ADB

ADB Working Paper Series on Regional Economic Integration

Determinants of Local Currency Bonds and Foreign Holdings: Implications for Bond Market Development in the People's Republic of China

Kee-Hong Bae

No. 97 | May 2012

Asian Development Bank

ADB

ADB Working Paper Series on Regional Economic Integration

Determinants of Local Currency Bonds and Foreign Holdings: Implications for Bond Market Development in the People's Republic of China

Kee-Hong Bae+

No. 97 | May 2012

This report is an output of a regional technical assistance project, RETA 6453: Capacity Building for Bond Market Development in ASEAN+3, managed by Jen-Chun Hsieh, Financial Sector Specialist of the Office of Regional Economic Integration (OREI). The project manager thanks Dr. Kee-Hong Bae, professor of the Schulich School of Business, York University for his assistance as consultant, with contributions from Noritaka Akamatsu, Deputy Head, Sabyasachi Mitra, Jen-Chun Hsieh, Raquel Borres of the OREI; Ying Qian, Director and Hyung Ju Lee, Financial Sector Specialist of the East Asia Department (EARD). Special thanks go to Guy Sacerdoti who provided editorial assistance and touched up the report.

+Professor, Schulich School of Business York University, 4700 Keele Street, North York, Ontario Canada. Tel. 416-736-2100 ext. 20248, kbae@schulich.yorku.ca

Asian Development Bank

The ADB Working Paper Series on Regional Economic Integration focuses on topics relating to regional cooperation and integration in the areas of infrastructure and software, trade and investment, money and finance, and regional public goods. The Series is a quick-disseminating, informal publication that seeks to provide information, generate discussion, and elicit comments. Working papers published under this Series may subsequently be published elsewhere.

May 2012
Publication Stock No.WPS124654

Contents

Figures Continued

Abstract

This case study explores which variables—macroeconomic, institutional, and capital controls—are most important in explaining cross-country differences in bond market development. It uses the ratio of amount of local currency bonds outstanding over GDP as a measure of bond market development from 43 countries during 1990–2009. The study examines government—and corporate bond markets separately, as the characteristics of these markets are substantially different and requires separate examination.

Main findings are derived from the comparative analysis. Several policy implications drawn from the findings are pertinent to the People's Republic of China (PRC) bond market. The most important implication is that the way to develop fixed income markets is to start with the government bond market. Another important implication from the empirical findings is that mature and well-developed banking sector is critically important to the further development of bond market, particularly to the corporate bond market. While the PRC bond market has developed significantly over recent years, there is much room for improvement. This report provides policy suggestions, albeit not necessarily from empirical findings, to further develop PRC bond markets.

Keywords: PRC bond market, debt securities, determinants, regulatory and legal infrastructure, off-shore CNY bonds

JEL Classification: E63, E65, G14, G18, G24, G28, N20

Abbreviations

ABS	asset-backed securities
AMC	Asset Management Company
ATS	Alternative Trading System
CBRC	China Bank Regulatory Commission
CCB	China Construction Bank
CDB	China Development Bank
CDS	credit default swap
CCDC	China Central Depository & Clearing Co. Ltd.
CDO	collateralized debt obligations
CEXIM	Export-Import Bank of China or China Eximbank
CFETS	China Foreign Exchange Trading System
CIRC	China Insurance Regulatory Commission
CP	commercial paper
CRA	credit rating agency
CSDCC	China Securities Depository and Clearing Corporation limited
CSRC	China Securities Regulatory Commission
DVP	delivery-versus-payment
FDI	foreign direct investment
IAS	International Accounting Standards
IBM	Interbank Market
IFRS	International Financial Reporting Standards
IPD	Implicit Pension Debt
MBS	mortgage-backed securities
MMMF	Money Market Mutual Funds
MOF	Ministry of Finance
MOLSS	Ministry of Labor and Social Security
MTN	medium-term notes
NBFI	nonbank financial institutions
NDRC	National Development and Reform Commission
NPL	nonperforming loans
NSSF	National Social Security Fund
OTC	over-the-counter
PBC	People’s Bank of China
PRC	People’s Republic of China
CNY	renminbi
SE	stock exchange
SME	small and medium enterprises
SMECN	Small and Medium Entrepreneurs Collected Notes
SOE	state-owned enterprise
UDIC	Urban Development and Investment Corporation

Executive Summary

Existing literature shows that well-functioning capital markets are instrumental to economic growth. Why is it, then, that some countries' capital markets—stock, bond, money, and banking markets—are better developed than those of other countries? More importantly, how does one promote the development of well-functioning capital markets?

This case study explores which variables—macroeconomic, institutional, and capital controls—are most important in explaining cross-country differences in bond market development. It uses the ratio of amount of local currency bonds outstanding over GDP as a measure of bond market development from 43 countries during 1990–2009. It examines government, financial, and corporate bond markets separately, as the characteristics of these markets are substantially different and warrant separate examination.

The main findings are as follows:

- The degree of economic development measured by GDP per capita is the most important variable in explaining the cross-country variation in all three types of bond markets;
- In government bond markets, the fiscal balance is the variable that robustly affects the amount of bonds outstanding. An increase of one standard deviation of budget deficit is associated with an increase of 10 percentage points in government bonds outstanding as a percent of GDP.
- In financial bond markets, no variable is robustly related to the amount of bonds outstanding except GDP per capita.
- In corporate bond markets, low interest rates, a large banking sector, and well-developed government bond markets are conducive to market development.
- Variables that measure a country's institutional quality do not explain cross-country variations in bond market development—regardless of whether government, financial, or corporate bond markets.

The result that a country's institutional quality—such as the investor rights protection—explains little of cross-country variations in corporate bonds is surprising. While institutional variables turn out not to be important in explaining cross-country variations in the domestic bond issues, it is shown that institutional variables are most important in attracting foreign investment in domestic bond markets.

Several policy implications are drawn from the findings that are pertinent to the People's Republic of China (PRC) bond market. Perhaps the most important implication is that the way to develop fixed income markets is to start with the government bond market, as it is more liquid and conducive to infrastructure development and can provide a benchmark yield curve for the broader credit market. In fact, one of the most significant and robust variables affecting the development of corporate bond markets is whether a country has a well-developed government bond market.

Another important implication from the empirical findings is that mature and well-developed banking sector is critically important to the further development of bond market, particularly to the corporate bond market development. For instance, regulating

market interest rates would create distortions of market behavior, impeding the development of benchmark yield curve, a critical financial infrastructure in promoting the development of bond market, and the pricing of corporate bonds. Interest rates that do not reflect true supply and demand market conditions for capital leads to misallocated resources and inefficiencies. Therefore, further interest rate liberalization should strengthen information conveyed by interest rates movements, allowing better price discovery for capital and the attendant risk.

While the PRC bond market has developed significantly over recent years, there is much room for improvement. Below are several policy suggestions, albeit not necessarily from empirical findings, to further develop PRC bond markets:

- Promoting active secondary bond markets

Promoting an active and liquid secondary market is one of the most important and most difficult aspects of bond market development. Policy suggestions to promote liquid secondary bond markets include (i) coordinating development of interbank and exchange markets, (ii) coordinating and refining the regulatory/supervisory framework, and (iii) diversifying the investor base.

Most trading takes place in the interbank market with only negligible trading transacted on exchange markets. While dealer markets—such as the interbank market—keep execution risk small, there are several disadvantages. An active secondary exchange bond market can reduce trading costs and provide more timely information on risk and return profiles for fixed income instruments. The development of an active secondary exchange market is indispensable to a fully developed bond market.

Several government agencies regulate different aspects of the PRC bond market. For instance, the interbank market is supervised by the People's Bank of China (PBC), while exchange markets by the China Securities Regulatory Commission (CSRC). Too many regulatory agencies could create and impose unnecessary administrative costs. There may be merit in creating a single umbrella regulatory body to oversee all bond markets.

Commercial banks are the dominant investors in PRC bond markets, particularly for government bonds. Excessive reliance on the banking system to mobilize savings for the purchase of government securities is costly for both the government and investors. Several ways to promote wider participation in the secondary market by different types of institutional investors would include (i) direct placement of government securities with end investors, (ii) allow direct market access for major savings pools such as retail or foreign investors, (iii) encouraging investment in government bonds by pension and mutual funds.

- Continue developing the corporate bond market

Current regulations on corporate bond issues include minimum flotation amounts and minimum ratings levels precludes all but a handful of firms from participating in the corporate bond market. The result is that most bond issuers are state-linked companies. Further deregulation on corporate bond issues will boost both supply and demand for corporate bonds. Policies that may help further deepen corporate bond

markets include (i) tax reform, (ii) credit risk assessment and pricing, and (iii) derivative market development.

Corporate bond interest income is taxable, while interest earned from government bonds is not. Equal treatment of interest income from government and corporate bonds would help.

Credit risk assessment and pricing ability is important for price discovery and liquidity. For the corporate bond market to further develop, the banking sector needs to better integrate with the international financial system in assessing firm credit risk and incorporating it into pricing.

Derivative products are useful in reallocating or diversifying risk, and appropriate regulatory reform liberalizing use of derivatives could help PRC's bond markets develop further.

1. Introduction

Existing literature demonstrates the importance of a country's institutional quality—in particular the degree of investor protection—in various aspects of financial markets. For example, La Porta, Lopez-de-Silanes, Shleifer, and Vishny [LLSV] (1997, 1998) show that countries with better institutions have larger and deeper capital markets. Markets with better institutions also have higher valuations of listed firms relative to assets (LLSV 2002; Claessens, Djankov, and Lang 2000), a larger number of listed firms (LLSV 1997) and higher quality of accounting information (Hung 2001; Ball, Robin, and Wu 2002; Fan and Wong 2002; Leuz, Nanda, and Wysocki 2003). Furthermore, these markets enable firms to make greater use of external finance (LLSV 1998) and larger investments from external funds (Rajan and Zingales 1998; Demirgüç-Kunt and Maksimovic 1998). In contrast, liquidity costs are higher in countries with poor investor protection (Brockman and Chung 2003) and impede informed arbitrage that capitalizes on firm-specific information, thereby resulting in less efficient stock price discovery (Morck, Yeung, and Yu 2000).

While the benefits of having good institutions in developing equity markets have been well documented, such evidence is scant for bond markets. One notable exception is Eichengreen and Luengnaruemitchai (2004), who argue that larger country size, stronger institutions, less volatile exchange rates, and more competitive banks tend to be positively associated with bond market capitalization. They also show that Asia's generally strong fiscal balances have not been conducive to government bond market growth. This study extends and improves on their study by investigating factors affecting the development of local-currency domestic bond markets using data from 43 countries from 1990 to 2009. The extent of bond market development is measured by the amount of bonds outstanding as a percentage of gross domestic product (GDP). Bond market size, however, is only one aspect of bond market development. It basically measures the primary bond market and may not capture well important aspects of secondary bond markets—such as liquidity. Nevertheless, the study uses this measure as its primary variable, as it is easily available across a large number of countries.

This study first explores which variables among macroeconomic, institutional, and capital control variables are most important in explaining cross-country differences of bond market development. The study examines government bond, financial bond, and corporate bond markets separately, as the characteristics of these markets are substantially different and warrant separate treatment.

The rest of the paper is organized as follows: Section 2 describes the data and variables used. Section 3 shows summary statistics. Section 4 presents the determinants of domestic bonds outstanding. Section 5 examines the determinants of foreign holdings of domestic bonds and whether foreign investors improve local government bond market liquidity. Section 6 examines the current status of the People's Republic of China (PRC) bond market. Section 7 draws from empirical findings the implications on PRC bond market development and makes some policy suggestions. Section 8 summarizes and concludes.

2. Data and Variable Construction

This section presents data on the amount of bond issues for the sample countries. It also lists and describes the variables that can affect local currency bond issues. The variables are grouped into macroeconomic variables, institutional variables, and capital flow variables.

2.1. Domestic Debt Securities

Data on the amount of bonds outstanding for government, financial institutions, and corporate issues were obtained from 1990 to 2009 for 43 countries/economies (Table 1). Twenty-three of the 43 sample countries are advanced economies with the rest from emerging markets. Total bonds outstanding are given, split into government, financial, and corporate categories, and in percentage of GDP and GDP per capita. Not surprisingly, both absolute and relative (in terms of GDP) amounts of domestic bonds outstanding are larger for developed markets than emerging markets. The mean of total bonds outstanding is 121.5% of GDP in mature markets, and a mere 46.2% in emerging markets. The breakdown of total bonds by type of issuer indicates that the biggest difference between advanced and emerging markets is in financial bonds. In mature markets, financial bonds outstanding averages 62.2% of GDP, while in emerging markets it is 7.4%.

Among developed economies, Ireland has the largest total domestic bonds outstanding relative to GDP—much of which is financial bonds (443.5% of GDP). Japan follows at 227.4%. Most Japanese domestic bonds are government bonds (190.5%). Among emerging markets, the Republic of Korea (KOR) has the largest bond market (130.4% of GDP). Its financial and corporate bond markets are also largest at 39.8% and 39.5% of GDP, respectively. In fact, KOR is the only emerging economy with a bond market larger than the average bond market in advanced economies.

The size of the PRC's bond market is 51.5% of GDP, of which government, financial, and corporate bond markets represent 29.3%, 15.1%, and 7.1%, respectively. Among the 43 sample countries, it is ranked 25th, whereas it is ranked 6th among the 20 emerging markets covered. PRC bond market size is as large as the mean of emerging markets, but is far below that of developed markets. In particular, corporate bond market size (including financial bonds) is only 22.2% compared with the 72.6% mean of developed markets.

2.2. Macroeconomic Variables

In analyzing determinants of bond market development, seven macroeconomic variables are used to capture the degree of economic and financial development, exchange rate volatility, and interest rate risk.

GDP per capita. Bond market development is affected by degree of economic development. While efficient capital market contributes to economic development, the development of capital markets proceeds in stages. Thus, the degree of economic development may dictate the need to develop a certain aspect of capital markets tailored to the individual country's economic and financial situation. For instance, a country in an early stage of economic development may not have immediate need for deep and liquid bond markets. It might focus more on developing its banking system and equity market. A country with few listed firms will not likely need a corporate bond market, but rather concentrate on government bond market development instead. Political stability is also often a function of GDP per

capita. Importantly, La Porta et al. (1998) argue that rule of law varies as a function of per capita GDP.

Fiscal policy. Fiscal policy can affect bond market development in several ways. On one hand, a country that runs budget deficits has greater need for selling government bonds to raise required funds than a country with a budget surplus. A well-developed government bond market is instrumental to the development of corporate bond market in that it "helps promote a class of dynamic, profitable fixed-income dealers" (Harwood 2000), and so public-sector deficits may indirectly affect corporate bond market development. On the other hand, a large supply of government debt securities may crowd out private debt securities, slowing corporate bond market development (McCauley and Remolona 2000).

Exports to GDP. Rajan and Zingales (2003) argue that less open economies tend to suppress securities market development. This is because entrenched interest groups try to protect their turf from being compromised by market competition. However, they will be less able to force their will when the economy is more open—both to foreign competition and in meeting external demand. As a measure of openness, this study uses the ratio of exports to GDP.

Exchange rate volatility. Greater exchange rate flexibility is both good and bad for domestic bond market development. To the extent that foreign investor participation is valuable to the development of domestic capital markets, high foreign exchange risk may discourage foreign participation. In contrast, if fixed exchange rates encourage foreign lenders to underestimate the risks of lending to local banks and corporations (Goldstein 1998), then the resulting foreign competition may slow development of the local financial intermediation market. This suggests that greater exchange rate volatility may be conducive to domestic bond market development. Annual exchange rate volatility is estimated as the absolute value of relative exchange rate changes over the year.

Domestic credit from banks. Banking markets compete with bond markets in supplying external finance to an economy, so that well-developed banking systems can undercut the need for developing bond markets. Alternatively, banks may serve as dealers and market makers in the bond market, so the development of bank and bond markets goes hand in hand.

Lending rate. Higher interest rates increase debt service costs for government and corporate issuers. Countries with high inflation rates confront greater political risk, with the increased likelihood that government will introduce wage and price controls or tamper with indexes. Higher inflation rates can raise contracting costs, making bond issuance difficult for firms. Demirgüç-Kunt and Maksimovic (1999) show that high inflation makes it costly for investors and firms to contract.

Stock market capitalization. Stock market size is used as a measure of the overall degree of capital market development. Stock market capitalization is measured as a ratio of market capitalization of listed companies to GDP.

2.3. Institutional Variables

This study uses five variables to capture the quality of a country's institutions.

Dummy for common law country. La Porta et al. (1998) show that the origin of a country's legal system explains the degree of investor protection in that country. English common-law countries offer creditors stronger legal protection against managers. The legal variables are from the La Porta et al. (1998) dataset.

Investment profile. This variable is an assessment of factors affecting the risk to investment. The risk rating assigned is the sum of three subcomponents, each with a maximum score of 4 points and a minimum score of 0 points. A score of 4 equates to Very Low Risk while a score of 0 to Very High Risk. The subcomponents are contract viability/expropriation, profits repatriation, payment delays.[1]

Law and order. Law and order are assessed separately, with each subcomponent rated from 0 to 3 points. The Law subcomponent assesses the strength and impartiality of the legal system, while the Order subcomponent evaluates public observance of the law. Thus, a country can enjoy a high rating – 3 – in terms of its judicial system, but a low rating – 1 – if it suffers from a very high crime rate or if laws are routinely ignored without effective sanctions (for example, widespread illegal strikes).

Bureaucratic quality. This variable measures the institutional strength and quality of the bureaucracy. High points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In low-risk countries, the bureaucracy—or civil service—tends to be autonomous from political pressure and to have an established mechanism for recruitment and training. Countries that lack the cushioning effect of a strong, independent bureaucracy receive low points.

Accounting standards. This variable measures the quality of a country's accounting standards. For investors to evaluate the firms they are interested in, accounting standards are critical for interpreting company performance. Accounting standards can also play an important role in financial contracting, as financial performance should be verifiable in a court of law should a conflict arise between bond issuers and investors. Accounting standards data are from the La Porta et al. (1998) dataset.

2.4. Degree of Capital Market Openness

A key theme in restructuring developing economies is opening up local capital markets to foreign portfolio investments. There is now much theory and empirical evidence to support the notion that foreign capital flows are beneficial. Foreign capital flows reduce the cost of capital because of increased risk-sharing between domestic and foreign agents. There is also increasing evidence that openness to foreign portfolio investment enhances governance of local corporations. To proxy for the degree of a country's capital flow openness, this study uses the variable in Quinn and Toyoda (2008). The indicator considers

[1] The data on investment profiles, law and order, and bureaucratic quality are from *International Country Risk Guide* (ICRG).

not only the existence (absence) of restrictions on capital flows, but the severity or magnitude of those restrictions.

3. Summary Statistics

We present summary statistics on the variables used in the empirical analyses for the 43 sample countries during the 1990–2009 period (Table 2). Panel A presents statistics using the entire sample period with Panel B using more recent 2005–2009 sample period. The first column lists the variables. The second and third columns show mean and median levels for all sample countries. Sample countries are split into developed and emerging markets—following the classification of Emerging Markets Database of S&P 500—and mean and median figures are presented in the next four columns. The last two columns summarize PRC statistics.

Looking at the amount of bonds measured as bonds outstanding scaled by GDP, the average amount of total bonds represents 59.3% of GDP for all sample countries over the entire sample period. The median is 48.7%. The amount of bonds outstanding in developed markets (mean=82.1%, median=71.2%) is more than twice as large as that in emerging markets (mean=33.1%, median=30.6%). The recent sample shows a similar picture with a large difference between developed and emerging markets. The most striking difference between developed and emerging markets in bond issuance is in financial bonds. The mean of financial bonds outstanding for the former is 35.3%, whereas it is only 4.4% for the latter. The median is more revealing. The medians for the two are 27.1% and 0.7%, respectively. Statistics on government and corporate bonds do not show as wide a difference between the two sets of countries.[2]

Turning to macroeconomic variables, statistics show, not surprisingly, that generally, developed markets have higher GDP per capita, lower fiscal deficits, larger exports, lower exchange rate volatility, larger banking sectors, lower interest rates, and larger stock markets.[3] A noteworthy change is that there has been a significant drop in exchange rate volatility in emerging markets in recent years. The annual exchange rate volatility is 16.9% for the entire sample period, whereas it is only 6.6% in 2005–2009.

