malaysia's per capita GDP growth averaged a high 4.43 percent while its Export-GDP ratio rose from 0.456 in 1975 to 0.911 in 1994 (pp. 34-35). This placed Malaysia just behind Hong Kong, which was a top performer among the 25 fastest growing emerging economies in Rodrik's list.

During the period from 1988 to 1997, total loans of commercial banks increased at an average compounded growth of 19.2% (Bank Negara Malaysia, 1999a, p. 405). However, Ariff and Yap (2001) highlighted several concerns arising from such high and sustained growth rates in bank loans. This huge increase in bank loans meant that the Malaysian commercial banks were increasingly exposed to the property development

and construction sectors, and also to loans for purposes of consumption credit and purchases of stocks.

During these years, Malaysia also enjoyed an equity market boom, boosted by large capital inflows. Net inflows for purchases of stocks and shares totalled some RM23 billion in 1993, more than triple the RM6.9 billion for 1992 ((Bank Negara Malaysia, 1994b, p. 35). The year before the Asian financial crisis erupted, 1996, was another favourable year for the Malaysian equity market as the Composite Index rose by 24 percent and market capitalization was 323 percent of GDP (Ariff & Yap 2001, p. 309). Furthermore, in the 1990s, up to the year 1996, a property boom resulted in double-digit increases in property prices in many urban centres (p. 309).

According to Bank Negara Malaysia's assessment, the Malaysian economy was "fundamentally sound" just before the onset of the Asian financial crisis (Bank Negara Malaysia, 1999a, p. 41). Among various key indicators, this view was based on the country's low external debt (41.5 percent of GNP in 1996) and solid fiscal position after five years of budget surpluses (Bank Negara Malaysia, 1997, Table A.23; Ministry of Finance, 1994, Table 4.2; 1998, Table 4.2). In 1996, the country also boasted of a high savings rate (38.5 percent of GNP), low unemployment (2.5 percent), and low inflation (3.5 percent), after years of robust economic growth (Bank Negara Malaysia, 1997, p. 2). The central bank had also implemented reforms and regulations to strengthen as well as liberalize the Malaysian banking sector. In fact, the level of net non-performing loans (NPLs) of the commercial banks had fallen to just 1.9 percent of total loans in 1996, from 8.8 percent in 1990. Between 1990 and 1996, pre-tax profits of commercial banks had quadrupled from RM1.4 billion to RM6.1 billion (Bank Negara Malaysia, 1999a, p. 395).

3.3.2 Aggressive Loans Growth Partly to Blame for Crisis Severity

While loans growth averaged about 12 percent *per annum* for the period 1992-94, this figure jumped to 29 percent *per annum* for the years 1995-97 (National Economic Action Council, 1998, p. 13). In fact, total loans had surged from RM56.8 billion in 1988 to RM276.3 billion by 1997, more than quadrupling in the 10 years (Bank Negara Malaysia, 1999a, p. 405). During these years when the Malaysian economy also experienced robust growth, the banking sector was the major source of financing for the local economy (Bank Negara Malaysia, various years).

The much higher loans growth for the years 1995-97 could be linked to Bank Negara Malaysia's introduction of the two-tier regulatory system in December 1994. This move was part of the central bank's efforts to reform the financial sector and encourage consolidation among the numerous commercial banks. The central bank envisaged bigger and stronger entities from any mergers as a result of this two-tier regulatory system to be better positioned to face greater competition due to the expected liberalization of global and regional financial services industry, under the General Agreement on Trade in Services (Bank Negara Malaysia, 1995; 1996; 1997).

To obtain Tier 1 status, commercial banks needed at least RM500 million in shareholders' funds and meet Bank Negara's CAMEL (Capital, Assets, Management, Earnings and Liquidity) test. Tier 1 banks were promised more leeway to conduct their business operations, including a more liberal regulatory environment. Nevertheless, instead of merging to boost their shareholders' funds and qualify for Tier 1 status, the larger commercial banks opted to raise their shareholders' funds to meet the RM500 million requirement and, consequently, boosted their loans portfolio. Subsequent to the announcement of two-tier regulatory system for commercial banks, Bank Negara Malaysia also announced a two-tier regulatory system for merchant banks in January

1996 with the same for finance companies to follow by end 1998 (Bank Negara Malaysia, 1995; 1996; 1997).

Eventually, on 10 April 1999, Bank Negara Malaysia announced the abolishment of the two-tier regulatory system for all banking institutions. The central bank acknowledged that the two-tier regulatory system, which relied on absolute capital size as one of the main requirements to achieve Tier 1 status, contributed to the overly aggressive loans growth in the subsequent period. This resulted in banking institutions striving to generate sufficient returns on the enlarged shareholders' funds. Furthermore, the aggressive loan expansion led to poor credit decisions and came at the expense of asset quality of the affected banking institutions (Bank Negara Malaysia, 2000, p. 134).

3.3.3 Onset of Asian Financial Crisis

Turbulence in the Malaysian currency and financial markets became evident when the Ringgit came under attack in May 1997 and again in July 1997. In its defence of the Ringgit especially in July, Bank Negara Malaysia had raised short-term interest rates, with the overnight and seven-day interbank rates spiking to 40-50 percent and 35 percent, respectively (Bank Negara Malaysia, 1998; Ariff & Yap, 2001). Unpegging of the Thai Baht on 2 July 1997 signalled the escalation of the 1997-98 Asian financial crisis, with Thailand, Malaysia, Indonesia, the Philippines and South Korea as the crisis' main victims. However, for three decades leading up to 1997, these countries achieved economic growth between 6-10 percent annually, reaping praise from many other countries (Kreinin, 2006, p. 344).

The large capital inflows from abroad resulted in persistent appreciation and, eventually, over-valuation of the five countries' currencies. Over-valuation of the Ringgit was estimated at 13.7 percent at end June 1997, as the appreciation in the

Ringgit was viewed as excessive and could not be justified by Malaysia's economic fundamentals then (Athukorala, 2001a, pp. 40-42). The over-valuation of these currencies meant the countries had difficulties defending their respective currencies against speculative attacks. In addition, the currency appreciation skewed the allocation of capital in the crisis-affected countries to non-traded sectors such as real estate and services, fuelling asset bubbles (Athukorala, 2001a; Sachs & Woo, 2000).

Furthermore, Goldstein (1998) commented that over-valuation of currencies of emerging economies, in terms of their real effective exchange rates, was a key leading indicator for currency as well as banking crises. Compounding this loss of competitiveness for the Malaysian export sector, 1996 was a difficult year for the exports of many Asian economies. After growing by 20.3 percent in 1995, Malaysia's merchandise exports were up only 6.5% in 1996 (Goldstein, 1998, pp. 15-16).

Current account deficits in some of the crisis-affected countries, including Malaysia, had been a concern for some years prior to the onset of the crisis. In 1997, the current account deficit for Malaysia was a sizeable 4.7 percent. In fact, Malaysia's current account balance averaged -5.6 percent of GDP for the period 1990-97 against surpluses of 12.8 percent and 10.3 percent for 1998-2000 and 2001-04, respectively (Krugman & Obstfeld, 2009, Table 22.4).

While these current account deficits were due to private investment exceeding private savings, the current account deficits could also be interpreted as a sign of vulnerability if they resulted from a situation of dwindling reserves and / or growing accumulation of external debt (Athukorala, 2001a; McLeod & Garnaut, 2000). Also, persistent and growing current account deficits left Malaysia and other crisis-affected countries exposed to speculative runs on their currencies (Athukorala, 2001a).

Looking at the broader picture, the 1990s had witnessed a tremendous surge in net capital flows to developing economies, including Malaysia. In fact, net capital

flows to such developing countries amounted to a staggering USD190 billion in 1996, more than 10 times the annual average of USD17.8 billion for the period 1984-89 (Athukorala, 2001a, p. 27). These flows also reflected the investments in emerging economies by hedge funds as well as other institutional investors. Kahler (1998) stressed that in 1996, the main beneficiaries of capital flows to developing countries were Brazil, China, Indonesia, Malaysia, Mexico and Thailand. These six countries accounted for some 40 percent of all capital flows to developing countries that year (p. 11).

After several years of strong economic growth, Bank Negara Malaysia had gradually nudged interest rates higher to deal with inflationary pressures as well as contain private sector demand. Inflation had hit a 10-year high of 4.7 percent in 1992 (Bank Negara Malaysia, 1994b, p. 19). Lured by attractive interest rate differentials, a booming equity market, and a bustling economy that fueled expectations of strengthening in the local currency, capital inflows into Malaysia grew throughout 1993. According to Bank Negara Malaysia, some RM9.5 billion was placed with commercial banks in December 1993 alone, which was double the placement for January-November 1993 (Bank Negara Malaysia, 1994b, p. 61). During the course of 1993, the Malaysian equity market set various records in rapid succession and eventually ended the year 98 percent higher than its end 1992 close (pp. 192-194).

Capital inflows were also in tandem with financial liberalization undertaken by Malaysia to boost Kuala Lumpur's position as an international financial centre. For Malaysia, the massive influx of short-term capital flows, in the form of portfolio investments, accounted for a hefty 45 percent of total capital inflow in 1996 (Athukorala, 2001a, p. 29). The equity market boom and rising share prices, with the Composite Index touching a high of 1238 in 1996, meant banks could lend more to their

customers, based on such shares as collateral, to acquire more assets, including shares (Sachs & Woo, 2000, p. 237).

Sachs and Woo (2000) noted that financial markets in the crisis-affected countries were unable to efficiently allocate the investment inflows, thereby helping to create asset bubbles in the recipient countries of such flows. Athukorala (2001a, p. 33) noted that by mid-1990s, foreign investors were responsible for about one-third of share trading on the local stock exchange, then known as the Kuala Lumpur Stock Exchange Berhad. He also commented on the fact that share trading on the Kuala Lumpur Stock Exchange Berhad was heavily concentrated in secondary shares, pointing to the speculative nature of such trading.

After July 1997, the Ringgit continued to weaken despite the central bank's efforts to support it (Ariff & Yap, 2001; Bank Negara Malaysia, 1998). The Ringgit had weakened to RM3.88 to the USD by end 1997 and a record low of RM4.88 to the USD on 7 January 1998 (Bank Negara Malaysia, 1998, pp. 57-58). Subsequently, the Ringgit strengthened to RM3.35 to the USD on 11 February 1998, but it went down to RM4.20 in August 1998 (Ariff & Yap, 2001, p. 313; Bank Negara Malaysia, 1998).

Volatility in the currency market also exacted a toll on the Malaysian equity market. The equity market's main index, the Composite Index, fell by a hefty 52 percent for the year 1997, after coming under increasing selling pressure beginning July (Bank Negara Malaysia, 1998, pp. 152-153). The index eventually fell to its 10-year low of 262.70 points on 1 September 1998 (Bank Negara Malaysia, 1999b, p. 169).

3.3.4 Government Policies and Measures to Deal with Asian Financial Crisis

Malaysia introduced selective exchange controls on 1 September 1998 and the currency peg of RM3.80 to the USD on 2 September 1998. Among the selective

exchange controls were a one-year moratorium on foreign portfolio funds in Malaysia (although FDI was unaffected); making the Ringgit non-legal tender outside the country (thus, putting a stop to profits of short-selling of Ringgit outside of Malaysia); and certain restrictions on Malaysians taking capital out of the country. However, Malaysia's current account remained fully convertible and foreign investors were allowed to repatriate profits, dividends and interest (Ariff & Yap, 2001; Bank Negara Malaysia, 1999a; 1999b).

The above measures allowed the central bank to quickly reduce domestic interest rates to revive the economy without exposing the Ringgit to greater turbulence especially in the wake of continued capital outflows. What was important, these selective exchange controls were designed to ensure minimal disruption to economic activities (Bank Negara Malaysia, 1999a). In fact, as the situation stabilized for Malaysia, the Malaysian government replaced the 12-month holding rule with a "repatriation levy" on 15 February 1999. That is, the principal of foreign portfolio funds was allowed to be repatriated earlier subject to a graduated levy. On 21 September 1999, this levy system was further simplified (pp. 601-602).

During the course of 1998, the Malaysian government needed to deal with tight liquidity as the Ringgit depreciated and capital flowed out. Interest rates in the country were high after being raised to 11 percent in February 1998 in response to the Ringgit hitting a low of RM4.88 to the USD on 7 January 1998 (Bank Negara Malaysia, 1999b, p. 8). As economic conditions in the country deteriorated, net NPLs rose to 8.9 percent of total loans at end June 1998 (based on the 3-month classification). For the first half of 1998, real GDP contracted by 4.8 percent (p. 8).

Fiscal policy was gradually loosened throughout 1998, beginning in March. From a targeted fiscal surplus of 2.5 percent of GDP for 1998 (projected in the 1998

Budget, which was released in October 1997), the government eventually projected a fiscal deficit of 3.5 percent of GDP for 1998 (Bank Negara Malaysia, 1999b, p. 9). Additional government expenditure was spent on fiscal measures such as setting up funds to support small- and medium-sized enterprises, setting up or expanding special funds to provide credit at lower rates to priority areas, increasing infrastructure spending selectively, raising allocation for social sector development and reducing taxes.

The National Economic Action Council, tasked with reviving the economy, unveiled its National Economic Recovery Plan in July 1998 with six objectives, namely stabilizing the Ringgit; restoring market confidence; maintaining financial market stability; strengthening economic fundamentals; continuing equity and socio-economic agenda; and revitalizing adversely affected sectors (Bank Negara Malaysia, 1999b, p. 9; National Economic Action Council, 1998, p. 44). To support the economy, the government had since embarked on an expansionary fiscal stance.

Eventually, with the selective exchange controls and Ringgit peg implemented in early September 1998, monetary policy could be eased in the same month. Bank Negara Malaysia then acted quickly to reduce its Statutory Reserve Requirement (SRR) ratio[10] and 3-month intervention rate[11] in phases. Beginning 1 July 1998, the SRR ratio was lowered from 10.0 percent gradually to 4.0 percent by 16 September 1998. Likewise, from 3 August 1998 onwards, the intervention rate was reduced from 11.00 percent to 7.00 percent by 9 November 1998 (Bank Negara Malaysia, 1999b, Table 2.2).

[10] The Statutory Reserve Requirement ratio is set as a percentage of a commercial bank's total deposit liabilities in a special account with Bank Negara Malaysia. These reserves earn no interest for the commercial bank and are effectively "locked in". Hence, the SRR ratio is an instrument through which the central bank controls the amount of loans and advances of the commercial banks and thus the liquidity in the banking system (Bank Negara Malaysia, 1989, pp. 175-176).

[11] The 3-month intervention rate was introduced to replace the average 3-month KLIBOR (Kuala Lumpur Interbank Offered Rate) in the computation of the BLR (Base Lending Rate) of banking institutions in 1998, as the effects of the Asian financial crisis escalated (Bank Negara Malaysia, 1998; 1999b). This was to cap the resulting increase in computation of the BLR as interest rates surged and the crisis worsened.

The full effect from the Asian financial crisis was felt in 1998 when the economy contracted by 7.4 percent (Bank Negara Malaysia, 2000). However, by Q2, 1999, the Malaysian economy had recovered to expand by 4.1 percent as the various government measures bore fruit.

3.3.5 Recovery from Asian Financial Crisis

The government, including Bank Negara Malaysia, had to move swiftly to deal with the sizeable NPLs and address the deteriorating asset quality of the banking sector. To this end, the following were set up:

(a) Pengurusan Danaharta Nasional Berhad (Danaharta), an asset management company that would purchase NPLs from the banking institutions, thereby enabling them to focus on core business activities, including extending credit / loans;

(b) Danamodal Nasional Berhad (Danamodal), a special purpose vehicle that would provide the needed capital injections for banking institutions impaired by capital loss; and

(c) Corporate Debt Restructuring Committee (CDRC), to enable lenders and borrowers to agree on a voluntary debt workout, thus facilitating debt restructuring (Bank Negara Malaysia, 1999b).

Danaharta recovered RM30.4 billion from the NPLs it acquired and ceased its operations on 31 December 2005. Of the amount Danaharta recovered, RM26.7 billion was realized in cash and the remaining RM3.7 billion in the form of residual recovery assets, putting its recovering rate at 58 percent (Bank Negara Malaysia, 2006, p. 132). Danaharta also redeemed in full RM11.1 billion zero-coupon bonds, representing their total face value.

Danamodal wound down its operations in December 2003. In total, Danamodal had injected RM7.6 billion into 10 banking institutions and had recovered RM6.6 billion of its capital investment. On 21 October 2003, before ceasing operations, Danamodal fully redeemed its RM11 billion 5-year zero-coupon unsecured redeemable bonds (Bank Negara Malaysia, 2004, pp. 107-108).

Of the three, CDRC was the first to cease operations, winding down in August 2002. Of the 48 cases that CDRC accepted and successfully restructured, the amount of total debt restructured was RM52.6 billion (Bank Negara Malaysia, 2003, pp. 115-116).

Following the Asian financial crisis, to strengthen and deal with the fragmented banking sector, Bank Negara Malaysia moved quickly with its merger programme in 1999 (Bank Negara Malaysia, 2002). Under its merger programme, 54 local banking institutions were merged into 10 banking groups, comprising commercial banks, finance companies and merchant banks, thus ensuring bigger and better capitalized entities going forward. In tandem with this, the central bank also raised the minimum capital for domestic banking groups to RM2 billion and foreign-owned banking institutions to RM300 million, to be met by December 2001.

In cognizance of the need to add breadth and depth to Malaysia's financial sector so as to facilitate economic recovery and better withstand future economic and financial turbulence, the Securities Commission launched its Capital Market Masterplan 1 (CMP1, 2001-10) in February 2001 and Bank Negara launched its Financial Sector Masterplan 1 (FSMP1, 2001-10) in March 2001. The FSMP1 was implemented in three phases. Phase 1 covered the merger programme and in 2001, the 10 merged banking groups were already engaged with finalizing business integration processes. By end 2001, all 10 banking groups had rationalized their branch network, which saw 187 branches closed and 54 branches relocated (Bank Negara Malaysia, 2002, p. 110).

In fact, just prior to the onset of the global financial crisis, but with the Malaysian economy recovered from the Asian crisis, data for 2007[12] showed that the Malaysian banking system was responsible for a still substantial 35 percent of overall financing of the Malaysian economy, although this share was down from 43 percent in 1997 (Bank Negara Malaysia, 2008). This decline reflected the slowdown in demand for loans as well as caution on the part of banks in their lending activities since the Asian financial crisis.

Under the Financial Sector Blueprint (2011-20), which succeeded the FSMP1 (Bank Negara Malaysia, 2011a), the central bank's policies and measures will be directed towards positioning the financial sector, especially the banking sector, to play a crucial role in supporting Malaysia's continued economic transformation to a higher value-added and high-income country by the year 2020. However, the central bank has acknowledged that changes in the country in the last decade resulted in financing activity of the corporate sector moving from being bank-based in the early years of the FSMP1 to being more market-based by 2010. In fact, a prime motivator to set up Danajamin Nasional Berhad in 2009 was because corporates were already sourcing over 50 percent of their financing requirements from the domestic bond market in the years before the onset of the global financial crisis (Bank Negara Malaysia, 2010, p. 58).[13]

Goh and Hooy (2008) also noted that the banking sector's role in providing financing to the large corporates was reduced following the Asian financial crisis and subsequent development of the Malaysian capital market. In fact, corporate debt securities (both conventional and Islamic) accounted for 58.5 percent of total corporate financing in 2010, up from 46.4 percent in 2001 (Bank Negara Malaysia, 2011b, p. 56). As a result of this shift, the banking sector has been increasingly focused on retail-based

[12] Calculated based on figures from Bank Negara Malaysia website: https*://www.bnm.gov.my/index.php?ch=statistic*
[13] See also Section 3.4.2.

lending. As at end 2010, share of loans to the household sector has grown to 55.4 percent, from 34.4 percent as at end 2001 (p. 56).

3.4 Malaysian Domestic Bond Market: Post Crisis

3.4.1 Need to Diversify Risks from Banking Sector

In Malaysia, the post-crisis period saw greater focus on the need for effective diversification of the sources of financing for the economy. The National Economic Recovery Plan, released in 1998, emphasized the necessity of a broad, deep and well-developed bond market that would provide a more stable source of long-term financing compared to short-term bank credit (National Economic Action Council, 1998; Securities Commission, 2004).

An additional advantage of such a step would be to diversify the risks of any cyclical downturn away from the Malaysian banking sector. Some progress has been made in this area. In 1997, when the Asian financial crisis erupted, the ratio of banking sector loans to GDP for Malaysia was a high 143 percent and the banking system was responsible for 43 percent of overall financing of the Malaysian economy. By 2007, just before the onset of the global financial crisis, these figures had moderated to about 100 percent and 35 percent respectively.[14] It should be noted that from 1997 onwards, the Malaysian bond market had overtaken the equity market in terms of amount of funds raised, becoming more important as a source of financing (Securities Commission, 2004). In 2008, PDS accounted for 15 percent of overall financing for the private sector, outstripping equities at 9 percent (Bank Negara Malaysia, 2009).

[14] Calculated based on figures from Bank Negara Malaysia website: https*://www.bnm.gov.my/index.php?ch=statistic*

As a result of efforts to develop the PDS market, there was a shift in the composition of the Malaysian bond market. While the share of private bonds in total bonds was about 48 percent as at end of 1998, the share of private bonds in total bonds has exceeded 50 percent since 1999. According to the World Bank and IMF (2001, p. 364), this percentage was a remarkable achievement for Malaysia. As at end 2006, this share was about 51 percent (Bank Negara Malaysia, 2007a p. 92). Furthermore, by 2006, over half of the total PDS had maturities exceeding five years, which underlined the importance of the Malaysian domestic bond market in reducing the maturity mismatch that contributed to the onset of the Asian financial crisis in Malaysia.

3.4.2 Greater Efforts to Spur Bond Market Development

In fact, Malaysia had turned to the PDS market to finance the restructuring of its banking sector in the aftermath of the Asian crisis. In 1998, the government's proposed USD2 billion international bond sale to raise funds to stimulate the Malaysian economy had to be postponed.[15] This decision followed the imposition of Malaysia's selective exchange control measures on 1 September 1998 and downgrades in the same month of the country's long-term foreign currency debt rating by Moody's Investors Service to Baa3 and by Standard & Poor's to BBB- (Securities Commission, 2004).

By the end of 1999, Danaharta and Danamodal had together issued bonds worth RM21 billion in nominal value – to recapitalize and strengthen the banking institutions. These bonds were guaranteed by the government. Besides Danaharta and Danamodal, some of the distressed companies also undertook refinancing of their loans *via* the PDS

[15] One may infer from this episode that the Malaysian government had been able to raise funds, even sizeable amounts, without undue problems through international bond issuance previously. Perhaps the ease of such international bond issuance may have contributed to a dependence on foreign currency borrowings that added to the severity of the Asian financial crisis for Malaysia as well as the other four victim countries (*e.g.* Hale, 2007a; Kaminsky & Reinhart, 2001).

market (Bank Negara Malaysia, 2002). Raising large amounts of funds *via* the domestic bond market during the post-crisis years did not pose any problem given Malaysia's high savings rates. For example, in 2003, Malaysia's gross national savings were estimated at approximately RM126 billion or 35 percent of the country's GNP (Ministry of Finance, 2003, p. vii).

Key developments in the aftermath of the Asian financial crisis are as follows:

(a) Prior to the crisis, development of the Malaysian bond market had been constrained by a fragmented regulatory structure, with multiple agencies carrying out oversight and developmental roles relating to the bond market (Securities Commission, 2004). Following the crisis, Malaysia created the multi-agency National Bond Market Committee in 1999, to facilitate the broader bond market development agenda. The National Bond Market Committee was chaired by the Secretary General of the Treasury and its members included senior officials from, among others, the Securities Commission, Bank Negara Malaysia and Ministry of Finance, thus easing the implementation of specific action plans (Bank Negara Malaysia, 1999b, p. 173).

(b) A key reform was ensuring more streamlined regulation of the corporate bond issuance process. Previously, the time-to-market for bond issues varied from nine to 12 months, exposing issuers to uncertainties over an extended period, including not knowing if their corporate bond issue proposals would be approved or rejected. With the introduction of the Guidelines on the Offering of Private Debt Securities (PDS Guidelines), effective 1 July 2000, the issuance process was greatly streamlined with centralization of the regulation of the corporate bond market with the Securities Commission. A post-vetting system of approval was introduced, whereby the issuer and principal adviser only needed to file a declaration of

compliance with the PDS Guidelines to secure an approval from the Securities Commission within 14 working days (Securities Commission, 2004).

(c) With the Securities Commission as the single authority of all securities other than shares and debentures issued by unlisted recreational clubs, there would be greater focus on development of the corporate bond market. Between end 1997 to end 2008, the Malaysian domestic debt securities market (including the Islamic portion) had grown almost four times to RM585.5 billion, of which about 10 percent was short-term debt securities. Of the domestic bond market (RM527 billion), corporate bonds and *sukuk* made up RM267.9 billion or 51 percent of the market (Bank Negara Malaysia & Securities Commission, 2009, p. 1).

(d) To maintain access to the domestic bond market in the wake of the global financial crisis, Bank Negara Malaysia established Danajamin Nasional Berhad, a national financial guarantee insurer. Danajamin Nasional Berhad would provide credit enhancement so that viable corporations would be able to raise funds from the domestic bond market even during periods of financial turbulence (Bank Negara Malaysia, 2010; Bank Negara Malaysia & Securities Commission, 2009).

Challenges remain in the continued development of the bond market. There will have to be on-going efforts to make the issuance process more cost-effective for issuers, including providing further issuance flexibility, enhancing time-to-market, and rationalizing information disclosure (Securities Commission, various years). In terms of meeting other requirements including government policies on issuance process and associated costs, efforts by the Malaysian government, encompassing those under the Capital Market Masterplan 2 (CMP2, 2011-20), will be on-going.

3.4.3 Launch of Capital Market Masterplan 1 and 2

In February 2001, the Malaysian government launched the country's Capital Market Masterplan 1, CMP1 (Securities Commission, 2001). The CMP1 represented a comprehensive plan to chart the strategic position and future developments of the Malaysian capital market over the period 2001-10 (Securities Commission, 2001). In the wake of the Asian financial crisis, the business community and other participants in the capital market were cognizant of the need for such a long-term plan to deal with challenges facing the Malaysian capital market.

The CMP1 had six broad objectives for the capital market, with five of these focused on certain core areas of the capital market, namely issuers, investors, market institutions, market intermediaries and the overall regulatory framework. The sixth objective was focused on Islamic finance, where Malaysia has substantial potential to assume a leading international role (Securities Commission, 2004, pp. 141-143).

The six objectives of CMP1 were: 1) Be the preferred fund-raising centre for Malaysian companies; 2) Promote an effective investment management industry and a more conducive environment for investors; 3) Enhance the competitive position and efficiency of market institutions; 4) Develop a strong and competitive environment for intermediation services; 5) Ensure a stronger and more facilitative regulatory regime; and 6) Establish Malaysia as an international Islamic capital market centre. The various strategic initiatives under the six broad objectives would contribute to the development of the Malaysian domestic bond market, especially the corporate bond segment.[16]

The capital market was expected to play a pivotal role in Malaysia's wide-ranging national development agenda, by facilitating effective capital formation and efficient mobilization of domestic savings. It was estimated that for the period of 2001-

[16] The various strategic initiatives are outlined in Securities Commission (2004, pp. 142-143).

10, the capital market had to raise at least RM500 billion to support the country's successful implementation of Vision 2020 (Securities Commission, 2004), thus helping Malaysia become a developed country by 2020. In 1991, the government had announced that under Vision 2020, Malaysia would become an industrialized and fully developed country by 2020. This would be achieved by Malaysia sustaining economic growth at 7 percent *per annum* and initiating structural changes in its economy, including its manufacturing sector (Economic Planning Unit, 2008).

To develop a more efficient, competitive and dynamic capital market meant the available avenues for fund raising would have to be broadened and deepened beyond existing avenues, including the equity market. As such, the priority was to accelerate development of the corporate bond market, in view of the historical dominance of the banking sector as a source of debt financing and possibly avert any recurrence of the Asian financial crisis.

Specific measures in the first half of the CMP1 to further develop the domestic bond market that have been implemented included, among others, ensuring liquidity in benchmark issues of Malaysian Government Securities, allowing regulated short-selling of Malaysian Government Securities and corporate bonds; establishing markets in Malaysian Government Securities futures and options; allowing international ratings for domestic bond issuance; and reviewing the tax framework to encourage issuance and investment in debt securities (Securities Commission, 2007).

Under the CMP1, the sequencing of measures took into account: 1) prevailing market conditions; 2) readiness of domestic financial services intermediaries and market institutions for further deregulation and liberalization; 3) implications for market stability and integrity; 4) consistency with broader national policy objectives; and 5) the availability of resources (Securities Commission, 2004). Implementation of the CMP1

in Phase 3 (2006-10), which was the final phase, focused on strengthening market processes and infrastructure for a fully-developed capital market as well as enhancing the Malaysian capital market's international positioning in areas of comparative advantage (Securities Commission, 2007).

At the close of the CMP1 period in 2010, about 95 percent of its 152 recommendations were completed (Securities Commission, 2012). In 2000, just before the launch of the CMP1, the Malaysian capital market was dominated by the equity market and government debt securities market. The Malaysian capital market has grown from RM718 billion in 2000 to RM2 trillion in 2010, that is, achieving a 11 percent growth *per annum* and exceeding the growth target set in the CMP1. The growth in the capital market has been on the back of greater breadth as the PDS and fund management segments have developed rapidly. This double-digit growth has also been helped by the growth of the Islamic capital market to just over RM1 trillion, growing by 13.6 percent *per annum* during the period 2000-2010 (Securities Commission, 2012, pp. 1-3). During this period, the Malaysian domestic bond market, including the Islamic bond segment, grew from RM273 billion to RM759 billion, recording an annual growth rate of 10.8 percent *per annum*.

In view of the achievements during the period of CMP1, strategies under the CMP2 focused on, among others, tackling the remaining challenges facing the Malaysian capital market. Key challenges identified by the CMP2 were as follows:

(a) Meeting the financing requirements for investments estimated at RM1.4 trillion for Malaysia's Economic Transformation Programme over the period 2011 to 2020.

(b) Addressing the structural imbalance between Malaysia's high level of private sector savings, which were mainly concentrated in a limited range of low-risk and highly liquid investments, and the country's growing need for risk capital.

(c) Promoting liquidity in Malaysia's secondary capital market.

(d) Identifying new growth opportunities, including exploring growth areas beyond the domestic economy.

In dealing with the above, the CMP2 identified growth strategies such as:

(a) Further widening access to bond financing for a wider base of industries as well as promoting greater retail participation in the bond market.

(b) Facilitating efforts, including on-going efforts to optimize any deployment of public sector savings held by Government Linked Investment Corporations, to resolve the savings-investment structural imbalance.

(c) Looking at internationalization of the Malaysian capital market, including its bond market, for further growth opportunities. For example, the removal of withholding tax and a facilitative approval framework saw foreign investments amounting to RM121 billion in local currency bonds in 2010.

(d) Maintaining Malaysia's premier position in Islamic finance and leveraging off continued internationalization of its capital market, including its Islamic capital market. Malaysia continues to lead in the global *sukuk* market and can harness this for greater benefits going forward.

3.4.4 Recent Boosts to Bond and *Sukuk* Market

During the period of CMP1, 2000 to 2010, the Malaysian capital market expanded from just RM718 billion to RM2 trillion. Within the capital market, the Islamic capital market, including the *sukuk* or Islamic bond market, grew from RM294

billion to RM1,050 billion. Hence, by 2010, the Islamic capital market made up slightly over half of the whole Malaysian capital market (Securities Commission, 2012, pp. 1-3).

During the CMP1 period, the Malaysian bond market grew from just RM273.1 billion to RM758.6 billion, achieving a robust growth of 10.8 percent *per annum* (p. 4). Malaysia's achievement over this period placed the country third in Asia (based on market capitalization over nominal GDP), after Japan and South Korea, the two leading local currency bond markets in Asia (p. 4).

In terms of *sukuk* issuance, Malaysia remained important, even globally. In fact, the country ranked with the Gulf region as the main hubs for *sukuk* issuance world-wide (Ariff *et al.*, 2009; Cakir & Raei, 2007). Its importance can also be seen from the following issuances:

(a) Malaysia issued the first sovereign global *sukuk*, totalling USD600 million, in 2002 (Bank Negara Malaysia, 2003, p. 179; 2007a, p. 91).

(b) Malaysia was the preferred issuance centre for the first *sukuk* issuance in 2004 by a multi-lateral financial institution, International Finance Corporation (Bank Negara Malaysia, 2005; p. 209; Bank Negara Malaysia & Securities Commission, 2009, p. 4).

(c) Malaysia was the issuance centre for the USD1.5 billion Emas Dollar *Sukuk* and USD3 billion Emas Dollar Bonds in 2009 by Petroliam Nasional Berhad, then the largest USD issuance, outside Japan, by an Asian entity (Bank Negara Malaysia, 2010, p. 62; Bank Negara Malaysia & Securities Commission, 2009, p. 4).

At the beginning of the CMP2, the *sukuk* market continued to grow strongly. Its growth rate was 18.8 percent in 2011 and a staggering 35.9 percent in 2012. As at end December 2012, total *sukuk* outstanding amounted to RM474.6 billion. Of this amount,

some 50.7 percent was issued by the Malaysian government and related entities, 42.6 percent by the private sector and the balance of 6.7 percent by foreign entities. The sharp growth of 35.9 percent in the *sukuk* market in 2012 was partly due to the issuance of PLUS Berhad's RM30.6 billion *sukuk*, which was then the world's single largest issuance of *sukuk* (Securities Commission, 2013, pp. 1-9).