Variables that measure a country's institutional quality indicate that developed markets have better institutions in protecting investor rights and transparency. This suggests it is important to control for the extent of economic development in analyzing the relation between bond market development and a country's institutional variable. In developed markets, 35% of the countries use common law, with a corresponding figure of 25% for emerging markets. The median investment profile for mature markets is 12, which is the highest scale, while the figure for emerging markets is 8.8. The strength of law and order in emerging markets (median=3) is only half of the developed markets (median=5.5). The degree of bureaucratic quality shows a similar pattern, the median equal to 2 in the former

[2] One can treat financial bonds as corporate bonds. However, this study examines financial and corporate bonds separately, as the characteristics of financial institutions and nonfinancial corporations are substantially different and may well be affected by different factors.

[3] Since the introduction of the euro in 1999, statistics on the domestic credit provided by banks and lending rates are unavailable from *World Development Indicators* for the eurozone members.

and 4 in the latter. The difference in the median accounting standards is less pronounced between the two groups— 55 in the former and 69 in the latter.

The capital control variable indicates a median developed market is fully open to foreign capital flows (median=100%), while the median emerging market is less open (median=62.5%).

We also present pairwise correlations among the variables (Table 3). GDP per capita is strongly related to all three types of bonds outstanding—government, financial, and corporate—suggesting that economic development is important in the overall bond market development. The fiscal balance is only significantly related to the government bond market, showing that countries with budget deficits tend to have larger government bond markets. Countries with larger exports tend to have larger financial and corporate bond markets. High exchange rate volatility and interest rates are negatively related to all three types of bonds, suggesting that volatile exchange rates and high interest rates hurt bond market development. Countries with larger banking sectors and stock markets are associated with bigger bond markets, suggesting that bond market development goes hand-in-hand with the development of overall financial markets. Countries with more open capital markets tend to have larger bond markets. Surprisingly, the correlation between a country's institutional strength—as measured by common law dummy and the amount of bonds outstanding—is never significant.

While the correlation analysis suggests determinants of bond market development, some variables are highly correlated with each other. For instance, GDP per capita is highly correlated with many other macroeconomic variables—such as domestic credit provided by banks and interest rates. It is also has strong correlation with capital flows. The next section analyzes the determinants of bond market development using multivariate regression analysis.

4. Determinants of Local Currency-Denominated Domestic Bond Issues

This section estimates cross-country panel regressions to examine if differences in bond market development can be accounted for by differences in macroeconomic, institutional, and capital control variables. Regressions for government, financial, and corporate bonds are estimated separately. In the regression analyses, it is assumed that the degree of economic development—GDP per capita—is the most important aspect of bond market development. It is included as explanatory variable in all regression specifications. An additional explanatory variable is added one at a time to the regression model. This approach is necessitated by data restrictions. Many variables have missing observations, so that including all explanatory variables in the regression allows only a limited number of usable country-year observations, making reliable estimation difficult. Standard errors are clustered at the country level, as bonds outstanding are serially correlated within each country.

4.1 Government Bonds

Regressions were performed that examine the determinants of government bonds outstanding (Table 4). In all regressions, fiscal balance is included as an explanatory variable in addition to GDP per capita, as government bond issuance normally finances a budget deficit. Column (1) includes GDP per capita and fiscal balance as explanatory variables. Both variables are significantly related to government bonds outstanding. A mature market with a large budget deficit tends to have a larger government bond market. For sample countries, the standard deviation of fiscal balance is 4%. Thus, an increase of one standard deviation in budget deficit is associated with a 10% increase in government bonds outstanding as a percentage of GDP.[4] Similarly, because the standard deviation of the logarithm of GDP per capita is 1.26, an increase of one standard deviation of GDP per capita is associated with a 10% increase in government bonds outstanding.

Each of the columns (2) through (8) adds another variable—exports to GDP, exchange rate volatility, lending rate, common law dummy, domestic credit provided by banks, stock market capitalization, and capital controls. Among these variables, only exchange rate volatility and lending rate are negatively and significantly related to government bonds outstanding. Column (9) includes all variables except lending rate and domestic credit provided by banks. The reason for the exclusion is that data are unavailable for euro zone members since 1999. The result shows that GDP per capita, fiscal balance, and exchange rate volatility are important determinants of government bonds outstanding. Column (10) includes all variables including lending rate and domestic credit. Again, the estimates on GDP per capita and fiscal balance are significant at the usual significance level. The estimate on the exchange rate volatility loses its significance, while lending rate retains its significance level.

High exchange rate volatility and interest rates are symptoms of emerging markets. Unreported regressions—to see if these variables are simply proxy variables for the characteristics of emerging markets—includes the dummy variable "1" if a sample country is an emerging market. The estimate on the lending rate loses significance, while the estimate on the exchange rate volatility is significantly negative. Unreported regressions examine the sensitivity of the results using subsample periods of 2000–2009 and 2005–2009. The results show that only the estimates on GDP per capita and fiscal balance are significant. Estimates on exchange rate volatility and lending rates become insignificant.

The study also examines whether institutional variables other than the common law dummy capture cross-country variations in government bond market development. Results show that none of the institutional variables matter to government bond market development.

Overall, the regression analyses results appear to indicate that the degree of economic development and budget deficits are the two most important determinants of government bond market development. While there is some evidence that high exchange rate volatility and lending rates negatively affect government bond development, the evidence is not robust.

[4] This finding should not be taken as the evidence that fiscal deficit itself promotes the development of government bond markets. The finding suggests that the supply of continuous government bonds is important to the development of bond market and help build a benchmark yield curve.

4.2. Financial Bonds

Regressions also examined determinants of financial bonds outstanding (Table 5). Columns (1) through (8) use the same explanatory variables as with the government bond market regressions. Among the explanatory variables, the lending rate is significantly negatively related to financial bonds outstanding, while domestic credit provided by banks is significantly positively related. Column (9) examines whether government bond market development has any impact on financial bond issuance. It finds no effect. Columns (10) and (11) include all explanatory variables both with and without the lending rate and domestic credit, respectively. Only GDP per capita is significant. The study also examines subsample results and finds similar results. In sum, the only variable of significance in affecting the financial bonds outstanding appears to be GDP per capita.

4.3. Corporate Bonds

The determinants of corporate bond issuance is also examined (Table 6). Again, the same regression specifications for government and financial bond issuance are used. The results in columns (1) to (9) show that exchange rate volatility and lending rate are significantly negatively related to corporate bonds outstanding. Domestic credit by banks is significantly positively related to corporate bonds outstanding. Finally, the extent of government bond market development positively affects corporate bond market development. In column (10)—which includes all variables except lending rate and domestic credit—only the government bond variable is significant. In column (11), in which all variables are included, none are significant, perhaps because so many observations are lost.

Unreported tests conduct several robustness tests. In the regressions using the 2000–2009 and 2005–2009 sub-periods, exchange rate volatility loses its significance. The most robust finding is that low interest rates, a well-developed banking sector, and the existence of a deep government bond market are conducive to corporate bond market development. The economic significance of these variables in affecting corporate bond market development appears large. The standard deviations of lending rate, domestic credit over GDP, and government bonds as a percentage of GDP are 10.5%, 97.4%, and 33.1%, respectively. Thus, a decrease of one standard deviation of lending rate and an increase of one standard deviation of domestic credit and government bonds outstanding are linked to an increase in corporate bonds outstanding of 2.1, 1.9, and 1.7 percentage points, respectively. Because average of corporate bonds outstanding for the sample countries is 5.6%, these figures are equivalent to the 30% to 40% increase in the size of corporate bond markets.

The study also examines if other institutional variables—beyond the common law dummy—matter to corporate bond market development. While less important to the development of government bond markets—where default risk is less important—institutional variables are likely to be more important in private contracting of corporate bond issues. Surprisingly, variables related to the quality of a country's institutions are never significant. In addition to the five institutional variables used in the study, the effect of a corruption index is also examined. According to the International Country Risk Guide (ICRG), the corruption index is "an assessment of corruption within the political system." Lower scores indicate that "high government officials are likely to demand special payments" and that illegal payments are generally expected throughout lower levels of government in the form of bribes "connected with import or export licenses, exchange controls, tax assessment, police protection, or

loans." Used alone, this variable is generally positively related to the amount of bonds outstanding. However, it becomes mostly insignificant and even negatively related to bonds outstanding due to a high correlation with GDP per capita.

The result that a country's institutional quality explains little of cross-country variation in corporate bonds is surprising in light of La Porta et al. (1997) results which show significant positive relationships between debt/GNP and common law legal tradition. They define debt as the sum of corporate bonds and bank loans. Because many international syndicate bank loans and nonfinancial corporate bonds issued overseas are dollar-denominated and sold to international investors, it could be that the measure of debt used in La Porta et al. (1997) is different from the measure in this study of nonfinancial corporate bonds, which are local-currency denominated domestic corporate bonds issued to a country's domestic residents. Consistent with this conjecture, the amount of international bonds outstanding over GDP is highly related to the quality of a country's institutions. Law and order, bureaucratic quality, accounting standards, and corruption are significantly and positively related to international bonds outstanding. This seems to suggest that international investors are more concerned with the institutional quality of an issuing country. However, in developing domestic corporate bond markets, as far as the size of the market is concerned, institutional variables appear to be of secondary importance.[5]

5. Foreign Holdings of Local Currency Government Bonds

This section examines what attracts foreign investors to local bond markets and if they play an important role of improving market liquidity. While there is ample evidence on the dynamics of foreign equity investment, there is little evidence on foreign bond investment. The issue is important as foreign investors can be catalysts for domestic bond market development by diversifying the institutional investor base and creating greater demand for local debt securities (Peiris 2010). For emerging markets with minimal domestic institutional investors—such as mutual funds, pension funds, and insurance companies, among others—foreign investors have greater importance. They not only provide demand but have more varied investment objectives, thus providing liquidity.

To measure actual foreign bond portfolio investments, the study uses data on US investor holdings of domestic bonds during 2003–2008. While US bond portfolio investments are not the only foreign investments, US investors represent a significant share of global capital flows. Furthermore, data on bond portfolio investments are not available from other countries.[6] The data used for this study are available at the US Treasury Department.

---

[5] The fact that institutional factors such as investor rights protection are not critical to the local-currency bond market development should not be interpreted as a finding suggesting that institutional factors should be ignored. The findings in the paper simply point out that institutional variables matter less to the issue of local currency bond market than to the issue of international bonds. What appears to matter most when it comes to the development of local currency bond market as defined the outstanding issues of local currency bonds is variables related to macro-economy, so that one should devote more attention to those economic variables.

[6] One could use Coordinated Portfolio Investment Survey data, which covers 67 investing countries (along with international organizations and bonds held as reserve assets) and 236 invested countries (including other countries classified as "confidential" and "unallocated" and international organizations). However, this data source mixes bonds in different currencies, especially local currencies and the US dollar.

On average, domestic bonds held by US investors in the sample countries totaled $23.6 billion (3.5% of GDP). In mature markets, US investors held $40.2 billion (5.3% of GDP) of local bonds, and $4.8 billion (1.5% of GDP) in emerging markets. The proportion of local bonds held by US investors ranged from 19.2% in Iceland to 0.04% in the PRC (see Figure 6).

Cross-country regressions examined if differences in US investor holdings of domestic debt securities are accounted for by cross-country differences in country characteristic variables (Table 7A). The dependent variable is domestic bonds held by US investors scaled by GDP. The explanatory variables include all variables used in Table 4. In all regressions, the logarithm of GDP per capita is included. Not surprisingly, coefficient estimates on this variable are positive and highly significant, indicating that US bond investors are more attracted to advanced economies. Columns (1) to (8) add one variable at a time to capture the importance of each variable in addition to the degree of economic development. Among the eight variables examined, estimations on fiscal balance, dummy for common law countries, and degree of capital controls are positive and significant. US investors tend to invest in bonds in countries with strong fiscal balances, use English common law, and are more open to capital flows. Column (8) includes as explanatory variables the fiscal balance, exports to GDP ratio, exchange rate volatility, lending rate, common law dummy, stock market capitalization, and capital controls. Again, the three variables of fiscal balance, common law dummy, and capital controls are important in explaining the cross-sectional variation in the dependent variable. The last column (10) includes two additional variables to the explanatory variables in column (9)—lending rate and domestic credit provided by banks. Including these two variables reduces the sample size to 99 country-year observations. Due to the small sample size, most variables lose significance, but the common law dummy remains positive and significant.

The positive relationship between US investor investments in domestic bonds and the dummy for common law countries supports the view that the quality of a country's institutions is important in attracting foreign investment. We examine the robustness of this result (Table 7B). The regression in column (9) of Table 7A is repeated using various measures of the quality of institutions. Columns (1) through (4) replace the common law dummy with investment profile, law and order, bureaucratic quality, and accounting standard, respectively. The coefficient estimates on all variables are positive and significant. The accounting standard appears to be particularly important as its explanatory power for the variation in the dependent variable increases to 41%, which is 10 to 15 percentage points higher than that of other regressions. This result is also consistent with Leuz, Lins, and Warnock (2009), who show that foreign investors tend to invest in firms with good corporate governance and better available information.

The results in Table 7 provide additional evidence underscoring the importance of institutional quality—such as investor rights protection—in the development of debt markets. Miller and Puthenpurackal (2002) examine the costs, wealth effects, and determinants of international capital raising for 260 public debt issues made by non-US firms in the Yankee bond market. They find that investors demand economically significant premiums on bonds issued by firms that are located in countries that do not protect investors' rights and do not have a prior history of reliable disclosure. Their results support the idea that better legal protection and more detailed disclosure increases the price investors are willing to pay for financial assets. Bae and Goyal (2009) examine how property rights affect private

contracting in bank loan markets. They find that when property rights are weaker, banks offer less credit, charge higher spreads, and lend only on a short-term basis.

Do foreign investors improve liquidity? The results in Table 7 indicate that the most important variable in attracting foreign investors' investments into local currency bonds is the quality of a country's institutions. The important question is whether foreign participation in local bond markets is related to secondary market liquidity. In a study of foreign participation in emerging markets' local currency bond markets, Peiris (2010) shows that government bond market liquidity in emerging markets remains limited when measured by turnover ratio. His study indicates that greater foreign participation in the domestic government bond market reduces long-term government bond yields, but not necessarily increases yield volatility.

To provide evidence, the study examines if foreign participation in local government bond markets is related to secondary market liquidity. Several International Monetary Fund (IMF) studies argue that institutional investors, both domestic and foreign, have played a critical role in developing capital markets and that wider and a more diversified institutional investor base is instrumental in developing local bond markets (IMF 2007, 2008). Thus, it could be that the presence of foreign investors helps develop liquid benchmarks, leading to improved liquidity in secondary markets.

To investigate the relationship between foreign participation and liquidity, the study uses US investors' holdings of domestic bonds as a proxy for foreign participation. As a measure of liquidity in secondary government bond markets, survey evidence compiled by *AsianBondsOnline* is used.[7]

Summary statistics on the bid-ask spread of government bond trading (Table 8) derive from data for 6 years (2000, 2004, and 2006–2009). Over the sample years, the mean and median spreads are 14.9 and 5.3 bps (bp), respectively. Looking at the median spread, there appears to be a decreasing trend in the spread during the period, although 2008 shows a big increase due to credit crisis. Indonesia has the highest spread with the mean and median of 58.5 and 34.3 bp, whereas KOR has the lowest spread with the mean and median of 2.6 and 1.8 bp.

The regression of bid-ask spreads on US investor holdings of domestic bonds is limited as data are available only for the years 2003–2008; and with spread data for 2000, 2004 and 2006–2009, there are only 4 years of usable data for the eight sample countries—leading to 32 sample observations for the regression analysis (Table 9). Column (1) regresses the spread on the foreign holdings of long-term plus short-term bonds. The coefficient estimate is negative but not significant. Columns (2) and (3) break US investors' holdings of domestic bonds into short- and long-term bonds and run regressions separately. The result shows that foreign holdings of short-term bonds are negatively and significantly related to spreads, whereas those of long-term bonds are negatively and insignificantly related to spreads. If one believes US holdings of domestic bonds are representative of foreign participation in domestic bonds, foreign investors' interest in short-term bonds is associated with a decrease in spread and an improvement in liquidity. The last column (4) includes the

[7] *AsianBondsOnline* provides statistics on the magnitude of bid-ask spreads quoted by market makers in eight secondary government bond markets (PRC; Hong Kong, China; Indonesia; The Republic of Korea; Malaysia; The Philippines; Singapore; and Thailand.

logarithm of GDP per capita to exclude the possibility that cross-country variation in spreads is simply due to the degree of economic development, as Singapore and Hong Kong, China are more developed markets. The results again indicate that foreign short-term holdings are negatively related to spread, and the relation is statistically significant.

There are several reasons the results in this section should be interpreted with caution. First, the data are based on a survey, not actual transaction data. Thus, they differ from spreads computed from actual transaction data. Second, US investor holdings data may not be a good proxy for trading activity of foreign institutional investors. Third, the sample size is too small. And finally, the causality could run in the other direction—foreign investors are attracted to deep and liquid markets, not that their participation improves local bond market liquidity. Nevertheless, even with these limitations, there appears to be a negative relationship between secondary government bond market liquidity in Asia and foreign participation.

6. Current Status of PRC Bond Market

6.1 Market Structure and Bond Instruments

PRC bond markets consist of the interbank market, exchange market, and over-the-counter (OTC) market.[8] The Shanghai and Shenzhen stock exchanges are the two organized exchange markets for bond trading. In the mid-1990s, commercial banks could not invest in the stock exchanges to avoid stock trading speculation. In 1997, the interbank market was established by the central bank for commercial banks to trade bonds. The China Government Securities Depositary Trust and Clearing Co., Ltd (CGSDTC) was designated official bond custodian to settle interbank market transactions. The market has undergone reforms with improved market rules, regulations, and services. Of the three bond markets, the interbank market does more than 90% of bond trading, depositary and trading volumes.

The PRC's bond markets handle a broad array of fixed-income securities with different risk and return profiles. Available fixed-income instruments include government bonds, central bank bonds, financial bonds, nonfinancial corporate bonds.

Government bonds are issued by the Ministry of Finance to finance public expenditure. They include Treasury bonds, electronic savings bonds, and local government bonds. Treasury bonds are distributed to institutional investors and are underwritten by auction through designated primary treasury dealers. Electronic savings bonds are targeted to individual investors and are distributed mainly through banks. These bonds cannot be traded on the secondary market, but can be sold back to banks. Technically, local governments cannot issue bonds, but they have access via a central government approval process.[9] According to a new pilot regulation issued by the Ministry of Finance on 17

[8] In 1988, the Ministry of Finance approved experimental circulation of treasury bonds via OTC transactions at commercial banks in 61 cities. These OTC transactions among commercial banks could be viewed as the real start of PRC's secondary bond market.

[9] According to PRC's budget law, local governments are prohibited from issuing bonds on their own. While there are no regulations limiting local government bond issuance, in actual practice local governments submit bond issuance proposals to the central government, with the State Council approving final issues, The central government issued CNY200 billion in bonds on behalf of provincial governments in 2009 CNYin response to the global financial crisis.

October 2011, the State Council ratifies local governments to issue bonds directly for the first time in almost 17 years as the government acts to prevent potential defaults by provincial and city-level governments that could wreak havoc in the country's financial sector[10]. This regulation will allow Zhejiang Province (CNY6.7bn), Guangdong Province (CNY6.9bn) and the cities of Shanghai (CNY7.1bn) and Shenzhen (CNY2.2bn) to issue three and five-year bonds on their own within approved limits for the Year 2011, with an aggregate limit of CNY22.9bn. The issuing amounts of the two different terms shall account for 50% of the limits separately. The Ministry will deal with payments of principals and interests on behalf of the issuing governments on a trial basis. Issuing governments are required to set up guarantee mechanism for debt repayments and pay the principals and/or interests in the designated fiscal account by the MOF. This regulation symbolizes a significant transformation of the policy thinking on national fiscal management.

At the end of 2010, government bonds outstanding totaled CNY6.7 trillion (Table 10). Treasury bonds accounted for about 90% of the total, with savings bonds and local government bonds representing 4% and 6%, respectively.

Central bank bonds, also called central banks bills, are short-term bonds issued to commercial banks with maturities of 3 months to 3 years. These bonds are issued by the central bank for monetary policy and are not intended to raise new capital. Central bank bonds are actively traded—though restricted to the interbank market—and have become popular short-term money market instruments for many institutions' liquidity management. At end-2010, central bank bonds outstanding totaled CNY4.1 trillion.

Financial bonds include bonds issued by policy banks, commercial banks, and securities companies. Policy bank bonds dominate, and include bonds issued by the China Development Bank (CDB), Export-Import Bank of China (or CEXIM), and Agriculture Development Bank of China (ADBC). Policy banks are state-owned, thus policy bonds hold sovereign credit status and have financing costs below that of other financial bonds. Of the three policy bond issuers, CDB is the largest with 71% of the CNY5.2 trillion in policy bonds issued in 2010, followed by ADBC and CEXIM at 18% and 11%, respectively. Policy bank bonds are traded only on the interbank market.

There are four types of corporate bonds: (i) enterprise bonds, (ii) listed company corporate bonds, (iii) commercial paper, and (iv) medium term notes. Enterprise bonds are issued by state-owned corporations, while listed company corporate bonds are issued by companies listed on the Shanghai and Shenzhen Stock exchanges. Enterprise bond issuance must be approved by the National Development and Reform Commission (NDRC) and related to

[10] Local governments have not been allowed to sell their own bonds or run budget deficits since 1994, when the State Council introduced a ban because of concerns they were running up huge debts they could not repay. But most have got around these restrictions by setting up conduit financing platforms or special purpose companies to arrange bank loans and other financing to pay for public works and investments. This practice multiplied exponentially after the central government launched its stimulus to deal with the 2008 financial crisis and local government debt more than doubled by some estimates, from about CNY4,000bn in 2007 to as much as CNY10,700bn at end-2010 (of which those incurred via the platforms amount to CNY4,970bn)– about 27 per cent of 2010 gross domestic product, according to the disclosed data by the National Audit Office in June 2011. There is huge concern among policymakers that much of this borrowing was spent on wasteful and uneconomic projects and that local governments will struggle to repay many of these loans. See Jamil Anderlini Report "China lets local governments issue bonds to prevent potential defaults", Financial Times, Front Page, 21 October 2011, and ChinaDaily USA "Zhejiang to issue 8b yuan bonds", Xinhua, 6 October 2011.

infrastructure finance. In contrast, listed company corporate bonds are regulated by the China Securities Regulatory Commission (CSRC). Enterprise bonds are mainly traded on the interbank market, while listed company corporate bonds are traded on exchange markets.

Commercial papers are short-term corporate bonds with maturities below 1 year. They are primarily issued by large corporations with sound reputations. At end-2010, commercial paper outstanding totaled CNY653 billion, or 3% of all bonds outstanding. Medium-term notes (MTNs)—with maturities ranging from 3- to 5-years—are regulated by the National Association of Financial Market Institutional Investors (NAFMII), a self-regulatory body approved by the State Council of China in 2007. MTNs are issued on the interbank market and share many features of commercial papers. The main issuers of MTNs are mostly large listed companies. At end-2010, outstanding MTNs totaled CNY1.4 trillion, or 7% of all bonds outstanding. MTNs have been a major source of corporate financing in recent years.

Relatively new on the market are small and medium enterprise (SME) joint bonds—or collectively issued notes. Joint bonds are originated by one entity, yet jointly applied for issuance by several enterprises under one common name. Direct financing is increasingly important to small enterprises as loan costs rise. Joint bonds offer SMEs another option for raising capital directly via the capital market. An SME by itself would not normally have the financial clout or business track record to issue bonds cost-effectively. Pooling SME requirements makes better sense.

Another recent development in the CNY-denominated bond market is off-shore CNY bond issuance. The first off-shore CNY-bonds—popularly known as “dim sum bonds”—were issued in Hong Kong, China in 2007, as part of a policy to internationalize the *yuan*. Through 2009, CNY38 billion dim sum bonds were issued in Hong Kong, China, according to the Hong Kong Monetary Authority. Dim sum bonds have increasingly attracted interest from the international community and from multinational corporations, such as the dim sum bonds issued by Unilever in Hong Kong, China—the first CNY-denominated off-shore bond issue by a European firm.

Of CNY20.2 trillion in total outstanding bonds at the end of 2010, government, central bank, and policy bank bonds accounted for 79% (Table 10). Corporate bonds, commercial paper, and MTNs totaled about 17%. Almost all bonds (94%) are issued and traded on the interbank market, with exchange markets accounting for a mere 1%. Treasury and corporate bonds (enterprise bonds and listed company corporate bonds) are the only bonds traded on exchange markets.

PRC commercial banks—particularly national banks—and insurance companies hold most PRC bonds outstanding (Table 11). [11] Commercial banks hold 69% and insurance companies 10%, followed by “special members” who hold 9%.—special members include the People’s Bank of China (PBC), Ministry of Finance (MOF), policy banks, Shanghai and Shenzhen Stock exchanges, and CGSDTC, among others. Many of the bonds held by these institutions are not traded. The holding structure of major bonds issued is again held by special members, commercial banks, and insurance companies, with the three groups holding 87% of total bonds (Table 12).

[11] The total amount of outstanding bonds held by different institutions is differs slightly from the figure in Table 10, perhaps due to double counting.

6.2. Regulatory and Legal Infrastructure of the PRC Bond Market

The highest regulatory authority for PRC bond markets is the State Council, under which several regulatory agencies governing different bond markets operate. These agencies include the PBC, CSRC, MOF, National Development and Reform Commission (NDRC), and China Banking Regulatory Commission (CBRC) (Table 13 & 14).

Broadly, the PBC supervises the interbank market, while CSRC regulates the exchange bond market. Specifically, the PBC operates government and municipal bond issues together with MOF and CSRC (for listed bonds). The PBC regulates financial policy bond issues and central bank bills. CBRC together with the PBC regulate issues of all deposit-taking institutions. The PBC also regulates issues of Small and Medium Entrepreneurs Collected Notes (SMECN) and commercial papers. The NAFMII is a self-regulatory organization in the interbank market and supervises issuance of MTNs. In practice, the NAFMII is under the control of the central bank, so MTN regulations are under the PBC. In contrast, CSRC regulates all listed bonds on the Shanghai and Shenzhen stock exchanges.

As PRC bond market development created various debt instruments serving different economic functions, the result has been unfortunate regulatory fragmentation between interbank and exchange bond markets. The existence of multiple markets trading different types of bonds does not necessarily harm the efficiency of the overall market. However, the fragmented authority over the two markets adds regulatory costs for issuers. For instance, four different types of corporate bonds are each supervised by a different regulatory body, adding costs as different regulations must be met. Enterprise bonds must be approved by NDRC. Listed company corporate bonds are regulated by CSRC. The issues of commercial papers are regulated by the PBC, while MTNs are regulated by NAFMII.

In addition, the main investors in the two markets are differentiated. Commercial banks are less active in the exchange markets, while insurance companies and other institutional investors are mostly excluded in the interbank market—where commercial banks are active.

There is room to realign and rationalize the regulatory framework more in line with standards commonly found in more mature markets. In general, a sound regulatory framework is increasingly aligned according to function rather than to accommodate specific institutions or instruments.

6.3 Growth of PRC Bond Markets

Summary statistics in Tables 1 and 2 show the PRC has reasonably large government and corporate bond markets. Over 1990–2009, the amount of bonds outstanding is on average 21.4% of GDP, about one-quarter of that in developed markets. However, the PRC bond market has grown tremendously since 2000 (Figure 1). The amount of bonds outstanding was 16.9% in 2000, rising to 51.5% by 2009—higher than the average of all emerging markets. While the size of the bond market has increased significantly in recent years, it remains less than half of the average of developed markets. This underdevelopment relative to mature markets mostly stems from a lack of financial bond issues, highlighting the relatively underdeveloped financial sector. In 2009, financial bonds outstanding equaled 15.1% of GDP, much higher than the emerging market average (7.4%), yet barely one fourth that in developed markets (60.7%). The corporate bond market has exploded since 2004—from virtually nil in 2000 to 7.1% of GDP in 2009. Average corporate bond issues in developed markets is 10.0%.

Figure 2 shows the domestic credit provided by banking sector over GDP and stock market capitalization over GDP from 1990 to 2009 for developed and emerging markets, and PRC. Domestic credit by banks has continuously increased, reaching 145% of GDP in 2009 (Figure 2A), roughly comparable to the 156% mean in developed markets. Stock market capitalization has also increased since 2000 (Figure 2B), and it has become even larger than developed stock markets during the 2006–2007 boom.

As proxy for financing through banks, stocks, and bonds, the study uses domestic credit provided by banks, stock market capitalization, and bonds outstanding. A clear message is that PRC's heavy reliance on banking for external finance has significantly weakened over the years (Figure 3). Almost all external financing was from banks in 1991. It has become much more diverse since, and in 2009 the proportion of external finance by bank, equity, and bond markets were 51.5%, 35.6%, and 12.9%, respectively.

Bond market turnover in Asian markets indicates that the secondary bond market in PRC is quite active, particularly in the corporate bond market (Figure 4). The average turnover ratio of government bonds in the PRC during 2007–2009 was 59%. The corresponding figure in other Asian government bond markets (except Japan) was 60%. In contrast, the turnover ratio of corporate bonds in the PRC reached 97%, whereas the average ratio in other Asian markets was only 24%. This high turnover is seldom seen even in developed markets. Unlike government bond markets, with only a few standardized instruments available—making trading easy—the corporate bond market holds a wide spectrum of bonds with different characteristics in maturity, coupon, default risk, and bond covenants, among others.

Secondary corporate bond market liquidity in the PRC appears quite high. The reason is that trading volume is one of the benchmarks for a bank's annual ranking, as required by the PBC. Therefore, banks have much to gain by inflating corporate bond trading volumes. It is not clear to what extent high corporate bond trading volumes are inflated by the government's regulation-driven incentives. Conventional wisdom among market participants is that the secondary bond market is not well developed. Survey evidence on the magnitude of bid-ask spreads of government bond trading is more consistent with this (Figure 5). Over 2007–2009, the average spread was 13.4 bp. In Hong Kong, China; Singapore; and the

Republic of Korea—where secondary bond markets are relatively well developed—the corresponding levels were 5.0, 8.8, and 2.4 bp, respectively. To the extent that bid-ask spreads are a more reliable measure of liquidity, the PRC bond market leaves much to be desired.

While PRC authorities liberalized its financial markets domestically and made significant reforms over recent years, its financial market—the bond market in particular—remains largely closed to international investors (Figure 6). Over 2003–2008, the average US domestic bond holdings in developed markets ranged from 5% to 8%, whereas it was 1 % to 2% in emerging markets. However, US investor holdings of PRC domestic bonds were almost nonexistent. Markets in Indonesia, Japan, the Republic of Korea, Malaysia, and Thailand all saw significant increases in foreign investment in local government bonds during the period (Figure 9). Huang and Zhu (2007) argue that the historical lessons on conceding sovereign rights built the cautious approach taken by PRC authorities—which may explain why the PRC bond market remains largely closed to foreign investors.

In sum, the PRC bond market has the most basic market infrastructure in place, but it lacks an active secondary market and foreign investments in domestic bonds needed for vibrant, efficient markets.

7. Policy Implications for PRC Bond Market Development

Capital market development depends on country-specific factors including the degree of economic development, extent of financial openness to global capital markets, diversity of investors, and available financial instruments, among others. While this is critically important for building an ideal strategy for capital market development—particularly bond markets—there are generally accepted guidelines for bond market development.[12] The consensus is that the easiest way to develop fixed-income markets is to start with the government bond market—it is generally liquid, drives to the development of market infrastructure, and can provide a benchmark yield curve for the broader credit market (Table 6). One of the most significant and robust variables as a determinant of corporate bond market development is whether the country has a well-developed government bond market.

The following sequence can be used to examine the current status of a country's bond market development and identify areas for further improvement:

- Build the requisite foundation for establishing an efficient government bond market—including sound fiscal and monetary policies, an effective regulatory infrastructure, a liberalized financial system, and an active money market (for example, developing a repurchase agreement (Repo) market);
- Develop an active secondary long-term bond market with depositary and clearing infrastructure. This stage includes development of a benchmark yield curve, diversified institutional investor base, and enhancement of liquidity in secondary market;

[12] For instance, see World Bank/IMF. 2001. *Developing Government Bond Markets*.

- Encourage corporate bond market development through establishment of sound internationally-accepted accounting standards, transparency and disclosure requirements; and independent and reliable credit rating agencies.

For the PRC, there are several major steps that can be taken to allow bond market development to proceed smoothly.[13]

7.1. Interest Rate Liberalization

The first step toward an efficient government bond market development—as suggested by the World Bank/IMF—is to establish sound fiscal and monetary policies, an effective regulatory infrastructure, an active money market, and a liberalized financial system. Among these prerequisites, the most pressing problem for the PRC is interest rate liberalization.

PRC interest rates are both market-determined—based on supply of and demand for capital—and regulated by the PBC. Authorities have begun liberalizing interest rates, allowing market participants to determine yields on various fixed-income instruments—short-term interbank rates, financial and Treasury bond yields, and corporate bond yields. Nonetheless, deposit rate ceilings and a floor on loan rates remain. Regulating key retail interest rates lessens the ability of market-determined rates to act as independent price signals, or as benchmarks for asset pricing or in determining monetary policy.

Lardy (2008) argues that the PRC financial system has in fact retrogressed, as the way the central bank controls interest rates has led to negative real returns on savings deposits. The gap between the nominal interest rate consumers receive on savings deposits against consumer price inflation is widening. Government control over lending and deposit rates has led to lending rates that are far too low, creating excess demand for bank loans and increased use of quantitative targets to control credit growth. More importantly, Porter and Xu (2009) show that short-term interbank rates in the PRC are heavily influenced by changes in administered interest rates. They find a 100 bp increase in both lending and deposit rates has an immediate effect of about 30 bp on the repo rate, eventually raising the rate by 40 bp. These changes not only increase the level of interest rates, but also their volatility. A 10 bp increase in both lending and deposit rates increases volatility by almost 50%.

Regulating key market prices necessarily creates many distortions. Interest rates that do not reflect true market conditions for supply and demand will misallocate capital and lead to the inefficient use of limited resources. Short-term interbank interest rates are central building blocks that provide a benchmark for pricing other financial assets. Fully liberalized interest rates allow term structures to indicate more accurate price signals and thus improve capital allocation. Further interest rate liberalization should, therefore, strengthen the information conveyed by interest rate movements, allowing better price discovery for risk and capital.

[13] Incidentally, many of the suggestions pointed out in the paper reflect similar policy challenges cited in the opening speech on the PRC bond market delivered by Dr. Kouqing Li, Deputy Director General of AFDC at the ADB-AFDC Workshop on Developing Sustainable Government Bond Markets on 15-18 August, 2011. He emphasizes the four issues: 1) expansion of market size, 2) underdevelopment of corporate bond market relative to government bond market, 3) investor base diversification, and 4) fragmentation of bond market into interbank bond market and exchange bond market.

7.2. Developing Active Secondary Bond Markets

Promoting an active and liquid secondary market is one of the most important and also most difficult aspects of bond market development. Below are several policy suggestions to promote liquid secondary bond markets in the PRC.

7.2.1. Coordinating Interbank and Exchange Market Development

The size of government and corporate bond markets in the PRC is large by any standard. However, market participants agree the secondary market lacks liquidity, particularly in the exchange markets. Most trading takes place in the interbank market with only negligible trading transacted in the exchange markets.

Traditionally, fixed-income securities markets are decentralized. Large investors or dealers directly contact several potential counterparties in the professional dealers market, with trades completed by telephone or even by messenger. The informal infrastructure serves the needs of wholesale market participants—such as dealers, brokers, and their institutional clients. Interdealer brokers are a special kind of financial intermediary providing trade execution services to other market intermediaries in a dealer market. They provide information on the prices and quantities at which other dealers are willing to transact. Interdealer brokers tend to keep the identity of their dealers anonymous to protect intermediaries against execution risk. In developing markets, interdealer brokers can play an important role of educating market participants and encouraging trading.

While a dealer market—such as an interbank market—has the advantage of a small execution risk, there are several disadvantages as well. First, transaction costs are higher in dealer markets than in automatic trading systems used by exchange markets. This is because dealers have incentives not to narrow spreads or fees. In a study of execution costs in US equity markets, Huang and Roll (1996) show that execution costs are twice as large for a sample of NASDAQ stocks as they are for a matched sample of NYSE stocks. While the corresponding statistics for fixed-income markets are not easily available, it is generally agreed that automated trading systems are the preferred venue for trading, with trade costs much lower than in dealer systems. Second, in dealership markets with negotiated trades, disclosure of price and trade quantity is typically incomplete. Several studies have examined trade disclosure in financial markets, including Admati and Pfleiderer (1991), Pagano and Roell (1996), and Madhavan (1995, 1996). The common thread in these articles is that disclosure is good for uninformed investors because it reduces adverse selection, the result of asymmetric information.[14]

Given the disadvantages of dealership markets as a trading system, coupled with increased use of automated trading systems globally, excessive reliance on the interbank market as the primary bond trading platform can be viewed as a bottleneck to further secondary bond market development. An active secondary exchange bond market can reduce trading costs and provide more timely information on risk and return profiles of fixed-income instruments. The development of active secondary exchange market is an indispensable part of a fully developed bond market.

[14] In contrast, Naik, Neuberger, and Viswanathan (1999) argue that in dealership environments, greater transparency requiring full and prompt disclosure of trade price and quantity may even reduce welfare.

7.2.2. The Experience of the Republic of Korea

Government-led bond market development in the Republic of Korea—since the 1997/98 Asian financial crisis—offers an interesting case study with important implications for the balanced development of secondary bond markets in the PRC.[15]

Before the Asian financial crisis, KOR's government bond market was virtually nonexistent due to a conservative fiscal policy, which brought little need for government bond issuance for raising funds. Following the crisis, government bond issuance dramatically rose to help fund the cost of financial restructuring and economic recovery. Bond issuance grew from a low of $153 billion in 1997 to over $1 trillion in 2009—an annual geometric growth rate above 20% (Figure 7A). The government and financial bond markets have continued to grow since 1997, while corporate bond market growth was mixed (Figure 7B).

KOR authorities have taken steps to improve bond market infrastructure and build the government bond as benchmark. Regulators adopted the Dutch auction system[16], primary dealer system, and a reopening structure, with mandatory exchange trading requirements for benchmark issues. Kang et al. (2006) say that among the reforms taken, two were particularly effective in improving market liquidity—the reopening system and mandatory exchange trading system for benchmark issues.

The reopening system—also called fungible-issue system—increases the number of benchmark issues. A fungible bond issued on the same terms and conditions as a bond previously issued has the advantage of increasing market depth for that particular bond. Under this system, "on-the-run" bonds issued over a certain period offer the same maturity and coupon rate. Since the reopening system was introduction in 2000, the average volume of benchmark issues increased from KRW1.4 trillion in 2000 to KRW9.8 trillion in 2004. The reopening system also helps improve liquidity on the secondary government bond market by expanding the volume of the benchmark series. After introducing the reopening system, yields on Treasury bonds were driven down relative to other government bonds by the increased liquidity available on the Treasury bond market.

Republic of Korea's secondary bond market was divided into an over-the-counter (OTC) market—under the supervision of the Korea Securities Dealers' Association (KSDA)—and the exchange market under the Korea Stock Exchange (KSE). The OTC market is fragmented and unorganized. One-to-one transactions are normally carried out between individual investors and securities firms (or among institutional investors). The exchange market was established as an interdealer market and runs an electronic trading system. Both listed and unlisted bonds are traded over the counter, whereas the KSE trades only listed bonds. Over-the-counter trading accounts for more than 97% of all trades, with exchange markets, largely inactive, covering the remainder.

In October 2002, the government introduced a mandatory exchange trading system for benchmark issues. Specifically, primary dealers could only trade benchmark government issues on the exchange market. Initially, the mandatory minimum trading requirement was

[15] Much of discussion on the development of Korean bond market is based on Kang, Kim, and Rhee (2006).