Furthermore, 2012 also witnessed the launch of the framework for Malaysian retail bonds and *sukuk*. Before its launch, investors in the Malaysian bond and *sukuk* market consisted of only corporate and institutional investors as the standard transaction size typically amounted to some RM5 million. With this new framework allowing for retail bonds and *sukuk* to be issued and traded on the Malaysian stock exchange, Bursa Malaysia Berhad, or over-the-counter *via* appointed banks, issuers had access to a much larger pool of investors. To encourage retail participation, safeguards and incentives, including government guarantees and stamp duty waivers for retail bond trades, were offered. Other tax incentives announced in the 2013 Budget included double deductions from 2012 to 2015 for additional expenses incurred in issuance of such bonds or *sukuk* (Securities Commission, 2013, pp. 1-7). The first retail *sukuk*, amounting to RM300 million, was issued by DanaInfra Nasional Berhad in February 2012 (Securities Commission, 2014, p. 8).

In September 2013, the Malaysian domestic government bond market reached a significant milestone with the inaugural issue of RM2.5 billion of 30-year Malaysian Government Securities. The issue was expected to boost issuance of longer-term debt securities, helping to lengthen the maturity profile of domestic bond issues (Bank Negara Malaysia, 2014). During the year, the Securities Commission allowed the limits of existing bonds and *sukuk* programmes to be increased so as to facilitate the issuance of bonds and *sukuk*. This move enabled issuers to tap their existing programmes to meet any increases in funding requirements (Securities Commission, 2014, p. 4).

There have been on-going measures to promote the Malaysian domestic bond market. For example, in 2014, the Securities Commission announced that:

(a) With effect from 1 January 2015, trading of unrated bonds and *sukuk* was permitted, subject to certain conditions; and

(b) With effect from 1 January 2017, credit ratings were no longer mandatory (Securities Commission, 2015).

In addition to the above measures, a major reform by the Securities Commission in 2015 was the introduction of the Lodge and Launch Framework pertaining to wholesale offerings of unlisted capital market products. That is, offerings of these products could be made without product authorization to investors deemed as sophisticated, such as accredited investors and high net worth entities and individuals (Securities Commission, 2016).

During the period 2011 to 2015, the Malaysian capital market continued to record robust growth, underpinned by the Islamic capital market. By the end of 2015, the Islamic capital market had grown to RM1.7 trillion, which comprised 60 percent of the Malaysian capital market. Malaysia has maintained its position as the global leader in the *sukuk* market with a 54.3 percent share of the global *sukuk* market as at end 2015 (Securities Commission, 2016, p. 9). In April 2015, the Malaysian government issued a 30-year *sukuk* amounting to USD500 million. The issue was then the longest maturity sovereign *sukuk* (Bank Negara Malaysia, 2016, p. 68).

As at end 2017, the Malaysian capital market had expanded to RM3.2 trillion. The Malaysian bond market, inclusive of *sukuk*, had grown to RM1.3 trillion. It was also the third largest bond market in Asia (in terms of market capitalization to GDP) and the top global *sukuk* market (Securities Commission, 2018, pp. 85 & 88). In 2017 alone, corporate bond issuance, inclusive of *sukuk*, amounted to RM125 billion, a figure

that was comparable to the size of the Malaysian domestic bond market of RM130 billion in 1997 (p. 88). This achievement is a testimony of the progress the Malaysian domestic bond market has made since the Asian financial crisis.

3.5 Malaysia Plays Part in Regional Bond Market Development

3.5.1 Asian Bond Fund 1 and 2

Based on the size threshold of USD100-200 billion for sustaining a liquid government bond market (McCauley & Remolona 2000), not many Asian economies would have met this requirement then. In their study, the authors noted that government bond markets in Thailand and the Philippines were still under USD20 billion each although South Korea's market had reached USD82 billion in the late 1990s. However, the Malaysian government bond market has grown to USD166 billion as at Q4, 2017 (BIS, 2018). Nevertheless, given that numerous Asian economies have relatively small government bond markets as well as incomplete market infrastructure (Bhattacharyay, 2013; Burger *et al.*, 2015; Park, 2016), a way forward for many Asian economies may be to develop regional bond markets.[17]

In the aftermath of the Asian financial crisis, there were collective efforts to broaden and deepen Asian bond markets, which included the Asian Bond Fund 1 and Asian Bond Fund 2, launched by the Executives' Meeting of East Asia-Pacific Central Bankers (EMEAP). EMEAP comprised 11 central banks or monetary authorities from countries or economies in the East Asia-Pacific region, namely Australia, China, Hong Kong, Indonesia, Japan, Malaysia, New Zealand, the Philippines, Singapore, South Korea and Thailand. The Asian Bond Fund was designed to catalyze the growth of Asian bond markets by allocating a portion of the reserves of central banks to purchases

[17] A proposal by Sakakibara on developing a regional bond market in Asia (cited in Mohanty, 2002).

of government and quasi-government securities (Bhattacharyay, 2013; EMEAP, 2005; Park, 2016).

Launched in June 2003, the Asian Bond Fund 1, amounting to USD1 billion of investments, was devoted exclusively to Asian sovereign and quasi-sovereign issues of dollar-denominated bonds. The Asian Bond Fund 2, which was twice the size of Asian Bond Fund 1, was launched in 2005. The BIS was the fund administrator for Asian Bond Fund 2 (Bhattacharyay, 2013; BIS, 2004; Park, 2016). Key objectives of the Asian Bond Fund 2 included providing investors with a convenient and lower-cost instrument to invest in Asian local currency bonds as well as identifying and removing impediments to bond market development (EMEAP, 2006; Park, 2016).

Notwithstanding the progress made thus far, there was room for improvement. There was need for regional credit rating agencies, regional credit enhancement and guarantee agencies and a regional currency unit for the denomination of sovereign bonds. However, under the Asian Bond Market Initiative, various working groups established in 2003 have been dealing with these and other issues (Bhattacharyay, 2013; Park, 2016; Securities Commission, 2018).

3.5.2 Asian Bond Fund 2 Represented Key Stride in Regional Collaboration

There was also close collaboration between the EMEAP and IMF in "an unprecedented exercise to qualify a central bank's holdings in bond funds as foreign reserves, based on key criteria of residence, liquidity and currency convertibility". The IMF's confirmation of Asian Bond Fund 2 holdings being eligible as foreign reserves was critical to participation by all EMEAP's central banks.[18] To ensure this, EMEAP's

[18] Details on this eligibility as foreign reserves are in EMEAP (2006, pp. 14-15).

investments in the Asian Bond Fund 2 were held through a BIS investment vehicle, the USD-denominated BIS Investment Pool (EMEAP, 2006).

By 2006, the Asian Bond Fund 2 Initiative had also partially fulfilled some of its key objectives. It had been a catalyst for some regulatory and tax reforms, and improvements to market infrastructure in the eight markets where EMEAP has invested.[19] For example, Malaysia and Thailand had accelerated tax reforms to exempt non-resident investors from withholding tax on investment income from local currency bonds. Both countries have also established new regulations on Exchange Traded Funds to facilitate the listing of the Malaysia Fund and Thailand Fund as Exchange Traded Funds (EMEAP, 2006; Felman *et al.*, 2011; Gray, Felman, Carvajal & Jobst, 2011). Also noteworthy were two related initiatives. The first was the Asian Development Bank USD10 billion regional multi-currency bond platform that has linked the domestic capital markets of China, Hong Kong, Malaysia, Singapore, and Thailand. The second initiative was the creation of the Asia Securities Industry and Financial Markets Association (Committee on the Global Financial System, 2007).

Five years after the launch of the Asian Bond Fund 2, a third-party review was conducted on the Asian Bond Fund 2 administered by the BIS, to assess the Asian Bond Fund 2's effectiveness (Chan, Chui, Packer & Remolona, 2012). The review noted that the Asian Bond Fund 2 contributed towards boosting the development of domestic bond markets of the eight Asian Bond Fund 2 economies. For example, between 2005 and 2009, there was strong growth in the local currency bond markets in the eight Asian Bond Fund 2 economies especially in China (+185.5 percent), Malaysia (+72.9 percent), Singapore (+80.7 percent), and South Korea (+35.4 percent), (p. 38)[20]. While the local currency government bond markets mostly dominated in the eight Asian Bond Fund 2

[19] The eight markets were China, Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea and Thailand.

[20] This review was based on local debt securities figures from Asian Bonds Online site: https*://asianbondsonline.adb.org/data-portal/*

economies, the review noted that the corporate bond markets in Hong Kong, Malaysia, Singapore and South Korea were also significant.

3.5.3 Room for Improvement in Regional Efforts

There have been studies on the possible creation of a Regional Basket Currency Bonds and Credit Guarantee and Investment Facility. The interim report on the study on "Minimizing Foreign Exchange Settlement Risk in ASEAN+3 Region"[21] was completed and distributed to member countries. Other areas of collaboration and cooperation have focused on identifying measures to promote rating harmonization and further utilization of local credit rating agencies in the ASEAN+3 region (Bank Negara Malaysia, 2007b; Bhattacharyay, 2013; Felman *et al.*, 2011; Gray *et al.*, 2011; Park, 2016).

There has been steady progress in regional cooperation in developing Asian bond markets since the Asian financial crisis. Despite the progress made, Bhattacharyay (2013) has viewed achievements by the Asian Bond Market Initiative and other initiatives as "short of expectations" (p. 127). Furthermore, the 2008-09 global financial crisis underscored problems linked to excessive dependence on international capital flows. Prior to the global financial crisis, achievements through regional financial cooperation included the establishment of the Credit Guarantee and Investment Facility to guarantee bonds in Asia and the creation of the ASEAN+3 Bond Market Forum so as to facilitate cross-border transaction (Park, 2016; Shimuzu, 2010).

[21] ASEAN+3 includes the 10 members of ASEAN (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam) plus China, Japan, and South Korea.

With the global financial crisis, there was renewed urgency to improve domestic capital markets, including bond markets, in the Asian economies. Specifically, bond markets were expected to play a bigger role in financing the region's massive infrastructure development. However, in the wake of financial turmoil especially the global financial crisis, progress and achievements to-date needed to be accelerated in ensuring that Asian bond markets could play a meaningful role in reducing financial turbulence, including those related to currency and maturity mismatches (Eichengreen & Luengnaruemitchai, 2006; Felman *et al.*, 2011; Gray *et al.*, 2011; Park, 2016; Spiegel, 2009). Furthermore, despite the progress achieved by Asian bond markets, Burger *et al.* (2015) noted that many Asian bond markets remained small although local currency bond markets in South Korea (120 percent in terms of market capitalization to nominal GDP) and Malaysia (110 percent) were the largest in terms of market capitalization to GDP.

While recognizing the progress that emerging economies in Asia had achieved in developing their bond markets, Park (2016) noted that, except for Hong Kong, Singapore and South Korea, liquidity was lacking in the other Asian bond markets, including China, India, Indonesia, Malaysia and Thailand (p. 18). Through the ASEAN Working Committee on Capital Market Development, member countries have continued to work towards facilitating various cross-border offerings, including debt securities, as well as supporting regional co-operation in the Islamic capital markets. The Working Committee has also focused on addressing critical gaps in domestic or local currency bond markets in the ASEAN region (Securities Commission, 2013). Given that Asia's financing requirements for infrastructure development were substantial, as much as USD8 trillion over 2011 to 2020, Park (2016) stated that structural impediments to continued development of their bond markets, especially corporate bond markets, needed to be resolved.

3.6 Conclusion

Since its beginnings in the late nineteenth century, the Malaysian capital market has made substantial progress. The local equity market, which preceded other markets, is considered fairly well-developed. At its peaks during the 1993 and 1996 bull runs, its market capitalization to GDP ratios were 375 percent and 323 percent, respectively (Ariff & Yap 2001, 309).

Despite its slower start compared to the equity market, the domestic bond market has made significant progress, especially in recent decades. In the 1950s and 1960s, government efforts to develop a nascent bond market were confined to the public bond market. In the 1980s when government stance shifted to promoting the private sector as the country's engine of growth, measures were directed to developing the corporate bond market or PDS market.

Throughout this period, the local banking sector continued to dominate and accounted for 43 percent of total financing of the Malaysian economy in 1997, when the Asian financial crisis first began (Bank Negara Malaysia, 2008). Studies on the Asian financial crisis concurred that the worst-affected Asian countries were made vulnerable by their over-dependence on their banking sectors to meet their financing needs, including Malaysia.

As such, in the aftermath of the crisis, Malaysia has taken steps to further develop its domestic bond market. When looking into the state of Asian bond markets, various studies have detailed the requirements of well-developed bond markets, focusing on the need for depth and liquidity in such markets. There is evidence that Malaysia has worked on those areas, including, among others, establishing benchmark government bond issues to enhance market liquidity, establishing the Bond Information

and Dissemination System to improve transparency, and working hard to develop its money and derivatives markets.

Underscoring the remarkable progress since the Asian financial crisis, the Malaysian capital market has grown to RM3.2 trillion as at end of 2017. The Malaysian bond market, inclusive of *sukuk*, has reached RM1.3 trillion in size. In 2017 alone, corporate bond issuance, inclusive of *sukuk*, amounted to RM125 billion, comparable to the size of the Malaysian domestic bond market of RM130 billion in 1997.

As the CMP2 nears the end of its lifespan, challenges remain in developing the Malaysian domestic bond market. It may be that findings in this study relating to potential determinants of the domestic bond and debt markets could be utilized in future policies and measures for continued development of the Malaysian domestic bond market as well as paving the way for more synergies with the banking sector.

CHAPTER 4

METHODOLOGY AND DATA

4.1 Introduction

This chapter covers theory of bond market development based on various studies on domestic or local currency bond markets in recent decades. As such, this chapter will facilitate the subsequent selection of explanatory variables for the analysis of the Malaysian domestic bond market in the full sample period (in Chapter 5), analysis of the Malaysian domestic bond market in the sub-sample period (in Chapter 6) and, finally, analysis for the banking sector and private financing, both full sample and sub-sample periods (in Chapter 7). Since this study is on the Malaysian domestic bond and debt markets, the following chapters will examine in greater detail the inter-workings of the domestic bond market and dominant local banking sector. For Chapter 7, which will look into the determinants of private financing, this study will define private financing as bank loans plus corporate bonds (La Porta *et al.*, 1997).

Essentially, Section 4.2 first discusses the various studies on domestic bond markets, covering aggregate bonds as well as bond segments, and spanning developed and developing economies in different regions. Later in Section 4.2, the discussion will be used to guide and facilitate identification of determinants of domestic bond market development based on the selected studies, either positively or negatively. That is, identification of the determinants of bond market development will hinge on bond market development theory in recent decades. Section 4.3 will discuss the selection of the variables, both dependent and independent, and cover in detail the data used in this

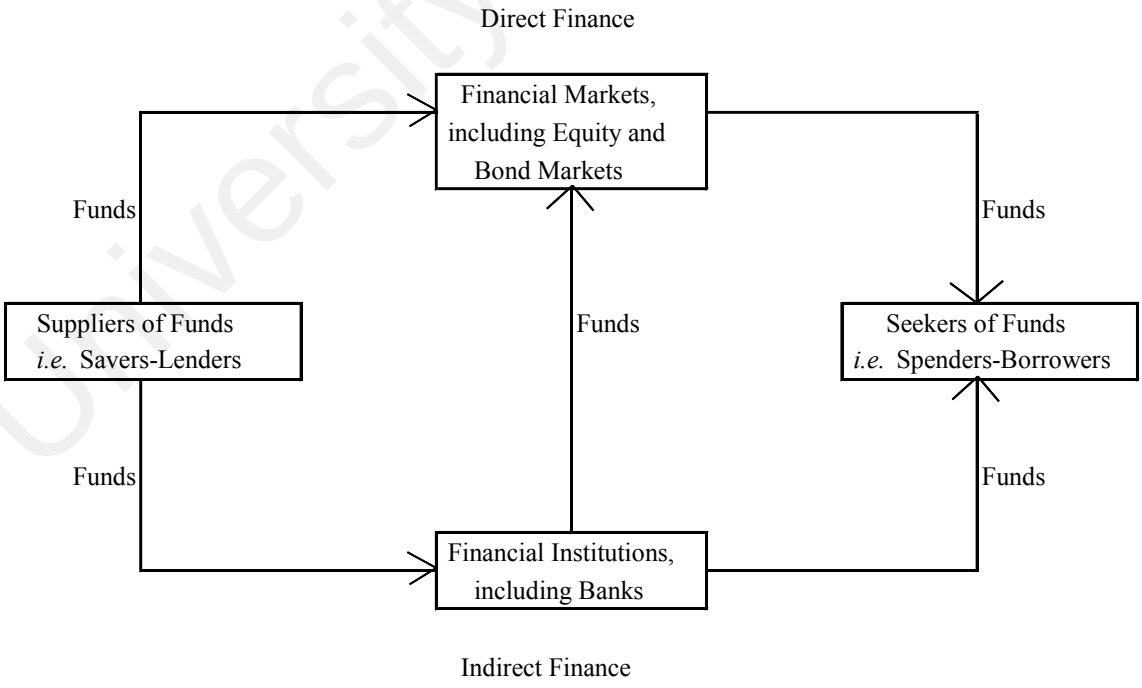
study, especially data sourced from the BIS. Section 4.4 will be on the methods used for analysis in this study.

4.2 Bond Market Development: Theoretical and Empirical Basis

4.2.1 Flow of Funds

This study examines the development of the Malaysian domestic bond and debt markets due to their important role within the Malaysian financial system (see also Sections 3.2.1 and 3.3). The theoretical foundation is premised on the flow of funds in the financial system as shown in Figure 4.1. Both the financial markets and financial intermediaries or institutions will channel funds from parties with excess funds to parties lacking or needing funds.

Figure 4.1: Financial System - Flow of Funds



From Figure 4.1, it can be seen that savers-lenders will be supplying funds through the financial markets (conduit for direct finance) and financial institutions

(providing indirect finance) to the seekers of funds, *i.e.* the spenders-borrowers. Hence, the Malaysian domestic bond market, as part of the financial markets, and banks, as part of the financial institutions, will perform the essential task of channelling funds from the savers-lenders to the spenders-borrowers. The economic players that are classified as savers-lenders include households, business firms, government entities and foreign parties with surplus funds. Such surplus funds include deposits placed with financial institutions including banks, and purchases of bonds and stocks. Meanwhile, households, business firms, government entities and foreign parties who suffer from a shortage of funds will be grouped as spenders-borrowers. These spenders-borrowers will be taking bank loans and selling bonds or stocks (Mishkin, 2013). The scope of this study is on the bond market and banks as shown in Figure 4.1.

4.2.2 Loanable Funds Theory

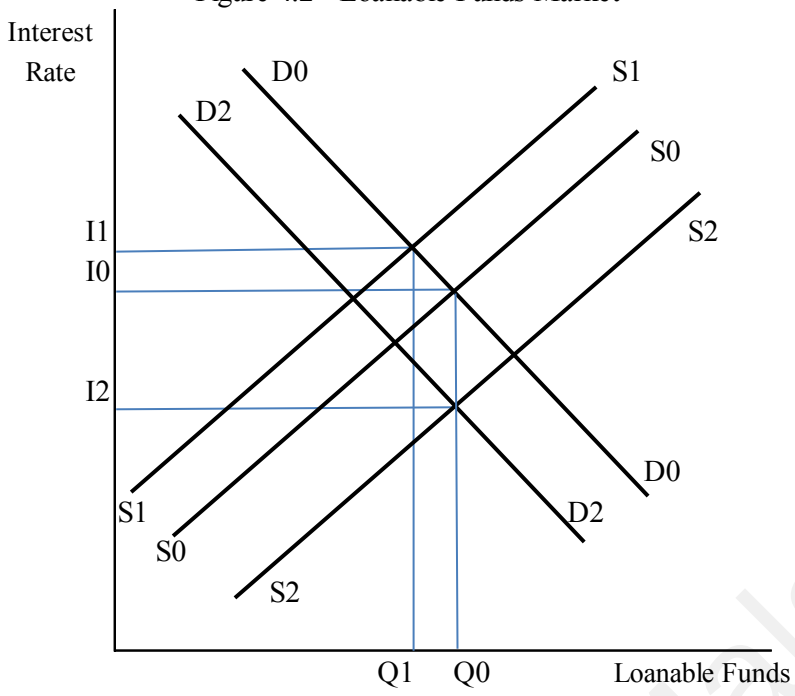
One of this study's objectives is to investigate the impact of Malaysia's monetary and fiscal policies on development of the Malaysian domestic bond market, including possible crowding-out on the private sector. That is, have Malaysia's persistent fiscal deficits, due to expansionary fiscal policies beginning 1998, resulted in higher interest rates that crowded out private investments and negatively impacted the private or corporate bond market? To explain the chain of events where fiscal deficits can lead to crowding-out on the private sector, this section looks into the loanable funds theory based on the assumption of a single financial market in a closed economy (Mankiw, 2018). In this closed economy, the savers and borrowers consist of households, firms and the government. Accordingly, all savers will have to deposit their saving into this financial market while all borrowers can only borrow from the

same financial market. There is only one interest rate, which is both the return to saving and the cost of borrowing.

In this closed economy, the supply of loanable funds will come mainly from the extra income set aside by the households (Private Saving) and saving by the government (Public Saving). This pool of private and public saving constitutes National Saving. An increase in the interest rate makes saving more attractive and will increase the quantity of loanable funds supplied. Meanwhile, the demand for loanable funds for investment purpose comes mainly from firms (Private Investment) and the government (Public Investment). Together, private and public investment constitute National Investment.

In the beginning, the supply of loanable funds is represented by the curve, S0S0, and the demand for such funds is shown by the curve, D0D0 (as shown in Figure 4.2). The interest rate in the financial market is I0, where the supply and demand for loanable funds are in balance at Q0. Within this closed economy, when the government incurs fiscal deficits, Public Saving is negative and will reduce National Saving. This means the curve for the supply of loanable funds shifts to the left, that is, the curve S0S0 shifts to S1S1. *Ceteris paribus*, the interest rate rises to I1 (that is, I1 > I0) and the quantity of loanable funds demanded and supplied in the market is only Q1 (that is, Q1 < Q0). In this situation, with a higher interest rate of I1, the fiscal deficit incurred by the government, leading to negative Public Saving, has reduced National Saving. As National Saving falls, the supply of loanable funds in the financial market has been reduced and, *ceteris paribus*, the interest rate is now higher when both demand and supply of loanable funds are in balance. At this point, the fall from Q0 to Q1 means that the fiscal deficit has pushed interest rate higher and crowded out investment.

Figure 4.2 - Loanable Funds Market



However, it can be seen in this case that the crowding-out effect occurred based on the following assumptions:

(a) Fiscal deficits, leading to negative Public Saving, will reduce National Saving and, thus, supply of loanable funds in the financial market.

(b) There is no change in the demand for loanable funds.

(c) The net effect from (a) and (b) causes interest rate to rise, thereby reducing investment and leading to crowding-out on the private sector.

Nevertheless, it is possible that fiscal deficits may not lead to crowding-out in certain situations. Assuming there is an economic shock to the closed economy and the government undertakes an expansionary fiscal policy that results in a fiscal deficit and negative Public Saving. At the same time, the savers (mainly households) decide to save more for contingency purposes, which leads to an increase in Private Saving. If the increase in Private Saving is more than the fall in Public Saving, the supply of loanable funds would increase. In this scenario, the curve S0S0 will shift to the right, as

shown by S2S2. Furthermore, if the economic shock also results in firms reducing their investment such that the demand for loanable funds falls, then the curve D0D0 may shift to the left to D2D2. From Figure 4.2, it can be seen that despite the fiscal deficit incurred by the government, the interest rate has fallen to I2 (that is, I2 < I0) while the amount of loanable funds demanded and supplied are in balance at Q0. In this situation, there is no crowding-out from the fiscal deficit.

4.2.3 Determinants of Domestic Bond Market Development

In this study, identification of independent variables as well as dependent variables has been guided by the empirical literature (*e.g.* Bae, 2012; Bhattacharyay, 2013; Burger *et al.*, 2015; Burger & Warnock, 2006; Eichengreen & Luengnaruemitchai, 2004; Harwood, 2000; La Porta *et al.,* 1997; Mihaljek *et al.,* 2002; Mohanty, 2002; Park, 2016; Turner, 2002) that have focused on development or underdevelopment of domestic bond markets, especially in Asian countries. Many of these studies, in turn, based their analysis of bond markets on other studies including those in the 1990s (*e.g.* Bentson, 1994; Committee on the Global Financial System, 1999; Schinasi & Smith, 1998).

As such, the empirical basis for bond market development in this study focuses on research efforts in the 1990s and 2000s. However, it should be noted that while the US bond markets were highly developed by the late 19th century, corporate bond markets in other countries including Germany and Japan "were virtually non-existent in 1980" (Schinasi & Smith, 1998, p. 15), which may explain the lack of studies on aggregate bond markets, encompassing both public and private bonds. In fact, data

from Asian Bonds Online[1] showed that corporate bonds in Japan made up less than 10 percent of Japan's aggregate domestic bond market as recently as 2015. However, corporate bonds have become a key segment of the Malaysian domestic bond market and studying the Malaysian domestic bond market will enable a closer examination of the corporate bond segment.

Based on the following studies on bond market development and their findings, the state of development of a country's domestic bond market, as measured by its market capitalization, is expected to be influenced by the following macroeconomic factors, which will be used to guide the selection of explanatory variables for this study:

(a) Size of Economy, Level of Economic Development and Economic Growth

In line with factor endowment, structural characteristics of an economy, its level of economic development and especially its size and economic growth may influence domestic bond market development (see, for example, Amante *et al.,* 2007;-Bae, 2012; Beck *et al.,* 2002; Bhattacharyay, 2013; Claessens *et al.*, 2007; Eichengreen *et al.,* 2002; Eichengreen & Luengnaruemitchai, 2004; 2006; La Porta *et al.,* 1997; Nierop, 2005; Park, 2016; Smith, 1995). Some studies have found evidence that emerging economies had difficulties getting international investors to hold their debt papers due to their "small size", giving rise to the term "original sin". However, Burger and Warnock (2006) found that emerging economies need not be constrained by the problem of size and could boost development of their domestic bond markets if they performed better at controlling long-term inflation and developed strong legal institutions. Subsequently, as domestic bond markets developed and grew in size, foreign participation in such markets may increase as transaction costs declined (Burger & Warnock, 2007). This

[1] Available at https://*asianbondsonline.adb.org/data-portal/*

would pave the way to resolving the problem of "original sin" where small economies are deemed too small to be able to borrow in their own currencies.

In their major study on 49 countries and their external finance, La Porta *et al.* (1997) included GDP growth as one of the determinants of external finance. Their study found GDP growth to be positively associated with external finance, which included bank loans and corporate bonds in the country.[2]

In another study on bond market trends in emerging economies, which included Malaysia, over the period 1994-2000, Mihaljek *et al.* (2002), using data on cumulative bond issues, discovered a positive relationship between GDP growth in real terms and size of total domestic bond market. However, this positive relationship was much weaker between real economic growth and corporate bond issuance. Still, smaller economies, including Malaysia, may have faced initial difficulties in developing their bond markets as liquid security markets may require a minimum efficient scale (Amante *et al.,* 2007; McCauley & Remolona, 2000).

(b) Openness of Economy

Based on the finance-growth nexus, Rajan and Zingales (2003) suggested that in economies that are exposed to international competition, vested interests in such economies will be less able to suppress competitive forces in the marketplace (Bae, 2012; Bhattacharyay, 2013; Eichengreen & Luengnaruemitchai, 2004). Their findings showed that a country's openness to trade, proxied by Total Exports plus Total Imports over GDP, contributed positively to its financial development. In fact, they stressed that this positive relationship between trade openness (that also facilitated capital mobility) and financial development was stronger in the period of 1981-97 when there was greater capital mobility between countries. In their studies on bond market development, Bae

[2] This study is also analyzing the same debt instruments, including bank loans and corporate bonds.

(2012), Bhattacharyay (2013), and Eichengreen and Luengnaruemitchai (2004) also found that a country's openness to trade had a positive impact on the size of its bond markets. These researchers were of the view that openness to trade translates to greater international competitiveness and promotes financial development, including bond market development.

(c) Size of Banking Sector

Looking at the history of some countries, for example, in the case of Malaysia and other Asian economies, banks have traditionally dominated their financial systems. Hence, banks in those countries will have "first-mover advantage" (*e.g.* Bentson, 1994; Burger & Warnock, 2006; Eichengreen & Luengnaruemitchai, 2004). Since the banking sector and bond market would be competing sources for providing external financing to entities needing funds, a well-established banking sector could act to suppress development of its competitors such as the domestic bond market, *e.g.* making bond issuance difficult or costly because of rent-seeking behaviour.

Nevertheless, there are complementarities and economies of scale that can be reaped in joint development of the banking sector and domestic bond market (Bae, 2012; Bhattacharyay, 2013; Burger & Warnock, 2006; Eichengreen & Luengnaruemitchai, 2004; Harwood, 2000; Park, 2016). These can be seen from banks acting as dealers, market makers and investors in the bond market. Burger and Warnock (2006) found that countries that had bigger bond markets also had bigger banking sectors, albeit not necessarily bigger equity markets. Bae (2012) stated that a "mature and well-developed banking sector is critically important to further development of bond market, particularly to the corporate bond market" (abstract). Furthermore, outstanding loans over GDP have been used as a proxy for the level or

extent of financial intermediation in an economy (*e.g.* De Gregorio & Guidotti, 1995; King & Levine, 1993).

However, Herring and Chatusripitak (2000) argued that countries could suffer economically when they depended heavily on their banking systems and equity markets to meet their financing needs at the expense of developing a viable bond market. Using Thailand's experience in the Asian financial crisis, they showed that a country without a well-developed bond market will tend to rely excessively on its banking sector. Thus resulting in an over-extended banking sector and increasing the country's risks to financial turmoil since banks are highly leveraged entities.

Hence, based on the studies by Herring and Chatusripitak (2000) as well as Essers *et al.* (2015) on domestic bond markets in some African countries, one can postulate a negative relationship in some countries between their domestic bond markets and banking sectors, especially if the banking sectors expanded at the expense of the domestic bond markets' development. Intuitively, an over-developed banking sector will lead one to expect an underdeveloped bond market.

(d) Concentration of Market Share in Banking Sector

In countries where the largest banks have a sizeable share of the market, the banks could act *via* rent-seeking behaviour to undermine efforts to develop the domestic bond market so as to protect their turf and profits. That is, the concentration of power that a big market share endowed the top banks in any country may be utilized by the same banks in making bond issuance difficult or unattractive, including cost-wise for prospective bond issuers (*e.g.* Bae, 2012; Bentson, 1994; Eichengreen & Luengnaruemitchai, 2004; Rajan & Zingales, 2003; Schinasi & Smith, 1998).

(e) Size of Equity Market

The reasoning about a well-established banking sector competing with the domestic bond market can also be used for the equity market, as the latter is also a possible avenue for corporations to raise needed financing for business expansion *etc.* As such, the relationship between the equity and domestic bond markets can be negative if they are competitors, or positive if their growth and development can bring about positive spillover effects to each other. In some countries including Malaysia, the equity market can also be said to have "first-mover advantage" as equity markets were developed ahead of bond markets.

Additionally, where the equity market is concerned, its size or market capitalization can also be used as a proxy for the level or extent of development in a country's capital market (Bae, 2012; Claessens *et al.*, 2007; Garcia & Lin, 1999). That is, there can be synergies between a well-functioning equity market and developing bond market since a thriving equity market often establishes adequate disclosure practice among corporates (World Bank & IMF, 2001).

(f) Impact on Macroeconomic Variables *via* Monetary and Fiscal Policies

Macroeconomic policies – both monetary and fiscal - may reduce or increase the risk of holding such domestic bonds through their impact on, among other things, interest rates, exchange rates, inflation, and fiscal balances as well as government debt (Bae, 2012, Bhattacharyay, 2013; Burger *et al.*, 2012; 2015; Burger & Warnock, 2006; Burger & Warnock, 2007; Committee on the Global Financial System, 2007; Eichengreen & Luengnaruemitchai, 2004; Essers *et al.,* 2015; Hale, 2007b; Mihaljek *et al.,* 2002; Park, 2016; Turner, 2002).

For example, high inflation or domestic interest rate volatility in a country may make it unattractive and more risky for its investors to hold bonds, for investment or savings purposes. As such, credible monetary policy that promotes economic growth while keeping inflationary pressures in check and maintaining interest rates at sustainable levels would facilitate bond market development by safeguarding returns (in the form of attractive interest rates) for bond investors.

The studies by Burger and Warnock (2006; 2007) found that countries with better inflation performance, especially long-term inflation,[3] possibly the result of more stable monetary and fiscal policies, may provide a more conducive environment for investors to hold bonds (see also Amante *et al.,* 2007; Bae, 2012; Burger *et al.*, 2012; 2015). However, Rose (2014) proposed that existence of local currency bond markets, with long maturity nominal bonds, would result in lower inflation. His study looked at a group of countries with different monetary regimes, including inflation-targeting and hard fixed exchange rates. He found that the existence of such local currency bond markets in countries that practised inflation-targeting resulted in lower inflation, by as much as 3-4 percent. Bond markets that were indexed to inflation or in foreign currencies did not produce similar results, *i.e.* noticeably lower inflation. Countries with long maturity nominal currency bond markets that adopted hard fixed exchange rate regimes also did not enjoy the same low inflation environments.