[16] Dutch auction system is an auction in which an item is initially offered at a high price which is then progressively lowered until a bid is made and the item is sold. This system effectively removes the *winner's curse*, the tendency for the winning bid in an auction to exceed the intrinsic value of the item purchased.

20%; later increased to 40%. Not surprisingly, the proportion of benchmark issues traded on the exchange market increased markedly, to over 50% of total trading volume. Bid-ask spreads also fell significantly—the spread on a 3-year benchmark issue fell from an average 18 bp at the time the mandatory requirement was introduced to 3.5 bp by 2005. The increase in the proportion of trading volume on the exchange market did not come at the expense of OTC trading. There is little evidence trading volumes on OTC markets decreased since mandatory exchange trading by primary dealers was introduced. Interestingly, the trading requirements on benchmark issues also helped improve liquidity for non-benchmark issues. From March 2002 to January 2003, the proportion of exchange trading of benchmark issues increased from 2.6% to 51.3%, whereas the corresponding figure for non-benchmark issues rose from 3.6% to 25.6%.

In sum, the mandatory exchange trading of benchmark government bonds by primary dealers enhanced overall liquidity of the secondary market for government bonds. Trading volumes for both benchmark and non-benchmark issues improved significantly, with the increase in trading volume not the result of migration out of the OTC market.

Republic of Korea's experience suggests that policymakers can influence where trading takes place. The direct regulation requiring exchange market transactions for specific market participants is effective. The government can jumpstart the system by being more interventionist, and as the system creates sufficient liquidity in both interbank and exchange markets, mandatory trading requirements can be removed. This interventionist approach could also be effective in the PRC bond market, as the trading inequality between interbank and exchange markets is too wide to be fixed by market forces alone.

7.2.3. Coordinating the Regulatory/Supervisory Framework

Balanced interbank and exchange market development requires government intervention—such as mandatory trading—for certain market participants. The question is who should initiate and impose these regulations. A plethora of government agencies—including PBC, CSRC, NDRC, CBRC, MOF, and NAFMII—regulate different aspects of PRC bond markets. For example, the interbank market is supervised by the PBC, while exchange markets by CSRC. A coordinating body or mechanism is needed to develop and regulate both interbank and exchange markets. Too many regulatory agencies could create and impose excessive regulatory costs. An umbrella body with the government's imprimatur to supervise all bond market regulatory agencies might be best.

7.2.4. Building a Diversified Investor Base

Commercial banks are the dominant investors in PRC bond markets, particularly government bond markets (Figure 8). The proportion of commercial banks holding government bonds is highest in the PRC. Excessive reliance on the banking system to mobilize savings for buying government securities will likely be costly for both the government and investors. Even in a system where the main assets of banks are government securities, banks tend to maintain a high margin between deposit rates and the return on government securities that banks hold as assets. The reason is that banks must be compensated for their role in transforming liquid deposits to long-term government bonds; and holding them on their balance sheet. Banks tend to buy (underwrite) and hold to maturity most of the long-term government bonds they underwrite. While some bonds are put into trading accounts, the proportion is relatively small. There are at least two reasons

for this: first, banks use historical accounting to value bonds, so there is less incentive to trade; and second, there are few tools for managing interest rate risk. While some hedging instruments such as interest rate swaps are available, the market is not large enough compared with the size of government bonds underwritten by banks. Therefore, seeking ways to break through buy-and-hold behavior by banks and encourage them to sell government bonds to other investors is needed if an active secondary bond market is to develop further.

There are several ways to promote secondary market participation by different types of institutional investors. These include (i) placing government securities with end investors, (ii) allowing direct access to major savings pool such as retail or foreign investors, and (iii) encouraging investment in government bonds by pension and mutual funds.

Finally, foreign investors are an important source of demand for fixed-income securities. In particular, foreign investors such as pension funds and insurance companies tend to have long investment horizons and policymakers may find them especially beneficial to the development of the long-term bond market. While limited, evidence in Section 5 shows that foreign investors could play an important role in improving liquidity in government bond markets. Thus, active foreign investor participation in the PRC bond market may be a worthwhile policy issue to consider.[17] A well-developed secondary bond market requires the full spectrum of institutional investors with different risk and return profiles and with different maturity structures. And foreign institutional investors could fill that void. Many Asian markets have seen a continued increase in foreign investments in local government bond markets in recent years (Figure 9).

A related problem in the PRC banking sector limiting the creation of a diversified investor base is the high degree of concentration by big banks in the banking market. In 2009, the top five banks' total assets were 70% of the combined total assets of the top 50 banks.[18] It was more than four times as large as that of the next five largest banks. While large banks are better equipped to compete in global markets, their monopoly power domestically could block further development of the banking sector as well as fixed-income securities markets. Through the competitive pressure they place on the quality and services of intermediaries, foreign investors could provide the necessary competition.

7.3. Developing Corporate Bond Market

The PRC's corporate bond market has exploded in size over recent years. The total amount of corporate bonds outstanding jumped from $1.1 billion in 1998 to $353.74 billion by the end of 2009—an impressive annual growth rate of 88.7%. In size, PRC corporates ranked 5th in the world, following the US, Japan, Spain, and Italy. The phenomenal growth is largely due to continuing government deregulation on corporate issuance. However, while large in absolute amounts, its relative size in terms of GDP remains relatively small at 7.1%—ranked 19th globally—suggesting much room for further growth. Current regulations

[17] A policy allowing foreign investor participation should take into account pros and cons of liberalizing capital flows. There is much debate on the role of foreign portfolio capital in developing markets. On one hand, episodes of financial crises have prompted many to question the benefits of large—and occasionally volatile—capital flows. On the other hand, there is a growing body of empirical evidence suggesting that opening capital markets to foreign investors is beneficial.

[18] The biggest five banks in total assets in 2009 were the Industrial and Commercial Bank of China, China Construction Bank, Agricultural Bank of China, Bank of China, and China Development Bank.

covering corporate bond issues—including minimum flotations and minimum ratings—precludes all but a handful able to join the corporate bond market. As a result, most of bond issuers are state-linked companies. Further deregulation would boost both supply and demand for corporate bonds. Policy options to help further develop PRC corporate bond markets are outlined below.

7.3.1. Tax Treatment

Taxes on interest income hurt corporate bond market development. In the PRC, interest income from corporate bonds is taxable, while that for government bonds is not.[19] For bond investors, the different tax treatments almost completely wipe out any additional interest income accrued from investing in corporate bonds over government bonds, restricting demand for corporate debt securities. Within Asia, the Republic of Korea and Malaysia have the largest corporate bond markets in bonds outstanding as percentage of GDP—39.5% and 28.7%, respectively (Table 1). These two corporate bond markets are even larger than Japan's. Tax treatment of interest income from government and corporate bonds is equal. In the Republic of Korea, interest income is subject to a 15.4% withholding tax for both government and corporate bonds, whereas in Malaysia there are no withholding taxes for either bond.

7.3.2. Credit Risk Assessment and Pricing

There are two main theories as to why firms would choose to borrow by selling bonds rather than by taking out bank loans. Diamond (1991) argues that firms with a reputation for being either safest or riskiest neither benefit from bank monitoring. These firms would obviously choose to borrow on the bond market, because bank loans impose additional monitoring costs, reducing any benefit. Rajan (1992) argues that while informed banks make flexible financial decisions—which prevent a firm's projects from going awry—the cost is that more banks potentially intrusive bargaining power over the firm's profits, particularly once projects have begun. By selling bonds, information disseminates to a large number of lenders, undercutting the information monopoly a bank has over a borrower and thus lowering the rent banks can charge the firm.

Both theories presume that the cost advantage of bond finance comes from the fact that banks price corporate loans according to the firm's creditworthiness. If the cost of bank financing does not reflect a corporation's credit quality—and/or if lending interest rates are distorted by regulation—there will be few market forces to lower the cost of borrowing for the firm, even after bond market disclosure. These conditions are absent from the PRC bond market. As discussed in section 7.2, bank lending rates are inflexible and regulated, and thus less likely to reflect credit history. They are not high enough to recover information rent associated with bond sales. Further, the secondary bond market is not liquid enough to disseminate information on firms through bond pricing.

Mathieson and Roldos (2004) point out that many emerging bond markets lack sophistication in assessing credit risk. This has been a major obstacle to the growth of emerging bond markets. There is a consensus on the need for credit ratings in assessing

[19] Tax rates for resident individuals and corporates are 20% and 25%, respectively. Nonresidents may invest in bonds only through Qualified Foreign Institutional Investors—a 10% withholding tax on interest income applies, which may be reduced due to specific tax treaties.

risk. They have been widely used in developed markets. Credit rating agencies (CRAs) are important providers of information. Yet there is no consensus on whether they provide an accurate assessment of credit risk as a leading indicator—witness the spectacular US bankruptcies at the height of the 2008/09 crisis, not to mention the effects on the structured bond market. Further, CRAs have a fundamental conflict of interest with issuers, the source of CRA revenue. This remains controversial. Conflicts of interest strain the reputation and credibility of CRAs. This reputation "capital" does not exist among many emerging-market CRAs and will be extremely difficult to build unless good governance filters through emerging market institutions.

To further develop the corporate bond market, the banking sector must be far more sophisticated and better integrated into the international financial system than it is today—particularly in assessing firm credit risk and incorporating it into pricing. Credit risk assessment and pricing capability are important for price discovery and liquidity, given the information asymmetry between investors and corporate bond issuers. Although PRC banks appear reasonably well developed if one uses the ratio of banking lending to GDP, the ratio is likely to overstate bank quality. If one measures the degree of banking sector development by bank lending efficiency, PRC banks leave much to be desired. In a study of the PRC banking industry, Dobson and Kashyap (2006) argue that government influence, while less direct than in the past, continues despite reforms. There remains tension between government influence on one hand, and on the other, the obligation of widely-held commercial banks to objectively make credit decisions based on a borrowers' ability to repay.

7.3.3. Derivative Markets

The cause and effect between a derivative contract and its underlying asset is complicated. On one hand, hedging instruments in fixed-income markets help investors manage the risk of default as well as price risk. In the absence of such instruments to hedge against any reversal in interest rate movement, investors will be reluctant to participate in the underlying fixed-income securities. On the other hand, the main cause of derivative market underdevelopment is underdevelopment of the underlying fixed-income market itself. The risk reallocation benefits of derivative products are apparent. And appropriate regulatory reform could help derivative markets further develop.

The PRC recently started *yuan*-denominated credit default swaps (CDS)—also known as "credit risk mitigation" tools. While clearly a step in the right direction, it remains unclear what the immediate benefits will be—and whether the new derivatives will contribute to corporate bond market development. CDS is a derivative contract that allows credit risk to be traded the same way a market prices risk. It can be used to transfer credit risk to a third party and to diversify credit risks. Thus, CDS pricing requires an accurate assessment of credit risk on the underlying entity the CDS represents. It also requires a benchmark yield curve. Neither requirement seems to be in place in the PRC banking sector. Further, whether the introduction of CDS enhances bond liquidity for the CDS contract entity remains debatable. Using an exhaustive sample of CDS and bond trades over 2002–2008 in the US, Das and Kalimipalli (2010) argue that the advent of the CDS is largely detrimental—bond markets became less efficient, witnesses greater pricing errors and experienced lower liquidity. In spite of this, one benefit of CDS is to free regulatory capital. By trading CDS, banks can transfer default risk and free up regulatory capital tied with risky

loans. CDS allows banks more resources for other lending. Given current banking regulations, these benefits from trading CDS are unlikely.

Most mature markets offer investors a wide range of instruments to manage interest rate risks. These instruments include interest rate futures, bond future contracts, interest rate swaps, and forward rate agreements. Among these, futures contracts on government bonds appear to be the most important for bond market development. While interest rate swaps and forward rate agreements are tools to manage interest rate risk, they are over-the-counter instruments mainly designed for large institutional investors. In contrast, government bond futures—such as T-bond futures contracts in the US—are highly standardized products easily accessible to small institutional investors and even individual investors. They can also improve liquidity of the underlying assets.

The PRC launched government bond futures in 1993—and the market collapsed in 1995. The problem was flawed market design and market structure, weak governance, lax risk management, and price manipulation (Chen and Zhou 2009). Another important factor in the market's failure was perhaps the small government bond market size at the time. Today, the PRC's government bond market appears large and mature enough to warrant the re-introduction of bond futures.

8. Summary, Limitations of the Study, and Recommendations for Further Study

This study examines determinants of government, financial, and corporate bond issuance using data on local currency domestic bonds outstanding from 43 countries during the period 1990–2009. The most important variable in the development of all three bond markets is the degree of economic development as measured by GDP per capita. Other important determinants include fiscal balance for government bonds, interest rate, domestic credit provided by banks, and the existence of a well-developed government bond market for corporate bond markets. Variables that measure the quality of a country's institutions are not important in explaining the development of domestic bond markets. In contrast, these variables are most important in explaining foreign holdings of domestic bonds and international bond issuance.

It is surprising that institutional factors such as investor rights protection do not contribute to the development of local currency domestic bond markets, particularly in corporate bond markets. Rather, macroeconomic policies maintain stable exchange rates and low interest rates, and banking sector development appears to be far more important contributors to the development of domestic markets. This finding does not mean that the institutional aspect of domestic bond market development can be ignored. This aspect is even useful to facilitate the development of a safe and liquid bond market. The evidence indicates that a country's institutions are critical in attracting foreign investors in domestic bond markets—investors generally perceived as playing a supportive role in local markets.

There are several implications for PRC bond market development. Perhaps the most important implication is domestic banking sector liberalization. While the PRC has implemented reforms step by step to modernize and strengthen the financial sectors in recent years, key retail interest rates remain regulated to some extent. Such regulation will

diminish the ability of market-determined rates to act as independent price signals, which makes the construction of a reliable benchmark yield curve difficult, which in turn hampers building an active secondary bond market. Domestic bank liberalization is also a complementary condition for corporate bond market development, as theory suggests that firms will find little cost advantage in bond issuance if bank loan rates don't correctly reflect credit risks.

There are several limitations on the study. First, for the proxy of bond market development, the analysis chose the outstanding amount of bonds issued. Although it could represent the development of the primary market comparatively well, it has limitation to analyze the development of the secondary market. It would be desirable if the analysis can be done for additional variables, which can explain the secondary market development such as 'bid-ask' spread and turnover ratio. Second, the coverage of the paper is limited to local-currency government bond and corporate bond markets. Expanding the scope of analysis to include, other non-traditional fixed income market instruments such as asset-backed securities (including those semi-ABSs) and the trust market, which has developed fast as a cheap substitute for formal fixed-income market, due to policy constraints on the latter, as well as foreign-currency denominated bonds will further shed light on the development of fixed-income markets.

References

A. Admati, and P. Pfleiderer. 1991. Sunshine Trading and Financial Markets Equilibrium. *Review of Financial Studies.* 4. pp. 443–481.

Asian Bonds Online. www.asianbondsonline.adb.org

K-H. Bae and V. Goyal. 2009. Creditor Rights, Contract Enforcement, and Costs of Loan Financing. *Journal of Finance.* 84. pp. 823–860.

R. Ball, A. Robin, and J. S. Wu. 2002. Properties of Accounting Earnings in Four East Asian Countries. *Unpublished working paper*. New York: University of Rochester.

Bank for International Settlements (BIS). Domestic and International Debt Securities Issues. http://www.bis.org/statistics/secstats.htm

P. Brockman and D. Chung. 2003. Investor Protection and Firm Liquidity. *Journal of Finance.* 58. pp. 921–938.

C. Chen and Z. Zhou. 2009. Rise and Fall of the First Financial Futures Market in China: The Case of Chinese Government Bond Futures. *China and World Economy*. 17 (2). pp. 110–124.

S. Claessens, S. Djankov, and L.H.P Lang. 2000. The Separation of Ownership and Control in East Asian Corporations. *Journal of Financial Economics.* 58. pp. 81–112.

S. Das and M. Kalimipalli. 2010. Did CDS Trading Improve the Market for Corporate Bonds?. *Working paper*.

A. Demirgüç-Kunt and V. Maksimovic. 1998. Finance and Firm Growth. *Journal of Finance.* 53. pp. 2107–2137.

A. Demirgüç-Kunt, A. and V. Maksimovic. 1999. Institutions, Financial Markets, and Firm Debt Maturity. *Journal of Financial Economics*. 54. pp. 295–336.

D.W. Diamond. 1991. Monitoring and Reputation: The Choice Between Bank Loans and Directly Placed Debt. *Journal of Political Economy.* 99. pp. 689–721.

W. Dobson and A. Kashyap. 2006. The Contradiction in China's Gradualist Banking Reforms*. Brookings Papers on Economic Activity.* Washington, D.C: Brookings Institution Press, BPEA.

B. Eichengreen, and P. Luengnaruemitchai. 2004. Why Doesn't Asia Have Bigger Bond Markets?. *NBER Working Paper*. 10576. Massachusetts: National Bureau of Economic Research, Inc.

J.P.H. Fan and T.J. Wong. 2002. Corporate Ownership Structure and the Informativeness of Accounting Earnings in East Asia. *Journal of Accounting and Economics.* 33. pp. 401–425.

M. Goldstein. 1998. The Asian Financial Crisis. *Institute of International Economics*.

A. Harwood. 2000. Building Local Currency Bond Markets: An Asian Perspective. International Finance Corporation.

H. Huang and N. Zhu. 2007. The Chinese Bond Market: Historical Lessons, Present Challenges, and Future Perspectives. *Working paper*.

R.D. Huang and H.R. Stoll. 1996. Dealer versus Auction Markets: A Paired Comparison of Execution Costs on NASDAQ and the NYSE. *Journal of Financial Economics, Elsevier*. 41 (3). pp. 313-357.

M. Hung. 2001. Accounting Standards and Value Relevance of Financial Statements: An International Analysis. *Journal of Accounting and Economics.* 30. pp. 401–420.

International Monetary Fund. 2007. Developing Capital Markets in APEC Member Economies. Background paper for the 14th APEC Finance Ministers' Meeting.

.——— 2008. Development of Bond Markets in Emerging Market Countries. Briefing Note for the G-7 Deputies' Meeting.

International Monetary Fund and the World Bank. Financial Stability Board. 2011. *Financial Stability Issues in Emerging Market and Developing Economies*.

K. Kang, G. Kim, and C. Rhee. 2006. Developing the Government Bond Market in South Korea : History, Challenges, and Implications for Asian Countries. *Asian Economic Paper*. 4. pp. 91–113.

R. La Porta, F. Lopez-de-Silane, A. Shleifer, and R.W Vishny. 1997. Legal Determinants of External Finance. *Journal of Finance*. 52. pp. 1131–1150.

———. 1998. Law and Finance. *Journal of Political Economy*. 106. pp. 1115-1155.

———. 2002. Investor Protection and Corporate Valuation. *Journal of Finance*. 57. pp. 1147–1170.

N. Lardy. 2008. Financial Repression in China. *Policy Brief*. 08-8. Peterson Institute for International Economics.

C. Leuz, K.V. Lins, and F.E. Warnock. 2009. Do Foreigners Invest Less in Poorly Governed Firms?. *Review of Financial Studies*. 22. pp. 3245–32585.

C. Leuz, D. Nanda, and P.D. Wysocki. 2003. Earnings Management and Investor Protection: An International Comparison. *Journal of Financial Economics*. 69. pp. 505–527.

K. Li. 2011. Opening Remarks at the ADB-AFDC Workshop on Developing Sustainable Government Bond Market. Shanghai, PRC. 15-18 August.

A. Madhavan. 1995. Consolidation, Fragmentation and the Disclosure of Trading Information. *Review of Financial Studies*. 8. pp. 579–603.

———. 1996. Security Prices and Market Transparency. *Journal of Financial Intermediation*. 5. pp. 255–283.

D. J. Mathieson and J. E. Roldos. 2004. Local Securities and Derivatives Markets in Emerging Markets: Selected Policy Issues. World Economic and Financial Surveys.

R. McCauley and E. Remolona. 2000. Size and Liquidity in Government Bond Markets. *BIS Quarterly Review*. pp. 52–58.

D. P. Miller and J. Puthenpurackal. 2002. The Costs, Wealth Effects, and Determinants of International Capital Raising: Evidence from Public Yankee Bonds. *Journal of Financial Intermediation.* 11. pp. 455–485.