Conversely, high interest rates, in absolute levels, and / or high spreads may make it unattractive or undesirable for entities to issue bonds due to the high interest cost in servicing the debt or bonds. In turn, this could dampen investor demand for the bonds if the high interest payments were viewed as unsustainable for the bond issuers

[3] As a proxy for long-term inflation, the study used inflation variance, that is, the variance of inflation rate over the past 10 years. The study was carried out using bond data as of end 2001, comprising unpublished long-term debt securities data from the BIS, which were further augmented with other data sources.

(Bae 2012; Eichengreen & Luengnaruemitchai, 2004; Essers *et al.,* 2015; Harwood, 2000).

However, spreads in interest rates may be a reflection of the level of competition and efficiency within the banking sector. That is, higher spreads in interest rates correspond to a low level of competition between banks and the resulting inefficiency within the sector itself (Eichengreen *et al.,* 2008; Mu *et al.,* 2013). If this is so, there may be a positive impact from higher interest spread on size of domestic bond markets.

(g) Exchange Rate Regime and Volatility

Bae (2012) found that exchange rate volatility was negatively related to government and corporate bonds. His findings supported the view that bond market development would benefit from stable exchange rates (see also Eichengreen & Luengnaruemitchai, 2004). However, this does not necessarily mean that fixed exchange rates will contribute to more developed or bigger bond markets. In fact, some have argued that fixed exchange rate regimes or even relatively stable exchange rates may lead to underestimation of exchange rate risks by international investors and lenders as well as the bond issuers (of both public and private sectors) in the country concerned (Eichengreen & Luengnaruemitchai, 2004; 2006; Goldstein, 1998).

However, since local currency bonds are issued for funding purposes, they are, to some extent, substitutes for other types of borrowings, including foreign or overseas borrowings. In this aspect, movements in the exchange rate such that the local currency appreciates or strengthens, making foreign borrowings including foreign currency bonds more cost effective, may have a negative effect on issuance of local currency bonds (Turner, 2012).

(h) Government Bond Market as Cornerstone

Developing the government bond market first will provide the needed benchmark yield curve for subsequent pricing of corporate bond issues (Bae, 2012; Schinasi & Smith, 1998; World Bank & IMF, 2001). In fact, development of a government bond market will help to "promote a class of dynamic, profitable fixed-income dealers" (Harwood, 2000, p. 13). The presence of a group of bond traders and market makers was critical for developing a deep, liquid and well-functioning bond market (Committee on the Global Financial System, 2007; Harwood, 2000; Luengnaruemitchai & Ong, 2005; Schinasi & Smith, 1998).

(i) Government Debt and Fiscal Balance

Since government bonds are issued by the government or public sector to finance its expenditure, studies on bond market development have established a positive relationship between government bonds as well as domestic bond market capitalization with government debt, or a negative relationship between the former group with a country's fiscal balances (Bae, 2012; Claessens *et al.*, 2007; Eichengreen & Luengnaruemitchai, 2004; Essers *et al.,* 2015; Park, 2016).

Nevertheless, sustained fiscal deficits may increase risks of crowding-out on the private sector, including the corporate bond market. That is, persistent fiscal deficits lead to a continual reduction in national savings *via* a fall in public savings. According to the loanable funds theory (Mankiw, 2018), this reduction in national savings and, thus, loanable funds will raise interest rates and crowd out private investments. Hence, persistent fiscal deficits will have a negative impact on corporate bond markets if such deficits result in crowding-out while fiscal surpluses will have a positive impact on the corporate bond market.

(j) Capital Controls

The study by Eichengreen and Luengnaruemitchai (2004) found that capital controls mattered where public bonds were concerned. Their study and another by Rajan and Zingales (2003) found countries that had capital account convertibility benefitted from foreign investors in their capital markets, including domestic government bond markets.

4.3 Variables and Data for Empirical Models

4.3.1 Definitions of Bonds, "Bond Market" and "Private Financing"

According to the World Bank and IMF's *Developing Government Bond Markets: A Handbook* (2001), bonds are "tradable securities of longer maturities (usually one year or more)" (p. 2). As such, the bond market is a market with "tradable securities of longer maturity (usually one year or more)" (p. 2). Such bonds are debt instruments that carry coupons or pay interest payments at regular or specified periods until the bonds reach maturity. In contrast, Treasury bills, which are short-term debt instruments, are "securities with a maturity of less than a year" (p. 2).

In the case of Malaysia, Bank Negara Malaysia (1999a) has defined the country's bond markets, both conventional and Islamic, as markets with public and private tradable securities with "maturities exceeding one year" (p. 298). As such, there is a difference in the definitions of long-term and short-term debt securities between Malaysian authorities with the international organizations such as the BIS, IMF and World Bank. That is, debt securities of one-year maturity are classified as short-term securities by the Malaysian authorities, but the same debt securities will be classified as long-term securities by the BIS, IMF and World Bank.

Hence, this section will define the terms used in this study as follows. First, for the purpose of this study, which is focused on the Malaysian domestic bond market, it should be stated that in all analysis of this study including in Chapter 7, private financing comprises bank loans and domestic corporate bonds (La Porta *et al.*, 1997).

Second, important studies on domestic bond markets, including those by Bae (2012), Claessens *et al.* (2007), Eichengreen and Luengnaruemitchai (2004), and Mihaljek *et al.* (2002), which serve as reference for this study, have been done with BIS data on domestic debt securities, which included both long-term and short-term data. Data provided by the BIS (under the BIS's old definitions, which were in use up to end 2011) were in the categories as follows:

(a) "Domestic debt securities", which were made up of both long-term and short-term maturities.
(b) "Domestic debt securities with remaining maturity up to one year", which comprised:
    (i) Short-term domestic debt securities; and
    (ii) Long-term domestic debt securities, with remaining maturity up to one year.

That is, the BIS did not publish just short-term domestic debt securities data previously.

The studies by Bae (2012), Claessens *et al.* (2007), Eichengreen and Luengnaruemitchai (2004), and Mihaljek *et al.* (2002) were done with data as specified in category (a). Nevertheless, even though such debt securities included short-term domestic debt securities, the bulk of the domestic debt securities comprised long-term debt securities or bonds. This can be seen from Table 4.1, which shows the percentages calculated for the sample period used in this study. Further explanation on the sample period is given in Section 4.3.2 below.

It is important to note that the percentages shown in Table 4.1 will understate the portion of long-term debt securities or bonds since the sum deducted (B) actually consisted of not just short-term debt securities, but also long-term debt securities with remaining maturity up to one year.

Table 4.1: Portion of Bonds or Long-term Debt Securities

Issuer / Bond	(A – B) / A (in Percent)	
	All Countries	Malaysia
All Issuers / Aggregate Bonds	74.0	73.1
Central Government / Government Bonds	73.1	96.0
Corporate Issuers / Corporate Bonds	86.6	83.9
Financial Institutions / Financial Bonds	70.8	22.7

Note:
A = Domestic debt securities
B = Domestic debt securities with remaining maturity up to one year

In fact, "domestic debt securities" data for Malaysia, with the exception of issuance by financial institutions, have percentages that are comparable to or higher (in the case of government bonds) than percentages for debt securities issuance by all countries. As such, findings in this study should be comparable with findings of past studies on domestic bond markets, including those by Bae (2012), Claessens *et al.* (2007), Eichengreen and Luengnaruemitchai, (2004) and Mihaljek *et al.* (2002). In the case of financial bonds for Malaysia, these bonds made up 25.9 percent of domestic aggregate bonds (the average for the full sample period).

For the Malaysian domestic government bond segment, the percentage was 96.0 percent, which was higher than the 73.1 percent for All Countries. For Malaysian domestic corporate bond segment, the percentage was 83.9 percent, which was comparable to the 86.6 percent for All Countries. Furthermore, Bank Negara Malaysia and the Securities Commission (2009) stated that for the period end 1997 to end 2008, the Malaysian domestic debt securities market had grown to RM585.5 billion, of which

about 10 percent was short-term debt securities (p. 1).[4] This confirmed that the Malaysian debt securities market comprised mainly (some 90 percent) of long-term debt securities or bonds. Since government and corporate bonds are the major and important segments of the domestic bond market in Malaysia, the findings of this study for the aggregate, government and corporate bond markets should be comparable with past studies on domestic bond markets.

4.3.2 Dependent Variables and Sample Periods (Domestic Bond Market and Private Financing)

The selected studies on bond markets have used the phrase "development of bond markets" to indicate growth in the size or capitalization of the bond markets. While the word "development" of a market (*e.g.* bond or equity market) could have broader application, this study will also use the word "development" to mean growth or increase in the size or capitalization of the bond market.

In various studies, including those done by the BIS, on bond market development, bond market development is proxied by capitalization of bond market (as a ratio to nominal GDP). In this study on determining the potential determinants of domestic bond market development in a multiple regression analysis, the proxy for one of the dependent variables – domestic bond market development in Malaysia – will be capitalization of domestic bond market in Malaysia as a ratio of nominal GDP.

[4] As discussed earlier, Malaysian authorities classify debt securities with original maturity of one year as short-term papers while the BIS and other international organizations classify them as long-term debt securities. Hence, this percentage of 10 percent of short-term papers may overstate the short-term portion when compared with the percentages of BIS "domestic debt securities".

Choosing capitalization of domestic bond market in Malaysia as the proxy for the dependent variable in this study will also facilitate comparison of findings of this study with other studies on bond market development.

Besides capitalization, turnover on bond markets is considered another measure of bond market development. However, government bonds in Malaysia tend to account for a sizeable portion of the country's bond market capitalization, ranging mostly between 40 percent to 50 percent based on data from the BIS for this study, and their trading has traditionally been limited due to regulatory conditions and investment practices in Malaysia (Bank Negara Malaysia, 1999a).[5] This trend would not have changed much as a high percentage of Malaysian domestic government bonds are held by the Employees Provident Fund, banking institutions and the country's central bank, insurance companies and development financial institutions (Bank Negara Malaysia, various years). According to figures released by the Malaysian government in 2017, some 70 percent of government bonds are held by these entities (New Straits Times, 2 November 2017).[6] Also, Bank Negara Malaysia (various years) said that for most years, their figures of such holdings – also about 70 percent – of Malaysian government bonds were held by residents, who mostly held such bonds to maturity. As such, turnover for the Malaysian bond market may be a less accurate measure of bond market development.[7]

In line with several noteworthy cross-country studies on domestic bond markets in the past decade (*e.g.* Bae, 2012; Burger *et al.*, 2015; Burger & Warnock, 2006; Claessens *et al.*, 2007; Eichengreen & Luengnaruemitchai, 2004; 2006), this study will

[5] Section 3.2.4 has more details on the reasons for low volume in secondary trading in the Malaysian domestic bond market.

[6] https://*www.nst.com.my/business/2017/11/298423/fed-govt-debt-manageable-moderate-level-finance-ministry*

[7] Furthermore, Eichengreen *et al.* (2006) commented that the Employees Provident Fund, Malaysia's state-owned pension fund, was estimated to hold up to 60 percent of domestic bonds in Malaysia, citing anecdotal evidence (p. 29). If accurate, a very large percentage of the bonds will mostly be held to maturity and hardly traded.

use secondary data from the website of the BIS.[8] Using BIS data will further facilitate comparison of this study's findings with those from the other major studies. The BIS website provides data of quarterly frequency, which is utilized in this study. However, overall, bond studies using data from different sources have compatible findings, including those by Bhattacharyay (2013) and Park (2016) with data from Asian Bonds Online,[9] such as the following:

(a) Positive relationships between size of the economies, fiscal deficits with size of their domestic bond markets.
(b) Negative relationships between interest rates / interest spreads and exchange rate variability with size of their domestic bond markets.

Domestic bond market development in Malaysia will be measured by the size or capitalization of the volume of outstanding domestic aggregate bonds in Malaysia. That is, the volume of outstanding domestic bonds in Malaysia will be used as the proxy for development of the Malaysian domestic bond market. Data from the BIS website are available for distinct categories such as aggregate bonds; government or public bonds; private bonds, that is, issuance by corporates; and issuance by financial institutions.

As such, this study will look at the potential determinants for the following domestic bond segments, banking sector and private financing in Malaysia:

(a) Total or aggregate bonds
(b) Government bonds
(c) Corporate bonds

[8] https://*www.bis.org/statistics/secstats.htm*
[9] According to Asian Bonds Online website, "Bonds are defined as long-term bonds and notes, Treasury bills, commercial papers, and other short-term notes." While, "Government bonds include obligations of the central government, local governments, and the central bank. Corporates comprise both public and private companies, including financial institutions. Financial institutions comprise both private and public sector banks, and other financial institutions."
https://*asianbondsonline.adb.org/data-portal/*

(d) Financial bonds

(e) Loans outstanding

(f) Private Financing (comprising Loans Outstanding plus Corporate Bonds)

In line with a major study by La Porta *et al.* (1997), this study will look into private financing, *i.e.* bank loans plus corporate bonds in the country. Private financing, using the definition by La Porta *et al.* (1997) to study these debt components, has not been examined before. However, given the importance of both the domestic corporate bond market and banking sector, findings in this study will be of interest, including from the perspective of future policy design.

Based on the availability of Malaysian domestic bond data from the BIS website, the full sample period for this study is from Q4, 1993 to Q4, 2011. This period covered the important periods for the domestic bond market and banking sector, including the years leading up to the 1997-98 Asian financial crisis and post-crisis years. In addition to the analysis for the full sample period, the study will also include a sub-sample period analysis from Q4, 2005 to Q4, 2011. Analysis of the sub-sample period also serves as a robustness check for findings from the full sample period.

The dependent variables and sample periods for Chapters 5, 6 and 7 are summarized in Table 4.2. The choice of sample periods will be further explained subsequently.

Table 4.2: Dependent Variables and Sample Periods

Chapter	Dependent Variable	Period
Chapter 5	(a) Total or Aggregate Bonds (b) Government Bonds (c) Corporate Bonds (d) Financial Bonds	Full Sample Period (Q4, 1993 to Q4, 2011)
Chapter 6	(a) Total or Aggregate Bonds (b) Government Bonds (c) Corporate Bonds (d) Financial Bonds	Sub-sample Period (Q4, 2005 to Q4, 2011)
Chapter 7	(e) Loans Outstanding (f) Private Financing (comprising Loans Outstanding + Corporate Bonds)	Full Sample Period (Q4, 1993 to Q4, 2011) Sub-sample Period (Q4, 2005 to Q4, 2011)

Quarterly data on the Malaysian domestic bond market were available beginning Q4, 1993 from the BIS website. However, as of January 2012, arising from the global financial crisis, the BIS has changed its definition for its categories of domestic debt securities (Gruic & Woodbridge, 2012). This revision to the BIS's debt securities statistics was made following the 2008-09 subprime crisis to facilitate comparability across different markets (see Table 4.3). Table 4.3 is based on information from Table 1 (BIS, 2012, p. 69).

As a result of the changes implemented by the BIS in 2012, the sample period for this study has been confined to Q4, 1993 to Q4, 2011 so that this study can utilize data based on the old BIS categorization. This choice was made as under the new definitions by the BIS, data on Malaysian domestic debt securities are available only from 2005 onwards. By 2005, the Malaysian domestic bond market would have been relatively developed and possibly resulted in this study missing important developments and transformation in the bond market. In fact, Burger *et al.* (2015), in their study on bond market development in 45 emerging Asian economies, also opted to utilize data based on the old BIS categorization and, thus, confined their period of analysis to end

2011. The authors expressed concerns that the "more recent data" from the BIS "may not be consistent with the historical data" (p. 4).

Table 4.3: BIS Debt Securities Statistics – Before 2012 and After 2012 Definitions (1)

	Before December 2012	After December 2012
Definition	Targeted at local investors	Issued by residents in their local market
Data source	Public sources	Central banks (2)
First year of data availability	1989	Varies by country
Frequency	Annual prior to 1994	Quarterly
Valuation	Face or nominal value	Face or nominal value (3)
Classification	National	*Handbook on Securities Statistics*
Sector	Financial institutions, excluding central banks; corporate issuers; governments, including central banks	Financial corporations, including central banks; non-financial corporations; general government
Currency	Not Available (5)	Partial (4)
Maturity	By remaining maturity (6)	Short-term by original maturity
Type of instrument (interest rate)	-	Partial (4)

Source: BIS (2012, Table 1)
Note:[10]
(1) Changes implemented in December 2012 were applied retroactively and, therefore, impact the full history of the statistics.
(2) Where central bank data are not available, public sources. Details of countries reporting practices are available on the BIS website at *www.bis.org/statistics/secstats.htm*.
(3) Nominal value equals face value plus accrued interest; where neither nominal nor face value is available, market value.
(4) Incomplete information is published.
(5) Previously assumed to be denominated in local currency.
(6) Previously original maturity where remaining maturity was not available.

Furthermore, starting with data from 2005 will result in this study not covering the years before and especially after the Asian financial crisis when there were major events in the Malaysian domestic bond market. Perhaps even more crucial, comparisons cannot be done for two specific periods, *i.e.* between the first period from 1993 to 1997 when Malaysia was running a balanced or surplus government budget

[10] Taken from BIS (2012, p. 69).

with the second period from 1998 to end 2011 when the government embarked on expansionary fiscal policies and incurred persistent and sizeable fiscal deficits.

Since one of the research questions for this study is whether there has been any crowding-out effect on the private sector from sustained fiscal deficits from 1998 to end 2011, the study period must include the years from 1993 onwards. These are some of the reasons the study has to depend on the BIS data based on the old categorization.

In addition to the above important reasons for using the old BIS data, there is another pressing rationale for this decision. Under its new definitions, debt securities issued by central banks are now grouped with debt securities issued by financial corporations. That is, bonds issued by Malaysia's central bank, Bank Negara Malaysia, are now under the category "Financial corporations, including central banks".

Before the changes, government or public bonds included both government and central bank issued bonds. This earlier definition was the same as that used in Malaysia for classification of government bonds (Bank Negara Malaysia & Securities Commission, 2009).

During the sample period for this study, there were occasions when Bank Negara Malaysia issued bonds to achieve specific objectives in conjunction with the Malaysian government. For example, in 1993, to encourage savings and educate individual Malaysians on the concept of investing in bonds as an alternative to other existing investment instruments, Bank Negara Malaysia issued RM1.4 billion 5-year discounted savings bonds – Malaysian Savings Bond (Bon Simpanan Malaysia) – to the public (Bank Negara Malaysia, 1994b). Hence, using BIS data series with the new classification would have resulted in different and possibly misleading findings for Malaysia's government bond and financial bond segments. There are concerns that the new categorization by the BIS may affect this study's findings pertaining to the

domestic government bond segment, and, ultimately, possibly diminish the relevance of certain policy implications of this study.

The sub-sample period, which covered the period of Q4, 2005 to Q4, 2011, began after the removal of the Ringgit peg on 21 July 2005 (Bank Negara Malaysia, 2006, pp. 74-75). That is, analysis of the sub-sample period covered a period when Malaysia did not have any selective exchange controls or currency peg.

In summary, for the purpose of this study, which includes identifying potential determinants of the Malaysian domestic bond market and segments of the market, including public or government domestic bonds, the new definitions instituted by the BIS would mean the portion of domestic bonds issued by Bank Negara Malaysia, the central bank of Malaysia, being taken out from the category of domestic government or public debt securities. As this would likely affect the findings of this study materially as regards potential determinants of domestic government or public bonds (as well as skewing the findings for domestic financial bonds too), the period of analysis for this study has been confined to Q4, 1993 to Q4, 2011. This time period also spans important financial crises such as the Asian financial crisis and global financial crisis.

Data for the study will also be obtained from other sources such as Bank Negara Malaysia, the IMF, including International Financial Statistics, and CEIC (a provider of economic data). The published data from the BIS and those on Malaysia's banking sector and government debt, which are of quarterly frequency, have been smoothed out to reduce seasonal fluctuations in the data.

4.3.3 Variables for Potential Determinants

The proxies or variables for potential determinants discussed in Section 4.2 that are used for analysis are given in Table 4.4.

Table 4.4: Determinants and Variables

Determinant	Variable	Abbreviation
Size of Economy, Level of Economic Development, or Economic Growth	Annual GDP Growth Rate	GROWR
Openness of Economy	Trade over Nominal GDP	TRADE
Size of Banking Sector, or Level of Financial Intermediation	Loans Outstanding over Nominal GDP	LOAN
Concentration of Market Share in Banking Sector	Share of largest bank's assets over Total Banking Assets	BANCON
Size of Equity Market, or Level of Capital Market Development	Equity Market Capitalization over Nominal GDP	EQMKT
Monetary and Fiscal Policies	Inflation Rate Log of Interbank Rate Standard Deviation of Interest Rate Spread between Interest Rates	INFL LIBR SDIBR SPREAD
Exchange Rate Regime and Volatility	Log of Exchange Rate; Standard Deviation of Exchange Rate	LEXR SDEXR
Size of Government Bond Market as Cornerstone for Developing Private Bond Market	Government Bond Capitalization over Nominal GDP	GDEBT
Dummy Variables for Breakpoint / Change and Events	(a) Selective Exchange Controls and Currency Peg (b) Breakpoint in Government Debt (c) Asian Financial Crisis (d) Global Financial Crisis	DVPEG DVBPGD DVAFC DVGFC

4.4 Methods

This study on the Malaysian domestic bond and debt markets, using time series data from Q4, 1993 to Q4, 2011, will first test a dynamic model to determine the noncontemporaneous, or lagged, relationships between the dependent and independent variables. That is, this study will employ an autoregressive distributed lag (ARDL) model (Gujarati & Porter, 2009; Pesaran & Shin, 1999; Pesaran, Shin & Smith, 2001; Stock & Watson, 2006).

In addition, studies on bond markets using multivariate (Ordinary Least Squares) approach include Bhattacharyay (2013). Bhattacharyay's empirical work involved identifying major determinants of development of bond markets in Asia. Using a similar approach, La Porta *et al.* (1997) looked at the legal determinants of capital markets based on a sample group of 49 countries. Their study was on external finance, which covered the equity market and selected debt components. The same debt instruments, *i.e.* bank loans and corporate bonds, are analyzed in this study (in Chapter 7).

Let 'y' be the dependent variable. The various dependent variables selected for this study are shown in Section 4.3.2 (Table 4.2).

Also, let 'x' represent the independent variable(s). The list of independent variables representing the list of selected determinants is defined in Section 4.3.3 and shown in Table 4.4.

First, all variables are tested for stationarity using Augmented Dickey-Fuller (ADF) Fisher unit root test. The second step is fitting the ARDL model as below.

$$\Delta y_t = \beta_0 + \beta_1 y_{t-1} + \sum_{i=1}^{m} \beta_{2i} X_{i,t-1} + \sum_{i=1}^{p} \propto_i \Delta y_{t-i} + \sum_{i=0}^{p_1} \gamma_i \Delta x_{1,t-i} + \cdots + \sum_{i=0}^{p_m} \theta_i \Delta x_{m,t-i} + u_t \quad (4.1)$$

m = number of potential determinants
$p, p_1, \ldots p_m$ = number of lags
u_t = error term

Equation 4.1 will be estimated. The ARDL F-bound test is used to check for the presence of long-run relationships between the various dependent variables with the selected independent variables. The various regression runs will be done employing lag lengths up to 4, given the full sample period for the study is from Q4, 1993 to Q4, 2011.

If long-run relationships can be established, then Equation 4.1 will be used. However, if the F-bound test does not find any long-run relationship, the multivariate regression model (in Equation 4.2) will be estimated. The general specification is:

$$\Delta y_t = \beta_0 + \sum_{i=1}^{p} \propto_i \Delta y_{t-i} + \sum_{i=0}^{p_1} \gamma_i \Delta x_{1,t-i} + \cdots + \sum_{i=0}^{p_m} \theta_i \Delta x_{m,t-i} + u_t \quad (4.2)$$

Different components of the domestic debt market will be analyzed as follows:

- Domestic bonds (in Chapters 5 and 6); and
- Bank loans and private financing, comprising bank loans plus corporate bonds (in Chapter 7).

For each dependent variable, a few specifications are considered in each chapter (that is, three specifications for full sample period and two for sub-sample period). In general, for each dependent variable, the variables or proxies for the banking sector, equity market and government debt or bond market are tested for statistical significance in the initial specifications. Subsequently, the variables for interest rates and exchange rates as well as dummy variables are then tested for inclusion in the later specifications. This method allows us to check that variables are consistently significant across two or three specifications. Further, this method demonstrates the incremental explanatory power as additional significant variables are added. Significant variables as well as the dummy variables are retained in the final models.

CHAPTER 5

ANALYSIS OF FINDINGS:

DOMESTIC BOND MARKET (FULL SAMPLE PERIOD)

5.1 Introduction

This chapter covers the selection of explanatory variables for regression models and the results of the regression models and analysis of the findings. Selection of the variables for the regression models is based on the various studies on domestic or local currency bond markets in Chapter 4. The tests are done to identify potential determinants for Malaysia's aggregate or total domestic bond market as well as its government, corporate and financial bond segments.

Section 5.2 will look into the selection of independent variables or proxies for the ARDL modelling. This selection is guided by the determinants of domestic bond markets from the various bond studies covered in Section 4.3. Analysis will be done on the different bond segments. Section 5.3 will report on the results of the ARDL modelling.

Sections 5.4 and 5.5 are on the selection of explanatory variables or proxies and results for the regression runs for the full sample period (Q4, 1993 to Q4, 2011) for the four dependent variables (in the form of first differences), which will be proxies for the data series of Total Bonds, Government Bonds, Corporate Bonds and Financial Bonds. Section 5.6 will summarize and discuss the findings from the regression results and Section 5.7 will conclude.

5.2 Variables for ARDL Modelling

Selection of the independent variables has been guided by Section 4.3 and they are used in the ARDL modelling initially, and subsequently in the regression analysis of the Malaysian domestic bond market, using quarterly bond data for the period Q4, 1993 to Q4, 2011 from the BIS. This time series study seeks to identify potential determinants of development of the Malaysian domestic bond market, *i.e.* the various factors driving domestic bond market development in Malaysia. Analysis will be carried out separately with aggregate bond capitalization to nominal GDP, government bond capitalization to nominal GDP, corporate bond capitalization to nominal GDP, and financial bond capitalization to nominal GDP since the different categories of domestic bonds may be impacted by separate drivers. These data series for the dependent variables have been smoothed out to reduce seasonal fluctuations.

Independent variables selected for analysis in this section are:

(a) Year-On-Year Growth of Real GDP, which is calculated after taking Logarithm (Log) of Real GDP. Real annual GDP growth has been calculated based on backward moving or rolling summation of real GDP over four quarters.

(b) Trade over Nominal GDP, which is calculated with both trade and Nominal GDP annualized by backward moving summation over four quarters. This trade ratio is calculated based on exports plus imports to GDP.

(c) Loans Outstanding over Nominal GDP, which is loans outstanding by commercial banks to annual Nominal GDP.

(d) Bank Concentration Ratio, which is estimated from Malayan Banking Berhad's Assets over Total Commercial Banking Assets. Share of assets held by Malayan Banking Berhad, Malaysia's largest commercial bank, is used as a proxy for concentration of the banking sector in Malaysia. While the bank concentration ratio

was defined as share of assets held by the top three banks in a country by Beck *et al.* (2003) (see also Eichengreen & Luengnaruemitchai, 2004), Malaysia's second largest commercial bank, Bank Bumiputra Berhad, was unlisted and its balance sheet figures unavailable to the public until it was merged with another local commercial bank in 2000 (Bank Negara Malaysia, 2001). However, since Malayan Banking Berhad holds about one-fifth of total assets of the commercial banking sector in Malaysia[1] or possibly close to half of the assets of the top three banks in Malaysia,[2] it should be an adequate proxy for bank concentration in Malaysia.

(e) Equity Market Capitalization over Nominal GDP

(f) Change in Exchange Rate, which is based on the Log of Exchange Rate.

(g) Exchange Rate Volatility, which is measured by standard deviation in quarterly Ringgit-USD exchange rate (end period).

(h) Change in Interest Rate, which is based on the Log of 3-Month Kuala Lumpur Interbank Offered Rate (3-m KLIBOR) as the 3-m KLIBOR is a key interest rate that is regarded as a benchmark for interest rates in Malaysia (see *e.g.* Bank Negara Malaysia, 1998).

(i) Interest Rate Volatility, which is measured by the Standard Deviation of 3-m KLIBOR.[3]

(j) Spread between Interest Rates, which is calculated from Average Lending Rate Minus 12-m Fixed Deposit (FD) Rate.

[1] Calculated from figures obtained from data set for this study.

[2] Malaysia's bank concentration ratio as *per* definition by Beck *et al.* (2003) was 48.6 percent and 52.8 percent in 2007 and 2011, respectively (based on the assets of its top three banks, namely Malayan Banking Berhad, CIMB Bank Berhad and Public Bank Berhad). Figures for Malayan Banking Berhad are obtained from the data set for this study and the other two top Malaysian banks from their published financial statements (CIMB Bank Berhad, various issues; Public Bank Berhad, various issues).

[3] The standard deviation used in this study is calculated from the moving average of eight quarters. Preliminary regression runs were done using the standard deviations from moving averages of four, eight and 12 quarters with the best fit from the standard deviation based on the moving average of 8 quarters. Hence, the standard deviation from the moving average of eight quarters is selected for all the final runs in this study.

(k) Inflation, which is calculated from Malaysia's main inflation gauge, the Consumer Price Index (year-on-year).

(l) Impact from Fiscal Policy, which will be measured by proxies for government debt as well as fiscal balance. Since this study uses quarterly data, the proxy for government debt, which is Government Debt over Nominal GDP, is based on a backward moving average over four quarters. This variable has been smoothened using a Hodrik-Prescott filter.

(m) Breakpoint / Change and Events, since the period of this study covered certain events and developments that need to be taken into consideration. Five dummy variables are introduced to account for them (shown in Table 5.1).

Table 5.1: List of Dummy Variables

Breakpoint / Change and Event	Dummy Variable
With persistent fiscal deficits in Malaysia since 1998 – DVBPGD, the dummy variable for breakpoint in government debt, has been created to denote the break in the trend in first quarter of 1998.	DVBPGD = 1 for Q1, 1998, and 0 otherwise.
Impact from the Asian financial crisis will be tested using a dummy variable (DVAFC), for the period between Q3, 1997 to Q3, 1999 (Bank Negara Malaysia, 1998; 1999a; 1999b).	DVAFC = 1 from Q3, 1997 to Q3, 1999, and 0 otherwise.
DVPEG is the dummy variable for Malaysia's currency peg and partial capital controls during the period when these were implemented (Bank Negara Malaysia, 1999a; 1999b; 2006).	DVPEG = 1 from Q3, 1998 to Q3, 2005, and 0 otherwise.
For the global financial crisis, its impact will be tested using the dummy variable (DVGFC), when the global financial crisis impacted the financial markets in Malaysia (see *e.g.* Bank Negara Malaysia, 2009; 2010).	DVGFC = 1 from Q1, 2008 to Q3, 2009, and 0 otherwise.
Malaysia's second credit rating agency, Malaysian Rating Corporation Berhad (MARC), was incorporated in October 1995 (Bank Negara Malaysia, 2000) and began operations on 17 June 1996.[4] Its impact will be tested using a dummy variable (DVCRA2). MARC's impact on domestic bond market development is expected to be positive (*e.g.* Harwood, 2000; Keller, 2005; Turner, 2002).[5]	DVCRA2 = 1 for Q2, 1996 to Q4, 2011, and 0 otherwise.

[4] MARC website http://*www.marc.com.my*

[5] However, this dummy variable for the second rating agency, DVCRA2, was left out from the final regression runs as it was not significant in any of the earlier regression runs. Bae (2012) commented that there was no consensus on the role of credit rating agencies in emerging economies in aiding bond market development.

5.3 Results of ARDL Modelling

Initially, ARDL modelling, including the Bounds F-test, was used (Gujarati & Porter, 2009; Pesaran *et al.,* 2001; Pesaran & Shin, 1999; Stock & Watson, 2006).

All four bond series weighted by Nominal GDP, namely Total Bonds over Nominal GDP (TB), Government Bonds over Nominal GDP (GB), Corporate Bonds over Nominal GDP (CB), and Financial Bonds over Nominal GDP (FB), were run as dependent variables against selected explanatory variables.

All the dependent and independent variables were first subjected to ADF Fisher Unit Root Test to ensure that the different series exhibit I(1) (unit root) or I(0) (stationary) behaviour. Results for the ADF Fisher Unit Root Test for first differences are attached as Appendix A and indicate that all dependent and independent variables are either I(1) or I(0) series. Also, the summary statistics for the variables and correlation matrices for the various dependent variables with their independent variables are attached as Appendices (Appendices B1, B2, B3, B4 and B5).

For all four dependent variables, various ARDL tests were done with different sets of regressors from the full list of chosen explanatory variables. However, none of the tests showed the existence of level relationships between the dependent variables with the explanatory variables.

With Total Bonds over Nominal GDP as the dependent variable, various explanatory variables were selected with the dummy variables in the ARDL runs. One of these models is attached as Appendix C, including the Serial Correlation LM Test for the residuals. The set of independent variables included GROWR, LOAN, EQMKT, TRADE, LEXR, GDEBT and the four dummy variables. The results of the bounds F-test show that the F-statistic is 1.9909. Hence, the null hypothesis of no long-run relationship could not be rejected based on the 5 percent lower and upper limit of

critical bounds value of [2.32, 3.5], where the number of lagged independent variables = k = 7 (excluding the dummy variables).

Appendix D shows the ARDL model with Government Bonds over Nominal GDP as the dependent variable and regressed against an identical list of explanatory variables, including the same dummy variables as in Appendix C previously. The Serial Correlation LM Test for the residuals for this ARDL model is included in Appendix D. The bounds F-test is again used to establish if a level relationship exists between the dependent and independent variables in the long run. Since the F-statistic is 1.7598, the null hypothesis of no long-run relationship could not be rejected based on the 5 percent lower and upper limit of the critical bounds value of [2.32, 3.5], where the number of lagged independent variables = k = 7 (excluding the dummy variables).

With Corporate Bonds over Nominal GDP as the dependent variable, an example of the ARDL model is attached in Appendix E, with the Serial Correlation LM Test. In this ARDL model, the F-statistic is 4.8680. As such, the null hypothesis of no long-run relationship between the dependent and independent variables is rejected based on the 5 percent lower and upper limit of the critical bounds values of [2.32,3.5], where k = 7. However, the ARDL regression model is a case with an unrestricted constant and no trend, so the t-Bounds test critical values are used to make a decision on the alternative hypothesis. For this run, the t-statistic for the estimated long-run relationship is -2.1645, with an absolute value of |2.1645|, which is less than the absolute value of either the I(0) or I(1) t-Bounds test at the 5 percent significance level, [-2.86, -4.57]. Accordingly, failure to reject the null hypothesis of t-Bounds test led to the conclusion that the cointegrating relationship does not hold.

In the ARDL model with Financial Bonds over Nominal GDP as the dependent variable, the F-statistic of 2.6438 shows that no conclusion can be made about the null

hypothesis based on the 5 percent lower and upper limit of the critical bounds values of [2.45, 3.61], where the number of lagged independent variables = k = 6. (Refer to Appendix F.)

5.4 Variables for Regression Models

As the ARDL analysis did not establish the existence of level relationships, the level variables were dropped from the model. Multivariate modelling will be used to analyse the relationships between the various dependent variables, which are proxies for measures of bond market development, and their potential determinants.

All the dependent and independent variables for regression analysis are listed in Table 5.2. Independent variables selected here are the same as those used in the ARDL modelling although some of these variables are now in the form of First Difference, based on tests to ensure that the chosen series are stationary (unit root tests are shown in Appendix G). The correlation matrices for the dependent and independent variables are attached as Appendices (Appendices H1, H2, H3 and H4).

As discussed in Section 4.4, three specifications are considered for each dependent variable in the following sections. All the chosen variables are entered into the models, and the contemporaneous term as well as the lags from one up to four quarters are considered. However, variables that are not significant are then dropped, although the dummy variables are retained in the final models. A battery of diagnostic checks are performed, including Serial Correlation LM test, Recursive Residuals, CUSUM test, CUSUM of Squares test and Variance Inflation Factors test.

Table 5.2: List of Variables for Regression Models

Variable	Abbreviation
First Difference of Total Bonds over Nominal GDP	DTB
First Difference of Government Bonds over Nominal GDP	DGB
First Difference of Corporate Bonds over Nominal GDP	DCB
First Difference of Financial Bonds over Nominal GDP	DFB
Annual GDP Growth Rate	GROWR
First Difference of Trade over Nominal GDP, up to 4 Lags	DTRADE
First Difference of Loans Outstanding over Nominal GDP, up to 4 Lags	DLOAN
First Difference of Bank Concentration Ratio, up to 4 Lags	DBANCON
Equity Market Capitalization over Nominal GDP, up to 4 Lags	EQMKT
Inflation Rate, up to 4 Lags	INFL
First Difference of Log of Exchange Rate, up to 4 Lags	DLEXR
First Difference of Log of 3-m KLIBOR, up to 4 Lags	DLIBR
Spread, being Average Lending Rate minus 12-m FD Rate, up to 4 Lags	SPREAD
Standard Deviation of Exchange Rate	SDEXR
Standard Deviation of 3-m KLIBOR	SDIBR
First Difference of Government Debt over Nominal GDP, up to 4 Lags	DGDEBT
First Difference of Fiscal Balance over Nominal GDP, up to 4 Lags	DFISC
Dummy Variable For Breakpoint in Government Debt	DVBPGD
Dummy Variable for Asian Financial Crisis	DVAFC
Dummy Variable for Ringgit Peg	DVPEG
Dummy Variable for Global Financial Crisis	DVGFC

5.5 Results of Regression Models

For all the following regression runs, significance of all explanatory variables are based on two-tailed tests unless stated otherwise. The relevant diagnostic tests have been carried out and are included in the Appendix Section (as Appendices I1, I2, and I3 to L1, L2 and L3).

5.5.1 Total Bonds over Nominal GDP

This subsection uses the First Difference of Total Bonds over Nominal GDP as the dependent variable. The regression results of the three different specifications are shown in Table 5.3 and labelled as Models 5.1A, 5.1B and 5.1C.

Table 5.3: Regression Results for Total Bonds

	5.1A	5.1B	5.1C
Constant	0.0359*** (0.0121)	0.0446*** (0.0123)	0.0305*** (0.0110)
First Difference of Loans Outstanding over Nominal GDP, $DLOAN_{t-3}$	-0.2521** (0.1103)	-0.2655** (0.1021)	-0.2068** (0.0784)
First Difference of Bank Concentration Ratio, $DBANCON_t$	-2.7195** (1.0691)	-3.0268*** (0.9827)	-2.3595** (0.8954)
Equity Market Capitalization over Nominal GDP, $EQMKT_{t-3}$	-0.0204*** (0.0073)	-0.0214*** (0.0073)	-0.0096* (0.0050)
First Difference of Log of Exchange Rate, $DLEXR_t$	-	-	-0.4402*** (0.1017)
Standard Deviation of Interest Rate, SDIBR	-	-0.0071* (0.0040)	-0.0093** (0.0044)
First Difference of Government Debt over Nominal GDP, $DGDEBT_{t-2}$	1.0538* (0.5311)	1.1119* (0.5609)	1.1403** (0.4872)
DV for Breakpoint in Govt. Debt, DVBPGD	0.1596*** (0.0169)	0.1624*** (0.0375)	0.0896*** (0.0269)
DV for Asian Financial Crisis, DVAFC	-	0.0034 (0.0314)	0.0265 (0.0246)
DV for Ringgit Peg, DVPEG	-	-	-0.0074 (0.0079)
DV for Global Financial Crisis, DVGFC	-	-0.0403*** (0.0101)	-0.0411*** (0.0071)
R-squared	0.3320	0.4077	0.6181
Adjusted R-squared	0.2790	0.3287	0.5523
No. observations	69	69	69
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	3.3459[0.5017]	2.7422[0.6018]	3.0394[0.5513]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
Dependent variable for Models 5.1A, 5.1B and 5.1C is First Difference of Total Bonds over Nominal GDP.

Three regression models are considered here. In the first specification (shown as Model 5.1A), only the banking sector, equity market and government debt as well as the dummy variable for break in the trend in government debt (DVBPGD) are included as the explanatory variables. For the second specification, the effects from the two financial crises and possible impact *via* interest rates are included, to obtain Model

5.1B. Finally, the full specification, which also includes the impact from exchange rates and currency peg, including partial capital controls, is given in Model 5.1C.

(i) Results for Model 5.1A

For Model 5.1A with five explanatory variables, all are significant, some with positive coefficients while the rest negative. They are First Difference of Loan over Nominal GDP ($DLOAN_{t-3}$), First Difference of Bank Concentration Ratio ($DBANCON_t$), Equity Market Capitalization over Nominal GDP ($EQMKT_{t-3}$), First Difference of Government Debt over Nominal GDP ($DGDEBT_{t-2}$), and the dummy variable, Breakpoint in Government Debt (DVBPGD). Here, the constant term is positively significant at the 1 percent level.

The variable, $DLOAN_{t-3}$ is significant at the 5 percent level and has a negative sign. A one percent increase in $DLOAN_{t-3}$ will lead to a 0.2521 percent fall in DTB_t after a lag of three quarters, holding the other variables constant. The negative sign appears to suggest that in the Malaysian context during the sample period of Q4, 1993 to Q4, 2011, the domestic bond market and banking sector were competitors, to some extent.

The variable, $DBANCON_t$, is significant at the 5 percent level. Given a one percent rise in $DBANCON_t$, the dependent variable, DTB_t, will see a sizeable 2.7195 percent drop, *ceteris paribus*. Since the variable, $DBANCON_t$, is a proxy of the degree of market concentration and power within the banking sector, the negative coefficient here indicates some degree of competition between the Malaysian domestic bond market and banking sector. This suggests that the power held by the biggest bank(s) in Malaysia has a negative impact on the level of aggregate bonds in the Malaysian domestic bond market as shown in other studies (Beck *et al.,* 2003; Eichengreen & Luengnaruemitchai, 2004).

The variable, $EQMKT_{t-3}$, is significant at the 1 percent level with a negative coefficient, suggesting competition between the Malaysian domestic bond and equity markets. However, the magnitude of its coefficient, at 0.0204, is much less when compared with those for other explanatory variables. A one percent increase in $EQMKT_{t-3}$ will result in DTB_t falling by 0.0204 percent after three quarters.

The variable, $DGDEBT_{t-2}$, is significant at the 10 percent level. That is, a one percent growth in $DGDEBT_{t-2}$ will contribute to a 1.0538 percent growth in DTB_t after a lag of two quarters. The dummy variable for Breakpoint in Government Debt, DVBPGD, is significant at 1 percent level with a positive coefficient. Hence, the break in the trend in government debt has a positive impact on government bond market capitalization over nominal GDP.

The adjusted R squared coefficient shows that some 28 percent of the variation in the changes in total bond market capitalization over nominal GDP can be explained by this model.

(ii) Results for Model 5.1B

The variable, SDIBR, which is the standard deviation of 3-m KLIBOR and measures interest rate volatility, is added along with two dummy variables, namely DVAFC, and DVGFC, to Model 5.1A to obtain Model 5.1B (see Table 5.3).

The newly included variable, $SDIBR_t$, is significant at the 10 percent level. A one percent increase in $SDIBR_t$ will result in the dependent variable, DTB_t, falling by 0.0071 percent.

Of the two additional dummy variables, only the one for global financial crisis, DVGFC, is significant and bears the expected sign. It is negatively significant at 1 percent. Hence, the impact of the global financial crisis on total bond market

capitalization over nominal GDP was negative. Although not significant, the dummy variable for Asian financial crisis, DVAFC, was postulated to have a positive sign as the Malaysian authorities turned to the domestic bond market to raise funds to resolve its banking sector problems (see *e.g.* Bank Negara Malaysia, 2000).

In Model 5.1B, the magnitude for the coefficients of $DLOAN_{t-3}$, $DBANCON_t$ and $DGDEBT_{t-2}$ has increased slightly. Furthermore, the variable, $DBANCON_t$, is now significant at 1 percent (vs 5 percent in Model 5.1A).

The adjusted R squared coefficient has increased to 0.3287 for Model 5.1B, from 0.2790 for Model 5.1A. Compared to the Model 5.1A, the larger Model 5.1B can explain almost 33 percent of the variation in the dependent variable, DTB_t.

(iii) Results for Model 5.1C

Variables such as Annual GDP Growth Rate (GROWR), Inflation Rate (INFL), First Difference of Log of Exchange Rate (DLEXR), First Difference of Log of Interbank Rate (DLIBR) are also explored in various regression runs to determine influential variables in boosting the growth of Malaysia's domestic aggregate bond market capitalization over nominal GDP. Model 5.1C in Table 5.3 has included potential determinants from previous cross-country bond studies that covered developed and emerging economies, which included Malaysia. Those studies found that domestic bond markets were influenced by factors that, among others, included impact from their banking sectors as well as the concentration of market share among the largest banks, equity markets, size of government debt or fiscal balances, interest rates (either absolute levels or spreads between borrowing costs and cost of funds), exchange rates, and capital controls.

The variable, $DLEXR_t$, which measures change in the growth in the exchange rate for the Ringgit, has been added to Model 5.1B to obtain Model 5.1C. Also

included in Model 5.1C is the dummy variable, DVPEG, which is included to capture possible impact from Malaysia's currency peg and partial capital controls during the Asian financial crisis. It is postulated to have a negative sign (Eichengreen & Luengnaruemitchai, 2004).

The variable, $DLEXR_t$, is significant at 1 percent with a negative coefficient. A one percent increase in $DLEXR_t$ will lead to a 0.4402 percent fall in DTB_t.

The dummy variable, DVPEG, has a negative sign as postulated, but it is not significant.

The inclusion of $DLEXR_t$ and DVPEG in Model 5.1C has resulted in the following:

- A drop in the magnitude of the negative coefficient for $DLOAN_{t-3}$ with a one percent rise in $DLOAN_{t-3}$ leading to a 0.2068 percent decline in DTB_t, after a lag of three quarters, but no change in its significance level (still at 5 percent);
- A fall in the magnitude of the negative coefficient for $DBANCON_t$, which means a one percent increase in $DBANCON_t$ can result in DTB_t falling by a still sizeable 2.3595 percent, with a drop in its significance level to five percent, from one percent in Model 5.1B;
- A noticeable decline in the magnitude of the negative coefficient for $EQMKT_{t-3}$, with a one percent rise in $EQMKT_{t-3}$ leading to a 0.0096 percent dip in DTB_t after three quarters as well as a drop in its significance to 10 percent, from one percent in Model 5.1B;
- An increase in the magnitude of the negative coefficient for $SDIBR_t$, which means a one percent increase in $SDIBR_t$ will result in a 0.0093 percent dip in DTB_t with its significance level rising to 5 percent from 10 percent in Model 5.1B;

- A slightly larger positive coefficient for $DGDEBT_{t-2}$, that is a one percent growth in $DGDEBT_{t-2}$ will contribute to a noticeable 1.403 percent increase in DTB_t after two quarters and a rise in its level significance to 5 percent, from 10 percent in Model 5.1B;
- A much smaller coefficient for DVBPGD, but no change in its significance level (remains at 1 percent).
- A larger coefficient for DVAFC although it remains insignificant; and
- A drop in the magnitude of the negative coefficient for DVGFC, but no change in its significance level of 1 percent.

The adjusted R squared coefficient is now 0.5523, which means Model 5.1C can explain over 55 percent of the variation in the changes in total bond market capitalization over nominal GDP.

5.5.2 Government Bonds over Nominal GDP

Here, as shown in Table 5.4, the dependent variable is First Difference of Government Bonds over Nominal GDP (DGB_t) for Models 5.2A, 5.2B and 5.2C. Selection of the explanatory variables has been guided by theory of bond market development, especially past public bond market studies on potential determinants.

A total of three specifications are considered in this subsection. The first specification, which is given in Model 5.2A, includes economic growth, impact from the banking sector, changes in exchange rate and government debt plus the dummy variable, DVBPGD, as the explanatory variables. To obtain the second and third specifications (in Models 5.2B and 5.2C), impact from the equity market as well as the effects of the two financial crises and currency peg are considered. The difference between the second and third models is the use of fiscal balance as the proxy for the

government's financial position in Model 5.2B while government debt is the proxy for the government's financial position in Model 5.2C.

Table 5.4: Regression Results for Government Bonds

	5.2A	5.2B	5.2C
Constant	-0.0045 (0.0032)	0.0299*** (0.0071)	0.0148 (0.0097)
Annual GDP Growth Rate, $GROWR_{t-3}$	0.1260** (0.0538)	0.0873** (0.0382)	0.1398*** (0.0342)
First Difference of Bank Concentration Ratio, $DBANCON_t$	-0.5520* (0.2942)	-0.9027*** (0.3111)	-0.9252*** (0.2958)
Equity Market Capitalization over Nominal GDP, $EQMKT_{t-4}$	-	-0.0187*** (0.0038)	-0.0108** (0.0051)
First Difference of Log of Exchange Rate, $DLEXR_{t-1}$	-0.1750*** (0.0318)	-0.1456*** (0.0308)	-0.1560*** (0.0281)
First Difference of Government Debt over Nominal GDP, $DGDEBT_t$	1.0647*** (0.2120)	-	0.7288*** (0.2550)
First Difference of Fiscal Balance over Nominal GDP, $DFISC_t$	-	-1.6269*** (0.5901)	-
DV for Breakpoint in Govt. Debt, DVBPGD	0.0102 (0.0169)	0.0337*** (0.0107)	0.0215** (0.0101)
DV for Asian Financial Crisis, DVAFC	-	0.0111* (0.0056)	0.0100 (0.0075)
DV for Ringgit Peg, DVPEG	-	-0.0030 (0.0041)	-0.0040 (0.0041)
DV for Global Financial Crisis, DVGFC	-	-0.0208*** (0.0056)	-0.0185*** (0.0061)
R-squared	0.5349	0.6099	0.6123
Adjusted R-squared	0.4997	0.5504	0.5532
No. observations	72	69	69
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	3.2043[0.5242]	5.4157[0.2472]	3.2088[0.5235]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
Dependent variable for Models 5.2A, 5.2B and 5.2C is First Difference of Government Bonds over Nominal GDP.

(i) Results for Model 5.2A

For Model 5.2A with five explanatory variables, the four explanatory variables that are significant here are Annual GDP Growth Rate ($GROWR_{t-3}$), First Difference Of Bank Concentration Ratio ($DBANCON_t$), First Difference of Log of Exchange Rate ($DLEXR_{t-1}$), and First Difference of Government Debt over Nominal GDP ($DGDEBT_t$). The constant term is not significant here.

The variable, $GROWR_{t-3}$, is significant at the 5 percent level. The size of its positive coefficient measures its impact on DGB_t three quarters ago, *ceteris paribus*. That is, a one percent rise in $GROWR_{t-3}$ will lead to a 0.1260 percent increase in DGB_t after three quarters.

The variable, $DBANCON_t$, is significant at the 10 percent level with a negative sign. That is, a one percent increase in $DBANCON_t$ will lead to the dependent variable, DGB_t, falling by 0.5520 percent, *ceteris paribus*.

The variable, $DLEXR_{t-1}$, is significant at the 1 percent level with a negative coefficient. A one percent rise in $DLEXR_{t-1}$ will result in DGB_t declining by 0.1750 percent after a lag of one quarter.

The variable, $DGDEBT_t$, is significant at the 1 percent level. The size of its positive coefficient measures its impact on the dependent variable, keeping other variables constant. A one percent growth in $DGDEBT_t$ will see a 1.0647 percent growth in DGB_t, that is almost a one-for-one increase. This is to be expected since the Malaysian authorities have mainly depended on domestic sources, including issuance of government bonds, to finance government development expenditure (*e.g.* Bank Negara Malaysia & Securities Commission, 2009). Here, the dummy variable for the Breakpoint in Government Debt, DVBPGD, is not significant at all.

The adjusted R squared coefficient is 0.4997, where almost 50 percent of the variation in the changes in government bond market capitalization over nominal GDP can be explained by the model.

(ii) Results for Model 5.2B

In Model 5.2B, the variable, $DFISC_t$, replaces $DGDEBT_t$. Also, the variable, $EQMKT_{t-4}$, and the three dummy variables – DVAFC, DVPEG and DVGFC – are added.

Model 5.2B has nine explanatory variables, of which eight are significant. The explanatory variables that are significant here are $GROWR_{t-3}$, $DBANCON_t$, $EQMKT_{t-4}$, $DLEXR_{t-1}$, $DFISC_t$ and the dummy variable for Breakpoint in Government Debt, DVBPGD, as well as the dummy variables for the Asian financial crisis and global financial crisis, (DVAFC and DVGFC). The positive constant term is significant at 1 percent here.

The variable, $GROWR_{t-3}$, remains significant at five percent with a positive coefficient. Here, the impact from a one percent increase in $GROWR_{t-3}$ will be felt after three quarters, with DGB_t rising by 0.0873 percent then.

The variable, $DBANCON_t$, is significant at the one percent level. Its negative coefficient measures its more noticeable effect on the dependent variable, DGB_t, *ceteris paribus*. A one percent rise in $DBANCON_t$ will now see a sizeable 0.9027 percent drop in DGB_t.

The negative coefficient for $EQMKT_{t-4}$ is quite small at -0.0187, measuring its impact from four quarters ago on DGB_t, keeping other variables constant. That is, a one percent rise in $EQMKT_{t-4}$ will only lead to a 0.0187 percent dip in DGB_t after a lag of four quarters.

The negative coefficient of $DLEXR_{t-1}$ captures its impact one quarter ago on the dependent variable, DGB_t, *ceteris paribus*. With a one percent increase in $DLEXR_t$, the dependent variable, DGB_t, will now fall by 0.1456 percent after one quarter.

The variable, $DFISC_t$, is significant at 1 percent with a negative coefficient. Hence, a one percent rise in $DFISC_t$ will lead to a sizeable 1.6269 percent fall in DGB_t. In Model 5.2B, the dummy variable, DVBPGD, is significant at the 1 percent level. The break in the trend of government debt has a positive impact on government bond market capitalization over nominal GDP.

Here, the dummy variable, DVAFC, is significant at the 1 percent level and it has the expected positive sign as the Malaysian authorities raised funds in the domestic bond market during the Asian financial crisis (*e.g.* Bank Negara Malaysia 1999b). The dummy variable, DVPEG, has the expected negative sign, but it is not significant.

However, the dummy variable, DVGFC, is significant at 1 percent with a negative coefficient. The impact from the global financial crisis on government bond market capitalization over nominal GDP was negative.

The adjusted R squared coefficient for Model 5.2B is 0.5504, with this model explaining some 55 percent of the variation in the changes in government bond market capitalization over nominal GDP.

(iii) Results for Model 5.2C

For Model 5.2C in Table 5.4, which also has nine explanatory variables, the seven variables that are significant here are Annual Growth Rate of Real GDP ($GROWR_{t-3}$), First Difference Of Bank Concentration Ratio ($DBANCON_t$), First Difference of Log of Exchange Rate ($DLEXR_{t-1}$), Equity Market Capitalization Over Nominal GDP ($EQMKT_{t-4}$), First Difference of Government Debt Over Nominal GDP

($DGDEBT_t$) with the dummy variable for the Breakpoint in Government Debt (DVBPGD), and the dummy variable for the global financial crisis (DVGFC).

Of the seven variables, three are significant with positive coefficients, namely, $GROWR_{t-3}$, at the 1 percent level now, $DGDEBT_t$ at 1 percent, and DVBPGD at 5 percent. A one percent rise in $GROWR_{t-3}$ will mean a 0.1398 percent increase in DGB_t after three quarters. The coefficient for $DGDEBT_t$ is now 0.7288, reflecting its impact on DGB_t. Here, a one percent growth in $DGDEBT_t$ will mean a 0.7288 percent growth in DGB_t. The break in the trend in government debt impacted government bond market capitalization over nominal GDP positively.

The variable, $DBANCON_t$, is significant at 1 percent with a negative sign. Its sizeable and negative coefficient reflects the considerable effect of $DBANCON_t$ on DGB_t, *ceteris paribus*. That is, a one percent rise in $DBANCON_t$ will result in a sizeable 0.9252 percent fall in DGB_t.

The variable, $EQMKT_{t-4}$, is significant at the 5 percent level and it has a negative sign, which can be expected if the domestic bond and local equity markets compete as avenues of choice to raise funds. The variable, $EQMKT_{t-4}$, appears to affect DGB_t with a lag length of four quarters although the magnitude of its coefficient is quite small. Here, the impact from a one percent growth in $EQMKT_{t-4}$ will be felt after four quarters and DGB_t will then dip by 0.0108 percent.

The variable, $DLEXR_{t-1}$, is significant at 1 percent. Assuming a one percent increase in $DLEXR_{t-1}$, the dependent variable, DGB_t, will decline by 0.1560 percent after a lag of one quarter, *ceteris paribus*.

Here, the dummy variable, DVGFC, is also significant at 1 percent with a negative coefficient. That is, the global financial crisis impacted government bond market capitalization over nominal GDP negatively.

The adjusted R squared coefficient for Model 5.2C is 0.5532, which means that this model helps to explain some 55.3 percent of the variation in the changes in government bond market capitalization over nominal GDP, similar to Model 5.2B.

5.5.3 Corporate Bonds over Nominal GDP

In Table 5.5, the dependent variable is First Difference of Corporate Bonds over Nominal GDP, DCB_t, and the results are shown as Models 5.3A, 5.3B and 5.3C. Corporate bonds in Malaysia are issued by corporations from many different industries or sectors and their determinants may be more diverse than those for the other categories of bonds. For example, corporate bond issuers in Malaysia included those from business services sector; construction and engineering; diversified holdings; financial services; mining and petroleum; property and real estate; transport, storage and communications sector; and the utilities sector (*e.g.* Bank Negara Malaysia, 2001; Ministry of Finance, 1999).

Here, three specifications are considered. In the first specification, which is reported as Model 5.3A, the explanatory variables included are related to the banking sector and government bond market capitalization plus the dummy variable for break in the trend of government debt. The second specification, which is shown as Model 5.3B, has two explanatory variables added, namely the proxy for changes in exchange rate and dummy variable for Malaysia's currency peg. The final specification, which is Model 5.3C, includes the two dummy variables for the financial crises.

Table 5.5: Regression Results for Corporate Bonds

	5.3A	5.3B	5.3C
Constant	0.0020 (0.0014)	0.0043*** (0.0015)	0.0040** (0.0016)
First Difference of Loans Outstanding over Nominal GDP, $DLOAN_{t-3}$	-0.0763*** (0.0241)	-0.0673*** (0.0220)	-0.0665*** (0.0228)
First Difference of Bank Concentration Ratio, $DBANCON_t$	-0.5169** (0.2217)	-0.4524* (0.2489)	-0.4407* (0.2472)
First Difference of Log of Exchange Rate, $DLEXR_t$	-	-0.0665*** (0.0243)	-0.0741*** (0.0256)
First Difference of Government Bonds over Nominal GDP, DGB_t	0.2503*** (0.0596)	0.1955*** (0.0631)	0.1884*** (0.0637)
DV for Breakpoint in Govt. Debt, DVBPGD	0.0189*** (0.0040)	0.0147*** (0.0042)	0.0107** (0.0052)
DV for Asian Financial Crisis, DVAFC	-	-	0.0040 (0.0038)
DV for Ringgit Peg, DVPEG	-	-0.0043 (0.0028)	-0.0043 (0.0029)
DV for Global Financial Crisis, DVGFC	-	-	0.0011 (0.0050)
R-squared	0.3179	0.3839	0.3890
Adjusted R-squared	0.2752	0.3242	0.3076
No. observations	69	69	69
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	1.5860[0.8113]	1.3341[0.8556]	1.9088[0.7525]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
Dependent variable for Models 5.3A, 5.3B and 5.3C is First Difference of Corporate Bonds over Nominal GDP.

(i) Results for Model 5.3A

For Model 5.3A, which has four explanatory variables, all of them are significant. They are First Difference of Loans Outstanding over Nominal GDP ($DLOAN_{t-3}$), First Difference of Bank Concentration Ratio ($DBANCON_t$), First Difference of Government Bonds over Nominal GDP (DGB_t) and the dummy variable, Breakpoint in Government Debt (DVBPGD). The constant term here is positive, but not significant.

The variable, $DLOAN_{t-3}$ is significant at 1 percent with a negative coefficient. A one percent increase in $DLOAN_{t-3}$ will mean a 0.0763 percent decline in DCB_t after three quarters, *ceteris paribus*. The negative coefficient suggests that banks compete with the domestic bond market in terms of providing funds to firms for their business needs (Bank Negara Malaysia & Securities Commission, 2009).

In addition, the variable, $DBANCON_t$, is significant at the 5 percent level with a negative coefficient (-0.5169). That is, a one percent rise in $DBANCON_t$ will result in a noticeable 0.5169 percent drop in DCB_t. This seems to further support the theory that in the Malaysian context, the domestic bond market competes with the more established banking sector in providing external funds needed by firms.

Here, the variable, DGB_t, is significant at 1 percent. Its positive coefficient of 0.2503 measures its impact on the dependent variable, DCB_t. If DGB_t grows by one percent, this will lead to a 0.2503 percent rise in DCB_t. The dummy variable for Breakpoint in Government Debt (DVBPGD) is significant at the 1 percent level. That is, the break in the trend in government debt had a positive impact on corporate bond market capitalization over nominal GDP.

Possibly due to the diverse nature of this category of bonds as corporate bond issuers are from many different industries or business sectors, the adjusted R squared coefficient is 0.2752, where the model can explain 27.5 percent of the variation in the changes in corporate bond market capitalization over nominal GDP.

(ii) Results for Model 5.3B

To obtain Model 5.3B, the variable, $DLEXR_t$, and dummy variable for the currency peg / partial capital controls, DVPEG, are added to Model 5.3A. This brings the total number of explanatory variables in Model 5.3B to six. Here, all explanatory

variables, except for DVPEG, are significant. The constant term here is positively significant at the 1 percent level.

The newly added variable, $DLEXR_t$, is significant at the 1 percent level, with the negative sign as postulated (Bae, 2012; Eichengreen & Luengnaruemitchai, 2004). A one percent increase in $DLEXR_t$ will lead to a 0.0665 percent fall in DCB_t. The dummy variable, DVPEG, has a negative sign as postulated, but it is not significant.

The additional variables in Model 5.3B have impacted the size of the coefficients and / or significance of the earlier variables as follows:

- $DLOAN_{t-3}$ remains significant at the 1 percent level, but has a smaller coefficient, that is a one percent increase in $DLOAN_{t-3}$ now leads to a 0.0673 percent drop in DCB_t after a lag of three quarters.
- $DBANCON_t$ is now significant at the 10 percent level (Eqn. 5.3A: 5 percent), with a one percent increase in $DBANCON_t$ resulting in a slightly smaller 0.4524 percent drop in DCB_t.
- DGB_t remains positively significant at 1 percent, but its coefficient has fallen substantially, that is, a one percent growth in DGB_t will now lead to a 0.1955 percent increase DCB_t.
- The dummy variable, DVBPGD, is still significant at 1 percent, and will result in a rise in corporate bond market capitalization over nominal GDP.

The adjusted R squared coefficient for Model 5.3B has improved to 0.3242, and the new model can explain over 32 percent of the variation in the changes in corporate bond market capitalization over nominal GDP.

(iii) Results for Model 5.3C

In Model 5.3C, the dummy variables, DVAFC and DVGFC, are added to capture the effects of the two major financial crises, thus bringing the total number to eight explanatory variables. However, the two newly added dummy variables are not significant. In Model 5.3C, the significance of DVBPGD drops to the 5 percent level.

In Model 5.3C, there are only slight changes in the size of the coefficients for $DLOAN_{t-3}$, $DBANCON_t$, and DGB_t. In contrast, the magnitude of the negative coefficient for $DLEXR_t$ has increased more. That is, a one percent rise in $DLEXR_t$ will now see a 0.0741 percent decline in the dependent variable, DCB_t, *ceteris paribus*. Also, the level of significance for the dummy variable, DVBPGD, has dropped to 5 percent from 1 percent in Model 5.3B earlier. Its coefficient is smaller, reflecting a reduced impact on increasing the corporate bond market capitalization over nominal GDP.

With the addition of DVAFC and DVGFC, the adjusted R squared coefficient dips to 0.3076. That is, the final model can explain about 31 percent of the variation in the changes in corporate bond market capitalization over nominal GDP.

5.5.4 Financial Bonds over Nominal GDP

In this subsection, the dependent variable is the First Difference of Financial Bonds over Nominal GDP, DFB_t. The results for the three specifications are reported in Table 5.6 (as Models 5.4A, 5.4B and 5.4C).

Three models for the financial bond segment are considered here. The first specification only has explanatory variables for the country's trade or openness of its economy, spread between interest rates and government debt plus the dummy variable

for break in the trend of government debt (shown as Model 5.4A). The second specification considers the impact of movements in exchange rates, shown as Model 5.4B. The full specification, which is shown as Model 5.4C, includes the three remaining dummy variables.

Table 5.6: Regression Results for Financial Bonds

	5.4A	5.4B	5.4C
Constant	0.0319*** (0.0092)	0.0315*** (0.0086)	0.0357*** (0.0088)
First Difference of Trade over Nominal GDP, $DTRADE_{t-2}$	0.1820** (0.0546)	0.1672** (0.0688)	0.1707** (0.0649)
First Difference of Log of Exchange Rate, $DLEXR_t$	-	-0.1459** (0.0665)	-0.1416*** (0.0516)
Spread between Interest Rates, $SPREAD_{t-3}$	-0.0112*** (0.0032)	-0.0110*** (0.0031)	-0.0132*** (0.0035)
First Difference of Government Debt over Nominal GDP, $DGDEBT_t$	-0.5274*** (0.1699)	-0.6060*** (0.1567)	-0.7365*** (0.1605)
DV for Breakpoint in Govt. Debt, DVBPGD	0.0367** (0.0174)	0.0264*** (0.0052)	0.0290*** (0.0107)
DV for Asian Financial Crisis, DVAFC	-	-	0.0002 (0.0114)
DV for Ringgit Peg, DVPEG	-	-	0.0069 (0.0045)
DV for Global Financial Crisis, DVGFC	-	-	-0.0115** (0.0057)
R-squared	0.3403	0.4419	0.4899
Adjusted R-squared	0.3009	0.3996	0.4251
No. observations	72	72	72
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	5.0660[0.2806]	2.1597[0.7064]	2.6046[0.6260]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
Dependent variable for Models 5.4A, 5.4B and 5.4C is First Difference of Financial Bonds over Nominal GDP.