R. Morck, B.Y. Yeung, and W. Yu. 2000. The Information Content of Stock Markets: Why Do Emerging Markets Have Synchronous Stock Price Movements? *Journal of Financial Economics*. 58. pp. 215–260.

N. Naik, A. Nerberber, and S. Viswanathan. 1999. Trade Disclosure Regulation in Markets with Negotiated Trades. *Review of Financial Studies*.12. pp. 873–900.

M. Pagano and A. Roell. 1996. Transparency and Liquidity: A Comparison of Auction and Dealer Markets with Informed Trading. *Journal of Finance*. 51. pp. 579–611.

S. Peiris. 2010. Foreign Participation in Emerging Markets' Local Currency Bond Markets. *IMF Working Paper*. 10 (88). International Monetary Fund.

N. Porter and T. Xu. 2009. What Drives China's Interbank Market? *IMF Working Paper*. 09 (189). International Monetary Fund.

D. Quinn and A.M. Toyoda. 2008. Does Capital Account Liberalization Lead to Growth? *Review of Financial Studies*. 21. pp. 1403–1449.

R. G. Rajan. 1992. Insiders and Outsiders: The Choice Between Informed and Arm's Length Debt. *Journal of Finance*. 47. pp. 1367–1400.

R. G. Rajan and L. Zingales. 1998. Which Capitalism? Lessons from the East Asian Crisis. *Journal of Applied Corporate Finance*. 11. pp. 40–48.

R. G. Rajan, H. Servaes, and L. Zingales. 2003. The Great Reversals: The Politics of Financial Development in the Twentieth Century. *Journal of Financial Economics*. 69. pp. 5–50.

U.S. Treasury Department http://www.treas.gov/tic/fpis.shtml#usclaims.

World Bank. World Development Indicators. http://data.worldbank.org/data-catalog/ world-development-indicators

World Bank and the International Monetary Fund (IMF). 2001. Developing Government Bond Markets: A Handbook.

Table1: List of Sample Economies and Outstanding Domestic Bond Issues

Economies	All bonds	Bonds issued by			GDP ($ billion)	GDP per capita
		Government	Financial institutions	Corporations		
A. Developed economies						
Australia	94.3	24.7	65.5	4.2	925	25,056
Austria	94.8	34.5	49.8	10.5	385	26,109
Belgium	126.3	63.5	58.0	4.9	469	24,156
Canada	97.3	67.8	18.7	10.8	1,340	25,657
Denmark	216.6	31.5	184.6	0.6	310	30,548
Finland	41.7	11.9	24.6	5.2	238	26,546
France	119.1	63.9	44.7	10.5	2,650	22,820
Germany	83.8	46.2	27.3	10.3	3,350	24,326
Hong Kong, China	23.3	9.7	9.0	4.6	215	34,587
Iceland	98.3	31.9	55.8	10.6	12	35,184
Ireland	495.3	50.8	443.5	1.0	227	28,914
Italy	174.6	93.4	57.0	24.2	2,110	18,479
Japan	227.4	190.5	21.4	15.5	5,070	38,182
Netherlands	125.3	48.1	64.3	12.9	792	26,094
New Zealand	24.2	24.2	0.0	0.0	125	14,984
Norway	62.4	24.8	30.5	7.1	382	40,936
Portugal	103.7	43.4	37.5	22.8	228	11,127
Singapore	63.4	48.4	12.7	2.4	182	28,765
Spain	133.5	41.3	43.1	49.0	1,460	15,534
Sweden	91.4	29.3	53.5	8.6	406	30,395
Switzerland	51.8	23.9	24.9	3.0	500	38,108
United Kingdom	71.2	54.7	15.5	1.0	2,170	27,211
United States	175.0	66.4	89.1	19.5	14,300	36,647
Mean	**121.5**	**48.9**	**62.2**	**10.4**	**1,645**	**27,407**
B. Emerging economies						
Argentina	18.6	15.1	1.0	2.4	309	9,880
Brazil	78.7	51.1	27.0	0.6	1,570	4,419
Chile	31.3	9.8	4.6	16.8	164	6,083
China, People's Republic of	51.5	29.3	15.1	7.1	4,980	2,206
Colombia	26.6	26.2	0.0	0.5	231	2,956
Greece	69.0	54.9	5.4	8.6	330	14,844
India	46.0	40.5	4.1	1.5	1,310	757
Indonesia	18.1	16.3	0.9	0.9	540	1,124
Korea, Republic of	130.4	51.1	39.8	39.5	833	15,444
Malaysia	98.8	48.9	21.2	28.7	192	4,974

Economies	All bonds	Bonds issued by			GDP ($ billion)	GDP per capita
		Government	Financial institutions	Corporations		
Mexico	41.5	24.0	14.1	3.3	875	6,099
Pakistan	28.0	28.0	0.0	0.0	167	660
Peru	17.3	12.9	1.5	3.0	127	2,915
Philippines	34.2	33.1	0.0	1.1	160	1,215
Poland	41.1	41.1	0.0	0.0	430	6,331
Russian Federation	4.0	4.0	0.0	0.0	1,230	2,793
South Africa	49.1	30.3	11.3	7.6	286	3,688
Thailand	68.4	47.6	1.3	19.6	264	2,566
Turkey	35.9	35.9	0.0	0.1	617	4,776
Venezuela	34.9	32.7	0.0	2.1	327	5,638
Mean	**46.2**	**31.6**	**7.4**	**7.2**	**747**	**4,968**

Notes:
1. Outstanding bond issues are in percentage of GDP.
2. All statistics are as of 2009 except for Hong Kong, China and Switzerland in which 2008 data are used.

Sources:
1. Bank for International Settlements, *BIS Quarterly Review* accessible at http://www.bis.org/statistics/secstats.htm.
2. World Bank, *World Development Indicators*, available at http://data.worldbank.org/data-catalog/world-development-indicators

Table 2: Summary Statistics

Panel A: sample period 1990–2009

Variables	All		Developed		Emerging		China, People's Rep. of (PRC)	
	mean	median	mean	median	mean	median	mean	median
Domestic local currency bonds (% of GDP)								
All bonds	59.31	48.72	82.13	71.23	33.07	30.61	21.42	15.79
Government	32.83	29.28	40.13	34.54	24.43	23.68	13.18	8.44
Financial	26.92	11.79	35.27	27.08	4.43	0.72	7.16	7.07
Corporate	5.56	2.92	6.73	5.17	4.21	0.68	1.07	0.27
Macroeconomic variables								
GDP per capita (constant 2000 $)	14724.59	13431.94	24160.63	23663.61	3920.31	3129.94	1055.03	915.87
Fiscal Balance (% of GDP)	(1.56)	(1.83)	(1.27)	(1.64)	(1.98)	(2.20)	(1.26)	(1.09)
Exports to GDP (%)	38.01	28.83	45.59	35.22	29.96	25.40	26.29	23.31
Exchange rate volatility (%)	12.28	5.42	5.43	4.36	16.85	6.22	4.32	1.01
Domestic credit provided by banks (% of GDP)	107.69	86.12	171.92	135.89	68.37	51.18	115.86	119.50
Lending interest rate (%)	13.64	9.86	7.19	6.65	18.10	14.55	7.47	6.25
Market Capitalization of listed companies (% of GDP)	70.25	49.06	87.74	66.81	50.32	31.84	40.73	31.85
Institutional variables								
Dummy for common law	0.30	0.00	0.35	0.00	0.25	0.00	0.00	0.00
Investment profile (scale 0-12)	8.15	7.96	8.99	9.00	7.18	7.17	6.83	7.15
Law and order (scale 0-6)	4.62	5.00	5.63	6.00	3.45	3.56	4.50	4.50
Bureaucratic quality (scale 0-4)	3.14	3.00	3.80	4.00	2.38	2.00	2.09	2.00
Accounting standard (scale 0-100)	62.60	64.00	67.60	69.00	55.93	55.00	-	-
Capital flow variable								
Capital control (scale 0-100)	78.30	86.25	91.93	100.00	61.81	62.50	41.25	42.50

Panel B: sample period 2005–2009

Variables	All		Developed		Emerging		PRC	
	mean	median	mean	median	mean	median	mean	median
Domestic local currency bonds (% of GDP)								
All bonds	72.71	56.20	99.18	84.19	42.28	35.89	46.35	48.13
Government	35.70	31.89	40.19	32.80	30.53	30.46	29.83	29.29
Financial	29.59	15.40	49.91	30.51	6.22	1.25	12.82	12.73
Corporate	7.43	4.22	9.08	6.82	5.52	1.94	3.70	2.98
Macroeconomic variables								
GDP per capita (constant 2000 $)	17023.66	15223.48	27825.86	27210.67	4817.18	3885.39	1841.60	1864.11
Fiscal Balance (% of GDP)	(0.82)	(1.24)	(0.41)	(0.51)	(1.38)	(1.83)	(0.79)	(0.77)
Exports to GDP (%)	45.65	31.69	58.22	44.63	34.28	28.82	35.10	37.08
Exchange rate volatility (%)	5.98	5.35	5.06	4.84	6.60	5.48	4.55	3.72
Domestic credit provided by banks (% of GDP)	110.38	112.32	170.82	159.18	73.67	48.57	132.32	133.48
Lending interest rate (%)	9.76	8.20	5.65	5.31	11.93	10.75	5.96	5.58
Market Capitalization of listed companies (% of GDP)	90.27	66.36	107.30	83.47	70.42	53.11	92.72	89.31
Institutional variables								
Dummy for common law	0.30	0.00	0.35	0.00	0.25	0.00	0.00	0.00
Investment profile (scale 0-10)	10.34	11.50	11.84	12.00	8.62	8.77	7.19	7.21
Law and order (scale 0-10)	4.48	5.00	5.41	5.50	3.41	3.00	4.50	4.50
Bureaucratic quality (scale 0-10)	3.10	3.00	3.76	4.00	2.35	2.00	2.00	2.00
Accounting standard (scale 0-100)	62.60	64.00	67.60	69.00	55.93	55.00	.	.
Capital flow variable								
Capital controls (scale 0-100)	79.64	87.50	92.72	100.00	63.82	62.50	42.50	42.50

Sources:

1. Local currency domestic bonds outstanding are from Bank for International Settlements for 1990–2009.
2. Macroeconomic variables are from the World Bank's *World Development Indicators* for the same period.
3. Variables related to institutional quality are from International Country Risk Guide for 1990–2008.
4. Capital control refers to the degree of control on capital flows with a lower score indicating greater capital control—data from Quinn and Toyoda, 2008.

Table 3: Correlation

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
[1] Government bond	1.00											
[2] Financial bond	0.20[c]	1.00										
[3] Corporate bond	0.25[c]	0.27[c]	1.00									
[4] GDP per capita	0.32[c]	0.56[c]	0.28[c]	1.00								
[5] Fiscal balance	(0.37)[c]	0.02	0.03	0.21[c]	1.00							
[6] Exports to GDP	(0.01)	0.06[a]	0.08[b]	0.25[c]	0.22[c]	1.00						
[7] Exchange rate volatility	(0.16)[c]	(0.11)[c]	(0.12)[c]	(0.16)[c]	(0.19)[c]	(0.08)[a]	1.00					
[8] Dummy for common law	(0.02)	(0.05)	0.06	0.02	0.03	0.29[c]	(0.17)[c]	1.00				
[9] Domestic credit	0.43[c]	0.41[c]	0.39[c]	0.55[c]	(0.09)[b]	0.03	(0.09)[b]	0.13[c]	1.00			
[10] Lending interest rate	(0.30)[c]	(0.35)[c]	(0.37)[c]	(0.52)[c]	(0.13)[c]	(0.26)[c]	0.48[c]	(0.36)[c]	(0.40)[c]	1.00		
[11] Stock market capitalization	0.02	0.13[c]	0.23[c]	0.36[c]	0.27[c]	0.58[c]	(0.18)[c]	0.40[c]	0.26[c]	(0.40)[c]	1.00	
[12] Capital controls	0.09[b]	0.30[c]	0.07[a]	0.60[c]	0.21[c]	0.25[c]	(0.26)[c]	(0.14)[c]	0.16[c]	(0.39)[c]	0.14[c]	1.00

Notes: a, b, and c denote significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Sources:

1. Local currency domestic bonds outstanding from Bank for International Settlements during 1990–2009.
2. Macroeconomic variables are obtained from World Bank's *World Development Indicators* for the same period.
3. Variables related to a country's institutional quality are from International Country Risk Guide during 1990–2008.
4. Capital controls refer to the degree of control on capital flows with lower score indicating more capital control—data from Quinn and Toyoda, 2008.

Table 4: Determinants of Government Bonds Outstanding

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Logarithm of GDP per capita	7.89*** (3.90)	7.85*** (4.03)	7.47*** (3.13)	6.74*** (3.11)	7.87*** (3.90)	5.65** (2.57)	8.17*** (3.84)	9.04*** (3.09)	9.01*** (3.22)	6.70** (2.63)
Fiscal balance	-2.73*** (-4.81)	-2.61*** (-5.32)	-3.15*** (-3.59)	-3.25*** (-3.56)	-2.72*** (-4.92)	-2.49*** (-4.67)	-2.67*** (-4.82)	-2.73*** (-4.66)	-2.59*** (-3.29)	-2.45*** (-3.87)
Exports to GDP		-0.02 (-0.26)							-0.03 (-0.52)	-0.02 (-0.37)
Exchange rate volatility			-0.26*** (-4.25)						-0.29*** (-3.06)	-7.86 (-1.24)
Lending rate				-0.44* (-1.77)						-0.56** (-2.42)
Dummy for common law					-1.39 (-0.28)				0.38 (0.06)	-2.90 (-0.44)
Domestic credit by banks						0.05 (0.90)				0.03 (0.57)
Stock market capitalization							-0.02 (-0.48)		-0.03 (-0.83)	-0.03 (-0.94)
Capital controls								-0.16 (-1.08)	-0.18 (-1.59)	-0.20 (-1.64)
Constant	-42.62** (-2.43)	-41.27** (-2.49)	-37.39* (-1.86)	-27.81 (-1.55)	-42.01** (-2.43)	-28.86* (-1.73)	-43.88** (-2.44)	-38.99** (-2.08)	-31.51 (-1.66)	-5.60 (-0.30)
Adjusted R^2	0.31	0.30	0.36	0.38	0.30	0.34	0.31	0.28	0.33	0.38
Number of observations	762	721	525	490	762	517	753	725	458	391

Notes:

1. Dependent variable is the amount of bonds outstanding scaled by GDP.
2. Independent variables include variables related to a country's macroeconomic situation, institutional quality, and degree of capital controls.
3. Numbers in parentheses are *t*-statistics. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Source: Author's

Table 5: Determinants of Financial Bonds Outstanding

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Logarithm of GDP per capita	13.03*** (5.58)	12.64*** (5.07)	11.32*** (3.66)	9.43*** (3.92)	12.67*** (5.14)	9.50*** (2.79)	13.03*** (5.04)	13.58*** (5.31)	12.37*** (4.64)	10.89*** (4.16)	9.44*** (3.68)
Fiscal balance	-0.59 (-0.78)									0.88 (0.79)	-0.03 (-0.04)
Exports to GDP		-0.07 (-1.16)								-0.08 (-0.78)	-0.11 (-1.28)
Exchange rate volatility			-0.03 (-1.67)							-0.11 (-1.52)	-0.04 (-0.47)
Lending rate				-0.21* (-1.85)							-0.21 (-1.11)
Dummy for common law					-1.81 (-0.28)					-2.20 (-0.28)	-3.05 (-0.38)
Domestic credit by banks						0.05* (1.71)					0.01 (0.26)
Stock market capitalization							-0.01 (-0.26)			-0.01 (-0.17)	0.01 (0.25)
Capital controls								-0.04 (-0.47)		0.00 (0.03)	0.01 (0.07)
Government bond									0.05 (0.50)	0.17 (0.94)	0.10 (0.57)
Constant	-96.34*** (-5.09)	-91.08*** (-4.60)	-81.76*** (-3.40)	-63.92*** (-3.32)	-93.02*** (-4.57)	-71.60*** (-2.83)	-95.77*** (-4.59)	-99.11*** (-4.52)	-92.56*** (-4.44)	-75.63*** (-3.43)	-62.56** (-2.69)
Adjusted R^2	0.24	0.28	0.34	0.38	0.23	0.36	0.24	0.23	0.24	0.39	0.43
Number of observations	762	815	568	546	858	582	843	818	858	458	391

Notes:
1. Dependent variable is bonds outstanding scaled by GDP.
2. Independent variables include variables related to a country's macro-economy, institutional quality, and degree of capital controls.
3. Numbers in parentheses are *t*-statistics. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively.

Source: Author's

Table 6: Determinants of Corporate Bonds Outstanding

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Logarithm of GDP per capita	1.89*** (3.85)	1.78*** (3.06)	2.11*** (3.19)	1.44* (1.98)	1.82*** (3.81)	1.30* (1.75)	1.57*** (3.15)	2.52*** (2.74)	1.48*** (3.19)	2.34 (1.61)	1.59 (1.12)
Fiscal balance	-0.06 (-0.43)									0.33 (0.94)	0.42 (1.41)
Exports to GDP		-0.00 (-0.01)								0.00 (0.03)	0.00 (0.04)
Exchange rate volatility			-0.02** (-2.36)							-0.02 (-1.08)	0.05 (0.95)
Lending rate				-0.20*** (-3.31)							-0.29 (-1.51)
Dummy for common law					1.12 (0.52)					0.77 (0.29)	-0.59 (-0.20)
Domestic credit by banks						0.02* (1.80)					1.45 (1.26)
Stock market capitalization							0.01 (1.15)			0.00 (0.31)	-0.00 (-0.22)
Capital controls								-0.08 (-1.01)		-0.11 (-0.87)	-0.16 (-1.29)
Government bond									0.05** (2.48)	0.07** (2.28)	0.03 (0.95)
Constant	-11.41** (-2.64)	-10.68** (-2.50)	-12.90** (-2.48)	-4.04 (-0.64)	-11.20** (-2.68)	-8.48 (-1.63)	-9.56** (-2.37)	-10.78** (-2.42)	-9.46** (-2.42)	-8.11 (-1.55)	6.96 (0.84)
Adjusted R^2	0.10	0.10	0.14	0.18	0.10	0.19	0.11	0.10	0.12	0.20	0.30
Number of observations	762	815	568	546	858	582	843	818	858	458	391

Notes:
1. Dependent variable is bonds outstanding scaled by GDP.
2. Independent variables include variables related to a country's macro economy, institutional quality, and degree of capital controls.
3. Numbers in parentheses are *t*-statistics. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively.