(i) Results for Model 5.4A

There are four explanatory variables in Model 5.4A, *i.e.* First Difference of Trade over Nominal GDP ($DTRADE_{t-2}$), Spread between Interest Rates ($SPREAD_{t-3}$), First Difference of Government Debt over Nominal GDP ($DGDEBT_t$), and the dummy

variable for Breakpoint in Government Debt (DVBPGD). In Model 5.4A, all four explanatory variables, including the dummy variable, are significant. The constant term is positive and significant at 1 percent.

Here, the variable, $DTRADE_{t-2}$, is significant as an explanatory variable for DFBt. It is significant at 5 percent and bears a positive sign, as expected. A one percent rise in $DTRADE_{t-2}$ will mean a 0.1820 percent increase in the dependent variable, DFB_t, after two quarters.

In Model 5.4A, the variable, $SPREAD_{t-3}$, is significant at 1 percent with a negative coefficient. With a one percent rise in $SPREAD_{t-3}$, DFB_t will decline by 0.0112 percent after three quarters.

The variable, $DGDEBT_t$, is significant at 1 percent, but bears a negative sign for the first time. That is, a one percent growth in $DGDEBT_t$ will lead to a 0.5274 percent fall in DFB_t.[6] However, the dummy variable for its breakpoint, DVBPGD, is significant at the 5 percent level. The break in the trend in government debt had a positive impact on financial bond market capitalization over nominal GDP.

The adjusted R squared coefficient is 0.3009, with Model 5.4A able to explain 30.09 percent of the variation in the changes in financial bond market capitalization over nominal GDP.

(ii) Results for Model 5.4B

The variable, $DLEXR_t$, is added to Model 5.4A to obtain Model 5.4B. The constant term in this model remains positive and significant at 1 percent.

[6] While the correlation matrices for $DGDEBT_t$ with other dependent variables (DTBt, DFBt and DCBt) show that the former is positively correlated with them, the dependent variable here, DFBt, is negatively correlated with $DGDEBT_t$ (-0.3000) (see Appendices H1-H4).

The variable, $DLEXR_t$, is significant at 5 percent and it has the expected negative sign. With a one percent rise in $DLEXR_t$, the dependent variable, DFB_t, will decline by 0.1459 percent.

Except for the dummy variable, DVBPGD, the other variables remain at the same level of significance when $DLEXR_t$ is added. There are only slight changes in the size of the coefficients for $DTRADE_{t-2}$, $SPREAD_{t-3}$ and $DGDEBT_t$. A one percent growth in $DTRADE_{t-2}$ will lead to DFB_t increasing by 0.1672 percent after two quarters. All else constant, a one percent increase in $SPREAD_{t-3}$ will now see DFB_t declining by 0.0110 percent after three quarters while a one percent growth in $DGDEBT_t$ will see DFB_t falling 0.6060 percent.

The adjusted R squared coefficient for Model 5.4B is 0.3996, noticeably higher than that for Model 5.4A. Here, the model can explain about 40 percent of the variation in the changes in corporate bond market capitalization over nominal GDP.

(iii) Results for Model 5.4C

The three dummy variables, DVAFC, DVGFC and DVPEG, are added to Model 5.4B to account for the effects of the two financial crises and obtain Model 5.4C. The constant term is significant and positive in Model 5.4C.

With the additional dummy variables to account for the effects of the two financial crises, the variable, $DLEXR_t$, is now significantly negative at the 1 percent level although the magnitude of its coefficient has dipped. The other variables have maintained their significance level with increases in the magnitude of their coefficients, *i.e.* $DTRADE_{t-2}$, $DGDEBT_t$, $SPREAD_{t-3}$, and DVBPGD. That is, the following will happen:

- A one percent growth in $DTRADE_{t-2}$ will lead to a 0.1707 percent rise in DFB_t after two quarters;
- A one percent increase in $SPREAD_{t-3}$ will see DFB_t declining by 0.0132 percent after a lag of three quarters;
- A one percent rise in $DLEXR_t$ will mean DFB_t falls by 0.1416 percent;
- A one percent growth in $DGDEBT_t$ will cause DFB_t to drop 0.7365 percent; and
- The dummy variable, DVBPGD, will have a bigger positive impact on financial bond market capitalization over nominal GDP.

Among the dummy variables, only DVBPGD is significant. All the other dummy variables are not significant. Furthermore, DVAFC and DVPEG do not have the expected signs.

The adjusted R squared coefficient for Model 5.4C is 0.4251, with the model able to explain 42.51 percent of the variation in the changes in financial bond market capitalization over nominal GDP.

5.6 Summary of Findings and Discussion

ARDL modelling in this chapter did not establish any long-run relationships between the four dependent variables and selected independent variables. This outcome may have been influenced by the following:

(a) The Malaysian government reduced its borrowings significantly between 1988 and 1997. Hence, this period witnessed a greater amount of redemptions of Malaysian Government Securities at RM22.2 billion, which was about three times the redemptions for the period 1978-87 (Bank Negara Malaysia, 1999a, p. 341). As a result, outstanding amounts of Malaysian Government Securities actually fell for the

period 1993 to 1995 and in the year 1997. These developments would have affected the proxies for government debt and fiscal balance as well as the data series for domestic aggregate bonds and domestic government bonds.

(b) The severity of the Asian financial crisis and its impact on certain dependent and independent variables were considerable.

(i) For example, the Asian financial crisis impacted Malaysia's economic growth, interest rates, inflation rates, exchange rates as well as necessitated the imposition of selective exchange controls and the Ringgit peg by the Malaysian government (see *e.g.* Bank Negara Malaysia, 1999a; 1999b; 2000).

(ii) Subsequently, as the Malaysian government turned to the domestic bond market to raise funds for economic recovery and bank recapitalization, issuance of domestic government bonds increased sharply in certain years (see *e.g.* Bank Negara Malaysia 1999a; 1999b; 2000).

(iii) In the post-crisis period, the low interest rate regime implemented by the Malaysian government also had other ramifications. For the period July 1998 to September 2005, the conduct of monetary policy in the low interest rate environment meant that interest rates, in their traditional role as policy instruments, became less effective (Goh & Yong, 2007).

In Section 5.5, regression results for the dependent variable, First Difference of Total Bonds over Nominal GDP, DTB_t, show that among the eight significant explanatory variables, $DLOAN_{t-3}$, $DBANCON_t$, $EQMKT_{t-3}$, $DLEXR_t$ and SDIBR, which are the proxies for the banking sector, bank concentration ratio, equity market, change in exchange rate and interest rate volatility, all have a negative impact on growth of the dependent variable, DTB_t. However, government debt, $DGDEBT_{t-2}$ and the dummy variable for break in the trend in government debt, DVBPGD, are both found to

have a positive effect on growth of DTB_t. Lastly, the dummy variable for the global financial crisis, DVGFC, exerted a significant and negative effect on DTB_t.

With DGB_t, First Difference of Government Bonds over Nominal GDP, as the dependent variable in the second set of models, the results show that explanatory variables with a significant and positive effect on DGB_t are $GROWR_{t-3}$, being the proxy for real GDP growth, and $DGDEBT_t$ with its dummy variable, DVBPGD. The alternate proxy for the Malaysian government's financial position, $DFISC_t$, is also found to be significant as an explanatory variable. That is, larger fiscal deficits by the Malaysian government will result in increases in issuance of government bonds. This means that the relationship between $DFISC_t$ and the dependent variable, DGB_t, is negative. Other explanatory variables with a significantly negative impact on DGB_t are $DBANCON_t$, $EQMKT_{t-4}$, $DLEXR_t$ and the dummy variable, DVGFC.

For the third dependent variable, First Difference of Corporate Bonds over Nominal GDP, DCB_t, one of the explanatory variables, $DGDEBT_t$, the proxy for government debt, is replaced with the First Difference of Government Bonds over Nominal GDP, DGB_t. This is done as a recent bond study on 43 countries, including Malaysia, for the period 1990 to 2009 by Bae (2012) found that size of the domestic government bond market was a major driving factor for growth of the domestic corporate bond market. In fact, regression results here also show that DGB_t has a significantly positive effect (at the one percent level) on the dependent variable, DCB_t.[7] The dummy variable, DVBPGD, is also significantly positive here. The other explanatory variables that are significant all have a negative impact on DCB_t. They are $DLOAN_{t-3}$, $DBANCON_t$ and $DLEXR_t$.

[7] In preliminary regression runs for the dependent variable, DCB_t, with $DGDEBT_t$ instead of DGB_t as one of the explanatory variables, the adjusted R squared values were lower, *e.g.* between 4-12 percent lower than the adjusted R squared values for models 5.3A, 5.3B and 5.3C.

The First Difference of Financial Bonds over Nominal GDP, DFB_t, which is the fourth dependent variable, is found to be negatively related to the proxy for government debt, $DGDEBT_t$, in contrast to the other three dependent variables, which are all positively related to DGDEBT (although the significant lags may differ). However, the impact from $DLEXR_t$ and $SPREAD_{t-3}$ is significantly negative, similar to their effect on the other dependent variables.

For the first time, $DTRADE_{t-2}$, which is the proxy for trade volume or openness of the economy, is significant as an explanatory variable in Chapter 5 and has a positive relationship with DFB_t. As a proxy for openness of the Malaysian economy and its level of competitiveness, this variable has been shown in other studies as having a positive impact on the development of domestic bond markets. Since Malaysia has a large external sector and Malaysian banks are extensively involved in trade financing, it is not surprising that this variable is significantly positive for this dependent variable (*e.g.* Bank Negara Malaysia 1994a; 1999a). The dummy variable, DVBPGD, has a significantly positive impact on DFB_t while DVGFC is significantly negative for DFB_t.

Findings in Chapter 5 show that potential determinants that have a positive impact on the Malaysian domestic aggregate bond market are government debt and the dummy variable for breakpoint in the trend in government debt or growing trend in the country's fiscal deficit. This finding that Malaysia's growing government debt or fiscal deficits would be positively related to the size of the country's domestic aggregate bond market is in line with various bond studies, including those by Bae (2012), Burger and Warnock (2006), Claessens *et al.* (2007), Eichengreen and Luengnaruemitchai (2004), and Mihaljek *et al.* (2002).

From the regression results, the potential determinants that would negatively impact development of the domestic aggregate bond market in Malaysia include

competition from the country's more established banking sector and equity market. The competition between Malaysia's domestic aggregate bond market and the well-established local banking sector for the full sample period of Q4, 1993 to Q4, 2011 should not come as a surprise. This is because the Malaysian government itself, when seeking to develop the bond market, promoted the domestic bond market to the private sector as an alternative avenue of raising funds (*e.g.* Bank Negara Malaysia, 1999a). This stance by the Malaysian government was further emphasized in the following years by the government, including the National Economic Action Council, after the Asian financial crisis (National Economic Action Council, 1998).

In addition, as highlighted by Herring and Chatusripitak (2000), based on a study on Thailand in the wake of the Asian financial crisis, heavy dependence on the local banking sector for financing the capital needs of the private sector would have been at the expense of development of the domestic bond market. Hence, the years of strong loans growth achieved by banks in Malaysia, a hefty 19.2 percent annually for the period 1988-97, leading up to the Asian financial crisis would have exerted a negative impact on the Malaysian domestic aggregate bond market (Bank Negara Malaysia, 1999a, p. 405). For the period 1995-97, loans growth was even higher, averaging about 29 percent *per annum* (National Economic Action Council, 1998, p. 13).

Similarly, the vibrant Malaysian equity market was also, to some extent, competing with the domestic aggregate bond market during this study's sample period. The competition between the equity market and domestic aggregate bond market is in line with findings from bond studies such as Bae (2012), Burger and Warnock (2006), Eichengreen and Luengnaruemitchai (2004), Mihaljek *et al.* (2002), and Mohanty (2002).

In fact, 1993 and 1996 were extremely favourable years for the Malaysian equity market as market capitalization reached highs of 375 percent of GDP in 1993 and 323 percent of GDP in 1996 (Ariff & Yap, 2001, p. 309). Such high ratios point to the excesses in the Malaysian economy and equity market for 1993 and 1996, leading up to the Asian financial crisis. According to Sahay *et al.* (2015), equity markets in emerging economies averaged about 40 percent of GDP for the years between 2000 to 2013, significantly lower than Malaysia's 1993 and 1996 ratios of 375 percent and 323 percent of GDP respectively. Furthermore, the corresponding figure for the group of advanced economies during the same period (2000-13) was about 70 percent of GDP (p. 6).

In addition, volatility in domestic interest rates and changes in exchange rate are found to have a significant and negative impact on growth of the Malaysian domestic aggregate bond market. Eichengreen and Luengnaruemitchai (2004) found that interest rate volatility had a negative impact on public and private bond markets. However, such a negative relationship is found in this study for the domestic aggregate bond market only, and not the other three bond segments.

Between 1994 and 1998, there were episodes of greater volatility in Malaysia's 3-month KLIBOR, which is used in this study since this rate was traditionally targeted by Bank Negara Malaysia in its conduct of monetary policy (Bank Negara Malaysia 1998, p. 80). For example, between 1994 and 1996, before the Asian financial crisis, the weighted average for the 3-month KLIBOR moved within a range of 4.40 percent to 7.60 percent. In 1997, as the Asian financial crisis started to be felt in Malaysia, its range was from 7.20 percent to as high as 10.0 percent. Subsequently, for the period February to August 1998, the weighted average was mostly within the range of 10.0 percent to 11.30 percent. Following the imposition of selective exchange controls by Malaysia on 1 September 1998, the range was from 6.84 percent to 9.50 percent for

September and for the month of December 1998, the range was from 6.28 percent to 7.00 percent (Bank Negara Malaysia, 1999c, Table V.3).

Lastly, the global financial crisis (represented by a dummy variable between 1Q2008 to 1Q2009 in this study) also had a negative impact on the growth of the Malaysian domestic aggregate bond market.

Besides the size of the local banking sector, concentration of market share within the sector, as measured by the bank concentration ratio, also has a significant and negative impact on the development of the domestic aggregate bond market, in line with the findings of Eichengreen and Luengnaruemitchai (2004) for total bonds and public bonds. As the Malaysian banking sector was developed much earlier than the domestic bond market, the former would have used its dominant position in the Malaysian economy to preserve its market share and market position (Bae, 2012; Bentson, 1994; Schinasi & Smith, 1998).

The study by Eichengreen and Luengnaruemitchai (2004) followed the definition on bank concentration that was used by Beck *et al.* (2003). That is, the bank concentration ratio was based on the country's three largest banks' share of assets. For this study, the bank concentration ratio has been calculated based on the share of Malaysia's largest commercial bank, Malayan Banking Berhad. This is because the country's second largest commercial bank up to the post-Asian financial crisis banking consolidation programme was Bank Bumiputra Malaysia Berhad, which was state-owned and not public listed.[8] Hence, its financial results were not published. However, after the bank merger exercise, a bank concentration ratio based on Malaysia's three largest banks, which are all public-listed entities – Malayan Banking Berhad, Public

[8] Bank Bumiputra Malaysia Berhad was eventually merged with another bank, which subsequently became CIMB Bank Berhad (see *e.g.* Bank Negara Malaysia, 2000; 2001).

Bank Berhad and CIMB Bank Berhad – was 52.8 percent as at end Q4, 2011.[9] This figure was about two-and-half times the asset share of Malayan Banking Berhad (18.9 percent). Accordingly, the negative impact on the Malaysian domestic aggregate bond market from a much higher bank concentration ratio of 52.8 percent could be correspondingly much larger.

In the case of the Malaysian domestic government bond market, study findings show that potential determinants that could significantly boost its development include the country's government debt and break in the trend of government debt (in fact, Malaysia's fiscal deficits were both persistent and growing), and the nation's economic growth (*e.g.* Burger & Warnock, 2006; Eichengreen & Luengnaruemitchai, 2004; Mihaljek *et al.,* 2002). The first two have been found to be significant drivers for the development of the domestic aggregate bond market as well and, where the government bond market is concerned, should be even more influential given that Malaysia's debt financing policy is one of preference or reliance on domestic or internal sources of funding (*e.g.* Bank Negara Malaysia, 1989; Ministry of Finance, 1998; Securities Commission, 2004).

Growth of the domestic government bond market is found to be significantly and negatively affected by concentration of market share within the banking sector rather than the sector's size, as was the case in Eichengreen and Luengnaruemitchai's 2004 study. Other potential determinants include size of the local equity market as well as appreciation of the local currency. Since the strengthening of the Ringgit has a negative impact on issuance of domestic government bonds, this points to the Malaysian government resorting to foreign borrowings as well as international bond issuance when

[9] Figures for Malayan Banking Berhad are obtained from the data set for this study and the other two top Malaysian banks from their published financial statements (CIMB Bank Berhad, various issues; Public Bank Berhad, various issues).

such alternatives become more attractive, that is, cheaper, on the back of a stronger local currency (*e.g.* Mihaljek *et al.,* 2002; Turner, 2012).

The dummy variable for the Asian financial crisis, DVAFC (which takes a value of 1 for the period Q3, 1997 to Q3, 1999), has a significant and positive impact on the domestic government bond market in the presence of the proxy for fiscal deficits in the regression runs. Net funds raised by the Malaysian government from the domestic bond market amounted to RM9.8 billion in 1998 and RM6.3 billion in 1999. However, in 1997, there was a net redemption by the public sector amounting to RM1.4 billion (Bank Negara Malaysia, 2000, p. 167; 2001, p. 172).

The dummy variable for Malaysia's currency peg and selective exchange controls, DVPEG, was not significant. However, the studies by Bae (2012) and Eichengreen and Luengnaruemitchai (2004) found capital controls to have a negative impact on domestic bond markets, including on government bonds in Bae's study.

As was the case with the domestic aggregate bond market, growth of the domestic government bond market was negatively impacted during the global financial crisis.

The other proxy for the government's financial position, *i.e.* fiscal surplus / deficit, indicates that fiscal surplus or deficit is a potential determinant for the domestic government bond market. But it is not so in the case of other segments of the domestic bond market (*i.e.* aggregate bond market, corporate bond market, financial bond market), where government debt is a potential determinant. Hence, when Malaysia registered a positive balance in its fiscal budget, the effect on issuance of government bonds in local currency is negative, while a growing negative balance in the fiscal budget will have a positive effect on issuance of domestic government bonds.

Findings from the regression results with First Difference of Corporate Bonds over Nominal GDP (DCB_t) as the dependent variable show that potential determinants for the domestic corporate bond market in Malaysia are the size of the domestic government bond market, in line with Bae (2012)'s study; trend in the country's fiscal deficits; the size of the local banking sector as well as the concentration of market share in the country's top banks and appreciation of the local currency. Where the banking sector is concerned, concentration of its market share appears to be more influential than the size of the banking sector.

While the level of concentration in the Malaysian banking sector is expected to have a negative impact, to some extent, on the domestic bond market, findings for the full sample period show that the bank concentration ratio has a significantly negative effect on domestic aggregate bonds, domestic government bonds as well as domestic corporate bonds. These findings suggest that the large banks in Malaysia could have used their market share and resulting power to dissuade corporates from issuing domestic bonds when raising long-term capital, similar to developments in other countries (Bentson, 1994; Eichengreen & Luengnaruemitchai, 2004; Rajan & Zingales, 2003; Schinasi & Smith, 1998). It is unsurprising that the large Malaysian banks resorted to such measures to stifle competition from the domestic bond market as government efforts to promote the domestic bond market touted it as a cheaper and viable avenue to raise longer-term funds (Bank Negara Malaysia & Securities Commission, 2009; National Economic Action Council, 1998).

From the list of potential determinants, the size of the domestic government bond market and break in the trend in the country's public debt both have a positive impact on the growth of the domestic corporate bond market. It appears that for Malaysia, during the period covered by this study (Q4, 1993 to Q4, 2011), the growth of domestic government bond issuance, as a result of persistent fiscal deficits beginning

1998, did not lead to any crowding-out effect on the issuance of domestic corporate bonds. Rather, it seemed to be the reverse for Malaysia since an increase in government bonds coincided with the growth in corporate bonds.

Between 1998 and 2011, the Malaysian government conducted expansionary fiscal policies that resulted in fiscal deficits amounting to some RM340 billion, or an average of RM24 billion a year over a period spanning 14 years. The fiscal deficits averaged 4.6 percent of GDP during this period (Ministry of Finance, various years). In light of these developments, there were grave concerns about the effect of crowding-out on the private sector. That is, Malaysia's persistent fiscal deficits, which resulted in a continual reduction in public savings, would also lead to a fall in national savings. In turn, this reduction in national savings will translate into a reduction in loanable funds, which can push up interest rates and crowd out private investments, *ceteris paribus* (Mankiw, 2018).

However, Bank Negara Malaysia has reiterated that, except for 1998 when liquidity was tight in the banking system, there has been ample liquidity in the banking system since 1999. Hence, domestic interest rates have been low, thus enabling the private sector to have adequate access to affordable credit. Furthermore, the central bank has also highlighted Malaysia's high savings as reflected in the Gross National Savings, which ranged between 35 to over 40 percent of GDP, for the years 1998 to 2011. According to Bank Negara Malaysia, these were factors that ensured that the growing government debt and expanding domestic government bond market have not led to any crowding-out effect on the private sector (Bank Negara Malaysia, various years).

While Malaysia's persistent fiscal deficits meant that public savings were reduced, the country's Gross National Savings remained high, supported by private

savings. Following the Asian financial crisis, Malaysia's Savings-Investment gap was positive for the years 1998-2011, reflecting higher private savings and lower private investments (Ministry of Finance, various years). Consequently, there was no crowding-out on the private sector, including the corporate bond market. Malaysia's experience of higher private savings, slump in private investments and sluggish loans growth in the wake of the crisis mirrored the UK's experience following the global financial crisis in 2008 when private savings rose sharply even as loans growth plunged (Begg, Vernasca, Fischer & Dornbusch, 2014).

Furthermore, as Bae (2012) highlighted in his study on local currency bond markets covering 43 advanced and developing countries, including Malaysia, for the period 1990-2009, a well-functioning government bond market was a major driver behind corporate bond market development. Bae stressed that a "deep" government bond market was needed The reasons that well-functioning government bond markets can boost development of corporate bond markets were covered in the study on government bond markets by the World Bank and IMF (2001). Among others, the reasons included benefits that a well-developed government bond market could provide to the corporate bond market such as a government benchmark yield curve to aid in the pricing and trading of corporate bonds, ensuring adequate infrastructure as well as a sufficient number of market participants including dealers and investors, for the corporate bond market.

Size of the local banking sector and its concentration ratio both have a significant and negative impact on growth of the domestic corporate bond market. This negative impact seems to indicate that there is competition between the local banking sector and domestic corporate bond market, at least during the period for this study. It should be noted that the Malaysian government promoted the issuance of domestic corporate bonds as a cheaper alternative to bank loans for raising funds amongst big

corporates when it established the country's first rating agency (Bank Negara Malaysia & Securities Commission, 2009; National Economic Action Council, 1998).

The negative impact of changes in the exchange rate means that issuance of domestic corporate bonds is adversely affected by instability in the local currency. Studies by Bae (2012) and Eichengreen and Luengnaruemitchai (2004) also found that exchange rate volatility was a negative factor for developing domestic bond markets.

Hale (2007a) stated that in the years before the Asian financial crisis, both public and private entities from many emerging markets took massive loans from foreign banks as well as issued international bonds actively. Mihaljek *et al.* (2002) in a study of 21 economies, found that domestic and international bonds were negatively correlated, on the whole as well as when public and private bonds were analyzed separately. The study concluded that developing local bond markets would help reduce a country's dependence on international bond issuance. Turner (2012) also discussed local currency bonds being substitutes for foreign or overseas borrowings, including foreign currency or international bonds. Of greater concern, Eichengreen and Luengnaruemitchai (2004) noted in their study covering 41 developed and developing countries, including Malaysia, that Asia was more dependent on bank loans and less reliant on bond markets *vis-à-vis* other regions, with this trend becoming even more so after 2001.

Findings from the models for the dependent variable of DFB_t, which is First Difference of Financial Bonds over Nominal GDP, suggest that potential determinants for Malaysia's domestic financial bond market include openness of the Malaysian economy as well as size of the country's trade, government debt and its trend of persistent fiscal deficits, interest spread (the difference between Malaysian's average

lending rate and 12-month fixed deposit rate), appreciation of the local currency and the global financial crisis.

The positive relationship between Malaysia's domestic financial bond segment and the country's trade is to be expected. Major government initiatives to boost Malaysia's economic recovery from the mid-1980s recession resulted in rapid expansion of the manufacturing and services sectors in the subsequent years (Bank Negara Malaysia, 1994a; 1999a). Malaysia's industrialization drive and economic transformation also contributed to a strong surge in its export sector (Athukorala, 2001a; Goldstein, 1998; Krugman, 1995; Rodrik, 1999).

As the financial institutions, especially Malaysia's commercial banks, were the main providers of trade financing, growth in their provision of trade financing would have been in tandem with their funding needs and issuance of debt securities, including Bankers Acceptances and Negotiable Certificates of Deposit. In fact, the introduction of Bankers Acceptances was primarily as a tool for financing trade, limited to periods anywhere from 21 days to 365 days (Bank Negara Malaysia, 1994a; 1999a).

However, it should be highlighted that government debt has a significant but negative impact on the growth of the domestic financial bond market. This is in stark contrast to the significant but positive impact government debt has on the other three segments of the domestic market, namely aggregate, government and corporate segments. Since domestic sources to finance fiscal deficits or government debt include issuance of government bonds and loans from the local banking sector, the negative relationship between government debt and the domestic financial bond segment may reflect the substitutability or competition between the two. That is, the Malaysian government can opt to issue government bonds or take a bank loan (which may then be

funded by the issuance of financial bonds). However, Bae (2012) found no relationship between the growth of government bonds or debt with growth of financial bonds.

Other potential determinants that have a significant and negative impact on the domestic financial bond market are interest spread and instability in the local currency in line with the studies by Mihaljek *et al.* (2002), Mu *et al.* (2013), and Turner (2012). The study by Mu *et al.* (2013) on government securities market and corporate bond market in Africa also found a significant and negative relationship between market capitalization with higher interest spreads, too. Other studies on bond market development that have found interest rates, in absolute levels or spreads, to be an important determinant included Bae (2012), Bhattacharyay (2013), Eichengreen and Luengnaruemitchai (2004), and van Rixtel *et al.* (2015). Lastly, the impact from the global financial crisis was also significantly negative.

In Malaysia, given the preference by the government to depend on domestic sources to finance its expenditure and fiscal deficits, an increase in government debt will inevitably lead to an increase in issuance of government bonds. Nevertheless, findings in this chapter show that, except for the domestic financial bond segment, the impact of government debt is positive on the other segments, *i.e.* aggregate bond and corporate bond.

Overall, this study finds a negative association between Malaysia's domestic bond market with both the local banking sector and equity market. However, it is possible that the sample period covered the years when there was greater competition between the different sectors in the Malaysian financial system. According to Song and Thakor (2010), their analysis of banks and capital markets (comprising bond and equity markets), in some advanced economies for the period 1960-2003, showed banks and the markets complemented each other for much of the period with "occasional spurts of

competition" (p. 1022). It may be that over time, the relationship between the Malaysian domestic bond market with local banks and the equity market could evolve to a positive one, as postulated by Song and Thakor.

5.7 Concluding Remarks

Key findings on the Malaysian domestic bond market for the full sample period are as follows:

(a) An increase in government debt or fiscal deficits has a positive impact on the domestic aggregate and government bond markets. This is expected as the Malaysian government depends on domestic sources to finance its expenditure and fiscal deficits.

(b) Growth in the domestic government bond market, which replaces government debt in the regression model for domestic corporate bonds, has a sizeable and positive impact on issuance of domestic corporate bonds. This finding confirms that in the case of the Malaysian corporate bond market, a major benefit of the well-developed domestic government bond market is as the foundation block for building the domestic corporate bond market. Furthermore, this finding is in line with other studies, notably Bae (2012).

(c) The local banking sector has a negative impact on the domestic aggregate and corporate bond markets, reflecting to some extent the competition between them. This competition may have resulted from the Malaysian government's promotion of the domestic bond market as an alternative source of cheaper and long-term financing to the private sector.

(d) The level of bank concentration has a negative and possibly sizeable impact on the domestic bond market (*i.e.* aggregate, government and corporate bonds). In

addition, one cannot rule out the possibility that a higher bank concentration ratio, which is based on Malaysia's three largest banks and not just the top bank's asset share used in this study, can result in a far bigger dampening effect on the country's domestic aggregate bond market or certain segments.

(e) The local equity market has a negative impact on the domestic aggregate and government bond markets, but the degree of competition between them appears to be less than between the local banking sector and domestic bond market.

(f) In contrast to the other domestic bond segments, an increase in government debt is negatively associated with the financial bond segment. This negative relationship may reflect the government's option of financing its debt or fiscal deficits through issuance of domestic government bonds or bank loans, where the latter may, in turn, be funded by the banks issuing financial bonds themselves.

(g) Growth in Malaysia's trade is positively associated with growth of the domestic financial bond segment as the Malaysian banks have been the main providers for the nation's trade financing.

(h) Malaysia's economic growth, a proxy for its level of economic progress, is positively linked to the domestic government bond market.

(i) Changes in the exchange rate, reflecting instability in the local currency, has a negative impact on growth of all segments of the domestic bond market.

CHAPTER 6

ANALYSIS OF FINDINGS:

DOMESTIC BOND MARKET (SUB-SAMPLE PERIOD)

6.1 Introduction

This chapter will report on the analysis of findings for a shorter period from Q4, 2005 to Q4, 2011. While this time period is short (limited to 25 observations), the work in this chapter serves the important function of a robustness check on findings from Chapter 5. This shorter period begins after the Malaysian government removed its currency peg on 21 July 2005 (Bank Negara Malaysia, 2006, pp. 74-75). As such, it will also facilitate the analysis of the development of the domestic bond market (with the same four dependent variables from Chapter 5) over a period when there were no selective exchange controls following the removal of the Ringgit peg.

This chapter consists of Sections 6.2 to 6.5 as follows. Sections 6.2 and 6.3 will cover selection of variables and regression models from the sub-sample period from Q4, 2005 to Q4, 2011 to determine potential drivers of Malaysia's domestic bond market development in tandem with the conduct of fiscal and monetary policies. As in Chapter 5, it includes the dummy variable for the global financial crisis, which, according to Malaysian authorities, did not affect the country much (*e.g.* Bank Negara Malaysia, 2010; 2011c). Given the country's sustained and sizeable fiscal deficits that began in 1998, this chapter will examine the extent to which these deficits – through expansionary fiscal policies – have impacted Malaysia's domestic bond market,

including any adverse impact on the corporate bond segment. Section 6.4 will summarize and discuss findings while Section 6.5 will conclude.

6.2 Variables for Sub-sample Analysis

Although the sub-sample period from Q4, 2005 to Q4, 2011 has been constrained by the changes implemented by the BIS on its data series (see, for example, Gruic & Wooldridge, 2012), this period is free of the effects of Malaysia's currency peg and, accordingly, no fixed exchange rate regime for Malaysia. It is also some years after the Asian financial crisis and post-crisis measures implemented by Malaysia, including accessing the domestic bond market for funds to revive and restructure the Malaysian economy and banking sector, and subsequent policies to further develop the domestic bond market. Hence, the analysis for the sub-sample period could add to the findings and analysis from Chapter 5, besides serving as a robustness check.

Without the currency peg in place, analysis for the sub-sample period should also assist in establishing the relationship between issuance of domestic bonds and international borrowings *via* any impact from the strengthening of the Ringgit. It should be noted that during the years the currency peg was in place and exchange rate risks were reduced as a consequence, Bank Negara Malaysia stated that the government tapped the international capital markets when overseas interest rates were favourable (*e.g.* Bank Negara Malaysia, 2003).

Furthermore, Malaysia was running fiscal deficits annually for the years 2005-2011. In fact, the fiscal deficits for these years totalled RM227.3 billion, or approximately RM32.5 billion a year, and averaged 4.6% of GDP yearly (Ministry of Finance, various years). Findings for the sub-sample period may provide further insights into the question of crowding-out on the private segment of the domestic bond

market, as a result of such persistent and sizeable fiscal deficits by the Malaysian government.

For this sub-sample period, nine explanatory variables have been selected from the list of 17 explanatory variables from Chapter 5 earlier. These variables are those that would be influenced by monetary and fiscal policies as macroeconomic policies may reduce or increase the risk of holding such domestic currency securities through their impact on, among other things, interest rates, exchange rates, inflation, fiscal balances as well as government debt (Bae, 2012; Bhattacharyay, 2013; Burger *et al.*, 2012; 2015; Burger & Warnock, 2006; Claessens *et al.*, 2007; Committee on the Global Financial System, 2007; Eichengreen & Luengnaruemitchai, 2004; Essers *et al.,* 2015; Hale, 2007b; Mihaljek *et al.,* 2002; Park, 2016; Turner, 2002).

(a) Inflation

Findings from Chapter 5 show that inflation is not a significant driver for growth of the Malaysian domestic bond market for any of the four bond series. This may be due to the fact that historically, inflation has been mostly low in the country. For example, for the period 1971 to 1995, the average annual inflation, as measured by the Consumer Price Index[1] (CPI), was just 3.2 percent even as the Malaysian economy experienced robust growth. That is, Malaysia registered real GDP growth of 7.4 percent for the same period (Yap & Kwek, 2012, p. 107)[2].

(b) Exchange Rate Movements and Volatility

Findings from Chapter 5 indicate that domestic bonds in Malaysia were a substitute for foreign borrowings including international bonds as the changes in the local currency, *i.e.* a stronger Ringgit had a significant and negative impact on the domestic bond market (all categories of domestic bonds). Thus, when the Asian financial crisis unfolded, these borrowers would have suffered a double hit to their net

[1] The commonly used inflation measurement in Malaysia.
[2] The averages for CPI and real GDP growth did not include the oil shock periods of 1973-74 and 1980-81.

worth when the local currency weakened, resulting in their liabilities rising while their assets fell (*e.g.* Hale, 2007a; Pettis, 2000).

(c) Interest Rate Movements and Volatility

Findings for the full sample period from Chapter 5 show that interest rates are not as influential as exchange rates to the development of the Malaysian domestic bond market. However, in the case of aggregate bonds in Malaysia, volatility of interest rates, as proxied by standard deviation of interest rate, is negatively significant. Also, in the tests for financial bonds, the spread between interest rates is found to be significant and negative. Tests for the sub-sample period will further explore the impact of Malaysian monetary policy, *via* the influence of interest rates.

(d) Government Debt and Fiscal Balance

Findings from Chapter 5 show that government debt is a significant driver for most segments of the Malaysian domestic bond market. That is, government debt has a significantly positive impact on aggregate bonds, government bonds and corporate bonds, but a significantly negative impact on financial bonds.

Regression results from Chapter 5 show that only in the case of government bonds is fiscal balance, in place of government debt as an explanatory variable, also significant as a potential determinant. The relationship is negative *i.e.* fiscal deficits would correspond to bigger issuance of government bonds in Malaysia.

In the case of Malaysia, between 1998 and 2011, Malaysia registered persistent fiscal deficits, averaging 4.6 percent of GDP, or some RM24 billion *per annum* (Bank Negara Malaysia, various years). In financing its deficits, the Malaysian government has traditionally favoured non-inflationary domestic sources (including Malaysian Government Securities) with some borrowings raised from external sources (*e.g.* Ministry of Finance, 1998). Since the fiscal deficits between 1998-2014 totalled RM290 billion, the impact of such fiscal deficits and growing public debt could help

explain why proxies for these factors were found to be so influential in regression runs for the full sample period of Q4, 1993 to Q4, 2011 in Chapter 5 earlier.

6.3 Results for Sub-sample Analysis

For these sub-sample regression runs, the four dependent variables and nine explanatory variables are shown in Table 6.1. In view of the short sample period (with 25 observations), very few variables are selected for inclusion in the regression models. This is to preserve statistical stability of the estimations. However, the explanatory variables chosen are those that would be influenced by Malaysia's fiscal policy or monetary policy, or both. For example, INFL, DLIBR, SPREAD and SDIBR would be affected by Malaysia's monetary policy (either as intermediate targets or final policy objectives).

Significance of the explanatory variables will be based on the two-tailed test of significance. For the sub-sample period, two specifications are considered for each dependent variable. As before, the selected models are passed through a series of diagnostic checks including Serial Correlation LM test, Recursive Residuals, CUSUM test, CUSUM Squares test and Variance Inflation Factors test. The relevant diagnostic tests for Chapter 6 are included in the Appendix Section (as Appendices M1and M2 to P1 and P2).

Table 6.1: List of Variables for Sub-sample Period

Variable	Abbreviation
First Difference of Total Bonds over Nominal GDP	DTB
First Difference of Government Bonds over Nominal GDP	DGB
First Difference of Corporate Bonds over Nominal GDP	DCB
First Difference of Financial Bonds over Nominal GDP	DFB
Inflation Rate, up to 4 Lags	INFL
First Difference of Log of Exchange Rate, up to 4 Lags	DLEXR
First Difference of Log of 3-m KLIBOR, up to 4 Lags	DLIBR

Table 6.1, continued

Variable	Abbreviation
Spread, being Average Lending Rate minus 12-m FD Rate, up to 4 Lags	SPREAD
Standard Deviation of Exchange Rate	SDEXR
Standard Deviation of 3-m KLIBOR	SDIBR
First Difference of Government Debt over Nominal GDP, up to 4 Lags	DGDEBT
First Difference of Fiscal Balance over Nominal GDP, up to 4 Lags	DFISC
Dummy Variable for Global Financial Crisis	DVGFC

6.3.1 Total Bonds over Nominal GDP

Here, the dependent variable is First Difference of Total Bonds over Nominal GDP, DTB_t. Table 6.2 reports the results for the two specifications (as Models 6.1A and 6.1B).

Table 6.2: Regression Results for Total Bonds (Sub-sample Period)

	6.1A	.1B
Constant	0.0061 (0.0046)	0.0122** (0.0049)
First Difference of Log of Exchange Rates, $DLEXR_t$	-0.9377*** (0.1513)	-0.8666*** (0.1051)
First Difference of Government Debt over Nominal GDP, $DGDEBT_{t-2}$	1.1772* (0.5977)	1.4970*** (0.4550)
DV for Global Financial Crisis, DVGFC	-	-0.0284*** (0.0062)
R-squared	0.6304	0.7246
Adjusted R-squared	0.5968	0.6853
No. observations	25	25
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	4.5031[0.1052]	1.5616[0.4580]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
Dependent variable for Models 6.1A and 6.1B is First Difference of Total Bonds over Nominal GDP.

There are two specifications to be considered in this subsection (shown as Models 6.1A and 6.1B). The first specification includes two explanatory variables that reflect the impact from Malaysia's fiscal and / or monetary policies. The second and

full specification for the sub-sample period adds the dummy variable, DVGFC, to account for the impact of the global financial crisis.

(i) Results for Model 6.1A

In Model 6.1A, there are two explanatory variables, First Difference of Log of Exchange Rate ($DLEXR_t$), and First Difference of Government Debt over Nominal GDP ($DGDEBT_{t-2}$). The constant term here is positive, but not significant.

$DLEXR_t$ has the expected negative sign and is significant at the 1 percent level, based on a two-tailed test of significance. A one percent increase in $DLEXR_t$ will mean a sizeable 0.9377 percent decline in DTB_t, *ceteris paribus*.

The other explanatory variable, $DGDEBT_{t-2}$, has a positive effect on the dependent variable and is significant at the 10 percent level. The size of its positive coefficient, which exceeds one, measures its sizeable impact. That is, a one percent growth in $DGDEBT_{t-2}$ will result in a 1.1772 percent rise in the dependent variable, DTB_t, after a lag of two quarters.

For Model 6.1A, the adjusted R square is 0.5968, which shows that this model can explain almost 60 percent of the variation in the changes in total bond market capitalization over nominal GDP.

(ii) Results for Model 6.1B

In Model 6.1B, the dummy variable for the global financial crisis, DVGFC, is added to the model. Here, the constant term is positively significant at the 5 percent level.

With the inclusion of the dummy variable in Model 6.1B, the variable, $DGDEBT_{t-2}$, has a larger positive estimator of 1.4970. It is now significant at the 1

percent level. In Model 6.1B, a one percent increase in $DGDEBT_{t-2}$ will result in a 1.4970 percent rise in the dependent variable, DTB_t, after two quarters.

Meanwhile, the explanatory variable, $DLEXR_t$, has remained negatively significant at 1 percent. However, the size of its negative coefficient is now smaller. This means a one percent increase in $DLEXR_t$ will see the dependent variable, DTB_t, falling by 0.8666 percent.

The dummy variable, DVGFC, has the postulated sign, which is negative. It is significant at the 1 percent level. That is, the impact from the global financial crisis on total bond market capitalization over nominal GDP was negative.

The adjusted R square for Model 6.1B is 0.6853, an increase of 0.0885 from Model 6.1A. This means the model can now explain some 69 percent of the variation in the changes in total bond market capitalization over nominal GDP.

6.3.2 Government Bonds over Nominal GDP

The dependent variable is the First Difference of Government Bonds over Nominal GDP, DGB_t. The results of the two specifications are shown in Table 6.3 (as Models 6.2A and 6.2B).

Two specifications are considered here. As before, the first includes three explanatory variables that reflect the impact from Malaysia's fiscal and / or monetary policies (in Model 6.2A), while the second and full model adds the dummy variable, DVGFC, to account for the impact of the global financial crisis (in Model 6.2B).

Table 6.3: Regression Results for Government Bonds (Sub-sample Period)

	6.2A	6.2B
Constant	0.0018 (0.0029)	0.0052* (0.0030)
First Difference of Log of Exchange Rates, $DLEXR_t$	-0.5977*** (0.1085)	-0.5573*** (0.1001)
First Difference of Log of Interest Rate, $DLIBR_t$	-0.0535** (0.0256)	-0.0501** (0.0233)
First Difference of Fiscal Balance over Nominal GDP, $DFISC_t$	-3.8804*** (1.1764)	-3.5314*** (1.0790)
DV For Global Financial Crisis, DVGFC	-	-0.0151** (0.0064)
R-squared	0.6785	0.7474
Adjusted R-squared	0.6326	0.6969
No. observations	25	25
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	4.2536[0.1192]	3.5891[0.1662]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
Dependent variable for Models 6.2A and 6.2B is First Difference of Government Bonds over Nominal GDP.

(i) Results for Model 6.2A

Model 6.2A has three explanatory variables, namely First Difference of Log of Exchange Rate ($DLEXR_t$), First Difference of Log of Interest Rate ($DLIBR_t$), and First Difference of Fiscal Balance over Nominal GDP ($DFISC_t$). The constant term here is positive, but not significant.

All three explanatory variables have negative signs, as postulated.

$DLEXR_t$ is negatively significant at 1 percent, based on a two-tailed test of significance. The magnitude of its negative coefficient measures the sizeable impact of this variable on the dependent variable, DGB_t, holding other variables constant. That is, if $DLEXR_t$ increases by one percent, the dependent variable, DGB_t, will decline by 0.5977 percent.

$DLIBR_t$ is also negatively significant at the 5 percent level. Its much smaller estimator captures its effect on the dependent variable, *ceteris paribus*. If $DLIBR_t$ increases by one percent, DGB_t will fall by 0.0535 percent.

The variable, $DFISC_t$, is negatively significant at the 1 percent level. However, its estimator, at -3.8804, is the largest among the three explanatory variables. A one percent increase in $DFISC_t$ will lead to a 3.8804 percent fall in the dependent variable, DGB_t. That is unsurprising and should be expected, given that Malaysian government bonds are often issued to finance government development expenditure (*e.g.* Bank Negara Malaysia & Securities Commission 2009). Hence, an increase in the fiscal surplus will mean the government has less need to issue bonds.

The adjusted R square for Model 6.2A is 0.6326, which shows the model can explain about 63 percent of the variation in the changes in government bond market capitalization over nominal GDP.

(ii) Results for Model 6.2B

The dummy variable, DVGFC, is added to obtain Model 6.2B. The constant term is positively significant at 10 percent.

As postulated, the global financial crisis had a negative impact on government bond market capitalization over nominal GDP. All three explanatory variables remain negatively significant at the same levels, even after the inclusion of DVGFC. However, the magnitude of their estimators has dropped with the inclusion of the dummy variable. All else constant, with the inclusion of DVGFC:

- A one percent increase in $DLEXR_t$ will result in a 0.5573 percent fall in DGB_t;

- A one percent rise in $DLIBR_t$ will lead to a 0.0501 percent drop in DGB_t; and

- A one percent increase in $DFISC_t$ will result in a 3.5314 percent fall in DGB_t.

The adjusted R square for the model in Model 6.2B has increased to 0.6969, with the model able to explain almost 70 percent of the variation in the changes in government bond market capitalization over nominal GDP.

6.3.3 Corporate Bonds over Nominal GDP

With the First Difference of Corporate Bonds over Nominal GDP (DCB_t) as the dependent variable, the results for the two specifications are shown in Table 6.4 (as Models 6.3A and 6.3B).

Table 6.4: Regression Results for Corporate Bonds (Sub-sample Period)

	6.3A	6.3B#
Constant	0.0068* (0.0037)	0.0039** (0.0018)
Inflation, $INFL_{t-2}$	-0.0015** (0.0007)	-0.0016*** (0.0004)
First Difference of Government Bonds over Nominal GDP, DGB_t	0.3238** (0.1178)	0.4816*** (0.1028)
DV for Global Financial Crisis, DVGFC	-	0.0095* (0.0047)
R-squared	0.3338	0.5361
Adjusted R-squared	0.2732	0.4433
No. observations	25	25
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	4.3438[0.1140]	0.1510[0.9273]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
An autoregressive model of order one is used to resolve the problem of autocorrelation.
Dependent variable for models 6.3A and 6.3B is First Difference of Corporate Bonds over Nominal GDP.

This subsection shows the two specifications considered here. The first specification includes two explanatory variables that reflect the impact from Malaysia's

fiscal and monetary policies (in Model 6.3A). The second and full specification has the dummy variable, DVGFC, to capture the effect of the global financial crisis (in Model 6.3B).

(i) Results for Model 6.3A

In Model 6.3A, the two explanatory variables are Inflation Rate ($INFL_{t-2}$) and First Difference of Government Bonds over Nominal GDP (DGB_t). The constant term here is significant at 10 percent and positive.

The independent variable, $INFL_{t-2}$, has a negative sign as expected. It is significant at the 5 percent level. Its negative coefficient of 0.0015 measures the impact of this variable two quarters ago on the dependent variable, DCB_t, *ceteris paribus*. Hence, a one percent increase in $INFL_{t-2}$ will lead to a 0.0015 percent fall in the dependent variable, DCB_t, after a lag of two quarters.

DGB_t, as the proxy for size of the government bond market here, has a positive sign, as postulated. The variable, DGB_t, is significant at the 5 percent level. The size of its estimator (0.3238) is noticeably larger than that for $INFL_{t-2}$, indicating DGB_t has a much bigger impact on the dependent variable, DCB_t. That is, a one percent increase in DGB_t will result in a 0.3238 percent rise in corporate bond market capitalization over nominal GDP. This is in line with Bae's study (2012), which found that the government bond market was the most important determinant for growth in the corporate bond market.

Possibly due to the diversity of issuers of corporate bonds, the adjusted R square here is 0.2732, indicating the regression model can explain only about 27 percent of the variation in the changes in corporate bond market capitalization over nominal GDP.

(ii) Results for Model 6.3B

The dummy variable, DVGFC, is included in Model 6.3B to capture the effects of the global financial crisis. The AR(1) term has also been added to deal with the problem of autocorrelation in Model 6.3B. The constant term here is positively significant at 5 percent.

In Model 6.3B, the explanatory variable, $INFL_{t-2}$, is now negatively significant at 1 percent (5 percent in Model 6.3A). However, its estimator seems fairly robust at -0.0016 (-0.0015 in Model 6.3A). That is, a one percent increase in $INFL_{t-2}$ will result in DCB_t falling by 0.0016 percent after a lag of two quarters.

The other explanatory variable, DGB_t, is also negatively significant at 1 percent (5 percent in Model 6.3A). However, its estimator has increased in magnitude. Hence, a one percent increase in DGB_t will result in a 0.4816 increase in DCB_t.

In Model 6.3B, DVGFC is significant at the 10 percent level. It has a positive sign, unlike in the models for the other dependent variables (DTB_t and DGB_t). That is, the global financial crisis had a positive effect on corporate bond market capitalization over nominal GDP.

The AR(1) term has been included to resolve the problem of autocorrelation. It is significantly negative at the 5 percent level (-0.5054).

The adjusted R square for Model 6.3B is 0.4433, compared to 0.2732 for Model 6.3A. That is, this model can explain over 44 percent of the variation in the changes of corporate bond market capitalization over nominal GDP.

6.3.4 Financial Bonds over Nominal GDP

With the First Difference of Financial Bonds over Nominal GDP, DFB_t, as the dependent variable, the results for the two specifications are shown in Table 6.5 (as Models 6.4A and 6.4B).

Two specifications are considered here. In Model 6.4A, the first specification includes two explanatory variables that reflect the impact from Malaysia's fiscal and / or monetary policies. Subsequently, the second and full specification includes the dummy variable, DVGFC, so as to account for any impact from the global financial crisis (in Model 6.3B).

Table 6.5: Regression Results for Financial Bonds (Sub-sample Period)

	6.4A	6.4B
Constant	0.0006 (0.0033)	0.0039 (0.0040)
First Difference of Log of Exchange Rate, $DLEXR_t$	-0.2346* (0.1285)	-0.2212* (0.1139)
First Difference of Government Debt over Nominal GDP, $DGDEBT_t$	-0.3911** (0.1714)	-0.5676*** (0.1693)
DV For Global Financial Crisis, DVGFC	-	-0.0140** (0.0053)
R-squared	0.2224	0.3456
Adjusted R-squared	0.1517	0.2521
No. observations	25	25
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	1.1079[0.5747]	1.8659[0.3934]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
Dependent variable for Models 6.4A and 6.4B is First Difference of Financial Bonds over Nominal GDP.

(i) Results for Model 6.4A

In Model 6.4A, both explanatory variables, First Difference of Log of Exchange Rate ($DLEXR_t$), and First Difference of Government Debt over Nominal GDP ($DGDEBT_t$) have negative coefficients.

The first explanatory variable, $DLEXR_t$, is significant at the 10 percent level. A one percent increase in $DLEXR_t$ will lead to a 0.2346 percent decline in the dependent variable, DFB_t, holding all else constant.

$DGDEBT_t$ is significant at 5 percent and its estimator is -0.3911, which captures its effect on the dependent variable, DFB_t, *ceteris paribus*. Hence, a one percent increase in $DGDEBT_t$ will produce a 0.3911 percent decline in DFB_t.

The adjusted R square for Model 6.4A is only 0.1517, where the model can explain about 15 percent of the variation in the changes in financial bond market capitalization over nominal GDP.

(ii) Results for Model 6.4B

The dummy variable, DVGFC, is included in Model 6.4B.

In Model 6.4B, $DLEXR_t$ has remained negatively significant at 10 percent. Here, a one percent increase in $DLEXR_t$ will lead to a 0.2212 percent drop in the dependent variable, DFB_t. $DGDEBT_t$, is now negatively significant at 1 percent. Its estimator has increased in magnitude to 0.5676. That is, a one percent increase in $DGDEBT_t$ will mean a 0.5676 percent fall in DFB_t, keeping other variables unchanged.

The dummy variable, DVGFC, has a negative coefficient (-0.0140) and is significant at 5 percent. The impact from the global financial crisis on financial bond market capitalization over nominal GDP is negative.

The adjusted R square for Model 6.4B has risen to 0.2521, with the model able to explain about 25 percent of the variation in the changes in financial bond market capitalization over nominal GDP.

6.4 Summary of Findings and Discussion

In the sub-sample regression runs for First Difference of Total Bonds over Nominal GDP as the dependent variable, DTB_t, the impact of the explanatory variable, $DGDEBT_{t-2}$, is significantly positive, as in the full sample regression runs. Furthermore, it is worth noting that DGDEBT also affected DTB_t in the sub-sample period after a lag of two quarters. For the sub-sample period, the two explanatory variables that significantly and negatively affected DTB_t are $DLEXR_t$ and DVGFC.

With the second dependent variable, the First Difference of Government Bonds over Nominal GDP, DGB_t, regression results for the sub-sample period indicate that none of the explanatory variables has a significant and positive impact on DGB_t, only explanatory variables with significant and negative impact on DGB_t.

Results for the sub-sample period show that the four explanatory variables that significantly and negatively affected DGB_t are $DLEXR_t$, $DLIBR_t$, $DFISC_t$ and DVGFC. Furthermore, the adjusted R square for this regression is 0.6311, which means 63.11 percent of the variation in the changes in government bond market capitalization over nominal GDP can be explained by the model. Of the two proxies for the government's financial position, only $DFISC_t$, which is the proxy for fiscal balance in the government budget, significantly and negatively affected DGB_t in the sub-sample period.

The explanatory variable, $DLEXR_t$, has a significant and negative impact on DGB_t in both sample periods. However, in the full sample period, it affected DGB_t

after a lag of one quarter whereas in the sub-sample period, it is the contemporaneous term that has an impact on DGB_t. It appears that in the sub-sample period, the impact from DLEXR is faster.

While interest rates appear to influence government bond issuance in Malaysia, findings for the sub-sample period showed that changes, *i.e.* a rise, in interest rates significantly and negatively affected DGB_t.

The third set of regression runs for the sub-sample period has the First Difference of Corporate Bonds over Nominal GDP, DCB_t, as the dependent variable. To resolve the problem of autocorrelation in these regression runs, an AR(1) term is included and it is significantly negative.

In the regression runs for the sub-sample period, only the independent variable of DGB_t has a significant and positive impact on the dependent variable, DCB_t. Its impact is also positive in full sample period. However, explanatory variables that negatively affected DCB_t in the sub-sample period are $INFL_{t-2}$ and the dummy variable for global financial crisis, DVGFC.

Of the nine selected independent variables for the sub-sample regression runs with DFB_t as the dependent variable, none of the selected explanatory variables postulated to impact DFB_t positively is found to be significant. Unlike its impact on the other three dependent variables, $DGDEBT_t$ has a significant and negative impact on DFB_t here. This is also the case for regression runs for the full sample period earlier and the finding is repeated in the sub-sample runs in this chapter.

Similarly, $DLEXR_t$ and DVGFC, also impacted DFB_t negatively in the sub-sample runs. That is, only three of the selected independent variables are significant and all three have a negative effect on DFB_t.

Table 6.6 below shows the comparison of potential determinants for Malaysia's domestic aggregate bond market for the full sample period (Q4, 1993-Q4, 2011) against potential determinants for the sub-sample period (Q4, 2005-Q4, 2011).

Table 6.6: Determinants of Domestic Aggregate Bond Market – Full Sample Period Versus Sub-sample Period

	Full Sample Period (Q4, 1993 to Q4, 2011)	Sub-sample Period (Q4, 2005 to Q4, 2011)
Positive Impact	Government Debt Breakpoint in Govt. Debt	Government Debt
Negative Impact	Banking Sector* Bank Concentration Ratio* Equity Market* Volatility in Interest Rates Change in Exchange Rates Global Financial Crisis	Change in Exchange Rates Global Financial Crisis

Note:* Not included in the list of explanatory variables for sub-sample analysis.

From Chapter 5, findings for the full sample period of Q4, 1993 to Q4, 2011 indicate eight potential determinants for the aggregate bond market (as shown in Table 6.6 above). Of the eight, two determinants, namely government debt and the dummy variable for the breakpoint in government debt trend, have a positive impact on the aggregate bond market. The remaining six potential determinants, which all have a significantly negative impact on the aggregate bond market, are loans outstanding and bank concentration ratio of the banking sector, size of the equity market, volatility in interest rates (as proxied by standard deviation in interest rate), changes in the exchange rate and the dummy variable for the global financial crisis, DVGFC.

For the sub-sample period, with reference to the nine selected explanatory variables in regression runs for the aggregate bond market, government debt is found to be a potential determinant with a positive impact, as in the full sample period (see Table

6.6). Similarly, changes in the exchange rate (proxied by First Difference of Log of Exchange Rate) is found to be a potential determinant with a significantly negative impact on aggregate bond market in both the full and sub-sample periods. Likewise, the impact from the dummy variable, DVGFC, is significant and negative in both full and sub-sample periods.

The regression results for the sub-sample period appear to affirm that the size of government debt is a potential determinant that has a significantly positive impact on the domestic aggregate bond market in Malaysia. This positive relationship between aggregate bonds and government debt is in line with studies by, among others, Bae (2012), Burger and Warnock (2006), Claessens *et al.* (2007), Eichengreen and Leungnaruemitchai (2004), Essers *et al.* (2015), and Mihaljek *et al.* (2002). Also, the Malaysian government's traditional stand has been to depend mostly on internal or domestic sources to finance its fiscal deficits (Ministry of Finance, various years).

In the sub-sample period, changes in the exchange rate and the dummy variable for the global financial crisis are found to be potential determinants that negatively affected the aggregate bond market. These determinants are also found to have a negative impact on the Malaysian aggregate bond market over the period Q4, 1993 to Q4, 2011.

Table 6.7 below shows the comparison of potential determinants for Malaysia's domestic government bond market for the full sample period (Q4, 1993-Q4, 2011) against the sub-sample period (Q4, 2005-Q4, 2011).

Table 6.7: Determinants of Domestic Government Bond Market – Full Sample Period Versus Sub-sample Period

	Full Sample Period (Q4, 1993 to Q4, 2011)	Sub-sample Period (Q4, 2005 to Q4, 2011)
Positive Impact	Government Debt Breakpoint in Govt. Debt* Real GDP Growth Rate* Asian Financial Crisis*	
Negative Impact	Fiscal Balance Bank Concentration Ratio* Equity Market* Change in Exchange Rates Global Financial Crisis	Fiscal Balance Change in Interest Rates Change in Exchange Rates Global Financial Crisis

Note:* Not included in the list of explanatory variables for sub-sample analysis.

Where the government bond market is concerned, findings from Chapter 5 show that both government debt and fiscal balance are potential determinants for growth of the domestic government bond market in Malaysia from Q4, 1993 to Q4, 2011. However, in the sub-sample period, only the proxy for fiscal balances is found to be significant, implying that in the period Q4, 2005 to Q4, 2011, fiscal balances are more effective in impacting the growth of domestic government bonds. A possible reason that government debt is not a potential determinant for the sub-sample period for the domestic government bond market is net repayments of government loans in the mid-2000s. For example, 2006 was the fourth straight year of net repayments by the public sector (Bank Negara Malaysia, 2007b, p. 51). Furthermore, the Malaysian government did not tap the international capital market for any new loans for the period 2004-06 (p. 51).

For the sub-sample period, changes in the exchange rate and the dummy variable for the global financial crisis, DVGFC, are found to have a significantly negative impact as in the full period. In the sub-sample period, there is a shorter transmission period from changes in the exchange rate to issuance of local currency government bonds, as

suggested by the impact from $DLEXR_t$, the contemporaneous term, on government bonds.

This development may also be due to the fact that the absolute amounts of the fiscal deficits have grown over time, possibly making issuance of government bonds more sensitive to changes in the exchange rate. In absolute amounts, the fiscal deficits averaged RM32.5 billion *per* annum in the sub-sample period, up 33.7 percent from the average of RM24.3 billion *per annum* for the full sample period. In fact, comparing the period of 1998-2004, the initial years of the fiscal deficits, when the average was noticeably lower at RM16.2 billion *per annum*, the average fiscal deficit has about doubled (+100.6 percent) for the sub-sample period (Ministry of Finance, various years, Table 4.1).

From Table 6.7, it can be seen that in the sub-sample period, increases in domestic interest rates have a negative impact on growth of the domestic government bond market. During this period, the stance of monetary policy was mostly accommodative and 3-month interbank rates averaged just 3.1 percent against 4.3 percent for the full sample period (Q4, 1993 to Q4, 2011). In view of the easier monetary policy for the sub-sample period, any interest rate hikes in the 3-month interbank rate may make a difference to the government's cost of borrowing and, thus, result in an adverse impact on issuance of domestic government bonds.[3]

However, volatility in interest rates is a potential determinant in the full sample period (refer to Table 6.6, on Domestic Aggregate Bond Market), but changes in interest rates are more influential for the sub-sample period (see Table 6.7, on Domestic Government Bond Market). Volatility in the 3-month interbank rates was much higher for the full sample period (standard deviation was 2.07 percent) than for the sub-sample

[3] The averages and standard deviations for the 3-month KLIBOR are calculated based on the quarterly data used in this study.

period (standard deviation was 0.54 percent). This contrasts with the mostly accommodative stance of monetary policy during the sub-sample period from Q4, 2005 to Q4, 2011 (Bank Negara Malaysia, 1999c).

Table 6.8 below shows the comparison of determinants for Malaysia's domestic corporate bond market for the full sample period (Q4, 1993-Q4, 2011) against the sub-sample period (Q4, 2005-Q4, 2011).

Table 6.8: Determinants of Domestic Corporate Bond Market – Full Sample Period Versus Sub-sample Period

	Full Sample Period (Q4, 1993 to Q4, 2011)	Sub-sample Period (Q4, 2005 to Q4, 2011)
Positive Impact	Size of Domestic Government Bond Market Breakpoint in Govt. Debt*	Size of Domestic Government Bond Market Global Financial Crisis
Negative Impact	Banking Sector* Bank Concentration Ratio* Change in Exchange Rates	Inflation

Note:* Not included in the list of explanatory variables for sub-sample analysis.

In the case of the corporate bond market, which comprises bond issuance by a diversity of issuers within the corporate sector, the potential determinant with a significantly positive impact in both the full and sub-sample periods is size of the government bond market. The proxy used for the size of the domestic government bond market is significant at the 1 percent level in both sample periods and in line with findings by Bae (2012) that a "deep" government bond market was the most important driver for corporate bond market development.

In fact, according to the World Bank and IMF (2001), emerging economies should first develop their government bond markets as well-functioning government bond markets will subsequently contribute to the development of private bond markets. This is because a well-developed government bond market can help support development of the private bond market (see Chapter 2, Section 2.2.3).

Here, the dummy variable for the global financial crisis, DVGFC, is significantly positive in the sub-sample period, but not significant at all in the full sample period. The impact from inflation is found to be significantly negative in the sub-sample period but not significant in the full sample period. However, the negative impact of inflation on the corporate bond market is in line with studies by Amante *et al.* (2007), Bae (2012), and Burger and Warnock (2006; 2007), where stable monetary policies and lower inflation were conducive to bond issuance. While the averages for inflation for the full sample period and sub-sample period are about the same, at 2.7 percent and 2.8 percent respectively, there was greater volatility in inflation rates during the sub-sample period. For example, inflation spiked as high as 8.4 percent for Q3, 2008 and also fell to -2.3 percent for Q3, 2009. Accordingly, the standard deviation of inflation for the sub-sample period is higher at 2.0 percent and only 1.5 percent for the full sample period.[4]

Table 6.9 shows the comparison of determinants for Malaysia's domestic financial bond market for the full sample period (Q4, 1993-Q4, 2011) against the sub-sample period (Q4, 2005-Q4, 2011).

[4] The averages and standard deviations for inflation rates are calculated based on the quarterly data used in this study.

Table 6.9: Determinants of Domestic Financial Bond Market – Full Sample Period Versus Sub-sample Period

	Full Sample Period (Q4, 1993 to Q4, 2011)	Sub-sample Period (Q4, 2005 to Q4, 2011)
Positive Impact	Trade* Breakpoint in Govt. Debt*	
Negative Impact	Government Debt Spread in Interest Rates Change in Exchange Rates Global Financial Crisis	Government Debt Change in Exchange Rates Global Financial Crisis

Note:* Not included in the list of explanatory variables for sub-sample analysis

In the case of the financial bond market, the potential determinants that have a significantly negative impact in the sub-sample period – government debt, appreciation of the local currency and the dummy variable for the global financial crisis, DVGFC – are also significantly negative for the full sample period as well.

In his study on 43 advanced and developing countries for the period 1990-2009, Bae (2012) found that the growth of local currency bonds issued by financial institutions was mainly influenced by GDP per capita, the proxy for level of economic development in his study. However, as discussed in Chapter 5, growth in the Malaysian financial bond segment is linked to debt securities issued by banking institutions for trade financing and their own funding requirements. Government debt that is financed by issuance of government bonds rather than bank loans will be negatively associated with the issuance of financial bonds, as shown in the findings in both Chapters 5 and 6 here.

The negative impact on growth of financial bonds from changes in the exchange rate suggests that instability in the local currency is not conducive to growth of such financial bonds (Eichengreen & Leungnaruemitchai, 2004).

6.5 Concluding Remarks

Key findings on the domestic bond market in the sub-sample period are as follows:

(a) Higher inflation will have a negative impact on the issuance of domestic corporate bonds. Average inflation was roughly similar in the full sample (2.7 percent) and sub-sample period (2.8 percent). However, there was greater volatility in inflation rates in the sub-sample period, which negatively impacted the growth of domestic corporate bonds accordingly. This is in line with studies that found low and stable inflation is supportive of development of domestic bond markets (*e.g.* Burger *et al.*, 2012; 2015; Burger & Warnock, 2006).

(b) Growth of the domestic government bond segment is positively associated with growth of the domestic corporate bond segment (in line with findings in Chapter 5).

(c) Increase in government debt may have a negative impact on the growth of the domestic financial bond segment, in contrast to the other bonds (similar to Chapter 5 findings).

(d) An increase in domestic interest rates will have a negative impact on issuance of domestic government bonds. The larger fiscal deficits in the sub-sample period would have resulted in higher total borrowing costs for the government, thus making issuance of domestic government bonds more sensitive to interest rate movements.

(e) Growth in government debt or fiscal deficits will lead to growth in the domestic aggregate and government bond markets (similar to Chapter 5 findings).

(f) Changes in the exchange rate or instability in the local currency will have a negative impact on the growth of the domestic bond market (*i.e.* aggregate bonds, government bonds and financial bonds).

CHAPTER 7

ANALYSIS OF FINDINGS:

PRIVATE FINANCING

7.1 Introduction

In view of the findings of Chapter 5 on the impact of the Malaysian banking sector and its concentration level on the domestic bond market, Chapter 7 will attempt to establish possible common ground between the Malaysian banking sector and private financing (comprising loans plus domestic corporate bonds)[1] with the domestic bond market. In addition, findings about the potential determinants for the banking sector and private financing for the full sample period in this chapter will facilitate further analysis into the impact of the level of concentration on the banking sector and private financing. If the findings point to certain potential determinants that positively impact the domestic bond market, but adversely affect the local banking sector, or *vice versa*, this should also be given due consideration in crafting future policies for the Malaysian capital market and financial sector.