Source: Author's

Table 7A: Determinants of US Investors' Holdings of Domestic Debt Securities

.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Logarithm of GDP per capita	0.01*** (2.89)	0.02*** (3.20)	0.01** (2.72)	0.01** (2.71)	0.02*** (3.19)	0.01*** (3.76)	0.01*** (3.28)	0.01** (2.17)	0.01** (2.24)	0.02** (2.22)
Fiscal balance	0.00* (1.93)								0.00** (2.11)	0.00 (0.66)
Exports to GDP		-0.00 (-0.35)							-0.00 (-1.17)	-0.00* (-2.03)
Exchange rate volatility			-0.00 (-0.33)						0.00 (1.34)	0.00 (1.66)
Lending rate				0.00 (0.86)						-0.00 (-0.25)
Dummy for common law					0.03* (1.69)				0.03** (2.12)	0.04** (2.67)
Domestic credit by banks						-0.01 (-0.57)				-0.02 (-1.20)
Stock market capitalization							0.00 (0.15)		-0.00* (-1.78)	-0.00 (-1.16)
Capital controls								0.00* (1.81)	0.00* (1.75)	0.00 (1.67)
Constant	-0.08** (-2.28)	-0.12*** (-2.87)	-0.07** (-2.26)	-0.08** (-2.44)	-0.11*** (-2.75)	-0.09*** (-2.93)	-0.10*** (-2.79)	-0.09** (-2.46)	-0.10** (-2.47)	-0.14** (-2.40)
Adjusted R^2	0.14	0.13	0.14	0.13	0.14	0.16	0.09	0.09	0.42	0.42
Number of observations	266	254	170	176	286	175	283	272	131	99

Notes:
1. Holdings of domestic bonds by US investors are obtained from US Treasury department for the period of 2003–2008.
2. Independent variables include variables related to a country's macroeconomic situation, institutional quality, and degree of capital controls.
3. Numbers in parentheses are *t*-statistics. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Source: Author's

Table 7B: Determinants of US Investors' Holdings of Domestic Debt Securities: Sensitivity Tests

	(1)	(2)	(3)	(4)
Logarithm of GDP per capita	0.00 (0.48)	-0.00 (-0.18)	-0.00 (-0.11)	-0.00 (-0.45)
Fiscal balance	0.00 (0.95)	0.00 (0.59)	0.00 (1.13)	0.00** (2.80)
Exports to GDP	-0.00 (-0.25)	-0.00 (-0.09)	-0.00 (-0.13)	-0.00 (-1.46)
Exchange rate volatility	0.00** (2.28)	0.00** (2.39)	0.00** (2.29)	0.00 (1.68)
Stock market capitalization	-0.00 (-0.73)	-0.00 (-0.66)	-0.00 (-0.74)	-0.00 (-0.56)
Capital control	0.00** (2.10)	0.00* (1.80)	0.00* (1.91)	0.00 (1.59)
Investment profile	0.00* (1.97)			
Law and order		0.01* (1.77)		
Bureaucratic quality			0.02** (2.52)	
Accounting standard				0.00*** (3.28)
Constant	-0.08** (-2.20)	-0.06* (-1.74)	-0.06* (-1.83)	-0.11** (-2.45)
Adjusted R^2	0.28	0.31	0.32	0.41
Number of observations (N)	101	101	101	116

Notes:
1. Holdings of domestic bonds by US investors from US Treasury department for 2003–2008.
2. Independent variables include variables related to a country's macro-economy, institutional quality, and degree of capital controls.
3. Numbers in parentheses are *t*-statistics. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively.

Source: Author's

Table 8: Summary Statistics of Bid-Ask Spreads of Government Bond Trading
(basis points)

Economy/Year	mean	median
Economy		
China, People's Republic of	15.87	15.00
Hong Kong, China	4.30	3.75
Indonesia	58.47	34.30
Malaysia	4.45	2.90
Philippines	22.37	22.40
Singapore	6.02	3.15
Korea, Republic of	2.55	1.75
Thailand	5.43	4.85
Year		
2000	22.14	4.20
2004	27.80	6.40
2006	7.77	3.00
2007	11.96	7.15
2008	13.37	13.60
2009	6.54	3.85
Total	**14.93**	**5.30**

Source: *AsianBondsOnline*

Table 9: Regression of Bid-Ask Spreads of Local Currency Government Bonds on US Investors' Local Currency Bond Holdings

	(1)	(2)	(3)	(4)
US investors' holdings				
Long-term plus short-term bonds	-3.14 (-1.37)			
Short-term bonds		-39.79* (-2.00)		-26.03*** (-2.79)
Long-term bonds			-3.11 (-1.32)	
Logarithm of GDP per capita				-8.13** (-2.26)
Constant	21.01** (2.53)	16.97*** (3.39)	20.81** (2.51)	85.39** (2.48)
Adjusted R^2	0.01	0.01	0.01	0.17
Number of Observations (N)	32	32	32	32

Notes:
1. Given the small sample size, only the logarithm of GDP is included as explanatory variable in addition to US investors' local bond holdings.
2. Numbers in parentheses are *t*-statistics. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively.

Source: Author's

Table 10: Bond Depositary Balance by Bond Type and Market as of the End of 2010
(CNY 100 million)

Bonds	Total	%	Interbank	Stock Exchange	OTC	Other
Government Bonds	66,628	33.0%	61,573	1,977	1,713	1,365
Treasury	59,628	29.6%	57,573	1,977	77	1
Savings (Electronic)	3,000	1.5%	0	0	1,636	1,364
Local Government	4,000	2.0%	4,000	0	0	0
Central Bank Bonds	40,909	20.3%	37,100	0	0	3,809
Policy Bank Bonds	51,604	25.6%	49,154	0	0	2,450
China Development Bank	36,805	18.2%	34,405	0	0	2,400
Export-Import Bank of China	5,529	2.7%	5,529	0	0	0
Agricultural Dev. Bank of China	9,270	4.6%	9,220	0	0	50
Government Supporting Institution Bonds	1,090	0.5%	1,090	0	0	0
Commercial Bank Bonds	6,095	3.0%	6,079	0	0	16
Nonbank Financial Institution Bonds	567	0.3%	567	0	0	0
Enterprise Bonds	14,510	7.2%	12,897	901	4	708
Central Enterprise	8,795	4.4%	7,743	343	4	705
Local Enterprise	5,694	2.8%	5,139	552	0	3
Collected Bonds	21	0.0%	15	6	0	0
Commercial Papers	6,530	3.2%	6,530	0	0	0
ABS/MBS	182	0.1%	170	0	0	12
Medium Term Notes	13,536	6.7%	13,536	0	0	0
SME Collected Notes	55	0.0%	55	0	0	0
Foreign Bonds	40	0.0%	40	0	0	0
Others	0	0.0%	0	0	0	0
Total	**201,746**		**188,791**	**2,878**	**1,717**	**8,360**
% of total	100%		94%	1%	1%	4%

Source: www.chinabond.com.cn

Table 11: Bond Depositary Balance by Investors as of the End of 2010
(CNY 100 million)

Institution	Amount	%
Special Members	17,533	9%
Commercial Banks	140,870	69%
National Commercial	121,924	60%
Foreign	1,807	1%
City Commercial	12,150	6%
Rural Commercial	4,101	2%
Rural Cooperative	803	0%
Rural	4	0%
Others	81	0%
Credit Cooperative Banks	4,259	2%
Nonbank Financial Institutions	859	0%
Securities Companies	1,513	1%
Insurance Institutions	19,622	10%
Funds Institutions	11,947	6%
Non-financial Institutions	437	0%
Interbank Market	398	0%
OTC Market	39	0%
Individuals	3,315	2%
Exchanges	2,879	1%
Others	172	0%
Total	**203,405**	**100%**

Source: www.chinabond.com.cn

Table 12: Bond Holdings Structure
(CNY 100 million)

	TB	Policy Bank Bonds			CB	CP	MTN	CBB	Total	%
		CDB	CEXIM	ADBC						
Special Members	15,569	49	111	118	53	149	193	35	16,277	11%
Commercial Banks	36,586	28,280	4,762	8,067	4,964	3,458	8,985	2,047	97,148	64%
National Commercial	30,043	24,838	4,090	6,709	3,485	2,863	7,428	1,564	81,019	53%
Foreign	552	174	73	78	2	41	99	3	1,022	1%
City Commercial	4,489	2,248	397	822	790	383	1,074	334	10,537	7%
Rural Commercial	1,211	836	170	396	591	126	331	127	3,788	2%
Rural Cooperative	261	162	30	56	93	40	43	17	702	0%
Rural	0	0	0	1	2	0	0	1	4	0%
Others	28	22	3	5	2	6	10	1	76	0%
Credit Cooperative Banks	653	920	166	342	880	144	600	214	3,918	3%
Nonbank Financial Institutions	290	28	9	21	176	90	187	19	820	1%
Securities Companies	21	84	18	14	520	292	443	83	1,475	1%
Insurance Institutions	3,642	5,567	115	303	5,497	367	265	3,013	18,769	12%
Funds Institutions	789	1,857	342	396	1,386	1,994	2,783	621	10,168	7%
Non-financial Institutions	61	16	5	10	129	37	77	63	398	0%
Interbank Market	23	16	5	10	129	37	77	63	359	0%
OTC Market	38	0	0	0	0	0	0	0	39	0%
Individuals	23	0	0	0	1	0	0	0	24	0%
Exchanges	1,977	0	0	0	901	0	0	0	2,878	2%
Others	17	4	2	0	3	0	3	0	29	0%
Total	**59,628**	**36,805**	**5,529**	**9,270**	**14,511**	**6,530**	**13,536**	**6,095**	**151,904**	**100%**

CB=Corporate Bonds; CBB=Commercial Bank Bonds; CDB=China Development Bank; CEXIM=Export-Import Bank of China; CP=Commercial Papers; MTN=Medium-term Note; TB=Treasury Bond.
Source: Shanghai Stock Exchange

Table 13: Institutional and Legal Framework of the People's Republic of China Bond Market

Market	Issuers	Main Investors	Trading Venue	Main Law	Regulator
Government bonds	Central government	Commercial banks	IBM, SE	State Council regulation	MOF/PBC CSRC (listing)
Municipal bonds	Local government	Institutional investors	IBM, SE	State Council regulation	MOF/PBC CSRC (listing)
Financial policy bonds	CDB, CEXIM, ADBC	Commercial banks	IBM	Charter from the S.C.	PBC
Central bank bills	PBC	Commercial banks	IBM	PBC Law	PBC
Subordinated bonds by banks	Banks	Commercial banks and insurance companies	IBM	PBC/CBRC regulation	CBRC/PBC
Securities firm bonds	Securities firms	Qualified Institutional investor	private placement	CSRC regulation	CSRC
Enterprise bonds	SOEs	Insurance companies	IBM,SE, OTC	State Council regulation	NDRC CSRC (listing)
Corporate bonds	Joint stock companies	Insurance companies	SE	State Council regulation/Company Law/Securities Law	CSRC
Convertible bonds	SE-listed corporations		SE	Company Law/Securities Law	CSRC
ABS/MBS				Trust Law/Special regulation envisaged	
SMECN	SME	Institutional Investors	IBM		PBC
CP/MTN	Non-financial Corporate	Institutional Investors	IBM		PBC

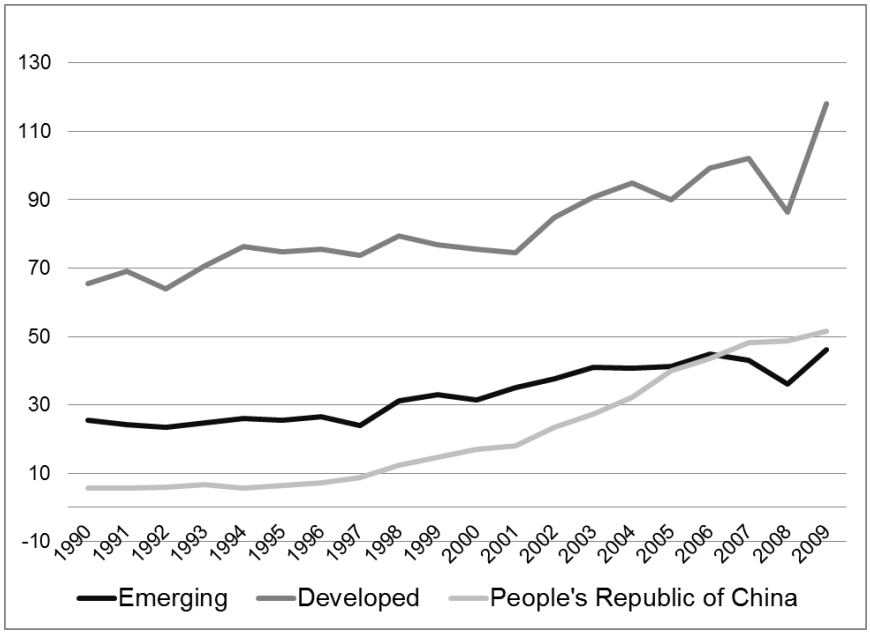
Note: See abbreviations for the definitions.
Sources: (i) Noritaka Akamatsu (2005) unpublished paper, "Future of China's Fixed Income Market," June, p.6 and (ii) China Securities Regulatory Commission, Shanghai Regulatory Bureau.

Table 14: Regulatory Framework of the Financial Intermediaries in the People's Republic of China

Agencies	Role & Function	Legal Framework
NDRC	Lead regulator of the enterprise bond market. supervises enterprise bonds related to infrastructure. Controls master issuance quota. Authorizes new issue applications. No responsibility for the secondary market or post-issue disclosure.	• Enterprise Bond Regulation 1993 • Enterprise Bond Issuance and Transfer Measures • 1993 State Council Notice
PBC	Regulator of money market, interbank bond market and trading platform (CFETS). Supervises CP, MTN issued by non-financial institutions in the interbank market, financial asset-backed securities, and SMECN.	• IBM Management Measures • IBM Trading Regulation • Provisional Regulation on Trading Activities on CFETS
CSRC	Securities market regulator. Supervises corporate bonds; real asset-backed securities ("Collective Asset Management Plan, CAMP"), and market participants including listed companies, securities companies, and other intermediaries, such as stock exchanges, securities investment funds and their asset managers.	• Company Law • Securities Law and its State Council interpretations • Securities Investment Fund Law • 1993 State Council Notice
CIRC	Insurance industry regulator. Determines permitted investments for insurance companies.	• Provisional Regulation on Investment in Enterprise Bonds by Insurance Company
CBRC	Banking regulator. Determines permitted activities (corporate bond issuance and guarantees, intermediary business, permitted investments).	• Capital and other prudential regulation for banks
MOF	Supervises NSSF and its investment activities.	• NSSF Investment Regulation
MOLSS	Supervises NSSF, corporate pension funds and their investment activities as well as regulating pension asset managers.	• Provisional Regulation on Management of Corporate Pension Funds
Shanghai & Shenzhen Stock Exchanges	Stock exchange operators. Supervise new listings and continuing disclosure (regulated by CSRC)	• Stock Exchange Listing Rules
CFETS	Trading platform for interbank foreign exchange and money market transactions. Also trading platform for government and financial bonds among members of the interbank bond market.	• Supervised by PBC
CCDC	Central depository for government, financial and corporate bonds, as well as central bank bills.	• Supervised by PBC and MOF （http://www.chinabond.com.cn）
CSDCC	Engages in all depository and settlement operations originally handled by the Shanghai and Shenzhen stock exchanges, marking the advent of the unified securities depository and settlement system in PRC.	• Supervised by CSRC （http://www.chinaclear.cn）

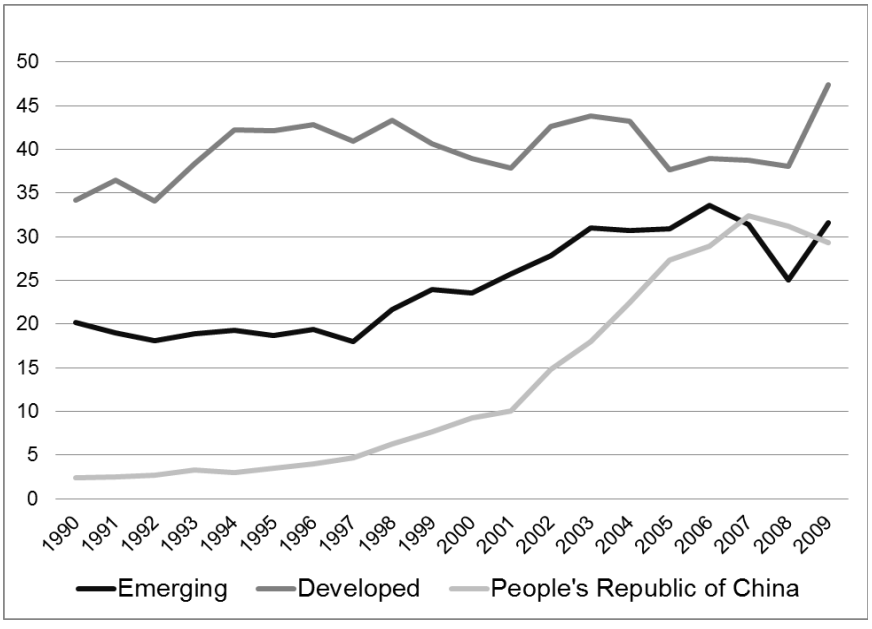
Note: See abbreviations for the definitions.
Sources: (i) Noritaka Akamatsu (2005) unpublished paper, "Future of China's Fixed Income Market," June, p.7 and (ii) China Securities Regulatory Commission, Shanghai Regulatory Bureau.

Figure 1A: Total Bond Issues
(% of GDP)



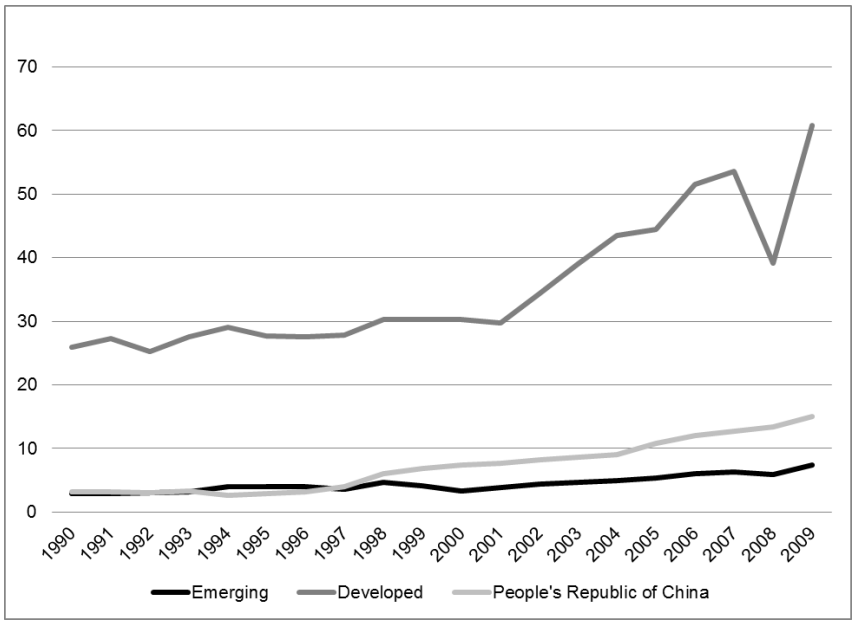
Source: Bank for International Settlements (BIS)

Figure 1B: Government Bond Issues
(% of GDP)



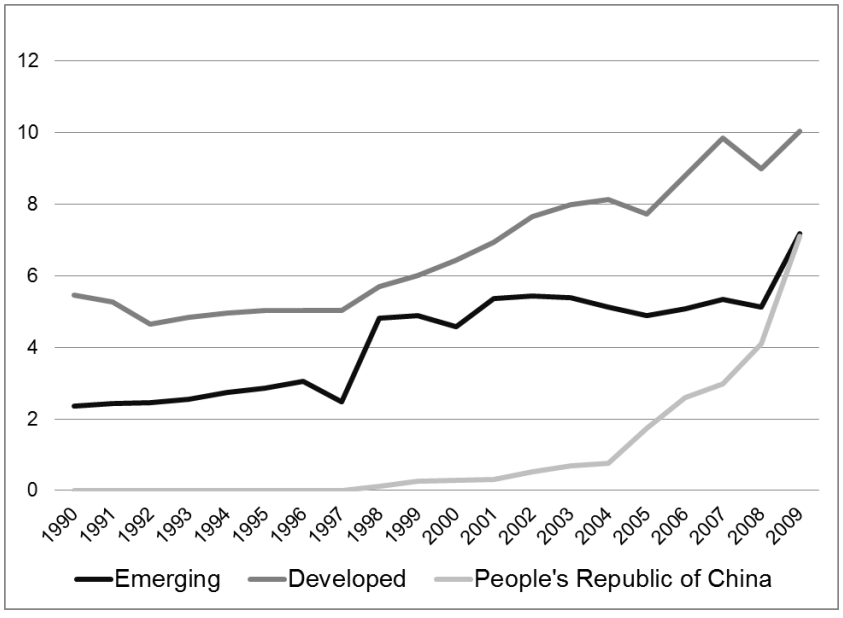
Source: Bank for International Settlements (BIS)

Figure 1C: Financial Bond Issues
(% of GDP)