Section 7.2 will be on the choice of variables and results for ARDL modelling. Section 7.3 will be on the selection of variables and reporting on multivariate hypothesis testing with bank loans as well as loans plus corporate bonds, as the two dependent variables for the full sample period (Q4, 1993 to Q4, 2011), while section 7.4 will be on the results for the sub-sample period (Q4, 2005 to Q4, 2011). Section 7.5 will summarize and discuss the findings, while Section 7.6 will conclude.

[1] This definition of private financing covers the same debt components in the study by La Porta *et al.* (1997).

7.2 ARDL Modelling

As in Chapter 5, ARDL modelling, including the Bounds F-test, is used for the runs with the two dependent variables of Loans Outstanding over Nominal GDP as well as (Loans Outstanding plus Corporate Bonds) over Nominal GDP, against the selected explanatory variables in Table 7.1 (Gujarati & Porter, 2009; Pesaran *et al.,* 2001; Pesaran & Shin, 1999; Stock & Watson, 2006).

Table 7.1: List of Variables for ARDL Modelling

Variable	Abbreviation
Loans Outstanding over Nominal GDP	LOAN
(Loans Outstanding plus Corporate Bonds) over Nominal GDP	PFIN
Annual GDP Growth Rate	GROWR
Trade over Nominal GDP	TRADE
Bank Concentration Ratio	BANCON
Equity Market Capitalization over Nominal GDP	EQMKT
Inflation Rate	INFL
Log of Exchange Rate	LEXR
Log of 3-m KLIBOR	LIBR
Spread, being Average Lending Rate minus 12-m FD Rate	SPREAD
Standard Deviation of Exchange Rate	SDEXR
Standard Deviation of 3-m KLIBOR	SDIBR
Government Debt over Nominal GDP	GDEBT
Fiscal Balance over Nominal GDP	FISC
Dummy Variable For Breakpoint in Government Debt	DVBPGD
Dummy Variable for Asian Financial Crisis	DVAFC
Dummy Variable for Ringgit Peg	DVPEG
Dummy Variable for Global Financial Crisis	DVGFC

As before, the data series for the dependent variables and government debt have been smoothed out to reduce seasonal fluctuations. The same explanatory variables have been selected in an attempt to establish a common ground on which to build more “embracive" government policies that can jointly develop the domestic bond market as well as the local banking sector, going forward. That is, findings of the same potential determinants that positively (or negatively) affect both the domestic bond market and

local banking sector can serve as input in policy-making for future financial measures or reforms.

The dependent variables are also subjected to ADF Fisher Unit Root Test to ensure that the series exhibit I(1) (unit root) or I(0) (stationary) behaviour. Results for the ADF Fisher Unit Root Test for first differences are attached as Appendix Q and indicate that all dependent and independent variables are either I(1) or I(0) series. The correlation matrices for the dependent and independent variables have been attached as Appendices R1 and R2.

Before testing (Loans Outstanding plus Corporate Bonds) over Nominal GDP, the data series of Loans Outstanding over Nominal GDP is also tested in an attempt to identify potential determinants of the growth of the Malaysian banking sector. An example of the ARDL model and Serial Correlation LM Test is shown in Appendix S. In this ARDL model, the F-statistic is 34.5346. As such, the null hypothesis of no long-run relationship between the dependent and independent variables is rejected based on the 5 percent lower and upper limit of the critical bounds values of [2.45,3.61], where k = 6. However, the ARDL regression model is a case with an unrestricted constant and no trend, so the t-Bounds test critical values are used to make a decision on the alternative hypotheses. For this run, the t-statistic is -4.3656, with an absolute value of |4.3656|, which is between the absolute value of either the I(0) or I(1) t-Bounds at the 5 percent significance level, [-2.86, -4.38]. Accordingly, failure to reject the null hypothesis of t-Bounds test means that no decision can be made.

With (Loans Outstanding plus Corporate Bonds) over Nominal GDP as the dependent variable, an example of the ARDL model and Serial Correlation LM Test is shown in Appendix T. In this ARDL model, the F-statistic is 4.1792. As such, the null hypothesis of no long-run relationship between the dependent and independent variables

is rejected based on the 5 percent lower and upper limit of the critical bounds values of [2.45,3.61], where k = 6. However, the ARDL regression model is a case with an unrestricted constant and no trend, so the t-Bounds test critical values are used to make a decision on the alternative hypotheses. For this run, the t-statistic for the estimated long-run relationship is -1.7408, with an absolute value of |1.7408|, which is less than the absolute value of either the I(0) or I(1) t-bound at the 5 percent significance level, [-2.86, -4.38]. Accordingly, failure to reject the null hypothesis of t-Bounds test leads to the conclusion that the cointegrating relationship does not hold.

7.3 Results of Regression Models (Full Sample Period)

Since the analysis here has not established the existence of level relationships, the level variables are dropped from the model. Once again, regression models will be used. This section will investigate potential determinants of bank loans and loans plus corporate bonds in the context of Malaysia with the dependent variables being First Difference of Loans Outstanding over Nominal GDP and First Difference of (Loans Outstanding plus Corporate Bonds) over Nominal GDP. The correlation matrices for the dependent and independent variables have been attached as Appendices U1 and U2.

Table 7.2 shows all the chosen variables that are entered into the model. Their contemporaneous terms with lags from one up to four quarters are considered. Variables that are not significant are excluded, although the four dummy variables are retained in the final Models. The selection of the independent variables has been based on tests to ensure that the chosen series are stationary (unit root tests are shown in Appendix G, as mentioned in Chapter 5 previously).

Table 7.2: List of Variables for Regression Models

Variable	Abbreviation
First Difference of Loans Outstanding over Nominal GDP	DLOAN
First Difference of (Loans Outstanding plus Corporate Bonds) over Nominal GDP	DPFIN
Annual GDP Growth Rate	GROWR
First Difference of Trade over Nominal GDP, up to 4 Lags	DTRADE
First Difference of Bank Concentration Ratio, up to 4 Lags	DBANCON
Equity Market Capitalization over Nominal GDP, up to 4 Lags	EQMKT
Inflation Rate, up to 4 Lags	INFL
First Difference of Log of Exchange Rate, up to 4 Lags	DLEXR
First Difference of Log of 3-m KLIBOR, up to 4 Lags	DLIBR
Spread, being Average Lending Rate minus 12-m FD Rate, up to 4 Lags	SPREAD
Standard Deviation of Exchange Rate	SDEXR
Standard Deviation of 3-m KLIBOR	SDIBR
First Difference of Government Debt over Nominal GDP, up to 4 Lags	DGDEBT
First Difference of Fiscal Balance over Nominal GDP, up to 4 Lags	DFISC
Dummy Variable For Breakpoint in Government Debt	DVBPGD
Dummy Variable for Asian Financial Crisis	DVAFC
Dummy Variable for Ringgit Peg	DVPEG
Dummy Variable for Global Financial Crisis	DVGFC

For the following regression runs, significance of all explanatory variables are based on two-tailed tests unless stated otherwise. The relevant diagnostic tests have been carried out and are included in the Appendix Section.

7.3.1 Loans Outstanding over Nominal GDP

In this subsection, the First Difference of Loans Outstanding over Nominal GDP is the dependent variable, $DLOAN_t$. The results of the three specifications are shown in Table 7.3 (as Models 7.1A, 7.1B and 7.1C).

Three specifications have been considered in this subsection. In the first specification, the explanatory variables included show the impact from the bank concentration ratio, spread between interest rates and government debt plus the dummy variable for break in the trend of government debt (Model 7.1A). The second specification includes the three dummy variables to account for the impact of the two

financial crises and Malaysia's currency peg (Model 7.1B). The third and full specification includes the proxy for the equity market to establish the relationship between the domestic banking sector and equity market (Model 7.1C).

Table 7.3: Regression Results for Loans Outstanding (Full Sample Period)

	7.1A	7.1B	7.1C
Constant	0.0358** (0.0168)	0.0426*** (0.0157)	0.0210 (0.0185)
Equity Market Capitalization over Nominal GDP, $EQMKT_{t-1}$	-	-	0.0125* (0.0067)
First Difference of Bank Concentration Ratio, $DBANCON_t$	-0.6408* (0.3260)	-0.7315** (0.3106)	-0.6660** (0.3195)
$SPREAD_{t-3}$	-0.0123** (0.0056)	-0.0119** (0.0052)	-0.0118** (0.0049)
First Difference of Government Debt over Nominal GDP, $DGDEBT_{t-1}$	1.1949*** (0.3837)	1.1574*** (0.3673)	1.3129*** (0.3789)
DV for Breakpoint in Govt. Debt, DVBPGD	-0.0227 (0.0147)	-0.0225 (0.0140)	-0.0178 (0.0147)
DV for Asian Financial Crisis, DVAFC	-	0.0003 (0.0119)	0.0036 (0.0118)
DV for Ringgit Peg, DVPEG	-	-0.0126 (0.0095)	-0.0118 (0.0085)
DV for Global Financial Crisis, DVGFC	-	-0.0392*** (0.0118)	-0.0347*** (0.0114)
R-squared	0.6669	0.7210	0.7331
Adjusted R-squared	0.6412	0.6850	0.6937
No. observations	71	71	71
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	1.3584[0.8514]	2.4854[0.6472]	1.5135[0.8242]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
An autoregressive model of order one is used to resolve the problem of autocorrelation.
Dependent variable for Models 7.1A, 7.1B and 7.1C is First Difference of Loans Outstanding over Nominal GDP.

(i) Results for Model 7.1A

In Model 7.1A, the three explanatory variables that are significant are First Difference of Bank Concentration Ratio ($DBANCON_t$), $SPREAD_{t-3}$ and First

Difference of Government Debt over Nominal GDP ($DGDEBT_{t-1}$). The two significant variables with negative coefficients are $DBANCON_t$ and $SPREAD_{t-3}$. $DBANCON_t$ is significant at the 10 percent level and its coefficient is -0.6408. That is, a one percent increase in $DBANCON_t$ can lead to a 0.6408 percent drop in the dependent variable, $DLOAN_t$. $SPREAD_{t-3}$ is significant at the 5 percent level. A one percent increase in $SPREAD_{t-3}$ will result in a 0.0123 percent fall in $DLOAN_t$.

Only $DGDEBT_{t-1}$, which is significant at the one percent level, has a positive relationship with $DLOAN_{t,}$. Its sizeable coefficient of 1.1949 indicates its positive impact on the dependent variable after one quarter, keeping all else constant. Hence, a one percent growth in $DGDEBT_{t-1}$ will see a 1.1949 percent rise in $DLOAN_t$, after one quarter. The dummy variable, DVBPGD, has a negative sign, but is not significant. Here, the constant term is positively significant at the 5 percent level.

The term, AR(1), has been included to resolve the problem of autocorrelation and is positively significant with a coefficient of 0.7138.

For Model 7.1A, the adjusted R square is 0.6412, which shows that this model can explain over 64 percent of the variation in the changes of bank loans over nominal GDP.

(ii) Results for Model 7.1B

In Model 7.1B, the remaining three dummy variables – DVAFC, DVPEG and DVGFC - have been added to capture the effects from the Asian financial crisis and currency peg as well as the impact from the global financial crisis. The constant is now positively significant at the 1 percent level.

Of the three newly added variables, only DVGFC, is significant. It has a negative coefficient (-0.0392) and is significant at the one percent level. That is, the

global financial crisis had a negative impact on bank loans over nominal GDP. The other two dummy variables have the expected signs, albeit are insignificant.

Among the previously significant variables, $DBANCON_t$, is now significant at the five percent level instead of 10 percent. Also, a one percent increase in $DBANCON_t$ now leads to a larger 0.7315 percent decline in $DLOAN_t$. $SPREAD_{t-3}$ has remained significant at 5 percent level with the magnitude of its coefficient marginally smaller. With a one percent increase in $SPREAD_{t-3}$, $DLOAN_t$ will fall by 0.0119 percent. $DGDEBT_{t-1}$ now has a slightly smaller coefficient of 1.1574. Notwithstanding this, a one percent growth in $DGDEBT_{t-1}$ will still lead to a sizeable 1.1574 percent rise in $DLOAN_t$. after a lag of one quarter.

The term, AR(1), has been included to resolve the problem of autocorrelation. It is positively significant with a coefficient of 0.6868.

For Model 7.1B, the adjusted R square has improved to 0.6850, which shows that this model can explain 68.5 percent of the variation in the changes in bank loans over nominal GDP.

(iii) Results for Model 7.1C

The variable, Equity Market Capitalization over Nominal GDP ($EQMKT_{t-1}$), is added to obtain Model 7.1C.

$EQMKT_{t-1}$ is positively significant at the 10 percent level. A one percent rise in $EQMKT_{t-1}$ will translate to a 0.0125 percent increase in $DLOAN_t$, after a lag of one quarter. The constant term is no longer significant. The inclusion of $EQMKT_{t-1}$, to Model 7.1C does not lead to any changes to the level of significance in the significant explanatory variables when compared with Model 7.1B. The coefficient for $SPREAD_{t-3}$ is barely changed (-0.0118). However, the following changes are observed:

- A drop in the magnitude of the coefficient of $DBANCON_t$ (remaining significant at 5 percent level), that is, a one percent rise in $DBANCON_t$ will result in a 0.6660 percent drop in $DLOAN_t$;
- A rise in the coefficient of $DGDEBT_{t-1}$ (significant at 1 percent level), which means a one percent growth in $DGDEBT_{t-1}$ will now lead to a 1.3129 percent rise in $DLOAN_t$, after a lag of one quarter; and
- A smaller coefficient of 0.5892 for AR(1) term (significant at one percent level).

For Model 7.1C, the adjusted R squared is 0.6937, where almost 70 percent of the variation in the changes of bank loans over nominal GDP can be explained by the model.

7.3.2 (Loans Outstanding plus Corporate Bonds) over Nominal GDP

In this subsection, the First Difference of (Loans Outstanding plus Corporate Bonds) over Nominal GDP is the dependent variable, $DPFIN_t$. The results of the three specifications are shown in Table 7.4 (as Models 7.2A, 7.2B and 7.2C).

Three specifications are considered. The first includes the explanatory variables equity market, change in exchange rates and government debt plus the dummy variable for break in the trend of government debt (Model 7.2A). The second specification adds the dummy variable for Malaysia's Ringgit peg (Model 7.2B). In the third and full specification, the remaining two dummy variables for the financial crises are included (Model 7.2C).

Table 7.4: Regression Results for (Loans Outstanding plus Corporate Bonds) (Full Sample Period)

	7.2A	7.2B	7.2C
Constant	-0.0339** (0.0169)	-0.0217 (0.0144)	-0.0188 (0.0151)
Equity Market Capitalization over Nominal GDP, $EQMKT_{t-1}$	0.0238** (0.0097)	0.0208** (0.0080)	0.0203** (0.0083)
First Difference of Log of Exchange Rate, $DLEXR_t$	-0.2347*** (0.0645)	-0.2466*** (0.0734)	-0.2638*** (0.0760)
First Difference of Government Debt over Nominal GDP, $DGDEBT_{t-1}$	2.1814*** (0.5337)	2.2872*** (0.5185)	2.1914*** (0.5320)
DV for Breakpoint in Govt. Debt, DVBPGD	-0.0147 (0.0251)	-0.0194 (0.0248)	-0.0255 (0.0300)
DV for Asian Financial Crisis, DVAFC	-	-	0.0102 (0.0157)
DV for Ringgit Peg, DVPEG	-	-0.0181** (0.0088)	-0.0206** (0.0093)
DV for Global Financial Crisis, DVGFC	-	-	-0.0229** (0.0099)
R-squared	0.6240	0.6394	0.6579
Adjusted R-squared	0.5951	0.6056	0.6137
No. observations	71	71	71
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	2.1837[0.7020]	2.6165[0.6239]	3.0834[0.5440]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
An autoregressive model of order one is used to resolve the problem of autocorrelation.
Dependent variable for Models 7.2A, 7.2B and 7.2C is First Difference of (Loans Outstanding plus Corporate Bonds) over Nominal GDP.

(i) Results for Model 7.2A

In Model 7.2A, the three explanatory variables that are significant are Equity Market Capitalization over Nominal GDP ($EQMKT_{t-1}$), First Difference of Log of Exchange Rate ($DLEXR_t$), and First Difference of Government Debt over Nominal GDP ($DGDEBT_{t-1}$). $EQMKT_{t-1}$ and $DGDEBT_{t-1}$ have positive coefficients, indicating their positive impact on the dependent variable, $DPFIN_t$. $EQMKT_{t-1}$ is significant at the 5 percent level with a rather small coefficient (0.0238), which measures its impact on $DPFIN_t$ one quarter ago, *ceteris paribus*. That is, a one percent rise in $EQMKT_{t-1}$ will lead to a 0.0238 percent increase in $DPFIN_t$, after one quarter. $DLEXR_t$ is significant at

the 1 percent level with a negative coefficient. A one percent increase in $DLEXR_t$ will lead to a 0.2347 percent fall in $DPFIN_t$. With a one percent growth in $DGDEBT_{t-1}$, the dependent variable, $DPFIN_t$, will rise by 2.1814 percent after a lag of one quarter, holding other variables constant. This shows the former's sizeable impact on the dependent variable. The dummy variable, DVBPGD, has a negative sign, but is not significant. Here, the constant term is significant at the 5 percent level and negative.

The term, AR(1), has been included to resolve the problem of autocorrelation and is significant (0.5997).

For Model 7.2A, the adjusted R square is 0.5951, which shows that this model can explain almost 60 percent of the variation in the changes in total debt over nominal GDP.

(ii) Results for Model 7.2B

The dummy variable for the currency peg, DVPEG, has been added to obtain Model 7.2B. The constant is no longer significant.

The newly added explanatory variable, DVPEG, has the expected negative sign and is significant at the 5 percent level. That is, the currency peg had a negative impact on total debt over nominal GDP. The other significant variables remain significant at the same levels as in Model 7.2A, with some changes in the size of their coefficients. Both $DLEXR_t$ (in terms of magnitude) and $DGDEBT_{t-1}$ now have slightly larger coefficients, with $EQMKT_{t-1}$ having a smaller coefficient. With the inclusion of DVPEG:

- A one percent increase in $EQMKT_{t-1}$ will mean a 0.0208 percent rise in $DPFIN_t$, after one quarter;
- A one percent rise in $DLEXR_t$ will result in a 0.2466 percent drop in $DPFIN_t$;

- A one percent growth in $DGDEBT_{t-1}$ will lead to a sizeable 2.2872 percent increase in $DPFIN_t$, after a lag of one quarter; and
- The AR(1) term is significant and positive (0.4883).

For Model 7.2B, the adjusted R square has improved to 0.6056, which shows that this model can explain 60.6 percent of the variation in the changes in total debt over nominal GDP.

(iii) Results for Model 7.2C

The remaining two dummy variables for the financial crises – DVAFC and DVGFC – are added to obtain Model 7.2C.

The dummy variable, DVAFC, has a positive sign although it is not significant. The other dummy variable, DVGFC, has the expected sign, which is negative, and it is significant at the 5 percent level. That is, the impact of the global financial crisis on total debt over nominal GDP was negative.

The inclusion of the two dummy variables, DVAFC and DVGFC, to Model 7.2C does not lead to any changes to the level of significance in the significant explanatory variables when compared with Model 7.2B. However, the following changes in their coefficients were observed:

- A dip in the coefficient of $EQMKT_{t-1}$ (remaining significant at 5 percent level), that is, a one percent rise in $EQMKT_{t-1}$ will now lead to a 0.0203 percent increase in $DPFIN_t$, after a lag of one quarter;
- An increase in the magnitude of the coefficient of $DLEXR_t$ (significant at 1 percent level), which means a one percent increase in $DLEXR_t$ will see a 0.2638 percent fall in $DPFIN_t$;

- A decline in the coefficient of $DGDEBT_{t-1}$ (significant at 1 percent level), which will see a one percent growth in $DGDEBT_{t-1}$ resulting in a 2.1914 percent increase in $DPFIN_t$, after one quarter;
- A rise in the magnitude of the negative coefficient of the dummy variable, DVPEG, to 0.0206 (significant at 5 percent level), that is, the impact of the currency peg on total debt over nominal GDP was negative; and
- The AR(1) term is significant and positive (0.5099).

For the Model 7.2C, the adjusted R squared is 0.6137, where 61.4 percent of the variation in the changes in total debt over nominal GDP can be explained by the model.

7.4 Results of Regression Models (Sub-Sample Period)

Table 7.5 shows the nine selected explanatory variables for the sub-sample regression runs in this subsection. The variables are INFL, DLEXR, DLIBR, SPREAD, SDEXR, SDIBR, and DGDEBT or DFISC as well as the dummy variable, DVGFC.

Table 7.5: List of Variables for Sub-sample Period

Variable	Abbreviation
First Difference of Loans Outstanding over Nominal GDP	DLOAN
First Difference of (Loans Outstanding plus Corporate Bonds) over Nominal GDP	DPFIN
Inflation Rate, up to 4 Lags	INFL
First Difference of Log of Exchange Rate, up to 4 Lags	DLEXR
First Difference of Log of 3-m KLIBOR, up to 4 Lags	DLIBR
Spread, being Average Lending Rate minus 12-m FD Rate, up to 4 Lags	SPREAD
Standard Deviation of Exchange Rate	SDEXR
Standard Deviation of 3-m KLIBOR	SDIBR
First Difference of Government Debt over Nominal GDP, up to 4 Lags	DGDEBT
First Difference of Fiscal Balance over Nominal GDP, up to 4 Lags	DFISC
Dummy Variable for Global Financial Crisis	DVGFC

As in Chapter 6, the same nine explanatory variables have been chosen as they would be influenced by Malaysia's fiscal or monetary policy, or both. For example, INFL, DLIBR, SPREAD and SDIBR would be affected by Malaysia's monetary policy. The number of explanatory variables has been limited to nine to ensure sufficient degrees of freedom in view of the short sub-sample period here (with 25 observations). Significance of the explanatory variables will be based on the two-tailed test of significance unless stated otherwise. The relevant diagnostic tests have been carried out and are included in the Appendix Section.

7.4.1 Loans Outstanding over Nominal GDP

Here, the dependent variable is the First Difference of Loans Outstanding over Nominal GDP, $DLOAN_t$. The results of the two specifications are shown in Table 7.6.

Table 7.6: Regression Results for Loans Outstanding (Sub-sample Period)

	7.3A	7.3B
Constant	0.0037 (0.0055)	0.0120 (0.0080)
First Difference of Government Debt over Nominal GDP, $DGDEBT_{t-1}$	2.0517*** (0.5896)	1.8928*** (0.4612)
DV for Global Financial Crisis, DVGFC	-	-0.0374*** (0.0094)
R-squared	0.5324	0.7163
Adjusted R-squared	0.4899	0.6758
No. observations	25	25
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	2.1301[0.3447]	2.5918[0.2737]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
An autoregressive model of order one is used to resolve the problem of autocorrelation.
Dependent variable for Models 7.3A and 7.3B is First Difference of Loans Outstanding over Nominal GDP.

Two specifications are considered in this subsection. The first specification includes the explanatory variables to measure the impact of monetary and / or fiscal policies (Model 7.3A). The second and full specification adds the dummy variable for the global financial crisis (Model 7.3B).

(i) Results for Model 7.3A

In Model 7.3A, the explanatory variable, First Difference of Government Debt over Nominal GDP ($DGDEBT_{t-1}$), is significant at the 1 percent level and the only significant variable among the proxies for government policies. It has a positive and sizeable coefficient. That is, a one percent growth in $DGDEBT_{t-1}$ will lead to a 2.0517 percent rise in $DLOAN_t$, after a lag of one quarter, *ceteris paribus*. The constant term here is positive, but not significant.

The term, AR(1), has been included to resolve the problem of autocorrelation and is significant at the 5 percent level. Its coefficient is 0.4349.

For Model 7.3A, the adjusted R square is 0.4899, which shows that this model can explain about 49 percent of the variation in the changes in bank loans over nominal GDP.

(ii) Results for Model 7.3B

In Model 7.3B, the dummy variable for the global financial crisis, DVGFC, is added to the model. The constant term remains positive, but is still not significant.

The dummy variable, DVGFC, has the postulated sign, which is negative. It is significant at the 1 percent level. Its coefficient is -0.0374. That is, the impact of the global financial crisis on bank loans over nominal GDP was negative.

Meanwhile, with the inclusion of the dummy variable, DVGFC, in Model 7.3B, the variable, $DGDEBT_{t-1}$, has a slightly smaller but still sizeably positive estimator.

That is, a one percent rise in $DGDEBT_{t-1}$ will result in a 1.8928 percent increase in $DLOAN_t$, after a lag of one quarter. It remains significant at the 1 percent level.

The term, AR(1), remains positively significant at the 1 percent level (0.6758).

The adjusted R square for Model 7.4B is noticeably higher at 0.6758. This means that the new model can now explain almost 68 percent of the variation in the changes in bank loans over nominal GDP.

7.4.2 (Loans Outstanding plus Corporate Bonds) over Nominal GDP

In this subsection, the dependent variable is the First Difference of (Loans Outstanding plus Corporate Bonds) over Nominal GDP, $DPFIN_t$. The results of the two specifications are shown in Table 7.7.

Table 7.7: Regression Results for (Loans Outstanding plus Corporate Bonds) (Sub-sample Period)

	7.4A	7.4B #
Constant	0.0083 (0.0079)	0.0137 (0.0082)
First Difference of Log of Exchange Rate, $DLEXR_t$	-0.1733 (0.1019)	-0.2121** (0.0865)
First Difference of Government Debt over Nominal GDP, $DGDEBT_{t-1}$	2.5049*** (0.6613)	2.4096*** (0.5470)
DV for Global Financial Crisis, DVGFC	-	-0.0264*** (0.0060)
R-squared	0.6803	0.7563
Adjusted R-squared	0.6346	0.7075
No. observations	25	25
Breusch-Godfrey Serial Correlation LM Test – Chi-squared statistic	0.3930[0.8216]	0.3349[0.8458]

Note:
Figures in parentheses are White heteroscedasticity-consistent standard errors.
***, **, * indicate significance at 1 percent, 5 percent and 10 percent level, respectively.
An autoregressive model of order one is used to resolve the problem of autocorrelation.
Dependent variable for Models 7.4A and 7.4B is First Difference of (Loans Outstanding plus Corporate Bonds) over Nominal GDP.

Two specifications are considered here. In the first specification, explanatory variables are included to measure the impact of monetary and / or fiscal policies (Model 7.4A). The second and full specification includes the dummy variable for the global financial crisis (Model 7.4B).

(i) Results for Model 7.4A

In Model 7.4A, there are two explanatory variables, First Difference of Log of Exchange Rate ($DLEXR_t$), and First Difference of Government Debt over Nominal GDP ($DGDEBT_{t-1}$). The constant term here is positive, but not significant.

The explanatory variable, $DLEXR_t$, has the expected negative sign, but it is not significant at the 10 percent level, based on a two-tailed test of significance. However, its p-value is 0.1039 and it is significantly negative if a one-tailed test is performed at the 10 percent level. Its negative coefficient of 0.1733 measures its effect on the dependent variable, $DPFIN_t$, *ceteris paribus*.

$DGDEBT_{t-1}$ has a positive effect on the dependent variable and is significant at the 1 percent level. The size of its positive coefficient, which exceeds two (2.5049), measures its sizeable effect one quarter ago on the dependent variable, $DPFIN_t$, *ceteris paribus*. That is, a one percent growth in $DGDEBT_{t-1}$ will lead to a 2.5049 percent growth in $DPFIN_t$, after a lag of one quarter.

The term, AR(1), has been included to resolve the problem of autocorrelation and is significant (0.6968).

For Model 7.4A, the adjusted R square is 0.6340, which shows that this model can explain over 63 percent of the variation in the changes in total debt over nominal GDP.

(ii) Results for Model 7.4B

In Model 7.4B, the dummy variable for the global financial crisis, DVGFC, is added to the model. The constant term remains positive, but is still not significant.

After adding DVGFC, the explanatory variable, $DLEXR_t$, is now significant at the 5 percent level in Model 7.4B. Also, the size of its negative coefficient is bigger at 0.2121. That is, a one percent rise in $DLEXR_t$ will lead to a 0.2121 percent drop in the dependent variable, $DPFIN_t$.

Meanwhile, with the inclusion of the dummy variable, DVGFC, in Model 7.4B, the variable, $DGDEBT_{t-1}$, has a slightly smaller but still sizeably positive estimator. It remains significant at the 1 percent level. That is, a one percent growth in $DGDEBT_{t-1}$ will result in a sizeable 2.4096 percent rise in $DPFIN_t$, after one quarter.

The dummy variable, DVGFC, has the postulated sign, which is negative. It is significant at the 1 percent level. Its coefficient is -0.0264. That is, the global financial crisis had a negative impact on total debt over nominal GDP.

The term, AR(1), remains positively significant at the 1 percent level (0.6511).

The adjusted R square for Model 7.4B is 0.7075. This means that the new model can now explain about 71 percent of the variation in the changes in total debt over nominal GDP.

7.5 Summary of Findings and Discussion

It is possible that long-run relationships between the dependent and independent variables in this chapter could not be established due to, in part, developments discussed in Section 5.6. In addition, the outcome of no long-run relationships may be affected by

the following developments that impacted the amount of Loans Outstanding in the full sample period:

(a) Aggressive growth of some 29 percent between 1995 and 1997 as Bank Negara Malaysia implemented the two-tier regulatory system in December1994 (see Section 3.3.2).

(b) Drop in growth rates in the years following the Asian financial crisis due to a slowdown in demand for loans, greater caution on the part of banks and on account of the merger programme implemented by Bank Negara Malaysia beginning 1999 (see *e.g.* Bank Negara Malaysia, 2002; 2008).

From Section 7.3, results for the dependent variable, $DLOAN_t$, showed that for the full sample period (Q4, 1993 to Q4, 2011), the significant explanatory variables are $EQMKT_{t-1}$, $DBANCON_t$, $SPREAD_{t-3}$, $DGDEBT_{t-1}$ and the dummy variable, DVGFC. Among these, the impact of $EQMKT_{t-1}$ and $DGDEBT_{t-1}$ on $DLOAN_t$ is positive. Both $DBANCON_t$ and $SPREAD_{t-3}$ impacted the dependent variable, $DLOAN_t$, negatively. The dummy variable, DVGFC, showed that the global financial crisis had a negative impact on $DLOAN_t$. Also, the AR(1) term is significant and positive.

Even though the explanatory variable, $SPREAD_{t-3}$, has a significantly negative impact on the dependent variable, $DLOAN_t$, none of the other proxies for interest rates is significant. As Goh and Yong (2007) noted, the imposition of selective exchange measures and sharp reduction in interest rates by the government to deal with the Asian financial crisis led to a structural shift in the domestic interest rate regime. The authors found that in the period of July 1998 to September 2005, bank lending was not responsive to interest rate increases, in contrast to the period of September 1994 to June 1998. The authors and Tee and Goh (2006) suggested that in the low interest rate

environment in the post-crisis period, profit margins were tighter, possibly necessitating caution on the part of banks to protect profits by reducing higher risk lending.

With $DPFIN_t$ as the second dependent variable in the analysis, regression results for the full sample period show that the significant explanatory variables are $EQMKT_{t-1}$, $DLEXR_t$, $DGDEBT_{t-1}$ as well as the dummy variables, DVPEG and DVGFC. The impact of $EQMKT_{t-1}$ and $DGDEBT_{t-1}$ on $DPFIN_t$ is positive. The explanatory variable, $DLEXR_t$, exerts a negative effect on the dependent variable. Both DVPEG and DVGFC had a negative impact on $DPFIN_t$. Also, the AR(1) term, included due to the problem of autocorrelation, is significantly positive.

Table 7.8 below compares the potential determinants for the full sample period of Q4, 1993 to Q4, 2011 for the domestic corporate bond market (from findings in Chapter 5) with the banking sector, that is, loans of commercial banks, and debt market in Malaysia (from findings in this chapter). This comparison will aid in facilitating the discussion of the similarities and contrasts between the potential determinants for the selected markets and banking sector.

Table 7.8: Comparison of Determinants and Impact (Full Sample Period)

	Domestic Corporate Bond Market	Banking Sector	Private Financing
Equity Market	Not significant	Positive	Positive
Banking Sector	Negative	Not applicable	Not applicable
Bank Concentration	Negative	Negative	Not significant
Change in Exchange Rate	Negative	Not significant	Negative
Spread between Interest Rates	Not significant	Negative	Not significant
Govt. Debt or Domestic Govt. Bond Market	Positive	Positive	Positive
Currency Peg	Not significant	Not significant	Negative
Global Financial Crisis	Not significant	Negative	Negative

From Table 7.8, it appears that the Malaysian equity market and banking sector, both of which were well-established prior to the domestic bond market especially the corporate bond segment, co-existed synergistically during the study period. That is, instead of competition between the equity market and banking sector, there may be complementarities between them during the period under study. However, while findings from Chapter 5 suggest that the local equity market did not impact the domestic corporate bond market during the full sample period, they show that the local equity market had a significant and negative effect on the size of the domestic aggregate bond market as well as the domestic government bond market, from Q4, 1993 to Q4, 2011.

It is also obvious from Table 7.8 that the banking sector has a negative impact on the domestic corporate bond market. As discussed earlier, the Malaysian government actively promoted the domestic bond market as an alternative source of cheaper long-term funding in their efforts to further develop the domestic bond market in the late 1980s and early 1990s. Such efforts included setting up Malaysia's first rating agency in November 1990 (Bank Negara Malaysia, 1991; Bank Negara Malaysia & Securities Commission, 2009; National Economic Action Council, 1998). Hence, it is not surprising that the banking sector, presumably exploiting its "first-mover" advantage, had a negative impact on the development of the domestic bond market, especially the domestic corporate bond market (*e.g.* Bentson, 1994; Eichengreen & Luengnaruemitchai, 2004; Schinasi & Smith, 1998). Nevertheless, as discussed earlier in Chapter 5, it is possible that over a longer time period, the relationship between the domestic bond market, including the corporate bond segment, with the local banking sector and equity market may evolve to a more complementary nature (Song & Thakor, 2010).

Furthermore, it should be noted from Table 7.8 that the level of bank concentration also has a significantly negative impact on the domestic corporate bond

market as well as the size of the banking sector itself. In fact, findings from Chapter 5 indicate that the level of concentration in the local banking sector exerted a negative impact on the growth of aggregate, government and corporate bonds in Malaysia. It should be noted that the findings in this chapter also point to the level of concentration in the Malaysian banking sector having a negative impact on loans growth itself for the full sample period between Q4, 1993 to Q4, 2011. These findings suggest that the large banks in Malaysia use their market power to stifle competition within the banking sector and, also, in competing with the domestic bond market in line with findings from studies by Bae (2012), Bentson (1994), and Schinasi and Smith (1998).

According to Sahay *et al.* (2015), in their study assessing the trade-offs between economic growth and stability that covered 128 economies, using data spanning the years 1980 to 2013, the current state of Malaysia's banking sector was considered to be both large and concentrated as just five banking groups held 70 percent of the total assets of the banking sector (p. 20).

Since the banking consolidation oversaw by Bank Negara Malaysia was completed in 2000-01 (Bank Negara Malaysia, 2002), it appears likely that, in terms of its concentration, the Malaysian banking sector was not made "less concentrated" by the consolidation exercise. That is because, given that 54 banking institutions were merged into 10 and subsequently, nine local banking groups, it is possible that the Malaysian banking sector became "more" concentrated. That is, the market share for the top Malaysian banks increased to some extent after the consolidation exercise. For example, for Malaysia's largest commercial bank, Malayan Banking Berhad, its share in the total assets of commercial banks averaged 18.9 percent for 1999 and rose to 19.8 percent for 2000 and 21.5 percent for 2001[2]. It would not be surprising if the

[2] Calculated from the BANCON ratios for the study. That is, the quarterly data for Malayan Banking Berhad's assets over total commercial banking assets.

consolidation exercise strengthened the top commercial banks in Malaysia and enabled them to increase their market share.

Bae (2012), in his study on bond market development in China for the period 1990 to 2009, had suggested that the high level of concentration in China's banking sector, where the top five banks held 70 percent of the total assets of the 50 largest banks, could stifle development of its banking sector and debt securities market (p. 22). That is, such a high level of concentration in China's banking sector could hinder the creation of a more diversified investor base.

Table 7.8 shows the spread between the lending rates and cost of funds is found to have a significant and negative effect on the banking sector's loans growth only. In the other regression runs, spread is found to be not significant to the growth of the domestic corporate bond market by itself or when combined with bank loans during the study period of Q4, 1993 to Q4, 2011.

Table 7.8 shows that changes in the exchange rate, reflecting instability in the Ringgit, negatively impacted the domestic corporate bond market and when combined with bank loans. This negative relationship is also found in Chapter 5 for all the dependent variables when tested.

Table 7.8 also highlights the impact from government debt on the banking sector and private financing is positive. This is also true of the impact of the domestic government bond market on the domestic corporate bond market (*e.g.* Bank Negara Malaysia, 1989; Eichengreen & Luengnaruemitchai, 2004; Mihaljek *et al.,* 2002; Ministry of Finance, 1998; Securities Commission, 2004). For the debt market, a significant driver of its growth is Malaysian government debt. This is in line with findings from Chapter 5 that the rising trend in the country's government debt has a positive relationship with the domestic market for aggregate bonds, government bonds

and corporate bonds. However, government debt is negatively related with growth of the domestic financial bond market.

Hence, findings from Chapters 5, 6 and 7 do not indicate any crowding-out effect on the Malaysian private sector during the study period of Q4, 1993 to Q4, 2011 from Malaysia's persistent fiscal deficits (beginning in 1998 and extending to Q4, 2011) and growing government debt. With the exception of 1998 when liquidity was tight in the banking system (Bank Negara Malaysia, 1999b), there was ample liquidity during the period from 1999 to 2011 (Bank Negara Malaysia, various years). Furthermore, Malaysia enjoyed high levels of savings for the same period (Bank Negara Malaysia, various years). Interest rates had also been reduced substantially by 1999, from their high rates during the initial onset of the Asian financial crisis (Bank Negara Malaysia, 1999b, p. 130).

During the full sample period, two events, namely the imposition of selective capital controls and a currency peg by the Malaysian government (represented by the dummy variable, DVPEG) as well as the global financial crisis (represented by the dummy variable, DVGFC), exerted a significant and negative effect on the growth of the debt market. However, Table 7.8 shows that the currency peg did not seem to have any significant impact on the domestic corporate bond market or the banking sector. Findings from Chapter 5 also show that the global financial crisis had a significant and negative impact on the Malaysian domestic aggregate bond market, domestic government bond segment and domestic financial bond segment.

For the sub-sample period from Q4, 2005 to Q4, 2011, a few of the earlier runs for the dependent variable, $DLOAN_t$, were affected by autocorrelation or did not pass some of the diagnostic tests. This can be expected due to the small sample size and the impact from the global financial crisis. However, the selected models show that

$DGDEBT_{t-1}$ has a significantly positive impact on $DLOAN_t$. Also, the dummy variable, DVGFC, exerted a negative impact on $DLOAN_t$. The AR(1) term is also included to resolve the issue of autocorrelation, and is significant and positive.

Results for the sub-sample period of Q4, 2005 to Q4, 2011 for $DPFIN_t$ show that among the nine explanatory variables selected, including DVGFC, the significant explanatory variables are $DLEXR_t$, $DGDEBT_{t-1}$ and DVGFC. Both $DLEXR_t$ and DVGFC impacted the dependent variable, $DPFIN_t$, negatively. The explanatory variable, $DGDEBT_{t-1}$, has a positive relationship with $DPFIN_t$. Again, the AR(1) term is included to deal with the problem of autocorrelation and is significantly positive.

Table 7.9 compares the potential determinants for the sub-sample period of Q4, 2005 to Q4, 2011 for the domestic corporate bond market (from findings in Chapter 6) with the banking sector and private financing in Malaysia (from findings in this chapter).

Table 7.9: Comparison of Determinants and Impact (Sub-sample Period)

	Domestic Corporate Bond Market	Banking Sector	Private Financing
Inflation	Negative	Not significant	Not significant
Change in Exchange Rate	Not significant	Not significant	Negative
Govt. Debt or Domestic Govt. Bond Market	Positive	Positive	Positive
Global Financial Crisis	Positive	Negative	Negative

Although the sub-sample period, from Q4, 2005 to Q4, 2011, is admittedly brief, Table 7.9 clearly shows the positive impact from government debt on the banking sector and private financing as well as the positive relationship between the size of the domestic government bond market and growth of the domestic corporate bond market

(*e.g.* Bank Negara Malaysia, 1989; Eichengreen & Luengnaruemitchai, 2004; Mihaljek *et al.,* 2002; Ministry of Finance, 1998; Securities Commission, 2004). For the sub-sample period, inflation is a potential determinant for growth of the domestic corporate bond market, impacting it negatively. The negative impact of inflation on growth of the domestic corporate bond market is in line with findings from various studies on aggregate bond or corporate bond markets (*e.g.* Amante *et al.,* 2007; Bae, 2012; Burger *et al.*, 2012; 2015; Burger & Warnock, 2006; 2007). Once again, any change in the exchange rate would have a negative impact on the growth of private financing. Lastly, the global financial crisis (represented by the dummy variable, DVGFC), exerted a significant and negative effect on the growth of private financing, and banking sector. However, it had a significantly positive impact on the corporate bond market.

In summary, findings on the full sample period show that there is complementarity between private financing (as proxied by the First Difference of (Loans Outstanding plus Corporate Bonds) over Nominal GDP) and equity market in Malaysia. Also, instability in the local currency has a significantly negative effect on private financing. Potential determinants for private financing include government debt, which has a positive impact on its growth, while the dummy variables for the Ringgit peg and global financial crisis both impacted private financing negatively. For the sub-sample period, the potential determinants or events that may materially affect private financing are government debt (positive impact), instability in the local currency (negative), and the global financial crisis (negative).

7.6 Concluding Remarks

Key findings on the Malaysian banking sector and private financing (comprising loans outstanding plus corporate bonds) for the full sample period are as follows:

(a) Growth in the local equity market has a positive impact on growth of the local banking sector and private financing. This suggests there is complementarity between the equity market and them.

(b) The level of bank concentration has a negative impact on loans growth itself, but no significant impact on private financing as a whole. This may indicate that the local banking sector is not a level playing field and the large banks in Malaysia use their market power to stifle competition from the smaller banks.

(c) Growth of the domestic government bond market has a positive impact on growth of the banking sector and private financing.

(d) Widening spreads in domestic interest rates have a negative impact on the banking sector, but no significant effect on private financing.

(e) Instability in the Ringgit and the imposition of the currency peg had a negative impact on private financing, but no significant impact on the banking sector.

A key finding for the sub-sample period is that growth of the domestic government bond segment has a positive impact on the banking sector and private financing (comprising loans outstanding plus domestic corporate bonds). Hence, there appears to be no signs of crowding-out from the growing government debt on the private sector even in the sub-sample period when the size of the fiscal deficits was much larger (RM32.5 billion *per annum*).

CHAPTER 8

CONCLUSION

8.1 Introduction

As bond markets are an integral part of a country's capital markets and their financial development, this study on the development of Malaysia's domestic bond market as well as its debt market seeks to add to the existing literature on domestic bond markets given their role in supporting economic growth.

Furthermore, over the span of the past two decades, Malaysia has achieved both economic success and weathered tough financial crises, including the 1997-98 Asian financial crisis. While the Asian financial crisis may have receded to the rather distant past for many parties, the scale of this crisis in Malaysia was such that the country's GDP contracted by 7.4 percent in 1998 (Bank Negara Malaysia, 2002, p. 4) and the Ringgit depreciated to RM4.88 to the USD in January 1998 (Bank Negara Malaysia, 1999b, p. 60).

Past research has shown that during economic booms (including the pre-Asian financial crisis years), borrowers in Malaysia and other countries tended to rely on relatively cheaper short-term foreign-currency funding. However, such dependence left the borrowers subject to a double hit during financial crises as the borrowers (including issuers of international bonds) suffered from a fall in their assets and rise in liabilities (as the local currencies weakened).

In contrast to such foreign bank loans and international bonds, a well-developed domestic bond market in Malaysia would enable issuers of local currency bonds to lock in interest rates and local currency funding over the longer tenure. Since the late 1980s, Malaysia had taken active steps to develop its domestic bond market, but the Asian financial crisis underscored that Malaysia needed to make greater efforts to develop its domestic bond market as well as further diversify its financial system.

In light of these reasons, the main focus of this study has been on development of the Malaysian domestic bond market, covering the period from Q4, 1993 to Q4, 2011 (based on availability of data from the BIS, which revised its debt securities statistics in 2012 arising from the global financial crisis). The study also sought to identify potential determinants or drivers of growth for the Malaysian domestic bond market (that is, for aggregate bonds, government bonds, corporate bonds and financial bonds) as well as for the local banking sector and private financing (comprising loans outstanding plus domestic corporate bonds). To identify potential drivers and constraints to development of the Malaysian domestic bond and debt markets as well as the local banking sector, this study has analyzed the impact from factors such as government debt, fiscal balances, interest rates, exchange rates, size of the banking sector and its concentration based on market share of the top bank(s), size of the equity market as well as impacts of the major financial crises during the sample period, namely the Asian financial crisis and global financial crisis.

8.2 Summary of Findings

Overall, the study has achieved its main objectives as follows:

(a) Identifying the determinants of the Malaysian domestic bond market during the full sample period.

(b) Identifying the determinants of the various segments of the Malaysian domestic bond market, namely government bond, corporate bond and financial bond.

(c) Investigating the impact from Malaysia's monetary and fiscal policies on development of the Malaysian domestic bond market, including the fact that there was no crowding-out from the government's persistent fiscal deficits on Malaysia's private sector, including the private bond market.

(d) Identifying the determinants of bank loans as well as private financing (comprising bank loans plus domestic corporate bonds).

In achieving objectives (a) and (b), findings from Chapter 5 show that potential determinants that have a positive impact on the Malaysian domestic bond market (that is, aggregate bonds and government bonds) are government debt and the dummy variable for breakpoint in government debt, that is, the change in the trend in the country's fiscal balances from balanced budgets / fiscal surpluses to persistent fiscal deficits beginning Q1, 1998. As government debt grows, the size of Malaysia's domestic aggregate bond market and domestic government bond segment will follow suit as issuance of domestic government bonds is the main source of funding for government development expenditure and government debt.

For the domestic corporate bond segment, results from Chapter 5 indicate that the size of the domestic government bond market is even more influential than government debt in boosting the development of this segment. Hence, in Malaysia's case, a better developed domestic government bond market, serving as the foundation, would actually contribute to greater development of the domestic corporate bond market.

Furthermore, the third objective of this study was met as findings suggest that for Malaysia, during the period covered by this study (Q4, 1993 to Q4, 2011), growth in

domestic government bond issuance, helping to finance sizeable and sustained fiscal deficits, did not result in any crowding-out effect on the issuance of domestic corporate bonds. Rather, it seems to be the reverse since an increase in government bonds coincided with growth in corporate bond issuance. However, as Bank Negara Malaysia (2002) highlighted, Malaysia had ample liquidity and high levels of national savings that helped ensure the private sector had adequate access to affordable credit during the years of sustained fiscal deficits.

Findings from Chapter 5 indicate that domestic financial bonds are negatively impacted by government debt, unlike the other segments. As government debt can be funded by issuance of government bonds or a bank loan (which may require the creditor bank to issue financial bonds to raise funding), this negative association may be a reflection of the competition between government bonds or bank loans as the choice of financing for government debt.

Findings on the full sample period (Q4, 1993 to Q4, 2011) show that development of the domestic bond market in Malaysia has to contend with some degree of competition from the country's more established banking sector for aggregate bonds and corporate bonds, and, to a lesser extent, from the popular equity market for aggregate bonds and government bonds.

In fact, the study found that for the full sample period, the bank concentration ratio, which measures the market share and, accordingly, concentration of power in the country's top bank(s), seems to exert a much greater impact on development of the domestic bond market (that is, on aggregate bonds, government bonds and corporate bonds) than the size of the banking sector *per se*. This negative impact from the banking sector and its level of concentration seems to indicate that there is competition between the local banking sector and domestic bond market, at least during the period

for this study. It should be noted that the Malaysian government actively promoted the issuance of domestic corporate bonds as a cheaper alternative to bank loans for raising funds amongst big corporates when it established the country's first rating agency and later in the post-Asian financial crisis period (National Economic Action Council, 1998).

Chapter 5 also found that economic growth has a positive impact on the issuance of domestic government bonds while trade is positively associated with the growth of financial bond segment. As Malaysian banks are the main providers of trade financing, the positive relationship between trade and issuance of financial bonds is to be expected.

For the full sample period, volatility, rather than increases in domestic interest rates, negatively affected the growth of the domestic aggregate bond market. Financial bonds are the only category of bonds that are negatively impacted by higher spreads in interest rates.

Changes in the exchange rate, reflecting instability in the local currency, have a negative impact on growth of the Malaysian domestic bond market (*i.e.* aggregate bonds as well as all bond segments). However, a stronger Ringgit may lead to potential domestic bond issuers seeking other funding alternatives such as foreign loans and / or foreign currency bond issuance, which may have contributed to financial or currency crises such as the 1997-98 Asian financial crisis.

The dummy variable for the Asian financial crisis, DVAFC, only had a significant and positive impact on the growth of domestic government bond issuance in the presence of the variable, DFISC, which is the proxy for fiscal deficits. The positive impact of DVAFC on domestic government bonds likely reflected the actions of the Malaysian government, especially in 1999. The Malaysian government actively raised

funds from the domestic bond market for its restructuring and bank recapitalization efforts soon after the Asian financial crisis hit the Malaysian economy.

Lastly, the global financial crisis (where its impact was captured using a dummy variable for the period covering Q1, 2008 to Q1, 2009) also had a negative impact on the growth of the Malaysian domestic bond market (that is, aggregate, government and financial bonds).

Analysis in Chapter 6 contributes further to meeting the three objectives of this study as set out in (a), (b) and, especially, (c). Also, findings from Chapter 6, with analysis done on the sub-sample period, serve as a robustness check for Chapter 5 and to facilitate a closer examination of the impact of Malaysia's monetary and fiscal policy impact on the domestic bond market. From Chapters 5 and 6, government debt is found to be a potential determinant with a positive impact in both the full and sub-sample periods. That is, growth in government debt is associated with growth of the domestic aggregate bond market, government and corporate bond segments.

Where the government bond market is concerned, regression runs in Chapter 5 show that both government debt and fiscal balance are significant at the 1 percent level, but in the sub-sample period, only the explanatory variable representing fiscal balances, DFISC, is found to be significant, suggesting that in the period 2005-11, fiscal balances are more effective in impacting the growth of domestic government bond segment since there were some years the government paid down its debt (as discussed in Section 6.4).

In the case of the corporate bond market, which comprises bond issuance by a diversity of issuers from the corporate sector, the potential determinant with a significant and positive impact in both the full and sub-sample periods is size of the government bond market. For the financial bond segment, government debt is a

potential determinant that is significantly negative in the sub-sample period as well as in the full sample period.

Changes in the exchange rate, reflecting instability in the Ringgit, is found to be a potential determinant with a significant and negative impact on the domestic bond market in the full sample period (*i.e.* aggregate bonds, government bonds, corporate bonds and financial bonds) and sub-sample period (aggregate bonds, government bonds and financial bonds).

The impact from the dummy variable for the global financial crisis, DVGFC, is significant and negative in both full sample and sub-sample periods for aggregate bonds, government bonds and financial bonds. However, DVGFC has a significantly positive impact on domestic corporate bonds in the sub-sample period, but was not significant in the full sample period.

While volatility in interest rates is a potential determinant that negatively affects growth of domestic aggregate bond issuance in the full sample period, changes in interest rates are more influential on the growth of the government bond segment for the sub-sample period. As discussed in Chapter 5 (Section 5.6), there was greater volatility in interest rates in the years 1994-99 while monetary policy was mostly accommodating in the sub-sample period. Hence, increases in interest rates may be more likely to have a negative impact on issuance of domestic government bonds. In view of the growing size of fiscal deficits in the sub-sample period, the Malaysian government may have been more likely to issue government bonds when domestic interest rates eased and *vice versa*.

Inflation is found to have a significantly negative impact on domestic corporate bond issuance in the sub-sample period, but is not significant in the full sample period. This may be due to the higher volatility in inflation rates in the sub-sample period as

compared to the full sample period (as discussed in Section 6.4). This finding in the sub-sample period is in line with a number of bond studies that found inflation affecting domestic bond markets negatively.

An important objective of this study has been to identify potential determinants of the Malaysian domestic bond market. However, this study has also attempted to make an additional contribution to the on-going debate about the relationship between the domestic bond market with the local banking sector (especially in Chapter 7), which is encapsulated in the study's objective (d).

Fulfilling objective (d) of this study, findings on the full sample period from Chapter 7 show that there is complementarity between private financing, as proxied by the First Difference of (Loans Outstanding plus Domestic Corporate Bonds) over Nominal GDP, and bank loans, representing the local banking sector, with the equity market in Malaysia. However, the impact from the bank concentration level is significantly negative on loans growth itself, although it is not significant on private financing. Nevertheless, it should be of some concern to the Malaysian government that the level of market concentration in the local banking sector has been found to have this negative impact on the development of the domestic bond market and loans growth as well. Furthermore, findings in this study indicate that the size of this negative impact is considerable (based on the magnitude of the coefficients for the bank concentration ratio in the various models in Chapters 5 and 7).

Higher spreads in interest rates impacted bank loans negatively, but not private financing. It is worth noting that higher spreads also affected the growth of the domestic financial bond segment in the full sample period (see Chapter 5). It is possible that issuance of financial bonds helps finance bank loans. Thus, both are negatively associated with higher spreads.

Here, the dummy variable for the Ringgit peg, DVPEG, is significantly negative in its impact on private financing, but not significant for bank loans. However, the results seem to suggest its impact on private financing was not that big.

Other findings also indicate that government debt is a potential determinant for growth in bank loans and private financing in both the full sample and sub-sample periods. Also, instability in the local currency has a negative effect on private financing for both periods. Finally, the impact from the dummy variable for the global financial crisis, DVGFC, on both the banking sector and private financing in the full sample and sub-sample periods was negative.

8.3 Significance of Findings and Policy Implications

Malaysia is a developing country with a private bond market that is on par with its government bond market. As such findings of this study strongly suggest that Malaysia's experience in developing its domestic bond market will be highly relevant in helping other emerging economies to develop their nascent bond markets. In light of Asia's growing demand for long-term financing in the coming years, the findings of this study, on the potential determinants of Malaysia's bond and debt markets as well as the country's experience in ensuring no crowding-out effects on its private bond market despite persistent fiscal deficits, underscore Malaysia's credentials as a role model for other emerging economies in developing their domestic bond markets.

It is hoped that the findings of this study on the potential determinants, including possible constraints, of the development of Malaysian domestic bond and debt markets will provide useful insights and can serve as input for the future of policy design to add greater depth and breadth to the Malaysian financial markets, especially the domestic bond market. Study findings on the existing competition between the domestic bond

market and banking sector as well as the equity market during the full sample period can also serve as possible input for crafting future policies that should be specifically designed to be more embracive so as to promote complementarity between the different components of the country's financial system.

In its efforts to promote the development of the domestic bond market in the late 1980s and especially in the 1990s, the Malaysian government often promoted the domestic bond market as an alternative to raise cheaper and longer-term funding as compared to bank loans. Official documents by the Malaysian authorities clearly stated the development of the domestic bond market would provide a cheaper source of funds especially for corporate organizations, rather than conventional bank loans (National Economic Action Council, 1998). Hence, it is not surprising that the local banking sector has viewed the domestic bond market as a rival that needed to be restrained. However, on a more positive note, Song and Thakor (2010), in their analysis of banks and capital markets (comprising bond and equity markets) in advanced economies, have suggested that over the longer term, banks and capital markets mostly complemented each other. It is possible that over a longer time period, the relationship between the Malaysian domestic bond market with the local banking sector and equity market could evolve to one of a more complementary nature.

As discussed in Chapters 5 and 7, there were causes that could have contributed to the fact that long-run relationships between the dependent and independent variables could not be established for the full sample period. One possible cause is the switch in Malaysia's fiscal stance from running balanced budgets and / or fiscal surpluses for the period 1993 to 1997 to expansionary fiscal policies with fiscal deficits from 1998 onwards. This would have affected issuance of domestic government bonds, one of the dependent variables, and the study's proxies for government debt and fiscal balance,

among the explanatory variables. As such, the lack of long-run relationships is possible.

Additionally, the severity of the Asian financial crisis and its toll on the Malaysian economy and banking sector also left a substantial impact on the various dependent and independent variables. For example, the amount of loans outstanding was impacted by the Asian financial crisis as well as Bank Negara's policies and measures even as early as 1993 onwards. These included its policies on interest rates to deal with large capital inflows into Malaysia, its decisions to implement the two-tier regulatory system beginning December 1994 and its bank merger programme initiated in 1999 (details are in Section 3.3, which is on the Malaysian banking sector). Notwithstanding this, the full sample period for this study represents an important epoch for the Malaysian domestic bond market and investigating this period has provided valuable insights to domestic bond market development.

Furthermore, findings in Chapters 5 and 7 show that the bank concentration ratio, a measure of the market power held by top Malaysian bank(s), has a significantly negative effect on the development of the domestic bond market, even more influential than the size of the local banking sector. In fact, findings in Chapter 7 indicate the bank concentration ratio even has a negative impact on loans growth itself, reflecting the adverse effects of the concentration of market power in the local banking sector in terms of providing a level playing field for the smaller banks in Malaysia. As such, findings from Chapters 5 and 7, especially where they pertain to the level of concentration in the local banking sector, should be of importance to policy design for future development of Malaysia's financial system. For example, in the oft-expressed wishes of the Malaysian government, including the central bank, for bigger banking groups so as to be better positioned in the globalization of financial services industry, further concentration of market share and power in the local banking sector may inadvertently

result in unwanted consequences for the domestic bond market and even the smaller banking groups, both of which need the government's nurturing and more embracive financial policies and reforms.

Also, the Malaysian government may need to be cognizant of the significant and negative effect of changes in exchange rate or instability in the Ringgit on the domestic bond market in their conduct of policies so as to promote exchange rate stability. Any such stance by the government is likely to be taken into consideration when public and private entities in Malaysia deliberate on their choice of financing. Ultimately, their decision in choosing the domestic bond market can contribute immeasurably to reducing their exchange rate risks as well as locking in funding at attractive and stable interest rates. In addition, the Malaysian government may need to consider offering incentives to potential issuers of domestic bonds to safeguard the country's economic well-being and reduce any risks of financial turmoil in the future.

The findings of this study also show that the development of the domestic government bond market has been instrumental in developing and boosting the private domestic bond market. Furthermore, this study found no evidence of crowding-out on the domestic corporate bond market over the full sample period. That is, the growth of the domestic government bond market is positively associated with an increase in the issuance of domestic corporate bonds. Hence, future policies on further developing the government bond market will be contributing to domestic bond market development and should be given higher priority by the Malaysian authorities.

In view of the size of Malaysia's PDS market, the Malaysian government can look into measures to further develop the PDS market to better meet the needs of various corporate bond issuers. For example, the World Bank and IMF (2001, p. 365) suggested that governments of developing countries should differentiate between

"major" and "minor" corporate bond issuers so that government policies to further develop their PDS markets can cater to the different needs or requirements of such issuers.

According to the World Bank and IMF (2001), "major" corporate bond issuers were those who were likely to issue higher quality bonds on a regular basis and such bonds were in demand by investors. Such "major" corporate bond issuers were likely to have higher credit ratings. "Minor" corporate bond issuers made up the rest of the issuers and were those with either smaller and / or infrequent bond issues. Since "major" and "minor" corporate bond issuers in Malaysia are likely to have different needs and characteristics, it makes sense for the Malaysian government to ensure that future policies to further develop the domestic bond market will embrace these possibly diverse needs and characteristics. This is because a well-functioning PDS market will be one that can best serve the needs of all the different issuers and not just those of the main players.

Overall, this study aims to provide a meaningful contribution to research work done on development of Malaysia's domestic bond market as well as provide input for more in-depth research on domestic bond markets in Malaysia and other emerging economies in future, especially for the purpose of policy design. This study has also extended the analysis to include bank loans for a more comprehensive understanding of the Malaysian domestic debt market.

8.4 Limitations of Study and Future Research Direction

This study on the Malaysian domestic bond market has been done utilizing data made publicly available by the BIS. While there are several advantages in using this

data set, including compatibility with major studies already carried out on numerous countries and regions, there are also limitations imposed by the data set.

Most importantly, the BIS changed the definition for its debt securities statistics in early 2012, implementing the changes retroactively, following the global financial crisis of 2008-09. These changes resulted in the sample period for this study being confined to Q4, 1993 to Q4, 2011 so as to utilize BIS data based on the old categorization.

There are two important reasons for doing this, *i.e.* using BIS data based on the old categorization that leaves this study with the sample period from Q4, 1993 to Q4, 2011. Firstly, under the new definitions by the BIS, data on Malaysian domestic debt securities were available only from 2005 onwards. Starting with data from 2005 will mean doing without the years before and especially after the Asian financial crisis when there were major developments in the Malaysian domestic bond market. Equally important, comparisons cannot be done for two specific periods, *i.e.* between the first period from 1993 to 1997 when Malaysia was running a balanced government budget or fiscal surpluses with the second period from 1998 to end 2011 when the government embarked on expansionary fiscal policies and incurred persistent and sizeable fiscal deficits. That is, this study will not be able to look into the issue of crowding-out effects on the private sector from Malaysia's sustained fiscal deficits from 1998 to end 2011. However, such a comparison has been made possible using BIS data (from the old classification) for this study's full sample period. Some of these findings are then supported by the results from the sub-sample period, which would not be possible with the new BIS data.

Secondly, under the 2012 changes implemented by the BIS, the definition of government bonds has been changed to classify central bank bond issues under

"Financial Bonds", which is different from the definition by Malaysian authorities. For Malaysia, the definition of government bonds include bonds issued by the Malaysian government and those issued by Bank Negara Malaysia, the central bank. Under the old classification by the BIS, government bonds included those issued by the governments and central banks. During the sample period for this study, there were occasions when Bank Negara Malaysia issued bonds to achieve specific objectives in conjunction with the Malaysian government. Hence, using BIS data series with the new classification would have resulted in different and possibly misleading findings for Malaysia's government bond and financial bond segments. For instance, this study has found that government debt has a positive impact on issuance of domestic government bonds, but a negative impact on issuance of domestic financial bonds. The new definition by the BIS could have materially affected such findings and, ultimately, may diminish the relevance of certain policy implications of this study.

In addition, the published data from the BIS used in this study and other major studies quoted in this thesis comprised both longer-term and short-term debt securities. However, the longer-term debt securities made up the major portion of these debt securities.[1] While the BIS previously made available data for short-term debt securities, these series included longer-term debt securities that had less than one year of their tenure remaining. As such, for data under the old categorization, there was no published data from the BIS on just longer-term debt securities and no way to extract or estimate this information from its published data either.

Lastly, this study utilized quarterly frequency data made available by the BIS and no long-run relationships could be established between the dependent and independent variables. Hence, future research on the Malaysian domestic bond market

[1] Recent data published by the BIS under the new categorization have disaggregated long-term and short-term domestic debt securities. In the case of Malaysia, the latest available figures showed that as at Q4, 2017, long-term debt securities made up some 94 percent of domestic debt securities (BIS, 2018, p. 231).

may benefit if monthly frequency data on disaggregated Malaysian debt securities (by tenure, type *etc*.) is widely disseminated by the Malaysian authorities. If currently unavailable, the authorities can consider collecting and making available higher frequency data. Such a move should provide impetus to future research work, thus contributing to greater clarity in those research endeavours and policy design in Malaysia.

Findings in this study point to the considerable and negative impact that Malaysia's high level of concentration in the local banking sector has on the development of the domestic bond market as well as loans growth itself. Beck *et al.* (2003) used a bank concentration ratio of the three largest banks for the countries in their study. Since Malaysia's second largest bank, Bank Bumiputra Malaysia Berhad, was not a public listed entity, a bank concentration ratio based on Malaysia's top three banks could not be obtained. The bank concentration ratio used in this study was based on just the largest bank in Malaysia, Malayan Banking Berhad's share of assets in total banking assets.

However, after Bank Negara Malaysia's bank consolidation exercise in the wake of the Asian financial crisis, the three largest banks in Malaysia were all public listed entities. Malaysia's bank concentration ratio for end 2011, based on its three largest banks, was 52.8 percent while a bank concentration ratio that is just based on Malayan Banking Berhad's asset share was 18.9 percent.[2] Hence, it is likely that Malaysia's bank concentration level in the full sample period of Q4, 1993 to Q4, 2011 had a bigger negative impact on the domestic bond market and loans growth than that estimated in this study.

[2] Figures for Malayan Banking Berhad are from the data set for this study. The figures for the other two top banks are calculated based on data from their published financial statements (CIMB Bank Berhad, 2012; Public Bank Berhad, 2012).

If the above supposition is accurate, then Malaysia's bank concentration is an important issue that should be given very careful consideration in future policy making as regards the nation's financial system, going forward. Hence, incorporating the actual data on Malaysia's bank concentration level in future research on the country's domestic bond market and local banking sector warrants further attention and should provide insightful contribution to national policy design and implementation.

8.5 Concluding Remarks

This study has confirmed that the Malaysian government has been successful in developing a sufficiently deep and well-functioning domestic government bond market that has served as a strong foundation for the growth of the domestic corporate bond market. In fact, growth of Malaysia's domestic corporate bond market, which has overtaken the domestic government bond market in size, places the country in the forefront of domestic corporate bond market development in the Asian region and globally.

This study has sought to help fill existing research gaps by identifying potential determinants of the development of Malaysian domestic bond market, in the presence of the sizeable banking sector as well as the established local equity market. As the sample period for this study is from Q4, 1993 to Q4, 2011, it also covered the periods when the Malaysian government was running a balanced budget and when it accumulated sizeable fiscal deficits subsequently. In view of the above factors, identification of the potential determinants that have contributed to or constrained the progress of the Malaysian domestic bond market should be relevant to the government's sustained efforts to further develop its financial markets, especially its domestic bond market. It is hoped that the findings in this study can be helpful as input to future

embracive government policy design and policies to further develop and / or reform the financial system, including promoting a more synergistic relationship between the domestic bond market and banking sector.

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