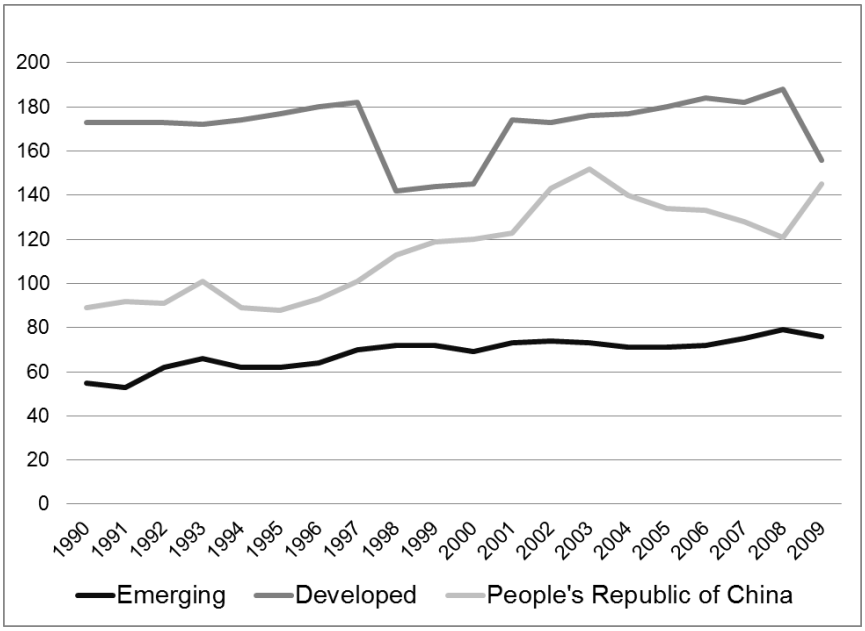
Source: Bank for International Settlements (BIS)

Figure 1D: Financial Bond Issues
(% of GDP)



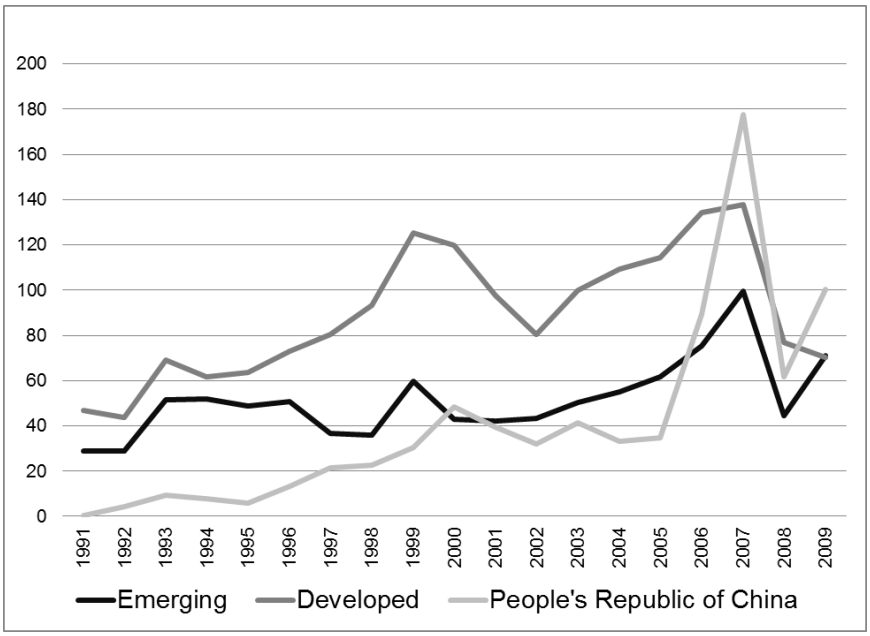
Source: Bank for International Settlements (BIS)

Figure 2A: Domestic Credit Provided by Banking Sector
(% of GDP)



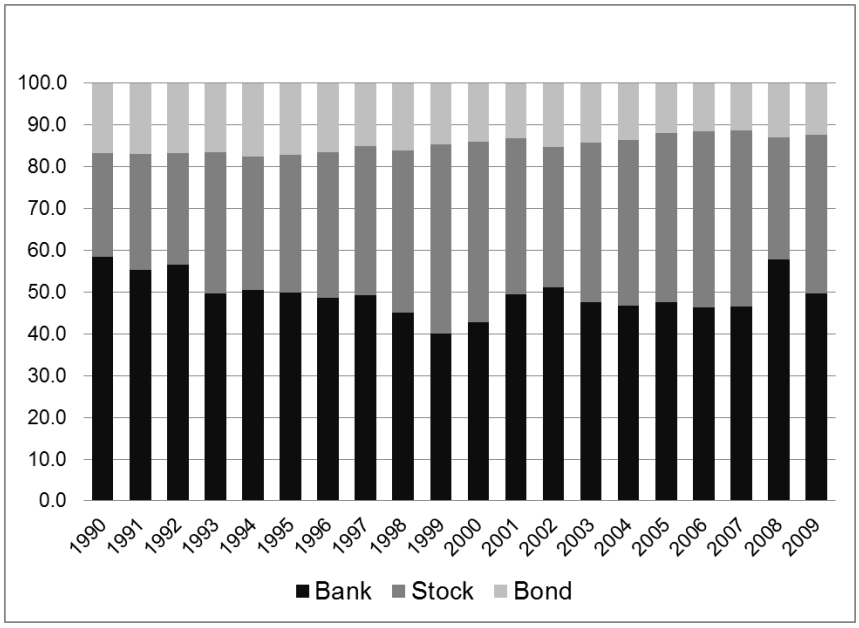
Source: BIS.

Figure 2B: Stock Market Capitalization
(% of GDP)



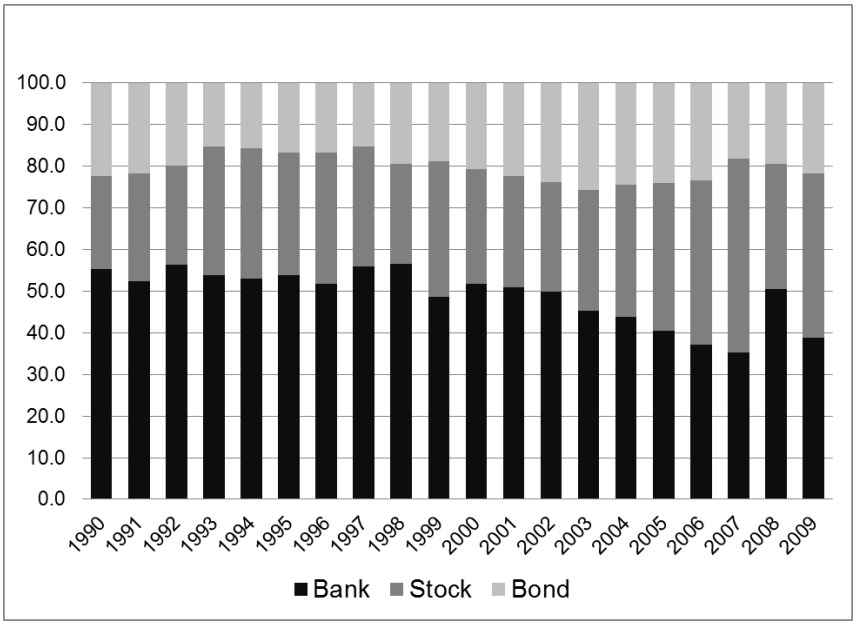
Source: BIS.

Figure 3A: Composition of External Finance - Developed Markets (% of total)



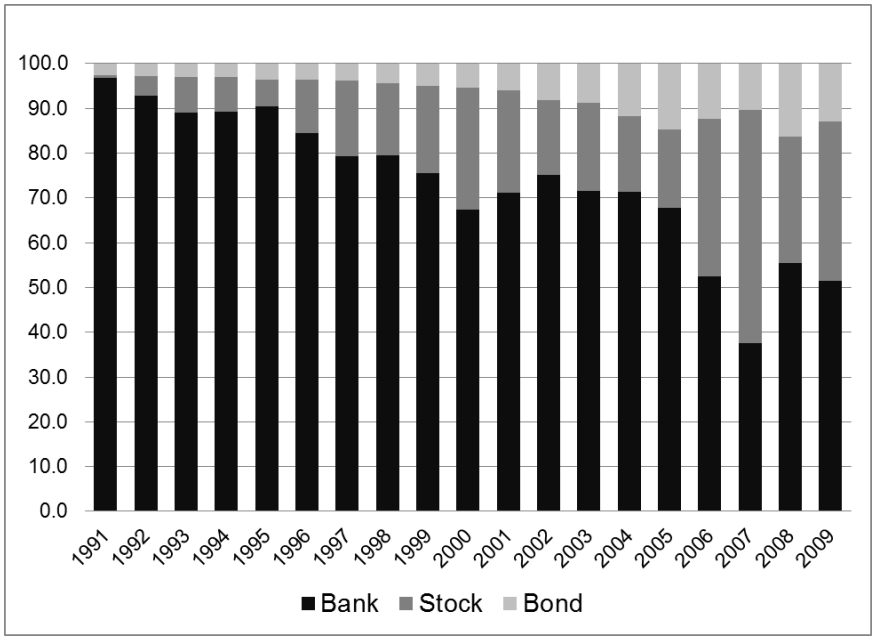
Source: BIS.

Figure 3B: Composition of External Finance - Emerging Markets (% of total)



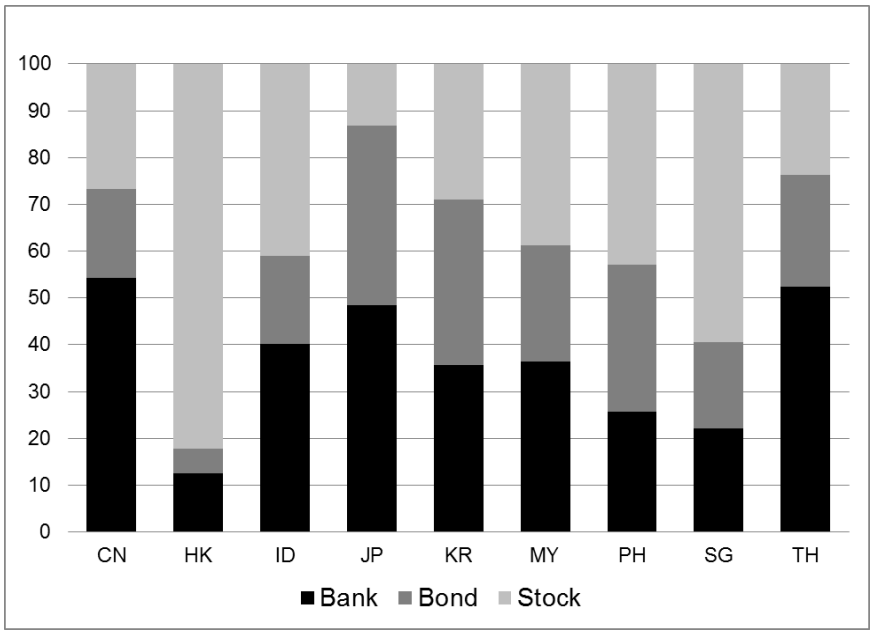
Source: BIS.

Figure 3C: Composition of External Finance–The People's Republic of China (% of total)



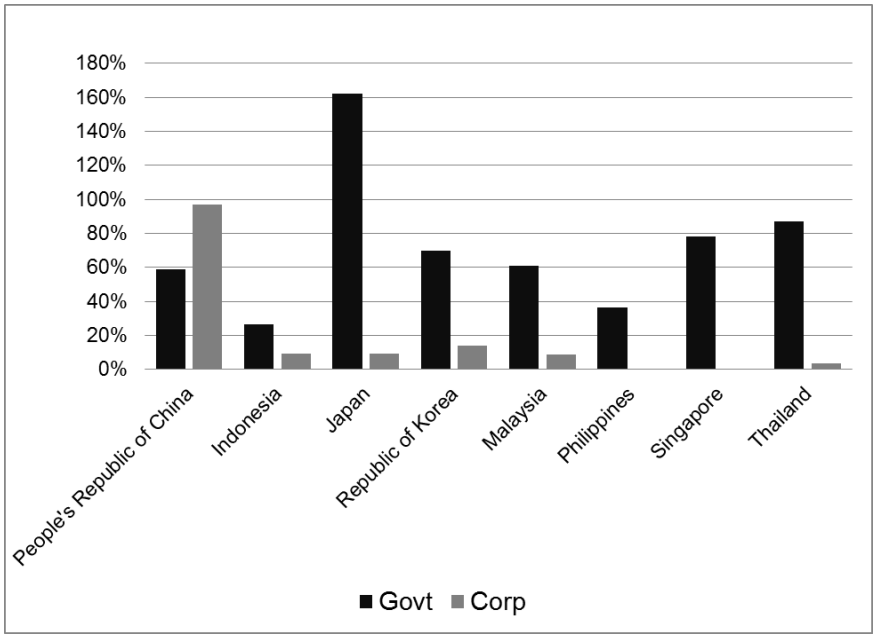
Source: BIS.

Figure 3D: Domestic Financing in Asian Markets as of 2009 (% of total)



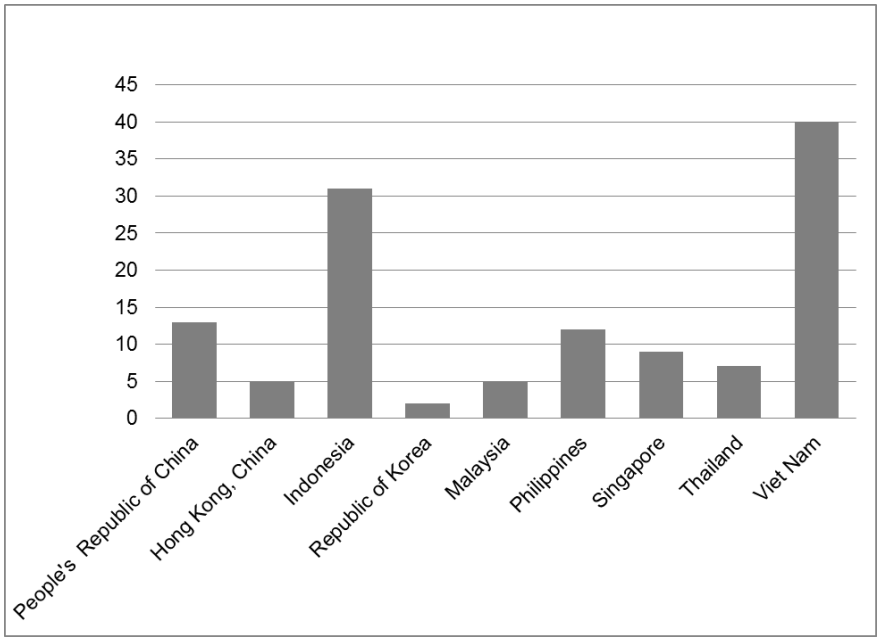
Source: BIS.

Figure 4: Bond Turnover Ratio – Average of 2007-2009



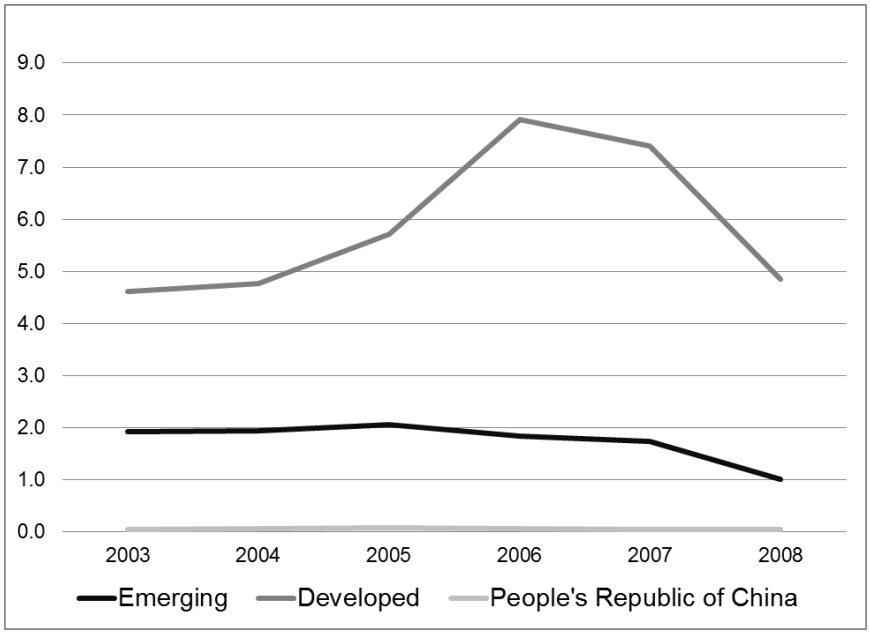
Source: *AsianBondsOnline*

Figure 5: Survey Evidence on Bid-Ask Spread of Government Bond Transactions – Average of 2007-2009



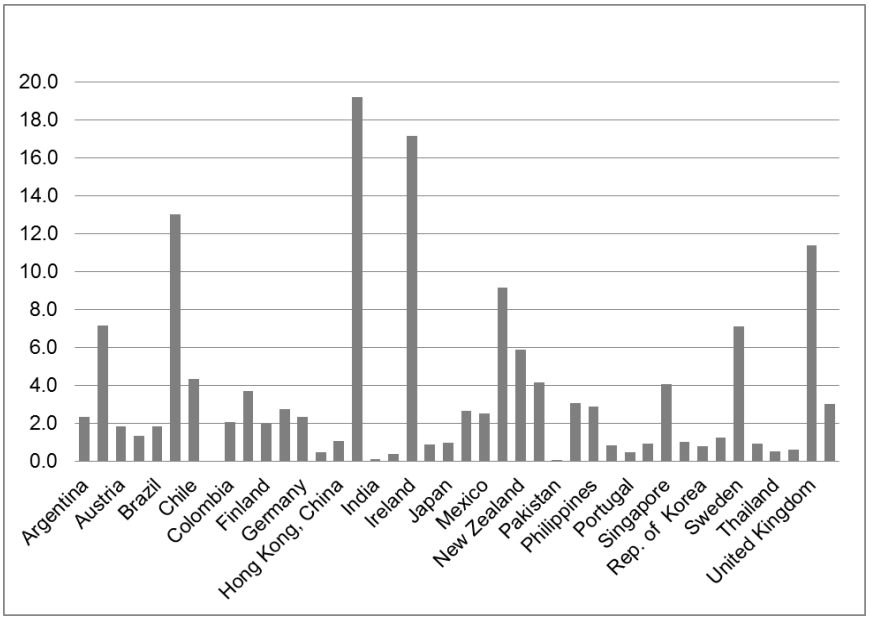
Source: *AsianBondsOnline*

Figure 6A: The United States Investors' Holdings of Local Currency Bonds (% of GDP)



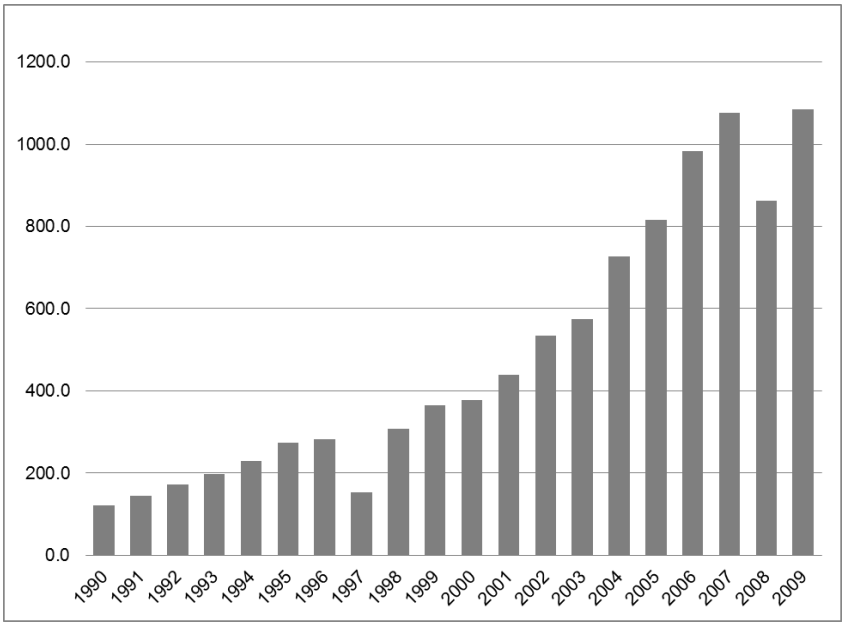
Source: US Treasury Department, available at http://www.treas.gov/tic/fpis.shtml#usclaims.

Figure 6B: The United States Investors' Holdings of Domestic Bonds – Average of 2003-2008 (% of GDP)



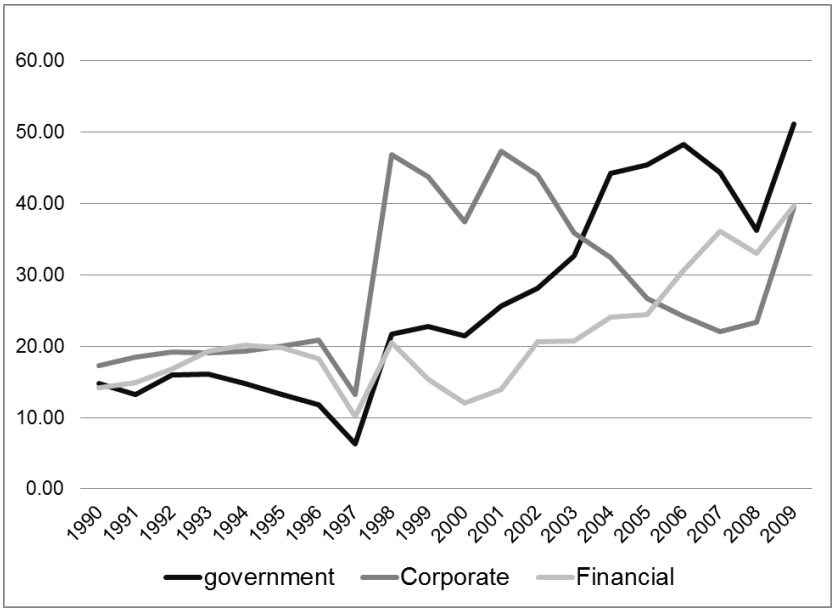
Source: US Treasury Department, available at http://www.treas.gov/tic/fpis.shtml#usclaims.

Figure 7A: Total Amount of Bonds Outstanding – The Republic of Korea ($ billion)



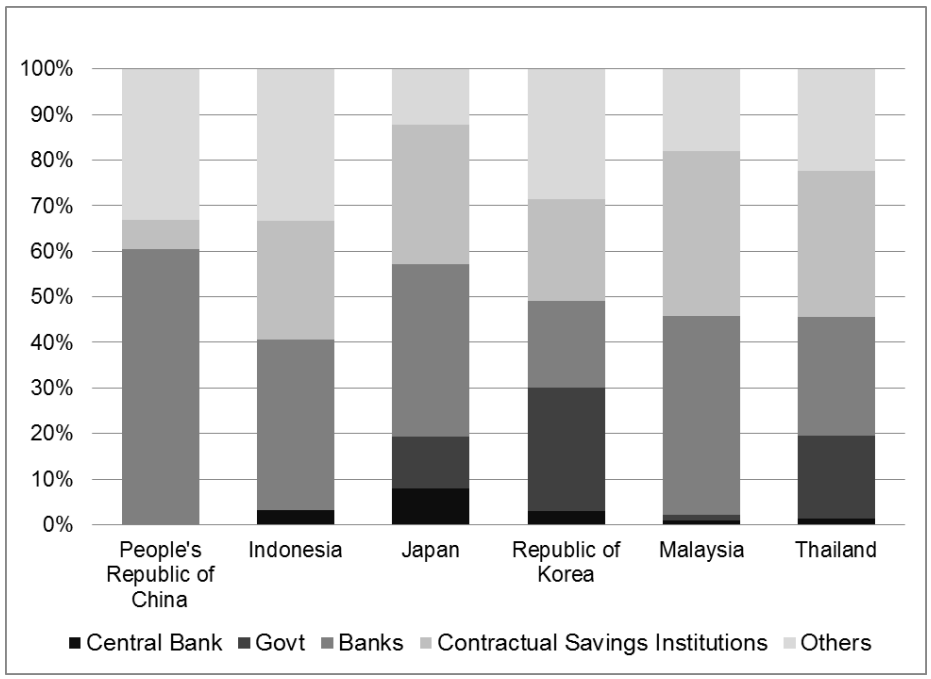
Source: Bank for International Settlements

Figure 7B: Bonds Outstanding – The Republic of Korea (% GDP)



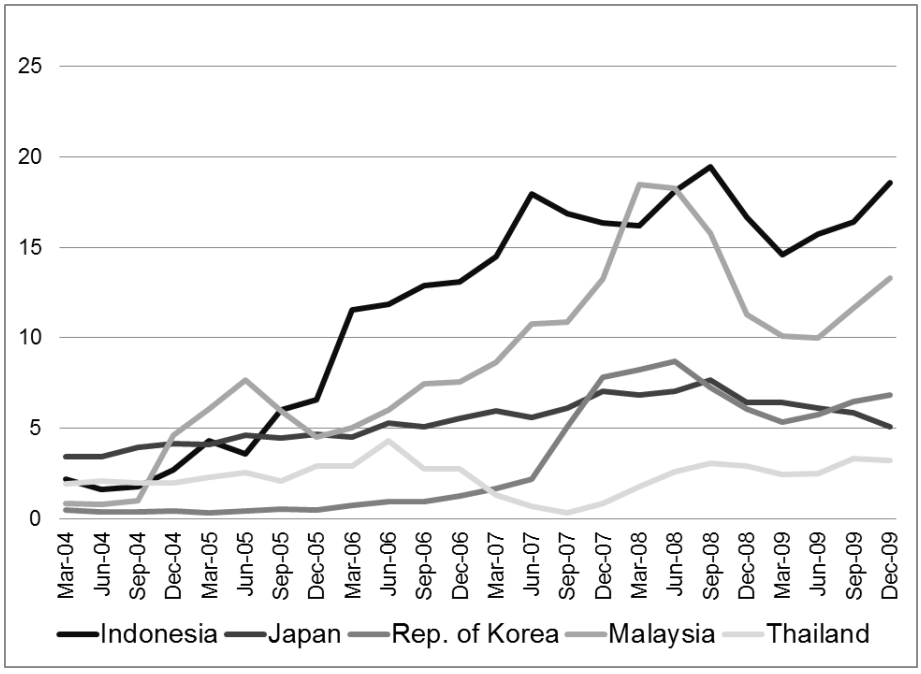
Source: Bank for International Settlements

Figure 8: Investor Profile: Government Bonds as of June 2010



Source: *AsianBondsOnline*

Figure 9: Foreign Holdings of Local Government Bonds



Source: *AsianBondsOnline*

ADB Working Paper Series on Regional Economic Integration*

1. "The ASEAN Economic Community and the European Experience" by Michael G. Plummer

2. "Economic Integration in East Asia: Trends, Prospects, and a Possible Roadmap" by Pradumna B. Rana

3. "Central Asia after Fifteen Years of Transition: Growth, Regional Cooperation, and Policy Choices" by Malcolm Dowling and Ganeshan Wignaraja

4. "Global Imbalances and the Asian Economies: Implications for Regional Cooperation" by Barry Eichengreen

5. "Toward Win-Win Regionalism in Asia: Issues and Challenges in Forming Efficient Trade Agreements" by Michael G. Plummer

6. "Liberalizing Cross-Border Capital Flows: How Effective Are Institutional Arrangements against Crisis in Southeast Asia" by Alfred Steinherr, Alessandro Cisotta, Erik Klär, and Kenan Šehović

7. "Managing the Noodle Bowl: The Fragility of East Asian Regionalism" by Richard E. Baldwin

8. "Measuring Regional Market Integration in Developing Asia: a Dynamic Factor Error Correction Model (DF-ECM) Approach" by Duo Qin, Marie Anne Cagas, Geoffrey Ducanes, Nedelyn Magtibay-Ramos, and Pilipinas F. Quising

9. "The Post-Crisis Sequencing of Economic Integration in Asia: Trade as a Complement to a Monetary Future" by Michael G. Plummer and Ganeshan Wignaraja

10. "Trade Intensity and Business Cycle Synchronization: The Case of East Asia" by Pradumna B. Rana

11. "Inequality and Growth Revisited" by Robert J. Barro

12. "Securitization in East Asia" by Paul Lejot, Douglas Arner, and Lotte Schou-Zibell

13. "Patterns and Determinants of Cross-border Financial Asset Holdings in East Asia" by Jong-Wha Lee

14. "Regionalism as an Engine of Multilateralism: A Case for a Single East Asian FTA" by Masahiro Kawai and Ganeshan Wignaraja

15. “The Impact of Capital Inflows on Emerging East Asian Economies: Is Too Much Money Chasing Too Little Good?” by Soyoung Kim and Doo Yong Yang

16. “Emerging East Asian Banking Systems Ten Years after the 1997/98 Crisis” by Charles Adams

17. “Real and Financial Integration in East Asia” by Soyoung Kim and Jong-Wha Lee

18. “Global Financial Turmoil: Impact and Challenges for Asia’s Financial Systems” by Jong-Wha Lee and Cyn-Young Park

19. “Cambodia’s Persistent Dollarization: Causes and Policy Options” by Jayant Menon

20. “Welfare Implications of International Financial Integration” by Jong-Wha Lee and Kwanho Shin

21. “Is the ASEAN-Korea Free Trade Area (AKFTA) an Optimal Free Trade Area?” by Donghyun Park, Innwon Park, and Gemma Esther B. Estrada

22. “India’s Bond Market—Developments and Challenges Ahead” by Stephen Wells and Lotte Schou- Zibell

23. “Commodity Prices and Monetary Policy in Emerging East Asia” by Hsiao Chink Tang

24. “Does Trade Integration Contribute to Peace?” by Jong-Wha Lee and Ju Hyun Pyun

25. “Aging in Asia: Trends, Impacts, and Responses” by Jayant Menon and Anna Melendez-Nakamura

26. “Re-considering Asian Financial Regionalism in the 1990s” by Shintaro Hamanaka

27. “Managing Success in Viet Nam: Macroeconomic Consequences of Large Capital Inflows with Limited Policy Tools” by Jayant Menon

28. “The Building Block versus Stumbling Block Debate of Regionalism: From the Perspective of Service Trade Liberalization in Asia” by Shintaro Hamanaka

29. “East Asian and European Economic Integration: A Comparative Analysis” by Giovanni Capannelli and Carlo Filippini

30. “Promoting Trade and Investment in India’s Northeastern Region” by M. Govinda Rao

31. "Emerging Asia: Decoupling or Recoupling" by Soyoung Kim, Jong-Wha Lee, and Cyn-Young Park

32. "India's Role in South Asia Trade and Investment Integration" by Rajiv Kumar and Manjeeta Singh

33. "Developing Indicators for Regional Economic Integration and Cooperation" by Giovanni Capannelli, Jong-Wha Lee, and Peter Petri

34. "Beyond the Crisis: Financial Regulatory Reform in Emerging Asia" by Chee Sung Lee and Cyn-Young Park

35. "Regional Economic Impacts of Cross-Border Infrastructure: A General Equilibrium Application to Thailand and Lao PDR" by Peter Warr, Jayant Menon, and Arief Anshory Yusuf

36. "Exchange Rate Regimes in the Asia-Pacific Region and the Global Financial Crisis" by Warwick J. McKibbin and Waranya Pim Chanthapun

37. "Roads for Asian Integration: Measuring ADB's Contribution to the Asian Highway Network" by Srinivasa Madhur, Ganeshan Wignaraja, and Peter Darjes

38. "The Financial Crisis and Money Markets in Emerging Asia" by Robert Rigg and Lotte Schou-Zibell

39. "Complements or Substitutes? Preferential and Multilateral Trade Liberalization at the Sectoral Level" by Mitsuyo Ando, Antoni Estevadeordal, and Christian Volpe Martincus

40. "Regulatory Reforms for Improving the Business Environment in Selected Asian Economies—How Monitoring and Comparative Benchmarking can Provide Incentive for Reform" by Lotte Schou-Zibell and Srinivasa Madhur

41. "Global Production Sharing, Trade Patterns, and Determinants of Trade Flows in East Asia" by Prema-chandra Athukorala and Jayant Menon

42. "Regionalism Cycle in Asia (-Pacific): A Game Theory Approach to the Rise and Fall of Asian Regional Institutions" by Shintaro Hamanaka

43. "A Macroprudential Framework for Monitoring and Examining Financial Soundness" by Lotte Schou-Zibell, Jose Ramon Albert, and Lei Lei Song

44. "A Macroprudential Framework for the Early Detection of Banking Problems in Emerging Economies" by Claudio Loser, Miguel Kiguel, and David Mermelstein

45. “The 2008 Financial Crisis and Potential Output in Asia: Impact and Policy Implications” by Cyn-Young Park, Ruperto Majuca, and Josef Yap

46. “Do Hub-and-Spoke Free Trade Agreements Increase Trade? A Panel Data Analysis” by Jung Hur, Joseph Alba, and Donghyun Park

47. “Does a Leapfrogging Growth Strategy Raise Growth Rate? Some International Evidence” by Zhi Wang, Shang-Jin Wei, and Anna Wong

48. “Crises in Asia: Recovery and Policy Responses” by Kiseok Hong and Hsiao Chink Tang

49. “A New Multi-Dimensional Framework for Analyzing Regional Integration: Regional Integration Evaluation (RIE) Methodology” by Donghyun Park and Mario Arturo Ruiz Estrada

50. “Regional Surveillance for East Asia: How Can It Be Designed to Complement Global Surveillance?” by Shinji Takagi

51. “Poverty Impacts of Government Expenditure from Natural Resource Revenues” by Peter Warr, Jayant Menon, and Arief Anshory Yusuf

52. “Methods for Ex Ante Economic Evaluation of Free Trade Agreements” by David Cheong

53. “The Role of Membership Rules in Regional Organizations” by Judith Kelley

54. “The Political Economy of Regional Cooperation in South Asia” by V.V. Desai

55. “Trade Facilitation Measures under Free Trade Agreements: Are They Discriminatory against Non-Members?” by Shintaro Hamanaka, Aiken Tafgar, and Dorothea Lazaro

56. “Production Networks and Trade Patterns in East Asia: Regionalization or Globalization?” by Prema-chandra Athukorala

57. “Global Financial Regulatory Reforms: Implications for Developing Asia” by Douglas W. Arner and Cyn-Young Park

58. “Asia’s Contribution to Global Rebalancing” by Charles Adams, Hoe Yun Jeong, and Cyn-Young Park

59. “Methods for Ex Post Economic Evaluation of Free Trade Agreements” by David Cheong

60. “Responding to the Global Financial and Economic Crisis: Meeting the Challenges in Asia” by Douglas W. Arner and Lotte Schou-Zibell

61. "Shaping New Regionalism in the Pacific Islands: Back to the Future?" by Satish Chand

62. "Organizing the Wider East Asia Region" by Christopher M. Dent

63. "Labour and Grassroots Civic Interests In Regional Institutions" by Helen E.S. Nesadurai

64. "Institutional Design of Regional Integration: Balancing Delegation and Representation" by Simon Hix

65. "Regional Judicial Institutions and Economic Cooperation: Lessons for Asia?" by Erik Voeten

66. "The Awakening Chinese Economy: Macro and Terms of. Trade Impacts on 10 Major Asia-Pacific Countries" by Yin Hua Mai, Philip Adams, Peter Dixon, and Jayant Menon

67. "Institutional Parameters of a Region-Wide Economic Agreement in Asia: Examination of Trans-Pacific Partnership and ASEAN+α Free Trade Agreement Approaches" by Shintaro Hamanaka

68. "Evolving Asian Power Balances and Alternate Conceptions for Building Regional Institutions" by Yong Wang

69. "ASEAN Economic Integration: Features, Fulfillments, Failures, and the Future" by Hal Hill and Jayant Menon

70. "Changing Impact of Fiscal Policy on Selected ASEAN Countries" by Hsiao Chink Tang, Philip Liu, and Eddie C. Cheung

71. "The Organizational Architecture of the Asia-Pacific: Insights from the New Institutionalism" by Stephan Haggard

72. "The Impact of Monetary Policy on Financial Markets in Small Open Economies: More or Less Effective During the Global Financial Crisis?" by Steven Pennings, Arief Ramayandi, and Hsiao Chink Tang

73. "What do Asian Countries Want the Seat at the High Table for? G20 as a New Global Economic Governance Forum and the Role of Asia" by Yoon Je Cho

74. "Asia's Strategic Participation in the Group of 20 for Global Economic Governance Reform: From the Perspective of International Trade" by Taeho Bark and Moonsung Kang

75. “ASEAN’s Free Trade Agreements with the People’s Republic of China, Japan, and the Republic of Korea: A Qualitative and Quantitative Analysis” by Gemma Estrada, Donghyun Park, Innwon Park, and Soonchan Park

76. “ASEAN-5 Macroeconomic Forecasting Using a GVAR Model” by Fei Han and Thiam Hee Ng

77. “Early Warning Systems in the Republic of Korea: Experiences, Lessons, and Future Steps” by Hyungmin Jung and Hoe Yun Jeong

78. “Trade and Investment in the Greater Mekong Subregion: Remaining Challenges and the Unfinished Policy Agenda” by Jayant Menon and Anna Cassandra Melendez

79. “Financial Integration in Emerging Asia: Challenges and Prospects” by Cyn-Young Park and Jong-Wha Lee

80. “Sequencing Regionalism: Theory, European Practice, and Lessons for Asia” by Richard E. Baldwin

81. “Economic Crises and Institutions for Regional Economic Cooperation” by C. Randall Henning

82. “Asian Regional Institutions and the Possibilities for Socializing the Behavior of States” by Amitav Acharya

83. “The People’s Republic of China and India: Commercial Policies in the Giants” by Ganeshan Wignaraja

84. “What Drives Different Types of Capital Flows and Their Volatilities” by Rogelio Mercado and Cyn-Young Park

85. “Institution Building for Africal Regionalism” by Gilbert M. Khadiagala

86. “What Drives Different Types of Capital Flows and Their Volatilities” by Rogelio Mercado and Cyn-Young Park

87. “The Role of the People’s Republic of China in International Fragmentation and Production Networks: An Empirical Investigation” by Hyun-Hoon Lee, Donghyun Park, and Jing Wang

88. “Utilizing the Multiple Mirror Technique to Assess the Quality of Cambodian Trade Statistics: by Shintaro Hamanaka

89. “Is Technical Assistance under Free Trade Agreements WTO-Plus?” Review of Japan–ASEAN Economic Partnership Agreements” by Shintaro Hamanaka

90. "Intra-Asia Exchange Rate Volatility and Intra-Asia Trade: Evidence by of Goods" by Hsiao Chink Tang

91. "Is Trade in Asia Really Integrating?" by Shintaro Hamanaka

92. "The PRC's Free Trade Agreements with ASEAN, Japan, and the Republic of Korea: A Comparative Analysis" by Gemma Estrada, Donghyun Park, Innwon Park, and Soonchan Park

93. "Assessing the Resilience of ASEAN Banking Systems: The Case of Philippines" by Jose Ramon Albert and Thiam Hee Ng"

94. "Measuring Commodity-Level Trade Costs in Asia: The Basis for Effective Trade Facilitation Policies in the Region" by Shintaro Hamanaka and Romana Domingo

95. "Measuring Commodity-Level Trade Costs in Asia: The Basis for Effective Trade Facilitation Policies in the Region" by Shintaro Hamanaka and Romana Domingo

96. "Why do Imports Fall More than Exports Especially During Crises? Evidence from Selected Asian Economies" by Hsiao Chink Tang

*These papers can be downloaded from (ARIC) http://aric.adb.org/archives.php?section=0&subsection=workingpapers or (ADB) http://www.adb.org/publications/series/regional-economic-integration-working-papers

Determinants of Local Currency Bonds and Foreign Holdings: Implications for Bond Market Development in the People's Republic of China

This report explores which variables—macroeconomic, institutional, and capital controls—are most important in explaining cross-country differences in bond market development. Main findings identify determinants of local currency bond development and foreign holdings. Several policy implications are drawn from the findings that are pertinent to the case study on PRC bond market.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.8 billion people who live on less than $2 a day, with 903 million struggling on less than $1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

Asian Development Bank
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org/poverty
Publication Stock No. WPS124654

Printed in the Philippines